Deepwater Port License Application
Blue Marlin Offshore Port (BMOP) Project

Volume IIa – Offshore Project Components Environmental Evaluation (Public)
Topic Report 5: Commercial and Recreational Fisheries

Submitted to:

Maritime Administration
Office of Deepwater Ports and Offshore Activities
1200 New Jersey Avenue SE, W21-309
Washington, DC 20590

United States Coast Guard
Commandant (CG-OES-2)
Stop 7509
2703 Martin Luther King Jr. Ave. SE
Washington, DC 20593-7509

Submitted by:

Blue Marlin Offshore Port LLC
8111 Westchester Drive
Suite 600
Dallas, Texas 75225

September 2020

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Deepwater Port License Application
Blue Marlin Offshore Port (BMOP) Project

Volume I:	General (Public), including Deepwater Port License Application and Appendices (*under separate cover*)
Volume IIa:	**Offshore Project Components Environmental Evaluation (Public) (*herein*)**
Volume IIb:	Onshore Project Components, Environmental Evaluation (Public) (*under separate cover*)
Volume III:	Technical Information [***Confidential***] (*under separate cover*)
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ABBREVIATIONS AND ACRONYMS

Applicant	Blue Marlin Offshore Port LLC
BMOP	Blue Marlin Offshore Port
BMPs	Best management practices
bph	barrels per hour
BOEM	United States Bureau of Ocean Energy Management
BSEE	Bureau of Safety and Environmental Enforcement
CALM	Catenary Anchor Leg Mooring
CFR	Code of Federal Regulations
DWP	Deepwater Port
DWPA	Deepwater Port Act of 1974
EC	East Cameron
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EPA	United States Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
FMP	Fishery management plan
GMFMC	Gulf of Mexico Fishery Management Council
GOM	Gulf of Mexico
HAPC	Habitat Area of Particular Concern
HDD	Horizontal Directional Drill
LDWF	Louisiana Department of Wildlife and Fisheries
LQ	living quarters
MARAD	U.S. Maritime Administration
MARPOL	International Convention for the Prevention of Pollution from Ships
MLV	mainline valve
MP	milepost
MRIP	Marine Recreational Information Program
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA Fisheries	National Oceanic and Atmospheric Administration Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NT	Nederland Terminal
NTL	Notice to Lessees
OCS	Outer Continental Shelf
OD	outside diameter
PLEM	Pipeline end manifold
Project	Blue Marlin Offshore Port
ROW	Right-of-way
SAFMC	South Atlantic Fishery Management Council
SAV	submerged aquatic vegetation
SEFSC	Southeast Fisheries Science Center

SPCC	Spill Prevention, Control, and Countermeasures
TPWD	Texas Parks and Wildlife Department
U.S.	United States
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
USDOT	United States Department of Transportation
USFWS	United States Fish and Wildlife Service
VBT	Vent Boom Tripod
VLCC	very large crude carrier
WC	West Cameron

PROJECT FAST FACTS

General Project Terminology	
Applicant	Blue Marlin Offshore Port LLC
Project Name	Blue Marlin Offshore Port (BMOP)

BMOP Location and General Information	
Nederland Terminal (NT)	The location where the oil for BMOP originates. This is the existing Sunoco Partners Marketing & Terminals L.P. facility located in Nederland, Jefferson County, Texas
New 42-inch Pipeline	37.02 miles of 42-inch pipeline from NT to Station 501
Existing Mainline from Cameron parish Louisiana to WC 509	Cameron Parish, Louisiana Louisiana State Blocks: WC 11, 20, 21 OCS Blocks: WC 21, 44, 43, 58, 79, 78, 95, 114, 113, 132, 133, 148, 169, 170, 183, 196, 205, 212, 213, 224, 230, 241, 245, 246, 255, 258, 259, 266, 269, 276, 275, 277, 282, 408, 431, 432, 433, 456, 459, 482, 483, 484, 508, 509
Deepwater Port Location (Platform – CALM Buoys)	West Cameron Block 509 (WC 509) West Cameron 508 (WC 508) East Cameron 263 (EC 263)
Deepwater Port Water Depth	156 to 162 feet water depth
Loading Capacity	80,000 barrels per hour (bph)

BMOP Deepwater Port Components	
Existing Stingray Pipeline (Mainline)	One existing 36-inch Outer Diameter (OD) pipeline, approximately 104 miles long from Station 501 in Cameron Parish, Louisiana to WC 509. This line consists of the existing 36-inch OD subsea line from WC 509 to Station 701 and the existing 36-inch OD onshore line from Station 501 to Station 701.
Deep Water Port (DWP)	The offshore loading facility site located in WC 509, WC 508, and EC 263. The facilities consist of the existing WC 509 Platform Complex; two new PLEMs and CALM Buoys in WC 508 and EC 263; two new Crude Oil Loading Pipelines from the WC 509 Platform Complex to the PLEMs and the flexible hoses attached to the CALM Buoys. The WC 509 Platform Complex will be converted from gas service to oil and gas service. The converted platforms will support oil export and natural gas transportation.
WC 509 Platform Complex (509 Complex)	The existing WC 509 Platform Complex consists of three platforms and two Vent Boom Tripods (VBT). The WC 509A Platform is the natural gas gathering platform. This will also house the 36-inch riser and pig barrel of the crude oil Mainline. The WC 509B Platform currently is the natural gas compression and control platform. It houses natural gas compressors, separators, the Control Room and Platform Complex's utilities. The WC 509B Platform will continue to house the natural gas separation facilities and the Platform Complex's utilities. It will also house the crude oil Control Room, metering facilities, and pig barrels for the two Crude Oil Loading Lines. The WC 509C Platform is the Living Quarters (LQ) platform and will continue in that role. The WC 509 VBTs are utilized to bridge the natural gas vent piping

BMOP Deepwater Port Components	
	to a point approximately 660 feet from the 509B Platform and will continue in this role for any planned and emergency natural gas blowdowns.
WC 148 Platform	The existing WC 148 Platform will be converted from natural gas transportation service to oil transportation service. All gas piping facilities on the deck will be removed and replaced with new pipe and a new Mainline Valve (MLV). This valve will be able to be remotely operated.
Catenary Anchor Leg Mooring (CALM) System	There will be two floating Calm Buoys installed approximately 4,710 feet and 6,085 feet from the WC 509B Platform. The CALM Buoys will be installed with a minimum of 5,000 feet separation. Each Buoy will be moored in place with 6 or more anchor chains connected to engineered anchors installed at locations around the Buoy. Flexible hoses will be connected from the PLEMs to the Calm Buoys. Floating flexible hoses will also be connected to the CALM Buoy and, during loading, the opposite end will be connected to the ship. CALM Buoy No. 1 will be installed in WC 508 and CALM Buoy No. 2 will be installed in EC 263.
Crude Oil Loading Pipelines	Two 36-inch diameter pipelines from the existing WC 509B Platform to the PLEMs.
Pipeline End Manifold (PLEM)	One PLEM will be installed on the seafloor at each CALM Buoy. Each PLEM will be connected to a 36-inch Crude Oil Loading Pipeline from the WC 509B Platform and a CALM Buoy floating above the PLEM. The two PLEMs will be in WC 508 and EC 263.
VLCC or other Crude Carrier	Very Large Crude Carriers (VLCCs), Suezmax, Aframax or other large capacity seafaring vessels.
Meter for Measuring Departing Crude Oil	The DWP will have two-meter stations with associated prover and lab facilities. One of the meter stations will be located at the new BMOP Pump Station adjacent to the NT and one will be located on the offshore crude export platform (WC 509B Platform).
Pre-fabrication Yards	Existing yards will be used along the northern Gulf of Mexico (GOM) coast.
Support Facility	An onshore support base will be established at an existing port facility to provide the necessary security to support the DWP operations.

BMOP Onshore Pipeline Components	
BMOP Pump Station	The onshore metering, pumping, and pig launcher station will be located in Nederland, Texas, adjacent to the existing NT.
Onshore Crude Oil Pipeline	A new, approximate 37.02-mile, 42-inch OD pipeline connecting the existing NT in Jefferson County, extending across Orange County, Texas to the existing 36-inch OD Mainline at Station 501 in Cameron Parish, Louisiana.
Station 501	The existing NGPL/Stingray interconnect facility (Station 501) will be abandoned and demolished. A new pig receiver and launcher will be installed to connect the new 42-inch OD onshore pipeline with the existing 36-inch OD onshore Stingray Mainline.
Station 701	The existing compressor Station 701 in Cameron Parish, Louisiana will be demolished. All existing natural gas equipment will be removed from the Station except for several large 10,000-barrel storage tanks. Approximately 1,000 feet of new 36-inch pipe, surge tanks, surge valves, and a new MLV will be installed. The existing 10,000-barrel tanks located at Station 701 will be converted to surge relief tanks.
Stingray ANR Tap Removal Site	BMOP will remove the tap and install 36-inch pipe in its place.

BMOP Onshore Pipeline Components	
Mainline Valves (MLV)	Six new MLVs will be installed within the permanent pipeline right-of-way (ROW) of the new build pipeline. MLVs will also be installed at the BMOP Pump Station, Station 501, and Station 701. These valves will be used for isolation and spill control purposes.
Pipeline Pig Launchers and Receivers	Pig Launchers/Receivers will be located at the BMOP Pump Station, Station 501, and the DWP. These are utilized for cleaning the pipelines and running intelligent devices to assess pipeline integrity.
Access Roads and Canals	The Project will utilize existing access roads and canals. One new temporary access road and four new permanent access roads will be required.
Pipe and Contractor Yards	BMOP will utilize existing facilities along the northern GOM coast, U.S. or international locations for manufacturing pipe and for fabricating the PLEMs, CALM Buoys, and end connectors. Pipe coating activities will be performed at existing facilities along the northern GOM coast. Selection of the marine contractor will be completed after the MARAD filing; however, the successful contractor(s) will utilize existing fabrication and logistical facilities located along the northern GOM coast.

