NFEnergía LLC

San Juan Micro-Fuel Handling Facility

Resource Report 7
Soils

Docket No.
CP21-___-000

September 15, 2021

NFEnergía LLC
SAN JUAN MICRO-FUEL HANDLING FACILITY
RESOURCE REPORT 7—SOILS

Minimum Filing Requirements for Environmental Reports:	Addressed in Section:
1. List, by milepost, the soil associations that would be crossed and describe the erosion potential, fertility, and drainage characteristics of each association.	Section 7.2
2. If an aboveground facility site is greater than 5 acres: (i) List the soil series within the property and the percentage of the property comprised of each series; (ii) List the percentage of each series which would be permanently disturbed; (iii) Describe the characteristics of each soil series; and (iv) Indicate which are classified as prime or unique farmland by the United States Department of Agriculture, Natural Resources Conservation Service.	Section 7.2
3. Identify, by milepost, potential impact from: Soil erosion due to water, wind, or loss of vegetation; soil compaction and damage to soil structure resulting from movement of construction vehicles; wet soils and soils with poor drainage that are especially prone to structural damage; damage to drainage tile systems due to movement of construction vehicles and trenching activities; and interference with the operation of agricultural equipment due to the probability of large stones or blasted rock occurring on or near the surface as a result of construction.	Section 7.3
4. Identify, by milepost, cropland and residential areas where loss of soil fertility due to trenching and backfilling could occur.	Section 7.3
5. Describe proposed mitigation measures to reduce the potential for adverse impact to soils or agricultural productivity. Compare proposed mitigation measures with the staff's current “Upland Erosion Control, Revegetation, and Maintenance Plan,” which is available from the Commission Internet home page or from the Commission staff, and explain how proposed mitigation measures provide equivalent or greater protections to the environment.	Section 7.4

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ACRONYMS AND ABBREVIATIONS

FERC	Federal Energy Regulatory Commission
LNG	liquefied natural gas
MFH Facility	San Juan Micro-Fuel Handling Facility
MLRA	Major Land Resource Area
NFEnergía	NFEnergía LLC
PREPA	Puerto Rico Electric Power Authority

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7.0 RESOURCE REPORT 7—SOILS

7.1 Introduction

NFEnergía LLC ("NFEnergía") is seeking authorization from the Federal Energy Regulatory Commission ("FERC") under Section 3 of the Natural Gas Act to continue operating the San Juan Micro-Fuel Handling Facility ("MFH Facility"), a liquefied natural gas ("LNG") import and regasification facility. The MFH Facility is located on approximately 6.1 paved and fenced acres of an industrial area at Wharves A and B of the Puerto de San Juan (Port of San Juan), Puerto Rico, which is situated among existing industrial uses in the north of Puerto Rico where it can supply power generation sources serving nearby load centers using minimal additional infrastructure. To operate the MFH Facility, "pocket-sized" LNG vessels (also called "shuttle vessels") bring LNG into the San Juan Harbor where the LNG is transferred from the shuttle vessel to a non-jurisdictional floating storage unit vessel that is semi-permanently moored adjacent to the MFH Facility site. The floating storage unit transfers LNG onshore where certain quantities remain liquefied and are transloaded onto trucks for over-the-road delivery to end users and certain quantities are regasified and made available to Units 5 and 6 of the adjacent San Juan Power Plant via a 75-foot long, 10-inch diameter segment of power plant piping. The MFH Facility has a regasification capacity of 130 million standard cubic feet per day and a truck loading capacity of 87.52 million standard cubic feet per day.

NFEnergía initially developed the MFH Facility to serve its commercial customers via a truck loading operation for distribution of LNG for regasification and use at behind-the-fence power generation facilities across Puerto Rico—typically multinational companies with manufacturing operations. In July 2018, Puerto Rico Electric Power Authority ("PREPA") issued a request for proposals to retrofit Units 5 and 6 of the San Juan Power Plant to enable dual-fuel capability and to supply PREPA with natural gas. NFEnergía participated in that competitive process and was chosen as the successful bidder. PREPA and NFEnergía entered into a contract to effectuate the award in March 2019 and the MFH Facility began operating in March 2020 and became fully operational in May 2020.

