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U S NAVY RESPONSES TO REGULATOR COMMENTS ON DRAFT LONG TERM
MONITORING WORK PLAN FOR SITE 1 INCINERATOR LANDFILL MCRD PARRIS ISLAND
SC
2/1/2005
NAVAL FACILITIES ENGINEERING COMMAND SOUTHERN DIVISION

RESPONSE TO SCDHEC COMMENTS
SITE/SWMU 1 DRAFT LONG TERM MONITORING (LTM) WORK PLAN
DONALD C. HARGROVE (SCDHEC)

GENERAL COMMENTS

1. **Comment:** Section 4.3.2, Groundwater Monitoring: This section specifies well screens with "10 slots per inch." This is not a valid specification for well screens. It appears that the intent was to specify a slot size of 0.010 inches. Please verify the size of the proposed well screens and revise the text accordingly.

Response: The well screen specification has been changed from '10 slots per inch' to 'slot size of 0.010 inches'.

2. **Comment:** A monitoring well approval cannot be written based on the specifications proposed in this work plan. More information should be provided, either within this workplan, or in a separate monitoring well approval request. In addition to the information provided in this work plan, the following information is also required (regulation citations provided):

- a) Proposed well construction details; R.61-71.H.1.a(2)
- b) Proposed drilling date. R.61-71.H.1.a(8)

Please refer to R.61-71.H.1.a for the complete list of required information.

Response: The following sentences will be added to the third paragraph on page 4-4 (Section 4.3.2): A Monitoring Well Approval Request will be submitted by the Navy contractor installing the wells. The Monitoring Well Approval Request will contain all information required by South Carolina Well Standards, R.61-71.H.1.a, including proposed well construction details and proposed drilling date(s).

RESPONSE TO EPA COMMENTS
SITE/SWMU 1 DRAFT LONG TERM MONITORING (LTM) WORK PLAN
PATRICIA J. GOLDBERG (EPA)

GENERAL COMMENTS

- 1. Comment:** The estimated time frame for achieving the defined success criteria recommended for marsh restoration is not clearly presented in the LTM work plan. As result, the time requirement triggering the implementation of the Saltwater Marsh Contingency Plan is also unclear. The frequency of native grass marsh monitoring presented in the LTM work plan differs from what was presented in the Final RA/CA Work Plan. The LTM work plan reports that plots of marsh grass will be inventoried annually. However, the Final RA/CA Work Plan reports that a “qualitative” evaluation would occur annually and a “quantitative” evaluation of the condition of the landfill marsh would be conducted three years after the completion of the restoration and to be compared to the success criteria. Section 14.6 of the Final RA/CA Work Plan states that should the restoration area not meet the percent survival of stems per square meter requirements at the end of the three year monitoring period, the Saltwater Marsh Contingency Plan will be implemented. Please clarify in the final work plan the estimated time to achieve the stem density success criteria and at what point will contingency measures be implemented. Additionally, please include a discussion of whether any short term (i.e., 1-yr, 2-yr, etc.) success criteria will be established.

Response: The LTM Work Plan will be modified to agree with the RA/CA Work Plan in that a “qualitative” evaluation will occur annually and a “quantitative” evaluation will occur after three years. Specifically, the density of smooth cordgrass in the restored marsh will be measured annually in comparison to the adjacent undisturbed marsh. After three years, the density of the smooth cordgrass in the disturbed marsh must have an average stem density equal to 75% of the average stem density in the adjacent undisturbed marsh. The following paragraph will be added to Section 3.0:

“The Environmental Partnering Team has agreed that the best way to measure the success of marsh restoration is by comparison to the adjacent undisturbed marsh. Therefore, concurrent sampling in the restored and reference marsh areas will be conducted annually in late summer or early fall (toward the end of the growing season). The restored marsh will have to meet the following criteria: an average stem density of smooth cordgrass in the restored marsh equal to 75% of the average stem density of this species in the adjacent undisturbed marsh at the end of three years. When this success criterion is met, sampling may be discontinued. However, if the success criterion is not met at the end of three years, options for ensuring success by the end of the 5-year review period will be considered by the team.”