PROJECT ENVIRONMENTAL EVALUATIOLN ASSESSMENT CRITERIA

Environmental Evaluation Assessment Criteria		
Criteria	**Values**	**Definition**
Outcome	**Direct**	***Direct effects*** are "caused by the action and occur at the same time and place" of the Project (40 CFR § 1508.8).
	Indirect	***Indirect effects*** are "caused by an action and are later in time or farther removed in distance but are still reasonably foreseeable. Indirect impacts may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems" (40 CFR § 1508.8). Indirect impacts are caused by the Project, but do not occur at the same time or place as the direct impacts.
	Cumulative	***Cumulative impact*** is "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR § 1508.7).
Type	**Adverse (Negative)**	***Adverse*** would cause unfavorable or undesirable outcomes for the natural or social environment. Negative impacts result in a net loss to the resource.
	Beneficial (Positive)	***Beneficial*** impact would cause positive or desirable outcomes for the natural or social environment. Beneficial impacts result in a net benefit to the resource.
Duration	**Short-term (Temporary)**	***Short-term (or temporary)*** impacts are those that would occur only during a specific phase of the proposed Project, such as noise during construction or certain installation activities. Short-term impacts would end at the time, or shortly after, construction activities ceased. The duration of most short-term impacts would be a few hours to a few days.
	Long-term	***Long-term*** impacts would occur either continually or periodically throughout the life of the Project (e.g., operational air emissions, stormwater discharge), or would last for years after an impact-producing activity occurred (e.g., removal of wildlife habitat).
Magnitude	**Negligible**	***Negligible*** impacts are generally those that might be perceptible, but in certain cases may be undetectable.
	Minor	***Minor*** effects are those that could be perceptible but are of very low intensity and may be too small to measure.
	Moderate	***Moderate*** impacts are more perceptible, can often be quantified, and may approach the thresholds for major impacts.
	Major	***Major*** impacts, based on their context and intensity (or severity), have the potential to meet the thresholds for significance set forth in CEQ regulations (40 CFR § 1508.27). Major impacts warrant additional attention in a NEPA analysis and a review of potential mitigation measures that would fulfill the policies set forth in NEPA, which include avoiding, minimizing, or mitigating major impacts.
Likelihood	**Unlikely**	Low probability.
	Potential	Possible or probable.

Environmental Evaluation Assessment Criteria		
Criteria	**Values**	**Definition**
	Likely	Certain.

5.0 COMMERCIAL AND RECREATIONAL FISHERIES

5.1 PROJECT OVERVIEW

Blue Marlin Offshore Port LLC (the Applicant) is proposing to develop the Blue Marlin Offshore Port (BMOP) Project (Project) in the Gulf of Mexico (GOM) to provide crude oil transportation and loading services for crude oil produced in the continental United States (U.S.). A Project overview map is provided in **Figure 5-1**. The Deepwater Port (DWP) will be utilized to load the transported crude oil onto very large crude carriers (VLCCs) (and other crude oil carriers) for export to the global market. The Applicant is filing this application for a license to construct, own, and operate the DWP pursuant to the Deepwater Port Act (DWPA) of 1974, as amended, and in accordance with U.S. Coast Guard (USCG) and U.S. Maritime Administration (MARAD) implementing regulations.

The primary purpose of the Project will be to provide for safe and reliable long-term supply of crude oil for export to the global market. Oil for export will be transported out of the existing Sunoco Partners Marketing and Terminals, L.P. terminal and storage facility in Jefferson County, Texas (Nederland Terminal or NT). This terminal is connected to multiple crude oil pipelines connecting to production from across the U.S. In addition, an affiliate of the Applicant owns the Stingray Pipeline System and has confirmed that its subsea pipeline and offshore platforms are suitable for converting to facilitate crude oil export from a DWP in the northern GOM. The Applicant has the exclusive right to lease or purchase the Stingray Pipeline System for use in the Project.

The DWP will be located in federal waters within and adjacent to the Outer Continental Shelf (OCS) in West Cameron Lease Blocks (WC) 509 and 508 and East Cameron (EC) Block 263. Following the existing Stingray pipeline, the DWP will be approximately 99 statute miles off the coast of Cameron Parish, Louisiana, with an approximate water depth of 162 feet. Crude oil will be routed from pumps at Nederland, through a new 42-inch outer diameter (OD) onshore pipeline to the existing Stingray Mainline at Station 501 (see **Figure 5-2**), and from there through the existing Stingray Mainline to the DWP. The crude oil will be metered at the BMOP Pump Station at the NT and on the existing WC 509B Platform and routed through two Crude Oil Loading Lines to Pipeline End Manifolds (PLEMs) located on the seafloor below two Catenary Anchor Leg Mooring (CALM) Buoys located in WC 508 and in EC 263. From each PLEM, the crude oil will be routed to its respective floating CALM Buoy through submerged flexible hoses. VLCCs (or other large seafaring crude oil vessels) will moor at a CALM Buoy, retrieve and connect the floating crude oil hoses connected to the CALM Buoy and the crude oil will then route from the Buoy to the VLCC for loading. Up to 365 VLCCs (or other crude oil carriers) will load per year.

In summary, the BMOP facilities consist of the pumps and meters at NT; a new approximate 37-mile, 42-inch OD pipeline; the existing 36-inch OD Mainline; an existing fixed, manned platform complex at WC 509; an existing platform at WC 148; two new Crude Oil Loading Pipelines; and two new PLEM and CALM Buoys located in WC 508 and EC 263. A schematic of the proposed DWP is provided in **Figure 5-3**. The crude oils that would be exported range from light to heavy grade crudes from the existing the NT facility.

Topic Report 5 identifies and discusses commercial and recreational fisheries. Because the onshore and offshore fisheries are similar, share the same stocks of fish, and are often included in the same landings data, this topic report discusses the fisheries resources where the onshore pipeline crosses Sabine Lake and the Neches River as well as where the Mainline and DWP will be located in the GOM. Potential impacts of construction and operation on these resources, and measures that will be implemented to reduce and mitigate potential Project-related impacts are described. Characterization of the fisheries potentially impacted by construction and operation of the Project is based on publicly available data.

To avoid and minimize potential impacts to the marine environment during construction and operation of the Project, the Applicant will implement construction and operation Best Management Practices (BMPs). In addition, to avoid and minimize potential impacts from spills, BMOP will adhere to its project-specific SPAR, its Coastal Louisiana Pipeline Facility Response Plan (PHMSA Sequence No. 3202), modified to include BMOP, and Energy Transfer's Sea Robin Oil Spill Response Plan (O-726), modified to include BMOP.

The following sections describe the existing fisheries resources in the Project area and identify potential environmental consequences to these resources associated with construction and operation of the Project. This section addresses the commercial and recreational fisheries onshore as well as offshore because the onshore fisheries are estuarine and part of the same fishery and landings data as the fisheries in nearshore waters of the GOM.

5.1.1 Abandonment and Conversion of Existing Facilities

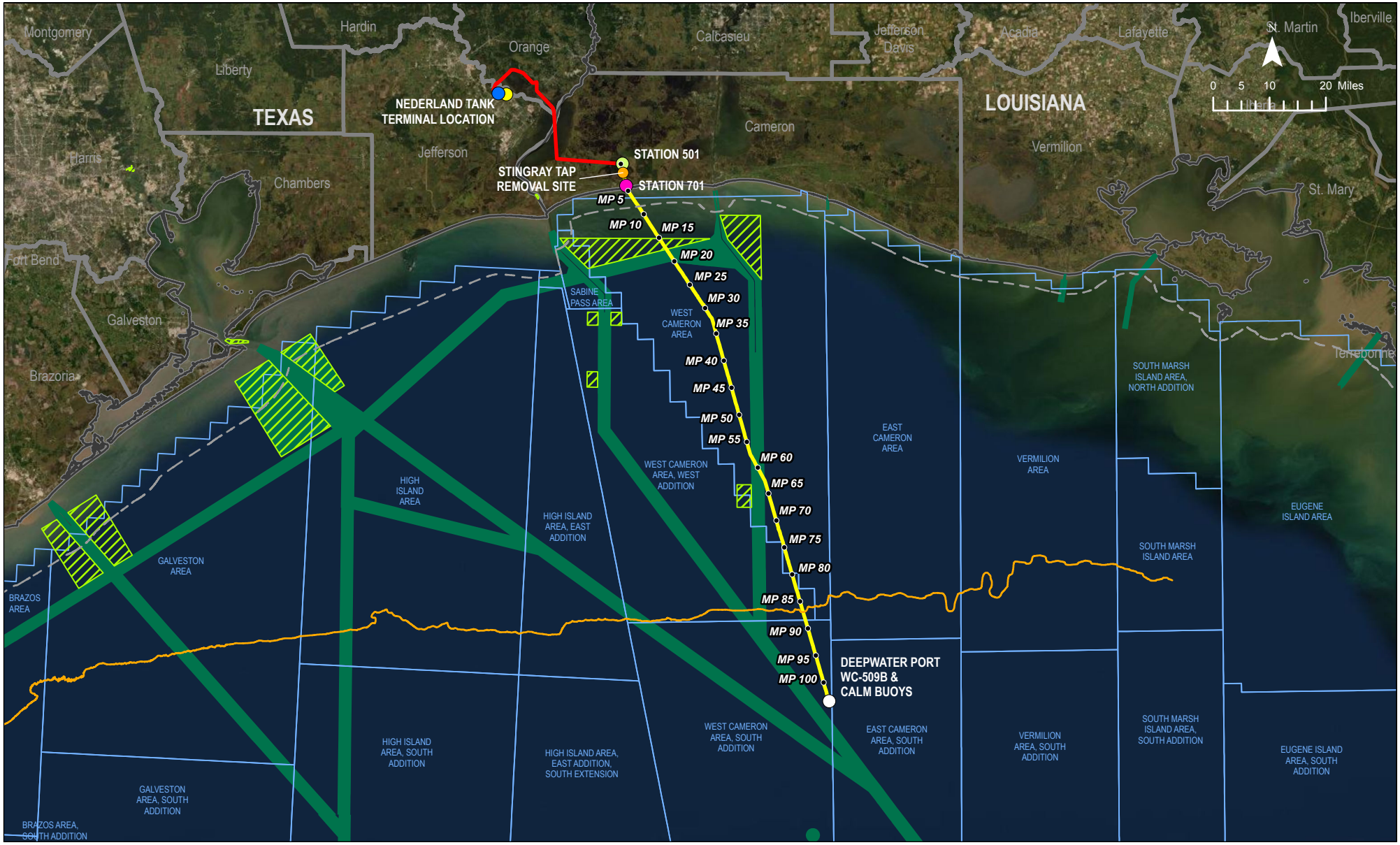
The Stingray Pipeline is currently comprised of a 36-inch pipeline (Mainline) that is fed natural gas and natural gas liquids by multiple lateral pipelines from various suppliers and producers. Stingray transports natural gas and liquids on the Mainline from the WC 509 Platform Complex to the onshore compressor station facility (Station 701) near Holly Beach in Cameron, Louisiana, and northward approximately four additional miles to the Natural Gas Pipeline Co. (NGPL)/Stingray interconnect (Station 501). The Stingray facilities from WC 509 to Station 501 will be abandoned through a FERC 7(b) Order and converted to use as DWP facilities (the filing has been made for abandonment). The Applicant intends to use all existing records and inspection data and perform additional engineering studies to obtain the appropriate agency approvals for converting all existing, reusable facilities. This includes updating the facilities to meet current regulations and guidelines, where appropriate. Abandonment under FERC 7(b) will be considered complete when the Mainline is completely isolated from all-natural gas sources and all-natural gas and produced liquids have been removed from the pipeline. This work will be completed by Stingray. Stingray will assign the existing right-of-way (ROW) Grant (and associated facilities—platforms at WC 148 and WC 509) to BMOP or another affiliate of ET for use in the BMOP Project. The Applicant intends to operate the new facilities under 49 Code of Federal Regulations (CFR) Part 195.

