



**Review of the Environmental Impact Assessment (EIA) for the
New Fortress Energy Marine Terminal and Pipeline Project
Old Harbour Bay, St. Catherine, Jamaica**

Done by

CL Environmental Limited

Prepared by:

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**With technical assistance from the
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This document contains the professional opinion of the Jamaica Environment Trust (JET). In arriving at our opinion we made every reasonable attempt to ensure that our resource persons are informed and reliable and experts in the area in which their comment and analysis is sought. JET encourages readers to apply their own critical analysis to the information provided in this document and by others, particularly where JET's opinion differs from those others.

Summary statement: With technical assistance from the Environmental Law Alliance Worldwide (ELAW), the Jamaica Environment Trust (JET) reviewed the Environmental Impact Assessment (EIA) for the New Fortress Energy Marine Terminal and Pipeline Project done by CL Environmental Limited. Two representatives from JET (Diana McCaulay and Nastassia Robinson) also attended the public meeting held on September 28th, 2016 at the Old Harbour Primary School in Old Harbour Bay. Our review follows.

Cumulative assessments of connected actions

JET reviewed the EIA for the Old Harbour Plant Repowering Project (190 MW) in November 2015 and at that time our review stated:

“The Old Harbour Plant Repowering project (190 MW) is only possible if a Floating Storage and Regasification Unit (FSRU) is built for the importation of liquefied natural gas (LNG). Similarly, the FSRU would not likely be built if the proposed Old Harbour Plant Repowering Project (190 MW) would not rely on LNG. **That is, the two projects are symbiotic.** Page 42 of the EIA states:

“4.3.2 Fuel Supply

“Natural gas will be supplied by a third party and subject to a separate Environmental Impact Assessment (EIA). The fuel supply plan will entail the importation of Liquefied Natural Gas (LNG) from the United States which will be supplied to a Floating Storage and Regasification Unit (FSRU). The FSRU would provide a level of storage and would convert the fuel into a gaseous form which would be piped to the JPS 190 MW facility either by terrestrial or marine pipeline, the determination of which will depend on the findings of the EIA.”

“A news story dated 11 November 2015 indicates the FSRU will be constructed at a cost of \$200 million.

“KINGSTON, Jamaica (JIS) – American company, New Fortress Energy LLC, will invest more than \$200 million to construct a Liquefied Natural Gas (LNG) terminal in Jamaica.

“The facility is expected to generate more than 200,000 metric tonnes of LNG annually, which will initially be supplied to the domestic market.

“There are also plans to expand output for delivery to other Caribbean countries, thereby positioning Jamaica as a regional hub for the supply of LNG.

“New Fortress was selected from a list of six entities which submitted bids to supply LNG to power the national energy grid, primarily through the Jamaica Public Service (JPS) Old Harbour 190-megawatt gas fired power plant.”¹

“The United States Environmental Protection Agency provides the following guidance for the preparation of EIAs for energy generation projects:

“All related or connected actions should be addressed in the EIA. There may be different entities and project proponents responsible for different aspects of proposed projects and alternatives. Even if there are different entities involved the test is whether a proposed energy project X would still be proposed if another project Y were not also proposed. For example, an energy generation plant is proposed but the electricity will need to be distributed and connected to transmission lines and the transmission lines would not be proposed for that particular location if it were not for the proposed energy generation plant. So the two projects should be assessed at the same time either by cross referencing in separate EIA documents or within a single, integrated document. The same logic applies to related projects such as pipelines, storage, port facilities and ships delivering fuels and the opening or expansion of quarries for building materials to be used in construction.”²

“Contrary to this guidance, the environmental impacts of the proposed Old Harbour Plant Repowering Project (190 MW) and the proposed Floating Storage and Regasification Unit (FSRU) are to be assessed separately, in separate EIAs, even though they are connected actions. **JET has been pointing out this flawed approach for almost ten years, but it continues.**

“Both the proposed Old Harbour Plant Repowering Project (190 MW) and the proposed Floating Storage and Regasification Unit (FSRU) would impact marine resources of the Portland Bight Protected Area that are described in Chapter 5 of the EIA. For example, the proposed Old Harbour Plant Repowering Project involves construction of a Seawater Intake System (described in Section 4.3.6 of the EIA) the construction and operation of which would impact marine resources of the Portland Bight Protected Area (PBPA). A proposed Floating Storage and Regasification Unit (FSRU) would also entail the construction and operation of infrastructure (pipelines and industrial equipment) within the Portland Bight Protected Area causing impacts to its marine resources. The impacts of the power and plant and the FSRU on the marine resources of the Portland Bight Protected Area would be cumulative. If the

