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TEXAS DESAL PROJECT

Final Report

To the Texas Water Development Board

Contract No.: 0904830972

September 2011



NRS Consulting Engineers, Inc.
Texas Registered Engineering Firm
F-2705

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Introduction

The Brownsville Public Utilities Board (BPUB) and Laguna Madre Water District (LMWD) serve communities in south Texas facing growing municipal and industrial water demands and increasingly limited water supplies. With support from the Texas Water Development Board (TWDB), both BPUB and LMWD piloted seawater desalination projects to determine the viability of desalinated seawater as an alternative water supply.

In June of 2009, BPUB received a grant from TWDB to perform stakeholder scoping in preparation for the development of full-scale seawater desalination facilities. Due to the newness of seawater desalination, there exist many unknowns in the areas of regulatory permitting and environmental effects. This scoping effort, dubbed the **Texas Desal Project**, aims to provide a science-based forum where environmental and permitting issues associated with the construction and operation of a full-scale seawater desalination facility may be identified and solutions integrated into the design process.

BPUB and LMWD retained NRS Consulting Engineers, who designed and managed construction of both pilot projects, to facilitate the six tasks comprising the Texas Desal Project.

Purpose and Need

In 2008, the National Academies of Science published a national study of the potential for seawater and brackish water desalination to help meet anticipated water supply needs in the United States. The study committee concluded that the cost of producing desalinated water is no longer the primary barrier to implementing desalination technology, but that “uncertainties regarding environmental impacts and ways to mitigate these impacts are some of the largest hurdles to implementation of desalination in the United States.” Possible environmental impacts of desalination are impingement and entrainment of marine organisms when seawater is taken in, ecological impacts from disposing of salt concentrates, and increased greenhouse gas emissions from increased energy use, among other concerns. Although limited studies to date suggest that the environmental impacts may be less detrimental than many other types of water supply, site-specific information necessary to make detailed conclusions on environmental impacts is typically lacking.

To minimize the degree to which environmental and permitting issues negatively influence project implementation budgets and timelines, BPUB and LMWD propose a proactive approach that would engage environmental and regulatory stakeholders in the state early in the design process. Scoping activities would include agency, non-governmental, and academic entities that would assist in identifying natural resource concerns and permitting requirements.

Seawater desalination is presently being considered by at least two Texas communities. The Brownsville Public Utilities Board (BPUB) recently completed a successful pilot project on the Brownsville Ship Channel and is preparing to construct a 2.5 mgd seawater desalination demonstration project. The facility would include the capacity to expand up to 25 mgd. The Laguna Madre Water District (LMWD) is currently conducting a pilot project on South Padre Island. Once piloting has been completed, LMWD envisions implementing a 1.0 mgd

seawater desalination production facility to provide water on the northern portion of South Padre Island. These two facilities would be first of their kind in the state and have drawn the interest of many different Texas stakeholders that could be involved in the planning, review, permitting, and impacts analysis of such projects.

In view of the precedent nature of these two projects in Texas, BPUB and LMWD proposed a proactive approach by conducting comprehensive stakeholder scoping of issues associated with the design and development of seawater desalination facilities in Texas. The scoping participants would include agency, non-governmental, and academic entities that would provide a science-based forum to assist in scoping natural resource concerns and permitting requirements. Information derived during scoping would aid planning activities about ways to avoid or minimize adverse impacts, and result in a list of future research needs relevant to the development of future seawater desalination in Texas. The proposal would ultimately result in a collaborative association of stakeholders in Texas with a precedent of working together to identify and minimize natural resource concerns associated with this new water supply strategy.

Scope of Work

The Texas Desal Project scope consisted of the following six tasks:

Task 1.0 – Concept Development

Finalize objectives of the scoping activities, including articulating critical concepts previously discussed with project sponsors and potential participants.

Task 2.0 – Organize Stakeholders

Solicit participation in the scoping process from selected representatives of state and federal natural resource and regulatory agencies, non-governmental organizations, and academic institutions. The purpose would be to provide a science-based forum where environmental and permitting issues associated with the construction and operation of a full-scale seawater desalination facility may be identified and solutions integrated into the design process.

Each stakeholder would have the opportunity and responsibility to:

- 1) Attend the public scoping meeting(s);
- 1) Participate in a site visit of the proposed projects and be briefed on the status and scope of the proposed seawater desalination projects;
- 2) Provide constructive feedback with regard to perceived environmental resource issues associated with the proposed facilities;
- 3) Provide references to relevant existing data and research addressing natural resource issues in the study area;
- 4) Assist in the development and evaluation of conceptual ideas to avoid or minimize any identified adverse impacts; and
- 5) Identify all regulatory and/or permitting requirements for construction and/or operation of the proposed full-scale facilities.

Although it is anticipated that other entities will also occasionally participate as necessary, core stakeholders will include representatives from the following organizations:

- 1) Project Sponsors (2) – Brownsville Public Utilities Board; Laguna Madre Water District and their designated consultants.
- 2) Federal Agencies (3) – U.S. Fish and Wildlife Service; U.S. Army Corps of Engineers; U.S. National Marine Fisheries Service.

- 3) State Agencies (3) – Texas Water Development Board; Texas Parks and Wildlife Department; Texas Commission on Environmental Quality.
- 4) Non-governmental Organizations (1) – Sierra Club (representing the Texas Living Waters Project).
- 5) Academic Institutions (4) – Harte Research Institute for Gulf of Mexico Studies (Texas A&M at Corpus Christi); Center for Research in Water Resources (University of Texas); University of Texas-Pan American; University of Texas at Brownsville and Texas Southmost College.

Task 3.0 – Conduct Public Scoping

Assist BPUB and LMWD in conducting at least one (1) public scoping meeting to initiate the National Environmental Policy Act (NEPA) process for preparation of an Environmental Impact Statement (EIS), should one be required for the project. This task will include:

- 1) Preparing and publishing a notice in the Federal Register of the intent to prepare and EIS and of the opportunity to participate in a public scoping meeting.
- 2) Preparing and presenting information regarding the proposed project during the scoping meeting.
- 3) Receiving and organizing all public comments received during scoping.
- 4) Using public comments to focus evaluation of the potential impacts of the proposed project.

Task 4.0 – Facilitate Orientation and Issue Identification

Orient stakeholder participants to the proposed projects and facilitate the identification of key natural resource and permitting issues. Specifically, this task will include:

- 1) Conducting a site visit for the stakeholders of the two seawater desalination projects and providing a summary of general seawater desalination technologies and processes.
 - a. Preparing and present a detailed history and development plan for each proposed project, including alternatives considered but rejected.
 - b. Summarizing plans and alternatives for incorporating renewable energy components to each project.
- 2) Facilitating a discussion and formal articulation by stakeholders of:
 - a. Key natural resource concerns and supporting technical information associated with the construction and operation of the proposed production-scale seawater desalination projects.
 - b. Applicable permitting, regulatory, and compliance requirements.
 - c. If necessary, recommendations regarding the scope and objectives for any special studies or investigations necessary to address data gaps.

Task 5.0 – Develop Detailed Permitting and Compliance Strategies

Based on the results of previous tasks, develop detailed permitting and environmental compliance strategies for each proposed seawater desalination project, including:

- 1) Comprehensive list of permits and compliance documents necessary for construction and operation.
- 2) Projected permitting and compliance timelines.
- 3) Projected permitting and compliance costs.

Task 6.0 – Coordination and Management

For six months after the notice to proceed, serve as a liaison between the project sponsors, engineering design teams, and stakeholders, providing regular (monthly) updates of:

- 1) Overall project status, including permitting and compliance planning activities.
- 2) Summary of design considerations incorporated to accommodate environmental concerns.
- 3) Outstanding environmental resource issues or areas of concern.

Results

In the following section, the approach and results of each task are described and presented. Because Task 6.0 (Coordination and Management) was administrative in nature, it was omitted from this discussion.

Task 1.0 – Concept Development

Approach

A meeting on September 17th, 2009 was organized among the project sponsors (BPUB and LMWD), project consultants (NRS Consulting Engineers, TRC Environmental Corporation, and WaterPR), and the Texas Water Development Board (TWDB). The purpose of the meeting was to outline the intended approach and establish a consensus regarding the objectives for the public scoping. In order to finalize the objectives of the scoping activities, including articulating critical concepts previously discussed with project sponsors and potential participants.

Results

Task 1.0 began with the conception of the project idea and was completed with this initial meeting with the core team. It was determined that a Stakeholder Workshop would be conducted before Christmas, and that the general public scoping meeting would be held in the spring of 2010. A summary of this initial kickoff meeting is included in Appendix A.

Task 2.0 – Organize Stakeholders

Approach

The objective of this task was to contact and solicit participation in the scoping process from representatives of state and federal natural resource and regulatory agencies, non-governmental organizations, and academic institutions.

Results

NRS conducted a series of meetings and phone calls to explain the project concept. Stakeholders from over forty organizations were contacted and invited to participate. The list of invited stakeholders included:

- Arroyo Colorado Watershed Partnership
- Brownsville Public Utility Board
- Bureau of Reclamation
- City of McAllen
- Coastal Bend Bays and Estuaries Program

- Coastal Conservation Association
- Environmental Protection Agency
- Guadalupe-Blanco River Authority
- Harte Research Institute for Gulf of Mexico Studies
- Laguna Madre Water District
- Lower Colorado River Authority
- Lower Laguna Madre Foundation
- Lower Rio Grande Valley Development Council
- National Marine Fisheries Service
- National Audubon Society
- National Wildlife Federation
- Nature Conservancy
- North Alamo Water Supply Corporation
- Port of Brownsville
- Rio Grande Regional Water Authority
- Rio Grande Regional Water Planning Group
- San Antonio River Authority
- San Antonio Water System
- San Patricio Municipal Water District
- Science Academy of South Texas
- Sierra Club
- Texas Commission on Environmental Quality
- Texas General Land Office
- Texas Parks & Wildlife Commission
- Texas Sea Grant College Program
- Texas Water Development Board
- United States Fish & Wildlife Service
- United States Army Corps of Engineers
- University of Texas at Austin
- University of Texas at Brownsville
- University of Texas Center for Research in Water Resources
- University of Texas Marine Science Institute
- University of Texas - Pan American
- Valley Municipal Utility District #2

An example of the invitation letter is included in Appendix B.

Task 3.0 – Conduct Public Scoping

Approach

The objective of this task was to assist BPUB and LMWD in conducting at least one public scoping meeting to initiate the National Environmental Policy Act (NEPA) process for preparation of an Environmental Impact Statement (EIS), should one be required for the project.

Results

After review of the permitting and compliance strategies for each of the two seawater desalination facilities, a direct federal nexus sufficient to trigger a NEPA process in each

project was not identified except for direct federal funding. As neither project has yet secured federal funding and only the Brownsville project has identified a need for public funding, there is no lead federal agency to initiate the NEPA process at this time.

For this reason, Task 3.0 was not executed. NRS continues to work with each project sponsor to coordinate the needs and objectives of this environmental scoping meeting with their broader objectives for building public support for their projects.

Task 4.0 – Facilitate Orientation and Issue Identification

Approach

The objectives of this task were to orient the stakeholder participants to the proposed projects and facilitate the identification of key natural resource and permitting issues by holding a two-day workshop featuring expert speakers and roundtable discussions. This objective would be performed in person during a workshop.

In addition, an opportunity would be provided for follow-up correspondence and discussion regarding the issues presented at the workshop. This objective would be performed through an on-line format supported by email correspondence.

Results

Workshop

Approximately 60 participants attended the stakeholders workshop held on December 3rd and 4th, 2009, at which speakers presented key environmental and permitting issues and two roundtable discussions were moderated by NRS. The two-day workshop also included site visits to both the pilot facilities on South Padre Island as well as the Brownsville Ship Channel.

The workshop opened the morning of December 3 with remarks from Commissioner Carlos Rubinstein of the Texas Commission on Environmental Quality. During the morning session, participants worked to establish a common understanding of the scoping project objectives and the background of desalination initiatives of Texas, and seawater desalination projects in south Texas in particular. Dr. George Ward, UT Center for Research in Water Resources, spoke about the oceanography of the Texas coast, and Jake White of NRS gave attendees a basic overview of reverse osmosis technology and applications. Jorge Arroyo of the Texas Water Development Board discussed a history of desalination initiatives in Texas, and representatives of the Brownsville PUB and Laguna Madre Water District talked about the status of their respective desalination projects in south Texas.

During lunch, Tyson Broad of the Lone Star Chapter of the Sierra Club gave the keynote address on the environmental perspective on desalination. Participants then spent the afternoon in roundtable discussions on environmental issues and concerns and envisioned permitting requirements for desalination projects on the Gulf of Mexico. Impingement, entrainment, and other intake issues were a concern, as well as the loss of natural resources associated with various intake scenarios. Concentrate disposal and management poses a challenge, as desalination typically has a 50% recovery rate. One item to consider is whether there is any resource value to concentrate. Stratification is another potential problem, and it

was noted that engineers often do not have a proper understanding of gravity issues in far field discharge.

Wind, solar, and wave power options are being investigated to address concerns with power consumption. However, green power options may have environmental impacts of their own, such as physical obstructions to fishing, shrimping, bird and bat migration, or siting hardware on critical habitat.

Discussion revealed many permitting and compliance issues that can affect desalination efforts. TCEQ representatives noted that one of the biggest problems is either too little or too much information on applications. Site visits are helpful for TCEQ, and applicants should be prepared to defend their proposal against discharge concerns, economic considerations, and safety concerns. Applicants were encouraged to come to TCEQ with more data and questions and get answers before submitting a formal application.

Representatives from TWBD, TGLO, TPWD, and US Fish and Wildlife Service also discussed their roles in the process, and issues that should ideally be discussed with them during the planning phase.

The second day (December 4) was devoted to learning from past experiences, and featured speakers who gave perspectives from both the scientific and practical sides of the desalination equation. Dr. Kenneth Dunton, UT Marine Science Institute, discussed the integration of science into policy and permitting issues, and Nikolay Voutchkov of Water Globe Consulting relayed his experiences with permitting and environmental issues he had encountered in other parts of the United States. Dr. Chris Reed of URS spoke about discharge and dilution, and Robert McConnell of Tampa Bay Water presented a case study of the Tampa Bay Seawater Desalination Project and the environmental monitoring results from the facility.

The session concluded with an overview of ongoing dialog opportunities via a stakeholder web community, and the schedule of deliverables for participants. Participants were asked to assist with the following over the next four months:

- Identify any permitting or regulatory responsibilities impacting development of a seawater desalination project
- Provide references to relevant data, studies, and research
- Provide a planning aid memorandum outlining potential environmental recommendations for ways to avoid or minimize the same
- Provide recommendations regarding future research and evaluating future seawater desalination projects proposed
- Participate in a site visit of the proposed BPUB and LMWD (optional)
- Attend one or more public scoping meetings (optional)

A list of attendees at the workshop, a final workshop agenda, speaker biographies, and the nine PowerPoint presentations delivered during the workshop are included in Appendix C. WaterPR was primarily responsible for developing the workshop agenda and materials, and facilitating registration and accommodations during the workshop.

Online Dialogue

On March 16, Michael Irlbeck corresponded with stakeholders via a written request for the submittal of pertinent information. To assist in natural resource issue discussion, NRS provided a summary of each project and the alternatives under consideration for each component (Table 1).

Table 1: Summary of Seawater Desalination Project Concepts

Project Component	Alternative Strategies Under Consideration	
	Brownsville Ship Channel SWRO Project (2.5 MGD at demonstration capacity; 25.0 MGD at full capacity)	South Padre Island SWRO Project (1.0 MGD at full capacity)
Intake	<ul style="list-style-type: none"> Constructed intake channel off the Ship Channel with filter media bed. Open water intake on the Ship Channel. 	<ul style="list-style-type: none"> Series of shallow beach wells and a raw water collection pipeline. Open water intake in the Gulf of Mexico with raw water intake pipeline directionally-drilled under the dunes.
Treatment System	<ul style="list-style-type: none"> Site located on the south shore of the Ship Channel; treatment technology to include membrane pretreatment and reverse osmosis. 	<ul style="list-style-type: none"> Site located on the bay-side of South Padre Island some distance north of Andy Bowie County Park; treatment technology to include membrane pretreatment and reverse osmosis.
Finished Water System	<ul style="list-style-type: none"> Ground storage tank and high service pump station. 	<ul style="list-style-type: none"> Ground storage tank and high service pump station.
Concentrate Disposal	<ul style="list-style-type: none"> Diffusion into the Gulf of Mexico (full 25 MGD scale only). No-discharge evaporation ponds (2.5 MGD demonstration only). Blend 1:1 (back to ambient TDS) with river water and discharge to the surface tidal flats south of the Ship Channel (2.5 MGD demonstration scale only). 	<ul style="list-style-type: none"> Diffusion into the Gulf of Mexico. Injection well into hypersaline geologic formation. Diffusion into Laguna Madre.
Power Consumption	<ul style="list-style-type: none"> Grid only. On-site renewable energy (wind) with grid supplement. 	<ul style="list-style-type: none"> Grid only. On-site renewable energy (wave buoys) with grid supplement.

The request letter and chart were distributed via email to project participants, as well as uploaded to a web page developed through Google Groups to connect participants and sponsors. Of the identified stakeholder entities, 38 individuals signed up to participate in the online dialog. The group page provided a forum where discussion threads on desalination-related issues as design components could be shared and moderated, and resources such as news articles and journal publications were uploaded for public review and comment. A screen image and written description of the group web page is included in Appendix D.

Planning Aid Memoranda

Fifteen planning aid memoranda were submitted, constituting responses from 33% of the identified stakeholders. A copy of each planning aid memorandum received by stakeholders is included in Appendix E. Table 2 presents a summary of these recommendations and concerns by major project component. With regard to the intake system, none of the proposed alternatives were identified as critically adverse. An intake off the Brownsville Ship Channel, with proper screening (to minimize impingement) and appropriate siting (e.g., as far away from the Gulf Pass and preferably not between San Martin Lake and Brazos-Santiago Pass), was generally considered as acceptable option. Similarly, a shallow beach well system on South Padre Island¹ was preferred to an open water intake system if

¹ Though beach wells were considered at the time of the workshop, a later, correlating study conducted by Laguna Madre Water District ultimately discarded the use of beach wells as a method of intake for the South Padre Island desalination facility.

appropriate considerations to ensure protection of shallow fresh aquifers, any instream or environmental flows, and dune habitats are included. Finally, most participants expressed concerns about impingement and entrainment of aquatic species with an open water intake in the Gulf of Mexico, but measures to minimize these potential impacts were also proposed (e.g., maximum distance from Gulf Pass and coastline with designed intake velocities of less than 0.5 cubic feet per second).

Participant comments on the treatment and finished water systems of the proposed seawater desalination projects related primarily to avoiding impacts to habitat and recreation. It was recognized that both potential project sites are and have been used by a variety of resident and migratory wildlife and avian species, some of which are federally listed as threatened or endangered (e.g., piping plover, ocelot and jaguarondi). Recommendations included limiting fragmentation of corridor habitat along the ship channel, avoiding sensitive dunes and barren flats, and limiting the proximity to recreational areas.

For concentrate disposal, there was general consensus that diffusion into the Gulf of Mexico was the preferred method over other alternatives, including diffusion in Laguna Madre, evaporation ponds, blending with surface water and discharging into tidal flats, or deep-well injection. However, with measures to minimize some identified potential impacts, there was conditional support for evaporation ponds and injection wells.

Finally, with regard to the anticipated power consumption of the proposed seawater desalination facilities, stakeholder participants expressed concerns primarily related to potential adverse impacts to avians. Both projects are located in the Central Flyway and are heavily used by migratory waterfowl, shorebirds, songbirds, and raptors, as well as by local terrestrial and marine bird species. Conventional power transmission infrastructure presents some risk of electrocution. While there was encouragement to pursue renewable energy applications to power the proposed desalination facilities (including wind, solar, and wave technologies), some concerns were expressed about some of these applications. Wind turbines were identified as posing a risk to avians along the coast, and recommendations were made to limit or avoid the use of this application.

Table 2: Summary of Responses to Desalination Project Components

Project Component **Comments** [= Recommendations = Concerns]

Intake

Constructed Intake Channel off Ship Channel with filter media bed **Sierra Club**
 Potential concentration of contamination in the filter media is a concern; Need to utilize a method for cleaning the filter media that avoids contamination.
TPWD
 Potential for an acceptable option.

Series of shallow beach wells and raw water collection pipeline **SARA**
 Our main concern is protecting instream and environmental flows.
Sierra Club
 Must avoid contamination or reduction of water levels in over-lying fresh water aquifer. It is our understanding that this method is cost-prohibitive.
TPWD
 From the perspective of protection of fish, a beach well-field intake option may be acceptable.
UT Pan Am
 Locate well back from dunes to avoid disturbance. Suggest alternating the use of pipes for discharge and intake to avoid fouling of intake pumps.

Open-water intake on the Ship Channel **Sierra Club** **TCEQ** **TPWD**
 Concerns about impingement and entrainment of aquatic species near intake.
TCEQ **TPWD**
 Distance from the coastline will be a critical element; Intake structure should be as far away from the Gulf Pass as possible.
TPWD
 Open-water intake is undesirable between San Martin Lake and Brazos-Santiago Pass.
UT Pan Am
 Recommends measures to minimize entrainment and impingement of species

Open-water intake in the Gulf of Mexico with raw intake pipeline directionally drilled under dunes **Sierra Club** **TCEQ** **TPWD**
 Concerns about impingement and entrainment of aquatic species near intake as well as disruption of nesting habitats during construction.
TCEQ **TPWD**
 Distance from the coastline will be a critical element; Intake structure should be as far always from the Gulf Pass as possible.
TPWD
 Recommends open-water intakes in the Gulf. Structures should be designed to limit intake velocities to 0.5 ft/sec and that the structure is located as far offshore as can reasonably be achieved.

Treatment System

Site located on the South shore of the Ship Channel; treatment technology to include membrane pretreatment and reverse osmosis **TPWD**
 Recommends pre- and post-construction monitoring to quantify impact to biota and water quality.
TPWD **USFWS**
 Rare species documented in the area, including piping plover and ocelot. Loss of habitat for the ocelot and jaguarondi and impeding or fragmenting travel corridors north and south of the Ship Channel are a concern. Recommend moving facility away from Loma Preserve.

Site locate on the bay-side of South Padre Island some distance north of Andy Bowie County Park; treatment technology to include membrane pretreatment and reverse osmosis **TPWD**
 Recommends pre- and post-construction monitoring to quantify impact to biota and water quality.
TPWD
 Rare species documented in the area, including the piping plover.
Sierra Club
 Due to the facility's proximity to Bowie Park, some noise and odor abatement may be necessary.

Finished Water System

Ground storage tank and high service pump station No comments received.

Concentrate Disposal

Diffusion into the Gulf of Mexico

Sierra Club

Location of disposal pipe may impact critical habitat. It is key to avoid wetlands and construction and maintenance activities during key nesting periods. The use of diffusers is recommended.

TCEQ TPWD USFWS

Recommends that diffusion pipeline needs to be piped far from the shoreline and away from Gulf pass.

UT Pan Am

Recommends diffusion into the water column above the sea floor.

No discharge evaporation ponds

Sierra Club

Recommends lining ponds to prevent contamination and ensuring availability for use on a year-round basis.

TPWD

Evaporation of concentrate at a suitable location may be an acceptable option, subject to review of detailed plans and provided that the ponds are managed in such a way as to minimize impact to birds and wildlife.

TWPD USFWS

Concerns that increases in salinity could impact sea grasses and the entire Laguna ecosystem. Pipeline placement can erode tidal flats by discharging in areas of piping plover use.

Injection well into hypersaline geologic formation

Sierra Club

Must avoid contamination of fresh water aquifers through over-pressurization of the injection system; Concerns about injection method during periods of well-maintenance.

Blend 1:1 with river water and discharge to surface tidal flats south of the Ship Channel

Sierra Club

Concerned about discharge when tidal flats are inundated.

TPWD

Concerned about locally high evaporation rates and potential for salt build-up. TWPD does not support diffusion of concentrate into the Ship Channel.

USFWS UT Pan Am

Concerned about soil erosion of tidal flats and negative effects on the piping plover.

Diffusion into Laguna Madre

Sierra Club

Recognizing the Laguna Madre is hypersaline, suggest analysis of possible impacts to aquatic species and habitats, keeping in mind the potential mixing in the bay.

TPWD

Does not support disposal of concentrate into the Lower Laguna Madre which is already hypersaline most of the year. Ill-effects of concentrate disposal can be exacerbated by high evaporation rates and combined with low rainfall and instream flows.

USFWS UT Pan Am

Sea grasses would likely be affected which are already stressed by various anthropogenic factors such as prop scars, nitrification, and dredging.

Power Consumption

Grid only

Citizen

These plants have high energy requirements. The application of conventional, non-renewable energy is unacceptable.

Sierra Club

Information should be collected regarding increased power consumption and water use associated with the development and operation of the project.

TPWD

Avian impacts are of concern for both sites and all options. Precautions need to be taken to ensure that birds are not electrocuted.

On-site renewable energy (wind) with grid supplement

TPWD

Cameron County is situated within the Central Flyway. Recommends following TPWDs voluntary guidelines for wind energy developers.

USFWS

Concerned about endangered aplomado falcons and other migratory birds. Recommend using turbines without blades, or that are short, well-marked, located among other equipment facilities, or use solar energy.

On-site renewable energy (wave buoys) with grid supplement

Sierra Club

Could lead to a greater understanding of wave technology and its use and limitations on the Gulf Coast.

UT Pan Am

Need pilot study to assess the cost/benefit ratio.

Recommended Research Topics

Because of the newness of seawater desalination applications in the United States and Texas, it was anticipated that the stakeholders may identify data gaps and other unknown factors that would be helpful to future project planning, but are beyond the scope of the proposed BPUB and LMWD projects. Such topics were identified by the stakeholders and are hereby provided to TWDB as recommended future research or analysis initiatives.

Demonstration of the accuracy of reverse osmosis projection software

"This would include a large (over 30 each) sample set. We would want to see each manufacturer's projection for water quality and capacity based on the software as opposed to the actual water quality and capacity seen at the full scale facility after it was originally installed, and then sometime into the future. A study of this type could help TCEQ possibly utilize reverse osmosis models instead of pilot studies if the results of the study show a very good correlation between the software outputs and the full scale outputs. If studies of this type have already been done, this could be a simple literature review summarizing the findings of others. If not, manufacturers would need to be contacted to find both software and real life results. No actual pilot testing is proposed."

- Texas Commission on Environmental Quality

Demonstration of identical performance of reverse osmosis modules from various manufacturers to ease piloting requirements

"If this type of study has not been performed, side by side pilots of several manufacturers' RO membranes on a variety of source waters should be conducted and the similarity of the RO permeate and flux rates should be analyzed. A study of this type could help TCEQ possibly allow the piloting of one membrane and then installation of another manufacture's membranes."

- Texas Commission on Environmental Quality

Reduction of the high energy demands of current desalination processes

"The need for something in the range of 13.5 MWh of power per day for a full-sized plant represents a huge energy use that, under conventional fossil fuel power, represents an unacceptable environmental impact to the local ecosystem and the global carbon budget. Sizing a local desalination plant to fit more comfortably into the available energy environment and using available or newly installed wind and solar generation capacity should be encouraged. A combination of reducing water needs through aggressive conservation and control of future growth in water demand would make it possible to downsize the energy needs of the desalination plant as well."

- Concerned citizen

Framework for desalinated water integration into existing distribution systems

"The purpose of this effort is to develop a set of guidelines for cost-effectively integrating desalinated water of specific quality and quantity with existing water sources of different origin (i.e., river water, well water and desalinated brackish water) in order to protect the integrity of the distribution system and household plumbing against corrosion; and to maintain, and whenever possible, to improve the bended water quality in terms of: taste, color and odor; disinfection byproducts; salinity; hardness; and suitability for irrigation, industrial applications and other uses. The water quality integration framework will define the issues that would need to be considered when

blending desalinated water with other water sources and provide guidelines of how to deal with these issues in a most cost-effective manner. This framework will also define how to quantify the benefits of using desalinated water to supplement existing water sources.”

- Water Globe Consulting

Gulf species salinity tolerance testing

“The results of these tests would provide a standard for evaluating potential impacts of seawater desalination concentrate discharges state-wide, and would allow generating “standard” list of salinity tolerance thresholds for common species inhabiting the Texas coastal waters. These thresholds can then be used to establish site-specific discharge permit salinity limits for desalination plant discharges based on the species observed in a given project discharge area. The species that will be considered will include both bottom dwellers with limited mobility as well as aquatic life capable to swim through the area of the discharge. The selection of these species will also be coordinated with the species selection requirements and guidelines for acute and chronic whole effluent toxicity (WET) testing defined by all pertinent regulations in Texas and by the USEPA WET testing protocols.”

- Water Globe Consulting

Evaluation of green technology to reduce carbon footprint

“Evaluate the effectiveness of alternative energy to help reduce carbon emissions and work toward achieving zero emissions during plant operations. This study should focus on collocating plants and overcoming environmental challenges.”

- San Antonio Water Systems

Investigation of seasonal distribution of marine organisms

“Water intake pipes will entrain marine life. Entrainment and impingement might be minimized by performing a study to determine the seasonal vertical distribution of marine organisms.”

- University of Texas Pan American

Task 5.0 – Develop Detailed Permitting and Compliance Strategies

Construction and operation of the desalination plants will require numerous environmental permits, approvals, and compliance documents. In some instances, the permit or approval required will vary according to the design alternative selected. As part of the Texas Desal Project, TRC Environmental Corporation prepared detailed permitting and environmental compliance strategies for each proposed seawater desalination project. The final reports are included in Appendix F. These strategies identify and summarize the array of environmental permits and compliance documents required to construct and operate the proposed plant under the design alternatives being considered. In addition, the reports provide timelines and approximate cost estimates to obtain permit and compliance approvals.

Appendices

Appendix A:
Kickoff Meeting Minutes

Stakeholder Scoping

For Implementing Seawater Desalination in Texas

Kickoff Meeting Minutes

Thursday, September 17, 2009 3:00 pm

Texas Water Development Board, Room 513

Attendees

Texas Water Development Board	Jorge Arroyo, Ruben Solis
Brownsville Public Utilities Board	GG Gomez
Laguna Madre Water District	Gavino Sotelo
NRS Consulting Engineers	Bill Norris, Mike Irlbeck
WaterPR	Robyn Hadley
TRC	Debbie Blackburn

Meeting Summary

Mike Irlbeck outlined the objectives and planned approach for the stakeholder scoping project. The approach includes forming a group of approximately 20 to 30 individuals representing key stakeholders in SWRO in Texas, including those from U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, U.S. National Marine Fisheries Service, Texas Parks and Wildlife Department, Texas Commission on Environmental Quality, Sierra Club (representing the Texas Living Waters Project), Harte Research Institute for Gulf of Mexico Studies (Texas A&M at Corpus Christi), Center for Research in Water Resources (University of Texas), and other local colleges. This group would be invited to participate in a 1 to 2 day workshop to be held in the Lower Rio Grande Valley before Christmas, if not before Thanksgiving. Also invited would be representatives with first-hand experience in planning, permitting, and operating the other SWRO projects in the US (Florida and California).

A broader scoping effort would include the general public during a public scoping event planned for Spring 2010. This event would allow the project sponsors to continue to educate the public about their projects and build local support, as well as initiate the federal NEPA process, if necessary.

Action Items

1. Mike (with WaterPR) will develop an agenda for the stakeholder workshop and circulate for review, along with proposed dates and venues.
2. Jorge will modify the TWDB/BPUB contract to change the Final Report Deadline from November 15, 2009 to April 15, 2010.
3. Jorge will contact a representative of the Tampa Bay SWRO project and invite them to present operational data at the planned stakeholder's conference.
4. Jorge will contact a representative from a SWRO project in Australia that has integrated renewable energy into the project and invite them to present at the planned stakeholder's conference.

Appendix B:

Sample Invitation Letter to Stakeholder



919 Congress Avenue, Suite 460
Austin, Texas 78701

October 23, 2009

Laura Huffman
State Director
Nature Conservancy - Texas Field Office
816 Congress Avenue, Suite 920
Austin, TX 78701

RE: Invitation to Participate in the Texas Desal Project

Dear Ms. Huffman:

On behalf of the Brownsville Public Utilities Board (BPUB) and the Laguna Madre Water District (LMWD), I am pleased to invite you to participate in the **Texas Desal Project**, a proactive scoping process to identify environmental resource concerns associated with the design, construction and operation of seawater desalination projects in Texas. As a stakeholder with an interest in the Gulf of Mexico, your contribution to this effort is welcomed. Other invited stakeholders include representatives from state and federal agencies, non-governmental organizations, academic institutions, and water supply entities. This project is being funded by the Texas Water Development Board (TWDB).

In 2008, the National Academies of Science considered the potential for desalination to help meet future water demands in the United States. In *Desalination: A National Perspective*, the study committee concluded that the cost of producing desalinated water is no longer the primary barrier, but that "*uncertainties regarding environmental impacts and ways to mitigate these impacts are some of the largest hurdles to implementation of desalination.*" Possible environmental impacts of desalination are impingement and entrainment of organisms when seawater is taken in, ecological impacts from disposing of salt concentrates, and increased energy consumption, among others. Although limited studies to date suggest that the environmental impacts may be less detrimental than other water supply alternatives, site-specific information necessary for detailed conclusions on environmental impacts is typically lacking.

www.NRSEngineers.com

Austin
919 Congress Ave., Suite 460
Austin, TX 78701
T: 512.236.8500
F: 512.477.9490

Dallas
2560 Southwell Road
Dallas, TX 75229
T: 214.351.0963
F: 214.350.1473

Harlingen
1222 E. Tyler, Suite C
Harlingen, TX 78550
T: 956.423.7409
F: 956.423.7482

San Antonio
1777 N.E. Loop 410, No. 600
San Antonio, TX 78217
T: 210.820.2619
F: 210.841.5790

In Texas, seawater desalination is planned to provide a total of almost 140,000 acre-feet of annual water supply by 2060. More immediately, two projects are under development by South Texas communities. In 2008, BPUB completed a successful pilot project on the Brownsville Ship Channel and is presently considering construction of a 2.5 million gallon per day (mgd) demonstration-scale seawater desalination project. In 2010, LMWD will complete another seawater desalination pilot project on South Padre Island. Pending favorable results, LMWD envisions implementing a 1.0 mgd seawater desalination production facility. These two facilities would be first of their kind in the state.

Two unique opportunities are therefore presented. First, because the state's first two projects are in a pre-design phase, a comprehensive scoping of potential environmental issues can be conducted prior to and during the development of each project. Information gained will aid planning and design decisions and help avoid and minimize potential adverse impacts. Second, anticipating the planning and development of other seawater desalination projects in the future, the Texas Desal Project will help establish an informed, science-based collaboration of stakeholders that can evaluate resource concerns associated with a broader application of this new water supply strategy.

In summary, your participation in the Texas Desal Project would begin at a Stakeholder Workshop scheduled for December 3-4, 2009 on South Padre Island (agenda enclosed). From that date through mid-April 2010, you will also be asked to:

- Identify any permitting or regulatory responsibilities your organization would have over development of a seawater desalination project
- Provide references to relevant data, studies, and research addressing resource issues
- Provide a planning aid memorandum outlining potential environmental impacts and recommendations for ways to avoid or minimize the same for each of the two projects
- Provide recommendations regarding future research and data collection needs relevant to evaluating future seawater desalination projects proposed in Texas
- Participate in a site visit of the proposed BPUB and LMWD seawater desalination projects (optional)
- Attend one or more public scoping meetings (optional)

To assist in event planning, please email Robyn Hadley of WaterPR (rhadley@waterpr.com) by **Wednesday, November 4, 2009** to let us know who will attend the Stakeholder Workshop, including their name, title, phone number, and email address, as well as if they will attend the optional site tour on the afternoon of December 4 (see agenda). While there is no registration fee for the workshop, seating is limited. At this time, we can accommodate up to two participants from each organization.

A block of rooms has been reserved at the Isla Grand Beach Resort on South Padre Island, where the workshop will be held. The address is 500 Padre Boulevard, South Padre Island, TX 78597. Cabanas are available for the state rate of \$85.00 per night. Two bedroom-two bath condos with a

full kitchen are available for \$170.00 per night. The hotel will also honor these rates through the weekend for anyone desiring to stay longer.

Please make your reservations directly with the hotel by calling 800-292-7704 or 956-761-6511. Ask for Jamie to obtain the "Texas Desal Project" rate. If you make online reservations at the hotel's website, www.islagrand.com, use the group code 0912WATERP.

If you have any questions, please do not hesitate to call me at (512) 851-7565. We look forward to working with you.

Sincerely,

A handwritten signature in black ink that reads "Michael Irlbeck". The signature is written in a cursive, slightly slanted style.

Michael J. Irlbeck
Director of Business Development

CC: John Bruciak, BPUB
Gavino Sotelo, LMWD
Jorge Arroyo, TWDB

Enclosures
Stakeholder Workshop Agenda
Invited Stakeholders

Appendix C:

Stakeholder Workshop Materials

Name	Organization	Title
GG Gomez	Brownsville Public Utilities Board	Director of Water and Wastewater Engineering & Operations
John Bruciak	Brownsville Public Utilities Board	General Manager/CEO
Roy Rodriguez, P.E.	City of McAllen	Utilities General Manager
James L. Murphy, Esq.	Guadalupe-Blanco River Authority	Executive Manager of Water Resources and Utility Operations
Dr. Jennifer Pollack	Harte Research Institute for Gulf of Mexico Studies	
Bill Norris, P.E.	NRS Consulting Engineers	Principal
Jesus Leal, P.E.	NRS Consulting Engineers	Principal
Jake White, P.E.	NRS Consulting Engineers	Director of Engineering
Mike Irlbeck	NRS Consulting Engineers	Director of Business Development
Chris Norris	NRS Consulting Engineers	
Bob Woithe, Ph.D.	PBS&J	Senior Scientist - Group Manager
Donald McGhee, CWS-VI	Rio Grande Regional Water Planning Group	HYDO SYSTEMS, INC
Rudy R. Farias	San Antonio River Authority	Water Resources and Community Development Manager
Billy Peché	San Antonio Water System	Manager - Legislative Affairs
Felix Arambula	San Antonio Water System	Intergovernmental Relations Coordinator
Joseph Rippole P. E.	San Antonio Water System	Project Engineer
Kenneth Brooks, P.G.	San Antonio Water System	Water Resource Planner
Suzanne Tenison	Science Academy of South Texas	Student
Michael Delesantro	Science Academy of South Texas	Environmental Science Teacher
Tyson Broad	Sierra Club	
Robert G. McConnell	Tampa Bay Water	Senior Environmental Analyst
Charles Maguire	Texas Commission on Environmental Quality	Director, Water Quality Division
Kelly Holligan	Texas Commission on Environmental Quality	Team Leader, Industrial Permits Team
Jaya Zyman-Ponebshek	Texas Commission on Environmental Quality	Team Leader, Storm Water & Pretreatment Team
Scott Swanson	Texas Commission on Environmental Quality	Technical Specialist, Resource Protection
Marlo W. Berg	Texas Commission on Environmental Quality	Engineer, Technical Review & Oversight Team
Monica Harris	Texas Commission on Environmental Quality	Manager, Planning and Implementation Section
Curtis Seaton	Texas Commission on Environmental Quality	Executive Assistant to Commissioner Rubinstein
Carlos Rubinstein	Texas Commission on Environmental Quality	Commissioner
Tammy S. Brooks	Texas General Land Office - Coastal Resources	Coastal Management Program Coordinator

	Program Area	
Jason Zeplin	Texas General Land Office - Lower Coast Field Office	Coastal Biologist
Pat Radloff	Texas Parks and Wildlife Commission	Water Quality Program Leader
James Tolan	Texas Parks and Wildlife Commission	Program Specialist
Mark Lingo	Texas Parks and Wildlife Commission	Lower Laguna Madre Ecosystem Leader
Cindy Loeffler	Texas Parks and Wildlife Department	Water Resources Branch Chief
Anthony (Tony) Reisinger	Texas Sea Grant College Program	
Jorge Arroyo	Texas Water Development Board	Director, Special Projects, Office of Planning
Carla G. Guthrie, Ph.D.	Texas Water Development Board	Ecologist, Bays and Estuaries Section, Surface Water Resources
Dharhas Pothina	Texas Water Development Board	
Deborah Blackburn	TRC Brandes	Senior Scientist
Jayson M. Hudson	U.S. Army Corps of Engineers	Regulatory Project Manager, Galveston District
Rusty Swafford	U.S. National Marine Fisheries Service	Supervisory Fisheries Biologist
David W. Hicks, Ph.D.	University of Texas at Brownsville	Biological Sciences
Dr. Ken Dunton	University of Texas Marine Science Institute	Professor, Aquatic Plant Ecology/Coastal Ecosystem Processes
Dr. Hudson DeYoe	University of Texas Pan American	Associate Professor
Craig D. Pedersen	URS	Vice President, Water Resources
Dr. George Ward	UT-Center for Research in Water Resources	
Nikolay Voutchkov, PE BCEE	Water Global Consulting	
Robyn Hadley	WaterPR	
Sharon Mineo	WaterPR	



TEXAS DESAL PROJECT



Stakeholder Workshop

Isla Grand Beach Resort
South Padre Island, Texas
December 3 and 4, 2009

Partially funded through a grant from the Texas Water Development Board



Thursday, December 3, 2009

All events will be held in the Majestic and Paradise Ballrooms unless otherwise noted.

7:00-8:00 a.m. Continental breakfast available in foyer near ballrooms

Opening

8:00 a.m. Welcome and Opening Remarks
Commissioner Carlos Rubinstein, Texas Commission on Environmental Quality

Session I - Establishing A Common Understanding

8:30 a.m. Introductions and Workshop Objectives
Mike Irlbeck, NRS Consulting Engineers

9:00 a.m. Oceanography of the Texas Coast
Dr. George Ward, UT Center for Research in Water Resources

9:30 a.m. Seawater Desalination 101 - RO Technology and Application
Jacob M. White, P.E., NRS Consulting Engineers

10:00 a.m. *Coffee Break*

10:30 a.m. Texas Seawater Desalination Initiative
Jorge Arroyo, P.E., Texas Water Development Board

11:00 a.m. Status of the Brownsville Seawater Desalination Project
Genoveva Gomez, P.E., Brownsville Public Utilities Board

11:30 a.m. Status of the South Padre Island Seawater Desalination Project
Gavino Sotelo, Laguna Madre Water District

Lunch Nautilus Room

12:00 p.m. Keynote Address: The Environmental Perspective
Tyson Broad, Lone Star Chapter - Sierra Club

Session II - Resource Concerns and Regulatory Processes

1:30 p.m. Roundtable Discussion on Environmental Issues and Concerns

3:00 p.m. *Coffee Break*

3:30 p.m. Roundtable Discussion on
Envisioned Permitting Requirements

Reception Hammerhead Deck

6:00 p.m. Hosted by NRS and URS



Friday, December 4, 2009

All events will be held in the Majestic and Paradise Ballrooms unless otherwise noted.

7:00-8:00 a.m. Continental breakfast available in foyer near ballrooms

Session III - Learning from Experience

8:00 a.m. Integrating Science into Policy and Permitting Decisions
Dr. Kenneth H. Dunton, University of Texas Marine Science Institute

8:45 a.m. Permitting and Environmental Issues in the U.S. (Florida and California)
Nikolay Voutchkov, P.E., Water Globe Consulting, LLC

9:15 a.m. Environmental Monitoring Results: Tampa Bay Seawater Desalination Project
Robert McConnell, Tampa Bay Water

9:45 a.m. Discharge and Dilution
Dr. Chris Reed, URS Corporation

10:30 a.m. *Coffee Break*

Concluding

11:00 a.m. Opportunities for Ongoing Dialogue
Robyn Hadley, WaterPR

11:30 a.m. Requested Deliverables and Schedule
Mike Irlbeck, NRS Consulting Engineers

Project Site Tours (Optional)

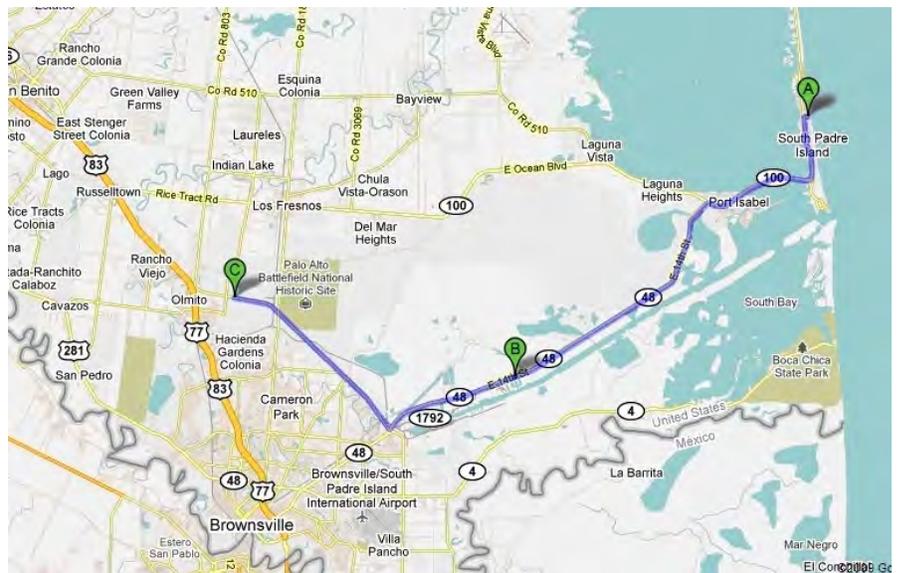
Meet in the Lobby of the Isla Grand at 1:15 p.m. for a caravan to project sites. The final tour should conclude by 3:30 p.m.

General location of facilities:

A. South Padre Island SWRO Pilot Project

B. Brownsville SWRO Project Site

C. Southmost Regional Water Project



Day One Presenters

Carlos Rubinstein, Texas Commission on Environmental Quality

Commissioner Rubinstein was appointed to the Texas Commission on Environmental Quality by Gov. Rick Perry on Aug. 31, 2009. Prior to his appointment, he served as TCEQ's deputy executive director, where his responsibilities included assisting the executive director in all major capacities, such as directing operations of all employees in 17 statewide offices, administrative oversight of agency budget, legislative activity, and implementation of agency policies.

Rubinstein serves on the Governmental Advisory Committee that provides advice to the EPA Administrator on environmental concerns regarding NAFTA, the North American Agreement on Environmental Cooperation, and the Commission for Environmental Cooperation. He also serves as a Texas representative in the Border Governors Conference water worktable and as a representative on the Environmental Flows Advisory Group.

Rubinstein previously served TCEQ as the director for the border and South-Central Texas area, and earlier as regional director for the Harlingen and Laredo offices. During this time, Rubinstein also served as the Rio Grande Watermaster, responsible for allocating, monitoring, and controlling the use of surface water in the Rio Grande basin from Fort Quitman to the mouth of the Rio Grande River. As watermaster, he was instrumental in finding a solution to Mexico's water debt to the United States. He also is a former city manager of Brownsville.

Rubinstein has a Bachelor of Science in Biology and Chemistry from The University of Texas–Pan American.

Mike Irlbeck, NRS Consulting Engineers

Mr. Irlbeck is the Director of Business Development for NRS Consulting Engineers and Befesa WaterBuild, leading the companies' marketing and tendering divisions as they pursue business opportunities in North America. Mr. Irlbeck joined NRS in April 2007 after serving 16 years with the U.S. Bureau of Reclamation in the Oklahoma-Texas Area Office.

Under his leadership, NRS completed the *Guidance Manual for Brackish Groundwater Desalination in Texas*, a document and website (www.desal.org/desaldemo) that won a Watermark Award for communications from the Texas Section-American Water Works Association and Water Environment Association of Texas in 2009. Mr. Irlbeck also played a key role in preparing the final Pilot Study Report on the Texas Seawater Desalination Demonstration Project (Brownsville, Texas) for the Texas Water Development Board and the state legislature.

Mike earned a B.S. in Wildlife and Fisheries Sciences from Texas A&M University, and he's a graduate of the U.S. Bureau of Reclamation Leadership Development Program. He's a member of the South Central Membrane Association, the American Membrane Technology Association, the International Desalination Association, and the Design-Build Institute of America.

George H. Ward, Ph.D., UT Center for Research in Water Resources

Dr. Ward received the Ph.D. in geophysical fluid dynamics in the 3rd quarter of the last century. For the past two decades he has been a Research Scientist at the University of Texas, before which he was a vice-president in an engineering consulting firm. He specializes in hydrodynamics and transport processes operating in natural fluid systems, especially surface watercourses, in which he has performed research and applied studies for over four decades. Much of this work has involved the dynamics and water quality of streams, lakes, and estuaries, and has ranged from special-purpose field experiments to model development and application. This work includes circulation studies in reservoirs, landscape modeling of runoff processes, coastal sediment transport and beach erosion, and streamflow and its hydroclimatological controls. He has prosecuted numerous projects in the coastal and nearshore environments, particularly the analysis and modeling of circulation of the bays and estuaries of Texas, and the specific effects of wasteloading and inflow. He has published over 50 technical papers, and about 200 technical reports, which hardly anyone has read.

Jacob M. White, P.E., NRS Consulting Engineers

Mr. White is the Director of Engineering for NRS, where he has worked since September 2003. Mr. White performs key tasks such as project management, directing engineering workload, directing field and production personnel, technical writing, and quality oversight. Key projects include serving as Project Engineer for Brownsville PUB's Seawater Desalination Pilot Facility, Project Engineer for the Laguna Madre Water District's Seawater Desalination Pilot Facility on South Padre Island, Project Engineer for the full-scale design of the Iron and Arsenic removal treatment system for the Brownsville PUB and Southmost Regional Water Authority, and Project Engineer for the Rio Grande Regional Water Planning Group.

Mr. White earned a B.S. in Mechanical Engineering from Kansas State University. He's a member of the International Desalination Association (IDA), the American Membrane Technology Association (AMTA), and the South Central Membrane Association (SCMA). He recently made a presentation on the Brownsville seawater desalination pilot facility at the IDA conference in Dubai, U.A.E.

Jorge Arroyo, P.E., Texas Water Development Board

Mr. Arroyo directs the Texas Water Development Board's Seawater and Brackish Groundwater Desalination Initiatives as part of the TWDB's Innovative Water Technologies programs. His TWDB responsibilities for water desalination have included drafting legislation, designing and implementing demonstration desalination programs, partnering with federal and state agencies involved in funding, research and/or permitting of desalination projects, and organizing and implementing workshops and stakeholder processes promoting desalination.

Genoveva G. Gomez, P.E., Brownsville Public Utilities Board

Ms. Gomez (G.G.) is the Director of Water/Wastewater Engineering & Operations for Brownsville Public Utilities Board (BPUB). She earned a Bachelor of Science degree in Civil Engineering from Texas A & M University in College Station and a Master of Business Administration from The University of Texas at Brownsville. She is a registered Professional Engineer in the State of Texas and has over 25 years of experience in Civil Engineering and surveying in the South Texas area. Ms. Gomez joined the Brownsville Public Utilities Board (BPUB) in 1999. She is an active member of several civic and professional organizations, such as American Society of Civil Engineers (ASCE), American Water Works Association (AWWA), and the American Membrane Technology Association (AMTA), to name a few.

Gavino Sotelo, Laguna Madre Water District

Mr. Sotelo is the General Manager of the Laguna Madre Water District, which serves the citizens and guests of South Padre Island, as well as the communities of Laguna Vista, Laguna Heights, and Port Isabel. He previously held the position of city manager of the City of Harlingen, city manager of the City of Lubbock, and assistant city manager for the City of Dallas. Mr. Sotelo is a native of Paint Rock, Texas.

Tyson Broad, Lone Star Chapter – Sierra Club

Mr. Broad is a Research Associate with the Lone Star Chapter of the Sierra Club. He has a B.S. in Geography from Texas A&M University and an M.S. in Geography/Natural Resources Management from Oregon State University. Mr. Broad served as the Water-Use Project Specialist for the U.S. Geological Survey in Portland, Oregon for eight years. Since joining the Sierra Club in 2004, he has focused on water issues in Central and South Central Texas and has co-authored the reports “*Water Loss from Texas Water Suppliers*,” “*Alternative Water Management Strategies for the 2006 South-Central Texas Water Plan*,” and “*Desalination: Is it Worth its Salt?*” He was recently named to the Environmental Flows Stakeholder Committee for the Guadalupe and San Antonio Basin and Bay Area.

Day Two Presenters

Kenneth H. Dunton, Ph.D., University of Texas Marine Science Institute

Dr. Dunton specializes in understanding marine food webs, particularly how they are influenced by changes in climate and by human activities. His research spans from the Arctic to the Antarctic and the waters of the Gulf of Mexico. Dr. Dunton works closely with industry in the Arctic to provide critical environmental data needed for oil and gas exploration. In Texas, he has been working with State and federal agencies to implement a Statewide monitoring program for conservation of seagrasses and has been actively involved with local agencies on the ecological benefits of freshwater releases into Texas estuarine systems.

He earned a B.S. from the University of Maine-Orono, an M.S. from Western Washington University, and his Ph.D. from the University of Alaska. Dr. Dunton is currently serving a 3-year term on the Minerals Management Service Outer Continental Shelf Scientific Committee (appointed by the U.S. Secretary of the Interior) and was recently appointed to the Guadalupe/San Antonio Basin and Bay Area Stakeholder Committee (BBASC).

Nikolay Voutchkov, P.E., BCEE, Water Globe Consulting, LLC

Mr. Voutchkov has over 25 years of experience in the field of seawater desalination, water and wastewater treatment and reuse. He is a former chief technology officer for Poseidon Resources. Currently Mr. Voutchkov provides independent technical advisory services associated with the permitting, development, financing and implementation of seawater desalination projects worldwide. He is a registered professional engineer and a diplomate of the American Academy of Environmental Engineers.

Robert McConnell, Tampa Bay Water

Mr. McConnell is a Senior Environmental Analyst with Tampa Bay Water, based in Clearwater, Florida. He has 19 years of public and private sector experience including hydrobiological monitoring programs, watershed and water quality studies, environmental risk assessments, ecological impact analyses and permitting. Currently, he is responsible for environmental programs and projects related to water supply production including seawater desalination, river withdrawals, groundwater wellfields, reuse/augmentation and source water protection.

Mr. McConnell earned a B.S. in Zoology from the University of Washington, and an M.S. in Environmental Health from the University of South Florida.

Chris Reed, URS Corporation

Dr. Reed has over 20 years experience in conducting hydrodynamic, sediment transport, dilution, water quality, and feasibility and design studies in coastal zones. His modeling experience includes analysis in rivers, lakes, wetlands, bays, estuaries and coastal zones with a focus on tidally and wind dominated and coastal regions. He has conducted numerous studies in rivers, estuaries, and offshore areas along the Atlantic, Pacific and Gulf coasts. He is also a co-author of the CMS-2D/3D hydrodynamic, wave and sediment transport model, which is part of the US Army Corps of Engineers' supported SMS software package.

Robyn Hadley, WaterPR LLC

Ms. Hadley is the Director of WaterPR, a public relations firm with a variety of clients involved in water production and conservation. Clients include NRS Consulting Engineers, Befesa WaterBuild, the South Central Membrane Association (SCMA), the American Rainwater Catchment Systems Association (ARCSA), the Texas Irrigation Expo, TCEQ's Source Water Assessment and Protection Plan (SWAP), and the Rio Grande Regional Water Planning Group. WaterPR manages non-profit organizations, coordinates conferences and events, and helps articulate the clients' priorities through the production of newsletters, logos, websites, brochures, and other materials.

She is a former press secretary, committee clerk, researcher, and administrative aide to three former Texas state senators, and the founder of the Capitol Crowd, the state's first online directory of state legislative and agency staff. She earned a journalism degree from the University of Texas at Austin, and worked as a reporter in Texas and Oklahoma before beginning her career with the state senate.



Texas Desal Project Stakeholder Workshop Invited Stakeholders

Federal Agencies

U.S. Fish and Wildlife Service
U.S. Army Corps of Engineers
U.S. Environmental Protection Agency
U.S. National Marine Fisheries Service
U.S. Bureau of Reclamation

State Agencies

Texas Water Development Board
Texas Parks and Wildlife Department
Texas Commission on Environmental Quality
Texas General Land Office

Non-governmental Organizations

Lone Star Chapter Sierra Club
National Audubon Society
National Wildlife Federation
Arroyo Colorado Watershed Partnership
Coastal Conservation Association – RGV Chapter
Coastal Bend Bays and Estuaries Program
The Nature Conservancy
Lower Laguna Madre Foundation

Public Water Providers

Brownsville Public Utilities Board
Laguna Madre Water District
City of McAllen
North Alamo Water Supply Corporation
Lower Colorado River Authority
Guadalupe-Blanco River Authority
San Antonio Water System
San Antonio River Authority
San Patricio Municipal Water District

Academic Institutions

Harte Research Institute for Gulf of Mexico Studies
Center for Research in Water Resources
University of Texas Marine Science Institute
University of Texas at Brownsville
University of Texas Pan American
University of Texas at Austin
Science Academy of South Texas
Texas Sea Grant College Program

Regional Interests

Port of Brownsville
Brownsville-Port Isabel Shrimp Producers Association
Lower Rio Grande Valley Development Council
Rio Grande Regional Water Authority
Rio Grande Regional Water Planning Group
Texas Shrimp Association

Technical Consultants

NRS Consulting Engineers
URS Corporation
Water Global Consulting
Tampa Bay Water
TRC Environmental
WaterPR
PBS&J
Befesa

Texas Desal Project Stakeholders Workshop

Desal 101

Presented by:
 Jacob M. White, P.E.
 December 3, 2009



- Siting issues and strategies
- Treatment process
- Concentrate management
- Finished water storage
- Power service/consumption

Seawater Desalination 101
Siting Issues

- Many factors influence the location of a full-scale Seawater desalination facility
 - Proximity to power
 - Proximity to finished water distribution system
 - Site security/proximity to other facilities
 - Potential impact of hurricanes
 - Wind and storm surge
 - Raw water quality

Seawater Desalination 101
Siting Issues (cont.)