Conversion of the Stingray facilities involves converting service to crude oil and changing flow direction in the Mainline; converting the platform at WC 148, herein referred to as the WC 148 Platform, to crude oil service from natural gas service; and converting the platform complex at WC 509, herein referred to as the WC 509 Platform Complex, to crude oil and natural gas service.

5.1.2 Major Offshore Project Components

All facilities for the proposed BMOP Project will be designed, constructed, tested, operated, and maintained in accordance with the U.S. Department of Transportation (USDOT) regulations in 49 CFR Part 195 (Transportation of Hazardous Liquids by Pipeline) and all other applicable federal and state regulations. The Project will consist of both onshore supply components and offshore/marine components, as described below and depicted in **Figure 5-1** and **Figure 5-2**.

BMOP PROJECT - FIGURE 5-1 - PROJECT OVERVIEW MAP



LEGEND

- EXISTING OFFSHORE PIPELINE MILEPOSTS
- STINGRAY TAP REMOVAL SITE
- NEDERLAND TANK TERMINAL LOCATION
- NEDERLAND PUMP STATION
- STATION 701 (TO BE CONVERTED TO OIL SERVICE)
- STATION 501 (TO BE CONVERTED TO OIL SERVICE)
- DEEPWATER PORT WC-509B AND CALM BUOYS
- EXISTING PIPELINE TO BE CONVERTED TO OIL SERVICE
- PROPOSED ONSHORE PIPELINE (NEW BUILD)
- DEPTH CONTOUR -108'
- STATE WATERS BOUNDARY
- SAFETY ANCHORAGES
- PROTRACTION AREA
- SHIPPING FAIRWAY
- COUNTY / PARISH
- STATE BOUNDARY

BLUE MARLIN OFFSHORE PORT PROJECT

PROJECT OVERVIEW MAP

COUNTY/PARISH:	VARIOUS	DRAWN BY:	CA
STATE:	TX/LA	CHECKED BY:	CW

DATE:	2020/09/17	PROJECTION:	NAD 1983 UTM Zone 15N

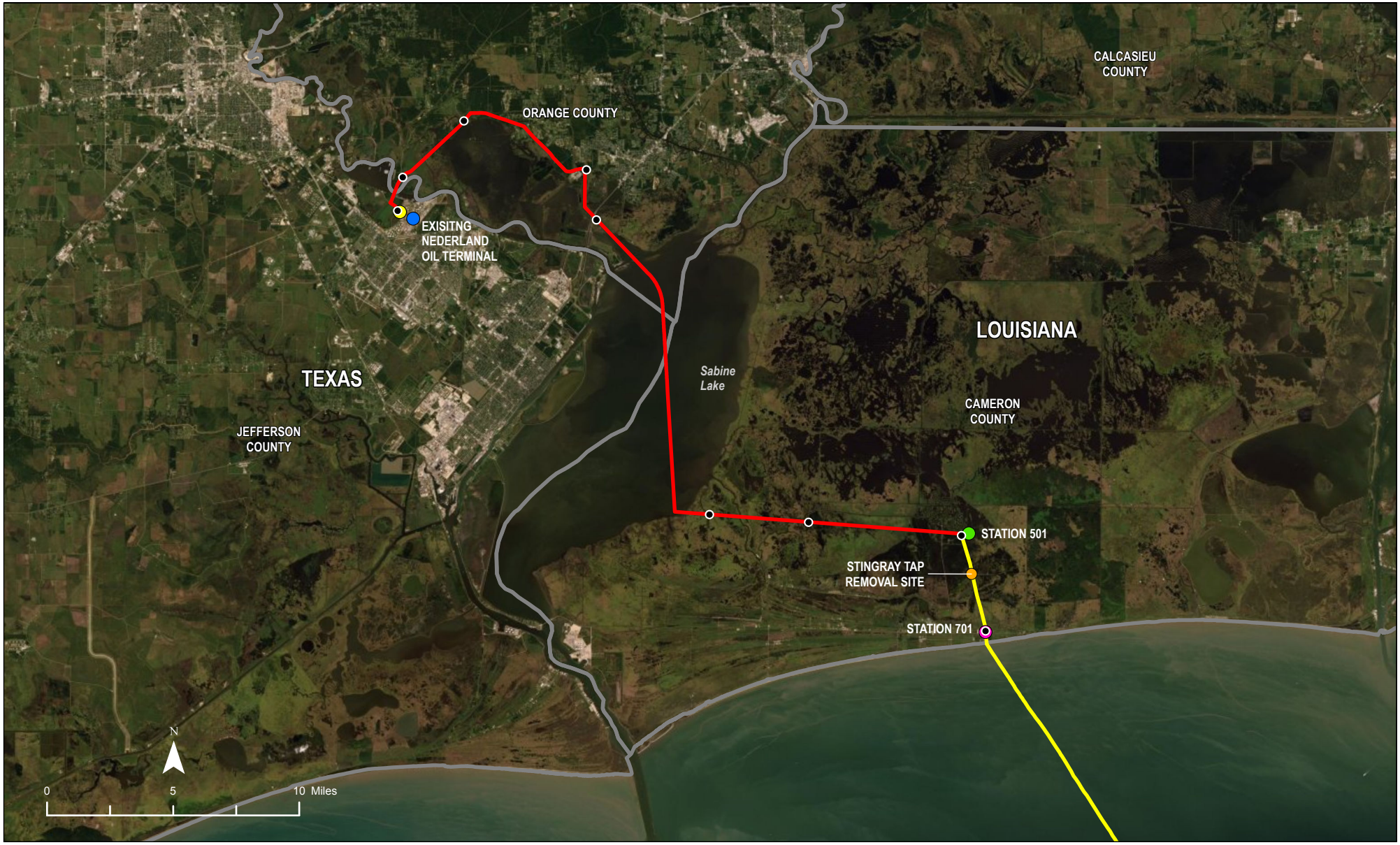
PREPARED BY

EXP Energy Services Inc.
T: +1.850.385.5441
F: +1.850.385.5523
1800 WEST LOOP SOUTH, SUITE 850
HOUSTON, TX 77027, USA

BLUE MARLIN OFFSHORE PORT PROJECT
FIGURE 5-1

DWG:	0802-01-005	SHEET:	1 OF 1

BMOP PROJECT - FIGURE 5-2 ONSHORE PROJECT COMPONENT OVERVIEW MAP



LEGEND

- MAINLINE VALVE
- NEDERLAND PUMP STATION
- STATION 501 (TO BE CONVERTED TO OIL SERVICE)
- STATION 701 (TO BE CONVERTED TO OIL SERVICE)
- EXISITNG NEDERLAND OIL TERMINAL
- STINGRAY TAP REMOVAL SITE
- EXISTING PIPELINE TO BE CONVERTED TO OIL SERVICE
- PROPOSED 42-INCH PIPELINE
- COUNTY / PARISH

BLUE MARLIN OFFSHORE PORT PROJECT
FIGURE 5-2 - ONSHORE PROJECT COMPONENT OVERVIEW MAP

COUNTY/PARISH:	VARIOUS	DRAWN BY:	CA
STATE:	TX/LA	CHECKED BY:	CW
DATE:	2020/09/17	PROJECTION:	NAD 1983 UTM Zone 15N

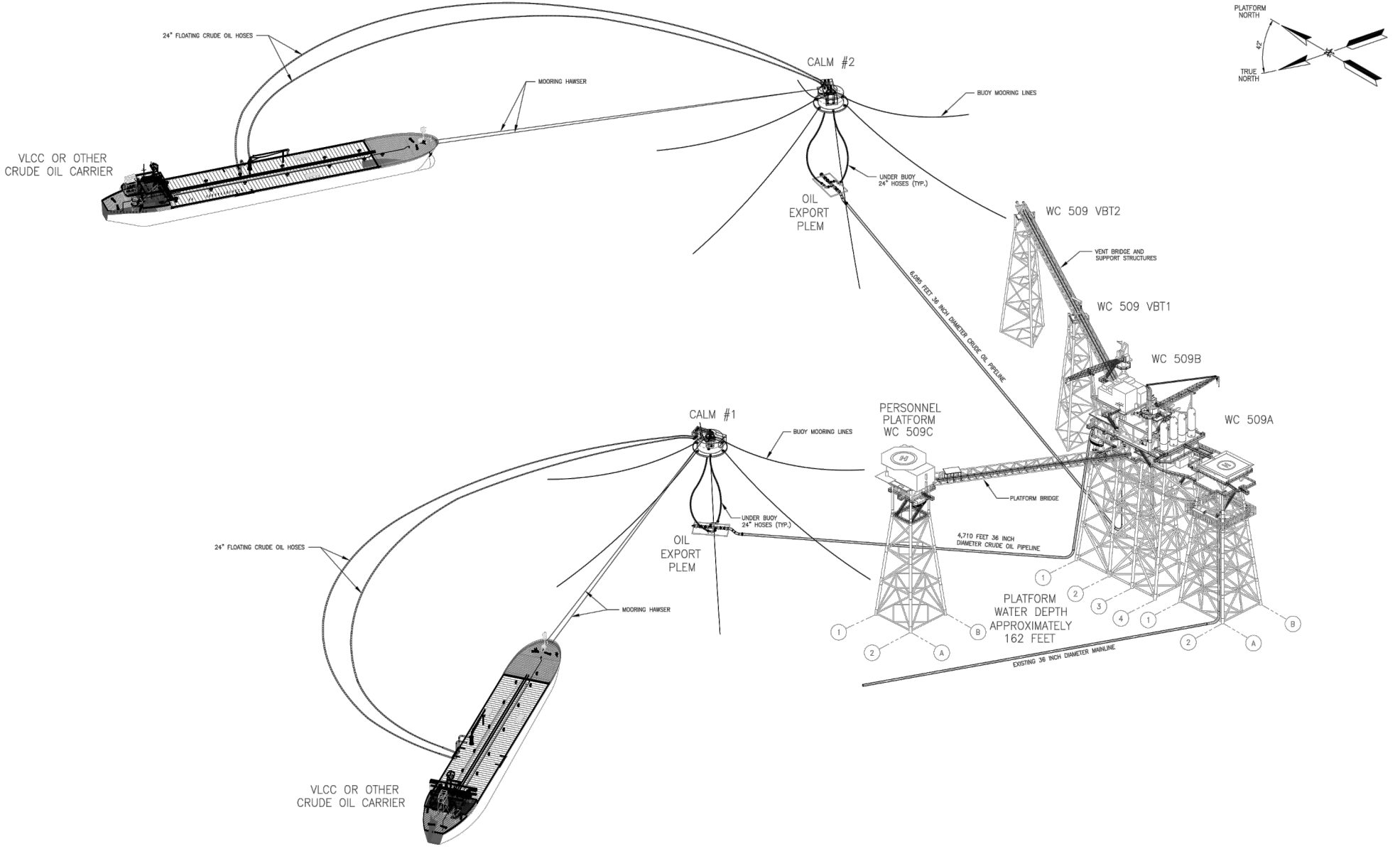
PREPARED BY

EXP Energy Services Inc.
T: +1.713.439.3600
F: +1.713.963.9085
1800 WEST LOOP SOUTH, SUITE 850
HOUSTON, TX 77027, USA

BLUE MARLIN OFFSHORE PORT PROJECT
FIGURE 5-2

DWG:	0802-01-009	SHEET:	1 OF 1

FIGURE 5-3 - BMOP DWP SCHEMATIC WITH VLCCs



The BMOP Project will consist of construction and operation of the following facilities:

New Onshore Facilities

- A new, approximate 37.02-mile, 42-inch OD pipeline connecting the existing NT in Jefferson County, Texas, to the existing 36-inch OD Mainline at Station 501 in Cameron Parish, Louisiana.
- A new pump station (BMOP Pump Station) located in Jefferson County, Texas, adjacent to the existing NT in Jefferson County, Texas at milepost (MP) 0.0. The pump station will include:
    - A pipeline header;
    - MLV;
    - Metering and pump equipment;
    - Electrical substation; and
    - Permanent access road.
- Six new MLVs will be installed within the permanent pipeline ROW of the new build pipeline. MLVs will also be installed at the BMOP Pump Station, Station 501, and Station 701. These valves will be used for isolation and spill control purposes.