¹ US company to spend more than \$200m to construct LNG terminal in Jamaica
<http://www.jamaicaobserver.com/news/US-company-to-spend-more-than--200m--to-construct-LNG-terminal-in-Jamaica>

² USEPA: EIA Technical Review Guidelines: Energy Generation and Transmission, CAFTA-DR, USEPA, USAID, EPA/315R11001, 2011.
<http://www2.epa.gov/international-cooperation/eia-technical-review-guidelines-energy-sector>

environmental impacts of the proposed Old Harbour Plant Repowering Project (190 MW) and the proposed Floating Storage and Regasification Unit (FSRU) are to be assessed separately, in separate EIAs, then the overall environmental impacts of the two connected projects would be improperly underestimated. This is of major significance to how the project's overall impact is evaluated in comparison to alternatives, such as wind and solar power generation projects, that would not require a Floating Storage and Regasification Unit (FSRU).

In addition, the provision of a more efficient power plant in the Portland Bight Protected Area (PBPA) along with an LNG Hub may well attract a range of industrial investments which are likely to have serious impacts on the biological diversity of the PBPA. This is not discussed at all. The map provided of the St. Catherine Coastal Development order (Pg. 295), which would show zoning, planned and existing land use was not reproduced at high enough resolution to be read. The map of the Highway 2000 Corridor Development Plan (Pg. 296) also could not be read, so JET is unable to say whether current planning instruments will adequately protect the natural resources of the PBPA in the event of a new influx of developments to the area."

We can only repeat these criticisms. The cumulative impact of connected actions and all aspects of any project should be assessed together in one EIA. These are in effect not two separate projects.

Impacts to coral reefs and seagrasses

The location of the project is the Portland Bight Protected Area (PBPA), which contains coral reefs and seagrasses, although the EIA downplays the significance of these marine resources due to their degradation.

"The proposed project site is located in the Portland Bight Protected Area (PBPA), totaling 1,876.2 km² in area, approximately 4.7% of the island of Jamaica.

"As reported in previous studies, the fringing reef system was reported approximately 3km from the shoreline (CLE, 2005), but no distinct coral reef communities were observed (CLE, 2005; ESL, 2006b, CLE 2012 and CLE 2015). The area was dominated by seagrass, *Thalassia testudinum*, and macroalgae with mounds of coral heads and coral rubble interspersed throughout (ESL, 2006b). The shoreline there is a patchy distribution of Halodule. The poor visibility and patchy distribution made mapping this bed impossible; however major seagrass beds successfully mapped in 2014 totalled 0.54 km² in area (Figure 5-109). The coral community occurs in an area with available substrate, which includes rubble, rock and dead patch reefs."

The project proponents are proposing to use horizontal directional drilling that would start on shore and then pass entirely beneath coral reefs and seagrasses in a manner that would likely cause little impact to them.

However, laying of the pipelines is one of only two major offshore construction activities that would occur in the marine environment. The second major component is driving in the piles that would support the floating platform. Driving piles into the seafloor can generate large quantities of churned up sediment, leading to increased turbidity and sedimentation. Page 352 of the EIA claims that there would be little impact from pile driving because the location of the piles supporting the marine terminal would be far from corals and seagrasses, and because the project would use silt screens to reduce the release of churned up sediment:

“Excess sediment in the water can interfere with sensitive and sessile species such as coral reefs and seagrass beds. Smothering of corals and seagrass may occur if there is excess and prolonged sedimentation, further resulting in habitat and species loss. Light penetration may also be reduced by the dredging activities. The reduced water quality may result in reduced photosynthesis of the seagrass beds. The offshore facility is far from these sensitive systems and should not have a major influence on any of these sensitive systems. The proper usage of silt screens or turbidity barriers is essential to any marine construction.”

The location of the floating platform is approximately 2000-2500 meters from corals and seagrasses to the west and north. See Figure 5-109 on page 261. With the use of silt curtains, that is probably a sufficiently large separation distance so that driving in the piles would not cause significant impacts to these marine resources, as long as permit requirements to suspend work during periods of bad weather are complied with.