FERC's National Environmental Policy Act review process requires that an applicant submit an Environmental Report consisting of up to 13 individual resource reports. This resource report is consistent with and meets or exceeds all applicable FERC filing requirements. A checklist showing the status of FERC's filing requirements for Resource Report 7 (18 Code of Federal Regulations § 380.12) is included before the table of contents.

Resource Report 7 provides a description of the soil characteristics underlying the MFH Facility and evaluates potential impacts of operation.

7.2 Existing Soil Resources

The area currently housing the MFH Facility had historically been disturbed and permanently converted to industrial use prior to the construction of the MFH Facility. The historic soil conditions, current soil conditions near the MFH Facility, and potential impacts associated with operation of the MFH Facility were obtained through a review of available soil and geographic

data, literature relevant to the MFH Facility area, and the 2019 *Report on the Geotechnical Exploration Performed at the Site of the Proposed NFE Microfuel Handling Facility* (Jaca & Sierra Engineering, 2019).

7.2.1 Soil Characteristics

Soil interpretations at the broadest scale in the United States are based on Major Land Resource Areas ("MLRA"). On a smaller scale, soil is mapped and described by soil map units, which consist of one or more soil series. The proposed facilities will be located within the Humid Coastal Plains MLRA (NRCS, 2006). The Humid Coastal Plains MLRA has four distinct regions, including the coastal plains, flood plains along rivers, small lagoon-like depressions, and areas of limestone karst. The small depression region is dominated by Histosols and Entisols, characterized as poorly drained Saprists or Aquents. The MFH Facility area is located within a poorly drained Aquent soil in a small, lagoon-like depression region of the Humid Coastal Plain MLRA.

Based on general soil maps of Puerto Rico (NRCS, 1984), the MFH Facility is within the Martin Pena-Saladar-Hydraqents soil map unit, dominated by the Martin Pena and Saladar soil series (refer to figure 7-1 in appendix 7A). Hydraqent soils are poorly drained, hydric soils often comprised of clayey alluvial deposits. The Martin Pena soil series is characterized as deep, very poorly drained soil with a mucky surface horizon over silty clay loam and clay horizons. The Martin Pena soils are formed in low depression areas in the humid coastal plain and river flood plains. The Saladar soil series is characterized as deep, poorly drained soil comprised almost entirely of a thick mucky horizon. The Saladar soils are developed in closed depressions and coastal marshes with restricted outlets (National Cooperative Soil Survey, 1978).

Prior to the construction of the MFH Facility, NFEnergía contracted Jaca & Sierra Engineering to conduct a geotechnical exploration of the MFH Facility area (Jaca & Sierra Engineering, 2019). The geotechnical exploration provides site-specific subsurface soil information obtained through several test borings conducted at the MFH Facility. The geotechnical exploration determined that the MFH Facility is generally underlain by man-made fill over soft clayey swamp deposits, occasional sand pockets, and older alluvial silty clay deposits over limestone at approximately 70 to 75 feet below the surface.

7.3 Operation Impacts

Significant impacts on soil resources associated with the operation of LNG facilities are typically associated with the permanent conversion of prime farmland, farmland of statewide importance, and unique farmland to industrial use.

The United States Department of Agriculture defines prime farmland as land that is best suited "for producing food, feed, forage, fiber, and oilseed crops" (Ditzler et al., 2017). This designation includes cultivated land, pastureland, woodland, or other lands that are either used for food or fiber crops or are available for these uses. Urbanized land and open water are excluded from prime farmland. Prime farmland typically contains few or no rocks, is permeable to water and air, is not excessively erodible or saturated with water for long periods, and is not subject to frequent prolonged flooding during the growing season. Soils that do not meet the above criteria may be considered prime farmland if the limiting factor is mitigated (e.g., if a flooding tendency is mitigated by artificial drainage).