Conversion of Existing Facilities

- The existing Station 501 is located at approximate MP 37 of the new 42-inch pipeline in Cameron Parish, Louisiana. All existing natural gas-related equipment owned by BMOP will be removed from the Station and new pipeline facilities will be installed. The new 42-inch pipeline will tie into the existing 36-inch Mainline at the site. The conversion of Station 501 will be expanded to include:
    - New pig receiver for the new 42-inch pipeline termination;
    - New pig launcher for existing 36-inch Mainline; and
    - New MLV.
- The existing compressor Station 701 in Cameron Parish, Louisiana, will be demolished. All existing natural gas equipment will be removed from the Station except for two 10,000-barrel storage tanks. The new facility will maintain office space, a natural gas interconnect, and surge tanks. Approximately 1,500 feet of new pipe, surge tanks, surge valves, and a new MLV will be installed. The existing 10,000-barrel tanks located at Station 701 will be converted to surge relief tanks.
- The existing ANR Tap (Stingray Tap Removal Site) is located at approximately Stingray Mainline MP 1.61 on the Stingray Mainline in Cameron Parish, Louisiana (approximate MP 38.6 on the BMOP pipeline system). BMOP will install a 36-inch OD pipe segment following removal of the tap.
- The existing Mainline from Station 501 to the WC 509 Platform Complex will be converted to crude oil service.
- The WC 148 Platform will be converted to crude oil service and a new mainline valve installed.
- The existing WC 509 Platform Complex will be converted from a gas transmission facility to a dual-purpose gas transmission and crude oil export facility. The existing equipment that will remain at the Platform Complex will include:
    - Existing natural gas piping and risers on WC 509A Platform;
    - Natural gas Vent Boom on WC 509 VBTs;
    - Natural gas separation facilities on WC 509B Platform; and
    - Heliport and helicopter fuel tank on WC 509A Platform.

New Offshore Facilities

- Two new CALM Buoys installed, one in WC 508 (CALM Buoy No. 1) and the other in EC 263 (CALM Buoy No. 2). The CALM Buoys will be anchored to the seafloor via an engineered mooring system capable of accommodating mooring forces exerted by a VLCC or other large seafaring vessels during loading operations. Two 24-inch diameter floating hoses will be connected to each CALM Buoy. The hoses will be approximately 1,500 feet long and used for loading operations.
- Two new PLEMs installed and anchored on the seafloor under the CALM Buoys. Two 24-inch undersea flexible hoses will be connected to each PLEM and associated CALM Buoy.
- Two Crude Oil Loading Pipelines, approximately 4,710 feet long to PLEM / CALM Buoy No. 1 and 6,085 feet long to PLEM / CALM Buoy No. 2, installed from the WC 509 Platform Complex to the PLEM and CALM locations, one for each PLEM and CALM Buoy (see **Figure 5-3**). The pipelines will be installed with the top of pipe at least three feet below the natural seafloor.
- New MLV on WC 148 Platform;
- Two new 36-inch risers connected to the Crude Oil Loading Pipelines on WC 509B Platform;
- New control room on WC 509B Platform;
- Three new pig barrels, one on the WC 509A Platform and two on WC 509B Platform;
- Meter station for crude oil on the WC 509B Platform;
- New living quarters (LQ) and heliport on WC 509C Platform;
- Surge valves and tank on the WC 509B Platform; and
- New ancillary equipment for the 509 Platform Complex (e.g., power generators, instrument/utility air system, fuel tanks, ac units, freshwater makers, firewater system, seawater and freshwater system, sewage treatment unit, fuel gas system, diesel system, closed drain system, open drain system, hydraulic power unit, hypochlorite system, cranes, communications tower and system, radar) to support operation of the offshore facilities.

Offshore Support Facilities

Support facilities for the Project will include:

- Safety Zone - The Applicant is requesting that the USCG Captain of the Port establish a Safety Zone around the entire DWP operations area. The Safety Zone will only be open to entry for VLCCs or other crude oil carriers prepared for connection for loading of crude oil, and the necessary service vessels supporting that process.
- Anchorage area – Existing USCG-designated anchorage areas will be utilized for VLCCs (or other crude carriers) awaiting mooring at a CALM Buoy or if they must disconnect from the CALM Buoys for safety reasons.
- Support vessel mooring area – A designated Service Vessel Mooring Area will be established in proximity to the offshore WC 509 facilities.
- Temporary pre-fabrication yards – Component fabrication will occur at multiple existing fabrication facilities within the GOM coastal region.
- Support facilities – Facilities within the GOM coastal region providing support for offshore operations and maintenance activities (e.g., helicopters, supply vessels, work boats, equipment suppliers, and maintenance workers).

Onshore Support Facilities

- Temporary use of existing pipe and contractor yards; and
- Use of existing access roads and canals.

5.2 EXISTING ENVIRONMENT

5.2.1 Fisheries Management

5.2.1.1 State Management of Commercial and Recreational Fisheries in the Project Area

Commercial and recreational marine fisheries in estuarine and GOM waters within 3.0 nautical miles (reef fish out 9.0 nautical miles) of the Louisiana coastline are managed by the Louisiana Department of Wildlife and Fisheries (LDWF). LDWF provides management recommendations to the Louisiana Wildlife and Fisheries Commission, which creates policies that LDWF then implements and regulates. The Coastal Fisheries Division of the Texas Parks and Wildlife Department (TPWD) regulates marine recreational and commercial fishing within Texas state waters, which includes estuarine waters and GOM waters within 9.0 nautical miles (10.4 statute miles) of the shoreline.

5.2.1.2 Federally Managed Commercial and Recreational Fisheries in the Project Area

The Gulf of Mexico Fishery Management Council (GMFMC) manages commercial and recreational fisheries resources in federal waters of the GOM Exclusive Economic Zone (EEZ) under the following eight fishery management plans (FMPs):

- Aquaculture (GMFMC, 2009);
- Coastal Migratory Pelagics (GMFMC and SAFMC, 1983);
- Corals (GMFMC and SAFMC, 1982a);
- Red drum (NMFS, 1986);
- Reef fish (GMFMC, 1981a);
- Shrimp (GMFMC, 1981b);
- Spiny lobster (GMFMC and SAFMC, 1982b);
- Stone crab (GMFMC, 1979).

Four of these FMPs—shrimp, red drum, reef fish, Coastal Migratory Pelagics—are for managed fisheries that occur in the northern GOM and possibly in the offshore Project area. In addition, the National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries) manages Atlantic highly migratory species through a consolidated FMP (NMFS, 2006; NOAA Fisheries, 2017) that includes GOM waters and fisheries. Management includes establishing fishing seasons, closures, landings and allocations, and guidelines on gear types, which are implemented through FMP amendments. FMPs also establish Essential Fish Habitat (EFH) and Habitat Areas of Particular Concern (HAPCs); EFH and HAPCs in the GOM are discussed in Section 6.2.4.3 of Topic Report 6, "Wildlife and Protected Species," (Volume IIa) and **Appendix D**, Essential Fish Habitat Assessment (Volume IIa).

The FMP for corals prohibits the collection of stony corals; there is no coral fishery in the GOM. Coral HAPCs and EFH are discussed in Section 6.2.4.3 of Topic Report 6 (Volume IIa), and **Appendix D**. The spiny lobster fishery occurs only in Florida and is not applicable to the Project area. There is currently no commercial aquaculture in federal waters of the GOM. The stone crab FMP (GMFMC, 1979) addresses commercial fisheries for a single species, the stone crab (*Menippe mercenaria*), in federal waters off the west coast of Florida. Stone crabs are harvested commercially in Texas, but within bays and estuaries and other state waters.

Shrimp Fishery of the Gulf of Mexico, U.S. Waters FMP

The shrimp FMP (GMFMC, 1981b) covers fisheries associated with six species of shrimp: brown shrimp (*Penaus aztecus*), white shrimp (*Penaeus setiferus*), pink shrimp (*Peneaus duorarum*), royal red shrimp (*Hymenopenaeus robustus*), seabob (*Xiphopeneus kroyer*), and rock shrimp (*Sicyonia brevirostris*). Almost all shrimp in the GOM are caught with trawls. White shrimp, brown shrimp, and to a lesser degree seabobs, are key species in what is the most valuable commercial fishery in Louisiana and Texas.

Red Drum Fishery of the Gulf of Mexico FMP

The red drum FMP (NMFS, 1986) addresses management of a single species, the red drum, or redfish (*Sciaenops ocellatus*). The red drum is one of the more important and sought-after species by recreational fishers in estuarine and marine environments throughout GOM shelf waters. The species formerly represented a targeted commercial finfish species throughout much of the GOM, but currently commercial harvest is prohibited in all GOM federal waters and GOM state waters off the Texas, Louisiana, Alabama, and Florida coasts.

Reef Fish of the Gulf of Mexico FMP

The reef fish fishery includes numerous species of snappers, groupers, tilefish, and jacks, with commercially important species in the northcentral GOM including red snapper (*Lutjanus campechanus)*, gray snapper (*L. griseus*), vermilion snapper (*Rhomboplites aurorubens*), yellowedge grouper (*Hyporthodus flavolimbatus*), and golden tilefish (*Lopholatilus chamaeleonticeps*). In the northern GOM commercial fisheries, groupers and snappers are caught using hook and line gear types, including rod and reel, bottom longlines, and buoy lines.

Coastal Migratory Pelagic Resources in the Gulf of Mexico FMP

Species prominent in the commercial landings in the northwestern GOM and managed under this FMP (GMFMC, 1983) include king mackerel (*Scomberomorus cavalla*), Spanish mackerel (*Scomberomorus maculatus*), and cobia (*Rachycentron canadum*). In the northwestern GOM, these species are generally caught with hook and line, either trolling or stationary.