Impacts to fisheries

Impacts to fisheries is discussed in greatest detail in Table 6.8 starting on page 326 of the EIA in response to stakeholder concerns. The material alludes to a small (200-meter) exclusion radius for fishers who use smaller nonmechanized vessels with oars.

“Stakeholder issues: 62% of respondents thought project could negatively affect fish catch.

“Response: Pilings and other in-water features associated with the offshore platform and pipeline will act as FADs (Fish Aggregation Devices) as well as providing suitable substrate and habitat for faunal colonization and recruitment. Furthermore, the 500m exclusion zone will help prevent the fishing of fish species in the area.

“Section 7.2.2.2 –The loss of fish eggs and larvae as a result of both the intake system as well as the cooling system should be minimal on the fish stocks as these planktonic stages have a high natural mortality rate. The loss of plankton (the base of the fish food web) is also expected to be minimal and as a result have a minimal impact on the existing system.

“The Fisheries Division believes that the potential impact on the majority of fishers and fishing activities should be minimal. However, there are some fishers, particularly those who use smaller nonmechanized vessels with oars, who fish in the area for small demersal and pelagic fish species using nets and hand lines who will be adversely impacted. These fishers may be somewhat displaced, particularly if there is a large sterile zone around the proposed FSU. As recommended by the Fisheries Division, we are willing to reduce the 500m restricted/exclusion zone to 200m so as to minimize the possible displacement of these fishers only (see Appendix 10).”

“Stakeholder issue: Proposed platform area is a red snapper feeding ground

“Response: Feeding habits of juvenile snapper shift based on size and plankton structure (Stephen T. Szedlmayer). A large section of the open area with minimal relief will remain while the addition of the platform should act more as a reef type plankton community and may serve to diversify and increase feeding resources. Further, the exclusion zone will help prevent the fishing of juvenile red snapper and other juvenile species in the area.

“The Fisheries Division added that the proposed site for the FSU is a feeding ground not just for the Red Snapper, but for several other demersal species, coastal pelagics and invertebrates such as Sea Cucumbers. The Fisheries Division’s expectation is that the installation and operation of the proposed FSU should have minimal medium to long term negative impacts on the ecology of the proposed site (given on the basis that effluents, noise, vibrations and other pollutants are kept within standards or eliminated where possible around the proposed FSU facility during installation and longer-term operations) (Appendix 10)”

Noise during construction is a concern, and the project proponent alludes to the use of vibropiling to reduce noise instead of the more conventional practice of hammer piling. See the following material on page 346 of the EIA.

“i. A soft start procedure can be used to cause marine animals to leave the immediate area of the piling. This involves starting the energy of the impact at approximately 1/10th of the desired level and progressively increasing the energy of the impact until the desired impact energy is achieved. The ramp up time should be determined by the time it would take the aquatic animal of interest to leave the high impact area.

“ii. Impact cushions of plywood, nylon or other material can be placed between the top of the pile and the hammer. These cushions can reduce the sound pressure level by between 4-26dB at the cost of requiring slightly more impacts to achieve the same penetration depth.

“iii. Bubble curtains may be used should noise mitigation be required for protection of marine animals. A bubble curtain is a vertical ‘curtain’ of bubbles that completely

surrounds the pile while driving is in progress. The bubbles present an impedance mismatch which results in transmission loss of between 320dB. Bubble curtains are less effective in areas where there are strong currents or high turbulence as the transmission loss depends on the whole pile being encased in the bubble curtain.

“iv. Use vibropiling where possible

“v. Reduce piling during breeding season.”

These measures are welcome but the commitment to using them seems less than certain. “... *we are willing* to reduce the 500m restricted/exclusion zone to 200m so as to minimize the possible displacement of these fishers only”

“... use vibropiling *where possible* ...”

These are essential mitigation measures. The project proponent should be required to comply with them.

Need for the ADO pipeline?

The project envisions not one, but two pipelines. The first is a major pipeline for the delivery of regassified natural gas to the Old Harbour power plant. The second pipeline would be for the delivery of automotive diesel oil (ADO) to the power plant, as discussed on page 45 of the EIA.

“A new (or refurbished) up to 8-inch (20.32 cm) ADO pipeline will run from the existing power plant and end at the pipeline end termination near the existing multipoint mooring buoys. This pipeline will be mostly directionally drilled from the shore and under the coral to a point near the mooring field.