- Strategy for siting a full-scale facility
 - Cost/Benefit analysis
 - Better water quality leads to a decrease in treatment cost
 - Capital and O&M
 - Needed infrastructure
 - Power to the site
 - Distance to distribution system
 - Distance to concentrate discharge
 - Travel time for personnel
 - Construction method for the site and facilities

Seawater Desalination 101
Treatment Process

- Ultimate goal is to remove harmful constituents from the raw water source



- Suspended materials
- Dissolved materials
 - Elevated levels of dissolved substances in seawater

Treatment processes

- Intake
- Pre-treatment
- Primary treatment
- Post-treatment

Seawater Desalination 101
Treatment Process (cont.)

- Pre-treatment
 - Remove larger contaminants from the raw water (suspended material)
 - Intake screening
 - Conventional treatment
 - Rapid mix, flocculation, clarification, filtration
 - Membrane treatment
 - Microfiltration/Ultrafiltration
 - Inside-out or outside-in
 - Pressure or vacuum
 - Other
 - Dissolved air flotation, disinfection, scale inhibitor, cartridge filtration, straining

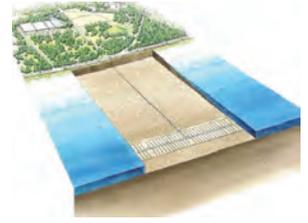
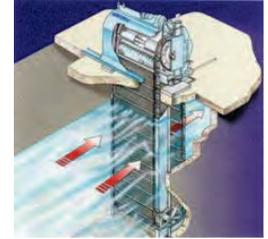
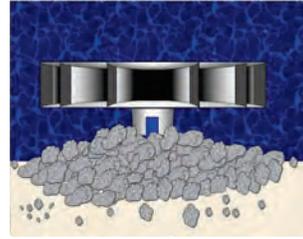


Raw Water Intake

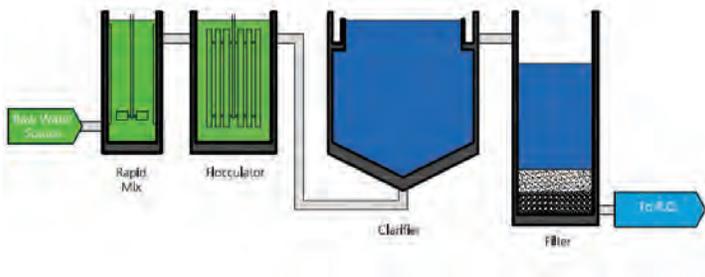


- 2 main types of intakes
 - Open intake
 - Subsurface intake
- Factors to take into consideration when selecting an intake method
 - Cost
 - Environmental impacts
 - Protection of aquatic species
 - Minimize negative impacts to the treatment scheme
 - Maintenance

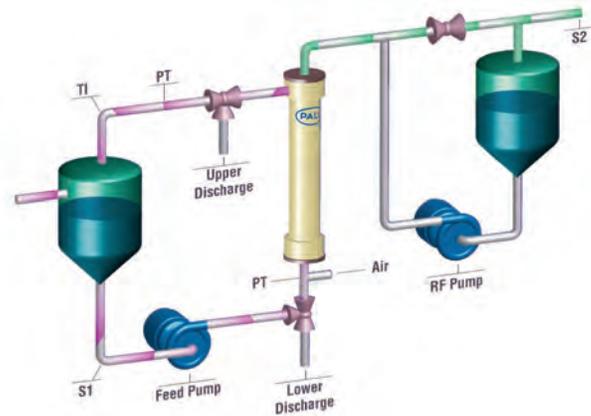
Intake Screening



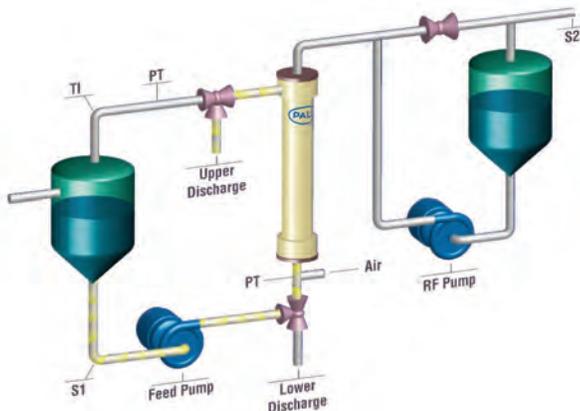
Conventional Treatment



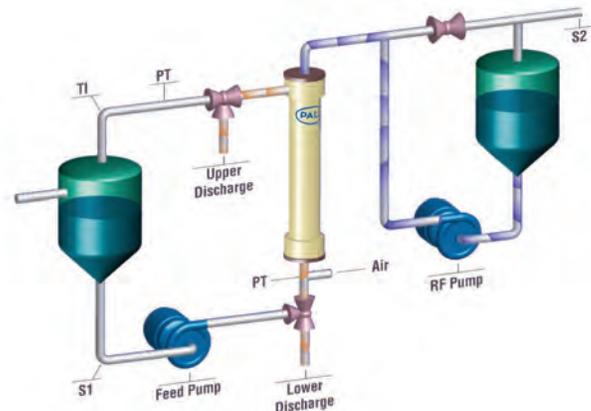
Membrane Treatment



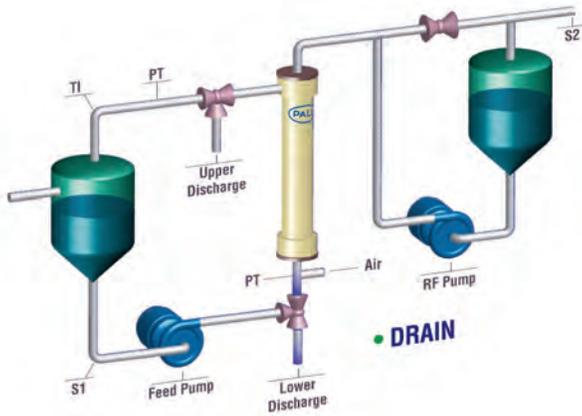
Membrane Treatment: Forward Flush



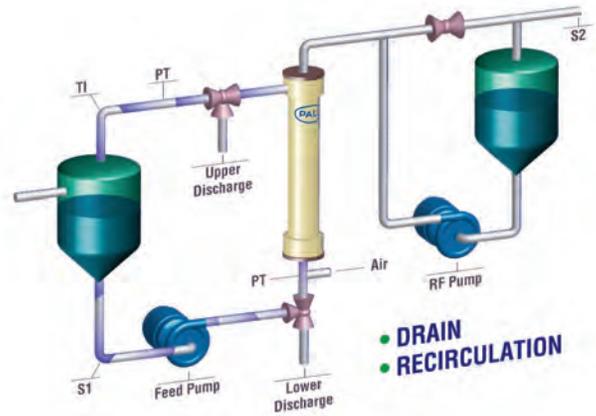
Membrane Treatment: Reverse Flush



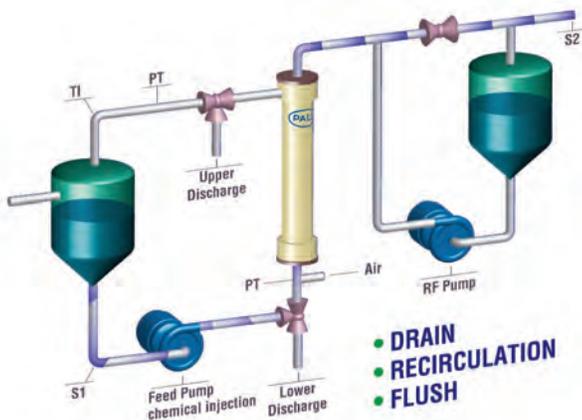
Membrane Treatment: EFM/CEB/CIP



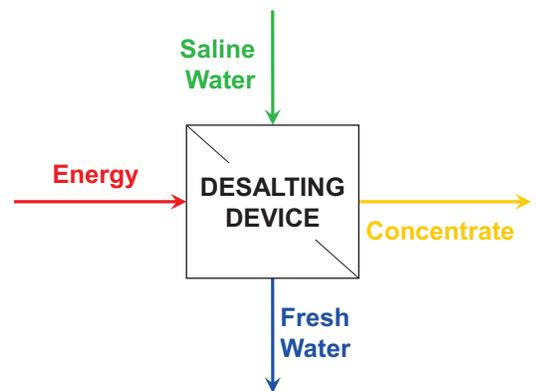
Membrane Treatment: EFM/CEB/CIP



Membrane Treatment: EFM/CEB/CIP



Primary Treatment: Desalination



Primary Treatment: Desalination



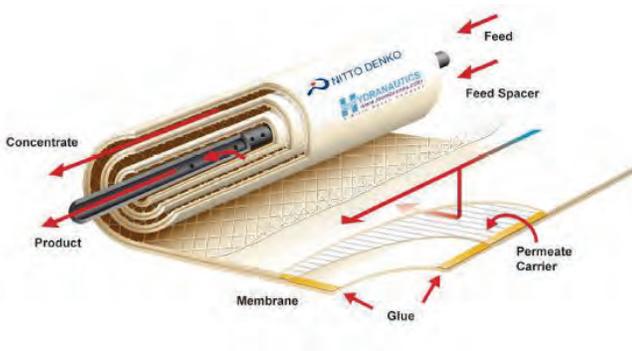
- **Thermal Distillation**
 - Evaporation and condensation



- **Membranes**
 - Electrodialysis Reversal (EDR) (voltage)
 - Reverse Osmosis (RO) (pressure)

Reverse Osmosis

- **What is Reverse Osmosis?**
 - Pressure driven desalination
 - Higher salt concentration = Higher feed pressure
 - Pressure greater than the osmotic pressure
 - Feed water pumped into a closed vessel that houses the membrane(s)
 - Permeate is produced by forcing the feed water through a semi-permeable membrane
 - Remaining feed water has a higher salt concentration



- What is Concentrate?
 - Byproduct of the desalination process
- What does Concentrate contain?
 - Elevated levels of salts and other dissolved parameters present in the feed water
 - Concentration depends on raw water quality and permeate production
- What doesn't Concentrate contain?
 - Chemicals, solids, or anything not present in the RO feed

- Concentrate disposal options
 - Sewer discharge
 - Deep well injection
 - Land application
 - Evaporation ponds
 - Zero liquid discharge



- Concentrate disposal options (cont.)
 - Surface Water Discharge
 - Direct discharge, mixing, or co-disposal
 - Diffusion to minimize environmental impact



- Post-Treatment
 - pH adjustment and water stabilization
 - Disinfection
- Treated Water Storage
 - On-site or adjacent storage provides a reserve water supply
 - Buffer between average and peak flow demands
- High Service Pumping
 - Deliver water from storage to consumers



- Proximity of facility to power infrastructure is critical
- Power costs are a factor in operating desalination facilities
 - 40 to 60 percent of operational cost



Seawater Desalination 101
Power Service and Consumption

- Co-location with power plant
 - Reduced capital cost for intake and discharge
 - Economy of scale
 - Blending of concentrate with cooling water from power plant
 - Minimize transmission infrastructure



Seawater Desalination 101
Alternative Energy

- Alternative Energy Technologies
 - Wind, Solar, and Hydrokinetic
 - Potentially used to supplement electrical requirements of desalination facilities
 - Implementation of specific technologies are site specific
 - Land use
 - Environmental conditions

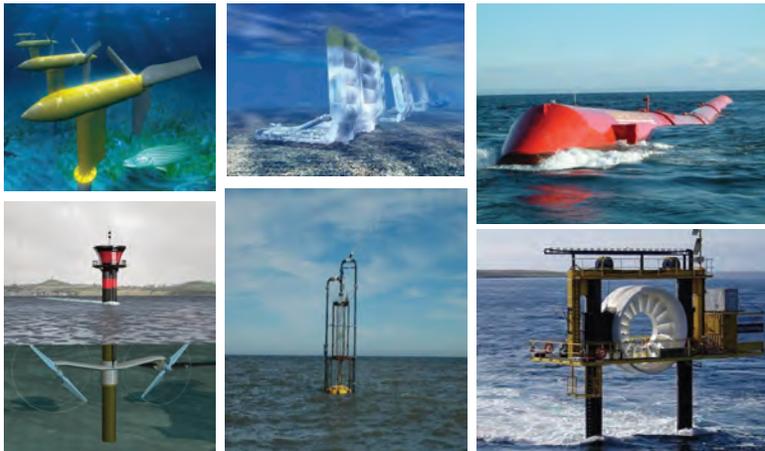
Seawater Desalination 101
Wind



Seawater Desalination 101
Solar



Seawater Desalination 101
Hydrokinetic Technologies



Seawater Desalination 101
Questions





Jorge Arroyo, P.E.
Texas Water Development Board

Texas Seawater Desalination Initiative



Texas Seawater Desalination

Jorge A Arroyo PE
Texas Water Development Board

South Padre Island – December 3, 2009

- Texas Seawater Desalination Initiative
 - Water development policy
 - Legislative guidance and funding
 - Incremental progress

2002	2003	2004	2005	2006	2007	2008	2009
Tampa Bay (first) Water for Texas 2002 Governor Rick Perry's request for a Seawater Desalination Proposal	78 th Texas Legislature (House Bill 1370)	Environmental Considerations for Assessment of Desalination Facility Siting and Operational Impacts (TPWD, TCEQ & TWDB)	20 th Texas Legislature appropriates funds for seawater pilot plant studies	20 th Texas Legislature appropriates funds for seawater pilot plant studies	21 st Texas Legislature: By additional funding authorized the seawater desalination		21 st Texas Legislature: By additional funding authorized the seawater desalination
	TWDB Seawater Desalination Study	2004 Biennial Report on Seawater Desalination	TWDB contracts seawater pilot plant study consultants	TWDB awards grant to Brownsville PUB for pilot plant study	TWDB awards grant to Laguna Madre Water District for regional facility planning		TWDB awards grant to Brownsville PUB for Brownsville Seawater Desalination
TWDB 2002 Recommendation			2004 Biennial Report on Seawater Desalination	2006 Biennial Report on Seawater Desalination		2008 Biennial Report on Seawater Desalination	
10 Statements of Interest	Feasibility studies by Brownsville Public Utilities Board, City of Corpus Christi, Brazos River Authority			Brownsville PUB issues interim report updating cost information for a 25 mgd facility to be located in the Port of Brownsville	Brownsville PUB awards pilot plant study and feasibility studies to be located in the Port of Brownsville		

2002
Tampa Bay Water Water for Texas 2002 Governor Rick Perry's request for a Seawater Desalination Proposal
TWDB 2002 Recommendation
10 Statements of Interest

- Technology
 - Seawater desalination: a new, abundant, drought-proof water source
- First *regions-based* State Water Plan
- Gov. Perry: A large-scale demonstration of seawater desalination in Texas
- TWDB recommendation:
 - Three sites
 - Feasibility Studies

2003	2004
78 th Texas Legislature House Bill 1370	
TWDB funds feasibility studies	Environmental Considerations for Assessment of Desalination Facility Siting and Operational Impacts (TPWD, TCEQ & TWDB)
	2004 Biennial Report on Seawater Desalination
Feasibility studies by Brownsville Public Utilities Board, City of Corpus Christi, Brazos River Authority	

- Texas House Bill 1370
 - All necessary actions to develop seawater desalination
 - Biennial reporting
- \$1.5 mill for feasibility studies
 - Technical and financial feasibility
- 2004 Biennial Report
 - Seawater desalination is technically feasible
 - Financial incentives will be needed
- Next step: pilot plant studies

2005	2006
79 th Texas Legislature appropriates funds for seawater pilot plant studies	
TWDB contracts seawater pilot plant study consultants	TWDB awards grant to Brownsville PUB for pilot plant study
TWDB develops minimum requirements for pilot plant studies	TWDB awards grant to Laguna Madre Water District for regional facility planning
	2006 Biennial Report on Seawater Desalination
	Brownsville PUB issues interim report updating cost information for a 25 mgd facility to be located in the Port of Brownsville

- Pilot plant study phase
 - 3 potential projects
 - Hands-on expertise
 - Criteria for allocating available funds
- Brownsville PUB
- Laguna Madre WD
- 2006 Biennial Report
 - 25 mgd plant at Brownsville ship channel
 - \$150 mill
 - \$70 mill grant

2007	2008
80 th Texas Legislature: No additional funding appropriated for seawater desalination	
	2008 Biennial Report on Seawater Desalination
Brownsville PUB obtains pilot plant study protocol approval from TCEQ; completes pilot plant study and formulates a revised proposal for a large-scale seawater desalination facility at the Port of Brownsville	

- Brownsville Pilot plant
 - \$3.3 ,mill
 - 2-yr process
- 2008 Biennial Report
 - 25 mgd plant at Brownsville ship channel -\$182.4 mill
 - \$100 mill financial assistance
 - Initial phase:
 - 2.5 mgd
 - \$67.5 mill
 - \$31.1 mill future capacity

2009
81 th Texas Legislature: No additional funding appropriated for seawater desalination
TWDB awards grant to Brownsville PUB to implement an Environmental Scoping Study


- No additional funds allocated specifically for seawater desalination
- Water Infrastructure Fund & State Participation Program
- 2010 Biennial Report
 - Renew request for funding for design/construction(?)
 - Identify need for any additional studies



Nikolay Voutchkov
Water Globe Consulting

Permitting and Environmental Issues in Florida and California



TEXAS DESAL PROJECT

Seawater Desalination

Permitting and Environmental Issues (Florida & California)

December 4, 2009



Water Globe Consulting

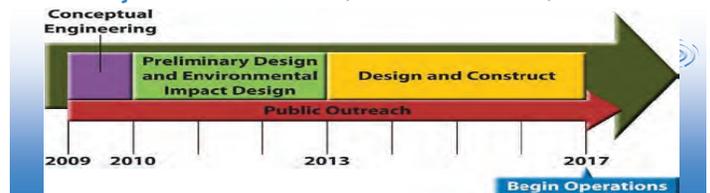
Nikolay Voutchkov, PE, BCEE

Desalination in Florida – Tampa Bay Water

- Tampa SWRO Plant – Fully Operational Since February 2008;
- Currently Operates Close to Maximum Capacity of 28.2 MGD;
- Planning for Plant Expansion from 25 to 30 MGD (35 MGD max) Planned to Begin this Month.
- Tampa-2 SWRO Project Planning Expected to Be Initiated within the Year.

Desalination in Florida – Coquina Coast Desalination Plant

- 11 Public Utilities Formed A Team Led by St. Johns River Water Management District to Build Regional SWRO Plant in Central Florida.
- Plant Capacity - 45 to 65 MGD;
- Projected Cost – US\$600 MM to US\$1.2 BB



Desalination in Florida – Coquina Coast Desalination Plant

45 to 65 MGD Coquina Coast SWRO Plant
US\$6 to \$9/1,000 gallons

25 MGD Tampa Bay Water SWRO Plant
Expansion to 30 MGD
Tampa 2 Desal – 20 MGD
US\$3.5 to 4.5/1,000 gallons



Northern California:
➤ 10 Projects;
➤ Total Capacity – 75 – 150 MGD

Southern California:
➤ 7 Projects;
➤ Total Capacity – 125 – 200 MGD

50 MGD Carlsbad Plant – One of the Largest Seawater Desalination Facilities in California

US\$3.0 to \$5.0/1,000 gallons

Status of Desalination Projects in Southern California

- 50 MGD Carlsbad Project:
 - Permitting is Completed;
 - Construction to Begin in Mid-December 09/Commissioning in 2012;
- 50 MGD Huntington Beach Project:
 - Permitting & Funding to Be Completed in the Spring of 2010;
 - Construction to Begin by Summer of 2010/Commissioning in 2013;
- 20 MGD West Basin & 10 MGD Long Beach Projects:
 - Demonstration Testing, Engineering & Permitting Studies;
 - Target Completion – 2015;
- Other Projects (Dana Point, San Onofre, etc.):
 - Ongoing Feasibility Studies & Preparation for Pilot Test (2009)
 - Target Completion – 2011

Desalination Permitting in CA & FL Key Challenges

- Unique Permitting Challenges:
 - Intake & Discharge Issues;
 - Product WQ Issues;
 - Coastal Use Issues;
 - Carbon Footprint Mitigation;
 - Public Perception & Growth Concerns.
- Lengthy & Complex Process:
 - 3 to 6 Years for Large Plants;
 - Sometimes Takes Longer to Permit than to Build a Desal Plant!
- Very Costly for Large Projects



Desalination vs. Conventional Water Plant Permitting – Where the Differences Come From?

- | | |
|---|---|
| <ul style="list-style-type: none"> ➤ Higher Salinity of the Discharge & Unique Toxicity Issues; ➤ Location – in High Visibility Areas w/ Multiple Public Uses; ➤ Tapping “Limitless Resource” Associated with Promoting “Limitless” Population Growth? | <ul style="list-style-type: none"> ➤ Limited Experience by Utilities, Engineering Community & Regulatory Agencies; ➤ “Unique” Intake Issues; ➤ Significantly Higher Energy Consumption & Carbon Footprint; ➤ Lack of Federal & State Regulations Specific to Desalination |
|---|---|

Key Desalination Plant Permitting & Environmental Issues

- Intake (Impingement & Entrainment) Impacts;
- Discharge Impacts;
- Drinking Water Quality Issues;
- Carbon Footprint Mitigation.

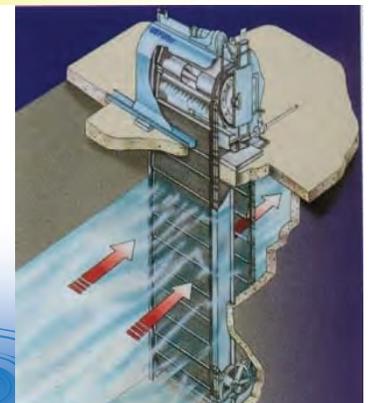
California Water Code vs. 316 (B) Intake Requirements

- CA Water Code Section 13142.5 (b) States:

“best available site, design, technology, and mitigation measures feasible shall be used to minimize the intake and mortality of all forms of marine life”
- 316 (B) Regulations Establish Numeric Impingement & Entrainment Reduction Goals & Do Not Allow Mitigation!

Impingement & Entrainment of Marine Organisms

- Impingement – potential injuries or loss of marine organisms retained on the intake screens.
- Entrainment – loss of marine organisms which enter the desalination plant with the source seawater.



Impingement & Entrainment Study & Minimization Plan

- **Purpose** – to Quantify Composition, Number, & Size of Larvae at the Intake & In the Water Body.
- **Sampling Locations:**
 - **Impingement** – Location of Intake Screens;
 - **Entrainment** - In Front of Intake and at Selected Water Body Locations
 - **300-μ Mesh Plankton Net.**
- **Sampling Frequency:**
 - 12 to 18 Consecutive Months;
 - Weekly – i.e., minimum of 52 Samples;
 - 24-hr Sample Collection for Impingement; Day/Night Samples for Entrainment.
- **I&E Assessment & Minimization Plan:**
 - Avg. Mass of Impinged Species – lbs/day;
 - Area of Entrainment Mitigation Area

Processing & Analysis of Collected I&E Samples

- **For Impingement Assessment** - Adult & Juvenile Species Trapped on the Screens are:
 - Identified/Classified;
 - Counted;
 - Weighted;
- **For Entrainment Assessment** – Larval Species Collected on the 300-μ Nets In Front of the Screens & In Various Areas of the Potential Impact Zone Are Identified and Counted.
- **Intake Area of Entrainment Impact** is Assessed (“Area of Production Forgone”).
- **Daily Average Weight of Impinged Organisms** is Estimated.

Case Study – Carlsbad Desalination Plant



Open Intakes Can Be Configured to Cause Minimal Impingement

Comprehensive Study at Carlsbad Intake Shows that the Daily Amount of Impingement of Fish is **Only 4 to 8 lbs/day**

(Daily Fish Intake of Two Pelicans)



Example – Carlsbad Entrainment/Mitigation Area

Entrained Species	Proportional Mortality (%) - PM	Source Water Body (Aqua Hedionda Lagoon)	Area of Production Forgone (acres)
Gobies	21.56	302 acres	65.11
Blennies	8.63	302 acres	26.06
Hypsopops	6.48	302 acres	19.57
Average	12.22	302 acres	36.93 (37 acres)

Three Abundant Lagoon Species Found to make-up 96 % of All Entrained Larval Fish

Area of Production Forgone = Mitigation Area

Initial Area = 37 acres/estimated for 304 MGD;

After Review by CCC Increased to 55.4 acres

• Ocean Species (Northern Anchovy) Added;

• 80 % vs. 50 % Confidence Level of the Entrainment Data.

Carlsbad Desalination Project – Flow, Entrainment & Impingement Minimization Plan

- **Best Available Site** (Alternative Sites in EIR);
- **Best Available Design** (Alternative Subsurface Intakes Explored in EIR & CCC Review);
- **Best Available Technology;**
- **Entrainment Mitigation** (1:1 Ratio w/ APF)
 - 37 acres (Phase I);
 - Up to 55.4 acres (Phase II);
 - Lagoon Dredging.
- **Impingement Mitigation** (Wetlands Will be Adequate Adult Fish Production)

Selecting Open Intake Site & Design for Minimum I&E

- **Near-shore Intakes:**
 - Usually Lowest Cost;
 - Worst Water Quality (i.e., Algal Blooms, Oil Spills, etc.);
 - Worst Impingement & Entrainment;
 - Fine Screening Technologies & Organism Return Systems.
- **Offshore Intakes:**
 - At least 1,000 feet From Shore;
 - Minimum Depth of 20 Feet (Preferable 30 ft or more);
 - Stay Away from Underwater Currents;
 - Wedgewire Screens Technologies;
 - Velocity Caps.
- **Collocated Intakes:**
 - Check the Intake Type Based on Study of Existing Plant

Passive Wedgewire Screens



Copper-Nickel Material Shows Promise In Marine Environment!
0.5 mm-2.0 mm openings



Alternative Subsurface Intakes – Ongoing Research

Municipal Water District of Orange County - Dana Point – Slant Well Tests



Source: MWDOC

Long Beach Water Department - Filtration Gallery Similar to Project in Fukuoka, Japan



Source: Toyobo

Beach Well Intakes – Good Choice for Small Plants

- Cold Water – Power Penalty;
- Capacity Decrease Over Time;
- Water Quality Changes;
- Iron & Manganese;
- Beach Erosion;
- **Wetlands.**



Intake Studies - Summary

- **Feasibility Study of Alternative Intake Technologies:**
 - Subsurface Intakes (Wells, Infiltration Galleries);
 - Open Ocean Intakes or Collocation w/ Power Plant.
- **Methodology for Assessment of I&E;**
- **Impingement & Entrainment Assessment Study (for Open/Collocated Intakes Only);**
- **Impingement & Entrainment Minimization & Mitigation Plan. (for Open/Collocated Intakes Only).**

Concentrate Discharge – The Most Difficult Task to Tackle!

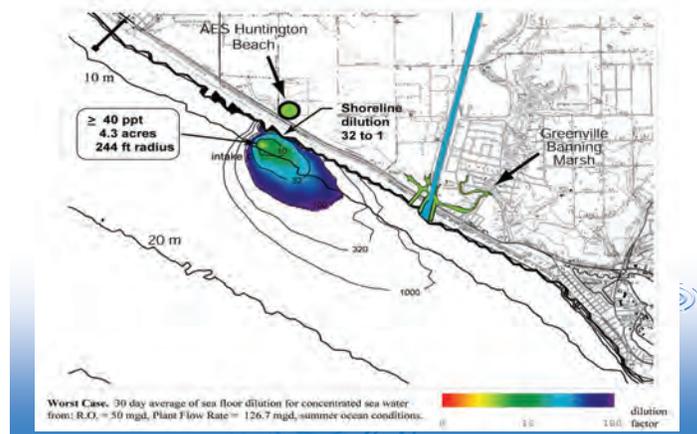


roccome@mail.ru

Key Environmental Discharge Issues and Concerns

- Discharge Dispersion and Recirculation to Plant Intake:
 - Salinity Field Under Worst-Case and Average Conditions;
 - Long-term Salinity Accumulation.
- Marine Organism Salinity Tolerance;
- Whole Effluent Toxicity of Plant Discharge;
- Numeric Effluent Water Quality Standards.

Concentrate Dispersal



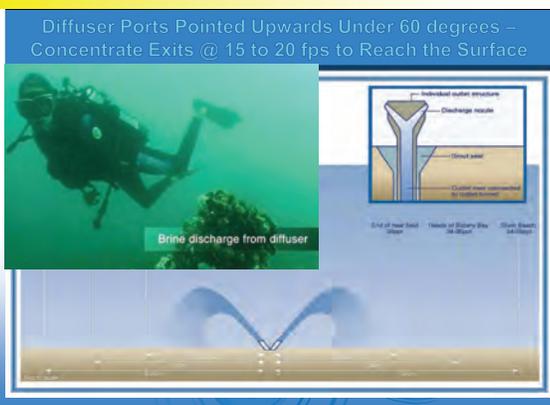
How to Assess Discharge Dispersion?

- **Hydrodynamic Modeling Study**
 - **Near-Field** – local/near-shore salinity elevation effects;
 - **Far-Field** – salinity accumulation in large water bodies.
- Background Data Collection/Model Calibration;
- Available Models:
 - **Cormix Model** – Approved by USEPA – Popular in Spain;
 - **Other Models** – for complex hydrodynamic conditions.
- **University of South Florida Model** – Used for Tampa Desalination Plant Far-Field Modeling;
- **Danish Hydraulic Institute Model** – Used for Tampa Near-Field Modeling;
- **Scripps Institution of Oceanography Model** – Used for Orlando and Huntington Beach Desalination Projects.

Alternatives for Dispersal of Saline Discharge

- Use Mixing Energy & Transport Capacity of Tidal Zone – Near-shore Discharge;
- Use the Buoyancy of Existing Fresh Water Discharge (Existing WWTP Outfall);
- Use the Buoyancy of Existing Thermal Discharge (Power Plant Cooling Water Outfall);
- Build New Diffuser System Directing Discharge Up Inland @ 15 FPS.

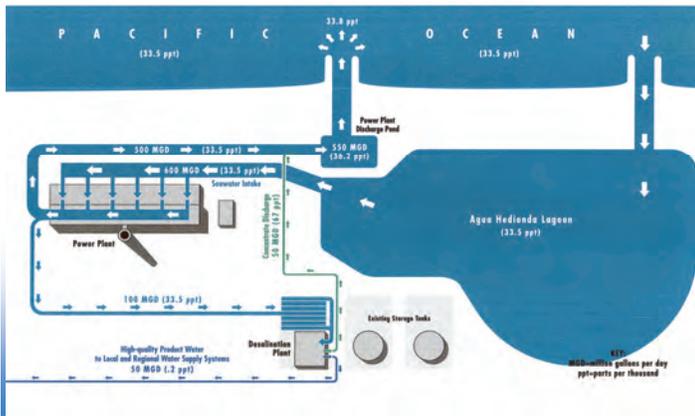
Diffuser Discharge – Most Common for Large Plants



Near-Shore vs. Diffuser Discharge



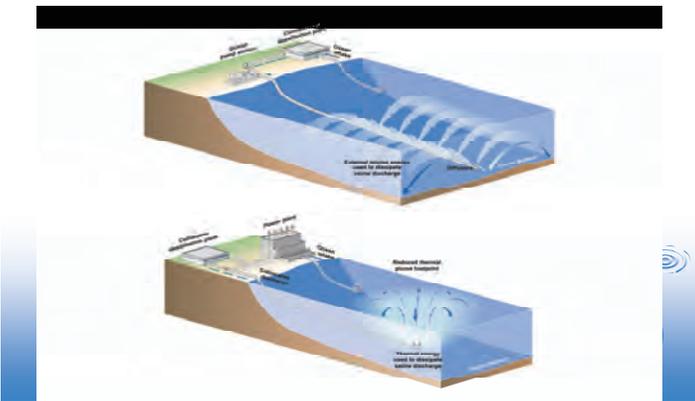
Desalination and Power Plant Collocation – Carlsbad, CA



Tampa Bay Desalination Project Intake/Discharge Configuration



Lowest Cost Disposal Co-Discharge w/ Existing Power Plant



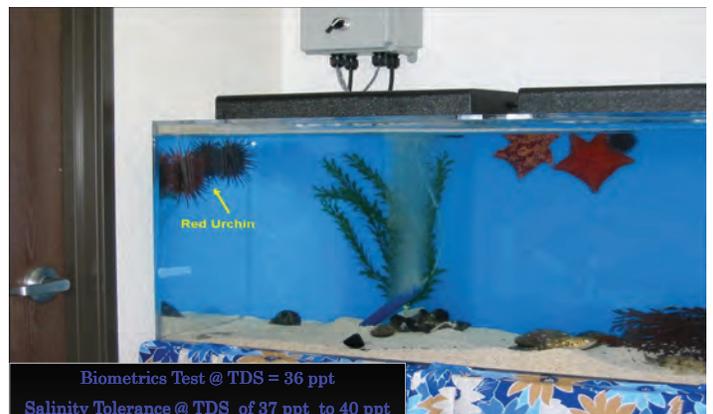
Salinity Tolerance of Marine Organisms Inhabiting Discharge Area

- Review of Marine Species in the Zone of Discharge:
 - Organisms in Water Column;
 - Bottom Dwellers;
 - Endangered Species.
- Salinity Tolerance Studies for Select Sensitive Organisms in the Area of Discharge;
- Whole Effluent Toxicity Studies;
- Long-term Marine Aquarium Studies.

New Method for Salinity Tolerance Evaluation – Key Steps

1. Determination of the Test Salinity Range – Average Mid-Depth/Mid ZID Salinity & Bottom Salinity @ Edge of ZID Determined Based on Hydrodynamic Modeling.
2. Identification of Site-Specific Test Species – Collect Species from the Area of the Discharge.
3. Biometrics Test – Long-Term Exposure to Average Steady State Conditions of Elevated Salinity.
4. Salinity Tolerance Test – Short-Term Exposure to Extreme Salinity for Period Determined Based on Hydrodynamic Modeling.

Marine Aquariums – Biometrics & Salinity Tolerance Tests



Biometrics Test @ 36 ppt

- 18 Marine Species;
- 5.5 Months;
- Monitoring of :
 - Mortality;
 - Eating Habits;
 - Weight Gain/Loss;
 - Reproduction;
 - Coloration;
 - Development of Marks/Lesions.



Salinity Tolerance Threshold Test

- Duration – 19 Days;
- Three Test Species;
- Test Salinities of 37, 38, 39 & 40 ppt.
- All Species Survived & Kept Reproductive Capacity!
- **Salinity Threshold – 40 ppt**
- **Short-Term Exposure Threshold – 46 ppt (up to 60 ppt for 2 hrs)**



Whole Effluent Toxicity (WET) Testing

- Test Used to Determine Maximum Salinity Threshold for the Duration of Worst-Case Event of Hydrodynamic Mixing.
- WET Performed for Range of 40 ppt to 60 ppt & Mortality Observed @ 2-hr Intervals.
- **Max Salinity Threshold** - The Highest Salinity At Which Test Organism Mortality is Below Target Level for Time of Exposure Represented Worst-Case Mixing.

Concentrate & Effluent Toxicity

- Concentrate Toxicity Can Be Caused:
 - High or Low Salinity Concentration (Osmosis);
 - Ion Imbalance - Difference in Ratios Between TDS and Key Ions (Ca, Mg, Na, Carbonates, Metals).
- Seawater Concentrate TDS < 40 ppt Not Likely to Exhibit Acute and Chronic Toxicity;
- Blends of Seawater or Brackish Water Concentrate and Wastewater May Cause Ion-Imbalance Triggered Toxicity;
- After Blending with Seawater Concentrate, Other Desalination Plant Waste Streams (i.e. Filter Backwash, Membrane Cleaning Solutions) Usually Do Not Exhibit Toxicity.

Whole Effluent Toxicity – What to Look For?

- Complete Acute and Chronic Toxicity Testing;
- Use Species Endogenous to the Discharge Area;
- Test At Worst-Case Scenario Blend:
 - For Open Ocean Discharges – Look for Assessing the Effect of Diffuser Dispersal;
 - For Co-Discharge with Wastewater Treatment Plant Effluent – Look for Ion Imbalance Triggered Toxicity;
 - For Co-discharge With Power Plants – Look for Effect of Temperature.

Carlsbad Desalination Project 2003 WET Tests - Scope

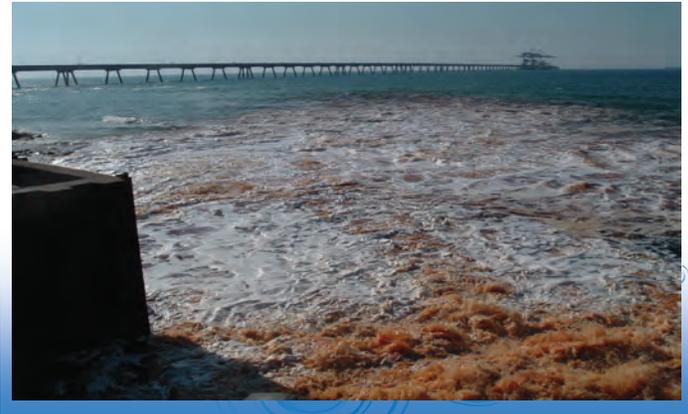
Test Species(1)	Chronic Toxicity Test Results	Acute Toxicity Test Results
Giant Kelp (<i>Macrocystis pyrifera</i>)	Macrocystis Germination – 100 %; Growth – No Difference from Control.	48-Hr Macrocystis Germination & Length – No Difference from Control.
Abalone (<i>Haliotis rufescens</i>)	Larval Development – No Difference from Control . Survival – 100%	NA
Topsmelt (<i>Atherinops affinis</i>)	Larval Growth Rate – No Difference from Control.	Survival – 100%

Notes: (1) Tested Species Are the Same as These Used for WET Testing of Power Plant Discharge.
(2) Test Salinity = 35.2 ppt (10:1 Ratio) vs. Actual = 50:1 Ratio (34 ppt).

Meeting the Effluent Discharge Standards – What to Look For?

- **Metals:**
 - Open Ocean Seawater Has Low Metal Concentration;
 - Metals May be An Issue When Combined with WWTP Discharge or Power Plant Discharge.
- **Turbidity** – contribution from coagulant;
- **Discolorization** – effect of beach well intake WQ and use of iron-based coagulants for pretreatment;
- **Oxygen & pH** – Potential Anoxia Effect of Salinity Plume;
- **US EPA Non-Degradation Rule** – Typical Conc. increase within 10 % of Background Levels

Disposal of Spent Filter Backwash



Permit Discharge Limits - Examples

Desalination Plant	Total Flow (MGD)	TDS (Avg.) (ppt)	TDS (Max.) (ppt)	Acute Toxicity TUa	Chronic Toxicity TUc	Flow Ratio
Carlsbad - 50 MGD; • 33.5 ppt - TDS(source); • 67.0 ppt (conc.)	54/60.3 (Conv. Pretreat)	40 (daily)	44 (Maximum Hourly)	0.765	16.5	Mixing Zone 15.1:1
Huntington Beach – 50MGD • 33.5 ppt – TDS (source); • 67.0 ppt (conc.)	57/64.5 (Mem. Pretreat)	(19.4 % Above Ambient)	(31.3 % Above Ambient)	None	8.5	Mixing Zone 7.5:1 Min. Dilution =2.24:1
Tampa – 25 MGD • 26 ppt – TDS (source); • 43 ppt (conc.)	22.8 (Conv. Pretreat)	35.8 (38% Above Ambient)	35.8 (38% Above Ambient)	None	None	Dilution =28:1 (20:1–minimum)

Discharge Studies - Summary

- **Hydrodynamic Discharge Dispersion Modeling:**
 - Average and Maximum Salinities in Zone of Initial Dilution @ Surface, Mid-column and Ocean Bottom.
 - Near & Far-field Analysis;
 - Assessment of Discharge/Intake Recirculation Effects.
- **Salinity Tolerance Study:**
 - To Establish Site-Specific Discharge Salinity Limit (Monthly Average Salinity Threshold).
- **Whole Effluent Toxicity Study (Acute & Chronic)**
 - To Establish Maximum Salinity Threshold.
- **Assessment of Compliance with Numeric WQ Limits of Receiving Surface Water Body:**
 - To confirm non-degradation of receiving water body – Use of permits disposal of waste streams other than concentrate
- **Impact on WWTP Receiving SWRO Discharge/Desal Water**

Desalinated Water Quality – Issues and Considerations

- **Water Quality Targets & Costs;**
- **Boron Issues;**
- **Disinfection Considerations;**
- **Corrosion Control Alternatives;**
- **Algal Toxins;**
- **Emerging Contaminants.**



Water Quality Targets vs. Costs

Target WQ	Constr. Costs	O&M Costs	Cost of Water
TDS/Cl = 500/250 mg/L; Boron = 1 mg/L.	1.0	1.0	1.0
TDS/Cl = 250/100 mg/L; Boron = 0.75 mg/L.	1.15-1.25	1.05-1.10	1.10-1.18
TDS/Cl = 100/50 mg/L; Boron = 0.5 mg/L.	1.27-1.38	1.18-1.25	1.23-1.32
TDS/Cl = 30/10 mg/L; Boron = 0.3 mg/L.	1.40-1.55	1.32-1.45	1.40-1.50

Target Boron Level - Considerations

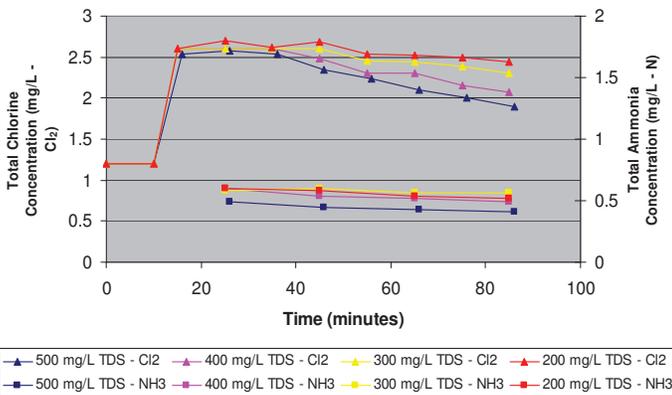
- Health Related Aspects – ≤ 1 mg/L;
- Irrigation of Ornamental Plants & Water Reuse ≤ 0.75 mg/L;
- Irrigation of Citrus Trees ≤ 0.3 to 0.5 mg/L;
- Irrigation of Vegetables & Grains < 2.5 mg/L;
- Red Wine Contains 6 – 8 mg/L of Boron!!!
- USEPA – No Boron Limit;
- WHO – Current Water Limit of 0.5 mg/L to be Replaced with 2.4 mg/L Next Year.



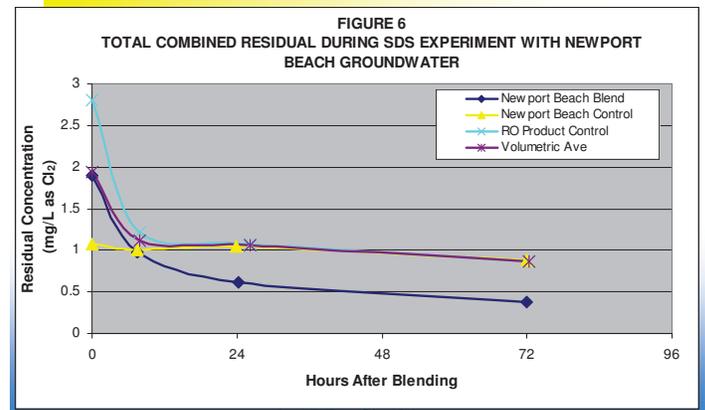
Disinfection Considerations

- Chlorination – the Most Suitable Disinfection Method for Desalinated Water;
 - Very Stable Chlorine Residual;
 - Blending w/ Other Waters Very Beneficial.
- Chloramination – Could be Trouble if Br Concentration > 0.4 mg/L;
 - Negative Effect on Chloramine Residual;
 - Solution – Super-chlorination or Br Removal to < 0.4 mg/L.
- Ozonation – Could be Trouble if Br Concentration > 0.2 mg/L;
 - Unacceptably High Levels of Bromates Formed – 50 to 150 $\mu\text{g/L}$ (Limit – 10 $\mu\text{g/L}$);
 - Solution – Blend w/ Other Water Sources, Super Ozonation, or Remove Bromides to Less Than 0.2 mg/L.

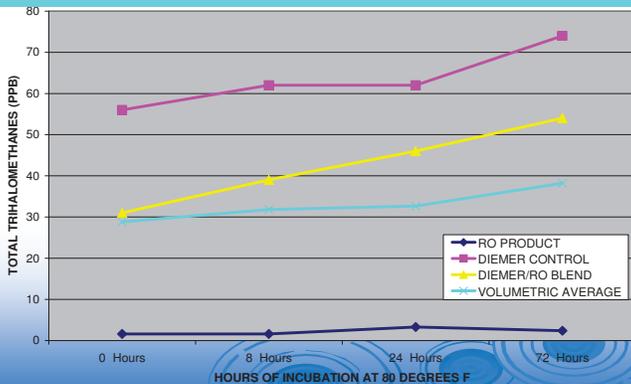
Chlorine Residual Stability
Poseidon-Carlsbad RO Pilot Plant Permeate



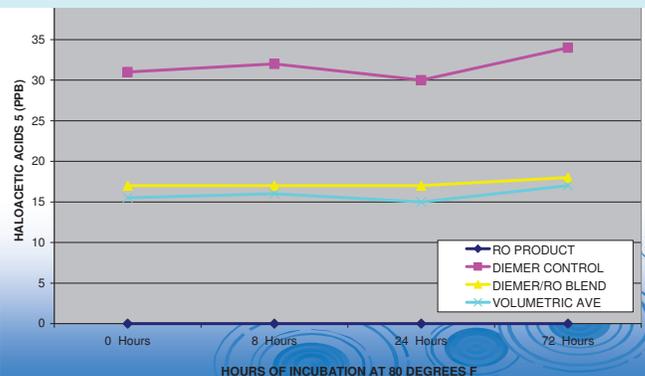
Effect of Blending on Chloramination



Comparison of TTHMS in Desalinated Water and Conventional Water Sources



HALOACETIC ACIDS IN DESALINATED WATER AND OTHER WATER SOURCES



Corrosion Control



- SWRO Permeate is Soft (Ca < 0.5 mg/L) and Has Little Buffer Capacity (low carbonate & bicarbonate content) – Aggressive!
- WHO Recommended Water Quality Targets:
 - Alkalinity > 40 mg/L;
 - CCPP = 4 to 10;
 - LSI = +0.5 to +1.0;
 - Total Hardness > 50 mg/L;
 - pH – 8.3 to 8.8;
 - Calcium Carbonate Precipitation Potential – Better Indicator than LSI;
 - Larson Ratio < 5 (for unlined steel pipes).
- Corrosion Inhibition Vs. Water Stabilization – Paradigm Change in Countries Which Use Predominantly Desalinated Water

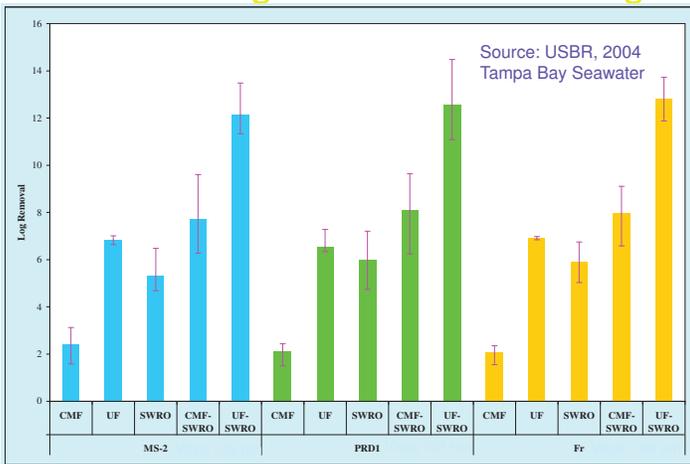
Algal Toxins – Effectively Removed by SWRO Membranes



Molecular Cut-Off @ 150 to 250 Daltons

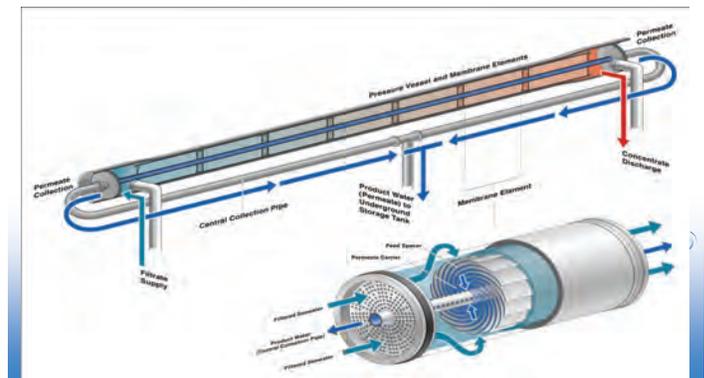
Compound	Formula	Molecular Weight (Daltons)
Anatoxin-a	C10H16NO	166
Anatoxin-a(S)	C6H19N4O4P	243
Saxitoxin	C8H16N7O4	274
Domoic Acid	C15H21NO6	311
Nodularin	C41H59N8O10	823
Brevetoxin	C50H57O13	865
Microcystin	C49H74N10O12	994

SWRO Pathogen Removal – 4 to 6 logs



Pathogen Removal – How to Monitor RO Membrane Integrity?

Salinity – 2 log Removal; Sulfates > 3 Log Removal



Endocrine Disruptors, NDMA & Dioxins – Not a Problem in Desalinated Water!

- Extensive Source Seawater & Product Water Testing @ Carlsbad and San Francisco Bay Show No Emerging Contaminants.
- No Emerging Contaminants in Seawater Concentrate!
- Wastewater Contains Large Quantities of Emerging Contaminants Not All of Which Are Well Rejected by BWRO Membranes – Require UV & Peroxide Post Treatment!

Product Water Related Studies - Summary

- Source Water Quality Characterization:
 - Measurement of Regulated Product WQ Constituents – 1 Year/Monthly;
 - Giardia, Crypto, Fecal & Total Coliforms & HTP Count + Turbidity;
 - Endocrine Disruptor Content Analysis.
- Algal Toxin Management Study:
 - Assessment of Algal Toxin Rejection During Algal Blooms/Red Tides.
 - Algal Toxin Monitoring & Operations Mitigation Plan.
- Distribution System Integration Plan:
 - Corrosion Control & Monitoring Study;
 - Blended Water DBP Assessment Study;
 - Disinfection Strategy and Control of Disinfection Residual.
 - Plant CT Analysis.
- RO Membrane Integrity Study:
 - Membrane Integrity Monitoring Method (TDS Conductivity Comparison)
 - SWRO Membrane Leak Removal/Cleaning

Desalination Plant Carbon Footprint

- All New California SWRO Projects Are Required to Include:
 - Carbon Footprint Assessment;
 - Greenhouse Gas (GHG) Reduction Plan.
- Green Building Design in Becoming a "Standard"!



Carlsbad Desalination Plant Total Carbon Footprint

- Annual Energy Use (AEU) = 274,000 MWh/yr; (13.5 kWh/1,000 gallons)
- Emission Factor (EF) = 546.46 tons CO₂/MWh;
- Plant Carbon Footprint = AEU x EF = **68,100 tons CO₂/yr;**
- Desalinated Water Production CF = **8.2 lbs CO₂/1,000 gallons;**
- Compares Favorably to Milk Production Carbon Footprint = **16 lbs CO₂/1,000 gallons.**

How Does Desalinated Water Compare?

- CF of the Average American = **20 tons CO₂/person/yr.**
- CF of Desalinated Water per Person = **0.11 tons CO₂/person/yr (0.55 %).**

Carlsbad GHG Reduction Plan – Roadmap for CF Reduction

- Reduction of Water Transfers from Northern CA – 69.6 %
- Energy Efficient Technologies and Equipment - 10.3 %
- Purchase of Renewable Energy Credits - 9.9 %
- Use of Warm Water for Desalination - 4.5 %
- Sequestration of CO₂ in Water Production - 3.1 %
- Regional Renewable Energy Projects - 0.8 %
- Reduction of Power Use for Water Reclamation - 0.7 %
- Reforestation and Wetland Restoration - 0.6 %
- Green Building Design/Solar Panels - 0.5 %

Summary of Permitting Studies & Issues

- **Intake** – I&E Assessment & Mitigation;
- **Discharge** – Concentrate Dissipation, Salinity Tolerance, Toxicity & WQ Limitations;
- **Drinking Water** – Corrosion, Disinfection, Boron, Cl & Na; Algal Toxins; WQ Integration & RO Log Removal Credit/Integrity Testing.
- **Carbon Footprint** – Project GHG Emissions Assessment & Minimization Plan.

Questions ?



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Brownsville Public Utilities Board

Status of the Brownsville Seawater Desalination Project



Agenda

- History
- Brackish Project - SRWA
- Seawater Pilot Plant
- Environmental Scoping Grant
- Demonstration Project

BPUB Water System



- Water Sources
 - Rio Grande (Surface)
 - Brackish Groundwater
- Water Storage:
 - Amistad and Falcon Reservoirs
 - Two Short-Term Raw Water Reservoirs

The Rio Grande 1990s Drought

- Amistad/Falcon Reservoirs: Record Lows
- Raw Water Delivery Problems
- Massive Growths of Hydrilla and Water Hyacinth
- High Cost of Water Rights



Brackish Groundwater Desalination

- TWDB Feasibility Study - 1995
- Technical/Financial Feasibility Study - 2000
- Aquifer Testing - 2001



Regional Approach

- *Increased Risk Share*
- *Economies of Scale*
- *Federal and State Funding*



Southmost Regional Water Authority



- *Formed in 1981*
- *Six Members*
- *Dormant*
- *Revived 2000*



Southmost Regional Water Authority

- *Brownsville Public Utilities Board (City of Brownsville)*
- *Valley Municipal Utility District 2 (Town of Rancho Viejo)*
- *City of Los Fresnos*
- *Town of Indian Lake*
- *Brownsville Navigation District (Port of Brownsville)*
- *Laguna Madre Water District*



SRWA Regional Desalination Plant

- *Utilizes Brackish Groundwater*
 - *Reliable Long-term Supply*
 - *Low Salinity of 3,000 mg/l total dissolved solids*
- *Cost: \$30 Million*
- *Five of the Six SRWA Members Participated in the Project*



Conclusions

- *Project was Huge Success*
- *Diversification*
- *Comparable Costs*
- *Oversized for Cost Effective Expansions*



Seawater RO Pilot Facility



History

- 2002 Gov. Perry Initiative
- 2003 Legislative directive
- 2004 Feasibility for three sites
 - Brownsville
 - Corpus Christi
 - Free Port
- 2005 Legislative appropriation for pilot in Brownsville \$2.5 M
- 2008 Piloting completed
- 2009 Environmental Scoping Grant



Project Goals

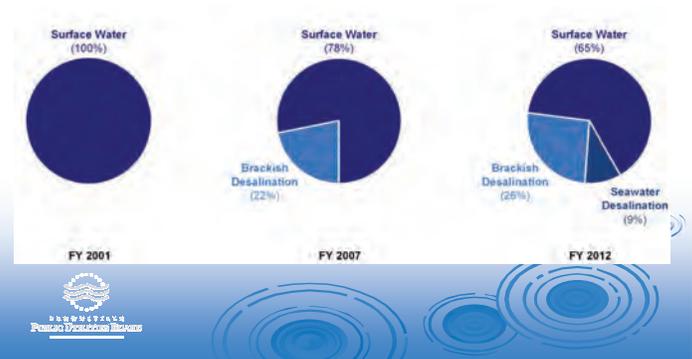
- Document and evaluate the quality of seawater at the proposed intake location
- Verify the performance of the conceptual open water intake
- Evaluate long-term performance of pretreatment units and the seawater membrane treatment process
- Serve as an educational and public relations tool for seawater desalination technology
- Define the most economical and effective components



Pilot Plant Location



Diversification



Conclusions

- Piloting results - seawater desalination at the Port of Brownsville is technically feasible
- Data information sufficient to develop full-scale 25 mgd facility
 - Conservative design due to unknowns
 - 2.5 MGD Plant
 - Research Facility
 - Cost \$22.5 Million
- Environmental Permitting
 - TWDB \$60,000 Grant conduct environmental survey/review process Seawater Plant



Conclusions (cont.)

- Propose a 2.5 mgd demonstration-scale facility at the Port of Brownsville
 - 9% of the BPUB water supply in 2012
 - Allow for the evaluation of system performance over several years prior to investment in a full-scale facility
 - Continued testing of the latest pretreatment and desalination technologies



Action Plan

- *Supplemental Funding Needed*
 - *Local support*
 - *Inclusion in local entities legislative agenda*
- *Beneficial to*
 - *Texas*
 - *Valley*
 - *Brownsville*

Contact Information

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Questions



SOUTH PADRE ISLAND DESALINATION PROJECT

PURPOSE

- The purpose of the proposed pilot study is to determine the most cost effective method of treating seawater for customers in and around the District service area.
- In general, the pilot facility will compare the costs, by piloting selected pretreatment systems, at least one seawater reverse osmosis membrane type, assess water quality sources from beach wells and the Gulf of Mexico and establish permitting channels to implement full scale facilities once pilot program is completed.



PROJECT SITE



SOUTH PADRE DESALINATION PROJECT

WORK PLAN

- A work plan was created to serve as a reference for measuring work progress and success for the duration of the project. The work plan encompasses three (3) tasks:

TASK #1 – Develop Raw Water Source Characterization

TASK #2 – Implement Pilot Study

TASK #3 – Prepare feasibility study and develop recommendations



SOUTH PADRE DESALINATION PROJECT

STATUS

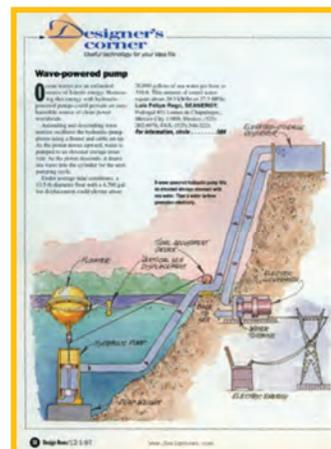
- The LMWD is still piloting the project.
- The pilot plant will continue collecting and analyzing data *until the end of this year* to determine if it is technically and financially feasible to produce drinking water from seawater.
- The draft reports needs to be submitted to the TWDB by December 2009, and the final report by February 27, 2010.



