



## 4.0 ENVIRONMENTAL CONSEQUENCES

Chapter 4, “Environmental Consequences,” provides a description of potential impacts that could be expected for the human and natural environment as a result of Alternative 1 (Proposed Project) and the alternatives. Impact information is predominantly based on preliminary design provided by the Applicant. The Corps recognizes that Palmetto Railways is conducting voluntary cleanup and site preparation of the Project site, and that these activities will be required to redevelop the site regardless of whether the Department of the Army (DA) permit is issued. An evaluation and discussion of the potential impacts that could be expected from these activities are included within each resource section.

Resource areas discussed in this chapter include:

- Geology and Soils (Section 4.1)
- Hydrology (Section 4.2)
- Water Quality (Section 4.3)
- Vegetation and Wildlife (Section 4.4)
- Waters of the U.S. (Section 4.5)
- Protected Species (Section 4.6)
- Essential Fish Habitat (Section 4.7)
- Transportation (Section 4.8)
- Land Use and Infrastructure (Section 4.9)
- Cultural Resources (Section 4.10)
- Visual Resources and Aesthetics (Section 4.11)
- Noise and Vibration (Section 4.12)
- Air Quality (Section 4.13)
- Climate Change (Section 4.14)
- Hazardous, Toxic, and Radioactive Waste (Section 4.15)
- Socioeconomics and Environmental Justice (Section 4.16)
- Human Health and Safety (Section 4.17)
- Section 4(f)/6(f) Resources (Section 4.18)

NEPA requires that three types of impacts be evaluated: direct, indirect and cumulative impacts. Direct and indirect impacts are discussed in Chapter 4, while cumulative impacts are discussed in Chapter 5, as described below:

- **Direct effects** – Direct effects are caused by a proposed action and occur at the same time and place (40 C.F.R. 1508.8). Direct impacts may have both beneficial and adverse effects.
- **Indirect effects** – Indirect effects are caused by a proposed action but occur later in time or are farther removed in distance but still reasonably likely to occur. Indirect effects 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 C.F.R. 1508.8).
- **Cumulative effects** – Cumulative effects are additive or indirect effects that would result from the incremental impact of a proposed action when added to other past, present, and

reasonably foreseeable future actions (RFFAs), regardless of what agency or person undertakes such other actions (40 C.F.R. 1508.7). Examples of RFFAs that could interact with Proposed Project-related impacts to result in cumulative impacts are the Charleston Harbor Post 45 (the deepening of the Charleston Harbor to 50+ feet mean low water), construction of the HLT (formerly the Navy Base Marine Container Terminal at the Charleston Naval Complex), and expansion of commercial, institutional, and industrial facilities.

Direct and indirect impacts of Alternative 1 (Proposed Project) and alternatives are further evaluated for each resource in relation to context, duration, intensity, type, and potential to occur:

- Context (limited, local, or regional)
- Duration (temporary, short-term, long-term, or permanent)
- Intensity (negligible, minor, moderate, major, No Effect, No Adverse Effect, Adverse Effect)
- Type (beneficial or adverse)
- Potential to occur (unlikely, possible, or probable)

In the introduction for each resource section, the reader is provided a brief description of the methodology used for assessing and evaluating potential impacts, as well as definitions related to the intensity of potential impacts. With the exception of waters of the U.S., each resource section used the following definitions related to the duration of potential impacts:

- Temporary = Up to 1 week
- Short-Term = Up to 5 years
- Long-Term = Up to 10 years
- Permanent = Longer than 10 years

The definitions related to the duration of potential impacts associated with waters of the U.S are derived from the time limits associated with the Charleston District Regional Condition for the 2012 Nationwide Permits, which assigns an impact of less than 6 months as Temporary and an impact of greater than 6 months as Permanent.

Lastly, an impact summary, which takes into account the significance of impacts after mitigation implementation, is provided for each resource evaluated at the end of each resource section. When discussing impacts to action alternatives for any resource area, mitigation measures as presented for Alternative 1 (Proposed Project) would also be applicable to the action alternatives.

## 4.1 GEOLOGY AND SOILS

### 4.1.1 Methods and Impact Definitions

Impacts to geology and soils were evaluated through a review of site-specific geotechnical reports, conceptual development plans specific to the alternatives, and available literature on the regional