SPECIFIC COMMENTS

2. Comment: Page 3-1, Next to Last Paragraph

See General Comment No. 1, above.

Response: The next to last paragraph and the last paragraph on Page 3-1 will be deleted and replaced with the text presented in Response No. 1, above.

3. Comment: Page 4-3, 1st Bullet Item

The bullet reports that three plots of marsh grass along each of four transects should be inventoried (twelve total). However, only three transects with three plots per transect (nine total) were inventoried to establish the current reference stem density success criteria. Please discuss.

Response: The Navy agrees with the comment. The first bullet item on Page 4-3 will be modified to the following:

"Three clusters of transects have been established to the north, east, and southwest of the landfill. Three quadrats of marsh grass along one transect at each of the three clusters should be inventoried (nine total)."

4. Comment: Page 4-4, Table

The table incorrectly reports that a 5-ft screen will be used to construct monitoring well PAI-01-MW-24, located upgradient and south of the capped landfill. The correct screen length for this well is 10-ft. Please correct the table.

Response: The table will be revised per the comment.

5. Comment: Page 4-5, Section 4.3.3, 2nd Sentence

The text reports that four transects with three plots each will be selected. See Specific Comment No. 2, above.

Response: The first through fourth sentences of Section 4.3.3 will be replaced with the following text to indicate that three transects with three quadrats each will be selected:

Three clusters of five transects have been established to the north, east, and southwest of the landfill. Thirty degrees separates each of the transects and the horizontal base point (180 degrees total). Each transect originates at the points shown on Figure 2 and extends out into the marsh approximately 140 feet. One transect from each cluster was randomly selected to be sampled each year and should be marked out by a brightly colored PVC rope. Three quadrats have been randomly selected to be inventoried at each randomly selected transect. At each quadrat, a one-meter by one-meter square frame should be constructed from PVC pipe. The distance between potential quadrats was assumed to be four feet along the 140 foot transects length since 1 meter is equal to 3.28 feet.

6. **Comment:** Page 4-5, Section 4.3.3, 6th Sentence

Clarify in the text if both dead and alive stems of native grass will be counted within the one-meter square frame.

Response: The word “alive” will be inserted between “of” and “stems” in the sixth sentence.

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RESPONSE TO SCDNR COMMENTS
SITE/SWMU 1 DRAFT LONG TERM MONITORING (LTM) WORK PLAN
ROBERT E. DUNCAN/PRISCILLA WENDT (SCDNR)

GENERAL COMMENTS

1. **Comment:** The recent survey conducted by MACTEC (October, 2004) confirms earlier observations of extremely low stem densities of *Spartina alterniflora* in the replanted marsh area. Although very few plants are visible in this area, it is uncertain whether most of the plants died, were washed away with the tides, or if they still are present and have viable rhizomes. The Trustees concur with the recommendation to wait until spring to see if new growth emerges from subsurface rhizomes; however, the Navy should be prepared to replant in an expeditious manner if *Spartina* does not emerge, in order to take advantage of the spring growing season. If replanting is necessary, the Navy should consider using container-grown nursery stock instead of bare-root stock, to enhance plant survival and the likelihood of successful marsh restoration.

Response: The Navy is committed to replanting *Spartina alterniflora* in an expeditious manner if the plant does not emerge in spots. Pending availability and cost, container-grown nursery stock will be considered instead of bare-root stock to enhance plant survival and the likelihood of successful marsh restoration.

2. **Comment:** The Trustees concur with EPA's comments regarding the lack of clarity and consistency between the RA/CA Workplan and the LTM Workplan regarding the frequency (quarterly vs. annual) and type of monitoring (qualitative vs. quantitative), and the timeframe for achieving the specified success criteria. We recognize that some of these discrepancies reflect changes in the approach to monitoring, which resulted from discussions among the Trustees and other members of the Partnering Team subsequent to finalizing the RA/CA Workplan. In order to clarify these issues, however, the Trustees recommend that the LTM Workplan be revised, taking the following two suggestions into account.
 - a. The Trustees believe that the average stem density of *Spartina alterniflora* that was used to define the success criteria for restored marsh areas is not truly representative of that in the adjacent undisturbed marsh. It was our understanding that the three transects surveyed by SCDNR and MACTEC staff on February 18, 2003 (Transects 5, 6, and 7 in Section 4.8.3 of the RA/CA Workplan) would be used as the sole basis for determining appropriate "reference" marsh stem densities. Instead of using these three transects alone, however, to calculate average "reference" stem densities, the RA/CA Workplan shows that two additional transects (Transects 1 and 2) extending from the upland edge of the landfill down through areas of marsh containing waste debris and contaminated sediments, were included in the calculation of an average "reference" stem density of 124 stems/m². The Trustees believe that it is inappropriate to include

