

RESTORATION IMPLEMENTATION AND MONITORING PLAN FOR THE NORTH PASS OIL SPILL

I. Introduction

This document describes the construction, monitoring, and reporting requirements for the Octave Pass crevasse-splay marsh creation project, to be constructed in the U.S. Fish and Wildlife Service operated Delta National Wildlife Refuge, Plaquemines Parish, Louisiana pursuant to the settlement of natural resource damage claims in the United States of America and the State of Louisiana for the North Pass Oil Spill.

II. Restoration Project

2.1 Description: This project entails cutting a crevasse in the right descending bank (*i.e.*, southern bank) of Octave Pass (Exhibit 1), in the Delta National Wildlife Refuge, to promote in-filling of the adjacent open water area (Brant Island) with sediment-laden river water. This project should eventually create 6.43 acres of sub-aerial land (splay marsh) and become colonized by native marsh vegetation.

2.2 Goal: Create a sustainable, structurally, and functionally equivalent emergent crevasse-splay marsh that compensates the public for lost services and resources due to the incident.

2.3 Objective: Establish at least 6.43 acres of emergent crevasse-splay marsh with associated vegetative communities.

III. Construction Requirements

3.1 Construction Criteria: Unless modified by the applicable permit, Devon Louisiana Corporation (hereafter referred to as “Devon Louisiana”) shall cut the crevasse at 3236236.44 N, 865703.99 E (NAD83, UTM, Zone 15), as depicted on Exhibit 2. The crevasse shall be cut in a manner to establish a channel no larger than 130 feet wide, 420 feet long on the southern edge and 400 feet long on the northern edge, and at a depth of -5.0 feet (NAVD 88) as depicted on Exhibit 2. The crevasse must be cut in conformance with all applicable permit requirements, and in a manner approved by the Trustee Council as likely to achieve the project goals and objectives. The spoil material may be deposited either continuously along the channel created by the construction activities, or mounded in the open water area of the receiving basin, in accordance with applicable permit requirements.

Devon Louisiana shall design the crevasse so as to cause the creation of a splay marsh of at least 1.0 acre in size by Year 5. The 1.0 acre of splay marsh shall be colonized by emergent marsh vegetation.

3.2 Construction Planning

(Notice of construction schedule with work plan and/or specifications)

3.3 Notice of Construction Completion: Immediately upon construction completion, Devon Louisiana will notify Chuck Armbruster, LOSCO Project Manager, by phone or email. Within 30 days of construction completion, Devon Louisiana shall submit as-built drawings of the crevasse and a construction completion report to the Trustee Council. The report shall include:

- a. a description of all benchmark(s) used with geographic coordinates of their location, and datum;
- b. ground photography of the benchmark(s) and crevasse;
- c. a list of the Project Managers and their contact information;
- d. location and description of projects as approved;
- e. description of the final, as-built features;
- f. major equipment used;
- g. list of construction sequences and activities, problems encountered; solutions to problems, etc.;
- h. construction change orders and field changes;
- i. list of pipeline and other utility crossings (list structure, owner, and representative to contact);
- j. report of safety record while on the job;
- k. additional comments pertaining to construction, completed project, etc., and;
- l. significant construction dates.

The report should demonstrate that the constructed crevasse complies with that proposed to the Trustee Council. Additionally, the deliverables shall include a post-construction, geo-rectified, aerial photograph of the project area.

3.4 Construction Review

3.4.1 Trustee Review Schedule and Procedure for the Restoration Project. Within 30 days of notification of construction completion, at least one member of the Trustee Council shall visit the site. Additionally, the Construction Completion Report will be reviewed by the Trustees within 30 days of receipt and, upon finding that construction is in accordance with the requirements of this implementation plan and the approved Work Plan, the Trustees will provide written notice to Devon Louisiana approving the completion of construction. If construction is not in accordance with the requirements of this Implementation Plan and the approved Work Plan, Devon Louisiana will undertake such activities as are necessary to achieve compliance.

IV. Monitoring Requirements

4.1 Initial Monitoring Period: The as-built drawings and aerial photography included in the construction completion report will fulfill the data requirements for the initial monitoring period. The data will be used by the Trustees during the maintenance period to determine if the performance criteria (Section V) have been met.

4.2 Maintenance Period: During the months of either August or September closest to Year 3 and Year 5 following the Construction Completion Certificate Date, Devon Louisiana shall monitor the project site to determine whether the project goals and objectives have been achieved, or whether corrective actions are necessary to meet the goals and objectives. Specifically, in these years, Devon Louisiana shall:

- a. measure the spatial extent of the vegetated crevasse-splay;
- b. survey the profile of the conveyance channel;
- c. record dominant (greater than trace abundances) emergent vegetation composition on the crevasse-splay; and
- d. document the variety of fauna observed utilizing the newly created crevasse-splay marsh.