Consolidated Highly Migratory Species FMP

Most species found in federal waters are managed by regional fishery management councils such as GMFMC. However, highly migratory species are different in that they are found throughout the Atlantic Ocean and must be managed both domestically and internationally. As a result, NOAA Fisheries has primary authority for developing and implementing this FMP. Fish managed by NOAA Fisheries through implementation of this FMP include tunas, swordfish, billfish, and sharks. Species that are prominent in the commercial landings in the northwestern GOM include yellowfin tuna (*Thunnus albacores*), bigeye tuna (*Thunnus obeses*), skipjack (*Katusuwonus pelamis*), swordfish (*Xiphias gladius*), and sharks. In the GOM, these species are most commonly caught using pelagic longlines.

5.2.2 Commercial Fisheries

The GOM commercial fisheries are some of the most productive in the world. In 2018, the National Marine Fisheries Service (NMFS) GOM Region (offshore West Florida, Alabama, Louisiana, Mississippi, and Texas) produced 16 percent of all U.S. commercial landings in both size (pounds) and value (NOAA Fisheries, 2018). Louisiana's total landings in 2018 were 1,033,126,651 pounds valued at $376,700,317, and Texas landings were 84,383,348 pounds with a value of $211,836,930 (NOAA Fisheries, 2020). These

total landings include landings in freshwater, estuarine waters, and marine waters. Texas and Louisiana landings for species representing significant portions of their commercial fisheries are listed in **Table 5-1** and **Table 5-2** by volume and value, respectively. The areas, or waters (fresh, estuarine, marine), where most (or all) of the landings are typically caught, are indicated by species in these tables.

5.2.2.1 Offshore Commercial Fisheries

Major components of the 2018 landings (**Table 5-1**) that would have been caught in offshore (marine) waters were menhaden (*Brevoortia patronus*), shrimp, red snapper, vermilion snapper, groupers (primarily yellowedge grouper), yellowfin tuna, sharks, and king mackerel. Details on these major components are provided below.

Between 86 and 92 percent of the annual GOM menhaden catch occurs off the Louisiana coast, with a lesser but substantial amount in Texas, Mississippi, and Alabama (Smith et al., 2001); however, much of the menhaden caught offshore of Texas is landed in Louisiana and shows up in Louisiana's landings (Culbertson et al., 2004; Keithly and Roberts, 2017). Two main centers of menhaden fishing activity are located along the Louisiana coast; one is within Breton and Chandeleur Sounds and the other along the western Louisiana coast from Atchafalaya Bay to Sabine Pass (Smith et al., 2001). Menhaden are caught using purse seines, with about 55 percent of the catch occurring in state waters and 45 percent in federal waters (Smith et al., 2001; Keithly and Roberts, 2017). Over 90 percent of the menhaden fishing occurs within 10 miles of shore (Smith et al., 2001).

TABLE 5-1
Most Important Species in 2018 Commercial Fishery Landings by Volume

Louisiana				Texas			
Fish	**Landings[a] (lbs)**	**Percent[b]**	**Waters[c]**	**Fish**	**Landings[a] (lbs)**	**Percent[b]**	**Waters[c]**
Menhaden	855,215,850	82.78	M	Shrimp	72,413,557	95.86	M
Shrimp	90,673,434	8.78	E,M	Eastern oyster	3,859,415	4.57	E
Blue crab	42,742,218	4.14	E	Blue crab	3,431,081	4.07	E
Crawfish	11,178,061	1.08	F	Red snapper	2,353,400	2.79	M
Eastern oyster	10,924,437	1.06	E	Black drum	1,469,000	1.74	E,M
Catfish	4,693,761	0.45	F	Yellowedge grouper	140,775	0.17	M
Black drum	2,680,321	0.26	E,M	Atlantic croaker	130,504	0.15	E,M
Buffalo fishes	2,591,717	0.25	F	Vermilion snapper	106,679	0.13	M
Herring	1,573,332	0.15	F	Golden tilefish	98,162	0.12	M
Gizzard shad	1,488,753	0.14	F	Mullet	127,815	0.15	M
Sheepshead	1,416,906	0.14	E,M	Catfish	76,884	0.09	F
Red snapper	1,413,706	0.14	M	King mackerel	34,379	0.04	M
Sharks	1,164,327	0.11	M	Warsaw grouper	20,614	0.02	M
King mackerel	1,021,128	0.10	M	Flounders	14,173	0.02	E,M
Carp	730,540	0.07	F	Herring	13,944	0.02	F
Striped mullet	630,242	0.02	M	Stone crab	12,233	0.01	M
Garfish	651,774	0.06	F	Sheepshead	11,633	0.01	E,M
Yellowfin tuna	527,125	0.05	M	Atlantic cutlassfish	8,413	0.01	M
Freshwater drum	505,926	0.05	F	Greater amberjack	6,523	0.01	M

TABLE 5-1
Most Important Species in 2018 Commercial Fishery Landings by Volume

Louisiana				Texas			
Fish	**Landings[a] (lbs)**	**Percent[b]**	**Waters[c]**	**Fish**	**Landings[a] (lbs)**	**Percent[b]**	**Waters[c]**
Vermilion snapper	254,231	0.02	F	Squid	8,313	0.01	M
Bowfin	249,999	0.02	M	Pigfish	3,917	0.00	M
Atlantic swordfish	176,490	0.02	M	Snowy grouper	3,782	0.00	M
Yellowedge grouper	76,868	0.01	M	Stingrays	3,464	0.00	M
Golden tilefish	68,935	0.01	M	Cobia	3,262	0.00	M
Flounders	61,251	0.01	E,M	Almaco jack	2,970	0.00	M
Florida pompano	43,961	0.00	M	Scamp	2,762	0.00	M
Greater amberjack	40,591	0.00	M	Ballyhoo	2,372	0.00	M

Notes:

[a] Landings data are 2018 commercial fisheries landings from NOAA Fisheries (2020) at: https://foss.nmfs.noaa.gov/apexfoss/f?p=215:200:1335898910549::::P200_GEO_LOV:1021

[b] Percent of all landings for the state.

[c] Waters harvested in most of the time; F = freshwater, E = estuarine waters, M = marine waters from shoreline to shelf break.

TABLE 5-2
Most Important Species in 2018 Commercial Fishery Landings by Value

Louisiana[a]			Texas[a]		
Species[b]	**Value ($)**	**Percent of Total[c]**	**Species[b]**	**Value ($)**	**Percent of Total[c]**
Shrimp	112,015,761	29.74	Shrimp	166,760,625	78.72
Menhaden	90,315,030	23.98	Oyster	23,998,793	11.33
Red snapper	6,111,526	1.62	Red snapper	10,837,874	5.12
Eastern oyster	75,972,997	20.17	Blue crab	4,886,275	2.31
Blue crab	60,666,723	16.10	Black drum	1,839,589	0.87
Crawfish	12,549,501	3.33	Atlantic croaker	1,276,440	0.60
Red snapper	6,111,526	1.62	Yellowedge grouper	643,921	0.30
Black drum	2,488,0.66	0.66	Vermilion snapper	333,331	0.16
Catfish	3,205,782	0.85	Golden tilefish	296,651	0.14
Yellowfin tuna	2,177,755	0.58	Mullet	327,966	0.15
Herring	2,084,948	0.55	Stone crab	89,306	0.04
King mackerel	2,002,848	0.53	Warsaw grouper	81,773	0.04
Sharks	800,826	0.21	Catfish	72,367	0.03
Sheepshead	755,952	0.20	King mackerel	70,133	0.03
Vermilion snapper	698,504	0.19	Flounder	72,594	0.03
Gizzard shad	680,355	0.18	Pigfish	40,458	0.02
Buffalofish	593,086	0.16	Killifish	40,396	0.02

TABLE 5-2
Most Important Species in 2018 Commercial Fishery Landings by Value

Louisiana[a]			Texas[a]		
Species[b]	**Value ($)**	**Percent of Total[c]**	**Species[b]**	**Value ($)**	**Percent of Total[c]**
Gar	496,995	0.13	Herring	21,056	0.01
Swordfish	399,877	0.11	Snowy grouper	14,912	0.01
Striped mullet	389,008	0.10	Ballyhoo	7,210	0.01
Bowfin	259,219	0.07	Squid	19,892	0.01
Yellowedge grouper	257,267	0.07	Greater amberjack	12,154	0.01
Florida pompano	172,743	0.05	Cobia	11,712	0.01
Flounders	157,103	0.04	Scamp	11,040	0.01
Golden tilefish	146,144	0.04	Atlantic cutlassfish	9,642	0.00
Freshwater drum	106,125	0.03	Sheepshead	7,210	0.00
Bigeye tuna	99,634	0.03	Almaco jack	5,335	0.00
Gray snapper	87,219	0.02	Dolphin	4,767	0.00
Atlantic croaker	81,799	0.02	Stingrays	4,040	0.00
Greater amberjack	81,364	0.02	Pinfish	3,950	0.00

Notes:
[a] Data are 2018 commercial fisheries landings from NOAA Fisheries (2020) at: https://foss.nmfs.noaa.gov/apexfoss/f?p=215:200:1335898910549::::P200_GEO_LOV:1021
[b] Top 22 species in landings.
[c] Percent of total of all species in the commercial landings for the state.

The shrimp fishery is the most valuable fishery in the GOM. In the northern GOM, the fishery includes brown shrimp, white shrimp, royal red shrimp, and seabobs, with brown shrimp and white shrimp forming over 96 percent of the harvest in Louisiana and Texas (NOAA Fisheries, 2020). Offshore, they are harvested mostly with otter trawls. White shrimp are harvested primarily in state waters and nearshore waters to depths of about 120 feet with peak harvests August-December; brown shrimp are harvested offshore to water depths of 240 feet year-round with most of the harvest occurring June-October (Keithly and Roberts, 2017). The offshore Project area lies within NOAA's shrimp Statistical Zone 17. Shrimping intensity (days 24 hours fished per square mile) is very high (2.6-7.8 days per square mile) in Zone 17 waters less than 60 feet deep and moderately high (1.3 to 2.6 days per square mile) in waters 60-180 feet deep (McDaniel et al., 2000).

Reef fish and the fishing effort for reef fish are strongly associated with structure, such as hard bottom, banks and topographical features and artificial reefs including oil and gas platforms. Hard bottoms and topographical features are discussed in Section 4.2.2.4 of Topic Report 4 (Volume IIa) and **Appendix D**. Artificial reefs are discussed in Section 4.2.2.5 of Topic Report 4 (Volume IIa). Analysis of fisheries observer data (Scot-Denton et al. 2011) indicates the waters of Statistical Zone 17, including the offshore Project area are commercially fished for reef fish species. Bottom longline sets were set in water depths of 116 to 1,272 feet with an average of 309 feet. Fishing with vertical lines (bandit reels and buoys) occurred from near shore to water depths of 1,830 feet, with most fishing taking place in water depths greater than 120 feet, and average depth of 164 feet. Red snapper and vermilion snapper provide the majority of the vertical line catch. Yellowedge grouper, red snapper, tilefish and blueline tilefish, and Atlantic sharpnose shark comprised the bulk of the longline catch.