In some areas, land that does not meet the criteria for prime farmland is considered farmland of statewide importance for the production of food, feed, fiber, forage, and oilseed crops. The appropriate state agencies determine the criteria for defining and delineating farmland of statewide importance, which generally includes areas that economically produce high crop yields when treated and managed according to acceptable farming methods. Impacts on prime farmland are of general concern because of the potential for decreases in long-term agricultural productivity.

The Martin Pena-Saladar-Hydraqents soil map unit has poor potential of supporting cultivated farm crops or specialty crops as the soil is prone to flooding (National Cooperative Soil Survey, 1978). Artificial drainage could have the potential to mitigate flooding, allowing the soil to be classified as prime farmland. However, the MFH Facility area has not been classified as prime farmland, farmland of statewide importance, or unique farmland by the Natural Resource Conservation Service. The entire MFH Facility area is developed land covered in man-made fill and further impacts on soil resources associated with the continued operation of the MFH Facility are not anticipated.

7.4 Mitigation Measures

As discussed in Resource Reports 11 and 13, NFEnergía will implement MFH Facility Emergency Response Plans (included as appendices 1C and 11C in Resource Reports 1 and 11), which describe measures to be implemented to prevent, and respond to, accidental spills or discharges. Post-construction activities and reporting, as outlined in FERC's Upland Erosion Control, Revegetation, and Maintenance Plan, do not apply as the MFH Facility footprint is located on previously developed land covered in man-made fill. Based on the assessment summarized above, impacts on soil resources associated with the operation of the MFH Facility are not anticipated, and further soil resource mitigation measures are not proposed.

7.5 References

Ditzler, C., K. Scheffe, and H.C. Monger, eds. 2017. Soil Survey Manual. U.S. Department of Agriculture Handbook 18.

Jaca & Sierra Engineering, PSC. 2019. Report on the Geotechnical Exploration Performed at the Site of the Proposed NFE Microfuel Handling Facility—Puerto Nuevo Wharf, San Juan, PR.

National Cooperative Soil Survey. 1978. Soil Survey of San Juan Area of Puerto Rico. Available online at: https://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/puerto_rico/PR686/0/San_Juan.pdf. Accessed: June 2021.

Natural Resource Conservation Service (NRCS). 1984. General Soil Map—Puerto Rico. Available online at: https://esdac.jrc.ec.europa.eu/content/general-soil-map-puerto-rico. Accessed: June 2021.