ADDITIONAL INFORMATION

- the high cost of energy is a major concern in desalination projects.
- Because of that, the LMWD will be testing an energy technology system (**Wave Powered Pump-SEAENERGY**) that consists of capturing ocean-wave energy to pump large volumes of seawater, consuming no fuel or electricity

- 1) Installation in summer 2010 (after engineering and permitting work).
- 2) The pilot would run until the end of 2010.



SEAENERGY
TECHNOLOGY

CONCLUSION



- *The Laguna Madre Water District is currently conducting a pilot project on South Padre Island. Once piloting has been completed, LMWD will implement a 1.0 mgd seawater desalination production facility to provide water on the northern portion of South Padre Island.*



SEAWATER DESALINATION PILOT PLANT



Water For the Future of Laguna Madre

QUESTIONS ?

Oceanography of the Texas coast

with special attention to potential concerns with siting de-sal projects

(Texas coast 101)

MORPHOLOGY

TIDES

WAVES

SEDIMENT TRANSPORT

CURRENTS & CIRCULATION

SALINITY & WATER QUALITY

ECOSYSTEMS

ISSUES

MORPHOLOGY

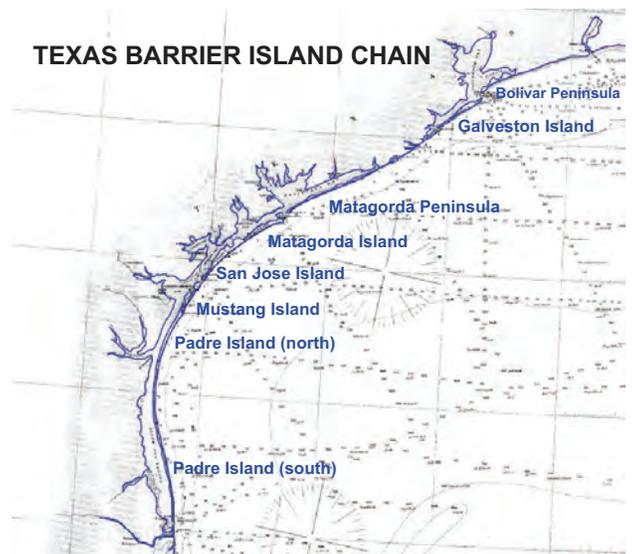


BARRIER ISLANDS

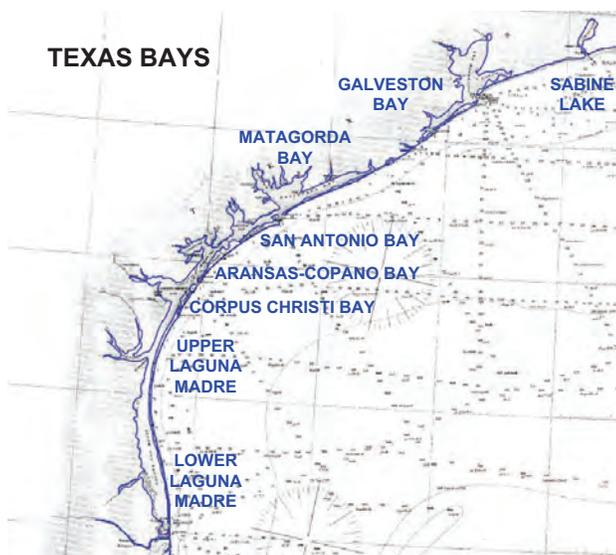


ESTUARIES

TEXAS BARRIER ISLAND CHAIN



TEXAS BAYS



SAN LUIS PASS

MORPHOLOGY

TIDES

WAVES

SEDIMENT TRANSPORT

CURRENTS & CIRCULATION

SALINITY & WATER QUALITY

ECOSYSTEMS

ISSUES

THREE FACTOIDS ABOUT TIDES ON THE TEXAS COAST



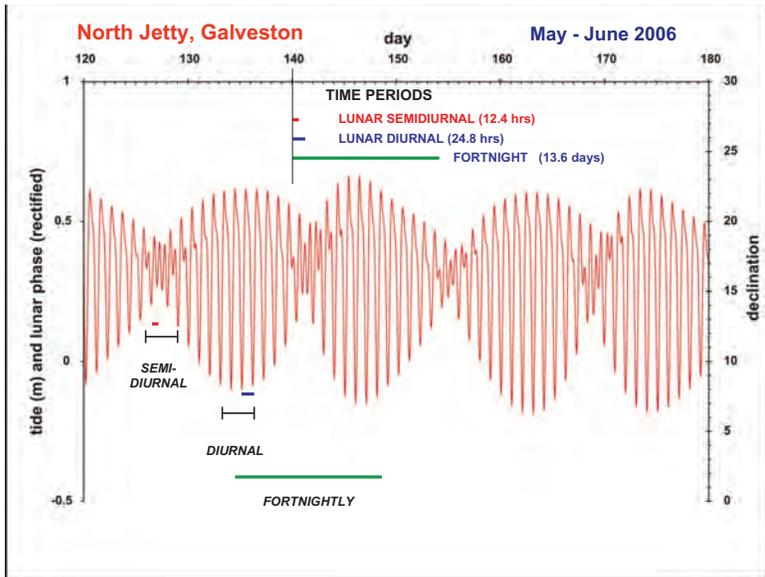
“Microtidal” - Offshore tidal range around a meter



Tide range greater on the Gulf shore, smaller inside the bays

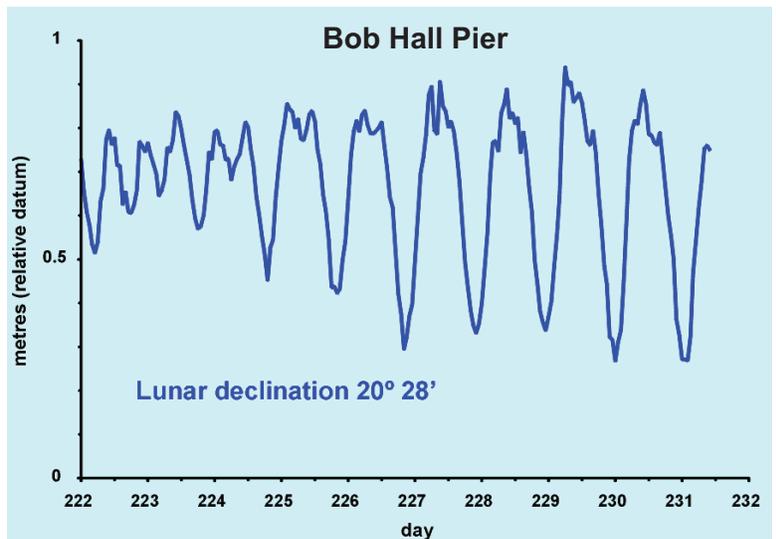
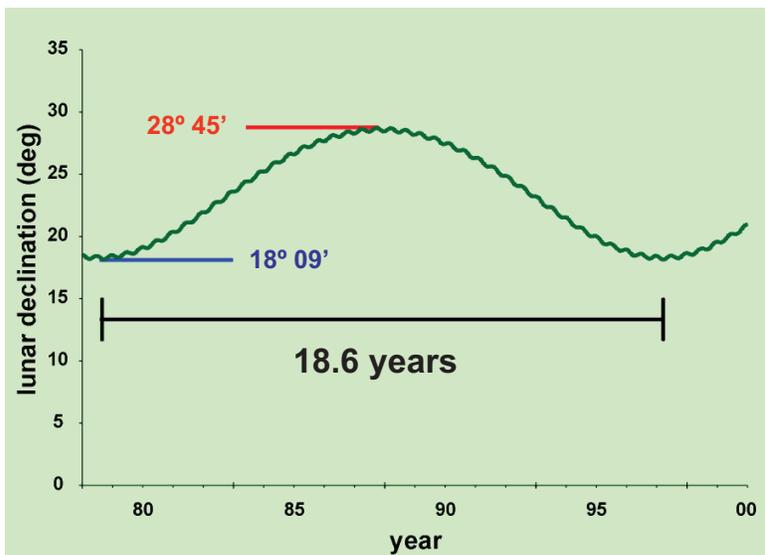


Dominated by 4 – 5 principal frequencies



Predominant tidal harmonics on Texas coast

SEMIDIURNAL	12.4 hr	LUNAR
DIURNAL	24.8 hr	LUNAR
FORTNIGHTLY	13.6 da	LUNAR DECLINATION



$$c \propto \sqrt{L} \quad (L = \text{wavelength})$$

Shorter waves: **Longer waves:**

travel more slowly

travel faster

dissipate more quickly

dissipate more slowly

SEA

Wide spectral range from short to long periods (wavelengths)

Irregular sea surface, sharp-crested tops, whitecaps

Occurs within, or in proximity to, storm centers or high-wind areas

Characteristic of the region of wave generation

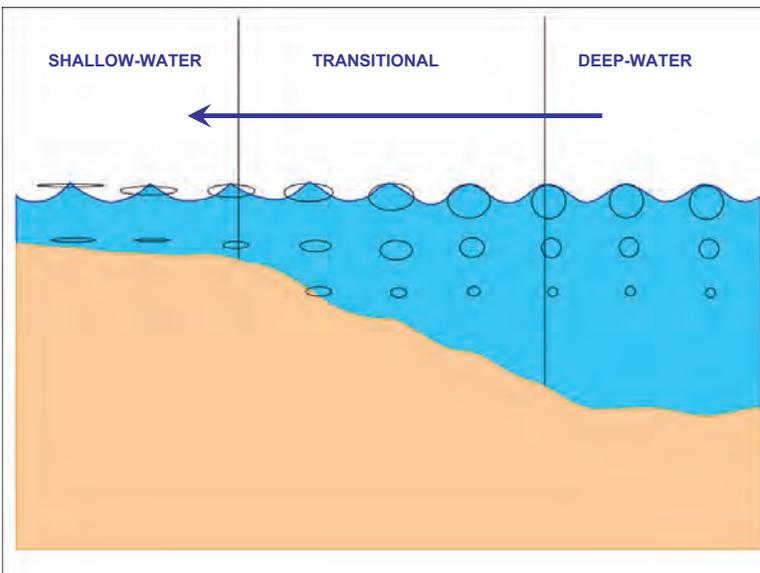
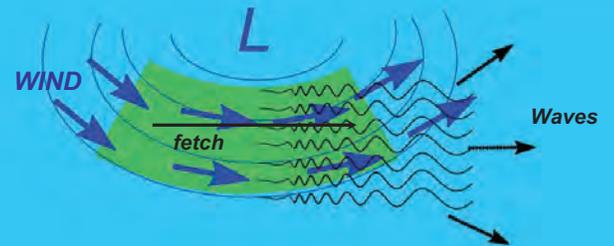
SWELL

Long period (wavelength) waves

Regular sea surface, rounded tops

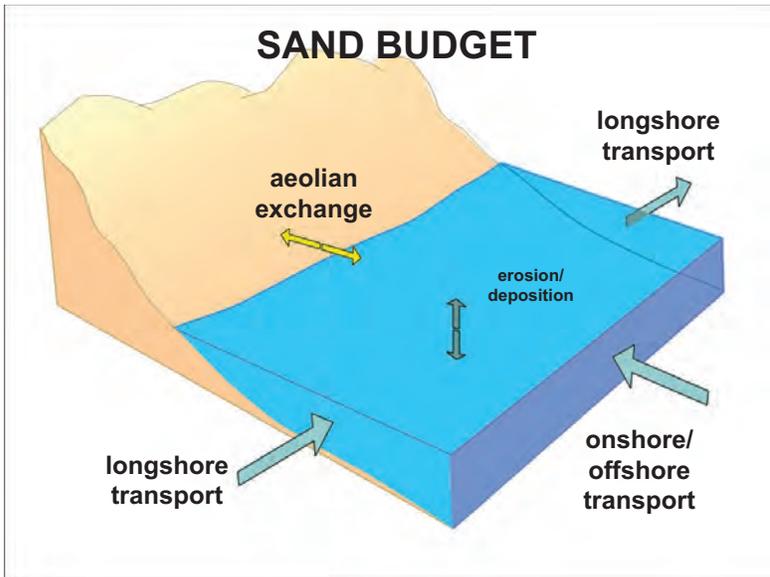
Occurs throughout the world's oceans

Propagates far from the region of generation





MORPHOLOGY
 TIDES
 WAVES
 SEDIMENT TRANSPORT
 CURRENTS & CIRCULATION
 SALINITY & WATER QUALITY
 ECOSYSTEMS
 ISSUES



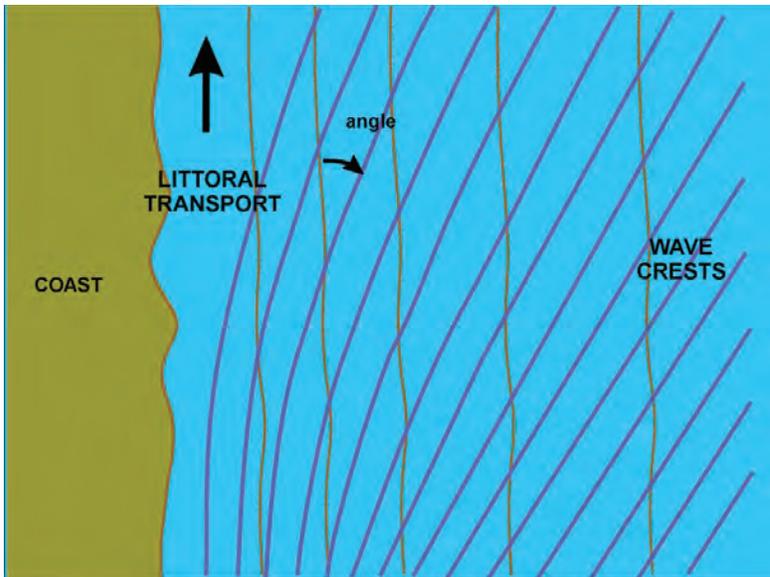
COMPONENTS OF COASTAL SAND TRANSPORT

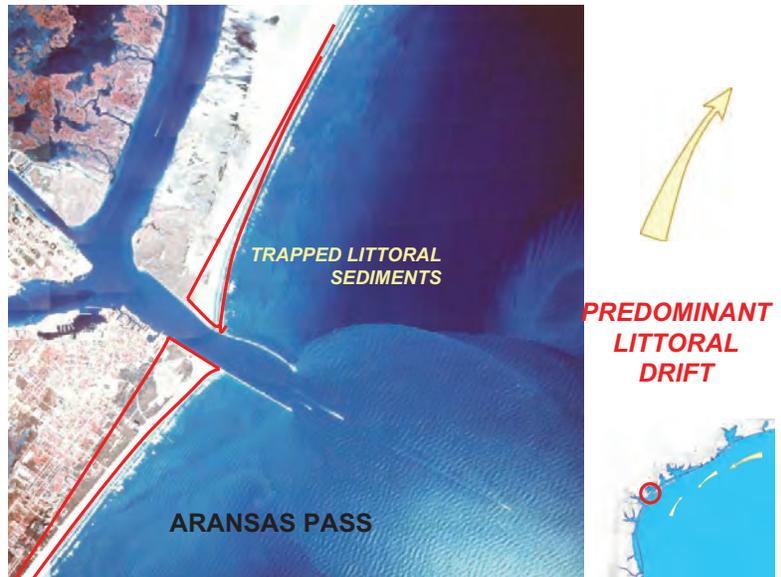
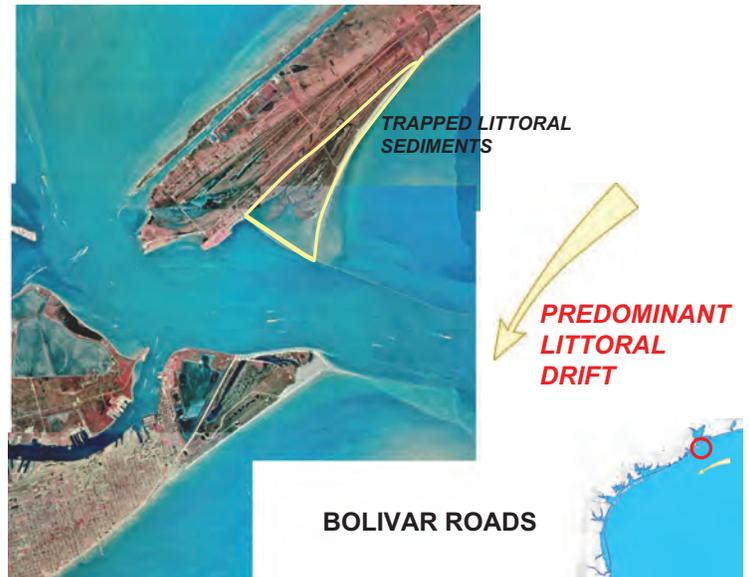
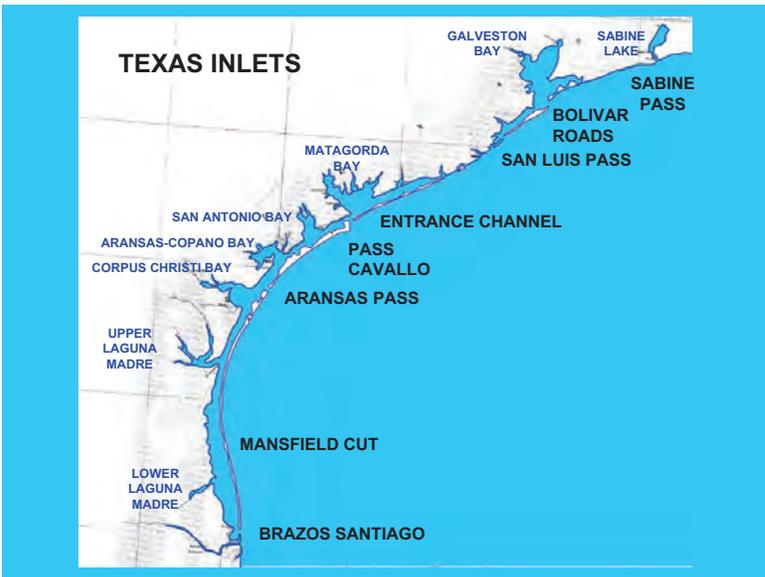
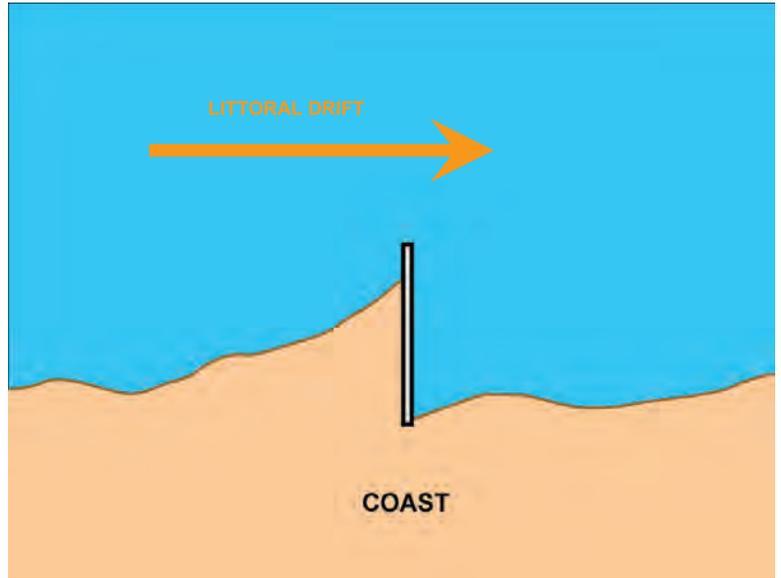
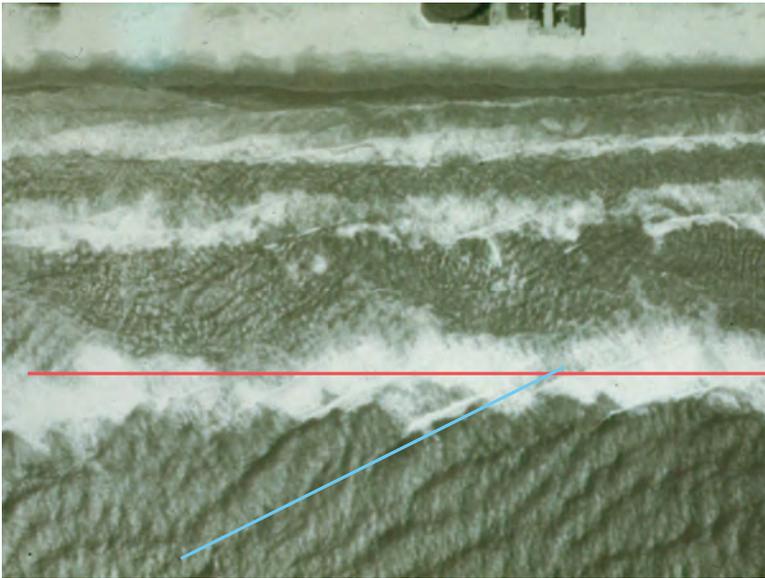
WATERBORNE (currents & waves)

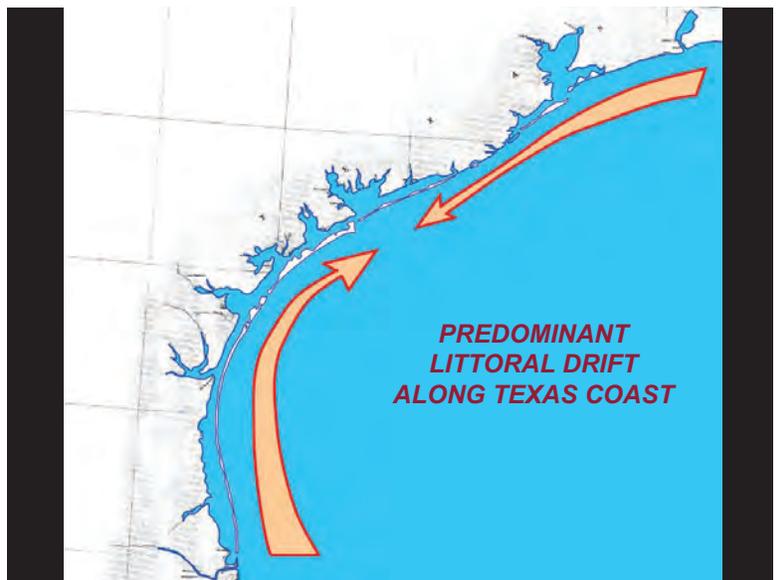
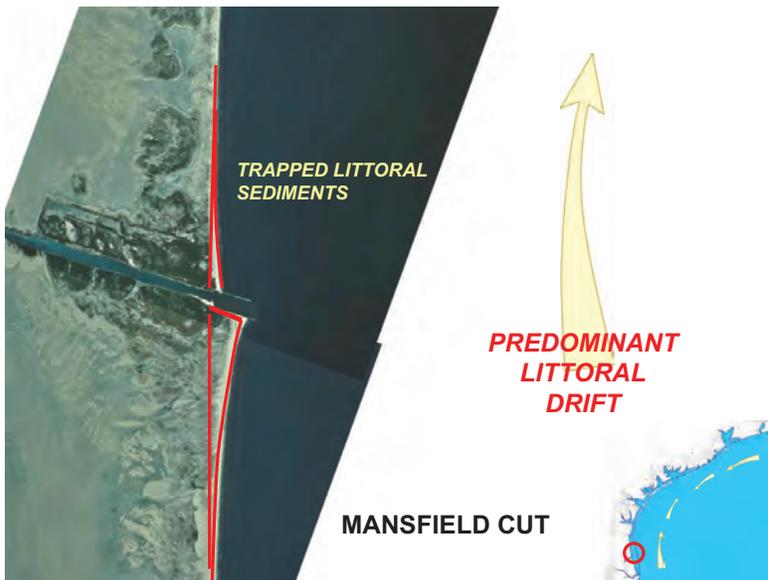
Horizontal:
 Littoral / longshore drift / transport
 Onshore/landward offshore/seaward

Vertical:
 Scour & deposition

AIRBORNE (ÆOLIAN)



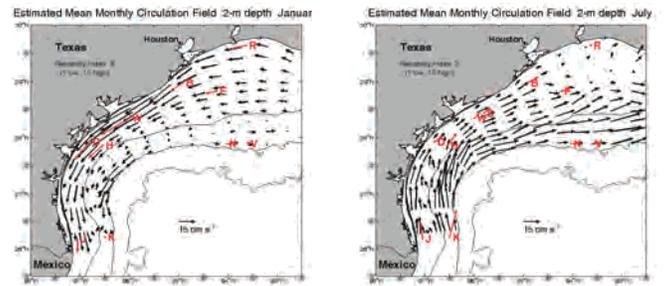




MORPHOLOGY
 TIDES
 WAVES
 SEDIMENT TRANSPORT
 CURRENTS & CIRCULATION
 SALINITY & WATER QUALITY
 ECOSYSTEMS
 ISSUES

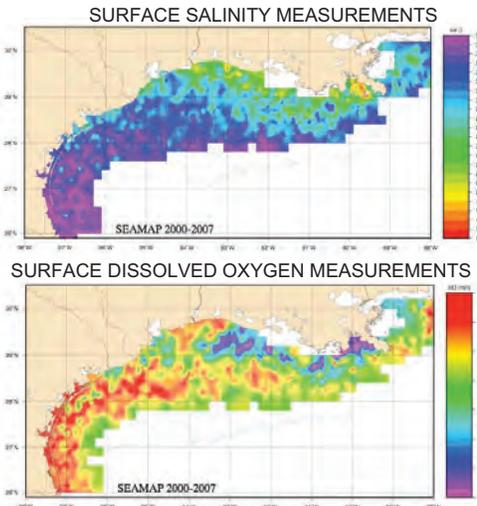
MORPHOLOGY
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 WAVES
 SEDIMENT TRANSPORT
 CURRENTS & CIRCULATION
 SALINITY & WATER QUALITY
 ECOSYSTEMS
 ISSUES

TEXAS COASTAL CURRENT



FALL-WINTER-SPRING

SUMMER

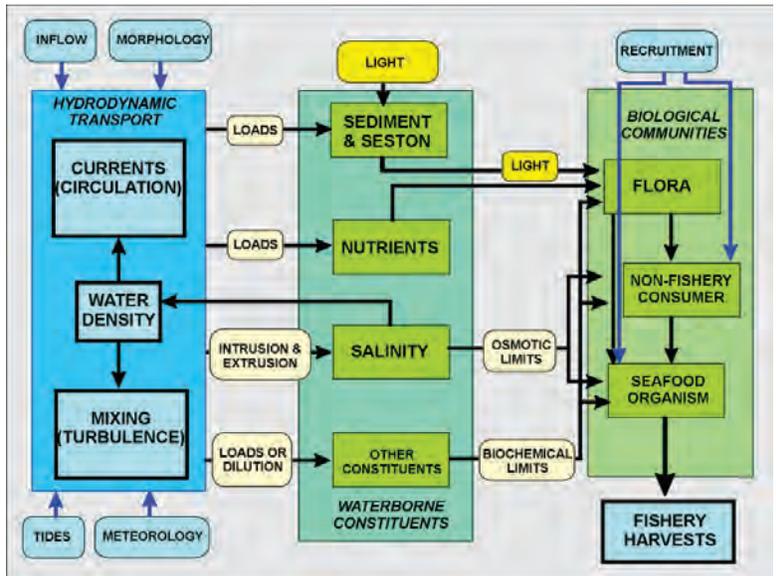


Source:

S. DiMarco, N. May, A. Quigg, M. Fisher, W. Denton, E. Grossman, J. Strauss, T. Bianchi, R. Mullins, F. Alvarez, 2009; 24-Year Climatology of Coastal Texas Water Quality. GOM Alliance, New Orleans.

ESTUARY CHARACTERISTICS

-  TRANSITIONAL BETWEEN FRESHWATER & MARINE
-  INFLUENCED BY MANY FACTORS
-  DYNAMIC, HIGHLY VARIABLE
-  PRODUCTIVE, BUT WITH SPECIALIZED ORGANISMS
-  WIDE RANGE IN HABITATS SPANNING THE ESTUARINE ZONE
-  MAJORITY OF THE LARGER ANIMALS IN ESTUARY ONLY TEMPORARILY FOR SPECIFIC BIOLOGICAL PURPOSES



ESTUARY CIRCULATION

PRIMARY FORCING FACTORS

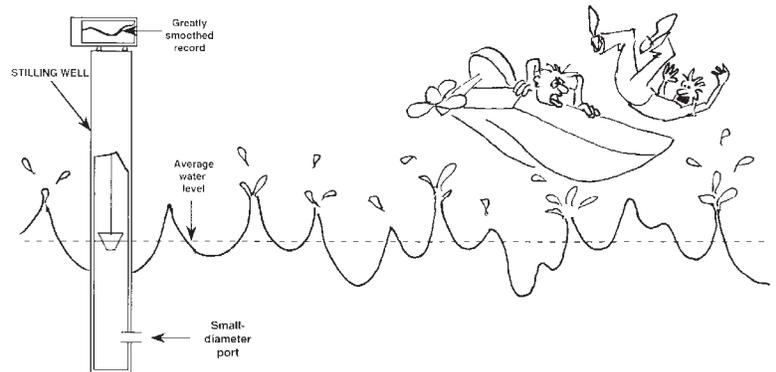
-  MORPHOLOGY & BATHYMETRY
-  TIDES
-  HYDROLOGY (FRESHWATER INFLOW)
-  METEOROLOGY
-  DENSITY (SALINITY) CURRENTS



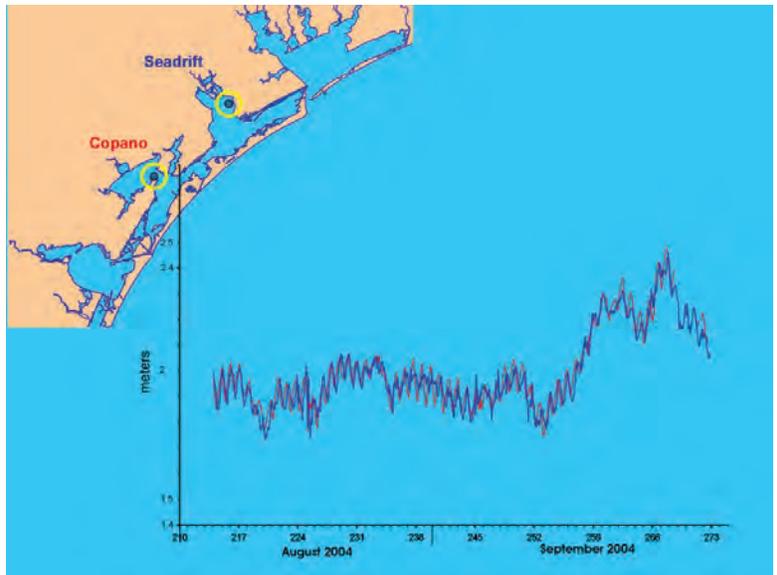
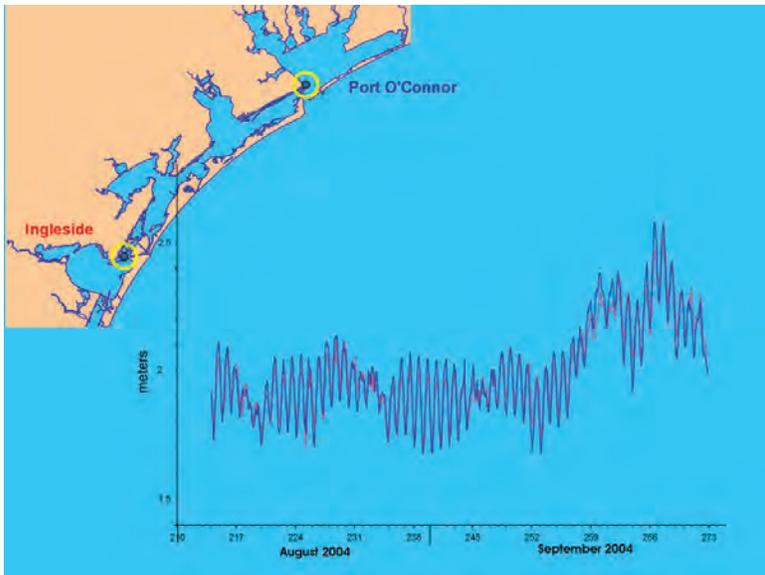
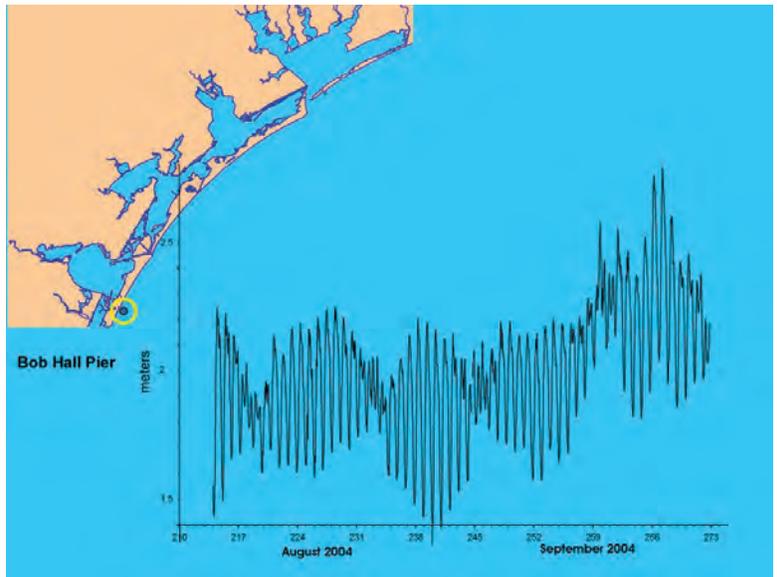
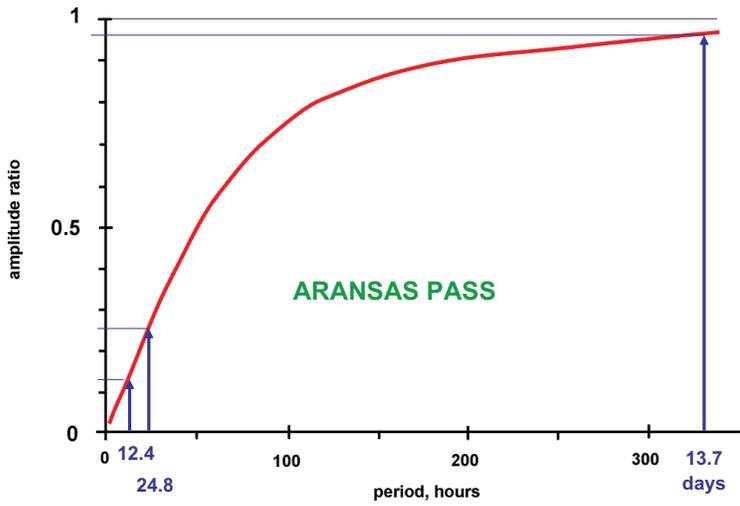
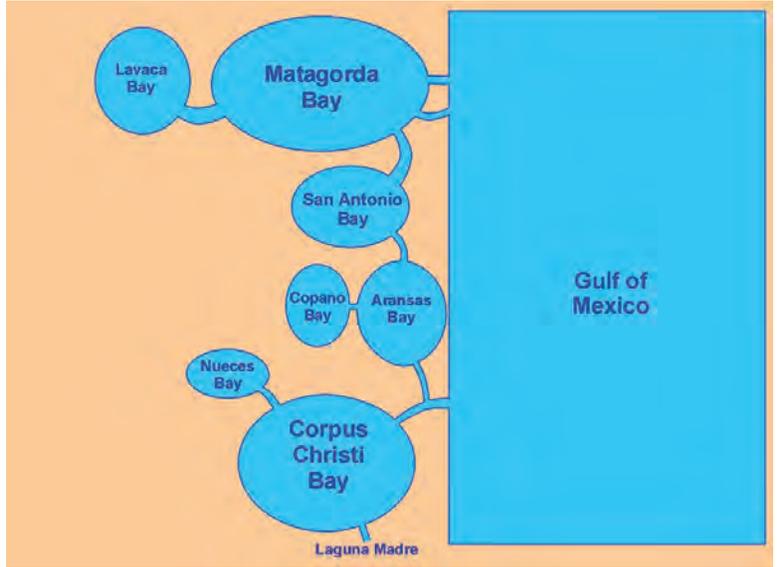
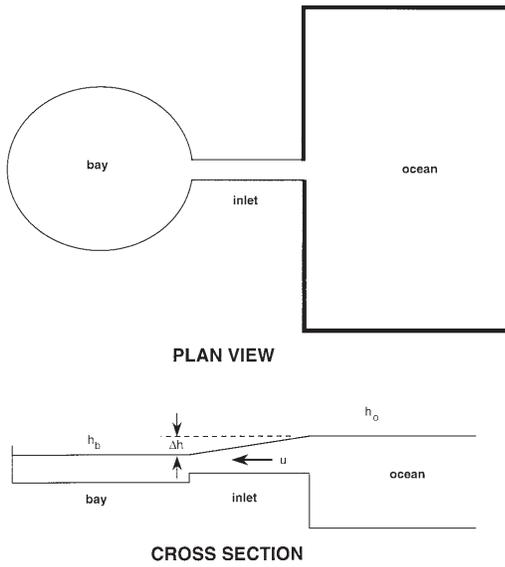
ESTUARY CIRCULATION

PRIMARY FORCING FACTORS

-  MORPHOLOGY & BATHYMETRY
-  TIDES
-  HYDROLOGY (FRESHWATER INFLOW)
-  METEOROLOGY
-  DENSITY (SALINITY) CURRENTS



STILLING WELL PRINCIPLE



ESTUARY CIRCULATION

PRIMARY FORCING FACTORS

-  MORPHOLOGY & BATHYMETRY
-  TIDES
-  HYDROLOGY (FRESHWATER INFLOW)
-  METEOROLOGY
-  DENSITY (SALINITY) CURRENTS

FACTOIDS ABOUT TEXAS SURFACE WATER

RAINFALL IS PRODUCED ALMOST ENTIRELY FROM DEEP CONVECTION

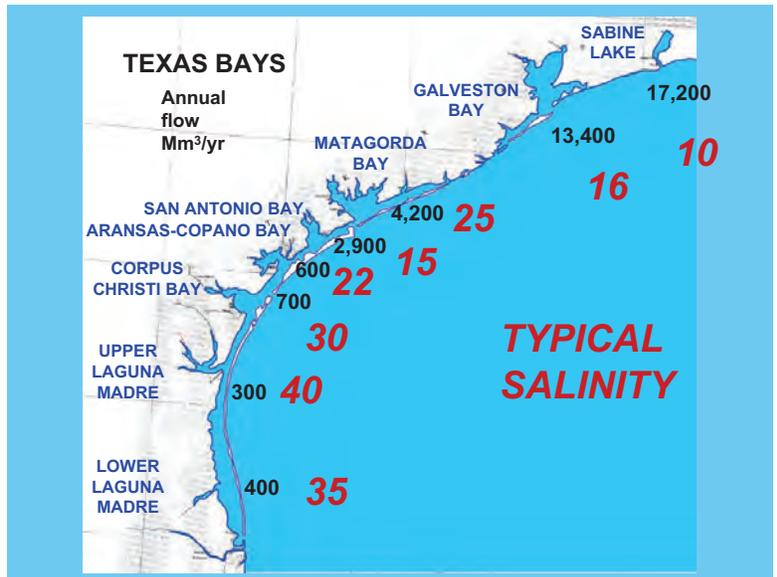
RAINFALL DECLINES PRECIPITOUSLY FROM EAST TO WEST

RUNOFF IS SMALL AS A PROPORTION OF RAINFALL

RUNOFF DECLINES EVEN MORE PRECIPITOUSLY FROM EAST TO WEST

STREAMFLOW IS FLASHY

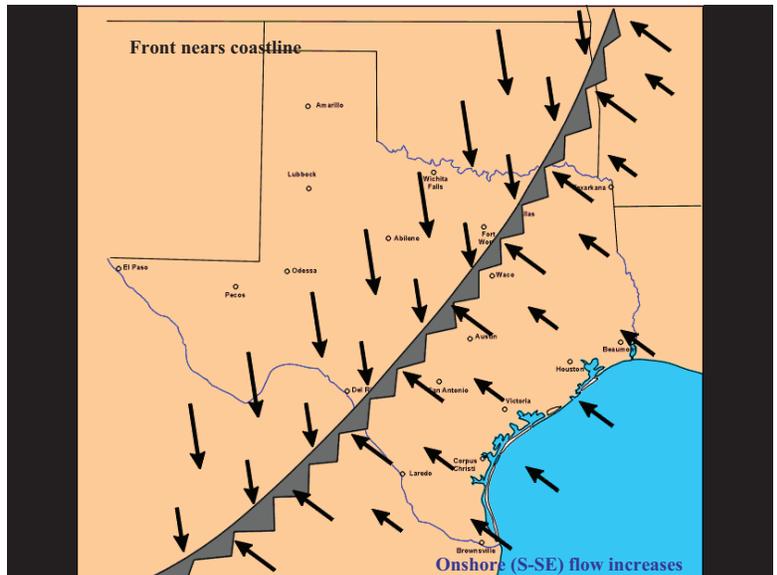
STREAMFLOW EXHIBITS LARGE VACILLATIONS ON TIME SCALES OF MONTHS TO YEARS

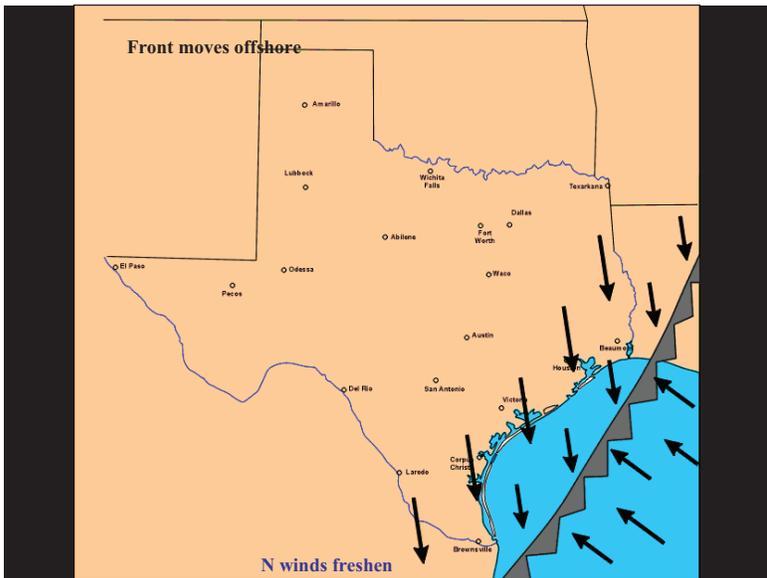


ESTUARY CIRCULATION

PRIMARY FORCING FACTORS

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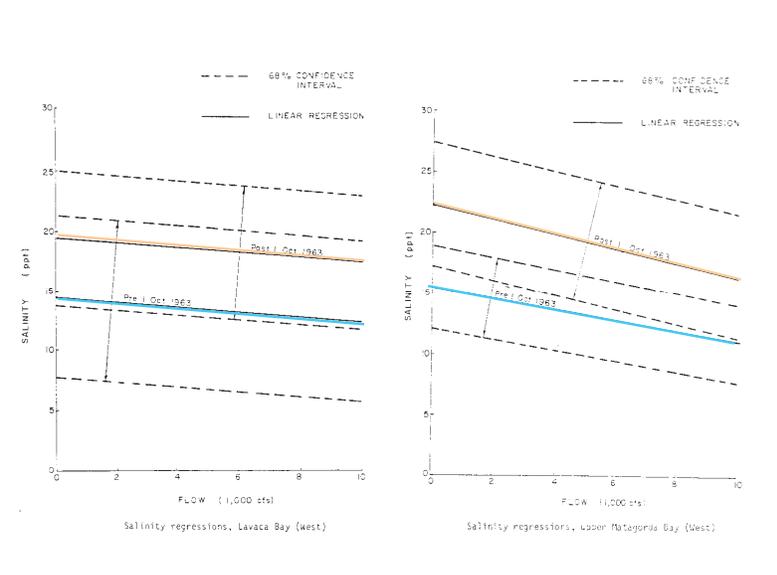
ESTUARY CIRCULATION

PRIMARY FORCING FACTORS

-  MORPHOLOGY & BATHYMETRY
-  TIDES
-  HYDROLOGY (FRESHWATER INFLOW)
-  METEOROLOGY
-  DENSITY (SALINITY) CURRENTS

THREE (3) FACTOIDS ABOUT DENSITY CURRENTS

-  FORCED BY THE HORIZONTAL GRADIENT IN SALINITY
-  FLOW ABOUT AN ORDER OF MAGNITUDE GREATER THAN INFLOW
-  INCREASES AS THE CUBE OF DEPTH





Tyson Broad
Lone Star Chapter – Sierra Club

The Environmental Perspective

Texas Desal Project Stakeholder Workshop

The Environmental Perspective



Tyson Broad
Lone Star Chapter Sierra Club



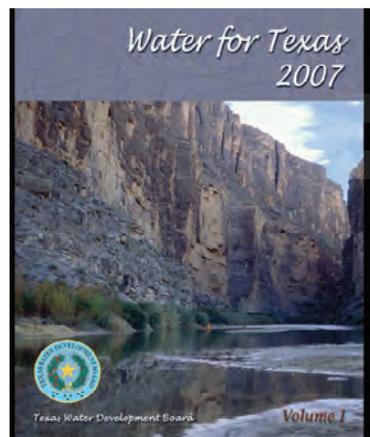
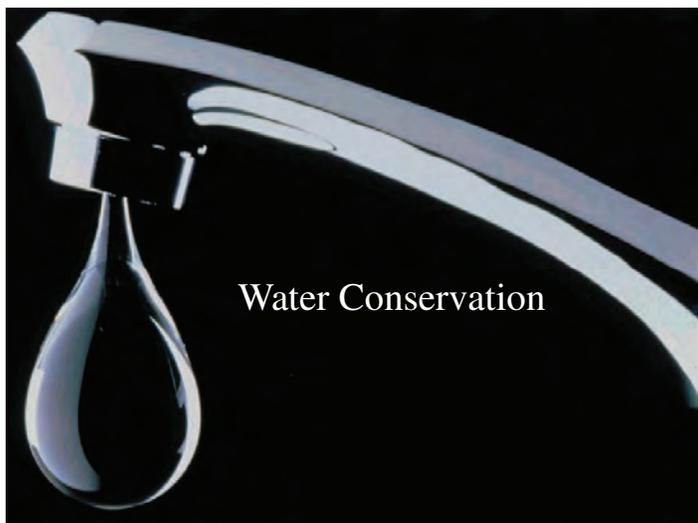
Texas Living Waters Project

Goals:

- Ensure adequate water for all needs
- Reduce future demand and foster efficient use
- Educate decision makers and public



NATIONAL WILDLIFE FEDERATION							
Estuary System	Periods Below Drought Tolerance Levels			Years With Low Freshwater Pulses			Overall Ranking
	Naturalized Conditions	Future Use	Increase	Naturalized Conditions	Future Use	Increase	
Sabalo Lake	2	10	400%	23	34	48%	Danger
Galveston Bay	0	5	>500%	10	16	60%	Danger
Matagorda Bay	3	20	567%	16	31	94%	Danger
San Antonio Bay	2	7	250%	19	24	26%	Danger
Copano/Aransas Bays	6	6	0%	21	21	0%	Good
Corpus Christi Bay	2	6	NA	13	35	169%	Danger
Upper Laguna Madre	3	3	0%	15	15	0%	Good



Water Supply Planning

- Water Demands
- Water Supplies

Projected Statewide Per Capita Water Use



A scientific analysis done by NWF:

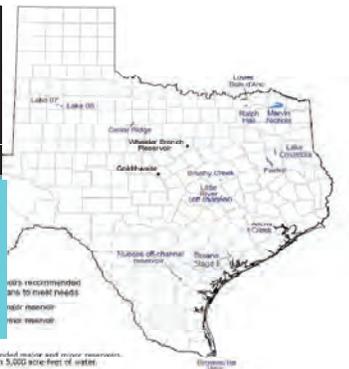
if all major cities had the goal to achieve water usage rates similar to San Antonio & El Paso...

(a 37% reduction in per-person use)

How much water could Texas save?

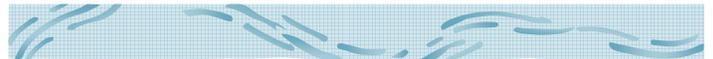
Estimated Conservation Potential in 2007 Water Plan

dam	water supply acre-feet/yr
Allens Creek	97,410
Fatril	112,000
Columbia	75,700
Marvin Nichols	489,840
Cedar Ridge	34,413
Lower Bois d' Arc	123,000
Brownsville Wier	20,643
Texana II	23,000
total	1,092,021



Water saved by 37% reduction by all major cities
= 1,047,885 acre-feet

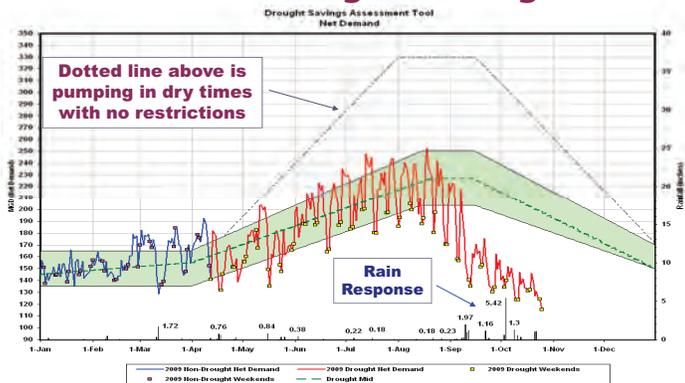
Figure 7. Location of recommended major and minor reservoirs. Major reservoirs hold more than 5,000 acre-feet of water.



Drought Management

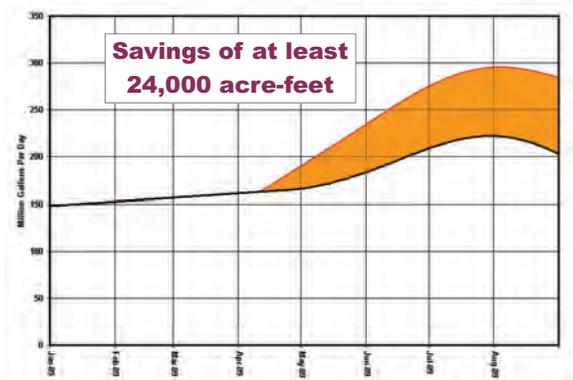
Photo: wunderground.com

2009 Drought Savings



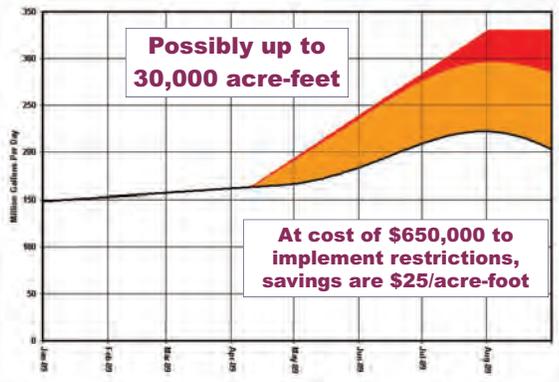
Source : San Antonio Water System

2009 Water Savings



Source: San Antonio Water System

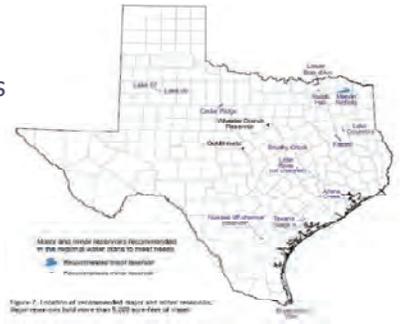
2009 Water Savings



Source: San Antonio Water System

Proposed Reservoirs in 2007 Water Plan

If Drought Management efforts were to reduce Per Capita Use by just 5% (9 gpcd) water demands in 2000 would have decreased by > 200,000 acre-feet...



Proposed Reservoirs in 2007 Water Plan

dam	water supply acre-feet/yr
Allens Creek	97,410
Fatril	112,000
Columbia	75,700
Marvin Nichols	489,840
Cedar Ridge	34,413
Lower Bois d' Arc	123,000
Brownsville Wier	20,643
Texasna II	23,000
total	1,092,021

This reduction will be 400,000 acre-feet in 2060!

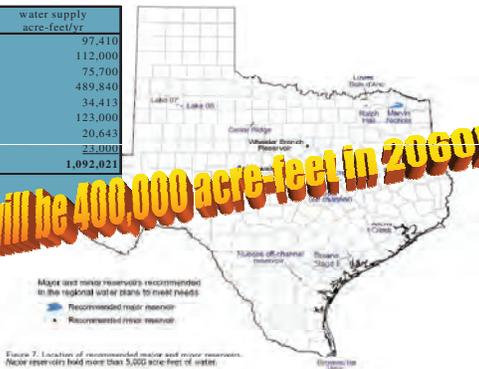
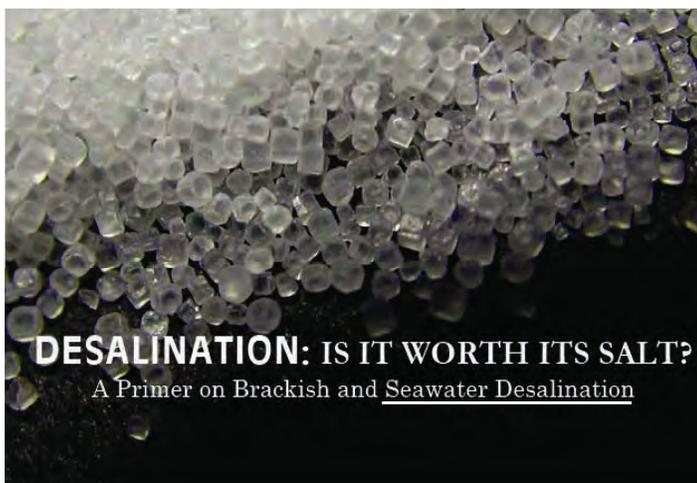
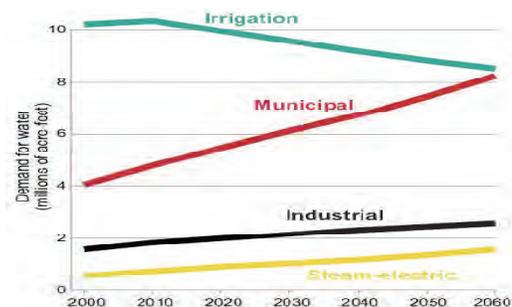


Figure 7. Location of recommended major and minor reservoirs. Major reservoirs hold more than 5,000 acre-feet of water.

2007 State Water Plan- Projected Demands



DESALINATION: IS IT WORTH ITS SALT?
A Primer on Brackish and Seawater Desalination

Photo by Cynthia

- Reduce development pressure on other sources
- May allow other sources to be used for environment
- Increase awareness of oceans
- Costs make water conservation more attractive

Ecological effects of brine disposal
Entrainment of aquatic species
Increased energy needs
Facility siting

Brine Disposal Considerations



Changes in salinity regime caused by brine itself



Contamination from chemicals used for pretreatment, membrane cleaning and preservation

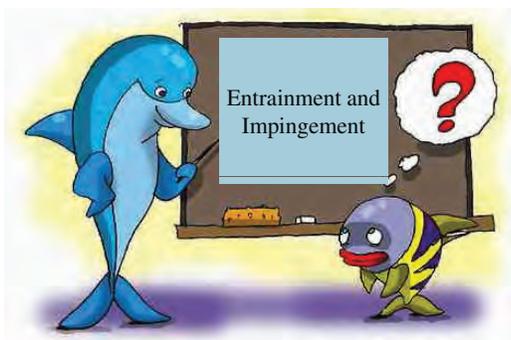


Contamination for concentrated source water constituents



Contamination or impairment of fish and shellfish resources and habitats

Slide Design stolen from George Ward



Ecological effects of brine disposal
Entrainment of aquatic species
Increased energy and water(?) needs
Facility siting

- 13 mW for 1 million
- 15 – 40k gallons for 1 mW gal of desalted water
- assume 50% recovery...

- 12.9 Kwh to produce 1,000 gal desalinated water
- 180 gpd is per capita use or 65,000 gal/year
- 800 kWh to produce enough desalinated water for year

- Energy is 1/3 to 1/2 cost
- \$0.01 increase in price/kWh results \$50 increase unit cost per acre ft.
- 25% increase in energy cost increase RO product water 11%

- Co-location with older facilities
- Subsidies
- Privatization of water resources

Stockphoto/Larry Lawhead

Stockphoto/Larry Lawhead

Ecological effects of brine disposal
 Entrainment of aquatic species
 Increased energy needs
Facility siting

Facility and Pipeline Siting

The collage consists of three rectangular images. The top image shows a large number of dark birds, possibly ducks or geese, resting on a sandy beach. The middle image shows a wetland area with tall green reeds and a body of water reflecting the sky. The bottom image shows a bird of prey, likely a falcon, in flight against a clear blue sky. To the right of the images are four small, light blue arrow icons pointing downwards.