The coastal pelagic, king mackerel, is harvested in continental shelf waters throughout the GOM. In the northern GOM they are caught with hook and line, often trolling (Hunter, 2015) in depths of 39 to 246 feet. Landings of king mackerel occur year-round with peaks in October-December (SEFSC, 2016). The fishery is managed with annual quotas.

Yellowfin and bigeye tuna are fished for with pelagic longlines (GMFMC, 2006). Most of the commercial tuna fishing effort in the GOM occurs in water depths of 656 feet more (Teo and Block, 2010) and well offshore of the Project area. Longline fishing vessels that target yellowfin tuna in the Gulf of Mexico also catch and sell dolphin, swordfish, and other tunas and sharks.

Commercial vessels in the shark fishery use pelagic and bottom longline gear (the most common), gillnets, rod & reel, handline, and bandit (vertical) gear (Southward-Hogan, 2010). Annual quotas are set on a species (e.g., blacktip sharks) or complex level (e.g., large coastal sharks) and are applied to the GOM region as a whole; fishing seasons close when 80 percent of the quota is filled.

5.2.2.2 Inshore Commercial Fisheries

Major components of the 2018 inshore landings (See **Table 5-1** and **Table 5-2**) were menhaden, shrimp, oyster (*Crassostrea virginica*), blue crab (*Callinectes sapidus*), and black drum (*Pogonias cromis*). Most oysters are harvested with dredges (Banks et al., 2016). There are large oyster reefs in both the Texas and Louisiana portions of Sabine Lake (Gelpi, 2019), but commercial harvesting of oysters is currently not allowed (Gelpi 2019; Banks et al., 2016). There are public seed oyster grounds in Sabine Lake and nearby Calcasieu Lake, but there are no private oyster leases along the Louisiana coastline west of Vermilion Bay. Commercial fisheries in Sabine Lake (See **Table 5-3**) produce blue crab, Atlantic croaker (*Micropogonias undulates*), black drum, flounder, whiting (*Menticirrhus* spp.), striped mullet (*Mugil cephalus*), and sheepshead (*Archosargus probatocephalus*) (Bohannon et al., 2015). Sabine Lake produced about 16 percent of Texas commercial blue crab landings (Bohannon et al., 2015). Shrimp are harvested primarily with otter trawls, blue crabs with traps/pots (Bourgeois et al., 2014), and black drum largely with very short benthic longlines referred to as trot lines (Leard et al., 1993).

TABLE 5-3
Texas Landings of Finfish and Shellfish in the Sabine Lake System

Year	Pounds Landed by Species[a,b]				
	Black Drum	Mullet	Brown Shrimp[c]	White Shrimp	Blue Crab
2005	--	1,334	--	833	821,823
2006	73	--	16	771	494,902
2007	0	186	--	4,404	519,937
2008	0	--	--	--	364,917
2009	0	--	--	2,525	393,667
2010	0	80	17,109	32,294	621,249
2011	0	2,442	8,957	35,047	392,310
2012	452	1,210	8,610	28,951	643,004

Notes:
[a] Landings (pounds) from Bohannon et al. (2015), for Texas landings only.
[b] Other species were reported in earlier years (1994-2004) including flounder and sheepshead, and "other."
[c] Includes lesser amounts of pink shrimp.

Freshwater Commercial Fisheries

Major components of the Louisiana freshwater commercial fisheries landings (See **Table 5-1** and **Table 5-2**) include wild crawfish (*Procambarus* spp.), catfish (*Ictalurus* spp), freshwater drum (*Aplondintus grunniens*), buffalofish (*Ictiobus* spp.), and shad (*Dorosoma* spp.), with crawfish and catfish representing about 70 percent and 18 percent of the freshwater landings respectively. However, most of these landings occurred to the east of the Project area, with the Atchafalaya River Basin producing the majority of the Louisiana landings and the Sabine River Basin producing less than 4 percent (Bonatakis, 2019). Significant freshwater components to Texas commercial landings are largely restricted to catfish. The Project area lies completely within areas identified as saltwater by Texas (TPWD, 2019) and Louisiana (LDWF, 2020). Commercial fishing for freshwater species is therefore very limited in the Project area.

5.2.3 Recreational Fisheries

Recreational fishing is a cultural staple in GOM states. It is estimated that more than 1.2 million Louisiana anglers participate each year, with an annual revenue of $2 billion that supports the local economy (ASA, 2019). According to the most recent (2016) Fisheries Economics of the U.S. report (NMFS, 2018), there were nearly three million recreational users within the GOM who made nearly 19 million trips. Within Louisiana waters, private boats and shore fishermen are the most common fishing mode making up 93 percent of all fishing trips, with chartered boats making up 7 percent (LA Creel, 2020). Key recreational target species and historical harvest numbers from 2007 to2013 are provided in **Table 5-4** based on data from NOAA's Marine Recreational Information Program (MRIP). In 2016, the most often harvested and released fish was the spotted seatrout with nearly 10 million fish harvested.

The State of Louisiana actively participated in the MRIP program; however, over time the LDWF found several issues with these surveys, namely their inability to obtain reliable landings of individual species in a timely manner and the ability to separate landings by regions of the state. On January 1, 2014, Louisiana stopped participating in the MRIP survey and began its own survey, called LA Creel. LA Creel is LDWF's recreational saltwater landings data collection program. LA Creel uses a combination of data collected dockside and through phone and email surveys to estimate recreational saltwater fish harvests. According the LA Creel (LDWF, 2020), the alligator gar was the most harvested species from 2014 to 2020 followed closely by red snapper (See **Table 5-5**).

TABLE 5-4
Key Target Species in the Louisiana Saltwater Recreational Fishery

Species	Total Fish [a] Harvested 2007-2013	Total Released [a] 2007-2013
Black drum (*Pogonias cromis*)	3,767,000	7,454,000
Atlantic croaker (*Micropogonias undulates*)	4,289,000	10,352,000
Sand seatrout (*Cynoscion arenarius*)	8,008,000	5,435,000
Spotted seatrout (*Cynoscion nebulosus*)	80,949,000	52,291,000
Southern kingfish (*Menticirrhus americanus*)	456,000	382,000
Sheepshead (*Archosargus probatocephalus*)	4,488,000	2,549,000
Red drum (*Sciaenops ocellatus*)	21,803,000	26,116,000
Red snapper (*Lutjanus campechanus*)	1,007,000	1,212,000
Southern Flounder (*Paralichthys lethostigma*)	3,260,000	519,000
Yellowfin tuna (*Thunnus albacares*)	143,000	17,000

Notes: [a] Data from NMFS, 2018.

TABLE 5-5
Most Commonly Caught Species in Louisiana Saltwater Recreational Fishery

Species	Harvested 2014-2020[a]	Habitats[b]
Alligator gar (*Atractosteus spatula*)	7,439,900	Brackish water of bayous, bays, and estuaries.
Red snapper (*Lutjanus campechanus*)	7,417,452	Offshore generally at depths of 30 to 620 feet.
Southern kingfish (*Menticirrhus americanus*)	3,939,234	Inshore & offshore waters to depths of about 30 feet.
Dolphinfish (*Coryphaena hippurus*)	2,298,444	Near coast at depths >279 feet. Mainly found offshore.
Red drum (*Sciaenops ocellatus*)	2,059,725	Estuary/bay, sandy bottom, mud flat, sea grass, oyster reef, surf zones, and continental shelf.
Atlantic tripletail (*Lobotes surinamensis*)	1,969,399	Coastal, found in bays, sounds and estuaries.
Black drum (*Pogonias cromis*)	1,692,945	Bay and inshore waters and offshore in GOM waters
Spotted seatrout (*Cynoscion nebulosus*)	1,448,857	Bay/estuary shallow in warm months, deeper in fall /winter.
Atlantic stingray (*Hypanus sabinus*)	482,755	Coastal waters 6.5-20 feet in summer, seasonally migrates offshore but rarely in water depths >80 feet.
Lane snapper (*Lutjanus synagris*)	342,333	Reefs and vegetated sandy bottoms in shallow inshore waters, offshore waters to depths of 1,300 feet.
Spanish Mackarel (*Scomberomorus maculatus*)	312,772	Epipelagic and migratory, at depths of 33-115 feet.
Southern flounder (*Paralichthys lethostigma*)	300,519	Over mud or silt bottoms in coastal/estuarine areas and lower reaches of rivers.
Sand seatrout (*Cynoscion arenarius*)	277,845	Muddy/sandy bottoms of estuaries, bays, lagoons and nearshore waters.
Atlantic spadefish (*Chaetodipterus faber*)	228,540	Found in shallow marine and brackish waters of mangroves, beaches, harbors, and shipwrecks.
African pompano (*Alectis ciliaris*)	200,210	Open water, reefs, shipwrecks, ledges depths <180 feet

Notes:

[a] Number of fish harvested per LDWF's recreational saltwater landings data collection program (LDWF, 2020). Records from 2014-to April 2020.

[b] From Florida Museum, Discover Fishes, Fish Species Profiles. Found online at https://www.floridamuseum.ufl.edu/discover-fish/species-profiles/.

Recreational fishing for species such as red snapper, lane snapper, red drum, black drum, Atlantic spadefish and sand seatrout occurs in offshore throughout the region, including the northern GOM at oil and gas platforms, artificial reefs, and hard banks. Recreational fishing for alligator gar, southern kingfish, Atlantic croaker, red drum, black drum, spotted sea trout, flounder, occurs throughout the inshore and estuarine waters of the northwestern GOM, including Sabine Lake.

5.3 ENVIRONMENTAL CONSEQUENCES

This section includes a discussion of the potential impacts that could result from the construction and operation of the offshore components of the Project. The study area within which potential impacts were assessed includes the area that would be affected physically by Project activities during construction and operation. As described in **Table 1-19** in Section 1.9.2 (Evaluation Criteria) of Topic Report 1 "Project Description, Purpose, and Need" (Volume IIa), the Project's effects on offshore commercial and recreational fisheries have been evaluated based on their potential to:

- Degrade the commercial, recreational, ecological, or scientific viability or significance of a biological resource;
- Measurably change the population size (density) or change the distribution of an important species in the region;
- Introduce new, invasive, or disruptive species in the proposed Project area; and/or
- Cause the loss or displacement of an important recreational resource, such as recreational fishing sites and other water-dependent recreational activities.

Activities associated with the construction, operation, and decommissioning of the DWP and associated pipeline that may have environmental consequences on commercial and recreational fisheries are included in **Table 5-6**. The following sections provide further information and discussion of potential environmental consequences.