“The onshore facility will include up to two 50,000 barrel storage tanks with approximately 55,000 barrels of containment in close proximity to the proposed new 190 MW power plant to be operated by JPS. This ADO line will provide a back-up fuel source to the JPS plant in case of interruptions in LNG delivery due to storms or other factors. The ADO will likely be supplied around once a year by ship and off loaded using a process similar to the existing process that the JPS plant uses.”

JET has several concerns about the ADO pipeline.

First, the terminus of the ADO pipeline is much closer to seagrasses and coral reefs – within 500 meters - than the terminus of the regassified natural gas pipeline.

Second, the ADO pipeline would be “mostly directionally drilled from the shore and under the coral to a point near the mooring field.” “Mostly” raises questions of the certainty of the project proponent’s commitment to protecting corals and seagrasses. The project proponent should specify exactly where the ADO pipeline would not be laid by horizontal directional drilling.

Third, there seems to be no rationale or justification for the ADO pipeline. Page 32 contains the following rationale for the project:

“3.1.3 Rationale and Objectives

“This proposed Project fits in with the National Energy Policy which seeks to develop a modern, efficient, diversified and environmentally sustainable energy sector providing affordable and accessible energy supplies, with long-term energy. The proposed Project forms the basis of providing a more diversified and environmentally friendly fuel source that has the potential to reduce the cost of electricity to the country and improve electricity supply reliability. The main objective is to provide the Jamaica Public Service Company’s Old Harbour Plant with a cleaner and more cost effective fuel in furtherance of the goals of the National Energy Policy.”

Since the ADO pipeline would only be for the delivery of 50,000 barrels of diesel fuel oil and would only be used “around once a year,” we question about whether there is sufficient justification for the ADO pipeline.

Impacts to the marine environment from a diesel spill

The EIA downplays the risks of a diesel spill as follows: “According to the National Oceanic and Atmospheric Administration (NOAA), diesel oil has a very low viscosity and is readily dispersed into the water column with moderate winds (5 -7 knots) or with breaking waves”.

This is only part of the story, however. With regard to Effects of a Diesel Spill on Wildlife and Plants, NOAA also says: “In terms of toxicity to water-column organisms, diesel is considered to be one of the most acutely toxic oil types. Fish, invertebrates, and seaweed that come in direct contact with a diesel spill may be killed. However, small spills in open water are so rapidly diluted that fish kills have never been reported. Fish kills have been reported for small spills in confined, shallow water.”

See: <http://response.restoration.noaa.gov/oil-and-chemical-spills/oil-spills/resources/small-diesel-spills.html>

The EIA should record all risks in full.

Water temperature

At the public meeting, there was discussion about the temperature of the water being returned to the marine environment after the vaporization process and assurances were made that it would not be warmer, but cooler temperatures can also have adverse impacts. JET would like to know how the temperature of water being released into the sea will be controlled.

Conduct of the public meeting

The public meeting was managed and moderated well by Mr. Paul Brown and there were no unnecessary speeches or public relations presentations, which was welcome. However, the two technical presentations were too long and technical for a community audience. This is a long standing problem.

A question about the sewage generated on the platform itself was not satisfactorily answered, because it is not enough to simply state that sewage will be handed in accordance with MARPOL, when there are few, if any, pump out facilities in Jamaica. Specifics about how the sewage generated on the platform will be dealt with should have been given in the EIA and at the public meeting.

With regard to storm surge risks, one slide referred to “coastal protective works” but no details were given. Coastal works themselves can have significant environmental impacts, so much greater detail is needed.

Underwater video was shown of the marine environment in the vicinity of the platform, and that was welcome, although the images showed much degradation and evidence of overfishing. It would have been helpful if the images were taken along transect lines and the transects shown on a map. As the images were presented, they could have been taken anywhere.

As usual, there was much cynicism about NEPA’s ability to monitor the project and this remains a problem for communities hearing promises of mitigation measures and enforcement which so rarely are undertaken in practice.

Permit Conditions

JET once again recommends that the main mitigation measures outlined in this EIA (and all others) be translated into specific, clear, enforceable permit conditions, instead of the blanket “all mitigation measures in the EIA are to be carried out” which has become the norm.

***Jamaica Environment Trust
24 October 2016***