Texas Living Waters Project

To learn more:

www.texaswatermatters.org





Tampa Bay Seawater Desalination Facility Environmental Impact Monitoring

Texas Desal Project - Stakeholder Workshop
December 4, 2009

R. McConnell¹, K. Maki Jenkins², A. Willis², K. Hackett³, R. Pribble³, R. Woithe²
¹ Tampa Bay Water, Clearwater, Florida
² PBS&J, Tampa, Florida
³ Janicki Environmental, St. Petersburg, Florida

Regional Drinking Water System

2.5 Million Residents Served

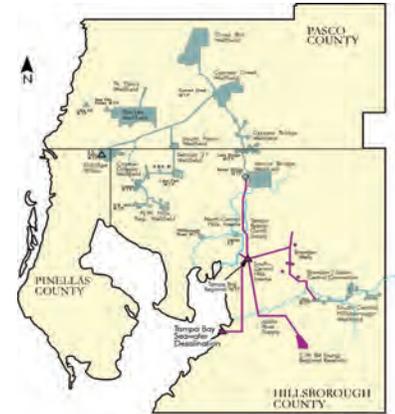
- Hillsborough County
- Pasco County
- Pinellas County
- New Port Richey
- St. Petersburg
- Tampa

244 mgd Average Daily Demand

Drinking Water Sources

- Groundwater
- Surface water
- Desalination

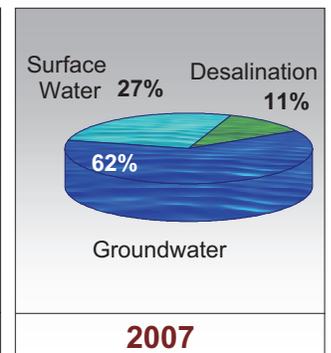
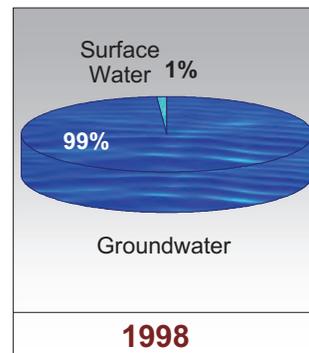
- Alternative Supplies
- Wellfields



Master Water Plan (1998) –
End of “Water Wars”

- Diversify Water Supply Sources by 2007
- Reduce pumping 68 mgd from 11 wellfields
 – **Largest environmental set aside in U.S.**
- Meet 47 mgd new demand
- Develop 85 mgd new alternative sources of drinking water

Water Sources



Seawater Desal Environmental Issues



- Water quality/salinity
 - circulation/mixing
 - stratification/flushing
- Estuarine/marine biota
- Permit-related studies
 - Hydrodynamic models
 - Far-field, near-field
 - Biological assessments

Tampa Bay Seawater Desalination Facility

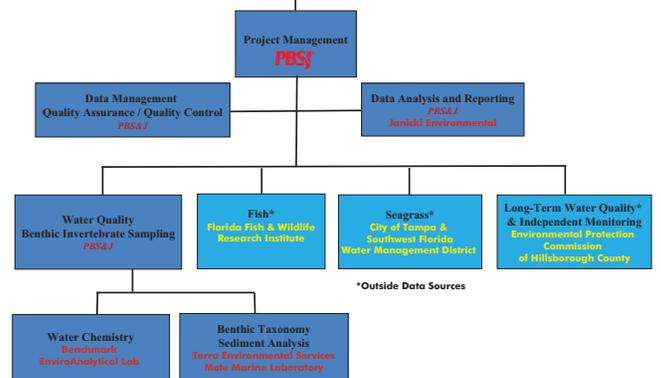




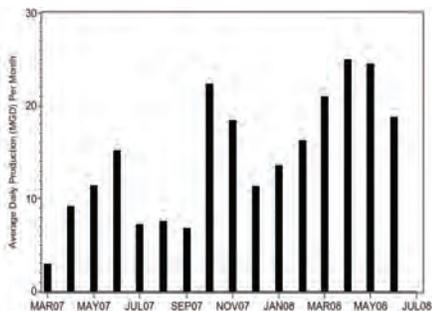
- State of Florida NPDES Industrial Wastewater Facility Permit requirements:
 - Facility discharge monitoring and toxicity testing
 - Hydrobiological monitoring program (HBMP) for potential effects on water quality and biological communities
- Coordinated with Tampa Bay Water's larger HBMP and data collection by other agencies
- Desal monitoring began 2002



Tampa Bay Seawater Desalination Hydrobiological Monitoring Program Organizational Chart

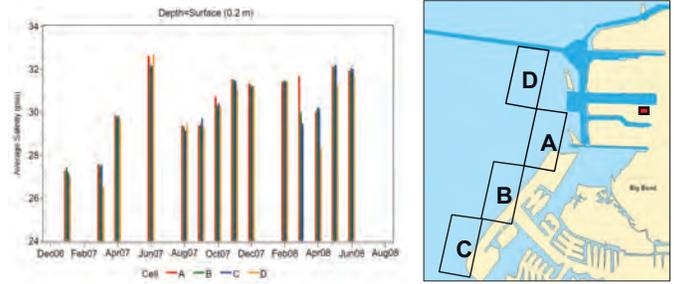
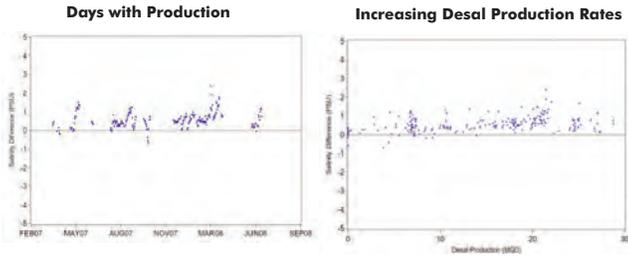


- Initial operation March 2003
- Intermittent production 2003-2005
- Off-line for improvements June 2005
- Resumed continuous operation March 2007
- Recent production more frequently at or near maximum



- Permit-Required Plan of Study
 - Pre-operational conditions, ongoing monitoring
 - Water quality sampling continuous, bimonthly
 - 3 fixed continuous salinity recorders
 - Benthic invertebrate sampling (A,B,C)
 - Fish and seagrass data
- Supplemental Sampling

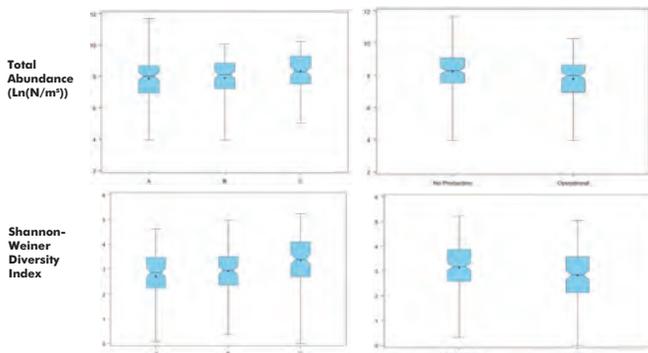




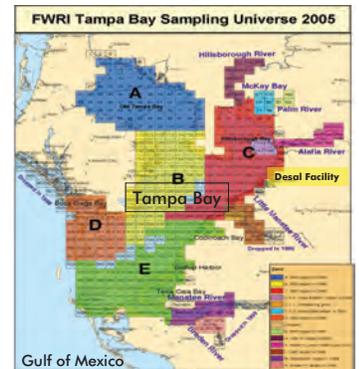
- 2007-2008 average Bay salinity near Desal about 26 psu, power plant canal salinities varied up to 4 psu daily, 8 psu seasonally
- Salinity varied with rainfall conditions
 - 2003 to 2005 salinity lower than normal
 - 2007 to 2008 salinity higher than normal
- Small salinity differences <1-2 psu near monitoring equipment detection limits
- None of the monitoring results indicate impacts greater than model predictions



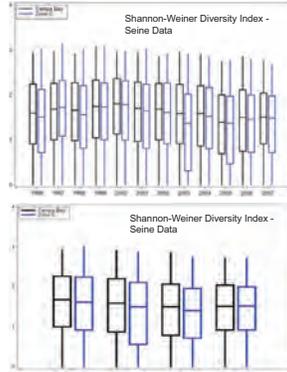
- 315 benthic samples analyzed from 2002-2007; 448 different taxa identified
- Samples evaluated by date, location, and facility operational status
- Salinity, temperature, sediment characteristics (e.g., grain size)
- Metrics: abundance, diversity, multivariate analyses



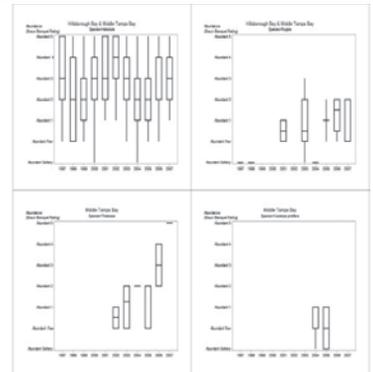
- Numerous recreational and commercial fisheries in Tampa Bay
- Monitoring data from Florida Wildlife Research Institute state-wide program
- Monthly samples collected at random sites using seines and trawls



- Fish data typically highly variable (mobility, red tides, habitat loss, fishing pressure)
- Compared seine and trawl data from Zone C near facility to Tampa Bay overall
- No difference by year or operational status (similar results for trawls)



- Important habitat for fish and other species in Tampa Bay
- Monitoring data from SWFWMD (mapping) and City of Tampa (transects)
- Infrequent, patchy and ephemeral near facility (transect examples)
- Highly variable within and between years



- Data collected from 2002-2008 under different operational conditions
- Small salinity differences near detection limits in power plant discharge canal
- No significant spatial or temporal changes in water quality
- No adverse impacts to abundance or diversity of biological resources
- Monitoring continues with additional evaluation as data are collected

Questions?

Contact info:

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 Tampa Bay Water
 727.791.2355
 rmcconnell@tampabaywater.org
 Robert Woithe, Ph.D.
 PBS&J
 5300 West Cypress St., Suite 200
 Tampa, Florida 33607
 813.281.8357
 rdwoithe@pbsj.com





Dr. Chris Reed
URS Corporation

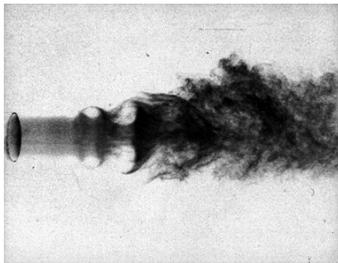
Discharge and Dilution

DISCHARGE and DILUTION
URS Corporation
12/4/2009

Discharge Basics
Analysis Tools
Accuracy

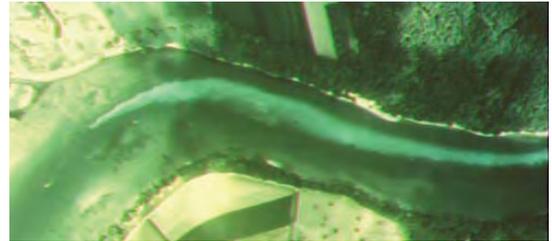
Discharge Basics

near field and far field



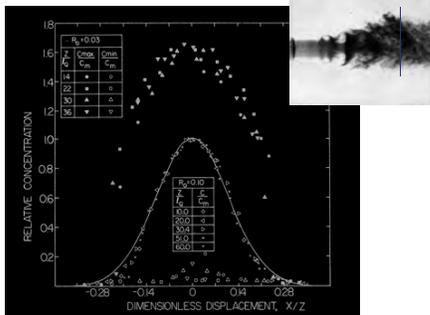
Discharge Basics

near field far field



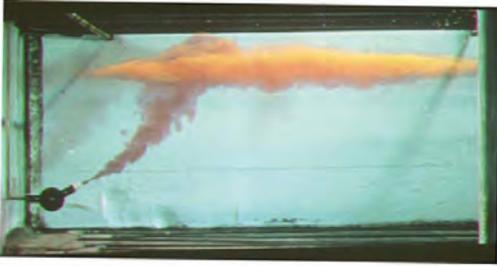
Discharge Basics

time averaging



Discharge Basics

positive buoyancy



Discharge Basics

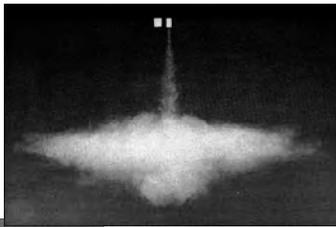
negative buoyancy



School of Civil & Environmental Engineering, UNSW Sydney NSW 2052 Australia

Discharge Basics

Ambient water conditions



Discharge Basics

unsteady flows and accumulation



Discharge Basics

Some key concepts:

- near field
- far field
- buoyancy
- unsteady flows and local accumulation
- ambient water conditions
- bathymetry or geometry

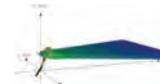
Analysis Tools

Spreadsheet

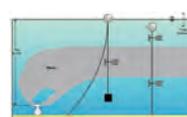
$$C_m = C_s \cdot 2.38 \left(\frac{z}{z_0} \right)^{1/2}$$

z (m)	C _s (mg/L)	C _m (mg/L)
0.1	100	23.8
0.2	100	33.5
0.5	100	50.0
1.0	100	71.4
2.0	100	100.0
5.0	100	158.1
10.0	100	238.0
20.0	100	335.4
50.0	100	500.0
100.0	100	714.3

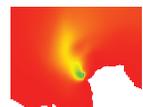
CORMIX



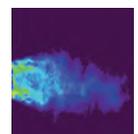
PLUMES



EFDC

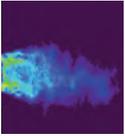


FLUENT or PHEONIX



Analysis Tools

FLUENT or PHEONIX



**Dynamic Pressure
or
Hydrostatic Pressure Assumption**

Hydrostatic Pressure Assumption:
vertical velocities are small relative to horizontal velocities
vertical momentum balance is ignored

Analysis Tools

Spreadsheet

Parameter	Round phase	Plane phase
Total Volume Flow Rate Q	Dimensions L ³ T ⁻³	Dimensions L ³ T ⁻³
Local velocity magnitude flow velocity	Dimensions L ² T ⁻²	Dimensions L ² T ⁻²
Characteristic length scale L _c	L	L
Maximum time averaged velocity u _{max}	$u_{max} = (1.8 \pm 0.01) \frac{Q}{L^2}$	$u_{max} = (1.9 \pm 0.008) \frac{Q}{L^2}$
Maximum time averaged trace concentration C _{max}	$C_{max} = (1.8 \pm 0.01) \frac{Q}{L^2}$	$C_{max} = (2.0 \pm 0.008) \frac{Q}{L^2}$
Mean distance x ₀	$x_0 = 0.21 \pm 0.001 L$	$x_0 = 0.09 \pm 0.002 L$
Effective scale of bathymetry B _{eff}	0.107 ± 0.004	0.110 ± 0.002
Concentration scale of bathymetry B _C	0.127 ± 0.004	0.101 ± 0.002
Ratio C _{max} /B _C	1.4 ± 0.1	1.2 ± 0.1

Parameter	Round phase	Plane phase
Total buoyancy flux B	Dimensions L ³ T ⁻³	Dimensions L ³ T ⁻³
Maximum time averaged velocity u _{max}	$u_{max} = (4.7 \pm 0.20) B^{1/3}$	$u_{max} = 1.66 B^{1/3}$
Maximum time averaged trace concentration C _{max}	$C_{max} = (0.1 \pm 0.01) B^{-1/3}$	$C_{max} = 2.81 B^{-1/3}$
Volume flux q	$q = 0.15 \pm 0.015 B^{2/3}$	$q = 0.54 B^{2/3}$
Velocity scale of bathymetry B _v	0.100 ± 0.005	0.110 ± 0.002
Concentration scale of bathymetry B _C	0.120 ± 0.005	0.117 ± 0.003
Ratio C _{max} /B _C	1.4 ± 0.1	0.91 ± 0.1

Near field – dynamic pressure implicit in approach

Far field – constrained to simple geometries

Buoyancy – constrained to simple geometries

Unsteady and accumulation – not simulated

Ambient water conditions – can be described explicitly

Bathymetric and Geometry – constrained to very simple geometries

Analysis Tools

CORMIX



Near field – dynamic pressure implicit in approach

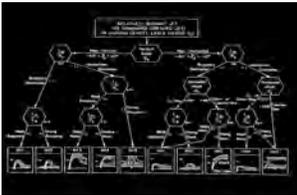
Far field – constrained to simple geometries

Buoyancy – constrained to simple geometries

Unsteady and accumulation – not simulated

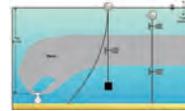
Ambient water conditions – can be described explicitly

Bathymetric and Geometry – constrained to simple geometries



Analysis Tools

PLUMES



Near field – dynamic pressure implicit in approach

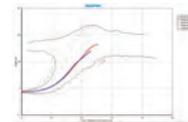
Far field – constrained to simple geometries

Buoyancy – constrained to simple geometries, limited to positively buoyant plumes

Unsteady and accumulation – simplified simulations

Ambient water conditions – can be described explicitly

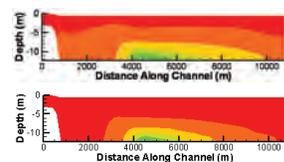
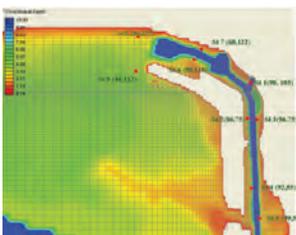
Bathymetric and Geometry – constrained to simple geometries



Discharge Basics

EFDC

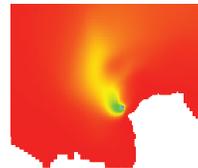
Vista Del Sol LNG
Corpus Christi, TX



Analysis Tools

EFDC

near bottom salinity contours



Near field – not simulated

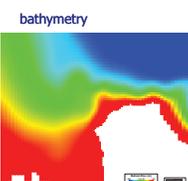
Far field – no constraints

Buoyancy – no constraints

Unsteady and accumulation – no constraints

Ambient water conditions – no constraints

Bathymetric and Geometry – no constraints



Accuracy

Inherent uncertainty in nature

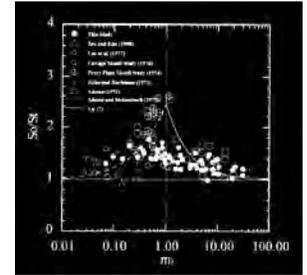
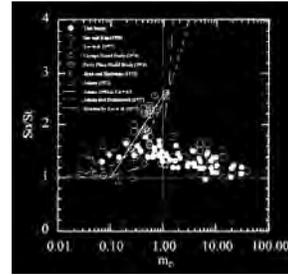
Diagnostics applications (calibration)

Prognostic applications (predictions)

Model assumptions

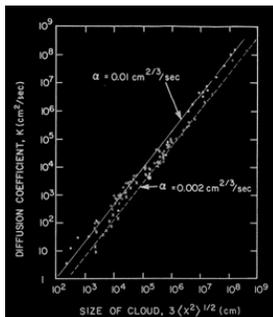
Accuracy

Inherent uncertainty in nature



Accuracy

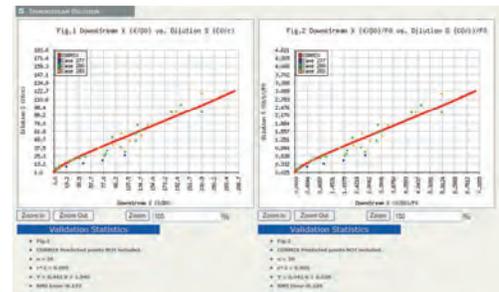
Inherent uncertainty in nature



- scatter in experimental data
- dependence of diffusion on plume size

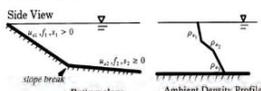
Accuracy

Diagnostic Applications



Accuracy

Mixing Zone Analysis of Brine Wastewaters with CORMIX



Ambient Conditions Assumptions

1. Uniform channel in downstream direction
2. Uniform ambient current field $u_{a1} = \text{constant}$; $u_{a2} = \text{constant}$
3. Positive near shore slope S_1 with break to S_2
4. Bounded laterally on one side only in near-field
5. Up to 3 layers of density with arbitrary stable profile

CORMIX - GTS ambient conditions specification.

Care should be exercised when simulating these flows within CORMIX. Although the system does recognize negatively buoyant FLOW CLASSES (NV, NH, MNU) the system assumes a flat bottom topography. In the FAR-FIELD AS DENSITY CURRENTS, these flows will have a strong tendency to travel downslope, following local bathymetric contours.

Accuracy

Versar, Inc. conducted a validation study for the state of Maryland on the application of CORMIX3 version v3.2 to power plant discharges.

This study highlights the limitations of methodology application where:

- detailed hydrographic data is not available
- tidal currents and unsteady build-up over multiple tidal cycles can occur
- where wind-induced ambient currents affect plume trajectory and mixing

Accuracy

Accuracy is not easily rated and is better defined in terms of a specific application

Ultimately the accuracy is more a factor of the experience of the user than the sophistication of the model

understanding of the inherent limitations of data and predictions

understanding of which physical process control the dilution

aware of the limitations and assumptions of each tool

Questions

Appendix D:
Summary of Online Dialogue

Google Group for Texas Desal Project

Group name: Texas Desal Project

Group home page: <http://groups.google.com/group/texas-desal-project>

Group email address texas-desal-project@googlegroups.com

Basic Information

Private group, have to be invited to join

Not listed when someone searches Google Groups

Everyone in attendance today will be invited

You do NOT have to create a Gmail account

Let us know if there are others you think should be invited

Managers (Mike & Robyn) invite members

Members can:

- Create and edit pages of information
- Upload files
- Post messages
- Set up email messaging or XML/RSS feeds to stay current

No moderation – this is meant to be an open and honest discussion among stakeholders

Current content

Six (6) discussion areas have been set up:

- Intake
- Treatment process
- Finished water distribution
- Concentrate disposal
- Power supply
- Site considerations

Files that have been uploaded:

- Texas Desal Project logos
- Workshop presentations (pdf)
- Brochure on Laguna Madre Water District's pilot project (LWMD_Final Brochure.pdf)
- Brochure on Brownsville PUB's pilot project (DESALbrochure_FINAL.pdf)
- Executive Summary of Pilot Study Report – Brownsville Seawater Desalination Project (Executive Summary.pdf) *To read whole report, please see www.desal.org/brownsville*

About the Texas Desal Project – grant funded by TWDB

Contact Us

Members

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[DISCUSSIONS](#)
[FILES](#)
[CONTACT US](#)
[MEMBERS](#)

[About this group](#)
[Edit my membership](#)
[Group settings](#)
[Management tasks](#)
[Invite members](#)

Group info
 Members: 38
 Language: English
 Group categories: Not categorized
[add a category](#)
[More group info](#)

[Home](#)
 Welcome to the online group for attendees of the Texas Desal Project workshop, which was held December 2 & 4, 2009 on South Padre Island. The goal of this group is for to share information about seawater desalination as an alternative water supply for Texas. You can get information here on the main components of a desalination facility, as well as contribute information for the group to discuss. Only invited members may access this group page. If you know someone who should be part of the group, please send us their contact information (our contact information is below) so we may send them an invitation.

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Appendix E:
Planning Aid Memoranda

Texas Desal Project Stakeholder**Planning Aid Memorandum Rec'd**

Arroyo Colorado Watershed Partnership	
Bureau of Reclamation	
Brownsville Public Utilities Board	
Citizen – Michael Delesantro	√
City of McAllen, Texas	
Coastal Bend Bays and Estuaries Program	
Coastal Conservation Association	
Environmental Protection Agency	
Guadalupe-Blanco River Authority	
Harte Research Institute for Gulf of Mexico Studies	
Laguna Madre Water District	
Lower Colorado River Authority	
Lower Laguna Madre Foundation	
Lower Rio Grande Valley Development Council	√
National Audubon Society	
National Marine Fisheries Service	
National Wildlife Federation	
Nature Conservancy	
North Alamo Water Supply Corporation	
NRS Consulting Engineers	
PBS&J	
Port of Brownsville	
Rio Grande Regional Water Authority	
Rio Grande Regional Water Planning Group	
San Antonio River Authority	√
San Antonio Water System	√
San Patricio Municipal Water District	
Science Academy of South Texas	
Sierra Club	√
Texas Commission on Environmental Quality	√
Texas General Land Office	√
Texas Parks & Wildlife Department	√
Texas Sea Grant College Program	
TRC	√
Texas Water Development Board	√
United States Fish & Wildlife Service	√
United States Army Corps of Engineers	√
University of Texas Center for Research in Water Resources	
URS	
University of Texas Brownsville	
University of Texas Pan American	√
University of Texas Marine Science Institute	
University of Texas at Austin	√
Valley Municipal Utility District #2	
Water Globe Consulting	√

Texas General Land Office - Corpus Christi Field Office

Comments on the Texas Desal Project

April 14, 2010

1) Permitting Requirements

The Texas General Land Office (GLO) is responsible for management of structures located on State owned land. This includes submerged land, beaches and dunes, and any State owned upland tracts.

Desalination plants will require a GLO lease or easement for any and all structures constructed on State owned lands. The structures could include the plant itself, pipelines, intakes, outflows, etc. Yearly fees will vary based on the project's size and classification type; ie. A public use project managed by a governmental agency, a commercial project managed by a corporate entity, etc.

It is recommended that coordination of projects to be located on State land begin early in the planning process. This will prevent permitting procedures from delaying projects in their latter stages. No structures may be constructed on State land without a proper lease or easement in place prior to the start of construction.

A Corps of Engineers permit will be required and will be subject to consistency review. The permit will be reviewed for impacts to coastal natural resource areas (CNRAs) and consistency with the goals and policies of the Coastal Management Program. The policies can be found at [http://info.sos.state.tx.us/pls/pub/readtac\\$ext.ViewTAC?tac_view=5&ti=31&pt=16&ch=501&sch=B&rl=Y](http://info.sos.state.tx.us/pls/pub/readtac$ext.ViewTAC?tac_view=5&ti=31&pt=16&ch=501&sch=B&rl=Y)

2) Resource Concerns

Numerous State and Federal agencies will concentrate on resource concerns. The GLO will work cooperatively with these agencies but no specific concerns can be identified at this time.

As part of the Coastal Management Program, impacts to CNRAs will be evaluated. A list of CNRAs can be found at <http://www.glo.state.tx.us/coastal/cmpdoc/chap4.html>

3) Measures to avoid, minimize, or mitigate adverse impacts

Minimizing impacts to State owned natural resources will be required and projects will be evaluated on a case-by-case basis. The General Land Office will work cooperatively with other State and Federal resource agencies to develop projects which minimize impacts to State owned land. If mitigation is required for impacts to resources located on State owned land, the mitigation projects must also be performed on State owned land.

Please see the list of CNRAs above.



Life's better outside.®

April 15, 2010

Mr. Michael Irlbeck
NRS Consulting Engineers
919 Congress Avenue, Suite 460
Austin, Texas 78701

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Chairman
San Antonio

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Vice-Chairman
Houston

Mark E. Bivins
Amarillo

Ralph H. Duggins
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Antonio Falcon, M.D.
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Dan Allen Hughes, Jr.
Beeville

Margaret Martin
Boerne

S. Reed Morlan
Houston

Lee M. Bass
Chairman-Emeritus
Fort Worth

Carter P. Smith
Executive Director

Re: Texas Desal Project .

Dear Mr. Irlbeck:

Mike

Texas Parks and Wildlife Department (TPWD, "the Department") appreciates the opportunity to provide input to the Texas Desal Project. It is commendable that the Project is actively seeking environmental input prior as part of the design phase of Texas' first full-scale seawater desalination project. We understand that you seek a written planning aid memorandum that: 1) identifies permitting requirements and/or the regulatory role of TPWD; 2) identifies potential resource concerns associated with the development and operation of the proposed seawater desalination facilities; and 3) recommends measures to avoid, minimize, or mitigate potential adverse impacts. Our detailed comments follow as appendices.

Please contact Dr. Patricia Radloff at 512-389-8730 if you have questions or need additional information concerning our comments. We look forward to continuing to work with the Texas Desal Project as you move forward in the design phase.

Sincerely,

Cindy Loeffler

Cindy Loeffler, P.E.
Chief, Water Resources Branch

CL/PLR/mes

Enclosures

Appendix 1 – TPWD's response to questions 1, 2, and 3

Appendix 2 – TPWD's Sensitive Habitat Guidelines

Appendix 3 – TPWD's DRAFT Voluntary Recommendations for Wind Energy Development

cc (w/ enclosures):

Dr. Patricia Radloff

Dr. Dan Opdyke

Ms. Cindy Loeffler

Mr. David Bradsby

Mr. Alex Nunez

Dr. James Tolan

Mr. Willy Cupit

Ms. Leslie Williams

Ms. Rebecca Hensley

Mr. Mark Lingo

Mr. Russell Hooten

Ms. Kathy Boydston

APPENDIX 1

TPWD's Responses to Questions 1, 2 and 3

TPWD's Responses to Questions 1, 2 and 3

Question 1 - Regulatory Role

TPWD has broad authority and obligations under the Parks and Wildlife Code related to the conservation and management of terrestrial and aquatic animal life and habitat. For example, see Parks and Wildlife Code §1.011 and §61.002. Perhaps most relevant to the Texas Desal Project are TPWD's obligations under Parks and Wildlife Code §12.0011, which establish that the Department is "the state agency with primary responsibility for protecting the state's fish and wildlife resources" and which authorize the Department to provide information and recommendations to protect on fish and wildlife resources to entities that make decisions affecting those resources.

TPWD issues hunting and fishing licenses and various special permits. TPWD also issues certain permits to take sand and gravel.

TPWD participates in regional and statewide water planning, instream flow studies, and freshwater inflow studies. TPWD regularly reviews and comments on many different types of projects and permits, including Texas Department of Transportation projects, mining permits, Public Utility Commission licenses, wind energy projects, ecological risk assessments, response action plans, U.S. Army Corps of Engineer permits and their state certification, water rights permits, wastewater discharge permits, Total Maximum Daily Loads (TMDLs), and watershed protection plans.

Questions 2 and 3 - Potential Resource Concerns and Recommendations

Some years ago, TPWD was directed by the legislature to develop sensitive habitat guidelines for aquaculture operations in the coastal zone (Appendix 2). While some of this material is specific to aquaculture operations, most of it is generally applicable to facility siting and discharge in coastal areas, and includes discussion of concerns related to topics such as special habitats and impingement and entrainment.

As noted in the following comments, TPWD anticipates that pre- and post-construction surveys will be conducted to eliminate unsuitable sites and to determine optimal locations for both intakes and outfalls. Optimal locations will be those that pose the least potential impact to habitat, water quality and marine aquatic life. These surveys should also be utilized to quantify long-term impacts to the environment and aid in the determination of appropriate mitigation measures. TPWD recommends a program of pre- and post-construction monitoring so that impacts to biota and water quality (or lack thereof) resulting from the project can be quantified.

TPWD asks that provision be made for regular inspection and long-term maintenance the facility and pipelines.

Plant and pipeline siting

Avoidance and/or minimization of wetland impacts should be incorporated in site selection and construction of both desalination facilities and their accompanying pipelines. TPWD will address wetland impacts during the coordination and comment period of the U.S. Army Cops of Engineers permitting process for 404 and Section 10 permits.

Intake location

TPWD's preferred option for both projects is open-water intakes in the Gulf. TPWD recommends that structures be designed to limit intake velocities to 0.5 foot/sec and that structures be located as far offshore as can reasonably be achieved.

Note that, as part of its review, TPWD will also consider potential impacts to freshwater and brackish water ecosystems arising from replacement of relatively "fresh" water by more saline water. Intakes are likely to be located in relatively "fresh" areas. When water is withdrawn, the "fresh" water will likely be replaced by more saline water. Over the long term, such changes in salinity regime can affect fresh water and brackish water ecosystems.

Placement of the intake structures in the general vicinity of the Gulf pass should be avoided. At some point in their life cycle, many aquatic species utilize Gulf passes along the Texas coast to migrate between the Gulf of Mexico and adjacent estuaries. The relatively small size of the passes serves to "concentrate" marine life, particularly incoming larval and early juvenile phases. Thus placement of an intake in or near a pass could magnify potential impacts to marine life. It is difficult to determine the optimal distance from a pass, but, in general, the further away from a pass, the better.

An open-water Brownsville Ship Channel intake is undesirable between San Martin Lake and the Brazos-Santiago Pass. Many areas adjacent to the Brownsville Ship Channel provide valuable nursery habitat for fish, including South Bay, seagrass flats north of the Ship Channel, Bahia Grande and San Martin Lake. As such, large numbers of larval and juvenile fish are likely to be concentrated in the Brownsville Ship Channel between San Martin Lake and the Brazos-Santiago Pass. The small cross-sectional area relative to the volume of water removed magnifies the potential for entrainment within the confines of the Ship Channel.

A constructed intake channel off the Ship Channel with filter media may be an acceptable option, subject to review of detailed plans and provided that intake velocities are below the 0.5 foot/sec threshold established by the U.S. Environmental Protection Agency for power plant intake structures.

From the perspective of protection of fish, a beach well-field intake option may be acceptable. However, there are other considerations with respect to threatened and endangered species and beach habitat that would need to be considered. It is our understanding that at the December 2009 Agency Workshop in South Padre Island, it was generally agreed that the small grain-size of the sand in the near-shore sediment may be an impediment.

TPWD will address wetland impacts through review of U.S. Army Corps of Engineers dredge and fill permits and/or Endangered Species Act Section 10 permits.

Concentrate disposal

TPWD encourages the Texas Desal Project to dispose of concentrate in a high-energy area of the Gulf of Mexico. Concentrate disposal into the Gulf of Mexico should be located a sufficient distance offshore and away from any gulf pass. TPWD anticipates that modeling will be needed to determine the most appropriate location for concentrate disposal in order to minimize impacts to marine aquatic life and water quality.

Evaporation of concentrate at a suitable location may be an acceptable alternative, subject to review of detailed plans and provided that evaporation ponds are managed in such a way as to avoid impacts to birds and wildlife.

TPWD does not support disposal of concentrate into the Lower Laguna Madre. The Lower Laguna Madre is hypersaline throughout most of the year. The potential impacts of concentrate disposal in the Lower Laguna Madre could be exacerbated because of low rainfall and freshwater inflow combined with high evaporation rates that are characteristic of the region. Blending to reduce salts concentrations to ambient TDS levels would be acceptable from a water quality perspective. However, any such proposal would be reviewed not only with respect to water quality, but also with respect to water supply and freshwater inflow. TPWD is concerned with the proposal to blend concentrate and apply it to surface tidal flats, due to locally high evaporation rates and the potential for salt build-up.

TPWD does not support disposal of concentrate in the Brownsville Ship Channel. The Ship Channel is a popular location for recreational fishing and, because of its depth, also serves as a thermal refuge for many fish species during extreme cold weather events. TPWD is concerned that the long-term disposal of concentrate could dramatically degrade water quality in the Brownsville Ship Channel and the southernmost portions of the Lower Laguna Madre.

TPWD will address concentrate disposal impacts through review of TCEQ wastewater discharge permits.

Power consumption

Both potential project sites are located in areas that provide suitable habitat that supports high avian diversity, including shorebirds, waterfowl, raptors, and grassland birds. Whether the project would receive power from the grid only or from on-site wind turbines with grid supplement, avian impacts are possible.

Birds can be electrocuted by simultaneously contacting energized and/or grounded structures, conductors, hardware, or equipment. Electrocutions may occur because of a combination of biological and electrical design. Biological factors are those that influence avian use of poles, such as habitat, prey and avian species. The electrical design factor that is most crucial to avian electrocutions is the physical separation between energized and/or grounded structures, conductors, hardware, or equipment that can be bridged by birds to complete a circuit. As a general rule, electrocution can occur on structures with the following:

- Phase conductors separated by less than the wrist-to-wrist or head-to-foot (flesh-to-flesh) distance of a bird;
- Distance between grounded hardware (e.g. grounded wires, metal braces) and any energized phase conductor that is less than the wrist-to-wrist or head-to-foot (flesh-to-flesh) distance of a bird (Avian Power Line Interaction Committee 2006).

In order to avoid or minimize potential negative impacts to birds, power line design should employ avian safety features described in:

Avian Power Line Interaction Committee (APLIC). 2006. *Suggested Practices for Avian Protection on Power Lines: the State of the Art in 2006*. Edison Electric Institute, APLIC, and the California Energy Commission, Washington, D.C. and Sacramento, CA. (Available online: <http://www.aplic.org>)

Two wind-energy projects have been constructed in Kenedy County, north of the project area and as many have as four have been proposed in Cameron and Willacy counties near the proposed project areas. Because Cameron County is situated within the Central Flyway, millions of circum-Gulf and trans-Gulf Neo-Tropical migrants may migrate through the proposed project areas. TPWD has developed voluntary guidelines for wind energy developers that provide recommendations that should be employed to avoid potential negative avian impacts (direct, indirect and cumulative). A copy of these guidelines and a site sensitivity matrix (Table 1) are attached (Appendix 3).

Rare, threatened, and endangered species

Numerous rare, threatened, and endangered species have been documented in Cameron County in the general proximity of the two potential desalination project sites. Approximately 40 occurrences of rare species have been documented within 1.5 miles of the Brownsville Ship Channel and much of Padre Island north of Andy Bowie Park has been designated as critical habitat for the federally listed Piping Plover (*Charadrius melodus*). State law prohibits the take (incidental or otherwise) of state-listed species. State-listed species may only be handled by persons possessing a **Scientific Collection Permit** or a **Letter of Authorization** issued by TPWD to relocate a species.

A list of species known to occur at the county level is available online at http://www.tpwd.state.tx.us/landwater/land/maps/gis/ris/endangered_species/index.phtml.

The Texas Natural Diversity Database (TXNDD) contains publicly available location specific data on rare, threatened and endangered species, natural communities and other significant features of conservation concern to TPWD. This site specific information for your project can be obtained by submitting a data request to txnodd@tpwd.state.tx.us.

APPENDIX 2

**Texas Parks and Wildlife Department
Sensitive Habitat Guidelines
July 2002, Updated 2007**

SENSITIVE HABITAT GUIDELINES

FOR AQUACULTURE OPERATIONS IN THE COASTAL ZONE

Texas Parks & Wildlife Department
Resource Protection Division
July 18, 2002
Updated February 2007

_____Robert L. Cook (signature)_____

Robert L. Cook, Executive Director

I. Background

Senate Bill 873, passed by the Texas legislature in 1999, authorizes the Texas Parks and Wildlife Department (TPWD) to establish guidelines that identify sensitive aquatic habitat within the coastal zone. These guidelines must be developed in consultation with the Texas Natural Resource Conservation Commission (TNRCC). The TNRCC must consider the guidelines when reviewing applications for new aquaculture wastewater discharge authorizations or expansions of existing facilities located within the coastal zone. The guidelines described below provide a method for evaluating the sensitivity of a particular site to aquaculture operations.

The goal of Texas Parks and Wildlife Department is to prevent degradation of sensitive aquatic habitats by aquaculture facilities in the coastal zone and, through work with aquaculture facilities, develop technologies which protect, increase and improve coastal habitats whenever possible.

The discussion below identifies how sensitive aquatic habitats can be identified, and the characteristics of those habitats making them potentially sensitive to aquaculture discharges. Wastes associated with aquaculture facilities are described. Finally a process is outlined which clarifies the steps necessary to evaluate the sensitivity of coastal habitats where aquaculture facilities are planned.

II. Identification of Sensitive Habitat

In the coastal zone, each proposed new aquaculture facility or aquaculture facility requesting an expansion will be evaluated in relation to its proposed location in the coastal ecosystem. Evaluation of the sensitivity of coastal habitat in an area may be determined in a variety of ways. The Texas General Land Office's (GLO) prioritization of coastal habitats for protection during spill events will be used as a tool for all areas for which it is available. This prioritization is detailed in the "Oil Spill Prevention and Response Atlas." There may be situations where information in the atlas is no longer current or where the atlas coverage is not available. In those cases, information about the sensitivity of the habitat may depend on knowledge of local experts or university or state scientists or other published studies.

The Texas General Land Office (GLO) has prioritized coastal habitats for protection during spill events. This prioritization of coastal habitats is described in detail in the GLO's "Oil Spill Prevention and Response Atlas." There are four atlases each covering a different region of the coast. The information in the atlases was compiled by Texas Parks and Wildlife Department (TPWD) using a consensus-based approach among local experts at a series of regional workshops. Participants were selected for their expertise with bay systems and included representatives from state and federal agencies, academia, industry, and environmental groups, fishing guides, and spill response personnel.

Participants outlined the distribution of sensitive coastal habitat on U.S. Geological Survey 7.5' topographic maps. Priorities of high, medium or low were determined by consensus. Areas of focus included wetlands, submerged aquatic vegetation, habitats used by birds, vertebrates such as mammals, reptiles and amphibians, oysters, clams, nursery areas and fish. Experts delineated habitats on maps and assigned habitat quality designations based on quality of natural resources in the area and number of functions in the natural community (for example, a wetland area may also serve as a nursery, as habitat for endangered species, and be heavily used by other species).

The experts assigned priority rankings based upon (1) uniqueness of resources, (2) the number of resources present, and (3) the quality of the resources. Areas with rare, threatened or endangered species received high priority. Multifunctional systems (such as prime wetlands that are also year-round bird habitat and nursery areas) received higher priority than prime areas for only one resource.

The prioritization was also influenced by the ranking of coastal habitats in order of decreasing sensitivity to oil beginning with: 1) seagrass flats, 2) mangroves (Nueces and Cameron counties only), 3) marshes and wetlands (tidally influenced), 4) sheltered tidal flats with vegetated margins, 5) riparian zones along

freshwater rivers, 6) oyster reefs, 7) exposed tidal flats, 8) spoil deposits/dredge spoil banks, 9) partially exposed bay margins, 10) sand-shell beach, 11) fine-grained sand beach, 12) man-made shore (seawalls, jetties, bulkheads, etc.) and 13) erosional scarps.

Although one goal of this project was to identify habitats needing protection during oil spills, the focus of the project was first and foremost on identifying the biological importance of different coastal habitats and then evaluating their potential sensitivity to physical and chemical impacts. This ranking of coastal habitats is therefore also considered appropriate in most cases for determining sensitivity to aquaculture activities.

Information for assessing the sensitive coastal habitats may be periodically updated by local, state and federal resource agencies. Resource agencies have access to the information produced and will refer to the information to assess potential impacts of proposed aquaculture discharges. There may be site-specific situations when it is appropriate for the TPWD, the TNRCC or an aquaculture facility to propose an alternative method of determining habitat sensitivity.

III. Coastal Habitat Sensitivity.

Sensitivity of coastal habitat to aquaculture activities is based on many factors. Several of these factors include physical or biological features of the coastal environment which may be important to consider. The majority of these factors were considered and discussed during development of the "Oil Spill Prevention and Response Atlas" described above. Resource agencies involved in considering applications for aquaculture discharges have the information in the atlases and will use this information to assess potential impacts from proposed discharges. The discussion below describes in detail some of those factors, how they may be considered in evaluating aquaculture facilities' impacts on sensitive habitat, important questions that should be addressed, and possible requirements for facilities to prevent impacts to sensitive habitats. These factors are not listed in priority order and their relevant importance would be expected to vary between different sites. In some cases, aquaculture facilities may have the opportunity to enhance one or more of these features.

Physical Features

A. Flushing rate. Is the proposed discharge point a location where there is little mixing because the location is sheltered by orientation and/or basin morphology from the wind, tidal flushing, or freshwater inflows? Is the discharge area one where waste materials would be likely to concentrate? Areas with low flushing rates may accumulate oxygen-demanding wastes leading to low oxygen concentrations in the receiving waters. Areas with low flushing rates may also concentrate algal blooms resulting from nutrient discharges. Blooms of *Karenia brevis*, the toxic red tide algae on the Texas coast, are known to concentrate and persist in areas with restricted flushing. Coastal areas where wastes will be rapidly dispersed are preferred. *Information will be required about local circulation patterns, tidal fluctuations, prevailing winds and prevailing currents in the vicinity of the discharge and its mixing zone. Areas with low flushing or water exchange rates may require more stringent limits for oxygen-demanding wastes.*

B. Reefs. Is the proposed discharge onto or adjacent to reefs, whether natural or artificially constructed? *Information will be required about proximity and size of reefs to the facility. Information will also be required about known or expected uses of nearby reefs, for example, commercial harvest of oysters, locations for recreational fishing, etc. Location of discharges may be altered to avoid impacts to reef habitats. Discharges may not affect the ability to commercially harvest shellfish in the vicinity of the discharge.*

Biological Features

A. Presence of endangered or threatened species or species of concern. Is the proposed discharge into a habitat which is used by endangered or threatened species or species of concern? *Information will be*

required about the documented presence of threatened or endangered species or species of concern in the vicinity of the facility or the types of habitats preferred by threatened or endangered species or species of concern in the vicinity of the facility, its intake(s) and discharge(s). Intake and/or discharge locations may need to be evaluated in areas where endangered or threatened species or species of concern are found or suspected to occur. Facilities which develop in areas with threatened or endangered species may be required to undergo Section 7 consultation with the U.S. Fish and Wildlife Service.

B. Spawning of aquatic organisms. Is the proposed discharge into waters that are used for spawning by fish, shellfish, or other marine organisms? Information on spawning locations will be available from TPWD. *Information, if available, will be required about the presence of fish, shellfish and marine organisms that spawn in the vicinity of the proposed facility's intake(s) and discharge(s). Timing and/or location of discharges may be altered to avoid disrupting spawning of aquatic organisms.*

C. Nesting of birds, mammals, amphibians and reptiles. Is the proposed discharge into or adjacent to waters, islands or other habitats commonly used by birds, mammals, reptiles or amphibians for breeding and nesting? Federal law prohibits disruption of migratory birds. *Information will be required about the proximity of the facility to colonial nesting water birds and other birds, mammals, reptiles or amphibians which are recreationally, ecologically or economically important. Timing and/or location of discharges may be altered to avoid disrupting breeding and nesting.*

D. Bird Roosts. Is the proposed discharge into or adjacent to waters, islands or other habitats which are used by birds for roosting? *Information will be required about the proximity of the facility to colonial water bird roosts. Timing and/or location of discharges may be altered to avoid disrupting bird roosts.*

E. Recreational use. Is the proposed discharge into or adjacent to an area which receives significant contact or noncontact recreational use? *Information will be required which describes known or expected contact and noncontact recreational uses of coastal habitat in the vicinity of the proposed facility. Location of discharges may be altered to avoid impacts to recreational use of an area.*

F. Nursery habitat for juvenile aquatic organisms. Is the proposed discharge into or near a habitat, such as seagrass beds or intertidal marsh, providing substantial food and hiding places from predators? Seagrass beds are one of the most important types of nursery habitat available in the coastal ecosystem. *Information will be required describing known nursery habitat in the vicinity of the facility, including location of seagrass beds and intertidal marshes. Timing and/or location of discharges may be altered to avoid nursery areas. Discharges into or adjacent to nursery areas may require more stringent limits for oxygen-demanding wastes, sediment, nutrients, and salinity.*

IV. Aquaculture Wastes.

Coastal aquaculture facilities may discharge several types of wastes. Traditionally wastes have been considered substances discharged into the air, water or land. However noise may also be considered a pollutant in the case of aquaculture facilities. Each proposed aquaculture facility should be evaluated according to its potential to produce the types of wastes and impacts listed below.

1. Oxygen-demanding wastes. Excreted wastes from cultured organisms may have elevated concentrations of ammonia and carbonaceous oxygen-demanding substances. These wastes, when metabolized by bacteria, may lower oxygen concentrations in bays and estuaries to which they are discharged. *The facility will provide information about the expected sources and concentrations of oxygen-demanding wastes, how concentrations will vary with time, and the factors affecting variation in concentration of oxygen-demanding wastes.*
2. Salinity change. The culture water may have a substantially different salinity, fresher or saltier, than the water to which it is being discharged. *The facility will describe the expected salinities of the discharge and receiving waters, characterize any differences between the salinity of the discharges and receiving water, and how those differences may change over time.*

3. Solids. Aquaculture facilities using unlined ponds or discharging high volumes of wastewater to unlined ditches may transport large quantities of inorganic solids to receiving waters. Excessive quantities of solids may increase turbidity in receiving water thus reducing light penetration and production of plant biomass and oxygen by phytoplankton or submerged plants. Additionally, excessive quantities of solids may cover benthic communities, killing benthic animals and plants. Generation of solids may be a significant issue during construction of the aquaculture facility if attempts are not made to control solids from ponds and ditches being dug and dirt levees being raised. *The facility will describe solids control activities during facility construction, operation and maintenance to ensure minimal solids movement into the coastal environment. Solids control activities must be adequate to ensure that solids will not be released into the environment during construction operations and that discharge ditches will not be subject to erosion during wastewater discharge activities.*
4. Disease. Culture conditions may lead to outbreaks of parasites or bacterial or viral diseases. There is concern that diseases concentrated on an aquaculture facility might infect natural populations of fish or shellfish when discharged. *The facility will describe anticipated and known pathogens which could infect the facility and the whether or not those pathogens can infect native populations. The facility will describe how the presence of pathogens will be monitored and, when detected, how pathogens will be controlled. The facility will describe how pathogen controls may affect the adjacent coastal ecosystem.*
5. Exotic species. Non-native species are frequently cultured. Concern exists that escape or accidental release of non-native species may negatively impact habitat or displace native populations. *The facility will provide information about any nonnative species expected to be cultured, likelihood of survival upon escape, and potential impact on the coastal ecosystem when escape occurs. Potential impacts may include out-competing native species for food and/or habitat, hybridization with native species, transfer of diseases, destruction of habitat, etc.*
6. Nutrients. Elevated concentrations of the macronutrients, nitrogen and phosphorus, and micronutrients may stimulate noxious growths of attached or phytoplanktonic algae. Blooms of phytoplankton stimulated by excess nutrients may increase turbidity, reduce light penetration and production of plant biomass and oxygen by submerged plants. Concern exists that the magnitude and frequency of harmful algal blooms is increasing and that those blooms may be stimulated by nutrients in wastewater discharges. *The facility will provide information about the expected sources and concentrations of nutrients, how concentrations will vary with time and the factors that will affect variation in concentrations of nutrients.*
7. Noise. Noises generated by an aquaculture facility associated with intake pumps, paddlewheel aerators, and predator harassment may disturb nesting and roosting activities of birds. *The facility should describe equipment and activities which will be expected to generate noise, the levels of noise expected to be generated, how noise generation will vary with time of day and season, and what actions the facility can/will take to minimize impacts of noise on the coastal ecosystem.*
8. Destruction of shoreline habitat. In addition to adding wastes to coastal environments, construction of aquaculture facilities may destroy shoreline habitat when intake and discharge structures are built. Wetlands may be impacted by the construction of the facility or water transport canals associated with the aquaculture facility. *Facilities should describe proposed modifications to shoreline habitats and how those modifications will be done in ways to mitigate impacts.*
9. Entrainment and impingement. Concern has been expressed in the past about the entrainment of native larval fish and shellfish into aquaculture facilities. This has been a concern associated with large-scale aquaculture facilities pumping millions of gallons of water every day from bays or estuaries. If water intakes are located near larval transport routes or nursery areas, recreationally, ecologically and economically important larval fish and shellfish may be entrained. Once entrained many of the fish and shellfish entrained may die within the aquaculture facility. *The facility should*

describe the type(s) of intake structure, how water withdrawals will be conducted, and techniques implemented to ensure there is minimal entrainment and impingement of recreationally, ecologically or economically important species.

10. Cumulative waste loading/impacts. Every habitat and ecosystem has limits to the amount of wastes which it can assimilate before experiencing unacceptable degradation. Cumulative impacts may result from habitat modifications from a variety of activities and waste loading, both nonpoint and point source, from one or more sources of wastes. *Information will be required describing the possible cumulative impacts resulting from the combined effects of the proposed facility with impacts from nearby activities and/or wastewater discharges.*

V. Guidelines for Evaluating the Sensitivity of Coastal Habitat

The aquaculture facility will identify its proposed location, including proposed site of the facility and proposed intake and discharge points, on the appropriate U.S. Geological Survey 7.5' topographic map in the appropriate "Oil Spill Prevention and Response Atlas." The appropriate atlas can be accessed by contacting the General Land Office at <http://www.glo.state.tx.us/oilspill/cdtool.html> or by calling 512-463-5339, the GLO's Public Information office. Lists of TPWD and GLO offices on the coast that can help accessing this information are attached. It is expected that adequate evaluations will require some degree of field assessments.

1. The applicant will identify the area on the map where the proposed facility will be sited. It will also identify the areas where the intake and discharge facilities will be located.
2. The applicant will refer to the "Data Supplement" and "Data Supplement Addendum" accompanying the map. The applicant will identify the priority designation for the area(s) identified in step 1 above and provide a description of organisms and habitats in the area(s).
3. If the proposed facility is not sited in any polygon or in close proximity to any polygon defined in the atlas, it is likely that a well-run and properly permitted facility will not impact sensitive coastal habitat. TPWD and TNRCC will conduct a review of the proposed location to ensure conditions have not changed substantially since the data for the atlas was compiled.
4. If the proposed facility is sited in an area included in one or more polygons, TPWD and TNRCC, in conjunction with the applicant, will conduct an intensive review of the proposed siting of the facility, its intake and discharge structures, and proposed waste generation and management activities. The review will be site-specific since all habitats are different and have different levels of sensitivity to different pollutant loads.
5. As part of the review in step 4, applicants may propose different locations of intake and discharge structures. Applicants may also propose different methods of managing wastes and impacts in order to ensure there is no significant degradation to site-specific habitat quality.
6. Based upon the joint review of the TPWD, TNRCC and the applicant, and the sensitivity of the potentially affected habitat, the applicant may be required to meet more stringent than typical effluent limits for certain wastes or may have to modify structural plans to avoid direct impacts to habitats.

APPENDIX 3

**Texas Parks and Wildlife Department
DRAFT Voluntary Recommendations for Wind Energy Development
February 2008**

Texas Parks and Wildlife Department
DRAFT
Voluntary Recommendations for Wind Energy Development

February 2008

I. INTRODUCTION

The following Voluntary Recommendations for Wind Energy Development (herein referred to as Recommendations) were developed by Texas Parks and Wildlife Department and do not necessarily represent the opinions of the wind industry or non-governmental organizations.

The purpose of these recommendations is to establish best management practices (BMP) for development of wind energy in Texas, promote the continued responsible development of wind facilities across the state, and enable Texas to develop its wind resources in a manner that minimizes adverse impacts to wildlife, habitats and natural resources of Texas through proper pre-project risk assessment, good project design and operation, and effective adaptive management practices.

II. BACKGROUND

Texas became the number one state in the U.S. for installed wind energy capacity in 2006. Texas citizens and their elected officials strongly support the continued expansion of wind generation to supply an increasing portion of the State's electric generation portfolio for many reasons, including:

- wind energy is an inexhaustible natural resource, and greater utilization of wind energy promotes Texas energy independence, directly offsetting the need for mining of lignite coal in Texas and other types of coal elsewhere, and decreasing the need for transportation of such fossil fuels by rail and truck, thereby reducing harmful impacts on wildlife, the environment, and human health caused by such activities
- wind turbines, once constructed and operational, consume no fuel and have no air emissions, directly decreasing the emissions of mercury, CO₂, NO_X, SO_X and other harmful emissions associated with combustion-generated power, which contribute to global warming and adversely impact all wildlife and humans
- wind turbines consume no water and emit no wastewater, helping conserve Texas' scarce water resources for wildlife and human consumption and preserving the purity of Texas groundwater and surface waters, to the benefit of Texas wildlife and humans

As the State adds new transmission infrastructure to support additional wind energy resources, the parties involved in developing these Recommendations recognize the importance of responsible development, construction, operation and eventual re-powering or potential decommissioning of wind projects.

These Recommendations are intended to ensure wildlife and habitats are protected throughout the project life by encouraging and facilitating continued responsible practices and promoting development of wind resources in a manner that minimizes adverse impacts on Texas wildlife.

III. RECOMMENDATIONS

Mitigation measures are recommended to occur in four general stages:

- A. The first stage involves project siting and development, where mitigation should focus on avoiding and/or reducing potential adverse impacts of a site before the facility is constructed.
- B. The second stage is construction where careful planning should avoid important habitat and reduce disturbance by conducting construction at appropriate times of year when practicable, and away from sensitive habitat areas.
- C. The third stage is operations, where measures should be implemented to minimize ongoing impacts.
- D. The fourth stage is the decommissioning stage at the end of the project's useful life, where restoration measures should be implemented to return the project area largely to its pre-construction state in accordance with landowner requests and contracts.

A. DEVELOPMENT PHASE BMP

1. Developers will collaborate early in the process with qualified expert consultants and relevant regulatory agencies to identify potential environmental concerns, such as the presence of Federal and State listed endangered and threatened species, wetlands, archeological and historical sites and similar issues, and to ensure compliance with all applicable laws and regulations, such as the Endangered Species Act, the Migratory Bird Treaty Act and all Texas laws governing the protection of threatened and endangered species. Developers will use qualified local expert consultants with specialized knowledge of local conditions when available and appropriate.
2. Developers or their consultants will contact TPWD Wildlife Habitat Assessment Program to gather information about habitat or the presence of sensitive species in a proposed project area.
3. Prior to construction, developers should contact TPWD to obtain a list of qualified experts with relevant expertise for specific project areas, if available. Information should be shared with such experts subject to signed confidentiality agreements.
4. Developers will, in collaboration with consultants and agencies, develop appropriate measures to assess the significance of such issues for a given project site, and appropriate means

to minimize adverse impacts. Such assessments may include studies on archeological and cultural resources, navigable waterways and wetlands delineation, a Phase 1 environmental site assessment, and similar analysis appropriate for specific projects. For avian and other wildlife species, such assessment measures include pre-construction monitoring surveys, literature surveys, and may include raptor nest surveys, radar monitoring and similar approaches as appropriate for individual projects, and in consideration of the level of pre-existing development in the region.

5. Developers will collect appropriate and pertinent information suitable for identifying the risk of potential impacts of the project on wildlife and habitat. This information would include avian use surveys conducted for a minimum of a twelve month period that take into consideration factors associated with region and habitat and designed to capture species, occurrence and abundance during all four seasons of the year. These studies are to be conducted on representative areas of the site that are expected to include wind turbines, unless not necessary due to availability of sufficient studies which have already been completed for other projects or phases in the region. Information should be collected that considers the following issues as appropriate:

- Identify avian use of a project area by species;
- Understand potential impacts from construction and operation of the proposed site;
- Determine seasonal variation, if any; and
- Collect data to aid in the analysis of impacts such as topographic features and weather conditions.

6. In areas of significant identified raptor activity, a minimum of one raptor nest survey is recommended to be conducted during breeding season and up to within 1-mile of proposed wind turbines location when possible and where appropriate to determine the location and species of active nests potentially disturbed by construction activities, and to identify active and potentially active nest sites with the highest likelihood of impacts from the operation of the wind plant.