TABLE 5--6
Potential Impacts on Commercial and Recreational Fisheries

Activity	Details	Duration of Impact	Mitigation Measures	Anticipated Level of Impact
Construction				
Pipeline Construction Onshore Pipeline, Crude Oil Loading Pipelines	• Seafloor disturbance during pipeline burial. • Turbidity and sedimentation during pipeline burial and lay barge anchoring. • The amount of seafloor disturbance is significantly reduced due to conversion of the existing Mainline (sealing side taps and removal of the MLV at WC 277). • Hydrostatic test water withdrawals and discharges. • Underwater noise.	Short-term	Compliance with U.S. Army Corps of Engineers (USACE) Permit, EPA Permit, and BOEM Right-of-way (ROW) Grant conditions All discharges will meet NPDES permit requirements. If necessary, based on regulatory requirements, the GOM seawater will be discharged through a neutralization and filtration	Negligible to minor and localized

TABLE 5--6
Potential Impacts on Commercial and Recreational Fisheries

Activity	Details	Duration of Impact	Mitigation Measures	Anticipated Level of Impact
			spread adjacent to the WC 509 Platform Complex platform and discharged overboard or retained in frac tanks and disposed of onshore	
CALM Buoy Installation	• Seafloor disturbance during Pipeline End Manifold (PLEM) and anchor installation. • Turbidity and sedimentation during PLEM and anchor installation. • Underwater noise from pile driving.	Short-term	Compliance with USACE Permit conditions	Negligible to minor and localized
Construction Vessel Operations	• Localized changes in water temperature, salinity, and dissolved oxygen due to vessel discharges. • Increase in turbidity and sedimentation due to anchoring and prop wash/scour (shallow areas). • Pollution due to potential spills of fuels or other hazardous materials. • Underwater noise.	Short-term	Compliance with federal regulations for vessel operations; Adherence to Spill Prevention, Control, and Countermeasures (SPCC) Plan	No effect
Operations				
Crude Oil Transfer	• Potential for oil spill from the offloading buoy or pipeline. • Safety zone restriction of fishing.	Lifetime of Project	Compliance with USCG regulations, the Coastal Louisiana Pipeline Facility Response Plan (PHMSA Sequence No. 3202), modified to include BMOP, and Energy Transfer's Sea Robin Oil Spill Response Plan (O-726), modified to include BMOP	Negligible and localized

TABLE 5--6
Potential Impacts on Commercial and Recreational Fisheries

Activity	Details	Duration of Impact	Mitigation Measures	Anticipated Level of Impact
Platform Operations	• Potential for spills of fuels or other hazardous materials. • Localized changes in water temperature, salinity, and dissolved oxygen due to platform discharges. • Ichthyoplankton entrainment in seawater intakes. • Sediment scour around the platform. • Safety zone restriction of fishing.	Lifetime of Project	Adherence to spill plan	Negligible and localized
Crude Oil Carrier Operations	• Localized changes in water temperature due to cycling of cooling water. • Ichthyoplankton entrainment in cooling water. • Potential spills of fuels, hazardous materials. • Underwater noise associated with mooring.	Lifetime of Project	Compliance with federal regulations for vessel operations; adherence to Energy Transfer's Sea Robin Oil Spill Response Plan (O-726), modified to include BMOP	Negligible to minor and localized
Support Vessel Operations	• Localized changes in water temperature due to cycling of cooling water. • Localized changes in water temperature, salinity, and dissolved oxygen due to ballast water exchange. • Increase in turbidity and sedimentation due to anchoring and prop wash/scour (shallow areas). • Pollution due to potential spills of fuels or other hazardous materials. • Underwater noise. • Safety zone restriction of fishing.	Lifetime of Project	Compliance with federal regulations for vessel operations; adherence to Energy Transfer's Sea Robin Oil Spill Response Plan (O-726), modified to include BMOP	Negligible to minor and localized
Upsets and Accidents				
Pipeline and Platform Operations	Potential oil spill.	Lifetime of Project	Continuous monitoring of pipeline operations, SCADA, early detection of abnormal operations, and remote shutdown; Compliance with EPA Permit and	Negligible and localized

TABLE 5--6 Potential Impacts on Commercial and Recreational Fisheries				
Activity	**Details**	**Duration of Impact**	**Mitigation Measures**	**Anticipated Level of Impact**
			MARAD License conditions, the Coastal Louisiana Pipeline Facility Response Plan (PHMSA Sequence No. 3202), modified to include BMOP, and Energy Transfer's Sea Robin Oil Spill Response Plan (O-726), modified to include BMOP	
Vessel Operations	Potential oil spill.	Lifetime of Project	Compliance with Energy Transfer's Sea Robin Oil Spill Response Plan (O-726), modified to include BMOP, and USCG regulations	Negligible and localized
Decommissioning				
Platform and Facility Removal	• Seafloor disturbance during removal. • Turbidity and sedimentation during removal. • Potential vessel related impacts, similar to facility construction. • Potential spills of fuels or other hazardous materials. • Underwater noise generated during removal. • Loss of structural habitat, restoration of soft bottom habitat. • Creation of structural habitat and fishing opportunity with Rigs to Reef.	Short-term	Compliance with USACE and EPA permits, BOEM ROW Grant, and MARAD License conditions	Negligible to minor and localized

TABLE 5--6
Potential Impacts on Commercial and Recreational Fisheries

Activity	Details	Duration of Impact	Mitigation Measures	Anticipated Level of Impact
Facility Abandonment in Place	• Seafloor disturbance during abandonment preparations. • Turbidity and sedimentation during abandonment preparations. • Localized changes in water quality due to pipeline purging.	Short-term	Compliance with USACE and BOEM/BSEE Permit conditions; Adherence to the Coastal Louisiana Pipeline Facility Response Plan (PHMSA Sequence No. 3202), modified to include BMOP, and Energy Transfer's Sea Robin Oil Spill Response Plan (O-726), modified to include BMOP; MARAD License conditions	Negligible to minor and localized
Support Vessel Operations	• Localized changes in water temperature due to cycling of cooling water. • Localized changes in water temperature, salinity, and dissolved oxygen due to vessel discharges. • Pollution due to potential spills of fuels or other hazardous materials. • Underwater noise.	Short-term	Compliance with federal regulations for vessel operations	Negligible to minor and localized

5.3.1 Construction and Installation

Construction activities with potential to affect fisheries include the installation of the onshore pipeline across Sabine Lake and installation of the Crude Oil Loading Pipelines, PLEMs, CALM Buoys, and service vessel moorings as well as epoxy sealing of existing side taps on the Mainline in the GOM. A description of offshore construction is provided in Topic Report 1 (Volume IIa). A description of pipeline construction in Sabine Lake is provided in Topic Report 1, "Project Description, Purpose, and Need" (Volume IIb).

None of the potential environmental consequences from Project construction are expected to have irreversible or significant impacts to commercial or recreational fisheries. Further, the amount of construction disturbance required, and potential impacts have been significantly reduced with the planned conversion of the existing Mainline, WC 509 Platform Complex, and WC 148 Platform.

5.3.1.1 Seafloor Disturbance

Installation of the DWP components will result in the temporary disturbance of approximately 467 acres of seafloor in the GOM. Installation of the new, onshore pipeline will result in temporary disturbance of approximately 154 acres of water bottoms in Sabine Lake. All of the area that will be affected is soft bottom habitat that has been designated as EFH. Only about 2.1 acres will be converted from soft bottom habitat to seafloor structures (PLEMs and CALM Buoy and service vessel moorings in the GOM); the remainder will revert back to available soft bottom habitat following construction. It is expected that the areas will be recolonized by benthic fauna within months of the completion of construction.

The proposed pipeline construction activities and installation of the PLEMs, CALM Buoy anchors, sealing side taps along the existing Mainline in federal waters, removal of the MLV at WC 277, and service vessel moorings may result in a temporary increase in total suspended solids (TSS) concentrations within the water column. However, it would be at concentrations that are below levels found to be harmful to fish and invertebrates (NOAA Fisheries, 2020). As discussed in Topic Report 6 (Volume IIa), **Appendix D** (Volume IIa), and Topic Report 4 (Volume IIb) - Aquatic Resources, these potential impacts will have only minor, short-term (or in the case of benthic impacts, long-term) effects on fish and invertebrates. Fish and invertebrates may temporarily avoid areas of disturbance and plumes, which could result in decreased catches in the areas; however, commercial and recreational fishermen will likely avoid these areas of disturbance.

These locations represent a very small portion of the area available to fishing in Sabine Lake and the GOM; all such effects on commercial and recreational fishing will be minor and short-term lasting only as long the activity is on-going at that location. Pipeline construction is expected to be completed within about 150 days in Sabine Lake and 60 days in the GOM.

5.3.1.2 Underwater Noise

Underwater noise will be generated by pile driving pipelay, and vessel operation. Increased sounds levels are believed to result in behavioral responses such as avoidance (see **Appendix D**). The effects will only last as long as active construction is ongoing but could potentially affect fishing success within the ensonified area during that time. Due to the amount of similar fish habitat in the area, the short-term impact to commercial and recreational fishing is expected to be negligible.

The loudest construction sounds will be generated during pile driving. The underwater sound that will be generated by pile-driving for installation of the PLEMs and CALM Buoy anchors will be at levels potentially injurious to fish. The effects will only last as long as pile driving is on-going, a total of approximately 16 days. During this time, impacts will be intermittent with fish expected to avoid the area. Due to the amount of similar fish habitat in the area, the short-term impact to commercial and recreational fishing is expected to be negligible.

5.3.1.3 Hydrostatic Testing

Hydrostatic testing of the pipelines will result in the withdrawal, use, and discharge of 26,234,000 gallons of seawater in the GOM, 368,000 gallons from the Neches River, 623,000 gallons of water from Sabine Lake, and 13,373,000 gallons from the surrounding marsh. As discussed in Topic Report 6 (Volume IIa) for the GOM and Topic Report 4 (Volume IIb) for Sabine Lake, these water withdrawals could result in mortalities of fish and invertebrate eggs and larvae through entrainment and impingement. However, with the implementation of BMPs, and the high abundance of eggs and larvae and their natural high mortality rate, the potential effects of the one-time uptake of hydrostatic test water will be negligible to any population or stock and will have no effect on recreational or commercial fisheries.

All discharges will meet the National Pollutant Discharge Elimination System (NPDES) permit requirements. If necessary, based on regulatory requirements, the GOM seawater will be discharged through a neutralization and filtration spread adjacent to the WC 509 Platform Complex platform and discharged overboard or retained in frac tanks and disposed of onshore

5.3.1.4 Vessel Discharges

Routine vessel discharges are expected to have no effect on fish or recreational and commercial fisheries. Commercial and recreational fisheries could, however, be impacted by accidental releases (i.e., spills) or the encountering of unanticipated contaminants. The severity of these impacts would depend on the nature and volume of the release, but most such releases associated with oil and gas activities in the GOM are small and have only minor, localized effects on water quality and no effect on fisheries.

5.3.2 Operations

Planned and routine activities during Project operations would have no effect on recreational or commercial fisheries in Sabine Lake. It is possible that unplanned inspections of the onshore pipeline could be required over the Project life span. If excavation or burial of the pipeline is required, it could have similar effects to those described above for pipelay during construction but over a much smaller area and shorter period. Potential effects on recreational and commercial fisheries will be minor and short-term.