Devon Louisiana shall give notice of the monitoring events to the Trustees at least 21 days in advance and arrange transportation so that the Trustees' representatives may accompany Devon Louisiana, or their representatives, on the visit to the Octave Pass crevasse. The date of the monitoring event may be changed upon agreement of Devon Louisiana and the Trustees if weather conditions justify rescheduling.

V. Performance Criteria

5.1 Spatial Extent: Spatial extent of the created crevasse-splay at Year 5 is at least equal to the 0.965 acres of vegetated wetland plants.

5.1.1 Monitoring requirements: Measure spatial extent of the vegetated crevasse-splay

5.1.2 Monitoring Method: Geo-rectified, near-vertical aerial photography

5.1.3 Monitoring Frequency: Year 3 and Year 5

5.2 Channel Profile: The conveyance channel profile of the crevasse-splay is at least equal to 50% of its constructed depth.

5.2.1 Monitoring requirements: Survey the profile of the conveyance channel

5.2.2 Monitoring Method: Topographic/bathymetric survey

5.2.3 *Monitoring Frequency:* Year 3 and Year 5

5.3 Vegetative presence: Emergent vegetation will be present on the crevasse-splay by Year 5.

5.3.1 *Monitoring requirements:* Record emergent vegetation composition on the crevasse-splay

5.3.2 *Monitoring Method:* Ground-truthing of aerial photography

5.3.3 *Monitoring Frequency:* Year 3 and Year 5

VI. Reporting Requirements

Devon Louisiana, or their representatives, shall submit a written report regarding the monitoring data within 60 days of each monitoring event. Following monitoring in both Year 3 and Year 5, the report shall describe: a) the results and analysis of the near-vertical aerial photography, as well as an area comparison of the current years photography to past years (*i.e.*, area of sub-aerial splay marsh in Year 3 compared to immediate post-construction, and Year 5 compared to Year 3), b) the degree of scouring or accretion occurring in the crevasse, and 3) the dominant (greater than trace abundances) species of flora and fauna observed colonizing or utilizing the crevasse-splay marsh. Following monitoring in Year 5, Devon Louisiana or their representatives shall also document their compliance with the performance criteria in Section V.

VII. Corrective Actions

7.1 Corrective Action: This term means any action that the Trustee Council deems necessary to ensure the success of the project.

- a. If, at any point during the 5-year monitoring period, the Trustee Council determines that corrective actions may be necessary, the Trustee Council may require Devon Louisiana to undertake such corrective actions. The Trustee Council may require Devon Louisiana to submit a report, within 45 days, that indicates what corrective actions will be undertaken by Devon Louisiana. Devon Louisiana may also submit such recommendations to the Trustee Council in the absence of a request for such a report at any point during the 5-year monitoring period. Prior to implementing any corrective action, Devon Louisiana must obtain approval from the Trustee Council of such action. Devon Louisiana shall undertake any required corrective actions at their expense, and in accordance with a schedule determined by the Trustee Council.
- b. If, at the end of the 5-year monitoring period, the Trustee Council determines that one or more of the performance criteria are not satisfied, the Trustee Council may

require corrective actions to be undertaken by Devon Louisiana. Devon Louisiana shall undertake any required corrective actions at their expense, and in accordance with a schedule determined by the Trustee Council.

- c. If corrective actions are required after the completion of the 5-year monitoring period, the deadline for project certification will be extended an additional year for every corrective action undertaken. During such period of extension, Devon Louisiana must perform the monitoring described above in Section 4.2 and meet the performance criteria listed in Section V.

7.2 Types of Corrective Actions: Examples of corrective actions that may be required to ensure growth of the splay marsh to the required extent include, but are not limited to: re-dredging the crevasse, dredging a new crevasse, or eradicating undesirable vegetation (*i.e.*, invasive species).

7.3 Limits on Corrective Actions: If Devon Louisiana is required to implement corrective actions after Year 5, as explained in section VII(b) of this Restoration Implementation and Monitoring Plan, and if Devon Louisiana has demonstrated best effort to satisfy the performance criteria through Year 5, then Devon Louisiana will not be required to implement corrective actions past Year 6 or submit more than one additional monitoring report. Best efforts include best efforts to: anticipate any potential failure to meet the performance criteria during the maintenance period (particularly Year 3 monitoring), address the effects of a potential failure as it is occurring and after the failure to meet the performance criteria has been discovered, take action in response to the Trustees' written recommendations during the monitoring period. To this extent, if best effort has been demonstrated throughout the project, then the Trustee Council will issue Devon Louisiana a Certificate of Completion.