7. There is not a consensus on which methodology is effective in predicting bat impacts for pre-construction studies. Wind energy representatives commit to continue to work with bat organizations and scientists to implement methodologies to assess potential bat mortality at prospective wind project locations in sensitive areas. In areas of known bat concentrations or near sensitive bat habitat, information should be collected that considers the following issues as appropriate:

- Seasonal patterns of abundance and use of a prospective site by bats; and
- Roosting areas and daily movement patterns.

8. If existing information suggests the probable occurrence of state and/or federal threatened or endangered species or their habitat on the project site, focused surveys may be recommended by the project's consultants and/or relevant regulatory agencies during the appropriate season to determine the presence or likelihood of presence of the species. For listed species, US Fish & Wildlife Service survey protocols should be followed, if available.

9. Preconstruction assessments may use existing information from comparable projects in comparable habitats within the same region for the relevant issues of concern. Preconstruction assessments should be compared with post construction monitoring data to assess the effectiveness of the guidelines.

10. Turbines should be located in consideration of topographic features that serve to concentrate birds or wildlife at particular areas within the site if determined during pre-construction assessment, or mitigation should be provided that addresses significant impacts.

11. Use of disturbed lands, if feasible, should be considered for priority siting (i.e. developed, cultivated, or otherwise disturbed by road or other development) unless these areas exhibit high use by birds or other wildlife species that are likely to be adversely affected by wind projects.

B. CONSTRUCTION PHASE BMP

1. Use reputable construction contractors and subcontractors, and adhere to best practices in wind project construction.

2. During construction, avoid areas of high risk potential to birds, or other species of concern that are likely to be adversely affected

3. Use tubular towers and avoid creating perching spots on wind turbines.

4. Electrical collection systems between turbines should be buried when feasible and environmentally sound, and bird flight diverter markings used where appropriate when overhead collection lines are used.

5. Use raptor protection measures such as adequate conductor spacing, perch guards and insulated jumper wires.

6. Limit substation and other associated facility pads to as small an area as is practical.

7. Ensure appropriate replacement of topsoil to the surface post-construction and use of best practices to minimize erosion.

8. Locate linear facilities (such as collector cable routes, transmission line routes, or access roads) in or adjacent to existing disturbed corridors or in areas of low habitat value in order to minimize habitat fragmentation and degradation;

9. When feasible, use existing surface roads and align roads to limit habitat fragmentation and erosion;

10. Use pilot warning and obstruction avoidance lighting as recommended by the FAA;

11. Avoid permanently installed upward-firing lighting for substation and O&M building lighting, when possible.

12. Stormwater runoff management plans should be developed to comply with stormwater runoff management plan requirements and all other applicable laws and regulations relating to stormwater.

C. OPERATIONS PHASE BMP

1. Post vehicle speed limits to minimize avian and wildlife mortality.
2. Follow construction, reduction of project road rights-of-way to extent practical and consistent with safety needs and code requirements and the requests of the landowner.
3. Revegetate reclaimed project road rights-of-way with appropriate site-specific native species, unless otherwise directed by the landowner based on prior land use, and properly maintain such rights-of-way in accordance with recommendations of qualified environmental consultants.
4. Implement 12 months of post-construction carcass studies that account for searcher efficiency and scavenging. The duration and intensity of such studies will vary by region, project and various factors such as site sensitivity and pre construction determination of bird and wildlife density, and pre existing information from comparable projects in comparable habitats for the relevant species of concern.

D. DECOMMISSIONING PHASE BMP

1. Developers will commit, as addressed in the landowner agreements, to removal of turbines, towers and all above-ground equipment, and proper disposal of same, through recycling where possible.
2. Remove foundations to an appropriate depth, consistent with local conditions and land uses, and properly dispose of same through recycling where possible in accordance with landowner requests and agreements. To the extent possible, return the project site to its pre-construction condition through filling in foundation excavations, and reseeding with appropriate native species, unless otherwise directed by landowner.
3. Remediation of Recognized Environmental Conditions at the Project Site (*e.g.*, lubricant leaks, etc) caused by the wind facility or its operation.

E. PROSPECTIVE USE OF BMPs

Wind representatives and other stakeholders are cognizant of the fact that developers must place turbine orders and other long-lead equipment orders well in advance of the expected delivery dates for such equipment, and will have invested significant sums, time and effort in development of projects prior to adoption of these BMPs. Nothing herein is intended, nor should be construed, to suggest that projects already under development and with construction timelines dictated by equipment orders already placed, should be in any way delayed or impacted by wind

representative's endorsement of these BMPs. It is expected that these BMPs will serve as a tool to help facilitate the continuation of responsible wind project development in Texas. Therefore, it is expected these BMPs to be effective for all projects that reach commercial operations date ("COD") after December 31, 2008.

Table 1. Site sensitivity for birds.

Bird usage sensitivity	Criteria	Pre-construction Monitoring Minimum Recommendations	Post-construction Monitoring Minimum Recommendations
Very High	<ul style="list-style-type: none"> * major migratory corridor; presence of known populations of lekking galliform species (<i>Tympanuchus cupido attwateri</i>, <i>T. pallidicinctus</i>) * breeding and/or wintering habitat for state or federally-listed T&E species 	<ul style="list-style-type: none"> * avoid if possible ** consult with relevant state and federal agencies to develop plans for avoidance and/or mitigation; minimum three years studies of usage * consult with relevant state and federal agencies to develop plans for avoidance and/or mitigation; minimum three years studies of usage by T&E species 	<ul style="list-style-type: none"> * minimum three years studies of usage * minimum three years studies of usage by T&E species
High	<ul style="list-style-type: none"> * in or adjacent to area of known high concentrations of bird usage (such as recognized important bird areas or other designated wilderness areas, aggregations of colonial-nesting waterbirds) * known migratory flyway for raptors, waterfowl, shorebirds, etc. * area of potential occupation by lekking species 	<ul style="list-style-type: none"> * minimum three years pre-construction surveys to determine specific areas and flight paths of high use - avoid these areas; if not avoidable, then avoid site * minimum two years surveys encompassing three spring and three fall months * minimum two years pre-construction surveys focusing on spring months and consultation/coordination with appropriate state wildlife professional 	<ul style="list-style-type: none"> * minimum three years post-construction mortality surveys; minimum two years BACI design usage surveys to determine displacement impact * minimum three years post-construction mortality surveys during migratory periods * minimum two years post-construction mortality surveys
Medium	<ul style="list-style-type: none"> * potential migratory path for state or federal listed threatened/endangered species * area of high concentrations of breeding/foraging raptors * rare and/or declining habitat for suite of imperiled species 	<ul style="list-style-type: none"> * minimum two years focused surveys during migratory periods in appropriate habitats * minimum two years raptor nesting surveys and site usage surveys - alter site layout to minimize potential risk * focused surveys of presence and usage of particular habitat; avoidance/mitigation of vulnerable species habitat * minimum two years with surveys focused around periods of potential high usage 	<ul style="list-style-type: none"> * minimum two years post-construction mortality surveys during migratory periods in appropriate habitats * minimum two years post-construction mortality surveys during all periods when raptors present * minimum two years post-construction mortality surveys * minimum two years post-construction mortality surveys focused around periods of potential high usage
Low	<ul style="list-style-type: none"> * area of no known migratory movements of significance or high bird concentrations 	<ul style="list-style-type: none"> * minimum one year bird usage surveys to gather information on bird assemblages by season 	<ul style="list-style-type: none"> * minimum one year post-construction mortality surveys

Table 2. Site sensitivity for bats.

Sensitivity	Criteria	Pre-construction Monitoring Minimum Recommendations	Post-construction Monitoring Minimum Recommendations
Very High	<ul style="list-style-type: none"> * Site is ≤ 50 km from known maternity colonies in the Texas Hill Country (see attached map), or 1 km from a known significant hibernacula or significant maternity roost in caves, abandoned mines, or karst topography in other regions. 	<ul style="list-style-type: none"> * Avoid if possible. * Minimum 2 years of pre-construction data from April through October will be required to inform site plan and help determine high risk period(s). 	<ul style="list-style-type: none"> * Post-construction monitoring during the core season when bats are active (i.e., April – October) for at minimum the first 2 years of wind turbine operation. * Post-construction monitoring may be reduced (e.g., reduced to July 1st – October 30th, if limited mortality is evident) or continued beyond 2 years (e.g., if substantial mortality is observed) based on the outcome of the monitoring, and in consultation with the TPWD.
High	<ul style="list-style-type: none"> * Site is ≤ 10 km from a known significant hibernacula, significant maternity roost or swarming/feeding site. * Site is ≤ 1 km from a shoreline of a major waterbody (e.g., areas that could potentially act as migration corridors or channelling features). * Site is ≤ 1 km from riparian habitat or other wetland features that serve as drinking and feeding sites, or from potential hibernacula habitat features (e.g. caves, abandoned mines, karst topography) * Site is located in forested habitat. 	<ul style="list-style-type: none"> * Minimum 1 year of pre-construction data from April through October will be required to inform site plan and help determine high risk period(s). 	<ul style="list-style-type: none"> * Post-construction monitoring during the core season when bats are active (i.e., April – October) for the first 2 years of wind turbine operation. * Post-construction monitoring may be reduced (e.g., reduced to July 1st – October 30th, if limited mortality is evident) or continued beyond 2 years (e.g., if substantial mortality is observed) based on the outcome of the monitoring, and in consultation with the TPWD.
Medium	<ul style="list-style-type: none"> * Site is ≤ 50 km from a known significant hibernacula, significant maternity roost, or swarming/feeding site. * Site is ≤ 5 km from riparian habitat or other wetland features that serve as drinking and feeding sites, or from potential hibernacula habitat features (e.g. caves, abandoned mines, karst topography) * Site is ≤ 5 km from a shoreline of major waterbodies * Site is located on landscape level linear habitat features (e.g., escarpments, ridges).** * Site is ≤ 5 km from forested habitat. 	<ul style="list-style-type: none"> * Minimum one year of pre-construction data from April through October will be required to inform site plan and help determine high risk period(s). IF data are available from similar existing sites, pre-construction monitoring may not be required. 	<ul style="list-style-type: none"> * Post-construction monitoring during the core season when bats are active (i.e., April – October) for minimum the first year of wind turbine operation. IF existing data from nearby or similar facilities indicate low spring/early summer fatalities, then monitoring may be adjusted to July through October. * Post-construction monitoring may be continued beyond 1 year (e.g., if substantial mortality is observed) based on the outcome of the monitoring, and in consultation with the TPWD.
Low	<ul style="list-style-type: none"> * Site does not contain any of the criteria listed above and/or has no recognized bat conservation features. 	<ul style="list-style-type: none"> * One year preconstruction survey July –October to develop relationships between pre-construction usage and post-construction mortality. 	<ul style="list-style-type: none"> * One year of post-construction monitoring from April through October. If existing data from nearby or similar facilities indicate low spring/early summer fatalities, then monitoring may be adjusted to July through October. * Post-construction monitoring may be continued beyond 1 year (e.g., if substantial mortality is observed) based on the outcome of the monitoring, and in consultation with the TPWD.

These site sensitivity tables are not part of the Recommendations for Wind Energy Development. These tables are provided by Texas Parks and Wildlife Department to assist in assessing the level of sensitivity (use) of the site for birds and bats, and recommended pre and post construction survey times, depending on the potential level of use by these species. These tables may or may not be supported by individual wind industry developers.

PLEASE READ

Memo

To: Michael Irlbeck, Project Manager, Texas Desal Project
From: Tyson Broad, Research Associate, Lone Star Chapter of Sierra Club
April 16, 2010

Sent via electronic means, April 16, 2010

Re: Comments re Planning Aid Memorandum and Research Topics

Michael:

Thank you for the opportunity to make input regarding the two proposed desalination projects and the proposed research topics. While the Sierra Club comments are of a general nature, we hope that you will find them useful to the planning process. They are listed by project and component of the project, with our comments in italics.

As a general note, any proposed project should follow Texas Parks and Wildlife Department's *Sensitive Habitat Guidelines for Aquaculture Operations in the Coastal Zone*. Many of the guidelines listed in this document apply to desalination operations.

Should you have any questions, please do not hesitate to contact me at (325) 248-3137.

Sincerely,
Tyson

Brownsville Ship Channel

Intake

- Constructed intake channel off Ship Channel with filter media bed:

A concern would be the potential concentration of contaminants in the filter media and the need to utilize a method for cleaning the filter media that avoids contamination.

- Open water intake on the Ship Channel:

We have concerns regarding the impingement and entrainment of aquatic species near the intakes.

Concentrate Disposal

Any disposal method should consider the potential for introduction of concentrated contaminants from the source water or contaminants from anti-scaling and anti-fouling processes.

- Diffusion into Gulf of Mexico

The location of the disposal pipe may have an impact on critical habitats, including wetlands and those found in the nearby National Wildlife Refuge. It is key to avoid construction and maintenance activities during critical nesting and migration periods. The use of diffusers will help avoid direct impacts resulting from disposal, such as hypoxia. These impacts should be modeled.

- No-discharge evaporation ponds

As the disposal stream may have additional concentrated contaminants from the source water, it is unclear what impacts evaporation ponds would have on wildlife that may come in contact with the evaporation ponds. Are these ponds to be lined to avoid contamination, and will they be available for use on a year-round basis?

- Blend with river water and disposal to tidal flats

The same considerations re evaporation ponds exist for this disposal method. In addition, the resulting changes in salinity and water quality in the tidal flats associated with disposal method should be considered. Consideration should also be given to whether this method could be utilized during periods when the tidal flats are inundated.

Power Consumption

- Grid only

If this method were utilized, a good product of the Texas Desal Project would be information regarding increased power consumption and water use associated with the development of the project.

- On-site renewable (wind) with grid supplement

Any turbines should be located and operated in such a manner as to have minimal impact on existing flyways and habitat.

South Padre Island SWRO Project

Intake

- Series of shallow beach wells and a raw water collection pipeline.

We are not familiar with the hydrogeology of the area, but suggest that methods be utilized to avoid contamination or reduction of water levels in the over-lying fresh water aquifer. (It is our understanding from previous discussions that beach wells at this location were cost prohibitive.)

- Open water intake in Gulf with raw water intake pipeline directionally drilled under the dunes.

We have concerns regarding the impingement and entrainment of aquatic species near the intakes, as well as the potential disruption of nesting habitats during construction.

Treatment System

Due to the facility's proximity to Bowie Park, some noise (and odor?) abatement might be necessary.

Concentrate Disposal

Any disposal method should consider the potential for introduction of concentrated contaminants from the source water or contaminants from anti-scaling and anti-fouling processes.

- Diffusion into the Gulf of Mexico.

The location of the disposal pipe may have an impact on critical habitats. It is key to avoid impacts to wetlands and construction and maintenance activities during key nesting and migration periods. Also, the use of diffusers will help avoid direct impacts resulting from disposal, but these impacts should be modeled.

- Injection well into hyper-saline geologic formation.

It is important to avoid contamination of fresh-water aquifers through over-pressurization of the injection system. What will be the injection method during periods of well maintenance?

- Diffusion into Laguna Madre.

We recognize that the Laguna Madre is considered a hyper-saline environment, but we suggest an analysis of possible impacts to aquatic species and habitats, keeping in mind the lack of mixing potential in the bay.

Power Consumption

- Grid only

If this method were utilized, a good product of the Texas Desal Project would be information regarding increased power consumption and water use associated with the development of the project.

- On-site renewable (wave buoys) with grid supplement

A good product of the Project will be an understanding of this technology and its possible use and limitations on the Gulf Coast.

Gulf of Mexico Salinity Tolerance Tests

A method to identify the salinity tolerance of key the aquatic species that would inhabit the area of a desalination plant concentrate discharge along the Texas Gulf Coast. This method would include the following four key steps: 1. Determination of the test salinity range; 2. Identification of site-specific test of key species inhabiting the discharge area; 3. Biometrics test at average discharge salinity; and 4. Salinity tolerance test at varying concentrate dilution levels. The individual species to be tested have not been determined, but your recommendations are welcomed. The results of these tests would provide a standard for evaluating potential impacts of seawater desalination concentrate discharges state-wide.

It is not clear if these tests are to a laboratory experiment or one to be conducted under natural conditions. As with any natural system, there are numerous variables associated with habitats, such as temperature, the duration of the exposure to salinities, the variability of salinities due to changes in freshwater inflow. Are salinities to be the only tested variable? Our concern is that the results of the experiment might result in misleading hypotheses if salinity is to be the only tested variable.

In addition to species, it will be important to also evaluate vegetation, such as sea grasses, that are critical component of habitats.

Mike Irlbeck

From: Ben Hodges [hodges@mail.utexas.edu]
Sent: Friday, April 16, 2010 12:05 PM
To: mirlbeck@nrseengineers.com
Subject: Texas Desal Workshop Comments

Mike,

Below are my thoughts on desalination issues.

Ben

Potential for hypoxia caused by the concentrate discharge plume

We do not understand the potential development of low dissolved oxygen (DO) – hypoxia – in a concentrate discharge plume. Near-field mixing at the outfall diffuser will reduce, but not eliminate, the concentrate salinity anomaly (i.e. the difference between concentrate salinity and ocean salinity). The result is a dense, underflowing, far-field plume. Eliminating the remaining salinity anomaly in the far-field requires turbulence from the overlying ocean water to lift the heavier concentrate up into the water column. *The key insight is that the mixing rate for the salinity moving upwards is the same as the DO resupply rate to the bottom water.* As the concentrate plume moves downslope along the bottom, it may lose DO through sediment oxygen demand faster than it gains DO from the overlying water. A layer of hypoxia may then cause a “dead zone” along the bottom. Even if benthic aquatic organisms can tolerate the concentrate salinity, they may not be able to survive an oxygen deficit.

Presently, our models do not capture the physical mixing processes that affect the extent, duration, and DO resupply for a far-field concentrate plume. It is difficult for standard 3D hydrodynamic models to represent a thin, dense layer along the bottom and accurately predict mixing rates. Such models tend to overpredict mixing and therefore underpredict a plume’s spatial extent and duration (and therefore its likelihood of causing hypoxia). Furthermore, we presently do not have adequate field data for concentrate plume behavior to validate improved hydrodynamic and mixing models. Data sets previously used to validate buoyant (rising) plumes (e.g. sewage treatment plant discharge) are entirely inadequate and even misleading for modeling bottom-trapped dense plumes.

The plume/hypoxia mechanism was found in a recent study of the hypersaline outflow from Oso Bay into Corpus Christi Bay. This hypersaline plume covers the bottom with a 30 cm layer of dense water that takes more than 24 hours to diffuse. A consistent hypoxic zone develops about 2 km offshore in only 4 m of water, despite active mixing from wind and currents. The hypersaline outflow from Oso Bay is a large field laboratory for studying how dense plumes propagate and mix. This field laboratory is more accessible than offshore locations where concentrate discharges may be located, and yet better represents plume dynamics than reduced-scale experiments in a traditional hydraulic laboratory. Any model that represents evolution of the Oso Bay plume should also be successful in modeling a desalination plant concentrate plume.

Based on the above, there are two research items that should be considered:

- 1) improving thin-layer mixing models as part of far-field plume modeling, and
- 2) collecting a comprehensive set of field data from the Oso Bay plume for model validation.

Dr. Ben R. Hodges, Assoc. Professor
Dept of Civil, Architectural and Environmental Engineering

4/16/2010

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Questions about graduate admissions? Check out <http://ewrewiki.wetpaint.com/> .

To; Michael Irlbeck, Project Manager

From: Michael Delesantro

Re: Comments Regarding the Texas Desal Project

I am submitting these comments here since they do not fall neatly into one of the categories set up on the Google Group site. My participation at the stakeholders meeting was as a concerned citizen who is active in environmental issues and environmental education in the Rio Grande Valley. I do not represent any group in an official capacity, though I have been active with the local chapters of the Sierra Club, Audubon Society, and the Valley Land Fund in the past.

In general, I support the concept of desalination as a source of new drinking water supplies on the Texas coast. However, I am concerned that there has been a rush to start desalination projects before other alternatives have been fully considered. Nowhere in the information I received at the stakeholders meeting did I see alternatives addressed. It is as if desalination has already been chosen as the preferred alternative. Your request for comments asks us to address the impacts of desalination without asking for any input on other ways to secure water supplies for the future. There was a brief mention of “the low-hanging fruit” of conservation by the representative of the Sierra Club at the meeting but I do not see that that alternative has been addressed adequately by the desal project.

Therefore, let me offer my comments from the standpoint of alternatives. I teach about these topics in my environmental science classes and have done some preliminary research into them but I have not done an exhaustive literature search or cost-benefit analysis. I leave those to others much more skilled than I.

1. I applaud the use of treated effluent water by the City of South Padre Island for their irrigation of roadway medians. However, I do not see that they have aggressively pursued water conservation education or regulation to encourage water conservation by their citizens in general. I estimate that per capita water consumption on SPI is at least as high as the average for the RGV despite the obviously more stringent circumstances of the island community. Nationwide, statewide, and regionwide, water use is far higher than what is considered necessary for a healthy and reasonable lifestyle. Reduction of per capita water use from the 150 to 175 gppd figures often quoted to a still- adequate level of 75 gppd would go a long way to alleviating water supply shortages or would drastically reduce the size and cost of any desal project needed for the future.

2. Use of greywater recycling by the city and its citizens is one obvious first step in water conservation. Again, the city’s use of effluent is applauded, but it would be very easy to encourage greywater use by the citizenry as a whole through some forward-thinking regulations in that regard. The added cost of greywater recycling would likely be far less than the cost of seawater desalination on a per gallon basis. Even recognizing the special environmental concerns of such recycling in a barrier island ecosystem, I predict costs would still be lower than those of desalination.

3. Rainwater catchment is another area of water supply that has been ignored for the most part. Some of the recent construction by the TPWD at their World Birding Center sites has taken advantage of rainwater catchment for irrigation of butterfly gardens and the like, but I do not see the promotion of that concept by community leaders on the island. A preliminary costing of such a system that I did suggests that retrofitting of an average home with gutters, filters, and water storage tanks would cost about \$2500. Annual maintenance after the initial set-up would be

negligible and the lifetime of the system would be at least 10 years, and likely up to 20 years. Expected water collections could be 20,000 or even as high as 30,000 gallons per year from a roof of 2000 square feet, This could be enough to irrigate an average lawn/landscape on the smallish lots typical of the island and would thus offer significant water savings if aggressively implemented throughout the community. Again, on a cost-per-gallon basis this is far lower than desalination over the life of the system.

4. Future water needs will depend greatly on the ability to practice aggressive conservation of water AND on the prospects for future growth of population on the island. It is never a topic that gets much discussion, but the question must be asked, What is the optimal size of South Padre Island? When is the city “big enough?” Commercial interests often expect continued and unlimited growth but we all know that environmental systems have their limits or carrying capacities. Any discussion of water needs for the future should set some reasonable limits on future expansion of the city. Planning and zoning and sensible regulation, in conjunction with forward-thinking economic incentives and penalties would go a long way to making sure that SPI does not outgrow its water supply. It is not reasonable to expect to build more and more projects of this magnitude as the island community grows and grows without thought to its impacts.

In summary, I propose that full consideration of aggressive conservation measures be made prior to the decisions on desalination in general and on sizing of any desalination plant in particular.

With respect to the actual process of desalination and its impacts on the island ecosystem I am most concerned by the high energy demands of the typical desalination system as presented. The need for something in the range of 13.5 MWh of power per day for a full-sized plant represents a huge energy use. Generation of that amount of power by anything other than renewable/sustainable means would represent an unacceptable environmental impact to the local ecosystem and the global carbon budget. It is unclear to me that such means exist at a price that would make them affordable to the project. Until such time as affordable renewable alternatives exist for generation of all the power needs of the project I would be hesitant to offer support. Using conventional power sources as a stop-gap measure until renewable sources came online would not be acceptable to me.

Sizing of any desalination plant to fit more comfortably into the available energy environment and using available or newly installed wind and solar generation capacity would seem to make sense. A combination of reducing water needs through aggressive conservation and control of future growth in water demand would make it possible to downsize the energy needs of the desalination plant as well.

Thank you for the opportunity to make these comments. I hope they are worth the time it takes for you to read them!



SAN ANTONIO
RIVER AUTHORITY

Water Brings Us Together

April 19, 2010

Micheal Irlbeck
NRS Engineering
919 Congress Avenue, Suite 460
Austin, Tx 78701

Dear Mr. Irlbeck,

The San Antonio River Authority would like to take a moment to address several issues we have concerning the Texas Desal Project. The San Antonio River Authority's main concern is the environmental factors effecting the bays and estuaries of Texas. SB2 (Instream Flows) and SB3 (Environmental Flow) were established with the purpose to make sure that state's rivers, bays, and estuaries remain healthy and productive. Protecting these flows is critical to the San Antonio River Authority because of the importance of preserving our natural water ways in the State of Texas.

The rapid growing population along with Texas' vulnerability to drought makes water supply an important issue for both human and the environment. The San Antonio River Authority has partnered in several studies that provide additional science in making policy decisions associated with SB2 and SB3. A surface/water groundwater interaction study is being finalized to better understand how the interaction between the two can be better managed to maintain flows to rivers and bays. The San Antonio River Authority has partnered with the state natural resource agencies to conduct a detailed instream flow study on the lower San Antonio River and Cibolo Creek. The San Antonio Guadalupe Estuary (SAGES) study was completed to help establish the scientific basis for evaluating the effects of inflows and diversions on the ecosystem of San Antonio Bay and its impact on whooping cranes. These studies demonstrate the San Antonio River Authority's concern for environmental sustainability of Texas' water resources.

The health and productivity for all biological organisms in the bays and estuaries is crucial for maintaining a sustainable environment. All factors that may have a negative impact on the health and productivity of the organisms in the bays and estuaries such as salinity levels, impingement, and entrainment of species associated with intake structures and also discharge of brine, need to be examined and addressed.

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April 19, 2010
NRS Engineering
Page 2

Instream flows and Environmental flows are important concerns not only for the San Antonio River Authority but also for the State of Texas. Therefore, the San Antonio River Authority would like to recommend that the effects of desalination projects on the environment are examined in great depth and not ignored. The San Antonio River Authority recognizes and supports the need for seawater desalination, but like any water project, design and development needs to be done in way that benefits both humans and the environment.

The San Antonio River Authority's staff is available for any assistance to the Texas Desal Project. Please feel free to contact me (210) 302-3641 or Rudy Farias at (210) 302-4243.

Sincerely,

A handwritten signature in black ink, appearing to read 'L. Yosko', with a stylized flourish at the end.

Landon Yosko
Project Administrator



DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON TX 77553-1229

May 12, 2010

Policy Analysis Section

SUBJECT: SWG-2010-00390; Texas Desal Project

Michael Irlbeck
Project Manager, NRS
919 Congress Avenue, Suite 460
Austin, Texas 78701-2153

Dear Mr. Irlbeck:

This concerns your request for April 12, 2010, request for a permit determination on behalf of Texas Desal Project. The project areas are located on the Brownsville Ship Channel and South Padre Island, in Cameron County, Texas.

Based on a desk review of the information you submitted, we conclude that a Department of the Army (DA) permit may be required since the proposed project seems to have impacts to waters of the United States, including the Gulf of Mexico and Brownsville Ship Channel. However, in order to determine to appropriate permit evaluation process, a detailed proposal will be required. The U.S. Army Corps of Engineers regulates the discharge of dredged or fill material within waters of the United States pursuant to Section 404 of the Clean Water Act as well as the placement of structures and/or work in navigable waters of the United States pursuant to Section 10 of the Rivers and Harbors Act of 1899.

If you have any questions concerning this determination, please reference file number SWG-2010-00390 and contact me at the letterhead address or by telephone at 409-766-3108 or email at jayson.m.hudson@usace.army.mil.

To assist us in improving our service to you, please complete the survey found at <http://per2.nwp.usace.army.mil/survey.html>.

Sincerely,

A handwritten signature in black ink, appearing to read "Jayson M. Hudson".

Jayson M. Hudson
Regulatory Project Manager
Policy Analysis Section

Enclosures

TEXAS DESALINATION PROJECT PLANNING AID MEMORANDUM

INTRODUCTION

At your request, the Office of Water at the TCEQ has developed this planning aid memo to provide general guidance on regulatory and permitting requirements, environmental concerns, and our suggestions related to your proposed seawater desalination plant project. The Water Quality Division, Water Quality Planning Division, and Water Supply Division all participated in the development of this memo. Contacts for each division will be supplied as well.

Once more specific information about the discharge location, intake structure location, and other design criteria are known, we recommend pre-application meetings with the programs specific to the areas of concerns raised in this memo.

REGULATORY AND PERMITTING REQUIREMENTS

Water Rights

A Water Use Permit may be required from the Water Rights Permitting and Availability Section. If the project seeks to divert *state water*, as defined by 30 Texas Administrative Code (TAC) §297.1(50), a water use permit pursuant to Texas Water Code (TWC) §11.121 is required.

In general, Water Use Permit Applications require that the following supplemental information be provided at the time an application is submitted:

- A statement describing how the proposed use of water addresses a water supply need in a manner that is consistent with the State Water Plan or the applicable approved Regional Water Plan for any area in which the proposed appropriation is located, or, in the alternative, describe conditions that warrant a waiver of this requirement.
- A U.S.G.S. 7.5 Minute Topographic Map showing the exact location of the dam, reservoir, and diversion point(s). A county map with the points identified is also helpful.
- Color photographs of the diversion point(s), including both downstream and upstream pictures, and a few shots of the land along the banks of the stream. The photos should be indexed to the topographic map.
- A completed application, including the Latitude and Longitude (in decimal degrees to six decimal places) of the diversion point(s) and how those coordinates were obtained. In addition, diversion point(s) must also be identified by the bearing and distance from a General Land Office survey corner.
- A completed *Core Data Form*.

Water Supply

Public Drinking Water - General Information:

Any time water is provided for human consumption to enough people to meet the definition of a public water system, then the entity producing the water is automatically a “public water system” and must meet all of TCEQ public drinking water rules, or face a violation and possibly enforcement. Public water systems are not defined by permit, but by the action of serving water to the public.

Public water systems in Texas are regulated through the “permit by rule” concept. Design and operation requirements are specified in 30 TAC 290 Subchapter D: Rules and Regulations for Public Water Systems, while water quality, analytical and reporting requirements are specified in 30 TAC 290 Subchapter F: Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements for Public Water Systems. Public Water Systems are bound by these rules; therefore, no specific permit is given. When a new water system is envisioned, the owner will have a licensed engineer in the state of Texas submit plans and specifications showing that the facilities meet the design requirements listed in the rules. TCEQ will review, and if appropriate, approve the plans and specification which then can be used to build the public water system facilities.

Public Drinking Water – Seawater intakes

Design and sampling requirements for drinking water intakes are specified in 30 TAC §290.41. These specifications are aimed to assist in the continual production of drinking water, rather than to protect aquatic life. Other regulations or agencies may have additional requirements related to design and monitoring. Location is also important; depending how far off the coast line these intakes are located;

Public Drinking Water – Treatment Facilities:

Design requirements for drinking water treatment facilities are specified in 30 TAC §290.42. Seawater desalination facilities are generally surface water treatment facilities. The specifications in the rules detail requirements for conventional surface and ground water treatment facilities. If a conventional treatment facility is chosen for a seawater desalination facility, then the specifications in the rules must be followed. Typically, however, seawater desalination is achieved using non-conventional treatment methods that are not specified in TCEQ’s rules. Use of treatment options not listed in TCEQ’s rules requires an exception to the rules, 30 TAC §290.42(g).

In most cases, a pilot study of at least 90 days duration must be conducted using the exact treatment technology desired for the ultimate design. This pilot is to prove the non-conventional treatment method can produce enough water to meet TCEQ’s capacity requirements, 30 TAC §290.45, and TCEQ’s water quality requirements, 30 TAC §290 Subchapter F. Before the pilot study is conducted, a pilot protocol should be submitted for TCEQ review and approval. Once the pilot study is approved; the pilot study is conducted, information is gathered, and a pilot report is submitted to TCEQ.

If the public water system can demonstrate, through the use of pilot data, that the full scale system will be capable to produce water that meets the requirements in 30 TAC §290.45 and 30

TAC §290 Subchapter F; the TCEQ will use the information provided in the pilot study report to grant the exception . The exception letter will detail the capacity of the facility, and all design, operation, maintenance and reporting requirements for the treatment unit(s). After the exception is granted, the engineer can submit plans and specifications for the treatment unit(s). TCEQ utilizes the exception letter's design specifications to review the proposed design. Proposed designs that meet these specifications are approved for construction.

Public Drinking Water – Distribution, Storage and Operations:

Design, and construction requirements for drinking water distribution and storage operations are specified in 30 TAC §290.43 and §290.44. Capacity requirements for production, storage and pressure maintenance are specified in 30 TAC §290.45, and operational considerations such as the type of operator required, records retention, and emergency operations are specified in 30 TAC §290.46. If an alternative method of meeting the rules is necessary for a seawater desalination plant, an exception can be requested to any rule in Subchapter D, not also specified in Subchapter F. The exception request must be supported with documentation that the alternative will not degrade either water quality or quantity.

Public Drinking Water – Drinking Water Quality and Reporting:

Drinking water quality and reporting requirements are specified in 30 TAC Subchapter F. Please pay special attention to 30 TAC §290.111, as it deals specifically with surface water treatment. Exceptions can not be granted to the requirements of Subchapter F because these are federal requirements which TCEQ can not waive.

Public Drinking Water – Other Requirements:

Each public water system must pay a yearly public health service fee as detailed in 30 TAC §290.51. Also systems must produce a yearly consumer confidence report as detailed in 30 TAC Subchapter H. Periodically TCEQ investigates each public water system during a comprehensive compliance investigation which is performed by a TCEQ regional investigator.

Wastewater Permitting

Wastewater Discharges into or Adjacent to Water in the State

Discharges of wastewater into or adjacent to water in the state require an authorization from the state. As we understand the project, the concentrate will likely be discharged either into the Gulf of Mexico or into the Laguna Madre. A Texas Pollutant Discharge Elimination System Permit (TPDES) would be required for either discharge location. A TPDES permit application comprises two reports, an administrative report and a technical report. Below a link to each of these reports on the TCEQ website:

Administrative Report:

<http://www.tceq.state.tx.us/assets/public/permitting/waterquality/forms/10411.pdf>

Technical Report:

<http://www.tceq.state.tx.us/assets/public/permitting/waterquality/forms/10055.pdf>

A document that provides instructions for completing these two reports is also available here:

http://www.tceq.state.tx.us/assets/public/permitting/waterquality/forms/10411_10055ins.pdf

Specific requirements placed in the wastewater permit will depend on site-specific condition related to the discharge method and location. Typically, TPDES permits contain an authorization for the discharge of specific wastestreams, effluent limits necessary to ensure the water quality of the area will be maintained and protected, general permit/monitoring/compliance provisions placed in all permits and site-specific provisions necessary to evaluate the discharge and protect the receiving stream. A discussion of potential parameters that may be limited in the permit is discussed below.

Storm water Discharges Associated with Construction Activities

Storm water discharges associated with storm water activity from large and small sites require authorization under the Construction General Permit (CGP) TXR 150000 according to their foot print of disturbance. If the proposed construction of either the Brownsville Ship Channel or South Padre Island SWRP projects are going to disturb more than five acres (each), a Notice of Intent (NOI) needs to be submitted to TCEQ to seek coverage under the GCP. As part of this permit, the operator must prepare and implement a storm water pollution plan (SWPPP). If the disturbance is less than five (5) acres but more than one (1) acre, a NOI is not necessary; however a SWPPP still needs to be prepared and implemented. If the disturbance is less than one (1) acre, no construction storm water permit is required.

Discharge of Concentrate to a POTW (if this option is selected)

Concentrate generated from the desalination process via reverse osmosis is not considered to be a categorical discharge. If the concentrate is discharged to a publicly owned treatment works (POTW) collection system, this discharge would be regulated by the local POTW who owns the sewer system. If the POTW that would be receiving this discharge has an approved pretreatment program, then they would regulate the discharge via the issuance of an industrial permit in accordance with their city ordinance and pretreatment program and would impose local discharge limits along with other specific and general prohibitions.

U.S. Corp of Engineers Section 404 Permit

While the TCEQ does not issue Section 404 Permits, we do provide a certification that the activity meets the water quality standards. It is likely that a portion of the desalination project will require a Section 404 permit.

SIGNIFICANT ENVIRONMENTAL CONCERNS AND CRITERIA

Water Rights

Potential environmental concerns associated with a Water Rights Permit include:

- Possible entrainment or impingement of aquatic organisms near the salt water intake structure. Measures may be needed to minimize impacts to aquatic resources due to entrainment or impingement.
- Changes in water quality related to the discharge of highly concentrated brine water concentrate as a byproduct of the desalination process. Depending on the method of disposal, discharge location, mixing potential, and concentration and volume of the discharge bay and estuarine salinities and aquatic community structure may be affected.
- Bay and estuary aquatic habitats, coastal wetlands, and other environmentally sensitive areas possibly affected by the location and construction of a desalination plant.
- Possible impacts to recreational uses of the nearby bay and estuary as a result of a desalination plant and intake or discharge structures.

Before knowing the details of the diversion, such as the specific location, we are unable to determine the specific permitting requirements of the project. Once the project details have been determined, we recommend that you schedule a pre-application meeting with the Water Rights Permitting staff. At that time, we can identify all of the specific administrative and technical requirements of your application.

Wastewater Permitting/Water Quality Issues

One of the identified concerns with the discharge of concentrate from a desalination plant is elevated salinity. Discharges with elevated salinity can adversely affect the natural salinity gradient and aquatic ecosystems of the receiving water. Impacts can be localized near the point of discharge, but very large discharges can potentially alter large-scale salinity gradients in estuaries. Concerns of artificial elevations of salinity include shifts in composition of the aquatic community, loss of estuarine productivity, and increases in the abundance of nuisance species such as the oyster drill that flourish at higher salinity levels.

Texas does not have numerical water quality standards for salinity or total dissolved solids (TDS) in marine waters. However, the water quality standards state that "salinity gradients in estuaries will be maintained to support attainable estuarine dependent aquatic life uses..." [30 TAC §307.4(g)]. Efforts will need to be made to quantify the salinity increase and to thoroughly evaluate potential ecological impacts. For new facilities, a review consistent with the antidegradation provisions of the Texas Surface Water Quality Standards will also be required as well.

Additionally, substances other than major salts are concentrated by membrane technology desalination. Ambient levels of metals such as copper, lead, cadmium, mercury as well as other potentially toxic substances are also concentrated in brine reject discharges. In terms of meeting the water quality standards, moderate increases in concentration might be a problem in some areas and not in others. Water quality criteria do exist for many of these parameters, so any potential discharges will have to maintain these criteria. As before, an antidegradation review will also be performed for new and expanding facilities.

To ensure the water quality criteria are maintained, a wastewater permit will likely contain effluent limits or monitoring requirements for the pollutants of concern in the discharge. Also, the requirements for discharges to different locations may vary depending on the water quality and aquatic life uses in the specific locations. Therefore, it is recommended that a pre-application meeting be held so all the potential issues and concerns about the specific location of the discharge and potential water quality concerns can be discussed prior to final plan and application development. The request for this document is an excellent first step.

REFERENCE MATERIAL

Program Area Contacts

Water Supply Contact: Marlo Wanielista Berg (512) 239-6967 - mberg@tceq.state.tx.us
David Williams (512) 239-0945 - dwilliam@tceq.state.tx.us

Water Rights Contact: Ron Ellis (512) 239- 1282 - roellis@tceq.state.tx.us

Wastewater Permitting Contact: Kelly Holligan (512) 239-2369 - kholliga@tceq.state.tx.us

Water Quality Standards Implementation: David Galindo (512) 239- 0951 -
dgalindo@tceq.state.tx.us

401 Certification of Section 404 Permits Contact: David Galindo (512) 239- 0951 -
dgalindo@tceq.state.tx.us

Storm water and Pretreatment Contact: Jaya Zyman-Ponebshek (512) 239-2012 -
jzymanpo@tceq.state.tx.us

Water Quality Standards and Monitoring Contact: Monica Harris (512) 239-5906 -
mharris@tceq.state.tx.us

Applicable Rules

Water Supply

Listed in text of document

Water Rights

30 TAC Chapter 295 and 297

Wastewater Permitting/Water Quality

Surface Water Quality Standards - 30 TAC Chapter 307

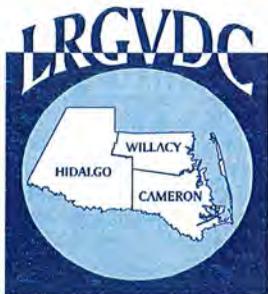
Procedures to Implement the Texas Surface Water Quality Standards - RG-194 (Revised)

Various General Wastewater Permitting Rules:
30 TAC Chapters 305, 281, 309, 39, and 21

RESEARCH TOPICS

Gulf of Mexico Salinity Tolerance Tests

Here are recommendations for the key aquatic species that would inhabit the the area of a desalination plant concentrate discharge along the Texas Gulf Coast. Bivalves such as scallops (Pectinidae), other benthic organisms such as sand dollars, and blue crabs (*Callinectes sapidus*) are organisms in the area of the Gulf and the Laguna Madre that may be especially sensitive to changes in salinity. Any testing would likely need to consider the different life stages of these organisms (e.g. larval, adult) since sensitivities may differ.



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EXECUTIVE DIRECTOR
Kenneth N. Jones, Jr.

May 18, 2010

Mr. Michael Irlbeck
Project Manager
NRS
919 Congress Ave., Suite 460
Austin, TX 78701

Dear Mr. Irlbeck,

As you are aware, the Lower Rio Grande Valley Development Council (LRGVDC) is the Regional Council of Governments serving Cameron, Hidalgo, and Willacy Counties. The pursuit of water supply alternatives such as the Texas Desal Project is encouraged by the LRGVDC, and this project is consistent with the Region M Water Supply Plan as well as the Regional Strategic Plan prepared for the LRGVDC Region.

Be advised that the LRGVDC supports expanding the present Texas Desal Project Scope-of-Work to include the following research topics:

1. **Gulf of Mexico Salinity Tolerance Test** – A method to identify the Salinity tolerance of key aquatic species that would inhabit the area of a desalination plant concentrate discharge along the Texas Gulf Coast
2. **Framework for Desalinated Water Integration into Existing Distribution Systems.** This effort would develop guidelines for cost-effectively integrating desalinated water of specific quality and quantity with existing water sources of different origins. The water integration framework would define the issues to be considered when blending desalinated water with other water sources and provide guidelines on dealing with these issues in a cost effective manner.

These expanded research efforts would most definitely advance Seawater Desalination in Texas.

Sincerely,

Kenneth N. Jones
Executive Director

TO: Micheal Irlbeck
FROM: Hudson DeYoe, UTPA Center for Subtropical Studies
RE: Texas Desal Project- Planning Aid Memorandum
DATE: 30 April 2010

1) Identify any permitting requirements and/or regulatory role, if any

No comment.

2) Identify potential resource concerns associated with the development and operation of the proposed seawater desalination facilities

3) Recommend measures to avoid, minimize, or mitigate potential adverse impacts. I've included a brief project summary of each of the two proposed

Impacts of these facilities could come from three areas- plant siting, water intake impacts, concentrate disposal.

Plant siting

Especially on South Padre Island, the facility should be located well back from the dunes to avoid dune disturbance. Intake and discharge pipes should be located to minimize dune impact. Redundancy in the system is needed to reduce the frequency of pipe maintenance. How will the fouling of intake pipes be avoided? One possible solution is to alternate the use of pipes for intake and concentrate discharge. The high salinity of the concentrate in a pipe will kill most marine life such as barnacles but a study to determine the duration of the treatment to produce effective results is needed.

Water intake

Water intake pipes will entrain marine life. Entrainment and impingement might be minimized by performing a study to determine the seasonal vertical distribution of marine organisms.

Concentrate disposal

Brownsville facility

Not sure what is meant by "diffusion" into a water body. Does it mean "diffuse" disposal? This is not the same as diffusion. That aside, any site for concentrate disposal will likely impact marine life at a local scale. Depending on local currents, a stable hypersaline layer might be established that could negatively impact benthic organisms over a larger area versus concentrate injection into the water column above the sea floor. Two studies are needed- one to characterize the benthic fauna in the proposed disposal sites and one to characterize the local currents and impact of tides. Maybe even a modeling effort would be appropriate for the latter.

Not having seen the tidal flat discharge site, I am not sure if there would be impacts of significance. I do know that Piping Plovers use that habitat. I have been studying cyanobacterial of tidal flats for several years and the use of a tidal flat would likely change the character of the site (more wetter and more saline?) from an ecological perspective.

South Padre Island facility

I am not keen on the Laguna Madre disposal option. Seagrasses would likely be affected which are already stressed by various anthropogenic factors (prop scars, nutrification, dredging). Can't comment on the injection well idea as I am not a geologist. Should consult one if you haven't already.

The use of wave buoys for power generation is an interesting idea but a pilot study is needed to realistically assess the cost/benefit ratio.

Research Topics

I suggested a number of studies above.

1. Gulf of Mexico Salinity Tolerance Tests – A method to identify the salinity tolerance of key the aquatic species that would inhabit the area of a desalination plant concentrate discharge along the Texas Gulf Coast. This method would include the following four key steps: 1. Determination of the test salinity range; 2. Identification of site-specific test of key species inhabiting the discharge area; 3. Biometrics test at average discharge salinity; and 4. Salinity tolerance test at varying concentrate dilution levels. The individual species to be tested have not been determined, but your recommendations are welcomed. The results of these tests would provide a standard for evaluating potential impacts of seawater desalination concentrate discharges state-wide.

One key element missing from the above is determination of the area of impact. This will depend on the disposal method (sea floor vs water column).

2. Log Removal Tests for Membranes – Present Texas Commission on Environmental Quality (TCEQ) log removal credits are based on membrane tests that are dated (approximately 15 years old). Given significant improvements in membrane technology, a new series of tests would be conducted with regard to bacteria and virus removal, enabling TCEQ to revisit present standards with recent performance results.

As mentioned earlier, red tide algal toxins might be an issue to consider.

Hudson DeYoe
Dept Biology
University of Texas Pan American
1201 W. University Dr.
Edinburg, TX 78539

April 14, 2010

Michael, Irlbeck
NRS
919 Congress Avenue, Suite 460
Austin, Texas 78701

RE: TEXAS DESAL PROJECT PARTICIPANTS – INFORMATION MEMORANDUM

Dear Mike:

Thank you for the opportunity to provide comments. At present I can not provide an organization planning aid memorandum I would like to provide some of my own comments that may assist in developing a state wide approach to seawater desalination project development.

1. Energy issues are critical to the successful development of a seawater desalination project. Alternative energy concepts and “going green concepts” are gaining more focus to reduce the impacts of carbon and other gas emissions. While each project may need to consider and evaluate the effectiveness of alternative energy and “green concepts”, I would ask the State to fund a study on evaluating the effective integration of alternative energy sources and “green technology” to help reduce carbon emissions and work toward achieving a zero emissions environment during plant operation. A component of this study would be a cost factor analysis and a cost benefit analysis comparing current energy methods and alternative energy methods both achieving a zero emissions environment. In addition, this study should concentrate on collocating plants, overcoming environment challenges, State and Federal accepted environmental solutions that are achievable and acceptable.
2. The State should develop a primer that would lay the foundation strategies for agencies developing seawater desalination projects. Currently, project approach appears to be ‘on the spot’ decision making that may not be based on an established process. This primer would formulate the processes and strategies each purveyor would need to follow to achieve a successfully completed project in accordance with State and Federal standards. This would avoid the “learn as you go” approach, establish a structured approach for any purveyor would follow, identify Federal and State agencies with jurisdiction and authority over various aspects of project development, identify Federal and State agencies with permit jurisdiction, etc.,
3. Ocean water/Seawater Desalination is a “Governor Perry” initiative. This execution of this initiative must be accelerated. The State must fund the development of seawater desalination projects to replace, supplement, and augment existing and dwindling water supplies. Based on the Governor’s Initiative, the State must assist municipalities in developing desalination projects. If in fact this is a State wide initiative and adequate drinking water is a state wide concern then the state should not expect each municipality’s rate payers to totally fund projects that can be developed to solve a state wide water need.
4. It would be helpful if the State (TWDB or TCEQ) would sponsor periodic seminars/conference to discuss current desalination technology that has had worldwide success in seawater desalination projects, an added focus on changing and developing technology that improves project development and desalination treatment of ocean water/seawater, and methods for brine/concentrate management.

Again, Mike thanks for the opportunity to comment.

Sincerely;

Joseph Rippole, PE
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June 1, 2010

Michael Irlbeck
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Consultation No. 21410-2010-TA-0349

Dear Mr. Irlbeck:

This responds to a May 17, 2010, letter regarding the effects of two proposed desalinization projects on federally listed species in Cameron County, Texas. In addition, your project was evaluated for wetlands and other important fish and wildlife resources.

The first proposed facility is to be located on the south shore of the Brownsville Ship Channel at a full capacity of 25 million gallons per day (MGD) with either an intake channel off the Ship Channel with filter media bed or open water intake on the Ship Channel. Options for the brine concentrate disposal are diffusion into the Gulf of Mexico (full 25 MGD scale only), no-discharge evaporation ponds (2.5 MGD demonstration only), or blend 1:1 (back to ambient total dissolved solids) with river water and discharge to the surface tidal flats south of the Ship Channel.

The Service recommends that the discharge be diffused into the Gulf of Mexico by pipeline due to the quantity of discharge. This needs to be piped far away from the shoreline, so the brine has more water for mixing and diluting. The Service does not recommend discharging into the tidal flats south of the Ship Channel, because it will cause soil erosion of the tidal flats, and will cause impacts to threatened wintering piping plovers.

Another major concern in this area is loss of habitat for the endangered ocelot and jaguarundi and impeding or fragmenting travel corridors north and south of the ship channel. The Service recommends moving the facility away from the Loma Preserve (conservation easement agreement between Brownsville Navigation District and the Laguna Atascosa National Wildlife Refuge). Also, the area of the proposed site has documented ocelot use. We also have concerns about locating a wind turbine on site as endangered aplomado falcons are in the area and can be impacted by turbine blades along with many other migratory birds in the area. The Service recommends a wind turbine without blades or one that is short, located among other equipment or facilities, and is well-marked, or use solar energy.

The second proposed location is on the bay-side of South Padre Island some distance north of Andy Bowie County Park at a full capacity of 1.0 MGD. Options to dispose of the brine are diffusion into the Gulf of Mexico, or an injection well into hypersaline geologic formation, or diffusion into Laguna Madre. Intake plans include building a series of shallow beach wells and a raw water collection pipeline, or an open water intake in the Gulf of Mexico with raw water intake pipeline directionally-drilled under the dunes.

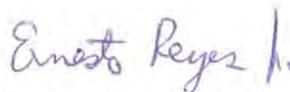
The Service recommends that discharge are diffused into the Gulf of Mexico by pipeline, far away from the shoreline, so the brine has more water for mixing and diluting; or by an injection well, but do not diffuse into the Laguna Madre. Increases of salinity in the Laguna could impact seagrasses and the entire Laguna ecosystem and pipeline placement in the Laguna Madre

can erode tidal flats by discharging in areas of piping plover use.

We appreciate the opportunity to provide pre-planning information and look forward to providing further assistance. Once the additional site specific information is received we can review your determinations of effects to each species and determine if other avoidance measures would be recommended.

If we can be of further assistance, please contact Ernesto Reyes at the above letterhead and telephone number.

Sincerely,



Ernesto Reyes Jr.
Senior Fish & Wildlife Biologist
For Allan M. Strand
Field Supervisor

cc:

Field Supervisor, U.S. Fish and Wildlife Service, Corpus Christi, TX
Kelly McDowell, South Texas Refuge Complex Project Leader, Alamo, TX
Sonny Perez, Laguna Atascosa NWR Manager, Rio Hondo, TX

Appendix F:

Permitting and Compliance Strategies

DRAFT SEAWATER DESALINATION PERMITTING REPORT

BROWNSVILLE PUBLIC UTILITIES BOARD

Prepared For:



Brownsville Public Utilities Board
Brownsville, Texas

Submitted To:



NRS Engineers
Austin, Texas

Prepared By:



TRC Environmental Corporation
Austin, Texas

April 2010





DRAFT SEAWATER DESALINATION PERMITTING REPORT

BROWNSVILLE PUBLIC UTILITIES BOARD

Submitted By:

TRC Environmental Corporation

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April 2010

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ABBREVIATIONS AND ACRONYMS

AST	Aboveground Storage Tank
BMP	Best Management Practice
BND	Brownsville Navigation District
BPUB	Brownsville Public Utilities Board
CCC	Coastal Coordination Council
CFR	Code of Federal Regulations
CWA	Clean Water Act
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FONSI	Finding of No Significant Impact
GLO	Texas General Land Office
mgd	Million Gallons per Day
NEPA	National Environmental Policy Act
NMFS	National Oceanic and Atmospheric Administration – National Marine Fisheries Service
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
PBR	Permit By Rule
SWPPP	Storm Water Pollution Prevention Plan
T&E	Threatened and Endangered
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
THC	Texas Historical Commission
TLAP	Texas Land Application Permit
TPDES	Texas Pollutant Discharge Elimination System
TPWD	Texas Parks and Wildlife Department
TWDB	Texas Water Development Board
TxDOT	Texas Department of Transportation
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
UST	Underground Storage Tank

1.0 INTRODUCTION

In anticipation of a projected water supply deficit in 2050, the Brownsville Public Utilities Board (BPUB) conducted a pilot study to determine the technical feasibility of operating a seawater desalination plant at the Brownsville Ship Channel (BPUB 2008). Based on the findings from the pilot study, the BPUB proposes to construct a 2.5 million gallons per day (mgd) demonstration-scale seawater desalination plant (Project) at the Port of Brownsville, Cameron County, Texas. The facility would be located along the south shore of the Brownsville Ship Channel. In anticipation of the expansion of the facility to a capacity of 25.0 mgd, several components of the demonstration-scale plant may be implemented at full-scale, including the intake system, concentration disposal system, and land acquisition.

Engineering design of the plant has not been completed and several design alternatives are under consideration. Table 1-1 summarizes the alternative design strategies being considered.

Table 1-1. Design Alternatives Under Consideration

Project Component	Alternatives
Intake	<ul style="list-style-type: none"> • Constructed intake channel off the Brownsville Ship Channel with filter media bed; or • Open water intake on the Brownsville Ship Channel.
Treatment System	<ul style="list-style-type: none"> • Treatment technology to include membrane pretreatment and reverse osmosis.
Finished Water System	<ul style="list-style-type: none"> • Ground storage tank and high service pump station.
Concentrate Disposal	<ul style="list-style-type: none"> • Diffusion into the Gulf of Mexico (full 25 mgd scale only); or • No-discharge evaporation ponds (2.5 mgd demonstration only); or • Blend 1:1 (back to ambient total dissolved solids) with raw water and discharge to the surface tidal flats south of the Brownsville Ship Channel (2.5 mgd demonstration scale only).
Power Consumption	<ul style="list-style-type: none"> • Grid only; or • On-site renewable energy (wind) with grid supplement.

Construction and operation of the desalination plant will require numerous environmental permits, approvals, and compliance documents. In some instances, the permit or approval required will vary according to the design alternative selected. This report identifies and summarizes the array of environmental permits and compliance documents required to construct and operate the proposed plant for both 2.5 mgd and 25 mgd scale under the design alternatives being considered. In addition, the report provides timelines and approximate cost estimates to obtain permit and compliance approvals.

2.0 FEDERAL PERMITS AND APPROVALS

Permitting and regulatory requirements for constructing a seawater desalination plant are similar to those required for a brackish groundwater desalination plant (Texas Water Development Board [TWDB] 2008). The following subsections detail the federal permits and approvals that must be considered prior to plant construction.

2.1 United States Army Corps of Engineers Section 10 and 404 Permits

The United States Army Corps of Engineers (USACE) is the federal agency primarily responsible for evaluating the construction activities that occur in U.S. waters, including wetlands. The Rivers and Harbors Act of 1899 Section 10 establishes a program to regulate construction activities in navigable waters, while Section 404 of the Clean Water Act (CWA) regulates the discharge of dredged and fill material into waters of the United States. The USACE administers individual permit decisions and jurisdictional determinations; develops policy and guidance; and enforces Sections 10 and 404 provisions. District Engineers are authorized to issue permits, including individual and nationwide permits.

There are several ways in which activities requiring Section 10 and 404 permits can be authorized, depending on the proposed activity and the extent of environmental impact. Nationwide permits (Appendix A) are often issued by USACE for categories of activities that are similar in nature and would have only minimal individual or cumulative adverse environmental effects. All activities authorized under any nationwide permit must meet the general conditions for nationwide permits (Appendix B) as well as any specific provisions listed for the project site. Nationwide permits typically take the least amount of time for approval and do not require a mandatory 30-day public review.

Individual permits are issued when a specific activity is not covered by a nationwide permit or the proposed impacts exceed certain limits set for nationwide permits. Approval for Individual permits can take several months to several years for approval depending on the complexity of the project, intensity of impacts and public opposition to the project. Individual permits require a 30-day mandatory public review period prior to approval by the USACE, with public meetings required if requested by the public.

In general, to obtain a Section 10 or 404 permit, applicants must demonstrate that construction activities would not significantly degrade the nation's waters and no practicable alternatives are less damaging to the aquatic environment. Applicants must construct projects to minimize impacts to water bodies and wetlands and provide appropriate and practicable mitigation, such as restoring or creating wetlands, for any remaining, unavoidable impacts. Permits will not be granted for projects that are found to be contrary to the public interest.

The State of Texas utilizes a joint application system to apply for permits and authorizations from several agencies as a single filing for activities affecting streams, waterways, waterbodies, wetlands, coastal areas and sources of water supply, including permits from both Texas Commission on Environmental Quality (TCEQ) and USACE. While the application submittal would be combined and submitted to the USACE-Galveston District, separate approvals must be received from each agency. As part of the permitting process, the USACE-Galveston District requests review of the project from other federal and state agencies including the U.S.

Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), Texas Parks and Wildlife Department (TPWD), Texas Historical Commission (THC), Texas General Land Office (GLO), and TCEQ.