areas impacted by landfill debris and contaminants in the calculation of “reference” stem densities. It is also inappropriate to include stem counts from transects that extend from upland to intertidal elevations when attempting to estimate the density of *Spartina alterniflora* at its preferred elevation in undisturbed intertidal saltmarsh. For these reasons, the Trustees recommend that the average “reference” stem density be based *solely* on the three transects established outside the boundary of the landfill. This would result in an average “reference” stem density of 174 stems/m² (as opposed to 124 stems/m², as indicated in the RA/CA Workplan). The Trustees believe that this number is an accurate estimate of average *Spartina* stem densities in the adjacent undisturbed marsh during late winter/early spring at an elevation consistent with that of the restored marsh. Following the protocol for calculating success criteria as described in the RA/CA Workplan, this would result in a *minimum* of 122 stems/m² (i.e., 70% of 174) in 80% of the restored area (i.e., in seven out of the nine 1-m² quadrats sampled at the end of three years), and a *minimum* of 52 stems/m² (i.e., 30% of 174) in 20% of the restored area (i.e., in the remaining two out of nine 1-m² quadrats sampled at the end of three years).

- b. As a simpler alternative to the method described above for determining the success of marsh restoration, the Trustees suggest that the following success criterion be considered: **an average stem density of *Spartina alterniflora* in the restored marsh equal to 75% of the average stem density of this species in the adjacent undisturbed marsh at the end of three years.** This approach is consistent with that recommended by the SCDNR for other marsh restoration projects, is simpler to calculate, and allows for more flexibility in determining the success of the project (i.e., there is no minimum stem density requirement, provided the average stem density is achieved). Ideally, the adjacent undisturbed marsh would be sampled in the same manner, and the average stem density in the restored marsh would be compared to that in the undisturbed marsh *measured at the same time* (rather than measured three years earlier and, possibly, in a different season). If this simpler approach is taken, the Trustees recommend that concurrent sampling in the restored and reference marsh areas be conducted annually in late summer or early fall (toward the end of the growing season). As soon as the success criterion is met, sampling may be discontinued. If the success criterion is not met at the end of three years, options for ensuring success by the end of the 5-year review period should be considered, as described in Section 14.6 of the RA/CA Workplan (Saltwater Marsh Contingency Plan). These options might include regrading, replanting, adding appropriate soil amendments, or taking other appropriate actions, as determined jointly by the Partnering Team in consultation with wetland restoration experts.

Response: For the success of marsh restoration, the Navy agrees that the following success criterion be considered: an *average* stem density of *Spartina alterniflora* in the restored marsh equal

to 75% of the *average* stem density of this species in the adjacent undisturbed marsh at the end of three years.

Concurrent sampling in the restored and reference marsh areas will be conducted annually in late summer or early fall (toward the end of the growing season). As soon as the success criterion is met, sampling may be discontinued.

The seventh paragraph in Section 3.0 will be changed to the following:

“The Environmental Partnering Team has agreed that the best way to measure the success of marsh restoration is by comparison to the adjacent undisturbed marsh. Therefore, concurrent sampling in the restored and reference marsh areas will be conducted annually in late summer or early fall (toward the end of the growing season). The restored marsh will have to meet the following criteria: an average stem density of smooth cordgrass in the restored marsh equal to 75% of the average stem density of this species in the adjacent undisturbed marsh at the end of three years. When this success criterion is met, sampling may be discontinued. However, if the success criterion is not met at the end of three years, options for ensuring success by the end of the 5-year review period will be considered by the team.”