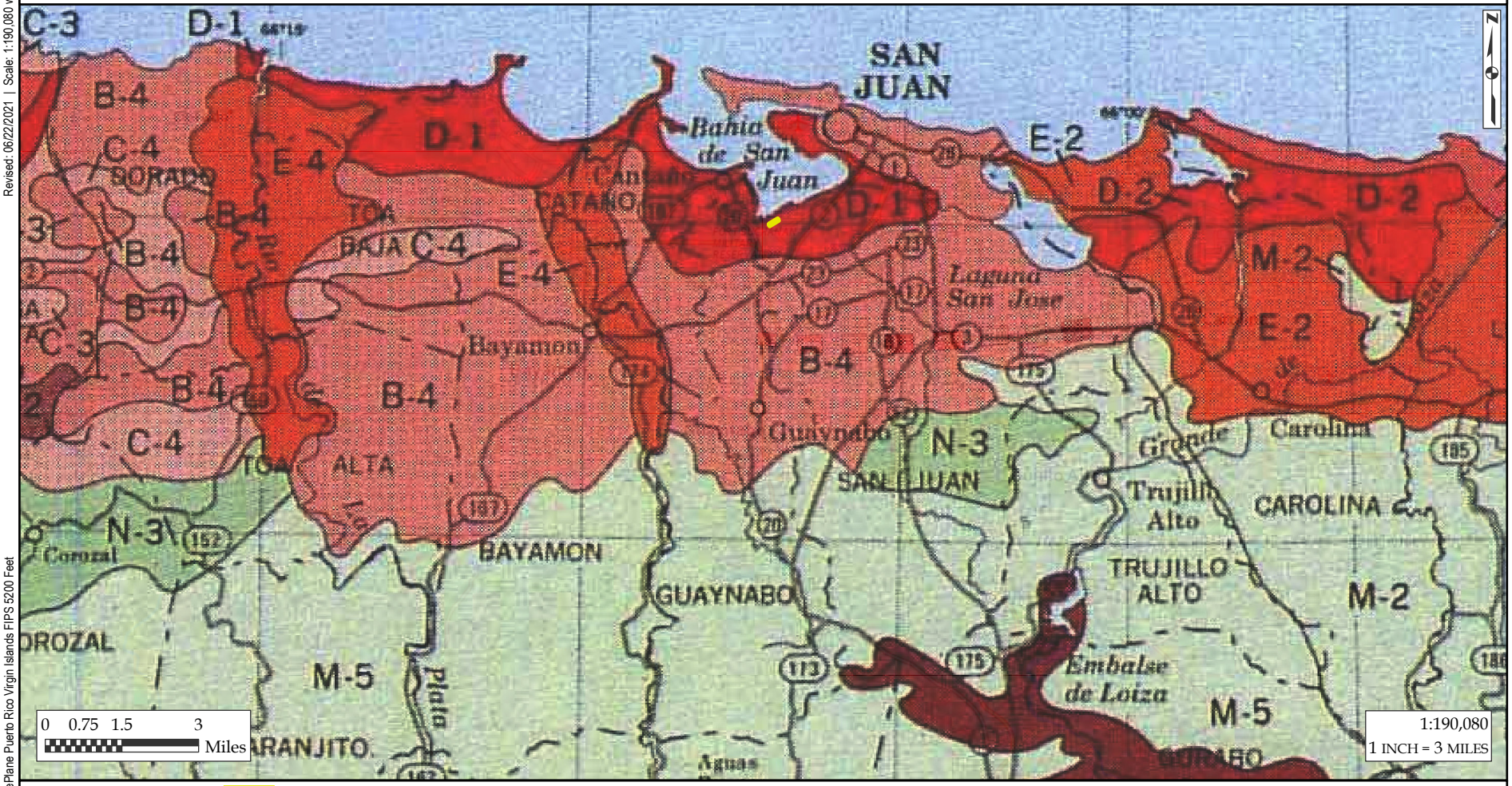
NRCS. 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296.

APPENDIX 7A FIGURES

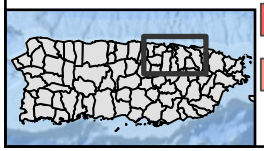
Revised: 06/22/2021 | Scale: 1:190,080 when printed at 8.5"x11"

Sub-Classification Descriptions:

A-4 Catano - Aguadilla Assn.
B-2 Almirante - Espinosa - Vega Alta Assn.
B-4 Almirante - Vega Alta - Matanzas Assn.
C-4 Tanama - Colinas - Soller Assn.
D-1 Martin Pena - Saladar - Hydraquents
D-2 Swamps - Marshes
E-2 Coloso - Toa Assn.
E-4 No description
M-2 Caguabo - Mucara - Naranjito Assn.
M-5 Mucara
N-3 Humatas - Naranjito - Consumo Assn.
S-2 Mabi - Rio Arriba Assn.



NOTES
1. Image URL: https://esdac.jrc.ec.europa.eu/images/Eudasm/latinamerica/images/maps/download/soil_puerto.jpg



Site Boundary

Humid Coastal Plains

Paleudults Tropohumods and Tropopsamments
Paleudults and Haplorthox
Rendolls and Tropudalfs with Numerous Limestone Outcrops
Fluvaquents, Hydraquents and Troposaprists
Hapludolls, Fluvaquents and Tropaquepts

Humid Uplands

Eutropepts
Tropohumults and Tropudults

Humid Upland Valleys

Eutropepts and Paleudalfs

Figure 7-1
General Soils Map
San Juan Micro-Fuel Handling Facility - NFEnergía, LLC
San Juan, Puerto Rico

NFEnergía puerto rico
ERM

COORDINATE SYSTEM: NAD 1983 StatePlane Puerto Rico Virgin Islands FIPS 5200 Feet