The application form for Section 10 and 404 Permits includes applicant information, a detailed description of the project, how much material would be discharged, identification of waters receiving material, identification of adjacent landowners, location maps of the project that include wetlands, streams and ditches, and a sketch plan view and cross-section drawn to scale with dimensions given, or engineering drawings showing location and extent of work. Additional application documents include a Section 401 application and a statement of compliance with the Texas Coastal Management Plan. The Section 401 certification and the Texas Coastal Management Plan are described in further detail in Section 3.1.1 and 3.4.1 respectively.

Design Alternatives

A Section 10 permit likely will be required from the USACE-Galveston District for construction of the intake and any outfall structures in the Brownsville Ship Channel and/or the Gulf of Mexico. Unless construction measures can be implemented to prevent discharge of any dredged or fill material, the requirements of Section 404 of the Clean Water Act also will apply. Additional Project components such as buildings, pipelines, and storage tanks that impact Waters of the U.S., including wetlands would require a Section 404 permit. A review of the USFWS National Wetland Inventory Map (USFWS 2009) identifies large areas of potential wetlands south of the Brownsville Ship Channel. Pre-construction field surveys of the Project site, as well as discussions with the USACE-Galveston District, would determine the wetland designation of the area. Any Section 404 permit also would require a Section 401 certification from the TCEQ that water quality would not be impaired. Anticipated permits for each design alternative are identified below.

Intake

- A constructed intake channel with a filter media bed would likely require an Individual Permit due to the anticipated amount of disturbance (greater than 25 cubic yards) to Waters of the U.S.
- An open water intake located in the Brownsville Ship Channel likely would require Nationwide Permit 12 (Utility Line Activities) if the amount of disturbance is less than ½ acre to Waters of the U.S.

Treatment System

No USACE permit would be necessary if the desalination plant location does not affect any jurisdictional wetlands.

Finished Water System

No USACE permit would be necessary if tank locations and associated pipeline installation avoid jurisdictional wetlands and stream crossings.

Concentrate Disposal

- Diffusion of concentrate into the Gulf of Mexico likely would require an Individual Permit due to the anticipated amount of disturbance to Waters of the U.S. (greater than ½ acre) by the pipeline and installation of the diffuser array.
- Disposal of concentrate into no-discharge evaporation ponds would not require a USACE permit if pond locations and pipelines avoid jurisdictional wetlands and stream crossings.
- Discharge of concentrate to the surface tidal flats south of the Brownsville Ship Channel would likely require Nationwide Permit 12 if the amount of disturbance is less than ½ acre and the tidal flats are determined to be jurisdictional wetlands. If greater than ½ acre of jurisdictional wetlands are disturbed, it is anticipated an Individual Permit would be required. If the tidal flats do not meet the requirements for jurisdictional wetlands, then no USACE permit would be required.

Power Consumption

- No USACE permit would be required to connect to the existing power grid as long as jurisdictional wetlands and stream crossings are avoided in siting any new transmission lines and associated structures.
- No USACE permit would be required for construction of wind turbines as long as the turbines and any associated Project components avoided jurisdictional wetlands and stream crossings.

2.2 National Environmental Policy Act Compliance

The National Environmental Policy Act (NEPA) establishes a national environmental policy and goals for the protection, maintenance, and enhancement of the environment and it provides a process for implementing these goals within federal agencies. Under Section 102 of NEPA, all federal agencies are required to incorporate environmental considerations into their planning and decision-making through a systematic interdisciplinary analysis of proposed undertakings. There are three levels of analysis depending on whether or not an undertaking could significantly affect the environment. These three levels include: categorical exclusion determination; preparation of an environmental assessment/finding of no significant impact (EA/FONSI); and preparation of an environmental impact statement (EIS) (EPA 2010).

At the first level, an undertaking may be categorically excluded from a detailed environmental analysis if it meets certain criteria which a federal agency has previously determined as having no significant environmental impact. A number of agencies have developed lists of actions which are normally categorically excluded from environmental evaluation under their NEPA regulations (EPA 2010).

At the second level of analysis, a federal agency prepares a written EA to determine whether or not a federal undertaking would significantly affect the environment. If the answer is no, the agency issues a FONSI. The FONSI may address measures which an agency will take to reduce (mitigate) potentially significant impacts (EPA 2010).

If the EA determines that the environmental consequences of a proposed federal undertaking may be significant, an EIS is prepared. An EIS is a more detailed evaluation of the proposed action and alternatives. The public, other federal agencies and outside parties may provide input into the preparation of an EIS and then comment on the draft EIS when it is completed. If a federal agency anticipates that an undertaking may significantly impact the environment, or if a project is environmentally controversial, a federal agency may choose to prepare an EIS without having to first prepare an EA (EPA 2010).

After a final EIS is prepared and at the time of its decision, a federal agency will prepare a public record of its decision addressing how the findings of the EIS, including consideration of alternatives, were incorporated into the agency's decision-making process (EPA 2010).

Design Alternatives

The USACE District Commander is the USACE NEPA official responsible for compliance with NEPA for actions within district boundaries. The USACE procedures implementing NEPA are found at 33 Code of Federal Regulations Part 230. BPUB will need to consult early with USACE to determine if the Project scope can be categorically excluded from detailed environmental analysis, or if the Project will require an EA or EIS. This decision will depend to a large degree on what type of Section 10/404 permit is applicable to the Project (Individual or Nationwide). Typically, USACE regulatory actions such as issuing permits only require an EA. Should a Nationwide Permit be granted, it is likely to be categorically excluded. However, given the size and scope of the Project, the District Engineer may determine that an EIS is required before a permit can be issued.

Intake

- A constructed intake channel with a filter media bed would require an Individual Permit due to the amount of disturbance (greater than 25 cubic yards) to Waters of the U.S. As stated above, it is anticipated an Individual Permit would require an EA or possibly an EIS, with the USACE-Galveston District Engineer determining which process will be conducted.
- An open water intake located in the Brownsville Ship Channel likely could be permitted under a Nationwide Permit 12 (Utility Line Activities) if construction disturbs less than ½ acre of Waters of the U.S. If the Project can be permitted under a Nationwide Permit, it could be categorically excluded or possibly an EA may be required, again with the USACE determining the final process.

Treatment System and Finished Water System

Even though no USACE permit would be required if treatment and finished water system facilities avoid jurisdictional wetlands and stream crossings, potential impacts would need to be evaluated in the EA or EIS issued for the intake permit.

Concentrate Disposal

- As discussed in Section 2.1, diffusion of concentrate into the Gulf of Mexico likely would require an Individual Permit due to the amount of disturbance to Waters of the U.S. (greater than ½ acre) by the pipeline and installation of the diffuser array. It is anticipated an Individual Permit would require an EA, possibly an EIS.

- Disposal of concentrate into no-discharge evaporation ponds would not require a USACE permit if pond locations and pipelines avoid jurisdictional wetlands and stream crossings; however, potential impacts associated with construction of the ponds would need to be evaluated in the EA or EIS.
- As discussed in Section 2.1, discharge of concentrate to the surface tidal flats south of the Brownsville Ship Channel likely would require a Nationwide Permit 12 if the amount of disturbance is less than ½ acre and the tidal flats are determined to be jurisdictional wetlands. In this case, it could be categorically excluded or possibly an EA may be required. If the tidal flats do not meet the requirements for jurisdictional wetlands, then no USACE permit would be required; however, potential impacts would still be evaluated as part of the overall Project EA or EIS.

Power Consumption

Although a USACE permit would not be required to connect to the existing power grid (as long as jurisdictional wetlands and stream crossings are avoided), it is anticipated potential impacts associated with upgrading existing or constructing new transmission lines would be require analysis as part of the overall Project impacts evaluated in an EA or EIS. Similarly, if the Project utilizes wind turbines for power supply, impacts associated with siting and construction of the turbines and associated electricity transmission and delivery facilities would be evaluated in the overall Project EA or EIS.

2.3 United States Fish and Wildlife Service and National Oceanic and Atmospheric Administration – National Marine Fisheries Service

The USFWS in the Department of the Interior and the National Oceanic and Atmospheric Administration – NMFS in the Department of Commerce share responsibility for administration of the Endangered Species Act (ESA). Section 7(a) of the ESA requires federal agencies to consult with USFWS and/or NMFS to ensure that project activities are not likely to jeopardize the continued existence of any federally listed threatened or endangered (T&E) species or result in the adverse modification of critical habitat. If adverse impacts to T&E species are anticipated by a project activity, USFWS and NMFS are authorized to issue Incidental Take Permits that exempt federal agencies and their permittees from civil and criminal penalties if they comply with the reasonable and prudent measures and the implementing terms and conditions of the permit.

Consultation with USFWS and NMFS for the purposes of preventing loss or damage to wildlife resources under the Fish and Wildlife Coordination Act also would be required. This consultation would involve an evaluation of fish and wildlife resources by USFWS and NMFS with recommendations for preservation and mitigation. Additional consultations with the NMFS would be required to evaluate the impacts of project construction, operations, and maintenance activities to Essential Fish Habitat and marine mammals in Gulf of Mexico waters. Essential Fish Habitat consultation is often combined with other consultations such as ESA. Specific responsibilities for each design alternative are discussed below.

Design Alternatives

One of the general conditions (Appendix B) of any nationwide permit issued by USACE is a determination by the District Engineer that requirements of the ESA have been satisfied. Since the Project will require a USACE permit, Section 7(a) consultation will have to occur. It should

be noted that issuance of a nationwide permit does not authorize lethal or non-lethal take of a T&E species. Should an activity be likely to result in lethal or non-lethal take of a protected species, an Incidental Take Permit must be obtained from USFWS and/or NMFS.

Intake

Given that species may be impinged and/or entrained by intake structures, consultation with USFWS and NMFS will be required before a USACE permit can be issued. It is anticipated that studies estimating the species and quantities of wildlife impacted by impingement and entrainment will be required, and should it be determined that protected species may potentially be impacted, authorization from USFWS and/or NMFS would be required.

Treatment System and Finished Water System

Although a USACE permit likely would not be required to construct treatment system facilities (as long as jurisdictional wetlands and stream crossings are avoided), it is anticipated USFWS would be need to be consulted as part of the overall Project impacts evaluated in an EA (discussed in Section 2.2). If pre-construction surveys determine that T&E species or critical habitat are present in or near facility and pipeline construction sites, consultation with USFWS would be required.

Concentrate Disposal

- Diffusion of concentrate into the Gulf of Mexico would potentially impact T&E species present and Essential Fish Habitat, and thus consultation with USFWS and NMFS would be required.
- Disposal of concentrate into no-discharge evaporation ponds would not require consultation with NMFS. It is likely that consultation with USFWS would still be required since construction of the evaporation ponds could potentially impact T&E and other wildlife species.
- Discharge of concentrate to the surface tidal flats south of the Brownsville Ship Channel likely would require consultation with USFWS.

Power Consumption

Although a USACE permit would not be required to connect to the existing power grid (as long as jurisdictional wetlands and stream crossings are avoided in siting any new transmission lines and any associated structures), it is anticipated USFWS would be need to be consulted as part of the overall Project impacts evaluated in an EA (discussed in Section 2.2). Similarly, if the Project utilizes wind turbines for power supply, USFWS likely would be consulted regarding potential impacts of construction to T&E and other wildlife species.

2.4 Federal Aviation Administration

The Federal Aviation Administration (FAA) is an agency of the U.S. Department of Transportation with authority to regulate and oversee all aspects of civil aviation in the U.S. In order to protect civil airspace, the FAA requires notice of construction of any structures that meet the following conditions:

- structures exceeding 200 feet in height;

- located within 20,000 feet of an airport with a runway exceeding 3,200 feet in length and the structure exceeds a slope of 100:1 from the nearest point of the nearest runway;
- located within 10,000 feet of an airport with a runway less than 3,200 feet in length and exceeds a slope of 50:1; or
- located within 5,000 feet of a heliport and exceeds a slope of 25:1.

Information required in the application includes applicant information, location and height of the structure, any lighting and markings to be used on the structure and distance to the nearest airport. The FAA would then issue a Determination of Hazard/No Hazard to Navigation.

Design Alternatives

The Brownsville/South Padre Island International Airport is located within 20,000 feet from the Port of Brownsville and has runways measuring 7,399 feet, 6,000 feet and 3,000 feet in length (FAA 2010). It is anticipated that Project construction would require a notice to the FAA.

Power Consumption

- FAA determination likely would not be required to connect to the existing power grid as most transmission lines are less than 200 feet in height.
- FAA determination may be required if the proposed wind turbines are greater than 200 feet in height.

3.0 STATE AND LOCAL PERMITS AND APPROVALS

State of Texas permitting agencies include the TCEQ, TPWD, THC, GLO, and Texas Department of Transportation (TxDOT). The following sub-sections detail the state and local permits and approvals that may be required for the Project.

3.1 Texas Commission on Environmental Quality

The TCEQ is the primary environmental protection agency for the state of Texas. The TCEQ oversees permitting and enforcement for air, waste, water quality and water quantity.

3.1.1 Water Quality Certification

The TCEQ has developed a tiered system of review for all individual Section 404 permit applications based upon project size and the amount of state water affected. The purpose of these reviews is to determine whether a proposed discharge will comply with state water quality standards. The extent of Section 401 certification review will vary between the different tiers, as well as the type of wetland affected.

Tier I projects are small projects that affect less than three acres of waters in the state, or less than 1,500 linear feet of streams. TCEQ has determined that incorporating certain best management practices (BMPs) and other requirements into the project will sufficiently minimize impacts to water quality. For Tier I projects, no further Section 401 review will be necessary if the permittee agrees to include those BMPs and requirements in their project which makes them part of their Section 404 permit. Projects that would impact rare and ecologically important wetlands including mangrove marshes and coastal dune swales would not qualify under Tier I.

Tier II projects include any project that does not qualify for a Tier I review or for which the applicant elects not to incorporate Tier I criteria. Tier II project applicants must submit a Tier II 401 Certification Questionnaire and Alternative Analysis Checklist. Information provided for the Tier II 401 Certification Questionnaire includes a description of methods that would be utilized for avoiding adverse impacts to water quality. Information provided in the Alternative Analysis Checklist includes a description and comparison of project alternatives including location, size, and technical feasibility. Tier II projects are subject to an individual certification review by TCEQ. After the USACE declares the application complete, a joint 30-day public notice is issued. The TCEQ may choose to hold a public hearing to consider potential adverse impacts of the project on water quality. Once the USACE issues a Statement of Findings or a decision document, the TCEQ has 10 days to make a 401 certification decision.

Design Alternatives

Project components that qualify for a USACE Nationwide Permit would likely qualify for Tier I Section 401 certification. Project components that would require a USACE Individual Permit likely would require Tier II Section 401 certification from the TCEQ.

Intake

- A constructed intake channel with a filter media bed likely would affect more than 3 acres of waters of the state and therefore need Tier II Section 401 certification.

- An open water intake located in the Brownsville Ship Channel likely would affect less than 3 acres of waters of the state and qualify for Tier I Section 401 certification.

Treatment System and Finished Water System

As no USACE permit would likely be necessary for either component, no Section 401 certification would be required.

Concentrate Disposal

- Diffusion of concentrate into the Gulf of Mexico likely would affect more than 3 acres of waters of the state and therefore need Tier II Section 401 certification.
- Disposal of concentrate into no-discharge evaporation ponds would not require a USACE permit and no Section 401 certification.
- Discharge of concentrate to the surface tidal flats south of the Brownsville Ship Channel may require a USACE Nationwide Permit and therefore likely would require Tier I Section 401 certification.

Power Consumption

As no USACE permit would likely be necessary for either component, no Section 401 certification would be required.

3.1.2 Texas Pollutant Discharge Elimination System Industrial Wastewater Permit and Texas Land Application Permit

The National Pollutant Discharge Elimination System (NPDES) permitting programs are established by section 402 of the Clean Water Act. Any person that discharges a pollutant (other than dredged or fill material) into waters of the United States from a point source must obtain a NPDES permit. Any NPDES permit must contain limitations to reflect the application of available treatment technologies, as well as any more stringent limitations needed to ensure compliance with water quality standards. EPA has promulgated regulations governing the administration of the NPDES program, and under the CWA, states may administer the NPDES program provided the program meets federal requirements. The State of Texas has the authority to administer the NPDES program, and in Texas, discharges of pollutants to surface water bodies are regulated by TCEQ.

Discharges of pollutants into surface water bodies are administered under Texas Pollutant Discharge Elimination System (TPDES) Wastewater Permits. Discharges of pollutants adjacent to waters of the state by irrigation, evaporation or subsurface drainage are administered under Texas Land Application Permits (TLAP). The application process for both permits, however, is the same.

Components of the permit application include an Administrative Report for Industrial Wastewater, Industrial Wastewater Technical Report, Submission Checklist, and Core Data Form, along with permitting fees. Information provided in the Administrative Report for Industrial Wastewater includes the applicant, application contact, application notices, the facility, and facility location. Detailed descriptions of the facility, operations, and location are included in the Industrial Wastewater Technical Report, which serves as the main body of the application.

After the TCEQ receives the application, staff will perform an Administration Review to confirm that the application is complete. The applicant would then be instructed to publish an initial Notice of Intent (NOI) to obtain a permit. During the Technical Review, the technical aspects of the application would be reviewed and evaluated and additional public reviews would be issued. This review process may include public meetings and hearings.

Design Alternatives

The TPDES Industrial Wastewater Permit and the TLAP would only apply to the concentrate disposal alternatives of the Project as identified below.

Concentrate Disposal

- Diffusion of concentrate into the Gulf of Mexico would require a TPDES Industrial Wastewater Permit.
- Disposal of concentrate into no-discharge evaporation ponds would require a TLAP.
- Discharge of concentrate to the surface tidal flats south of the Brownsville Ship Channel likely would require a TPDES.

3.1.3 Discharge of Hydrostatic Test Water Permit

The TCEQ has a General Permit (TXG670000) for discharges resulting from the hydrostatic testing of pipelines, tanks, and other containers into water in the state. Under the General Permit, a regular schedule of water quality sampling and monitoring of the discharge must be conducted. A NOI form must be submitted to TCEQ, as well as the local municipal separate storm sewer system (MS4) operator if applicable. After TCEQ reviews the NOI, it will issue an Acknowledgement Certificate acknowledging coverage under the General Permit, or a Notice of Deficiency if there is insufficient information provided in the application.

Design Alternatives

Construction of the desalination facility and all associated components, regardless of alternative, would require hydrostatic testing of pipelines and therefore be required to obtain a discharge permit. It is likely that the Project would qualify for the Discharges of Hydrostatic Test Water General Permit. It should be noted, however, that the Draft 2010 Texas Clean Water Act 303(d) list of impaired water bodies lists the Brownsville Ship Channel as being impaired for bacteria. The General Permit does not allow for discharges of the constituents for which the waterbody is impaired (i.e. bacteria). Should the General Permit be denied, a TPDES permit as described in Section 3.1.2 would need to be required.

3.1.4 Storm Water Discharges from Large Construction Activities

The TCEQ has a Construction General Permit (TXR150000) for storm water controls applicable to construction projects. Large construction activities which disturb 5 or more acres of land are regulated under this general permit. Under the general permit, a Storm Water Pollution Prevention Plan (SWP3) must be prepared and implemented. A NOI form must be submitted to TCEQ and posted at the construction site. The NOI must also be submitted to the local MS4 operator, if applicable. After TCEQ reviews the NOI, it will issue an Acknowledgement

Certificate acknowledging coverage under the general permit, or a Notice of Deficiency if there is insufficient information provided in the application.

Design Alternatives

Construction of the desalination facility and all associated components, regardless of alternative, would disturb more than 5 acres and therefore be required to obtain Storm Water Discharge Permit. It is likely that the Project would qualify for the Construction General Permit. It should be noted, however, that the Draft 2010 Texas Clean Water Act 303(d) list of impaired water bodies lists the Brownsville Ship Channel as being impaired for bacteria. The Construction General Permit does not allow for discharges of the constituents for which the waterbody is impaired (i.e. bacteria). Should the Construction General Permit be denied, an individual TPDES permit would be needed. In addition, the current Construction Storm Water General Permit will expire on March 5, 2013, with the potential for revised permit conditions.

3.1.5 Land Application for Water Treatment Plant Sludge

The state of Texas requires that all facilities seeking to dispose of water treatment plant sludge in a landfill, surface impoundment, or waste pile must register with TCEQ. Registration requires submittal of a water treatment sludge registration application as well as sludge and soil analysis reports.

Design Alternatives

It is anticipated that the desalination facility, regardless of design alternative, would include at least one sludge pond for backwash waste. Registration of the sludge pond would also cover the periodic disposal of the pond solids to a permitted landfill.

3.1.6 Water Rights Permit

Water in the rivers, streams, underflow, creeks, tides, lakes and every bay and arm of the Texas portion of the Gulf of Mexico is considered state water. Rights to use state waters may be acquired through appropriation via the permitting process established in Texas Water Code, Chapter 11, and Title 30, Texas Administrative Code (TAC). The state may authorize the use of state water through a permitting system administered by the TCEQ or by the adjudication of claims by state court under the state's water rights adjudication act. Each application for a permit is reviewed for administrative and technical requirements to evaluate its impact on other water rights, bays and estuaries, conservation, water availability, public welfare, etc.

Design Alternatives

The desalination plant would operate at either the 2.5 mgd demonstration-scale or at the full-scale of 25.0 mgd. Both options would require acquisition of a water rights permit, however, obtaining a permit for the full-scale amount would prevent acquiring an additional water right permit in the future.

3.1.7 Texas Public Water System Review

Texas statute requires that the TCEQ ensure that public water systems supply safe drinking water in adequate quantities, are financially stable and technically sound, and promote use of regional and area-wide drinking water systems. While a facility is not required to obtain a permit related to drinking water standards to operate, the TCEQ is required to review completed plans and

specifications and business plans for all contemplated public water systems not exempted by Texas Health and Safety Code, §341.035(d). Facilities also are required to continually monitor water quality submit reports to the TCEQ. The rules and regulations for a public water system facility are covered in 30 TAC §290.

Design Alternatives

The construction of the desalination facility, regardless of design alternatives selected, would be considered a new public water system and subject to review and approval by the TCEQ.

3.1.8 Petroleum Storage Tanks Registration

The TCEQ is charged with enforcing rules and regulations pertaining to aboveground storage tanks (ASTs) and underground storage tanks (USTs) storing petroleum products. All USTs as well as ASTs with a capacity of 1,100 gallons or greater are required to be registered with TCEQ. TCEQ also requires 30-day notification prior to installing, repairing, or otherwise working on ASTs and USTs.

Design Alternatives

Should the desalination facility install any USTs or regulated ASTs proper notification and registration with the TCEQ would be required.

3.1.9 Air Permit by Rule

Water treatment plants are permitted by rule with respect to air quality if they meet the conditions stated in 30 TAC §106.4 and §106.532. Total actual emissions authorized under permit by rule from the facility shall not exceed 250 tons per year (tpy) of carbon monoxide (CO) or nitrogen oxides (NO_x); 25 tpy of volatile organic compounds (VOC), inhalable particulate matter (PM₁₀) or of any other air contaminant except carbon dioxide, water, nitrogen, methane, ethane, hydrogen, and oxygen; or 10 tpy sulfur dioxide (SO₂) or chlorine (30 TAC §106.4 and §106.532). The following activities are not permitted by rule under 30 TAC §106.4:

- gas stripping or aeration facilities where VOC or other air contaminants are stripped from water directly to the atmosphere;
- disposal facilities using land surface treatment;
- surface facilities associated with injection wells;
- cooling towers in which VOC or other air contaminants may be stripped to the atmosphere.

TCEQ does not require registration of facilities operating under this permit by rule but the facilities must keep a copy of 30 TAC §106.4 and §106.532 as well as any records documenting compliance with rules. Should a facility not meet the conditions of the permit by rule, a New Source Review Permit would be required. Information provided in the application package includes applicant and facility information, process flow description and diagram, maximum operating schedule and emissions calculations, use of best available control technology, and atmospheric dispersion modeling. A 30-day public review period is required for facilities undergoing New Source Review.

It should be noted that TCEQ has proposed changes to the Texas State Implementation Plan that EPA is proposing to disapprove (74 Federal Register 48450). Currently, TCEQ is working to address concerns raised by EPA and anticipates proposing new rules through September 2010 (TCEQ 2010).

Design Alternatives

It is unknown at this time how the proposed new air rules from TCEQ may affect the Project.

Intake

It is anticipated that operations of either intake option would meet the permit by rule qualifications for water treatment facilities and no further air permits would be required.

Treatment System and Finished Water System

It is anticipated that operations of the desalination plant would meet the permit by rule qualifications for water treatment facilities and no further air permits would be required.

Concentrate Disposal

- Diffusion of concentrate into the Gulf of Mexico likely would meet the permit by rule qualifications for water treatment facilities and no further air permits would be required.
- Disposal of concentrate into no-discharge evaporation ponds likely would not meet the permit by rule qualifications for water treatment facilities and therefore require a New Source Review permit.
- Discharge of concentrate to the surface tidal flats south of the Brownsville Ship Channel likely would meet the permit by rule qualifications for water treatment facilities and no further air permits would be required.

Power Consumption

It is anticipated that either power option would meet the permit by rule qualifications for water treatment facilities and no further air permits would be required.

3.2 Texas Parks and Wildlife Department

The mission of the TPWD is to manage and conserve the natural and cultural resources of Texas and to provide hunting, fishing and outdoor recreation opportunities.

3.2.1 Protected Species Consultation

Issuance of a federal or state permit requires consultation with the TPWD to determine the potential impacts of Project construction, operations, and maintenance activities on any state-listed threatened or endangered species. No Incidental Take Permits currently are available for any activities that may result in the death or injury of a state-listed threatened or endangered species.

Design Alternatives

Due to the federal and multiple state permits required for the Project, TPWD would be need to be consulted regarding potential impacts of construction and operation of the facility to state-listed T&E and other wildlife species.

Intake

Given that species may be impinged and/or entrained by intake structures, consultation with TPWD will be required before a USACE permit can be issued. It is anticipated that studies estimating the species and quantities of wildlife impacted by impingement and entrainment will be required.

Treatment System and Finished Water System

Although a USACE permit likely would not be required to construct treatment system facilities (as long as jurisdictional wetlands and stream crossings are avoided), TPWD would need to be consulted as part of the overall Project impacts evaluated in an EA (discussed in Section 2.2).

Concentrate Disposal

- Diffusion of concentrate into the Gulf of Mexico would potentially impact T&E species present, and thus consultation with TPWD would be required.
- Disposal of concentrate into no-discharge evaporation ponds would likely require a TLAP permit which requires consultation with TPWD prior to issuance.
- Discharge of concentrate to the surface tidal flats south of the Brownsville Ship Channel would likely require a TLAP permit which requires consultation with TPWD prior to issuance.

Power Consumption

Although no state or federal permits would be required to connect to the existing power grid or to utilize wind turbines (as long as jurisdictional wetlands and stream crossings are avoided in siting any structures), it is anticipated TPWD would be need to be consulted as part of the overall Project impacts evaluated in an EA (discussed in Section 2.2).

3.2.2 Sand and Gravel Permit

A Sand and Gravel permit, issued by TPWD, would be required for any activity that would disturb or take marl, sand of commercial value, and all gravel, shell, and mudshell located within tidewater limits or freshwater areas of the state, and on islands within those limits and areas. An application must be filed with TPWD that includes information on the size of the stream, the nature of the banks and the bed of the stream, the amount of material to be disturbed or removed, the adjacent landowners, and the probable effects on the stream and its other users. A General permit is issued when an activity disturbs less than 1,000 cubic yards of material, is not likely to adversely affect any natural resource and follows established best management practices. A 30-day public review period is required for the General permit. If a project does not meet the standards for a General permit then an Individual permit would be required. A 30-day public review period is also required for an Individual permit as well as a public hearing.

Design Alternatives**Intake**

- A constructed intake channel with a filter media bed would likely require a General permit.

- An open water intake located in the Brownsville Ship Channel would likely require a General permit.

Treatment System and Finished Water System

No Sand and Gravel permit would be required to construct the treatment or finished water system.

Concentrate Disposal

- Diffusion of concentrate into the Gulf of Mexico likely would likely disturb more than 1,000 cubic yards and require an Individual permit.
- Disposal of concentrate into no-discharge evaporation ponds would not require a Sand and Gravel permit.
- Discharge of concentrate to the surface tidal flats south of the Brownsville Ship Channel may require a General permit.

Power Consumption

No Sand and Gravel permit would be required to connect to the existing power grid or for the construction of wind turbines.

3.3 Texas Historical Commission

The THC is the state agency charged with preserving Texas' architectural, archeological and cultural landmarks. An Antiquities Permit is required when state agencies or political subdivisions of the state propose any action on public land involving five or more acres of ground disturbance; 5,000 or more cubic yards of earth moving; or any project that has the potential to disturb recorded historic or archeological sites. The Antiquities Permit allows a professional archeologist to investigate whether there are potentially any cultural or historical resources, including those that may be submerged, affected by construction of the project. Consultation with the THC under Section 106 of the National Historic Preservation Act (NHPA) is required for any activities associated with federal funds, permits or lands that potentially impact cultural or historical resources.

Design Alternatives

The Brownsville Navigation District (BND) is a political subdivision of the state, therefore, all lands owned by the BND along the Brownsville Ship Channel are considered public lands. As the entire Project would disturb more than 5 acres of public lands, regardless of the design alternatives selected, an Antiquities Permit would be needed. In addition, as a USACE permit is required for either intake option, NHPA consultation would be needed for the entire Project scope.

3.4 Texas General Land Office

The GLO is responsible for managing state lands and mineral-right properties throughout the state. These lands include beaches, bays, estuaries and other "submerged" lands out to 10.3 miles in the Gulf of Mexico.

3.4.1 Coastal Management Program

Federal and state permits issued for projects within the identified coastal zone are reviewed by the Coastal Coordination Council (CCC) for consistency with the goals and policies of the Texas Coastal Management Program (CMP). The CCC is charged with adopting uniform goals and policies to guide decision-making by all entities regulating or managing natural resource use within the Texas coastal area. The CCC reviews significant actions taken or authorized by state agencies and subdivisions that may adversely affect coastal natural resources to determine their consistency with the CMP goals and policies. The CCC is chaired by the GLO and is comprised of members from various agencies and the public. Permitting agencies, such as the USACE and TCEQ, must perform the consistency review and then refer it to the CCC. The applicant must also provide a consistency assertion. Project consistency is generally obtained by compliance with the rules and permit conditions of the issuing agencies.

Design Alternatives

The proposed location of the Project site along the Brownsville Ship Channel is within the identified coastal zone. Issuance of a USACE permit for either intake option would require a consistency review by the CCC.

3.4.2 Miscellaneous Easement

Miscellaneous Easements are issued on both coastal submerged lands and state-owned uplands for projects which require a right-of-way on, across, under, or over state-owned lands, pursuant to Texas Natural Resources Code §51.291. Miscellaneous Easement contracts cover activities such as oil and gas pipelines, power transmission lines, communication lines, roads, and certain other structures and uses. Components of the application package includes applicant information, location of the right-of-way, technical aspects of the pipeline, specifics on installation and any best management practices to be included.

Design Alternatives

The issuance of a Miscellaneous Easement would only apply to the portions of the Project involving installation of pipelines, roads, and power transmission lines that cross state lands. Should other facilities such as lagoons, evaporation ponds, etc. be located on state lands, other easements may be required.

3.5 Texas Department of Transportation

TxDOT is the state transportation agency charged with overseeing the state's transportation systems. Installations of pipelines in TxDOT right-of-way in Cameron County requires approval of a Utility Line request by the TxDOT Pharr District Engineer. The Utility Line request shall include plans that detail the design, proposed location, vertical elevations, and horizontal alignments of the project. The request also commits the applicant to use best management practices to minimize erosion and sedimentation, and require revegetation of the project area.

Design Alternatives

Construction of the desalination plant and facilities also may require additional permits such as driveway access to a state highway or construction of an access road that connects to a state highway.

3.6 Cameron County

Depending on the specific location of the desalination plant and associated facilities, various Cameron County permits and requirements may be required. These permits could include zoning permits, conditional use permits, building permits, floodplain management requirements, and local road construction permits. According to Cameron County staff, there are no specific county ordinances or regulations regarding environmental restrictions such as vegetation or tree removal, noise, or air quality.

3.7 Brownsville Navigation District

The Brownsville Navigation District (BND) owns all waterfront facilities on the Brownsville Ship Channel, at the Main Harbor and at the Fishing Harbor. Location of the desalination plant along the south shore of the Brownsville Ship Channel likely will require a lease from the BND. BND leasing policies include building setback requirements, building code compliance, required connections to a sanitary sewer system, and availability of pipeline easements. BND leasing policies also require concurrence on USACE permits.

3.8 Railroad Companies

According to the Brownsville Navigation District, the Port of Brownsville is served by Union Pacific, Burlington Northern Santa Fe and TFM rail companies. Pipelines that cross any rail line would require approval from the appropriate rail company.

4.0 PERMITTING COSTS AND SCHEDULES

Obtaining regulatory approvals and permits for a project can be a lengthy and sometimes costly endeavor. It is anticipated the permitting process for a seawater desalination plant in Texas will be complex process. A seawater desalination plant has never been permitted before in Texas; therefore, the timelines and costs to obtain permits are based on typical times and order-of-magnitude costs to obtain similar permits for other similar-scale projects.

Table 4-1 presents a general schedule and order-of-magnitude costs required to obtain the federal, state, and local permits necessary to construct and operate a seawater desalination plant on the Brownsville Ship Channel. The costs estimated in Table 4-1 do not include costs for any additional data collection, mitigation or monitoring requirements imposed as a result of permitting or consultation. In addition, schedule estimates do not include additional meetings requested by the public or contested case hearings.

Table 4-1. General Costs and Schedules for Potential Permits

Permit/Approval	Agency	Schedule (months)	Cost (\$1000)	Intake Options		Treatment System	Finished Water System	Concentrate Discharge Options			Power Options	
				Intake Channel	Open Water Intake			Diffusion into Gulf of Mexico	No Discharge Evaporation Pond	Discharge to Tidal Flats	Existing Grid	Wind Turbine(s) Supplement
Section 10/404 Nationwide Permit	USACE	4 – 8	20 – 35		✓					✓		
Section 10/404 Individual Permit	USACE	6 – 18	45 – 85	✓				✓				
NEPA – EA (excludes other permit costs)	USACE	6 – 18	50 – 250	✓	✓	✓ ¹	✓ ¹	✓	✓ ¹	✓	✓ ¹	✓ ¹
NEPA - EIS	USACE	12 – 36	500 – 3000	✓ ²	✓ ²			✓		✓ ²		
ESA	USFWS	2 – 12	30 – 60	✓	✓	✓ ¹	✓ ¹	✓	✓ ¹	✓ ¹	✓ ¹	✓ ¹
ESA/Essential Fish Habitat	NMFS	2 – 12	35 – 70	✓	✓			✓				
Navigable Airspace Hazard Determination	FAA	2 – 4	<1									✓
Section 401 Certification	TCEQ	4 – 18	2 – 5	✓	✓			✓		✓		
TPDES – Industrial Wastewater Discharge Permit	TCEQ	13 – 18	20 – 75					✓		✓		
Texas Land Application Permit	TCEQ	13 – 18	20 – 75						✓			
TPDES – Hydrostatic Test Water Discharge Permit	TCEQ	1 – 2	5 – 15	✓	✓	✓	✓	✓		✓		
TPDES – Construction Discharge Permit	TCEQ	1 – 2	5 – 15	✓	✓	✓	✓	✓	✓	✓	✓	✓
Land Application for Water Treatment Sludge	TCEQ	1 – 2	5 – 10			✓						
Water Rights Permit	TCEQ	8 – 24	10 – 50	✓	✓	✓	✓	✓	✓	✓	✓	✓
Public Water System Registration	TCEQ	3 – 12	10 – 15	✓	✓	✓	✓	✓	✓	✓	✓	✓
Petroleum Storage Tanks Registration	TCEQ	1 – 2	<1 – 2			✓	✓					
Air Permit by Rule	TCEQ	1 – 2	<1 – 2	✓	✓	✓	✓	✓		✓	✓	✓
New Source Review Air Permit	TCEQ	12 – 18	6 – 12						✓			
Protected Species Consultation	TPWD	2 – 6	10 – 20	✓	✓	✓ ¹	✓ ¹	✓	✓	✓	✓ ¹	✓ ¹
Sand and Gravel Permit	TPWD	2 – 6	5 – 10	✓	✓			✓		✓		
Antiquities Permit	THC	1 – 2	<1	✓	✓	✓	✓	✓	✓	✓	✓	✓
National Historic Preservation Act Section 106 Review and Compliance	THC	3 – 8	20 – 150	✓	✓	✓ ¹	✓ ¹	✓	✓ ¹	✓	✓ ¹	✓ ¹
Coastal Management Program	GLO	4 – 18	5 – 10	✓	✓	✓	✓	✓	✓	✓	✓	✓
Miscellaneous Easement	GLO	3 – 6	5 – 10	✓	✓	✓	✓	✓	✓	✓	✓	✓
Utility Line Request	TxDOT	1 – 3	1 – 4				✓	✓		✓	✓	
Local Permits and Easements	Cameron County, BND, Railroad Companies	1 – 12	5 – 20	✓	✓	✓	✓	✓	✓	✓	✓	✓

1 – Permit or authorization not directly required by alternative, however, due to permits or authorizations issued for other components, impacts from the alternative would be evaluated as part of the entire Project scope; 2 – Authorization possible but not likely

5.0 REFERENCES

Brownsville Public Utilities Board. (2008). *Final Pilot Study Report Texas Seawater Desalination Demonstration Project*. Austin, Texas.

Federal Aviation Administration. (2010). *U.S. and Territories Airport Lookup*. Retrieved April 11, 2010, from <https://airports-gis.faa.gov/airportsgis/airportLookup/>

Texas Commission on Environmental Quality. (2010). *Texas' Air Permitting Program Rulemaking*. Retrieved April 7, 2010, from http://www.tceq.state.tx.us/permitting/air/announcements/nsr_announce_12_10_09.html

Texas Water Development Board. (2008). *Guidance Manual for Brackish Groundwater Desalination in Texas*. Austin, Texas

United States Environmental Protection Agency. (2010). *National Environmental Policy Act Basic Information*. Retrieved March 22, 2010, from <http://www.epa.gov/compliance/basics/nepa.html>

United States Fish and Wildlife Service. (2009). *Wetlands Mapper*. Retrieved April 9, 2010, from <http://www.fws.gov/wetlands/Data/Mapper.html>

APPENDIX A

USACE NATIONWIDE PERMITS

significant” as defined under Executive Order 12866, and (2) concerns an environmental health or safety risk that we have reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, we must evaluate the environmental health or safety effects of the proposed rule on children, and explain why the regulation is preferable to other potentially effective and reasonably feasible alternatives.

The NWP's issued today are not subject to this Executive Order because they are not economically significant as defined in Executive Order 12866. In addition, these NWP's do not concern an environmental or safety risk that we have reason to believe may have a disproportionate effect on children.

Executive Order 13175

Executive Order 13175, entitled “Consultation and Coordination with Indian Tribal Governments” (65 FR 67249, November 6, 2000), requires agencies to develop an accountable process to ensure “meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications.” The phrase “policies that have tribal implications” is defined in the Executive Order to include regulations that have “substantial direct effects on one or more Indian tribes, on the relationship between the Federal government and the Indian tribes, or on the distribution of power and responsibilities between the Federal government and Indian tribes.”

The NWP's issued today do not have tribal implications. They are generally consistent with current agency practice and will not have substantial direct effects on tribal governments, on the relationship between the Federal government and the Indian tribes, or on the distribution of power and responsibilities between the Federal government and Indian tribes. Therefore, Executive Order 13175 does not apply to this proposal. Corps districts are conducting government-to-government consultation with Indian tribes to develop regional conditions that help protect tribal rights and trust resources, and to facilitate compliance with general condition 16, Tribal Rights.

Environmental Documentation

A decision document, which includes an environmental assessment and Finding of No Significant Impact (FONSI), has been prepared for each NWP. These decision documents are available at: <http://www.regulations.gov> (docket ID number COE-2006-0005). They are also available by contacting

Headquarters, U.S. Army Corps of Engineers, Operations and Regulatory Community of Practice, 441 G Street, NW., Washington, DC 20314-1000.

Congressional Review Act

The Congressional Review Act, 5 U.S.C. 801 et seq., as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. We will submit a report containing the final NWP's and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States. A major rule cannot take effect until 60 days after it is published in the **Federal Register**. The proposed NWP's are not a “major rule” as defined by 5 U.S.C. 804(2).

Executive Order 12898

Executive Order 12898 requires that, to the greatest extent practicable and permitted by law, each Federal agency must make achieving environmental justice part of its mission. Executive Order 12898 provides that each Federal agency conduct its programs, policies, and activities that substantially affect human health or the environment in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons (including populations) from participation in, denying persons (including populations) the benefits of, or subjecting persons (including populations) to discrimination under such programs, policies, and activities because of their race, color, or national origin.

The NWP's issued today are not expected to negatively impact any community, and therefore are not expected to cause any disproportionately high and adverse impacts to minority or low-income communities.

Executive Order 13211

The proposed NWP's are not a “significant energy action” as defined in Executive Order 13211, “Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use” (66 FR 28355, May 22, 2001) because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy.

Authority

We are issuing new NWP's, modifying existing NWP's, and reissuing NWP's without change under the authority of Section 404(e) of the Clean Water Act (33 U.S.C. 1344) and Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 401 et seq.).

Dated: March 1, 2007.

Don T. Riley,

Major General, U.S. Army, Director of Civil Works.

Nationwide Permits, Conditions, Further Information, and Definitions

A. Index of Nationwide Permits, Conditions, Further Information, and Definitions

Nationwide Permits

1. Aids to Navigation.
2. Structures in Artificial Canals.
3. Maintenance.
4. Fish and Wildlife Harvesting, Enhancement, and Attraction Devices and Activities.
5. Scientific Measurement Devices.
6. Survey Activities.
7. Outfall Structures and Associated Intake Structures.
8. Oil and Gas Structures on the Outer Continental Shelf.
9. Structures in Fleeting and Anchorage Areas.
10. Mooring Buoys.
11. Temporary Recreational Structures.
12. Utility Line Activities.
13. Bank Stabilization.
14. Linear Transportation Projects.
15. U.S. Coast Guard Approved Bridges.
16. Return Water From Upland Contained Disposal Areas.
17. Hydropower Projects.
18. Minor Discharges.
19. Minor Dredging
20. Oil Spill Cleanup.
21. Surface Coal Mining Operations.
22. Removal of Vessels.
23. Approved Categorical Exclusions.
24. Indian Tribe or State Administered Section 404 Programs.
25. Structural Discharges.
26. [Reserved].
27. Aquatic Habitat Restoration, Establishment, and Enhancement Activities.
28. Modifications of Existing Marinas.
29. Residential Developments.
30. Moist Soil Management for Wildlife.
31. Maintenance of Existing Flood Control Facilities.
32. Completed Enforcement Actions.
33. Temporary Construction, Access, and Dewatering.
34. Cranberry Production Activities.
35. Maintenance Dredging of Existing Basins.
36. Boat Ramps.
37. Emergency Watershed Protection and Rehabilitation.
38. Cleanup of Hazardous and Toxic Waste.
39. Commercial and Institutional Developments.
40. Agricultural Activities.

41. Reshaping Existing Drainage Ditches.
42. Recreational Facilities.
43. Stormwater Management Facilities.
44. Mining Activities.
45. Repair of Uplands Damaged by Discrete Events.
46. Discharges in Ditches.
47. Pipeline Safety Program Designated Time Sensitive Inspections and Repairs.
48. Existing Commercial Shellfish Aquaculture Activities.
49. Coal Remining Activities.
50. Underground Coal Mining Activities.

Nationwide Permit General Conditions

1. Navigation.
2. Aquatic Life Movements.
3. Spawning Areas.
4. Migratory Bird Breeding Areas.
5. Shellfish Beds.
6. Suitable Material.
7. Water Supply Intakes.
8. Adverse Effects from Impoundments.
9. Management of Water Flows.
10. Fills Within 100-Year Floodplains.
11. Equipment.
12. Soil Erosion and Sediment Controls.
13. Removal of Temporary Fills.
14. Proper Maintenance.
15. Wild and Scenic Rivers.
16. Tribal Rights.
17. Endangered Species.
18. Historic Properties.
19. Designated Critical Resource Waters.
20. Mitigation.
21. Water Quality.
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B. Nationwide Permits

1. *Aids to Navigation.* The placement of aids to navigation and regulatory markers which are approved by and installed in accordance with the requirements of the U.S. Coast Guard (see 33 CFR, chapter I, subchapter C, part 66). (Section 10)

2. *Structures in Artificial Canals.* Structures constructed in artificial canals within principally residential developments where the connection of the canal to a navigable water of the United States has been previously authorized (see 33 CFR 322.5(g)). (Section 10)

3. *Maintenance.* (a) The repair, rehabilitation, or replacement of any previously authorized, currently serviceable, structure, or fill, or of any currently serviceable structure or fill authorized by 33 CFR 330.3, provided that the structure or fill is not to be put to uses differing from those uses specified or contemplated for it in the original permit or the most recently authorized modification. Minor deviations in the structure's configuration or filled area, including those due to changes in materials, construction techniques, or current construction codes or safety standards that are necessary to make the repair, rehabilitation, or replacement are authorized. This NWP authorizes the repair, rehabilitation, or replacement of those structures or fills destroyed or damaged by storms, floods, fire or other discrete events, provided the repair, rehabilitation, or replacement is commenced, or is under contract to commence, within two years of the date of their destruction or damage. In cases of catastrophic events, such as hurricanes or tornadoes, this two-year limit may be waived by the district engineer, provided the permittee can demonstrate funding, contract, or other similar delays.

(b) This NWP also authorizes the removal of accumulated sediments and debris in the vicinity of and within existing structures (e.g., bridges, culverted road crossings, water intake structures, etc.) and the placement of new or additional riprap to protect the structure. The removal of sediment is limited to the minimum necessary to restore the waterway in the immediate vicinity of the structure to the approximate dimensions that existed when the structure was built, but cannot extend further than 200 feet in any direction from the structure. This 200 foot limit does not apply to maintenance

dredging to remove accumulated sediments blocking or restricting outfall and intake structures or to maintenance dredging to remove accumulated sediments from canals associated with outfall and intake structures. All dredged or excavated materials must be deposited and retained in an upland area unless otherwise specifically approved by the district engineer under separate authorization. The placement of riprap must be the minimum necessary to protect the structure or to ensure the safety of the structure. Any bank stabilization measures not directly associated with the structure will require a separate authorization from the district engineer.

(c) This NWP also authorizes temporary structures, fills, and work necessary to conduct the maintenance activity. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

(d) This NWP does not authorize maintenance dredging for the primary purpose of navigation or beach restoration. This NWP does not authorize new stream channelization or stream relocation projects.

Notification: For activities authorized by paragraph (b) of this NWP, the permittee must submit a pre-construction notification to the district engineer prior to commencing the activity (see general condition 27). Where maintenance dredging is proposed, the pre-construction notification must include information regarding the original design capacities and configurations of the outfalls, intakes, small impoundments, and canals. (Sections 10 and 404)

Note: This NWP authorizes the repair, rehabilitation, or replacement of any previously authorized structure or fill that does not qualify for the Clean Water Act Section 404(f) exemption for maintenance.

4. *Fish and Wildlife Harvesting, Enhancement, and Attraction Devices and Activities.* Fish and wildlife harvesting devices and activities such as pound nets, crab traps, crab dredging, eel pots, lobster traps, duck blinds, and

clam and oyster digging, and small fish attraction devices such as open water fish concentrators (sea kites, etc.). This NWP does not authorize artificial reefs or impoundments and semi-impoundments of waters of the United States for the culture or holding of motile species such as lobster, or the use of covered oyster trays or clam racks. (Sections 10 and 404)

5. *Scientific Measurement Devices.*

Devices, whose purpose is to measure and record scientific data, such as staff gages, tide gages, water recording devices, water quality testing and improvement devices, and similar structures. Small weirs and flumes constructed primarily to record water quantity and velocity are also authorized provided the discharge is limited to 25 cubic yards. (Sections 10 and 404)

6. *Survey Activities.* Survey activities, such as core sampling, seismic exploratory operations, plugging of seismic shot holes and other exploratory-type bore holes, exploratory trenching, soil surveys, sampling, and historic resources surveys. For the purposes of this NWP, the term "exploratory trenching" means mechanical land clearing of the upper soil profile to expose bedrock or substrate, for the purpose of mapping or sampling the exposed material. The area in which the exploratory trench is dug must be restored to its pre-construction elevation upon completion of the work. In wetlands, the top 6 to 12 inches of the trench should normally be backfilled with topsoil from the trench. This NWP authorizes the construction of temporary pads, provided the discharge does not exceed 25 cubic yards. Discharges and structures associated with the recovery of historic resources are not authorized by this NWP. Drilling and the discharge of excavated material from test wells for oil and gas exploration are not authorized by this NWP; the plugging of such wells is authorized. Fill placed for roads and other similar activities is not authorized by this NWP. The NWP does not authorize any permanent structures. The discharge of drilling mud and cuttings may require a permit under Section 402 of the Clean Water Act. (Sections 10 and 404)

7. *Outfall Structures and Associated Intake Structures.* Activities related to the construction or modification of outfall structures and associated intake structures, where the effluent from the outfall is authorized, conditionally authorized, or specifically exempted by, or that are otherwise in compliance with regulations issued under the National Pollutant Discharge Elimination System

Program (Section 402 of the Clean Water Act). The construction of intake structures is not authorized by this NWP, unless they are directly associated with an authorized outfall structure.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 27.) (Sections 10 and 404)

8. *Oil and Gas Structures on the Outer Continental Shelf.* Structures for the exploration, production, and transportation of oil, gas, and minerals on the outer continental shelf within areas leased for such purposes by the Department of the Interior, Minerals Management Service. Such structures shall not be placed within the limits of any designated shipping safety fairway or traffic separation scheme, except temporary anchors that comply with the fairway regulations in 33 CFR 322.5(l). The district engineer will review such proposals to ensure compliance with the provisions of the fairway regulations in 33 CFR 322.5(l). Any Corps review under this NWP will be limited to the effects on navigation and national security in accordance with 33 CFR 322.5(f). Such structures will not be placed in established danger zones or restricted areas as designated in 33 CFR part 334, nor will such structures be permitted in EPA or Corps designated dredged material disposal areas.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 27.) (Section 10)

9. *Structures in Fleeting and Anchorage Areas.* Structures, buoys, floats and other devices placed within anchorage or fleeting areas to facilitate moorage of vessels where the U.S. Coast Guard has established such areas for that purpose. (Section 10)

10. *Mooring Buoys.* Non-commercial, single-boat, mooring buoys. (Section 10)

11. *Temporary Recreational Structures.* Temporary buoys, markers, small floating docks, and similar structures placed for recreational use during specific events such as water skiing competitions and boat races or seasonal use, provided that such structures are removed within 30 days after use has been discontinued. At Corps of Engineers reservoirs, the reservoir manager must approve each buoy or marker individually. (Section 10)

12. *Utility Line Activities.* Activities required for the construction, maintenance, repair, and removal of utility lines and associated facilities in waters of the United States, provided the activity does not result in the loss

of greater than 1/2 acre of waters of the United States.

Utility lines: This NWP authorizes the construction, maintenance, or repair of utility lines, including outfall and intake structures, and the associated excavation, backfill, or bedding for the utility lines, in all waters of the United States, provided there is no change in pre-construction contours. A "utility line" is defined as any pipe or pipeline for the transportation of any gaseous, liquid, liquescent, or slurry substance, for any purpose, and any cable, line, or wire for the transmission for any purpose of electrical energy, telephone, and telegraph messages, and radio and television communication. The term "utility line" does not include activities that drain a water of the United States, such as drainage tile or french drains, but it does apply to pipes conveying drainage from another area.

Material resulting from trench excavation may be temporarily sidecast into waters of the United States for no more than three months, provided the material is not placed in such a manner that it is dispersed by currents or other forces. The district engineer may extend the period of temporary side casting for no more than a total of 180 days, where appropriate. In wetlands, the top 6 to 12 inches of the trench should normally be backfilled with topsoil from the trench. The trench cannot be constructed or backfilled in such a manner as to drain waters of the United States (e.g., backfilling with extensive gravel layers, creating a french drain effect). Any exposed slopes and stream banks must be stabilized immediately upon completion of the utility line crossing of each waterbody.

Utility line substations: This NWP authorizes the construction, maintenance, or expansion of substation facilities associated with a power line or utility line in non-tidal waters of the United States, provided the activity, in combination with all other activities included in one single and complete project, does not result in the loss of greater than 1/2 acre of waters of the United States. This NWP does not authorize discharges into non-tidal wetlands adjacent to tidal waters of the United States to construct, maintain, or expand substation facilities.

Foundations for overhead utility line towers, poles, and anchors: This NWP authorizes the construction or maintenance of foundations for overhead utility line towers, poles, and anchors in all waters of the United States, provided the foundations are the minimum size necessary and separate footings for each tower leg (rather than

a larger single pad) are used where feasible.

Access roads: This NWP authorizes the construction of access roads for the construction and maintenance of utility lines, including overhead power lines and utility line substations, in non-tidal waters of the United States, provided the total discharge from a single and complete project does not cause the loss of greater than 1/2-acre of non-tidal waters of the United States. This NWP does not authorize discharges into non-tidal wetlands adjacent to tidal waters for access roads. Access roads must be the minimum width necessary (see Note 2, below). Access roads must be constructed so that the length of the road minimizes any adverse effects on waters of the United States and must be as near as possible to pre-construction contours and elevations (e.g., at grade corduroy roads or geotextile/gravel roads). Access roads constructed above pre-construction contours and elevations in waters of the United States must be properly bridged or culverted to maintain surface flows.

This NWP may authorize utility lines in or affecting navigable waters of the United States even if there is no associated discharge of dredged or fill material (See 33 CFR part 322). Overhead utility lines constructed over section 10 waters and utility lines that are routed in or under section 10 waters without a discharge of dredged or fill material require a section 10 permit.

This NWP also authorizes temporary structures, fills, and work necessary to conduct the utility line activity. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if any of the following criteria are met: (1) The activity involves mechanized land clearing in a forested wetland for the utility line right-of-way; (2) a section 10 permit is required; (3) the utility line in waters of the United States, excluding overhead lines, exceeds 500 feet; (4) the utility line is placed within a

jurisdictional area (i.e., water of the United States), and it runs parallel to a stream bed that is within that jurisdictional area; (5) discharges that result in the loss of greater than 1/10-acre of waters of the United States; (6) permanent access roads are constructed above grade in waters of the United States for a distance of more than 500 feet; or (7) permanent access roads are constructed in waters of the United States with impervious materials. (See general condition 27.) (Sections 10 and 404)

Note 1: Where the proposed utility line is constructed or installed in navigable waters of the United States (i.e., section 10 waters), copies of the pre-construction notification and NWP verification will be sent by the Corps to the National Oceanic and Atmospheric Administration (NOAA), National Ocean Service (NOS), for charting the utility line to protect navigation.

Note 2: Access roads used for both construction and maintenance may be authorized, provided they meet the terms and conditions of this NWP. Access roads used solely for construction of the utility line must be removed upon completion of the work, accordance with the requirements for temporary fills.

Note 3: Pipes or pipelines used to transport gaseous, liquid, liquescent, or slurry substances over navigable waters of the United States are considered to be bridges, not utility lines, and may require a permit from the U.S. Coast Guard pursuant to Section 9 of the Rivers and Harbors Act of 1899. However, any discharges of dredged or fill material into waters of the United States associated with such pipelines will require a section 404 permit (see NWP 15).

13. Bank Stabilization. Bank stabilization activities necessary for erosion prevention, provided the activity meets all of the following criteria:

(a) No material is placed in excess of the minimum needed for erosion protection;

(b) The activity is no more than 500 feet in length along the bank, unless this criterion is waived in writing by the district engineer;

(c) The activity will not exceed an average of one cubic yard per running foot placed along the bank below the plane of the ordinary high water mark or the high tide line, unless this criterion is waived in writing by the district engineer;

(d) The activity does not involve discharges of dredged or fill material into special aquatic sites, unless this criterion is waived in writing by the district engineer;

(e) No material is of the type, or is placed in any location, or in any manner, to impair surface water flow

into or out of any water of the United States;

(f) No material is placed in a manner that will be eroded by normal or expected high flows (properly anchored trees and treetops may be used in low energy areas); and, (g) The activity is not a stream channelization activity.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if the bank stabilization activity: (1) Involves discharges into special aquatic sites; (2) is in excess of 500 feet in length; or (3) will involve the discharge of greater than an average of one cubic yard per running foot along the bank below the plane of the ordinary high water mark or the high tide line. (See general condition 27.) (Sections 10 and 404)

14. Linear Transportation Projects. Activities required for the construction, expansion, modification, or improvement of linear transportation projects (e.g., roads, highways, railways, trails, airport runways, and taxiways) in waters of the United States. For linear transportation projects in non-tidal waters, the discharge cannot cause the loss of greater than 1/2-acre of waters of the United States. For linear transportation projects in tidal waters, the discharge cannot cause the loss of greater than 1/3-acre of waters of the United States. Any stream channel modification, including bank stabilization, is limited to the minimum necessary to construct or protect the linear transportation project; such modifications must be in the immediate vicinity of the project.

This NWP also authorizes temporary structures, fills, and work necessary to construct the linear transportation project. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

This NWP cannot be used to authorize non-linear features commonly associated with transportation projects, such as vehicle maintenance or storage buildings, parking lots, train stations, or aircraft hangars.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if: (1) The loss of waters of the United States exceeds $\frac{1}{10}$ acre; or (2) there is a discharge in a special aquatic site, including wetlands. (See general condition 27.) (Sections 10 and 404)

Note: Some discharges for the construction of farm roads or forest roads, or temporary roads for moving mining equipment, may qualify for an exemption under Section 404(f) of the Clean Water Act (see 33 CFR 323.4).