In the GOM, operational activities that could potentially affect recreational and commercial fishing include platform operations, crude oil transfers, and VLCC or other crude oil carrier operations. To minimize and avoid potential impacts, the Project will follow the best management practices (BMPs) in its Port Operations Manual (see Appendix G, Volume III [*Confidential*]) and Energy Transfer's Sea Robin Oil Spill Response Plan (O-726), modified to include BMOP. The BMOP Project involves converting the existing WC 509 Platform Complex and Mainline, which are currently in operation. None of the potential environmental consequences from DWP operations are expected to have irreversible or significant impacts to commercial or recreational fisheries.

5.3.2.1 Platform Operations

Safety Zones will be established around the platform extending 1,640 feet from the platform and 820 feet from the service vessel moorings. Fishing vessels will not be allowed in the area, resulting in a loss of approximately 124 acres of GOM waters for fishing. Recreational fishing effort in this area is not known but likely minimal to non-extant based on the distance from shore (Ditton and Auyong, 1984). Commercial hook and line fishing and trawling may occur in the area. Due to the amount of similar fish habitat in the area, the proposed DWP will have a long-term but negligible effect on recreational and commercial fishing.

Platform operations that could affect fisheries include water withdrawals and discharges, lighting, and general vessel activity. During operations, seawater withdrawals and discharges will occur at the WC 509 Platform Complex. The water intakes could result in mortality to fish and invertebrate eggs and larvae entrained in the water. However, with implementation of BMPs, and the high abundance of eggs and larvae and their natural high mortality rate, the potential effects of the water intake will be long-term but negligible to any population or stock. The proposed Project will be under the jurisdiction of the EPA and require a NPDES Permit from EPA Region 6 to discharge wastewater. All platform discharges will meet the requirements of the platform's NPDES permit and will therefore not result in unreasonable degradation of the ocean waters.

As noted above, the proposed Project involves the conversion of an existing platform complex. Therefore, the proposed Project will not result in a significant change to current conditions (e.g., lighting, the presence

of platform jackets/pilings). No effects on recreational or commercial fisheries are expected from DWP operations.

5.3.2.2 Crude Oil Transfer / VLCC Operations

Safety Zones will be established around each of the CALM Buoys extending 1,640 feet from each buoy and encompassing a total of approximately 97 acres. Fishing vessels will not be allowed in the area, resulting in a loss of GOM waters available for fishing. Recreational fishing effort in this area is likely minimal to non-existent based on the distance from shore (Ditton and Auyong, 1984); commercial hook and line fishing and trawling may intermittently occur in the area. Due to the amount of similar fish habitat in the area, the potential long-term impact to commercial and recreational fishing is expected to be negligible.

The PLEMs and the mooring systems of the CALM Buoys will remain on the seafloor during operations representing a continued loss of soft bottom seafloor habitat for the life of the Project; however, the new structure may attract fish. Wind and current actions on the buoys will result in some movement with intermittent sweeping of the anchor chains disturbing a few acres of seafloor. These habitat conversions and seafloor disturbances represent negligible impacts on GOM fish habitat and would have no effect on commercial or recreational fisheries.

The VLCCs or other crude oil carriers calling on the DWP at a maximum rate of one call per day during operations will withdraw GOM seawater primarily for use as engine cooling water. A discussion on the need for cooling water is provided in Topic Report 3, "Water and Sediment Quality and Use" (Volume IIa). Fish and invertebrate eggs and larvae could be entrained and impinged at the intake and would be expected to result in 100 percent mortality of all entrained organisms. The Applicant conducted an analysis of the potential entrainment effects which is provided in **Appendix D**. The potential entrainment effects are considered to be negligible on recruitment due to the densities of eggs and larvae in the GOM and their naturally high mortality rate. Further, use of cooling water by vessels at the DWP will be no different from existing vessel operations in the northern GOM. No effect on recreational or commercial fisheries are expected.

5.3.3 Accidental Releases

Vessels involved in Project operations will operate in accordance with USCG and International Convention for the Prevention of Pollution from Ships (MARPOL) requirements to minimize the potential for a release of oils and/or chemicals to the GOM. Per 33 CFR Part 155, the USCG requires that all vessels have a Vessel Response Plan for responding in the event of a small release and all vessels will be equipped with spill response kits so that immediate action could be taken in the case of a spill. Each vessel operator will monitor their operations and have a spill kit readily available to contain and clean up any releases. Thus, the risk potential for impacts on the coastal and marine environment from a spill from vessels is considered negligible and no effect on recreational or commercial fisheries is expected.

5.3.4 Upsets and Accidents

Fish and invertebrate resources, and therefore recreational or commercial fisheries could be impacted by an inadvertent release of oil, diesel, lubricants, or other chemicals were to occur. Such spills could occur during construction, operation, or decommissioning, but in all cases, the releases would likely be small or minor. The fate and transport of a spill is dependent on the size of the spill and the type of material spilled, in addition to other factors.

Accidental spilling of hazardous substances such as gasoline, oil, hydraulic fluids, drilling muds, or diesel fuel is a potential risk associated with the proposed Project and can negatively impact water and sediment quality in the Project area. Quantities of chemicals and lubricants expected to be stored on the WC 509 Platform Complex are indicated in Topic Report 1 (Volume IIa). Hazardous materials will be stored and managed in accordance with all applicable regulations. The proposed DWP will not include refueling capabilities for personnel and supply vessels. Limited amounts of fuel will be stored at the DWP for emergency needs to support vessels and helicopters, and for use during startup. In the event of an inadvertent release, a Project-specific Spill Contingency Plan and the Energy Transfer Sea Robin Oil Spill Response Plan would be implemented. Based on this requirement, and the fact that large quantities of petroleum hydrocarbons or other hazardous waste will not be stored on the DWP, the risk of impacts to the fisheries from a spill is considered negligible.

Appendix F (Volume IIa) contains a Project-specific Oil Spill Trajectory and Fate Modeling Report. In addition, **Appendix F** (Volume IIa) contains a Tactical Response Assessment, which provides a discussion of potential response tactics that will facilitate a rapid and effective incident response to a spill. In the event of a large spill, an emergency response would be mobilized from shore.

The facility spill plan will include procedures for both a minor operational spill (several gallons) and a major accident in which a significant volume of oil is accidentally released. Adherence to all plans and regulatory requirements will result in very low potential for such releases and short-term, negligible impacts to recreational and commercial fisheries in the unlikely event a release occurs.

5.3.5 Decommissioning

Decommissioning will consist of abandoning in place all components that are embedded in the seafloor and water bottoms as well as removal of all Project components located on or above the seafloor. In Sabine Lake, the onshore pipeline will be abandoned in place and therefore will result in no seafloor disturbance or effects on recreational or commercial fisheries. In the GOM, the Mainline and the Crude Oil Loading Lines will be abandoned in place with no effects on fisheries, but the DWP platforms, service vessel moorings, PLEMs, and CALM Buoys and associated moorings, will all be removed resulting in seabed disturbance and potential water quality effects such as increased turbidity, TSS concentrations, and reduced dissolve oxygen concentrations. The use of vessels during removal will result in under water noise, routine discharges, and general disturbance. The potential effects of these activities will be similar to those described for installation of these components with commercial and recreational fishermen likely avoiding these areas. The area of disturbance represents a very small portion of the area available to fishing in the GOM so all such potential effects on commercial and recreational fishing will be minor and short-term, lasting only as long the activity is ongoing at that location. Explosives are not expected to be used for platform or pile removal; if they are, the assessment of associated impacts on fish and fisheries will be addressed at that time.

With the removal of the platforms, PLEMs, and moorings, there will be a loss of structural habitat and its biotic assemblages including the fish, with a conversion back to soft bottom habitats. The Applicant's plan is to transport the topsides by derrick barge to shore for disposal and install the bulk of the platform substructure at a GOM Rigs to Reef location. Similar biotic assemblages will develop at the new location with installation of the structure at the Rigs to Reef location where fishing is allowed resulting in increased fishing opportunities. With decommissioning, the Safety Zones will no longer be in place at the DWP location and fishing over the soft bottom habitats at the location will be allowed resulting in another gain in fishing opportunities. As required by regulation, platform legs as well as the foundation piles of the PLEMs and CALM Buoys, will be cut below the mudline. All components and debris on the seafloor will be removed and disposed of onshore. Regulation and Bureau of Safety and Environmental Enforcement

(BSEE) Notice to Lessees (NTL) No. 2019-G05 require a trawl or geophysical survey be conducted to verify the seafloor is clear of any and all obstructions and debris that could interfere with fishing.

Potential impacts from decommissioning could directly impact the marine environment including invertebrates, fish and indirectly impact commercial and recreational fisheries in the vicinity of the offshore Project components, however any impacts would be minor, short-term, and localized. Structural habitat in the form of platforms, PLEMs, and moorings will be removed and converted to the original soft bottom habitats open to fishing. This and the use of the platform substructure for the Rigs to Reefs program is expected to result in a net gain in opportunities for the recreational and commercial fisheries.

5.4 CUMULATIVE IMPACTS

A complete discussion of cumulative impacts is included in **Appendix C**, "Framework for Cumulative Impacts Analysis" (Volume IIa).

5.5 MITIGATION MEASURES

The Project is not located in proximity to especially sensitive or unique benthic habitats such as live bottom or submerged aquatic vegetation (SAV). Converting the existing Mainline, the existing WC 509 Platform Complex, and the existing WC 148 Platform, and adhering to all regulations and permit requirements, as well as spill contingency planning, will limit potential impacts from construction and operation. All in-water construction activities will comply with federal regulations to control the discharge of operational waste, such as bilge and ballast waters, trash and debris, and sanitary and domestic waste, that could be generated from all vessels associated with the Project. In addition, as per USCG and EPA regulations, an Oil Spill Contingency Plan, and Horizontal Directional Drill (HDD) Contingency Plan would be implemented during all phases of the Project. Potential impacts to commercial and recreational fisheries from construction and operation of the Project are not significant; therefore, no mitigation measures specifically directed at fisheries resources are proposed.

5.6 SUMMARY OF POTENTIAL IMPACTS

The Project is not expected to:

- Degrade the commercial, recreational, ecological, or scientific viability or significance of a biological resource;
- Measurably change the population size (density) or change the distribution of an important species in the region;
- Introduce new, invasive, or disruptive species in the proposed Project area; and/or
- Cause the loss or displacement of an important recreational resource, such as recreational fishing sites and other water-dependent recreational activities.

No live-bottom, reefs, SAV, or other special or sensitive habitats are located near the proposed Project, therefore no significant impacts to these resources are expected. Potential impacts on the commercial and recreational fisheries from Project construction, operation, and decommissioning of the Project are expected to be negligible to minor with most impacts short-term (See **Table 5-6**). None of the potential impacts to the fisheries are expected to be significant or irreversible.

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