15. *U.S. Coast Guard Approved Bridges.* Discharges of dredged or fill material incidental to the construction of bridges across navigable waters of the United States, including cofferdams, abutments, foundation seals, piers, and temporary construction and access fills, provided such discharges have been authorized by the U.S. Coast Guard as part of the bridge permit. Causeways and approach fills are not included in this NWP and will require a separate section 404 permit. (Section 404)

16. *Return Water From Upland Contained Disposal Areas.* Return water from an upland contained dredged material disposal area. The return water from a contained disposal area is administratively defined as a discharge of dredged material by 33 CFR 323.2(d), even though the disposal itself occurs on the upland and does not require a section 404 permit. This NWP satisfies the technical requirement for a section 404 permit for the return water where the quality of the return water is controlled by the state through the section 401 certification procedures. The dredging activity may require a section 404 permit (33 CFR 323.2(d)), and will require a section 10 permit if located in navigable waters of the United States. (Section 404)

17. *Hydropower Projects.* Discharges of dredged or fill material associated with hydropower projects having: (a) Less than 5000 kW of total generating capacity at existing reservoirs, where the project, including the fill, is licensed by the Federal Energy Regulatory Commission (FERC) under the Federal Power Act of 1920, as amended; or (b) a licensing exemption granted by the FERC pursuant to Section 408 of the Energy Security Act of 1980 (16 U.S.C. 2705 and 2708) and Section 30 of the Federal Power Act, as amended.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 27.) (Section 404)

18. *Minor Discharges.* Minor discharges of dredged or fill material

into all waters of the United States, provided the activity meets all of the following criteria:

(a) The quantity of discharged material and the volume of area excavated do not exceed 25 cubic yards below the plane of the ordinary high water mark or the high tide line;

(b) The discharge will not cause the loss of more than $\frac{1}{10}$ acre of waters of the United States; and

(c) The discharge is not placed for the purpose of a stream diversion.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if: (1) The discharge or the volume of area excavated exceeds 10 cubic yards below the plane of the ordinary high water mark or the high tide line, or (2) the discharge is in a special aquatic site, including wetlands. (See general condition 27.) (Sections 10 and 404)

19. *Minor Dredging.* Dredging of no more than 25 cubic yards below the plane of the ordinary high water mark or the mean high water mark from navigable waters of the United States (i.e., section 10 waters). This NWP does not authorize the dredging or degradation through siltation of coral reefs, sites that support submerged aquatic vegetation (including sites where submerged aquatic vegetation is documented to exist but may not be present in a given year), anadromous fish spawning areas, or wetlands, or the connection of canals or other artificial waterways to navigable waters of the United States (see 33 CFR 322.5(g)). (Sections 10 and 404)

20. *Oil Spill Cleanup.* Activities required for the containment and cleanup of oil and hazardous substances that are subject to the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR part 300) provided that the work is done in accordance with the Spill Control and Countermeasure Plan required by 40 CFR 112.3 and any existing state contingency plan and provided that the Regional Response Team (if one exists in the area) concurs with the proposed containment and cleanup action. This NWP also authorizes activities required for the cleanup of oil releases in waters of the United States from electrical equipment that are governed by EPA's polychlorinated biphenyl spill response regulations at 40 CFR part 761. (Sections 10 and 404)

21. *Surface Coal Mining Operations.* Discharges of dredged or fill material into waters of the United States associated with surface coal mining and reclamation operations provided the activities are already authorized, or are

currently being processed as part of an integrated permit processing procedure, by the Department of Interior (DOI), Office of Surface Mining (OSM), or by states with approved programs under Title V of the Surface Mining Control and Reclamation Act of 1977.

Notification: The permittee must submit a pre-construction notification to the district engineer and receive written authorization prior to commencing the activity. (See general condition 27.) (Sections 10 and 404)

22. *Removal of Vessels.* Temporary structures or minor discharges of dredged or fill material required for the removal of wrecked, abandoned, or disabled vessels, or the removal of man-made obstructions to navigation. This NWP does not authorize maintenance dredging, shoal removal, or riverbank snagging.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if: (1) The vessel is listed or eligible for listing in the National Register of Historic Places; or (2) the activity is conducted in a special aquatic site, including coral reefs and wetlands. (See general condition 27.) If condition 1 above is triggered, the permittee cannot commence the activity until informed by the district engineer that compliance with the "Historic Properties" general condition is completed. (Sections 10 and 404)

Note 1: If a removed vessel is disposed of in waters of the United States, a permit from the U.S. EPA may be required (see 40 CFR 229.3). If a Department of the Army permit is required for vessel disposal in waters of the United States, separate authorization will be required.

Note 2: Compliance with general condition 17, Endangered Species, and general condition 18, Historic Properties, is required for all NWPs. The concern with historic properties is emphasized in the notification requirements for this NWP because of the likelihood that submerged vessels may be historic properties.

23. *Approved Categorical Exclusions.* Activities undertaken, assisted, authorized, regulated, funded, or financed, in whole or in part, by another Federal agency or department where:

(a) That agency or department has determined, pursuant to the Council on Environmental Quality's implementing regulations for the National Environmental Policy Act (40 CFR part 1500 et seq.), that the activity is categorically excluded from environmental documentation, because it is included within a category of actions which neither individually nor

cumulatively have a significant effect on the human environment; and

(b) The Office of the Chief of Engineers (Attn: CECW-CO) has concurred with that agency's or department's determination that the activity is categorically excluded and approved the activity for authorization under NWP 23.

The Office of the Chief of Engineers may require additional conditions, including pre-construction notification, for authorization of an agency's categorical exclusions under this NWP.

Notification: Certain categorical exclusions approved for authorization under this NWP require the permittee to submit a pre-construction notification to the district engineer prior to commencing the activity (see general condition 27). The activities that require pre-construction notification are listed in the appropriate Regulatory Guidance Letters. (Sections 10 and 404)

Note: The agency or department may submit an application for an activity believed to be categorically excluded to the Office of the Chief of Engineers (Attn: CECW-CO). Prior to approval for authorization under this NWP of any agency's activity, the Office of the Chief of Engineers will solicit public comment. As of the date of issuance of this NWP, agencies with approved categorical exclusions are the: Bureau of Reclamation, Federal Highway Administration, and U.S. Coast Guard. Activities approved for authorization under this NWP as of the date of this notice are found in Corps Regulatory Guidance Letter 05-07, which is available at: <http://www.usace.army.mil/inet/functions/cw/cecwo/reg/rglindx.htm>. Any future approved categorical exclusions will be announced in Regulatory Guidance Letters and posted on this same Web site.

24. Indian Tribe or State Administered Section 404 Programs. Any activity permitted by a state or Indian Tribe administering its own section 404 permit program pursuant to 33 U.S.C. 1344(g)-(l) is permitted pursuant to Section 10 of the Rivers and Harbors Act of 1899. (Section 10)

Note 1: As of the date of the promulgation of this NWP, only New Jersey and Michigan administer their own section 404 permit programs.

Note 2: Those activities that do not involve an Indian Tribe or State section 404 permit are not included in this NWP, but certain structures will be exempted by Section 154 of Pub. L. 94-587, 90 Stat. 2917 (33 U.S.C. 591) (see 33 CFR 322.3(a)(2)).

25. Structural Discharges. Discharges of material such as concrete, sand, rock, etc., into tightly sealed forms or cells where the material will be used as a structural member for standard pile supported structures, such as bridges, transmission line footings, and

walkways, or for general navigation, such as mooring cells, including the excavation of bottom material from within the form prior to the discharge of concrete, sand, rock, etc. This NWP does not authorize filled structural members that would support buildings, building pads, homes, house pads, parking areas, storage areas and other such structures. The structure itself may require a section 10 permit if located in navigable waters of the United States. (Section 404)

26. [Reserved]

27. Aquatic Habitat Restoration, Establishment, and Enhancement Activities. Activities in waters of the United States associated with the restoration, enhancement, and establishment of tidal and non-tidal wetlands and riparian areas and the restoration and enhancement of non-tidal streams and other non-tidal open waters, provided those activities result in net increases in aquatic resource functions and services.

To the extent that a Corps permit is required, activities authorized by this NWP include, but are not limited to: the removal of accumulated sediments; the installation, removal, and maintenance of small water control structures, dikes, and berms; the installation of current deflectors; the enhancement, restoration, or establishment of riffle and pool stream structure; the placement of in-stream habitat structures; modifications of the stream bed and/or banks to restore or establish stream meanders; the backfilling of artificial channels and drainage ditches; the removal of existing drainage structures; the construction of small nesting islands; the construction of open water areas; the construction of oyster habitat over unvegetated bottom in tidal waters; shellfish seeding; activities needed to reestablish vegetation, including plowing or discing for seed bed preparation and the planting of appropriate wetland species; mechanized land clearing to remove non-native invasive, exotic, or nuisance vegetation; and other related activities. Only native plant species should be planted at the site.

This NWP authorizes the relocation of non-tidal waters, including non-tidal wetlands and streams, on the project site provided there are net increases in aquatic resource functions and services.

Except for the relocation of non-tidal waters on the project site, this NWP does not authorize the conversion of a stream or natural wetlands to another aquatic habitat type (e.g., stream to wetland or vice versa) or uplands. This NWP does not authorize stream channelization. This NWP does not

authorize the relocation of tidal waters or the conversion of tidal waters, including tidal wetlands, to other aquatic uses, such as the conversion of tidal wetlands into open water impoundments.

Reversion. For enhancement, restoration, and establishment activities conducted: (1) In accordance with the terms and conditions of a binding wetland enhancement, restoration, or establishment agreement between the landowner and the U.S. Fish and Wildlife Service (FWS), the Natural Resources Conservation Service (NRCS), the Farm Service Agency (FSA), the National Marine Fisheries Service (NMFS), the National Ocean Service (NOS), or their designated state cooperating agencies; (2) as voluntary wetland restoration, enhancement, and establishment actions documented by the NRCS or USDA Technical Service Provider pursuant to NRCS Field Office Technical Guide standards; or (3) on reclaimed surface coal mine lands, in accordance with a Surface Mining Control and Reclamation Act permit issued by the OSM or the applicable state agency, this NWP also authorizes any future discharge of dredged or fill material associated with the reversion of the area to its documented prior condition and use (i.e., prior to the restoration, enhancement, or establishment activities). The reversion must occur within five years after expiration of a limited term wetland restoration or establishment agreement or permit, and is authorized in these circumstances even if the discharge occurs after this NWP expires. The five-year reversion limit does not apply to agreements without time limits reached between the landowner and the FWS, NRCS, FSA, NMFS, NOS, or an appropriate state cooperating agency. This NWP also authorizes discharges of dredged or fill material in waters of the United States for the reversion of wetlands that were restored, enhanced, or established on prior-converted cropland that has not been abandoned or on uplands, in accordance with a binding agreement between the landowner and NRCS, FSA, FWS, or their designated state cooperating agencies (even though the restoration, enhancement, or establishment activity did not require a section 404 permit). The prior condition will be documented in the original agreement or permit, and the determination of return to prior conditions will be made by the Federal agency or appropriate state agency executing the agreement or permit. Before conducting any reversion activity the permittee or the appropriate Federal

or state agency must notify the district engineer and include the documentation of the prior condition. Once an area has reverted to its prior physical condition, it will be subject to whatever the Corps Regulatory requirements are applicable to that type of land at the time. The requirement that the activity result in a net increase in aquatic resource functions and services does not apply to reversion activities meeting the above conditions. Except for the activities described above, this NWP does not authorize any future discharge of dredged or fill material associated with the reversion of the area to its prior condition. In such cases a separate permit would be required for any reversion.

Reporting: For those activities that do not require pre-construction notification, the permittee must submit to the district engineer a copy of: (1) The binding wetland enhancement, restoration, or establishment agreement, or a project description, including project plans and location map; (2) the NRCS or USDA Technical Service Provider documentation for the voluntary wetland restoration, enhancement, or establishment action; or (3) the SMCRA permit issued by OSM or the applicable state agency. These documents must be submitted to the district engineer at least 30 days prior to commencing activities in waters of the United States authorized by this NWP.

Notification. The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity (see general condition 27), except for the following activities:

(1) Activities conducted on non-Federal public lands and private lands, in accordance with the terms and conditions of a binding wetland enhancement, restoration, or establishment agreement between the landowner and the U.S. FWS, NRCS, FSA, NMFS, NOS, or their designated state cooperating agencies;

(2) Voluntary wetland restoration, enhancement, and establishment actions documented by the NRCS or USDA Technical Service Provider pursuant to NRCS Field Office Technical Guide standards; or

(3) The reclamation of surface coal mine lands, in accordance with an SMCRA permit issued by the OSM or the applicable state agency.

However, the permittee must submit a copy of the appropriate documentation. (Sections 10 and 404)

Note: This NWP can be used to authorize compensatory mitigation projects, including mitigation banks and in-lieu fee programs.

However, this NWP does not authorize the reversion of an area used for a compensatory mitigation project to its prior condition, since compensatory mitigation is generally intended to be permanent.

28. Modifications of Existing Marinas. Reconfiguration of existing docking facilities within an authorized marina area. No dredging, additional slips, dock spaces, or expansion of any kind within waters of the United States is authorized by this NWP. (Section 10)

29. Residential Developments. Discharges of dredged or fill material into non-tidal waters of the United States for the construction or expansion of a single residence, a multiple unit residential development, or a residential subdivision. This NWP authorizes the construction of building foundations and building pads and attendant features that are necessary for the use of the residence or residential development. Attendant features may include but are not limited to roads, parking lots, garages, yards, utility lines, storm water management facilities, septic fields, and recreation facilities such as playgrounds, playing fields, and golf courses (provided the golf course is an integral part of the residential development).

The discharge must not cause the loss of greater than 1/2-acre of non-tidal waters of the United States, including the loss of no more than 300 linear feet of stream bed, unless for intermittent and ephemeral stream beds this 300 linear foot limit is waived in writing by the district engineer. This NWP does not authorize discharges into non-tidal wetlands adjacent to tidal waters.

Subdivisions: For residential subdivisions, the aggregate total loss of waters of United States authorized by this NWP cannot exceed 1/2 acre. This includes any loss of waters of the United States associated with development of individual subdivision lots.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 27.) (Sections 10 and 404)

30. Moist Soil Management for Wildlife. Discharges of dredged or fill material into non-tidal waters of the United States and maintenance activities that are associated with moist soil management for wildlife for the purpose of continuing ongoing, site-specific, wildlife management activities where soil manipulation is used to manage habitat and feeding areas for wildlife. Such activities include, but are not limited to, plowing or discing to impede succession, preparing seed beds, or establishing fire breaks. Sufficient

riparian areas must be maintained adjacent to all open water bodies, including streams to preclude water quality degradation due to erosion and sedimentation. This NWP does not authorize the construction of new dikes, roads, water control structures, or similar features associated with the management areas. The activity must not result in a net loss of aquatic resource functions and services. This NWP does not authorize the conversion of wetlands to uplands, impoundments, or other open water bodies. (Section 404).

Note: The repair, maintenance, or replacement of existing water control structures or the repair or maintenance of dikes may be authorized by NWP 3. Some such activities may qualify for an exemption under Section 404(f) of the Clean Water Act (see 33 CFR 323.4).

31. Maintenance of Existing Flood Control Facilities. Discharges of dredged or fill material resulting from activities associated with the maintenance of existing flood control facilities, including debris basins, retention/detention basins, levees, and channels that: (i) were previously authorized by the Corps by individual permit, general permit, by 33 CFR 330.3, or did not require a permit at the time they were constructed, or (ii) were constructed by the Corps and transferred to a non-Federal sponsor for operation and maintenance. Activities authorized by this NWP are limited to those resulting from maintenance activities that are conducted within the "maintenance baseline," as described in the definition below. Discharges of dredged or fill materials associated with maintenance activities in flood control facilities in any watercourse that have previously been determined to be within the maintenance baseline are authorized under this NWP. This NWP does not authorize the removal of sediment and associated vegetation from natural water courses except when these activities have been included in the maintenance baseline. All dredged material must be placed in an upland site or an authorized disposal site in waters of the United States, and proper siltation controls must be used.

Maintenance Baseline: The maintenance baseline is a description of the physical characteristics (e.g., depth, width, length, location, configuration, or design flood capacity, etc.) of a flood control project within which maintenance activities are normally authorized by NWP 31, subject to any case-specific conditions required by the district engineer. The district engineer will approve the maintenance baseline

based on the approved or constructed capacity of the flood control facility, whichever is smaller, including any areas where there are no constructed channels, but which are part of the facility. The prospective permittee will provide documentation of the physical characteristics of the flood control facility (which will normally consist of as-built or approved drawings) and documentation of the approved and constructed design capacities of the flood control facility. If no evidence of the constructed capacity exists, the approved capacity will be used. The documentation will also include best management practices to ensure that the impacts to the aquatic environment are minimal, especially in maintenance areas where there are no constructed channels. (The Corps may request maintenance records in areas where there has not been recent maintenance.) Revocation or modification of the final determination of the maintenance baseline can only be done in accordance with 33 CFR 330.5. Except in emergencies as described below, this NWP cannot be used until the district engineer approves the maintenance baseline and determines the need for mitigation and any regional or activity-specific conditions. Once determined, the maintenance baseline will remain valid for any subsequent reissuance of this NWP. This NWP does not authorize maintenance of a flood control facility that has been abandoned. A flood control facility will be considered abandoned if it has operated at a significantly reduced capacity without needed maintenance being accomplished in a timely manner.

Mitigation: The district engineer will determine any required mitigation one-time only for impacts associated with maintenance work at the same time that the maintenance baseline is approved. Such one-time mitigation will be required when necessary to ensure that adverse environmental impacts are no more than minimal, both individually and cumulatively. Such mitigation will only be required once for any specific reach of a flood control project. However, if one-time mitigation is required for impacts associated with maintenance activities, the district engineer will not delay needed maintenance, provided the district engineer and the permittee establish a schedule for identification, approval, development, construction and completion of any such required mitigation. Once the one-time mitigation described above has been completed, or a determination made that mitigation is not required, no

further mitigation will be required for maintenance activities within the maintenance baseline. In determining appropriate mitigation, the district engineer will give special consideration to natural water courses that have been included in the maintenance baseline and require compensatory mitigation and/or best management practices as appropriate.

Emergency Situations: In emergency situations, this NWP may be used to authorize maintenance activities in flood control facilities for which no maintenance baseline has been approved. Emergency situations are those which would result in an unacceptable hazard to life, a significant loss of property, or an immediate, unforeseen, and significant economic hardship if action is not taken before a maintenance baseline can be approved. In such situations, the determination of mitigation requirements, if any, may be deferred until the emergency has been resolved. Once the emergency has ended, a maintenance baseline must be established expeditiously, and mitigation, including mitigation for maintenance conducted during the emergency, must be required as appropriate.

Notification: The permittee must submit a pre-construction notification to the district engineer before any maintenance work is conducted (see general condition 27). The pre-construction notification may be for activity-specific maintenance or for maintenance of the entire flood control facility by submitting a five-year (or less) maintenance plan. The pre-construction notification must include a description of the maintenance baseline and the dredged material disposal site. (Sections 10 and 404)

32. Completed Enforcement Actions. Any structure, work, or discharge of dredged or fill material remaining in place or undertaken for mitigation, restoration, or environmental benefit in compliance with either:

(i) The terms of a final written Corps non-judicial settlement agreement resolving a violation of Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act of 1899; or the terms of an EPA 309(a) order on consent resolving a violation of Section 404 of the Clean Water Act, provided that:

(a) The unauthorized activity affected no more than 5 acres of non-tidal waters or 1 acre of tidal waters;

(b) The settlement agreement provides for environmental benefits, to an equal or greater degree, than the environmental detriments caused by the

unauthorized activity that is authorized by this NWP; and

(c) The district engineer issues a verification letter authorizing the activity subject to the terms and conditions of this NWP and the settlement agreement, including a specified completion date; or

(ii) The terms of a final Federal court decision, consent decree, or settlement agreement resulting from an enforcement action brought by the United States under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act of 1899; or

(iii) The terms of a final court decision, consent decree, settlement agreement, or non-judicial settlement agreement resulting from a natural resource damage claim brought by a trustee or trustees for natural resources (as defined by the National Contingency Plan at 40 CFR subpart G) under Section 311 of the Clean Water Act, Section 107 of the Comprehensive Environmental Response, Compensation and Liability Act, Section 312 of the National Marine Sanctuaries Act, Section 1002 of the Oil Pollution Act of 1990, or the Park System Resource Protection Act at 16 U.S.C. 19jj, to the extent that a Corps permit is required.

Compliance is a condition of the NWP itself. Any authorization under this NWP is automatically revoked if the permittee does not comply with the terms of this NWP or the terms of the court decision, consent decree, or judicial/non-judicial settlement agreement. This NWP does not apply to any activities occurring after the date of the decision, decree, or agreement that are not for the purpose of mitigation, restoration, or environmental benefit. Before reaching any settlement agreement, the Corps will ensure compliance with the provisions of 33 CFR part 326 and 33 CFR 330.6(d)(2) and (e). (Sections 10 and 404)

33. Temporary Construction, Access, and Dewatering. Temporary structures, work, and discharges, including cofferdams, necessary for construction activities or access fills or dewatering of construction sites, provided that the associated primary activity is authorized by the Corps of Engineers or the U.S. Coast Guard. This NWP also authorizes temporary structures, work, and discharges, including cofferdams, necessary for construction activities not otherwise subject to the Corps or U.S. Coast Guard permit requirements. Appropriate measures must be taken to maintain near normal downstream flows and to minimize flooding. Fill must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. The use of dredged

material may be allowed if the district engineer determines that it will not cause more than minimal adverse effects on aquatic resources. Following completion of construction, temporary fill must be entirely removed to upland areas, dredged material must be returned to its original location, and the affected areas must be restored to pre-construction elevations. The affected areas must also be revegetated, as appropriate. This permit does not authorize the use of cofferdams to dewater wetlands or other aquatic areas to change their use. Structures left in place after construction is completed require a section 10 permit if located in navigable waters of the United States. (See 33 CFR part 322.)

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity (see general condition 27). The pre-construction notification must include a restoration plan showing how all temporary fills and structures will be removed and the area restored to pre-project conditions. (Sections 10 and 404)

34. Cranberry Production Activities. Discharges of dredged or fill material for dikes, berms, pumps, water control structures or leveling of cranberry beds associated with expansion, enhancement, or modification activities at existing cranberry production operations. The cumulative total acreage of disturbance per cranberry production operation, including but not limited to, filling, flooding, ditching, or clearing, must not exceed 10 acres of waters of the United States, including wetlands. The activity must not result in a net loss of wetland acreage. This NWP does not authorize any discharge of dredged or fill material related to other cranberry production activities such as warehouses, processing facilities, or parking areas. For the purposes of this NWP, the cumulative total of 10 acres will be measured over the period that this NWP is valid.

Notification: The permittee must submit a pre-construction notification to the district engineer once during the period that this NWP is valid, and the NWP will then authorize discharges of dredge or fill material at an existing operation for the permit term, provided the 10-acre limit is not exceeded. (See general condition 27.) (Section 404)

35. Maintenance Dredging of Existing Basins. Excavation and removal of accumulated sediment for maintenance of existing marina basins, access channels to marinas or boat slips, and boat slips to previously authorized depths or controlling depths for ingress/ egress, whichever is less, provided the

dredged material is deposited at an upland site and proper siltation controls are used. (Section 10)

36. Boat Ramps. Activities required for the construction of boat ramps, provided the activity meets all of the following criteria:

(a) The discharge into waters of the United States does not exceed 50 cubic yards of concrete, rock, crushed stone or gravel into forms, or in the form of pre-cast concrete planks or slabs, unless the 50 cubic yard limit is waived in writing by the district engineer;

(b) The boat ramp does not exceed 20 feet in width, unless this criterion is waived in writing by the district engineer;

(c) The base material is crushed stone, gravel or other suitable material;

(d) The excavation is limited to the area necessary for site preparation and all excavated material is removed to the upland; and,

(e) No material is placed in special aquatic sites, including wetlands.

The use of unsuitable material that is structurally unstable is not authorized. If dredging in navigable waters of the United States is necessary to provide access to the boat ramp, the dredging may be authorized by another NWP, a regional general permit, or an individual permit.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if: (1) The discharge into waters of the United States exceeds 50 cubic yards, or (2) the boat ramp exceeds 20 feet in width. (See general condition 27.) (Sections 10 and 404)

37. Emergency Watershed Protection and Rehabilitation. Work done by or funded by:

(a) The Natural Resources Conservation Service for a situation requiring immediate action under its emergency Watershed Protection Program (7 CFR part 624);

(b) The U.S. Forest Service under its Burned-Area Emergency Rehabilitation Handbook (FSH 509.13);

(c) The Department of the Interior for wildland fire management burned area emergency stabilization and rehabilitation (DOI Manual part 620, Ch. 3);

(d) The Office of Surface Mining, or states with approved programs, for abandoned mine land reclamation activities under Title IV of the Surface Mining Control and Reclamation Act (30 CFR subchapter R), where the activity does not involve coal extraction; or

(e) The Farm Service Agency under its Emergency Conservation Program (7 CFR part 701).

In general, the prospective permittee should wait until the district engineer issues an NWP verification before proceeding with the watershed protection and rehabilitation activity. However, in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur, the emergency watershed protection and rehabilitation activity may proceed immediately and the district engineer will consider the information in the pre-construction notification any comments received as a result of agency coordination to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity (see general condition 27). (Sections 10 and 404)

38. Cleanup of Hazardous and Toxic Waste. Specific activities required to effect the containment, stabilization, or removal of hazardous or toxic waste materials that are performed, ordered, or sponsored by a government agency with established legal or regulatory authority. Court ordered remedial action plans or related settlements are also authorized by this NWP. This NWP does not authorize the establishment of new disposal sites or the expansion of existing sites used for the disposal of hazardous or toxic waste.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 27.) (Sections 10 and 404)

Note: Activities undertaken entirely on a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) site by authority of CERCLA as approved or required by EPA, are not required to obtain permits under Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act.

39. Commercial and Institutional Developments. Discharges of dredged or fill material into non-tidal waters of the United States for the construction or expansion of commercial and institutional building foundations and building pads and attendant features that are necessary for the use and maintenance of the structures. Attendant features may include, but are not limited to, roads, parking lots, garages, yards, utility lines, storm water management facilities, and recreation facilities such as playgrounds and playing fields. Examples of commercial developments include retail stores, industrial facilities, restaurants,

business parks, and shopping centers. Examples of institutional developments include schools, fire stations, government office buildings, judicial buildings, public works buildings, libraries, hospitals, and places of worship. The construction of new golf courses, new ski areas, or oil and gas wells is not authorized by this NWP.

The discharge must not cause the loss of greater than 1/2-acre of non-tidal waters of the United States, including the loss of no more than 300 linear feet of stream bed, unless for intermittent and ephemeral stream beds this 300 linear foot limit is waived in writing by the district engineer. This NWP does not authorize discharges into non-tidal wetlands adjacent to tidal waters.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 27.) (Sections 10 and 404)

40. Agricultural Activities. Discharges of dredged or fill material into non-tidal waters of the United States for agricultural activities, including the construction of building pads for farm buildings. Authorized activities include the installation, placement, or construction of drainage tiles, ditches, or levees; mechanized land clearing; land leveling; the relocation of existing serviceable drainage ditches constructed in waters of the United States; and similar activities.

This NWP also authorizes the construction of farm ponds in non-tidal waters of the United States, excluding perennial streams, provided the farm pond is used solely for agricultural purposes. This NWP does not authorize the construction of aquaculture ponds.

This NWP also authorizes discharges of dredged or fill material into non-tidal waters of the United States to relocate existing serviceable drainage ditches constructed in non-tidal streams.

The discharge must not cause the loss of greater than 1/2-acre of non-tidal waters of the United States. This NWP does not authorize discharges into non-tidal wetlands adjacent to tidal waters. This NWP does not authorize the relocation of greater than 300 linear feet of existing serviceable drainage ditches constructed in non-tidal streams, unless for drainage ditches constructed in intermittent and ephemeral streams, this 300 linear foot limit is waived in writing by the district engineer.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 27.) (Section 404)

Note: Some discharges for agricultural activities may qualify for an exemption under Section 404(f) of the Clean Water Act (see 33 CFR 323.4). This NWP authorizes the construction of farm ponds that do not qualify for the Clean Water Act Section 404(f)(1)(C) exemption because of the recapture provision at Section 404(f)(2).

41. Reshaping Existing Drainage Ditches. Discharges of dredged or fill material into non-tidal waters of the United States, excluding non-tidal wetlands adjacent to tidal waters, to modify the cross-sectional configuration of currently serviceable drainage ditches constructed in waters of the United States, for the purpose of improving water quality by regrading the drainage ditch with gentler slopes, which can reduce erosion, increase growth of vegetation, and increase uptake of nutrients and other substances by vegetation. The reshaping of the ditch cannot increase drainage capacity beyond the original as-built capacity nor can it expand the area drained by the ditch as originally constructed (i.e., the capacity of the ditch must be the same as originally constructed and it cannot drain additional wetlands or other waters of the United States). Compensatory mitigation is not required because the work is designed to improve water quality.

This NWP does not authorize the relocation of drainage ditches constructed in waters of the United States; the location of the centerline of the reshaped drainage ditch must be approximately the same as the location of the centerline of the original drainage ditch. This NWP does not authorize stream channelization or stream relocation projects.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity, if more than 500 linear feet of drainage ditch will be reshaped. (See general condition 27.) (Section 404)

42. Recreational Facilities. Discharges of dredged or fill material into non-tidal waters of the United States for the construction or expansion of recreational facilities. Examples of recreational facilities that may be authorized by this NWP include playing fields (e.g., football fields, baseball fields), basketball courts, tennis courts, hiking trails, bike paths, golf courses, ski areas, horse paths, nature centers, and campgrounds (excluding recreational vehicle parks). This NWP also authorizes the construction or expansion of small support facilities, such as maintenance and storage buildings and stables that are directly related to the recreational activity, but it

does not authorize the construction of hotels, restaurants, racetracks, stadiums, arenas, or similar facilities.

The discharge must not cause the loss of greater than 1/2-acre of non-tidal waters of the United States, including the loss of no more than 300 linear feet of stream bed, unless for intermittent and ephemeral stream beds this 300 linear foot limit is waived in writing by the district engineer. This NWP does not authorize discharges into non-tidal wetlands adjacent to tidal waters.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 27.) (Section 404)

43. Stormwater Management Facilities. Discharges of dredged or fill material into non-tidal waters of the United States for the construction and maintenance of stormwater management facilities, including the excavation of stormwater ponds/facilities, detention basins, and retention basins; the installation and maintenance of water control structures, outfall structures and emergency spillways; and the maintenance dredging of existing stormwater management ponds/facilities and detention and retention basins.

The discharge must not cause the loss of greater than 1/2-acre of non-tidal waters of the United States, including the loss of no more than 300 linear feet of stream bed, unless for intermittent and ephemeral stream beds this 300 linear foot limit is waived in writing by the district engineer. This NWP does not authorize discharges into non-tidal wetlands adjacent to tidal waters. This NWP does not authorize discharges of dredged or fill material for the construction of new stormwater management facilities in perennial streams.

Notification: For the construction of new stormwater management facilities, or the expansion of existing stormwater management facilities, the permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 27.) Maintenance activities do not require pre-construction notification if they are limited to restoring the original design capacities of the stormwater management facility. (Section 404)

44. Mining Activities. Discharges of dredged or fill material into non-tidal waters of the United States for mining activities, except for coal mining activities. The discharge must not cause the loss of greater than 1/2-acre of non-tidal waters of the United States. This NWP does not authorize discharges into

non-tidal wetlands adjacent to tidal waters.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 27.) If reclamation is required by other statutes, then a copy of the reclamation plan must be submitted with the pre-construction notification. (Sections 10 and 404)

45. *Repair of Uplands Damaged by Discrete Events.* This NWP authorizes discharges of dredged or fill material, including dredging or excavation, into all waters of the United States for activities associated with the restoration of upland areas damaged by storms, floods, or other discrete events. This NWP authorizes bank stabilization to protect the restored uplands. The restoration of the damaged areas, including any bank stabilization, must not exceed the contours, or ordinary high water mark, that existed before the damage occurred. The district engineer retains the right to determine the extent of the pre-existing conditions and the extent of any restoration work authorized by this NWP. The work must commence, or be under contract to commence, within two years of the date of damage, unless this condition is waived in writing by the district engineer. This NWP cannot be used to reclaim lands lost to normal erosion processes over an extended period.

Minor dredging is limited to the amount necessary to restore the damaged upland area and should not significantly alter the pre-existing bottom contours of the waterbody.

Notification: The permittee must submit a pre-construction notification to the district engineer (see general condition 27) within 12-months of the date of the damage. The pre-construction notification should include documentation, such as a recent topographic survey or photographs, to justify the extent of the proposed restoration. (Sections 10 and 404)

Note: Uplands lost as a result of a storm, flood, or other discrete event can be replaced without a section 404 permit, if the uplands are restored to the ordinary high water mark (in non-tidal waters) or high tide line (in tidal waters). (See also 33 CFR 328.5.)

46. *Discharges in Ditches.* Discharges of dredged or fill material into non-tidal ditches that are: (1) Constructed in uplands, (2) receive water from an area determined to be a water of the United States prior to the construction of the ditch, (3) divert water to an area determined to be a water of the United States prior to the construction of the ditch, and (4) are determined to be

waters of the United States. The discharge must not cause the loss of greater than one acre of waters of the United States.

This NWP does not authorize discharges of dredged or fill material into ditches constructed in streams or other waters of the United States, or in streams that have been relocated in uplands. This NWP does not authorize discharges of dredged or fill material that increase the capacity of the ditch and drain those areas determined to be waters of the United States prior to construction of the ditch.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 27.) (Section 404)

47. *Pipeline Safety Program Designated Time Sensitive Inspections and Repairs.* Activities required for the inspection, repair, rehabilitation, or replacement of any currently serviceable structure or fill for pipelines that have been identified by the Pipeline and Hazardous Materials Safety Administration's Pipeline Safety Program (PHP) within the U.S. Department of Transportation as time-sensitive (see 49 CFR parts 192 and 195) and additional maintenance activities done in conjunction with the time-sensitive inspection and repair activities. All activities must meet the following criteria:

(a) Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable when temporary structures, work and discharges, including cofferdams, are necessary for construction activities or access fills or dewatering of construction sites;

(b) Material resulting from trench excavation may be temporarily sidecast into waters of the United States for no more than three months, provided that the material is not placed in such a manner that it is dispersed by currents or other forces. The district engineer may extend the period of temporary side casting for no more than a total of 180 days, where appropriate. The trench cannot be constructed or backfilled in such a manner as to drain waters of the United States (e.g., backfilling with extensive gravel layers, creating a french drain effect);

(c) Temporary fill must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate;

(d) In wetlands, the top 6 to 12 inches of the trench should normally be backfilled with topsoil from the trench so that there is no change in preconstruction contours;

(e) To the maximum extent practicable, the restoration of open waters must be to the pre-construction course, condition, capacity, and location of the waterbody;

(f) Any exposed slopes and stream banks must be stabilized immediately upon completion of the project;

(g) Additional maintenance activities done in conjunction with the time-sensitive inspection or repair must not result in additional losses of waters of the United States; and,

(h) The permittee is a participant in the Pipeline Repair and Environmental Guidance System (PREGS).

Reporting: The permittee must submit a post construction report to the PHP within seven days after completing the work. The report must be submitted electronically to PHP via PREGS. The report must contain the following information: Project sites located in waters of the United States, temporary access routes, stream dewatering sites, temporary fills and temporary structures identified on a map of the pipeline corridor; photographs of the pre- and post-construction work areas located in waters of the United States; and a list of best management practices employed for each pipeline segment shown on the map. (Section 10 and 404)

Note: Division engineers may modify this NWP by adding regional conditions to protect the aquatic environment, as long as those regional conditions do not require pre-construction notification or other actions that would delay time sensitive inspections and repairs. Examples of appropriate regional conditions include best management practices.

48. *Existing Commercial Shellfish Aquaculture Activities.* This NWP authorizes the installation of buoys, floats, racks, trays, nets, lines, tubes, containers, and other structures necessary for the continued operation of the existing commercial aquaculture activity. This NWP also authorizes discharges of dredged or fill material necessary for shellfish seeding, rearing, cultivating, transplanting, and harvesting activities. Rafts and other floating structures must be securely anchored and clearly marked.

This NWP does not authorize new operations or the expansion of the project area for an existing commercial shellfish aquaculture activity. This NWP does not authorize the cultivation of new species (i.e., species not previously cultivated in the waterbody). This NWP

does not authorize attendant features such as docks, piers, boat ramps, stockpiles, staging areas, or the deposition of shell material back into waters of the United States as waste.

Reporting: For those activities that do not require pre-construction notification, the permittee must submit a report to the district engineer that includes the following information: (1) The size of the project area for the commercial shellfish aquaculture activity (in acres); (2) the location of the activity; (3) a brief description of the culture method and harvesting method(s); (4) the name(s) of the cultivated species; and (5) whether canopy predator nets are being used. This is a subset of the information that would be required for pre-construction notification. This report may be provided by letter or using an optional reporting form provided by the Corps. Only one report needs to be submitted during the period this NWP is valid, as long as there are no changes to the operation that require pre-construction notification. The report must be submitted to the district engineer within 90 days of the effective date of this NWP.

Notification: The permittee must submit a pre-construction notification to the district engineer if: (1) The project area is greater than 100 acres; or (2) there is any reconfiguration of the aquaculture activity, such as relocating existing operations into portions of the project area not previously used for aquaculture activities; or (3) there is a change in species being cultivated; or (4) there is a change in culture methods (e.g., from bottom culture to off-bottom culture); or (5) dredge harvesting, tilling, or harrowing is conducted in areas inhabited by submerged aquatic vegetation. (See general condition 27.) (Sections 10 and 404)

Note: The permittee should notify the applicable U.S. Coast Guard office regarding the project.

49. Coal Remining Activities.

Discharges of dredged or fill material into non-tidal waters of the United States associated with the remining and reclamation of lands that were previously mined for coal, provided the activities are already authorized, or are currently being processed as part of an integrated permit processing procedure, by the Department of Interior (DOI) Office of Surface Mining (OSM), or by states with approved programs under Title IV or Title V of the Surface Mining Control and Reclamation Act of 1977. Areas previously mined include reclaimed mine sites, abandoned mine land areas, or lands under bond

forfeiture contracts. The permittee must clearly demonstrate to the district engineer that the reclamation plan will result in a net increase in aquatic resource functions. As part of the project, the permittee may conduct coal mining activities in an adjacent area, provided the newly mined area is less than 40 percent of the area being remined plus any unmined area necessary for the reclamation of the remined area.

Notification: The permittee must submit a pre-construction notification to the district engineer and receive written authorization prior to commencing the activity. (See general condition 27.) (Sections 10 and 404)

50. *Underground Coal Mining Activities.* Discharges of dredged or fill material into non-tidal waters of the United States associated with underground coal mining and reclamation operations provided the activities are authorized, or are currently being processed as part of an integrated permit processing procedure, by the Department of Interior (DOI), Office of Surface Mining (OSM), or by states with approved programs under Title V of the Surface Mining Control and Reclamation Act of 1977.

This NWP does not authorize discharges into non-tidal wetlands adjacent to tidal waters. This NWP does not authorize coal preparation and processing activities outside of the mine site.

Notification: The permittee must submit a pre-construction notification to the district engineer and receive written authorization prior to commencing the activity. (See general condition 27.) If reclamation is required by other statutes, then a copy of the reclamation plan must be submitted with the pre-construction notification. (Sections 10 and 404)

Note: Coal preparation and processing activities outside of the mine site may be authorized by NWP 21.

C. Nationwide Permit General Conditions

Note: To qualify for NWP authorization, the prospective permittee must comply with the following general conditions, as appropriate, in addition to any regional or case-specific conditions imposed by the division engineer or district engineer. Prospective permittees should contact the appropriate Corps district office to determine if regional conditions have been imposed on an NWP. Prospective permittees should also contact the appropriate Corps district office to determine the status of Clean Water Act Section 401 water quality certification and/or Coastal Zone Management Act consistency for an NWP.

1. *Navigation.* (a) No activity may cause more than a minimal adverse effect on navigation.

(b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.

(c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

2. *Aquatic Life Movements.* No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. Culverts placed in streams must be installed to maintain low flow conditions.

3. *Spawning Areas.* Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

4. *Migratory Bird Breeding Areas.* Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

5. *Shellfish Beds.* No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48.

6. *Suitable Material.* No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).

7. *Water Supply Intakes.* No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement

of public water supply intake structures or adjacent bank stabilization.

8. *Adverse Effects From Impoundments.* If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

9. *Management of Water Flows.* To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization and storm water management activities, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

10. *Fills Within 100-Year Floodplains.* The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

11. *Equipment.* Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. *Soil Erosion and Sediment Controls.* Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow.

13. *Removal of Temporary Fills.* Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

14. *Proper Maintenance.* Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety.

15. *Wild and Scenic Rivers.* No activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official

study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency in the area (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service).

16. *Tribal Rights.* No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

17. *Endangered Species.* (a) No activity is authorized under any NWP which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which "may affect" a listed species or critical habitat, unless Section 7 consultation addressing the effects of the proposed activity has been completed.

(b) Federal agencies should follow their own procedures for complying with the requirements of the ESA. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements.

(c) Non-federal permittees shall notify the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species or designated critical habitat, the pre-construction notification must include the name(s) of the endangered or threatened species that may be affected by the proposed work or that utilize the designated critical habitat that may be affected by the proposed work. The district engineer will determine whether the proposed activity "may affect" or will have "no effect" to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps' determination within 45 days of receipt of a complete pre-construction notification. In cases where the non-Federal applicant has identified listed

species or critical habitat that might be affected or is in the vicinity of the project, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification the proposed activities will have "no effect" on listed species or critical habitat, or until Section 7 consultation has been completed.

(d) As a result of formal or informal consultation with the FWS or NMFS the district engineer may add species-specific regional endangered species conditions to the NWPs.

(e) Authorization of an activity by a NWP does not authorize the "take" of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the U.S. FWS or the NMFS, both lethal and non-lethal "takes" of protected species are in violation of the ESA. Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the U.S. FWS and NMFS or their world wide Web pages at <http://www.fws.gov/> and <http://www.noaa.gov/fisheries.html> respectively.

18. *Historic Properties.* (a) In cases where the district engineer determines that the activity may affect properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

(b) Federal permittees should follow their own procedures for complying with the requirements of Section 106 of the National Historic Preservation Act. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if the authorized activity may have the potential to cause effects to any historic properties listed, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties may be affected by the proposed work or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of or potential for the presence of historic resources can be sought from the State

Historic Preservation Officer or Tribal Historic Preservation Officer, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based on the information submitted and these efforts, the district engineer shall determine whether the proposed activity has the potential to cause an effect on the historic properties. Where the non-Federal applicant has identified historic properties which the activity may have the potential to cause effects and so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects or that consultation under Section 106 of the NHPA has been completed.

(d) The district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA Section 106 consultation is required. Section 106 consultation is not required when the Corps determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR 800.3(a)). If NHPA section 106 consultation is required and will occur, the district engineer will notify the non-Federal applicant that he or she cannot begin work until Section 106 consultation is completed.

(e) Prospective permittees should be aware that section 110k of the NHPA (16 U.S.C. 470h-2(k)) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of Section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, explaining the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate

Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

19. *Designated Critical Resource Waters.* Critical resource waters include, NOAA-designated marine sanctuaries, National Estuarine Research Reserves, state natural heritage sites, and outstanding national resource waters or other waters officially designated by a state as having particular environmental or ecological significance and identified by the district engineer after notice and opportunity for public comment. The district engineer may also designate additional critical resource waters after notice and opportunity for comment.

(a) Discharges of dredged or fill material into waters of the United States are not authorized by NHPAs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, and 50 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

(b) For NHPAs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, and 38, notification is required in accordance with general condition 27, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NHPAs only after it is determined that the impacts to the critical resource waters will be no more than minimal.

20. *Mitigation.* The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that adverse effects on the aquatic environment are minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating) will be required to the extent necessary to ensure that the adverse effects to the aquatic environment are minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed $\frac{1}{10}$ acre and require pre-construction notification, unless the district engineer determines in writing that some other form of mitigation would be more environmentally appropriate and provides a project-

specific waiver of this requirement. For wetland losses of $\frac{1}{10}$ acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in minimal adverse effects on the aquatic environment. Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, wetland restoration should be the first compensatory mitigation option considered.

(d) For losses of streams or other open waters that require pre-construction notification, the district engineer may require compensatory mitigation, such as stream restoration, to ensure that the activity results in minimal adverse effects on the aquatic environment.

(e) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NHPAs. For example, if an NHPA has an acreage limit of $\frac{1}{2}$ acre, it cannot be used to authorize any project resulting in the loss of greater than $\frac{1}{2}$ acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that a project already meeting the established acreage limits also satisfies the minimal impact requirement associated with the NHPAs.

(f) Compensatory mitigation plans for projects in or near streams or other open waters will normally include a requirement for the establishment, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, riparian areas may be the only compensatory mitigation required. Riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland

compensatory mitigation for wetland losses.

(g) Permittees may propose the use of mitigation banks, in-lieu fee arrangements or separate activity-specific compensatory mitigation. In all cases, the mitigation provisions will specify the party responsible for accomplishing and/or complying with the mitigation plan.

(h) Where certain functions and services of waters of the United States are permanently adversely affected, such as the conversion of a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse effects of the project to the minimal level.

21. *Water Quality.* Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA Section 401, individual 401 Water Quality Certification must be obtained or waived (see 33 CFR 330.4(c)). The district engineer or State or Tribe may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

22. *Coastal Zone Management.* In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). The district engineer or a State may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

23. *Regional and Case-By-Case Conditions.* The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

24. *Use of Multiple Nationwide Permits.* The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United

States for the total project cannot exceed $\frac{1}{3}$ -acre.

25. *Transfer of Nationwide Permit Verifications.* If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:

“When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.”

(Transferee)

(Date)

26. *Compliance Certification.* Each permittee who received an NWP verification from the Corps must submit a signed certification regarding the completed work and any required mitigation. The certification form must be forwarded by the Corps with the NWP verification letter and will include:

(a) A statement that the authorized work was done in accordance with the NWP authorization, including any general or specific conditions;

(b) A statement that any required mitigation was completed in accordance with the permit conditions; and

(c) The signature of the permittee certifying the completion of the work and mitigation.

27. *Pre-Construction Notification.* (a) *Timing.* Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, as a general rule, will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review

process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity:

(1) Until notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or

(2) If 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 17 that listed species or critical habitat might be affected or in the vicinity of the project, or to notify the Corps pursuant to general condition 18 that the activity may have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that is “no effect” on listed species or “no potential to cause effects” on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or Section 106 of the National Historic Preservation (see 33 CFR 330.4(g)) is completed. Also, work cannot begin under NWPs 21, 49, or 50 until the permittee has received written approval from the Corps. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee cannot begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) *Contents of Pre-Construction Notification:* The PCN must be in writing and include the following information:

(1) Name, address and telephone numbers of the prospective permittee;

(2) Location of the proposed project;

(3) A description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause; any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. The description should be sufficiently detailed to allow the district engineer to

determine that the adverse effects of the project will be minimal and to determine the need for compensatory mitigation. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the project and when provided result in a quicker decision.);

(4) The PCN must include a delineation of special aquatic sites and other waters of the United States on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters of the United States, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many waters of the United States. Furthermore, the 45 day period will not start until the delineation has been submitted to or completed by the Corps, where appropriate;

(5) If the proposed activity will result in the loss of greater than $\frac{1}{10}$ acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

(6) If any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, for non-Federal applicants the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work. Federal applicants must provide documentation demonstrating compliance with the Endangered Species Act; and

(7) For an activity that may affect a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, for non-Federal applicants the PCN must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property. Federal applicants must provide documentation demonstrating compliance with Section 106 of the National Historic Preservation Act.

(c) *Form of Pre-Construction Notification:* The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is a PCN and must include all of

the information required in paragraphs (b)(1) through (7) of this general condition. A letter containing the required information may also be used.

(d) *Agency Coordination:* (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the project's adverse environmental effects to a minimal level.

(2) For all NWP 48 activities requiring pre-construction notification and for other NWP activities requiring pre-construction notification to the district engineer that result in the loss of greater than $\frac{1}{2}$ -acre of waters of the United States, the district engineer will immediately provide (e.g., via facsimile transmission, overnight mail, or other expeditious manner) a copy of the PCN to the appropriate Federal or state offices (U.S. FWS, state natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Office (THPO), and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will then have 10 calendar days from the date the material is transmitted to telephone or fax the district engineer notice that they intend to provide substantive, site-specific comments. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame, but will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

(3) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by Section 305(b)(4)(B) of the

Magnuson-Stevens Fishery Conservation and Management Act.

(4) Applicants are encouraged to provide the Corps multiple copies of pre-construction notifications to expedite agency coordination.

(5) For NWP 48 activities that require reporting, the district engineer will provide a copy of each report within 10 calendar days of receipt to the appropriate regional office of the NMFS.

(e) *District Engineer's Decision:* In reviewing the PCN for the proposed activity, the district engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. If the proposed activity requires a PCN and will result in a loss of greater than $\frac{1}{10}$ acre of wetlands, the prospective permittee should submit a mitigation proposal with the PCN. Applicants may also propose compensatory mitigation for projects with smaller impacts. The district engineer will consider any proposed compensatory mitigation the applicant has included in the proposal in determining whether the net adverse environmental effects to the aquatic environment of the proposed work are minimal. The compensatory mitigation proposal may be either conceptual or detailed. If the district engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse effects on the aquatic environment are minimal, after considering mitigation, the district engineer will notify the permittee and include any conditions the district engineer deems necessary. The district engineer must approve any compensatory mitigation proposal before the permittee commences work. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the district engineer will expeditiously review the proposed compensatory mitigation plan. The district engineer must review the plan within 45 calendar days of receiving a complete PCN and determine whether the proposed mitigation would ensure no more than minimal adverse effects on the aquatic environment. If the net adverse effects of the project on the aquatic environment (after consideration of the compensatory mitigation proposal) are determined by the district engineer to be minimal, the district engineer will provide a timely written response to the applicant. The response will state that the project can proceed under the terms and conditions of the NWP.

If the district engineer determines that the adverse effects of the proposed work are more than minimal, then the district engineer will notify the applicant either: (1) That the project does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (2) that the project is authorized under the NWP subject to the applicant's submission of a mitigation plan that would reduce the adverse effects on the aquatic environment to the minimal level; or (3) that the project is authorized under the NWP with specific modifications or conditions. Where the district engineer determines that mitigation is required to ensure no more than minimal adverse effects occur to the aquatic environment, the activity will be authorized within the 45-day PCN period. The authorization will include the necessary conceptual or specific mitigation or a requirement that the applicant submit a mitigation plan that would reduce the adverse effects on the aquatic environment to the minimal level. When mitigation is required, no work in waters of the United States may occur until the district engineer has approved a specific mitigation plan.

28. *Single and Complete Project.* The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

D. Further Information

1. District Engineers have authority to determine if an activity complies with the terms and conditions of an NWP.

2. NWPs do not obviate the need to obtain other federal, state, or local permits, approvals, or authorizations required by law.

3. NWPs do not grant any property rights or exclusive privileges.

4. NWPs do not authorize any injury to the property or rights of others.

5. NWPs do not authorize interference with any existing or proposed Federal project.

E. Definitions

Best management practices (BMPs): Policies, practices, procedures, or structures implemented to mitigate the adverse environmental effects on surface water quality resulting from development. BMPs are categorized as structural or non-structural.

Compensatory mitigation: The restoration, establishment (creation), enhancement, or preservation of aquatic resources for the purpose of compensating for unavoidable adverse impacts which remain after all

appropriate and practicable avoidance and minimization has been achieved.

Currently serviceable: Useable as is or with some maintenance, but not so degraded as to essentially require reconstruction.

Discharge: The term "discharge" means any discharge of dredged or fill material and any activity that causes or results in such a discharge.

Enhancement: The manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area.

Ephemeral stream: An ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

Establishment (creation): The manipulation of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site. Establishment results in a gain in aquatic resource area.

Historic Property: Any prehistoric or historic district, site (including archaeological site), building, structure, or other object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria (36 CFR part 60).

Independent utility: A test to determine what constitutes a single and complete project in the Corps regulatory program. A project is considered to have independent utility if it would be constructed absent the construction of other projects in the project area. Portions of a multi-phase project that depend upon other phases of the project do not have independent utility. Phases of a project that would be constructed even if the other phases were not built can be considered as separate single and complete projects with independent utility.

Intermittent stream: An intermittent stream has flowing water during certain

times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow.

Loss of waters of the United States: Waters of the United States that are permanently adversely affected by filling, flooding, excavation, or drainage because of the regulated activity. Permanent adverse effects include permanent discharges of dredged or fill material that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody. The acreage of loss of waters of the United States is a threshold measurement of the impact to jurisdictional waters for determining whether a project may qualify for an NWP; it is not a net threshold that is calculated after considering compensatory mitigation that may be used to offset losses of aquatic functions and services. The loss of stream bed includes the linear feet of stream bed that is filled or excavated. Waters of the United States temporarily filled, flooded, excavated, or drained, but restored to pre-construction contours and elevations after construction, are not included in the measurement of loss of waters of the United States. Impacts resulting from activities eligible for exemptions under Section 404(f) of the Clean Water Act are not considered when calculating the loss of waters of the United States.

Non-tidal wetland: A non-tidal wetland is a wetland that is not subject to the ebb and flow of tidal waters. The definition of a wetland can be found at 33 CFR 328.3(b). Non-tidal wetlands contiguous to tidal waters are located landward of the high tide line (i.e., spring high tide line).

Open water: For purposes of the NWPs, an open water is any area that in a year with normal patterns of precipitation has water flowing or standing above ground to the extent that an ordinary high water mark can be determined. Aquatic vegetation within the area of standing or flowing water is either non-emergent, sparse, or absent. Vegetated shallows are considered to be open waters. Examples of "open waters" include rivers, streams, lakes, and ponds.

Ordinary High Water Mark: An ordinary high water mark is a line on the shore established by the fluctuations of water and indicated by physical characteristics, or by other appropriate means that consider the characteristics of the surrounding areas (see 33 CFR 328.3(e)).

Perennial stream: A perennial stream has flowing water year-round during a typical year. The water table is located above the stream bed for most of the year. Groundwater is the primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow.

Practicable: Available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

Pre-construction notification: A request submitted by the project proponent to the Corps for confirmation that a particular activity is authorized by nationwide permit. The request may be a permit application, letter, or similar document that includes information about the proposed work and its anticipated environmental effects. Pre-construction notification may be required by the terms and conditions of a nationwide permit, or by regional conditions. A pre-construction notification may be voluntarily submitted in cases where pre-construction notification is not required and the project proponent wants confirmation that the activity is authorized by nationwide permit.

Preservation: The removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in a gain of aquatic resource area or functions.

Re-establishment: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area.

Rehabilitation: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area.

Restoration: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: Re-establishment and rehabilitation.

Riffle and pool complex: Riffle and pool complexes are special aquatic sites under the 404(b)(1) Guidelines. Riffle and pool complexes sometimes characterize steep gradient sections of streams. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a coarse substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. A slower stream velocity, a streaming flow, a smooth surface, and a finer substrate characterize pools.

Riparian areas: Riparian areas are lands adjacent to streams, lakes, and estuarine-marine shorelines. Riparian areas are transitional between terrestrial and aquatic ecosystems, through which surface and subsurface hydrology connects waterbodies with their adjacent uplands. Riparian areas provide a variety of ecological functions and services and help improve or maintain local water quality. (See general condition 20.)

Shellfish seeding: The placement of shellfish seed and/or suitable substrate to increase shellfish production. Shellfish seed consists of immature individual shellfish or individual shellfish attached to shells or shell fragments (i.e., spat on shell). Suitable substrate may consist of shellfish shells, shell fragments, or other appropriate materials placed into waters for shellfish habitat.

Single and complete project: The term "single and complete project" is defined at 33 CFR 330.2(i) as the total project proposed or accomplished by one owner/developer or partnership or other association of owners/developers. A single and complete project must have independent utility (see definition). For linear projects, a "single and complete project" is all crossings of a single water of the United States (i.e., a single waterbody) at a specific location. For linear projects crossing a single waterbody several times at separate and distant locations, each crossing is considered a single and complete project. However, individual channels in a braided stream or river, or individual arms of a large, irregularly shaped wetland or lake, etc., are not separate waterbodies, and crossings of such features cannot be considered separately.

Stormwater management: Stormwater management is the mechanism for controlling stormwater runoff for the purposes of reducing downstream erosion, water quality degradation, and flooding and mitigating the adverse

effects of changes in land use on the aquatic environment.

Stormwater management facilities: Stormwater management facilities are those facilities, including but not limited to, stormwater retention and detention ponds and best management practices, which retain water for a period of time to control runoff and/or improve the quality (i.e., by reducing the concentration of nutrients, sediments, hazardous substances and other pollutants) of stormwater runoff.

Stream bed: The substrate of the stream channel between the ordinary high water marks. The substrate may be bedrock or inorganic particles that range in size from clay to boulders. Wetlands contiguous to the stream bed, but outside of the ordinary high water marks, are not considered part of the stream bed.

Stream channelization: The manipulation of a stream's course, condition, capacity, or location that causes more than minimal interruption of normal stream processes. A channelized stream remains a water of the United States.

Structure: An object that is arranged in a definite pattern of organization. Examples of structures include, without limitation, any pier, boat dock, boat ramp, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, artificial island, artificial reef, permanent mooring structure, power transmission line, permanently moored floating vessel, piling, aid to navigation, or any other manmade obstacle or obstruction.

Tidal wetland: A tidal wetland is a wetland (i.e., water of the United States) that is inundated by tidal waters. The definitions of a wetland and tidal waters can be found at 33 CFR 328.3(b) and 33 CFR 328.3(f), respectively. Tidal waters rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by other waters, wind, or other effects. Tidal wetlands are located channelward of the high tide line, which is defined at 33 CFR 328.3(d).

Vegetated shallows: Vegetated shallows are special aquatic sites under the 404(b)(1) Guidelines. They are areas that are permanently inundated and under normal circumstances have rooted aquatic vegetation, such as seagrasses in marine and estuarine systems and a variety of vascular rooted plants in freshwater systems.

Waterbody: For purposes of the NWP, a waterbody is a jurisdictional

water of the United States that, during a year with normal patterns of precipitation, has water flowing or standing above ground to the extent that an ordinary high water mark (OHWM) or other indicators of jurisdiction can be determined, as well as any wetland area

(see 33 CFR 328.3(b)). If a jurisdictional wetland is adjacent—meaning bordering, contiguous, or neighboring—to a jurisdictional waterbody displaying an OHWM or other indicators of jurisdiction, that waterbody and its adjacent wetlands are considered

together as a single aquatic unit (see 33 CFR 328.4(c)(2)). Examples of “waterbodies” include streams, rivers, lakes, ponds, and wetlands.

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APPENDIX B

USACE NATIONWIDE PERMIT GENERAL CONDITIONS

Nationwide Permit General Conditions

The following general conditions must be followed in order for any authorization by an NWP to be valid:

1. **Navigation**. No activity may cause more than a minimal adverse effect on navigation.
2. **Proper Maintenance**. Any structure or fill authorized shall be properly maintained, including maintenance to ensure public safety.
3. **Soil Erosion and Sediment Controls**. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date.
4. **Aquatic Life Movements**. No activity may substantially disrupt the movement of those species of aquatic life indigenous to the waterbody, including those species which normally migrate through the area, unless the activity's primary purpose is to impound water. Culverts placed in streams must be installed to maintain low flow conditions.
5. **Equipment**. Heavy equipment working in wetlands must be placed on mats, or other measures must be taken to minimize soil disturbance.
6. **Regional and Case-By-Case Conditions**. The activity must comply with any regional conditions which may have been added by the division engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the State or tribe in its Section 401 water quality certification and Coastal Zone Management Act consistency determination.
7. **Wild and Scenic Rivers**. No activity may occur in a component of the National Wild and Scenic River System; or in a river officially designated by Congress as a "study river" for possible inclusion in the system, while the river is in an official study status; unless the appropriate Federal agency, with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation, or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency in the area (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service).
8. **Tribal Rights**. No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.
9. **Water Quality**. (a) In certain States and tribal lands an individual 401 water quality certification must be obtained or waived (See 33 CFR 330.4(c)).
(b) For NWPs 12, 14, 17, 18, 32, 39, 40, 42, 43, and 44, where the State or tribal 401 certification (either generically or individually) does not require or approve a water quality management plan, the permittee must include design criteria and techniques that will ensure that the authorized work does not result in more than minimal degradation of water quality. An important component of a water quality management plan includes stormwater management that minimizes degradation of the downstream aquatic system, including water quality. Refer to General Condition 21 for stormwater management requirements. Another important component of a water quality management plan is the establishment and maintenance of vegetated buffers next to open waters, including streams. Refer to General Condition 19 for vegetated buffer requirements for the NWPs.
10. **Coastal Zone Management**. In certain states, an individual state coastal zone management consistency concurrence must be obtained or waived (see Section 330.4(d)).
11. **Endangered Species**. (a) No activity is authorized under any NWP which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act, or which will destroy or adversely modify the critical habitat of such species. Non-federal permittees shall notify the District Engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project, or is located in the designated critical habitat and shall not begin work on the activity until notified by the District Engineer that the requirements of the Endangered Species Act have been satisfied and that the activity is authorized. For activities that may affect Federally-listed endangered or threatened species or designated critical habitat, the notification must include the name(s) of the endangered or threatened species that may be affected by the proposed work or that utilize the designated critical habitat that may be affected by the proposed work. As a result of formal or informal consultation with the FWS or NMFS, the District Engineer may add species-specific regional endangered species conditions to the NWPs.
(b) Authorization of an activity by a nationwide permit does not authorize the "take" of a threatened or endangered species as defined under the Federal Endangered Species Act. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the U.S. Fish and Wildlife Service or the National Marine Fisheries Service, both lethal and non-lethal "takes" of protected species are in violation of the Endangered Species Act. Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the U.S. Fish and Wildlife Service and National

Marine Fisheries Service or their world wide web pages at <http://www.fws.gov/r9endspp/endspp.html> and http://www.nfms.gov/prot_res/esahome.html, respectively.

12. **Historic Properties.** No activity which may affect historic properties listed, or eligible for listing, in the National Register of Historic Places is authorized, until the DE has complied with the provisions of 33 CFR Part 325, Appendix C. The prospective permittee must notify the District Engineer if the authorized activity may affect any historic properties listed, determined to be eligible, or which the prospective permittee has reason to believe may be eligible for listing on the National Register of Historic Places, and shall not begin the activity until notified by the District Engineer that the requirements of the National Historic Preservation Act have been satisfied and that the activity is authorized. Information on the location and existence of historic resources can be obtained from the State Historic Preservation Office and the National Register of Historic Places (see 33 CFR 330.4(g)). For activities that may affect historic properties listed in, or eligible for listing in, the National Register of Historic Places, the notification must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property.

13. **Notification.**

(a) Timing: Where required by the terms of the NWP, the prospective permittee must notify the District Engineer with a preconstruction notification (PCN) as early as possible. The District Engineer must determine if the PCN is complete within 30 days of the date of receipt and can request the additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the District Engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the District Engineer. The prospective permittee shall not begin the activity:

(1) Until notified in writing by the District Engineer that the activity may proceed under the NWP with any special conditions imposed by the District or Division Engineer; or

(2) If notified in writing by the District or Division Engineer that an individual permit is required; or

(3) Unless 45 days have passed from the District Engineer's receipt of the complete notification and the prospective permittee has not received written notice from the District or Division Engineer. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) Contents of Notification: The notification must be in writing and include the following information:

(1) Name, address, and telephone numbers of the prospective permittee;

(2) Location of the proposed project;

(3) Brief description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause; any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity; and

(4) For NWPs 7, 12, 14, 18, 21, 34, 38, 39, 40, 42, and 43, the PCN must also include a delineation of affected special aquatic sites, including wetlands, vegetated shallows (e.g., submerged aquatic vegetation, seagrass beds), and riffle and pool complexes (see paragraph 13(f));

(5) For NWP 7, Outfall Structures and Maintenance, the PCN must include information regarding the original design capacities and configurations of those areas of the facility where maintenance dredging or excavation is proposed.

(6) For NWP 14, Linear Transportation Crossings, the PCN must include a compensatory mitigation proposal to offset permanent losses of waters of the United States and a statement describing how temporary losses of waters of the United States will be minimized to the maximum extent practicable.

(7) For NWP 21, Surface Coal Mining Activities, the PCN must include an Office of Surface Mining (OSM) or state-approved mitigation plan.

(8) For NWP 27, Stream and Wetland Restoration, the PCN must include documentation of the prior condition of the site that will be reverted by the permittee.

(9) For NWP 29, Single-Family Housing, the PCN must also include:

(i) Any past use of this NWP by the individual permittee and/or the permittee's spouse;

(ii) A statement that the single-family housing activity is for a personal residence of the permittee;

(iii) A description of the entire parcel, including its size, and a delineation of wetlands. For the purpose of this NWP, parcels of land measuring 1/4 acre or less will not require a formal on-site delineation. However, the applicant shall provide an indication of where the wetlands are and the amount of wetlands that exists on the property. For parcels greater than 1/4 acre in size, a formal wetland delineation must be prepared in accordance with the current method required by the Corps. (See paragraph 13(f));

(iv) A written description of all land (including, if available, legal descriptions) owned by the prospective permittee and/or the prospective permittee's spouse, within a one mile radius of the parcel, in any form of

ownership (including any land owned as a partner, corporation, joint tenant, co-tenant, or as a tenant-by-the-entirety) and any land on which a purchase and sale agreement or other contract for sale or purchase has been executed;

(10) For NWP 31, Maintenance of Existing Flood Control Projects, the prospective permittee must either notify the District Engineer with a PCN prior to each maintenance activity or submit a five year (or less) maintenance plan. In addition, the PCN must include all of the following:

(i) Sufficient baseline information so as to identify the approved channel depths and configurations and existing facilities. Minor deviations are authorized, provided the approved flood control protection or drainage is not increased;

(ii) A delineation of any affected special aquatic sites, including wetlands; and,

(iii) Location of the dredged material disposal site.

(11) For NWP 33, Temporary Construction, Access, and Dewatering, the PCN must also include a restoration plan of reasonable measures to avoid and minimize adverse effects to aquatic resources.

(12) For NWPs 39, 43, and 44, the PCN must also include a written statement to the District Engineer explaining how avoidance and minimization of losses of waters of the United States were achieved on the project site.

(13) For NWP 39, Residential, Commercial, and Institutional Developments, the PCN must include a compensatory mitigation proposal that offsets unavoidable losses of waters of the United States or justification explaining why compensatory mitigation should not be required.

(14) For NWP 40, Agricultural Activities, the PCN must include a compensatory mitigation proposal to offset losses of waters of the United States.

(15) For NWP 43, Stormwater Management Facilities, the PCN must include, for the construction of new stormwater management facilities, a maintenance plan (in accordance with State and local requirements, if applicable) and a compensatory mitigation proposal to offset losses of waters of the United States.

(16) For NWP 44, Mining Activities, the PCN must include a description of all waters of the United States adversely affected by the project, a description of measures taken to minimize adverse effects to waters of the United States, a description of measures taken to comply with the criteria of the NWP, and a reclamation plan (for aggregate mining activities in isolated waters and non-tidal wetlands adjacent to headwaters and any hard rock/mineral mining activities).

(17) For activities that may adversely affect Federally-listed endangered or threatened species, the PCN must include the name(s) of those endangered or threatened species that may be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work.

(18) For activities that may affect historic properties listed in, or eligible for listing in, the National Register of Historic Places, the PCN must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property.

(19) For NWPs 12, 14, 29, 39, 40, 42, 43, and 44, where the proposed work involves discharges of dredged or fill material into waters of the United States resulting in permanent, above-grade fills within 100-year floodplains (as identified on FEMA's Flood Insurance Rate Maps or FEMA-approved local floodplain maps), the notification must include documentation demonstrating that the proposed work complies with the appropriate FEMA or FEMA-approved local floodplain construction requirements.

(c) Form of Notification: The standard individual permit application form (Form ENG 4345) may be used as the notification but must clearly indicate that it is a PCN and must include all of the information required in (b) (1)-(19) of General Condition 13. A letter containing the requisite information may also be used.

(d) District Engineer's Decision: In reviewing the PCN for the proposed activity, the District Engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. The prospective permittee may, optionally, submit a proposed mitigation plan with the PCN to expedite the process and the District Engineer will consider any proposed compensatory mitigation the applicant has included in the proposal in determining whether the net adverse environmental effects to the aquatic environment of the proposed work are minimal. If the District Engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse effects on the aquatic environment are minimal, the District Engineer will notify the permittee and include any conditions the District Engineer deems necessary.

Any compensatory mitigation proposal must be approved by the District Engineer prior to commencing work. If the prospective permittee is required to submit a compensatory mitigation proposal with the PCN, the proposal may be either conceptual or detailed. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the District Engineer will expeditiously review the proposed compensatory mitigation plan. The District Engineer must review the plan within 45 days of receiving a complete PCN and determine whether the conceptual or specific proposed mitigation would ensure no more than minimal adverse effects on the

aquatic environment. If the net adverse effects of the project on the aquatic environment (after consideration of the compensatory mitigation proposal) are determined by the District Engineer to be minimal, the District Engineer will provide a timely written response to the applicant stating that the project can proceed under the terms and conditions of the nationwide permit.

If the District Engineer determines that the adverse effects of the proposed work are more than minimal, then he will notify the applicant either: (1) that the project does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (2) that the project is authorized under the NWP subject to the applicant's submission of a mitigation proposal that would reduce the adverse effects on the aquatic environment to the minimal level; or (3) that the project is authorized under the NWP with specific modifications or conditions. Where the District Engineer determines that mitigation is required in order to ensure no more than minimal adverse effects on the aquatic environment, the activity will be authorized within the 45-day PCN period, including the necessary conceptual or specific mitigation or a requirement that the applicant submit a mitigation proposal that would reduce the adverse effects on the aquatic environment to the minimal level. When conceptual mitigation is included, or a mitigation plan is required under item (2) above, no work in waters of the United States will occur until the District Engineer has approved a specific mitigation plan.

(e) Agency Coordination: The District Engineer will consider any comments from Federal and State agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the project's adverse effects on the aquatic environment to a minimal level.

For activities requiring notification to the District Engineer that result in the loss of greater than 1/2 acre of waters of the United States, the District Engineer will, upon receipt of a notification, provide immediately (e.g., via facsimile transmission, overnight mail, or other expeditious manner), a copy to the appropriate offices of the Fish and Wildlife Service, State natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO), and, if appropriate, the National Marine Fisheries Service. With the exception of NWP 37, these agencies will then have 10 calendar days from the date the material is transmitted to telephone or fax the District Engineer notice that they intend to provide substantive, site-specific comments. If so contacted by an agency, the District Engineer will wait an additional 15 calendar days before making a decision on the notification. The District Engineer will fully consider agency comments received within the specified time frame, but will provide no response to the resource agency, except as provided below. The District Engineer will indicate in the administrative record associated with each notification that the resource agencies' concerns were considered. As required by Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act, the District Engineer will provide a response to National Marine Fisheries Service within 30 days of receipt of any Essential Fish Habitat conservation recommendations. Applicants are encouraged to provide the Corps multiple copies of notifications to expedite agency notification.

(f) Wetlands Delineations: Wetland delineations must be prepared in accordance with the current method required by the Corps. For NWP 29 see paragraph (b)(9)(iii) for parcels less than 1/4 acre in size. The permittee may ask the Corps to delineate the special aquatic site. There may be some delay if the Corps does the delineation. Furthermore, the 45-day period will not start until the wetland delineation has been completed and submitted to the Corps, where appropriate.

14. **Compliance Certification.** Every permittee who has received a Nationwide permit verification from the Corps will submit a signed certification regarding the completed work and any required mitigation. The certification will be forwarded by the Corps with the authorization letter. The certification will include: a.) A statement that the authorized work was done in accordance with the Corps authorization, including any general or specific conditions; b.) A statement that any required mitigation was completed in accordance with the permit conditions; and c.) The signature of the permittee certifying the completion of the work and mitigation.

15. **Use of Multiple Nationwide Permits.** The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3 acre.

16. **Water Supply Intakes.** No activity, including structures and work in navigable waters of the United States or discharges of dredged or fill material, may occur in the proximity of a public water supply intake except where the activity is for repair of the public water supply intake structures or adjacent bank stabilization.

17. **Shellfish Beds.** No activity, including structures and work in navigable waters of the United States or discharges of dredged or fill material, may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWP 4.

18. **Suitable Material.** No activity, including structures and work in navigable waters of the United States or discharges of dredged or fill material, may consist of unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.)

and material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).

19. **Mitigation.** The project must be designed and constructed to avoid and minimize adverse effects to waters of the United States to the maximum extent practicable at the project site (i.e., on site). Mitigation will be required when necessary to ensure that the adverse effects to the aquatic environment are minimal. The District Engineer will consider the factors discussed below when determining the acceptability of appropriate and practicable mitigation necessary to offset adverse effects on the aquatic environment that are more than minimal.

(a) To be practicable, the mitigation must be available and capable of being done considering costs, existing technology, and logistics in light of the overall project purposes. Examples of mitigation that may be appropriate and practicable include, but are not limited to: reducing the size of the project; establishing and maintaining wetland or upland vegetated buffers to protect open waters such as streams; and replacing losses of aquatic resource functions and values by creating, restoring, enhancing, or preserving similar functions and values, preferably in the same watershed;

(b) The District Engineer will require restoration, creation, enhancement, or preservation of other aquatic resources in order to offset the authorized impacts to the extent necessary to ensure that the adverse effects on the aquatic environment are minimal. An important element of any compensatory mitigation plan for projects in or near streams or other open waters is the establishment and maintenance, to the maximum extent practicable, of vegetated buffers next to open waters on the project site. The vegetated buffer should consist of native species. The District Engineer will determine the appropriate width of the vegetated buffer and in which cases it will be required. Normally, the vegetated buffer will be 25 to 50 feet wide on each side of the stream, but the District Engineer may require wider vegetated buffers to address documented water quality concerns. If there are open waters on the project site and the District Engineer requires compensatory mitigation for wetland impacts to ensure that the net adverse effects on the aquatic environment are minimal, any vegetated buffer will comprise no more than 1/3 of the remaining compensatory mitigation acreage after the permanently filled wetlands have been replaced on a one-to-one acreage basis. In addition, compensatory mitigation must address adverse effects on wetland functions and values and cannot be used to offset the acreage of wetland losses that would occur in order to meet the acreage limits of some of the NWP (e.g., for NWP 39, 1/4 acre of wetlands cannot be created to change a 1/2 acre loss of wetlands to a 1/4 acre loss; however, 1/2 acre of created wetlands can be used to reduce the impacts of a 1/3 acre loss of wetlands). If the prospective permittee is required to submit a compensatory mitigation proposal with the PCN, the proposal may be either conceptual or detailed.

(c) To the extent appropriate, permittees should consider mitigation banking and other appropriate forms of compensatory mitigation. If the District Engineer determines that compensatory mitigation is necessary to offset losses of waters of the United States and ensure that the net adverse effects of the authorized work on the aquatic environment are minimal, consolidated mitigation approaches, such as mitigation banks, will be the preferred method of providing compensatory mitigation, unless the District Engineer determines that activity-specific compensatory mitigation is more appropriate, based on which is best for the aquatic environment. These types of mitigation are preferred because they involve larger blocks of protected aquatic environment, are more likely to meet the mitigation goals, and are more easily checked for compliance. If a mitigation bank or other consolidated mitigation approach is not available in the watershed, the District Engineer will consider other appropriate forms of compensatory mitigation to offset the losses of waters of the United States to ensure that the net adverse effects of the authorized work on the aquatic environment are minimal.

20. **Spawning Areas.** Activities, including structures and work in navigable waters of the United States or discharges of dredged or fill material, in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., excavate, fill, or smother downstream by substantial turbidity) of an important spawning area are not authorized.

21. **Management of Water Flows.** To the maximum extent practicable, the activity must be designed to maintain preconstruction downstream flow conditions (e.g., location, capacity, and flow rates). Furthermore, the activity must not permanently restrict or impede the passage of normal or expected high flows (unless the primary purpose of the fill is to impound waters) and the structure or discharge of dredged or fill material must withstand expected high flows. The activity must, to the maximum extent practicable, provide for retaining excess flows from the site, provide for maintaining surface flow rates from the site similar to preconstruction conditions, and must not increase water flows from the project site, relocate water, or redirect water flow beyond preconstruction conditions. In addition, the activity must, to the maximum extent practicable, reduce adverse effects such as flooding or erosion downstream and upstream of the project site, unless the activity is part of a larger system designed to manage water flows.

22. **Adverse Effects From Impoundments.** If the activity, including structures and work in navigable waters of the United States or discharge of dredged or fill material, creates an impoundment of water, adverse effects on the

aquatic system caused by the accelerated passage of water and/or the restriction of its flow shall be minimized to the maximum extent practicable.

23. **Waterfowl Breeding Areas**. Activities, including structures and work in navigable waters of the United States or discharges of dredged or fill material, into breeding areas for migratory waterfowl must be avoided to the maximum extent practicable.

24. **Removal of Temporary Fills**. Any temporary fills must be removed in their entirety and the affected areas returned to their preexisting elevation.

25. **Designated Critical Resource Waters**. Critical resource waters include, NOAA-designated marine sanctuaries, National Estuarine Research Reserves, National Wild and Scenic Rivers, critical habitat for Federally listed threatened and endangered species, coral reefs, State natural heritage sites, and outstanding national resource waters or other waters officially designated by a State as having particular environmental or ecological significance and identified by the District Engineer after notice and opportunity for public comment. The District Engineer may also designate additional critical resource waters after notice and opportunity for comment.

(a) Except as noted below, discharges of dredged or fill material into waters of the United States are not authorized by NWP 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, and 44 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters. Discharges of dredged or fill materials into waters of the United States may be authorized by the above NWPs in National Wild and Scenic Rivers if the activity complies with General Condition 7. Further, such discharges may be authorized in designated critical habitat for Federally listed threatened or endangered species if the activity complies with General Condition 11 and the U.S. Fish and Wildlife Service or the National Marine Fisheries Service has concurred in a determination of compliance with this condition.

(b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, and 38, notification is required in accordance with General Condition 13, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The District Engineer may authorize activities under these NWPs only after he determines that the impacts to the critical resource waters will be no more than minimal.

26. **Fills Within 100-Year Floodplains**. For purposes of this general condition, 100-year floodplains will be identified through the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps or FEMA-approved local floodplain maps.

(a) **Discharges Below Headwaters**. Discharges of dredged or fill material into waters of the United States resulting in permanent, above-grade fills within the 100-year floodplain at or below the point on a stream where the average annual flow is five cubic feet per second (i.e., below headwaters) are not authorized by NWPs 29, 39, 40, 42, 43, and 44. For NWPs 12 and 14, the prospective permittee must notify the District Engineer in accordance with General Condition 13 and the notification must include documentation that any permanent, above-grade fills in waters of the United States within the 100-year floodplain below headwaters comply with FEMA or FEMA-approved local floodplain construction requirements.

(b) **Discharges in Headwaters** (i.e., above the point on a stream where the average annual flow is five cubic feet per second).

(1) **Flood Fringe**. Discharges of dredged or fill material into waters of the United States resulting in permanent, above-grade fills within the flood fringe of the 100-year floodplain of headwaters are not authorized by NWPs 12, 14, 29, 39, 40, 42, 43, and 44, unless the prospective permittee notifies the District Engineer in accordance with General Condition 13. The notification must include documentation that such discharges comply with FEMA or FEMA-approved local floodplain construction requirements.

(2) **Floodway**. Discharges of dredged or fill material into waters of the United States resulting in permanent, above-grade fills within the floodway of the 100-year floodplain of headwaters are not authorized by NWPs 29, 39, 40, 42, 43, and 44. For NWPs 12 and 14, the permittee must notify the District Engineer in accordance with General Condition 13 and the notification must include documentation that any permanent, above grade fills proposed in the floodway comply with FEMA or FEMA-approved local floodplain construction requirements.

DRAFT SEAWATER DESALINATION PERMITTING REPORT

LAGUNA MADRE WATER DISTRICT

Prepared For:



Laguna Madre Water District
Port Isabel, Texas

Submitted To:



NRS Engineers
Austin, Texas

Prepared By:



TRC Environmental Corporation
Austin, Texas

April 2010





DRAFT SEAWATER DESALINATION PERMITTING REPORT

LAGUNA MADRE WATER DISTRICT

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ABBREVIATIONS AND ACRONYMS

AST	Aboveground Storage Tank
BMP	Best Management Practice
BND	Brownsville Navigation District
CCC	Coastal Coordination Council
CMP	Coastal Management Plan
CWA	Clean Water Act
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FONSI	Finding of No Significant Impact
GLO	Texas General Land Office
LMWD	Laguna Madre Water District
mgd	Million Gallons per Day
NEPA	National Environmental Policy Act
NMFS	National Oceanic and Atmospheric Administration – National Marine Fisheries Service
NOI	Notice of Intent
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
RRC	Railroad Commission of Texas
SWPPP	Storm Water Pollution Prevention Plan
T&E	Threatened and Endangered
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
THC	Texas Historical Commission
TLAP	Texas Land Application Permit
TPDES	Texas Pollutant Discharge Elimination System
TPWD	Texas Parks and Wildlife Department
TWDB	Texas Water Development Board
TxDOT	Texas Department of Transportation
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
UST	Underground Storage Tank

1.0 INTRODUCTION

In an effort to meet rising water demand, the Laguna Madre Water District (LMWD) conducted a pilot study to determine the technical feasibility of operating a seawater desalination plant on South Padre Island (Texas Water Development Board [TWDB] 2010). Based on the findings from the pilot study, the LMWD proposes to construct a 1 million gallon per day (mgd) seawater desalination plant (Project) on South Padre Island, Cameron County, Texas. The facility would be located on the bay-side of South Padre Island north of Andy Bowie County Park.

Engineering design of the plant has not been completed and several design alternatives are under consideration. Table 1-1 summarizes the alternative design strategies being considered.

Table 1-1. Design Alternatives Under Consideration

Project Component	Alternatives
Intake	<ul style="list-style-type: none"> • Series of shallow beach wells and a raw water collection pipeline. • Open water intake in the Gulf of Mexico with raw water intake pipeline directionally-drilled under the dunes.
Treatment System	<ul style="list-style-type: none"> • Treatment technology to include membrane pretreatment and reverse osmosis.
Finished Water System	<ul style="list-style-type: none"> • Ground storage tank and high service pump station.
Concentrate Disposal	<ul style="list-style-type: none"> • Diffusion into the Gulf of Mexico. • Injection well into hypersaline geologic formation. • Diffusion into Laguna Madre.
Power Consumption	<ul style="list-style-type: none"> • Grid only. • On-site renewable energy (wave buoys) with grid supplement.

Construction and operation of the desalination plant will require numerous environmental permits, approvals, and compliance documents. In some instances, the permit or approval required will vary according to the design alternative selected. This report identifies and summarizes the array of environmental permits and compliance documents required to construct and operate the proposed plant under the design alternatives being considered. In addition, the report provides timelines and approximate cost estimates to obtain permit and compliance approvals.

2.0 FEDERAL PERMITS AND APPROVALS

Permitting and regulatory requirements for constructing a seawater desalination plant are similar to those required for a brackish groundwater desalination plant (TWDB 2008). The following subsections detail the federal permits and approvals that must be considered prior to plant construction.

2.1 United States Army Corps of Engineers Section 10 and 404 Permits

The United States Army Corps of Engineers (USACE) is the federal agency primarily responsible for evaluating the construction activities that occur in United States (U.S.) waters, including wetlands. The Rivers and Harbors Act of 1899 Section 10 establishes a program to regulate construction activities in navigable waters, while Section 404 of the Clean Water Act (CWA) regulates the discharge of dredged and fill material into waters of the United States. The USACE administers individual permit decisions and jurisdictional determinations; develops policy and guidance; and enforces Sections 10 and 404 provisions. District Engineers are authorized to issue permits, including individual and nationwide permits.

There are several ways in which activities requiring Section 10 and 404 permits can be authorized, depending on the proposed activity and the extent of environmental impact. Nationwide permits (Appendix A) are often issued by USACE for categories of activities that are similar in nature and would have only minimal individual or cumulative adverse environmental effects. All activities authorized under any nationwide permit must meet the general conditions for nationwide permits (Appendix B) as well as any specific provisions listed for the project site. Nationwide permits typically take the least amount of time for approval and do not require a mandatory 30-day public review.

Individual permits are issued when a specific activity is not covered by a nationwide permit or the proposed impacts exceed certain limits set for nationwide permits. Approval for Individual permits can take several months to several years for approval depending on the complexity of the project, intensity of impacts and public opposition to the project. Individual permits require a 30-day mandatory public review period prior to approval by the USACE, with public meetings required if requested by the public.

In general, to obtain a Section 10 or 404 permit, applicants must demonstrate that construction activities would not significantly degrade the nation's waters and no practicable alternatives are less damaging to the aquatic environment. Applicants must construct projects to minimize impacts to water bodies and wetlands and provide appropriate and practicable mitigation, such as restoring or creating wetlands, for any remaining, unavoidable impacts. Permits will not be granted for projects that are found to be contrary to the public interest.

The State of Texas utilizes a joint application system to apply for permits and authorizations from several agencies as a single filing for activities affecting streams, waterways, waterbodies, wetlands, coastal areas and sources of water supply, including permits from both Texas Commission on Environmental Quality (TCEQ) and USACE. While the application submittal would be combined and submitted to the USACE-Galveston District, separate approvals must be received from each agency. As part of the permitting process, the USACE-Galveston District requests review of the project from other federal and state agencies including the U.S.

Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), Texas Parks and Wildlife Department (TPWD), Texas Historical Commission (THC), Texas General Land Office (GLO), and TCEQ.

The application form for Section 10 and 404 Permits includes applicant information, a detailed description of the project, how much material would be discharged, identification of waters receiving material, identification of adjacent landowners, location maps of the project that include wetlands, streams and ditches, and a sketch plan view and cross-section drawn to scale with dimensions given, or engineering drawings showing location and extent of work. Additional application documents include a Section 401 application and a statement of compliance with the Texas Coastal Management Plan. The Section 401 application and the Texas Coastal Management Program are described in further detail in Section 3.1.1 and 3.4.1 respectively.

Design Alternatives

A Section 10 permit likely will be required from the USACE-Galveston District for construction of the intake and any outfall structures in the Gulf of Mexico and/or the Laguna Madre. Unless construction measures can be implemented to prevent discharge of any dredged or fill material, the requirements of Section 404 of the Clean Water Act also will apply. Additional Project components such as buildings, pipelines, and storage tanks that impact Waters of the U.S., including wetlands, would require a Section 404 permit. A review of the USFWS National Wetland Inventory Map (USFWS 2009a) identifies large areas of potential wetlands north of Andy Bowie County Park. Pre-construction field surveys of the Project site, as well as discussions with the USACE-Galveston District, would determine the wetland designation of the area. Any Section 404 permit also would require a Section 401 certification from the TCEQ that water quality would not be impaired. Anticipated permits for each design alternative are identified below.

Intake

- A series of shallow beach wells may require a Nationwide Permit 12 (Utility Line Activities) under Section 10 if any of the buried raw water collection pipelines extend into the Gulf of Mexico. Should construction of the beach wells and pipelines disturb more than ½ acre of Waters of the U.S. including wetlands, then an Individual Permit would be required.
- An open water intake located in the Gulf of Mexico likely would require Nationwide Permit 12 (Utility Line Activities) if the amount of disturbance is less than ½ acre to Waters of the U.S.

Treatment System

No USACE permit would be necessary if the desalination plant location does not affect any jurisdictional wetlands.

Finished Water System

No USACE permit would be necessary if tank locations and associated pipeline installation avoid jurisdictional wetlands and stream crossings.

Concentrate Disposal

- Diffusion of concentrate into the Gulf of Mexico likely would require an Individual Permit due to the anticipated amount of disturbance to Waters of the U.S. (greater than ½ acre) by the pipeline and installation of the diffuser array.
- Disposal of concentrate via injection well would not require a USACE permit if well locations and pipelines avoid jurisdictional wetlands and stream crossings.
- Diffusion of concentrate into Laguna Madre likely would require an Individual Permit due to the anticipated amount of disturbance to Waters of the U.S. (greater than ½ acre) by the pipeline and installation of the diffuser array.

Power Consumption

- No USACE permit would be required to connect to the existing power grid as long as jurisdictional wetlands and stream crossings are avoided in siting any new transmission lines and any associated structures.
- A USACE Section 10 Individual Permit would be required for installation of wave buoys in the Gulf of Mexico as this activity is not permitted under a Nationwide Permit.

2.2 National Environmental Policy Act Compliance

The National Environmental Policy Act (NEPA) establishes a national environmental policy and goals for the protection, maintenance, and enhancement of the environment and it provides a process for implementing these goals within federal agencies. Under Section 102 of NEPA, all federal agencies are required to incorporate environmental considerations into their planning and decision-making through a systematic interdisciplinary analysis of proposed undertakings. There are three levels of analysis depending on whether or not an undertaking could significantly affect the environment. These three levels include: categorical exclusion determination; preparation of an environmental assessment/finding of no significant impact (EA/FONSI); and preparation of an environmental impact statement (EIS) (EPA 2010).

At the first level, an undertaking may be categorically excluded from a detailed environmental analysis if it meets certain criteria which a federal agency has previously determined as having no significant environmental impact. A number of agencies have developed lists of actions which are normally categorically excluded from environmental evaluation under their NEPA regulations (EPA 2010).

At the second level of analysis, a federal agency prepares a written EA to determine whether or not a federal undertaking would significantly affect the environment. If the answer is no, the agency issues a FONSI. The FONSI may address measures which an agency will take to reduce (mitigate) potentially significant impacts (EPA 2010).

If the EA determines that the environmental consequences of a proposed federal undertaking may be significant, an EIS is prepared. An EIS is a more detailed evaluation of the proposed action and alternatives. The public, other federal agencies and outside parties may provide input into the

preparation of an EIS and then comment on the draft EIS when it is completed. If a federal agency anticipates that an undertaking may significantly impact the environment, or if a project is environmentally controversial, a federal agency may choose to prepare an EIS without having to first prepare an EA (EPA 2010).

After a final EIS is prepared and at the time of its decision, a federal agency will prepare a public record of its decision addressing how the findings of the EIS, including consideration of alternatives, were incorporated into the agency's decision-making process (EPA 2010).

Design Alternatives

The USACE District Commander is the USACE NEPA official responsible for compliance with NEPA for actions within district boundaries. The USACE procedures implementing NEPA are found at 33 Code of Federal Regulations Part 230. LMWD will need to consult early with USACE to determine if the Project scope can be categorically excluded from detailed environmental analysis, or if the Project will require an EA or EIS. This decision will depend to a large degree on what type of Section 10/404 permit is applicable to the Project (Individual or Nationwide). Typically, USACE regulatory actions such as issuing permits only require an EA. Should a Nationwide Permit be granted, it is likely to be categorically excluded. However, given the potentially unknown effects of the Project, the District Engineer may determine that an EIS is required before a permit can be issued.

Intake

- Construction of beach wells may require a Nationwide Permit. If the Project can be permitted under a Nationwide Permit, it could be categorically excluded or possibly an EA may be required, again with the USACE-Galveston District Engineer determining which process will be conducted.
- An open water intake located in the Gulf of Mexico likely could be permitted under a Nationwide Permit 12 (Utility Line Activities) if construction disturbs less than ½ acre of Waters of the U.S. If the Project can be permitted under a Nationwide Permit, it could be categorically excluded or possibly an EA may be required, again with the USACE determining the final process.

Treatment System and Finished Water System

Even though no USACE permit would be required if treatment and finished water system facilities avoid jurisdictional wetlands and stream crossings, potential impacts would need to be evaluated in the EA issued for the intake permit (if applicable).

Concentrate Disposal

- As discussed in Section 2.1, diffusion of concentrate into the Gulf of Mexico likely would require an Individual Permit due to the amount of disturbance to Waters of the U.S. (greater than ½ acre) by the pipeline and installation of the diffuser array. It is anticipated an Individual Permit would require an EA, possibly an EIS.
- Disposal of concentrate via injection well into a hypersaline geologic formation would not require a USACE permit if well locations and pipelines avoid jurisdictional wetlands and stream crossings; however, potential impacts associated with construction of the wells would need to be evaluated in the EA issued for the intake permit (if applicable).

- As discussed in Section 2.1, diffusion of concentrate into Laguna Madre likely would require an Individual Permit due to the amount of disturbance to Waters of the U.S. (greater than ½ acre) by the pipeline and installation of the diffuser array. It is anticipated an Individual Permit would require an EA, possibly an EIS.

Power Consumption

- No USACE permit would be required to connect to the existing power grid as long as jurisdictional wetlands and stream crossings are avoided in siting any new transmission lines and any associated structures. However, potential impacts would need to be evaluated in the EA issued for the intake permit (if applicable).
- A USACE Section 10 permit would be required for installation of wave buoys in the Gulf of Mexico. It is anticipated that an EA would be required, possibly an EIS.

2.3 United States Fish and Wildlife Service and National Oceanic and Atmospheric Administration – National Marine Fisheries Service

The USFWS in the Department of the Interior and the National Oceanic and Atmospheric Administration –NMFS in the Department of Commerce share responsibility for administration of the Endangered Species Act (ESA). Section 7(a) of the ESA requires federal agencies to consult with USFWS and/or NMFS to ensure that project activities are not likely to jeopardize the continued existence of any federally listed threatened or endangered (T&E) species or result in the adverse modification of critical habitat. If adverse impacts to T&E species are anticipated by a project activity, USFWS and NMFS are authorized to issue Incidental Take Permits that exempt federal agencies and their permittees from civil and criminal penalties if they comply with the reasonable and prudent measures and the implementing terms and conditions of the permit.

Consultation with USFWS and NMFS for the purposes of preventing loss or damage to wildlife resources under the Fish and Wildlife Coordination Act also would be required. This consultation would involve an evaluation of fish and wildlife resources by USFWS and NMFS with recommendations for preservation and mitigation. Additional consultations with the NMFS would be required to evaluate the impacts of project construction, operations, and maintenance activities to Essential Fish Habitat and marine mammals in Gulf of Mexico waters. Essential Fish Habitat consultation is often combined with other consultations such as ESA. Specific responsibilities for each design alternative are discussed below.

Design Alternatives

One of the general conditions (Appendix B) of any nationwide permit issued by USACE is a determination by the District Engineer that requirements of the ESA have been satisfied. Since the Project will require a USACE permit, Section 7(a) consultation will have to occur. It should be noted that issuance of a nationwide permit does not authorize lethal or non-lethal take of a T&E species. Should an activity be likely to result in lethal or non-lethal take of a protected species, an Incidental Take Permit must be obtained from USFWS and/or NMFS. A review of the USFWS Critical Habitat Map (USFWS 2009b) identifies large areas designated critical habitat for piping plover north of Andy Bowie County Park on the bay-side as well as the gulf-

side of South Padre Island. It is anticipated that pre-construction field surveys of the Project site to assess potential impacts of the Project on the piping plover and its habitat will be required.

Intake

- A series of shallow beach wells would potentially impact T&E species as well as critical habitat and therefore require consultation with USFWS.
- An open water intake located in the Gulf of Mexico has potential to impinge and entrain T&E species. Consultation with USFWS and NMFS would be required.

Treatment System and Finished Water System

If pre-construction surveys determine that T&E species or critical habitat are present in or near facility and pipeline construction sites consultation with USFWS would be required.

Concentrate Disposal

- Diffusion of concentrate into the Gulf of Mexico would potentially impact T&E species present and Essential Fish Habitat, and thus consultation with USFWS and NMFS would be required.
- Disposal of concentrate via injection well would not require consultation with NMFS. It is likely that consultation with USFWS would still be required since construction of the wells could potentially impact T&E species.
- Diffusion of concentrate into Laguna Madre would potentially impact T&E species present and Essential Fish Habitat, and thus consultation with USFWS and NMFS would be required.

Power Consumption

- Although a USACE permit would not be required to connect to the existing power grid (as long as jurisdictional wetlands and stream crossings are avoided in siting any new transmission lines and any associated structures), it is anticipated USFWS would be need to be consulted since construction of the any new facilities could potentially impact T&E species.
- A USACE Section 10 permit would be required for installation of wave buoys in the Gulf of Mexico and would potentially impact T&E species present and Essential Fish Habitat. Therefore, consultation with USFWS and NMFS would be required.

3.0 STATE AND LOCAL PERMITS AND APPROVALS

State of Texas permitting agencies include the TCEQ, TPWD, THC, GLO, and Texas Department of Transportation (TxDOT). The following sub-sections detail the state and local permits and approvals that may be required for the Project.

3.1 Texas Commission on Environmental Quality

The TCEQ is the primary environmental protection agency for the state of Texas. The TCEQ oversees permitting and enforcement for air, waste, water quality and water quantity.

3.1.1 Water Quality Certification

The TCEQ has developed a tiered system of review for all individual Section 404 permit applications based upon project size and the amount of state water affected. The purpose of these reviews is to determine whether a proposed discharge will comply with state water quality standards. The extent of Section 401 certification review will vary between the different tiers, as well as the type of wetland affected.

Tier I projects are small projects that affect less than three acres of waters in the state, or less than 1,500 linear feet of streams. TCEQ has determined that incorporating certain best management practices (BMPs) and other requirements into the project will sufficiently minimize impacts to water quality. For Tier I projects, no further Section 401 review will be necessary if the permittee agrees to include those BMPs and requirements in their project which makes them part of their Section 404 permit. Projects that would impact rare and ecologically important wetlands including mangrove marshes and coastal dune swales would not qualify under Tier I.

Tier II projects include any project that does not qualify for a Tier I review or for which the applicant elects not to incorporate Tier I criteria. Tier II project applicants must submit a Tier II 401 Certification Questionnaire and Alternative Analysis Checklist. Information provided for the Tier II 401 Certification Questionnaire includes a description of methods that would be utilized for avoiding adverse impacts to water quality. Information provided in the Alternative Analysis Checklist includes a description and comparison of project alternatives including location, size, and technical feasibility. Tier II projects are subject to an individual certification review by TCEQ. After the USACE declares the application complete, a joint 30-day public notice is issued. The TCEQ may choose to hold a public hearing to consider potential adverse impacts of the project on water quality. Once the USACE issues a Statement of Findings or a decision document, the TCEQ has 10 days to make a 401 certification decision.

Design Alternatives

Project components that qualify for a USACE Nationwide Permit likely would qualify for Tier I Section 401 certification. Project components that would require a USACE Individual Permit likely would require Tier II Section 401 certification from the TCEQ.

Intake

- A series of beach wells may not require a USACE permit and therefore not require Section 401 certification. However, should a USACE permit be required, no more than 3 acres of waters of the state would be affected and therefore a Tier I Section 401 certification would be required.

- An open water intake located in the Gulf of Mexico likely would affect less than 3 acres of waters of the state and qualify for Tier I Section 401 certification.

Treatment System and Finished Water System

As no USACE permit would likely be necessary for either component, no Section 401 certification would be required.

Concentrate Disposal

- Diffusion of concentrate into the Gulf of Mexico likely would affect more than 3 acres of waters of the state and therefore need Tier II Section 401 certification.
- Disposal of concentrate via injection well would not require a USACE permit and no Section 401 certification.
- Discharge of concentrate into Laguna Madre likely would affect more than 3 acres of waters of the state and therefore require Tier II Section 401 certification.

Power Consumption

- As no USACE permit likely would be necessary for to connect to the existing grid, no Section 401 certification would be required.
- Installation of wave buoys likely would affect more than 3 acres of waters of the state and therefore require Tier II Section 401 certification.

3.1.2 Texas Pollutant Discharge Elimination System Industrial Wastewater Permit

The National Pollutant Discharge Elimination System (NPDES) permitting programs are established by section 402 of the Clean Water Act. Any person that discharges a pollutant (other than dredged or fill material) into waters of the United States from a point source must obtain a NPDES permit. Any NPDES permit must contain limitations to reflect the application of available treatment technologies, as well as any more stringent limitations needed to ensure compliance with water quality standards. EPA has promulgated regulations governing the administration of the NPDES program, and under the CWA, states may administer the NPDES program provided the program meets federal requirements. The State of Texas has the authority to administer the NPDES program, and in Texas, discharges of pollutants to surface water bodies are regulated by TCEQ under the Texas Pollutant Discharge Elimination System (TPDES) Wastewater Permits.

Components of the permit application include an Administrative Report for Industrial Wastewater, Industrial Wastewater Technical Report, Submission Checklist, and Core Data Form, along with permitting fees. Information provided in the Administrative Report for Industrial Wastewater includes the applicant, application contact, application notices, the facility, and facility location. Detailed descriptions of the facility, operations, and location are included in the Industrial Wastewater Technical Report, which serves as the main body of the application.

After the TCEQ receives the application, staff will perform an Administration Review to confirm that the application is complete. The applicant would then be instructed to publish an initial

Notice of Intent (NOI) to obtain a permit. During the Technical Review, the technical aspects of the application would be reviewed and evaluated and additional public reviews would be issued. This review process may include public meetings and hearings.

Design Alternatives

The TPDES Industrial Wastewater Permit would only apply to the concentrate disposal alternatives of the Project as identified below.

Concentrate Disposal

- Diffusion of concentrate into the Gulf of Mexico would require a TPDES Industrial Wastewater Permit.
- Disposal of concentrate via injection well would not require a TPDES Industrial Wastewater Permit.
- Diffusion of concentrate into Laguna Madre would require a TPDES Industrial Wastewater Permit.

3.1.3 Underground Injection Control (UIC) Permit

Wells used to "...inject, transmit, or dispose of industrial and municipal waste or oil and gas waste into a subsurface stratum..." (Chapter 27 Texas Water Code) are regulated by either TCEQ or the Railroad Commission of Texas (RRC) depending on the type of well. An individual or general permit, in accordance with 30 TAC §331 Subchapter L, may be issued to dispose of nonhazardous brine produced by a desalination operation in a Class I injection well. The TCEQ regulates Class I injection wells with the RRC reviewing and providing comments. Currently, the TCEQ is developing a general permit for the disposal of nonhazardous brine. Final adoption of the general permit conditions is expected in 2010.

The UIC permit application process for a Class I nonhazardous injection well involves providing applicant information along with detailed well design and geologic mapping, predictive reservoir modeling, waste compatibility, and waste management. As with the TPDES process in Section 3.1.2, the application undergoes administrative, technical and public reviews. The review process also may also include public meetings and hearings.

Design Alternatives

The UIC Permit would only apply to the concentrate disposal alternatives of the Project as identified below.

Concentrate Disposal

- Diffusion of concentrate into the Gulf of Mexico would not require a UIC permit.
- Disposal of concentrate via injection well would require a UIC permit for a Class I injection well.
- Diffusion of concentrate into Laguna Madre would not require a UIC permit.

3.1.4 Discharge of Hydrostatic Test Water Permit

The TCEQ has a General Permit (TXG670000) for discharges resulting from the hydrostatic testing of pipelines, tanks, and other containers into water in the state. Under the General Permit, a regular schedule of water quality sampling and monitoring of the discharge must be conducted. A NOI form must be submitted to TCEQ, as well as the local municipal separate storm sewer system (MS4) operator if applicable. After TCEQ reviews the NOI, it will issue an Acknowledgement Certificate acknowledging coverage under the General Permit, or a Notice of Deficiency if there is insufficient information provided in the application.

Design Alternatives

Construction of the desalination facility and all associated components, regardless of alternative, would require hydrostatic testing of pipelines and therefore be required to obtain a discharge permit. It is likely that the Project would qualify for the Discharges of Hydrostatic Test Water General Permit. It should be noted, however, that the Draft 2010 Texas Clean Water Act 303(d) list of impaired water bodies (TCEQ 2010a) lists the Gulf of Mexico as being impaired for mercury in edible tissue. The General Permit does not allow for discharges of the constituents for which the waterbody is impaired (i.e. mercury). Should the General Permit be denied, a TPDES permit as described in Section 3.1.2 would be required.

3.1.5 Storm Water Discharges from Large Construction Activities

The TCEQ has a Construction General Permit (TXR150000) for storm water controls applicable to construction projects. Large construction activities which disturb 5 or more acres of land are regulated under this general permit. Under the general permit, a Storm Water Pollution Prevention Plan (SWP3) must be prepared and implemented. A NOI form must be submitted to TCEQ and posted at the construction site. The NOI must also be submitted to the local MS4 operator, if applicable. After TCEQ reviews the NOI, it will issue an Acknowledgement Certificate acknowledging coverage under the general permit, or a Notice of Deficiency if there is insufficient information provided in the application.

Design Alternatives

Construction of the desalination facility and all associated components, regardless of alternative, would disturb more than 5 acres and therefore be required to obtain Storm Water Discharge Permit. It is likely that the Project would qualify for the Construction General Permit. It should be noted, however, that the Draft 2010 Texas Clean Water Act 303(d) list of impaired water bodies (TCEQ 2010a) lists the Gulf of Mexico as being impaired for mercury in edible tissue. The General Permit does not allow for discharges of the constituents for which the waterbody is impaired (i.e. mercury). Should the Construction General Permit be denied, an individual TPDES permit would be required. In addition, the current Construction Storm Water General Permit will expire on March 5, 2013, with the potential for revised permit conditions.

3.1.6 Land Application for Water Treatment Plant Sludge

The state of Texas requires that all facilities seeking to dispose of water treatment plant sludge in a landfill, surface impoundment, or waste pile must register with TCEQ. Registration requires submittal of a water treatment sludge registration application as well as sludge and soil analysis reports.

Design Alternatives

It is anticipated that the desalination facility, regardless of design alternative, would include at least one sludge pond for backwash waste. Registration of the sludge pond would also cover the periodic disposal of the pond solids to a permitted landfill.

3.1.7 Water Rights Permit

Water in the rivers, streams, underflow, creeks, tides, lakes and every bay and arm of the Texas portion of the Gulf of Mexico is considered state water. Rights to use state waters may be acquired through appropriation via the permitting process established in Texas Water Code, Chapter 11, and Title 30, Texas Administrative Code (TAC). The state may authorize the use of state water through a permitting system administered by the TCEQ or by the adjudication of claims by state court under the state's water rights adjudication act. Each application for a permit is reviewed for administrative and technical requirements to evaluate its impact on other water rights, bays and estuaries, conservation, water availability, public welfare, etc.

Design Alternatives

The desalination plant would operate at 1.0 mgd and need a water right of approximately 2,802 acre-feet per year.

3.1.8 Texas Public Water System Review

Texas statute requires that the TCEQ ensure that public water systems supply safe drinking water in adequate quantities, are financially stable and technically sound, and promote use of regional and area-wide drinking water systems. While a facility is not required to obtain a permit related to drinking water standards to operate, the TCEQ is required to review completed plans and specifications and business plans for all contemplated public water systems not exempted by Texas Health and Safety Code, §341.035(d). Facilities also are required to continually monitor water quality submit reports to the TCEQ. The rules and regulations for a public water system facility are covered in 30 TAC §290.

Design Alternatives

The construction of the desalination facility, regardless of design alternatives selected, would be considered a new public water system and subject to review and approval by the TCEQ.

3.1.9 Petroleum Storage Tanks Registration

The TCEQ is charged with enforcing rules and regulations pertaining to aboveground storage tanks (ASTs) and underground storage tanks (USTs) storing petroleum products. All USTs as well as ASTs with a capacity of 1,100 gallons or greater are required to be registered with TCEQ. TCEQ also requires 30-day notification prior to installing, repairing, or otherwise working on ASTs and USTs.

Design Alternatives

Should the desalination facility install any USTs or regulated ASTs proper notification and registration with the TCEQ would be required.

3.1.10 Air Permits

Water treatment plants are permitted by rule with respect to air quality if they meet the conditions stated in 30 TAC §106.4 and §106.532. Total actual emissions authorized under permit by rule from the facility shall not exceed 250 tons per year (tpy) of carbon monoxide (CO) or nitrogen oxides (NO_x); 25 tpy of volatile organic compounds (VOC), inhalable particulate matter (PM₁₀) or of any other air contaminant except carbon dioxide, water, nitrogen, methane, ethane, hydrogen, and oxygen; or 10 tpy sulfur dioxide (SO₂) or chlorine (30 TAC §106.4 and §106.532). The following activities are not permitted by rule under 30 TAC §106.4:

- gas stripping or aeration facilities where VOC or other air contaminants are stripped from water directly to the atmosphere;
- disposal facilities using land surface treatment;
- surface facilities associated with injection wells;
- cooling towers in which VOC or other air contaminants may be stripped to the atmosphere.

TCEQ does not require registration of facilities operating under this permit by rule but the facilities must keep a copy of 30 TAC §106.4 and §106.532 as well as any records documenting compliance with rules. Should a facility not meet the conditions of the permit by rule, a New Source Review Permit would be required. Information provided in the application package includes applicant and facility information, process flow description and diagram, maximum operating schedule and emissions calculations, use of best available control technology, and atmospheric dispersion modeling. A 30-day public review period is required for facilities undergoing New Source Review.

It should be noted that TCEQ has proposed changes to the Texas State Implementation Plan that EPA is proposing to disapprove (74 Federal Register 48450). Currently, TCEQ is working to address concerns raised by EPA and anticipates proposing new rules through September 2010 (TCEQ 2010).

Design Alternatives

It is unknown at this time how the proposed new air rules from TCEQ may affect the Project.

Intake

It is anticipated that operations of either intake option would meet the permit by rule qualifications for water treatment facilities and no further air permits would be required.

Treatment System and Finished Water System

It is anticipated that operations of the desalination plant would meet the permit by rule qualifications for water treatment facilities and no further air permits would be required.

Concentrate Disposal

- Diffusion of concentrate into the Gulf of Mexico likely would meet the permit by rule qualifications for water treatment facilities and no further air permits would be required.

- Disposal of concentrate via injection well would not meet the permit by rule qualifications for water treatment facilities and therefore require a New Source Review permit.
- Discharge of concentrate into Laguna Madre likely would meet the permit by rule qualifications for water treatment facilities and no further air permits would be required.

Power Consumption

It is anticipated that either power option would meet the permit by rule qualifications for water treatment facilities and no further air permits would be required.

3.2 Texas Parks and Wildlife Department

The mission of the TPWD is to manage and conserve the natural and cultural resources of Texas and to provide hunting, fishing and outdoor recreation opportunities.

3.2.1 Protected Species Consultation

Issuance of a federal or state permit requires consultation with the TPWD to determine the potential impacts of Project construction, operations, and maintenance activities on any state-listed threatened or endangered species. No Incidental Take Permits currently are available for any activities that may result in the death or injury of a state-listed threatened or endangered species.

Design Alternatives

Due to the multiple state permits required for the Project, TPWD would be need to be consulted regarding potential impacts of construction and operation of the facility to state-listed T&E and other wildlife species.

Intake

- A series of shallow beach wells would require approval by TCEQ under the Public Water Systems review, which requires consultation with TPWD prior to issuance.
- An open water intake located in the Gulf of Mexico has potential to impinge and entrain state-listed T&E species. Consultation with TPWD would be required.

Treatment System and Finished Water System

Construction of the treatment system and finished water system must be approved by TCEQ under the Public Water System Plan Review which requires TPWD consultation prior to issuance.

Concentrate Disposal

- Diffusion of concentrate into the Gulf of Mexico would require a TPDES permit that requires consultation with TPWD prior to issuance.
- Disposal of concentrate via injection well would require a UIC permit that requires consultation with TPWD prior to issuance.
- Diffusion of concentrate into Laguna Madre would require a TPDES permit that requires consultation with TPWD prior to issuance.

Power Consumption

- Although no federal or state permits would be required to connect to the existing power grid, it is anticipated TPWD would be need to be consulted since construction of the any new facilities could potentially impact known T&E species in the area.
- A USACE Section 10 permit would be required for installation of wave buoys in the Gulf of Mexico and would potentially impact T&E species present; therefore, consultation with TPWD would be required.

3.2.2 Sand and Gravel Permit

A Sand and Gravel permit, issued by TPWD, would be required for any activity that would disturb or take marl, sand of commercial value, and all gravel, shell, and mudshell located within tidewater limits or freshwater areas of the state, and on islands within those limits and areas. An application must be filed with TPWD that includes information on the size of the stream, the nature of the banks and the bed of the stream, the amount of material to be disturbed or removed, the adjacent landowners, and the probable effects on the stream and its other users. A General permit is issued when an activity disturbs less than 1,000 cubic yards of material, is not likely to adversely affect any natural resource and follows established best management practices. A 30-day public review period is required for the General permit. If a project does not meet the standards for a General permit then an Individual permit would be required. A 30-day public review period is also required for an Individual permit as well as a public hearing.

Design Alternatives

Intake

- A series of beach wells would likely not require a Sand and Gravel Permit.
- An open water intake located in the Gulf of Mexico would likely require a General permit.

Treatment System and Finished Water System

No Sand and Gravel permit would be required to construct the treatment or finished water system.

Concentrate Disposal

- Diffusion of concentrate into the Gulf of Mexico likely would likely disturb more than 1,000 cubic yards and require an Individual permit.
- Disposal of concentrate via injection well would not require a Sand and Gravel permit.
- Diffusion of concentrate into Laguna Madre likely would likely disturb more than 1,000 cubic yards and require an Individual permit.

Power Consumption

- No Sand and Gravel permit would be required to connect to the existing power grid.
- Installation of wave buoys may require a General permit.

3.3 Texas Historical Commission

The THC is the state agency charged with preserving Texas' architectural, archeological and cultural landmarks. An Antiquities Permit is required when state agencies or political subdivisions of the state propose any action on public land involving five or more acres of ground disturbance; 5,000 or more cubic yards of earth moving; or any project that has the potential to disturb recorded historic or archeological sites. The Antiquities Permit allows a professional archeologist to investigate whether there are potentially any cultural or historical resources, including those that may be submerged, affected by construction of the project. Consultation with the THC under Section 106 of the National Historic Preservation Act (NHPA) is required for any activities associated with federal funds, permits or lands that potentially impact cultural or historical resources.

Design Alternatives

The Laguna Madre Water District is a political subdivision of the state, therefore, all lands owned by the LMWD are considered public lands. As the entire Project would disturb more than 5 acres of public lands, regardless of the design alternatives selected, an Antiquities Permit would be needed.

Intake

- A series of shallow beach wells would require consultation with the THC under the Antiquities Code of Texas; however, if no federal permit, property, or funds are required for the Project, consultation under NHPA would not be required.
- An open water intake located in the Gulf of Mexico would require a USACE permit and consultation under NHPA prior to issuance.

Treatment System and Finished Water System

Construction of the treatment and finished water systems would require consultation with the THC under the Antiquities Code of Texas; however, if no federal permit, property, or funds are required for the Project, consultation under NHPA would not be needed.

Concentrate Disposal

- Diffusion of concentrate into the Gulf of Mexico would require a USACE permit and consultation under NHPA prior to issuance.
- Disposal of concentrate via injection well would require consultation with the THC under the Antiquities Code of Texas; however, if no federal permit, property, or funds are required for the Project, consultation under NHPA would not be needed.
- Diffusion of concentrate into Laguna Madre would require a USACE permit and consultation under NHPA prior to issuance.

Power Consumption

- Construction of new transmission lines may require consultation with THC under the Antiquities Code of Texas if public lands are impacted; however, if no federal permit, property, or funds are required for the Project, consultation under NHPA would not be needed.
- A USACE Section 10 permit would be required for installation of wave buoys in the Gulf of Mexico and consultation under NHPA would be required prior to permit issuance.

3.4 Texas General Land Office

The GLO is responsible for managing state lands and mineral-right properties throughout the state. These lands include beaches, bays, estuaries and other "submerged" lands out to 10.3 miles in the Gulf of Mexico.

3.4.1 Coastal Management Program

Federal and state permits issued for projects within the identified coastal zone are reviewed by the Coastal Coordination Council (CCC) for consistency with the goals and policies of the Texas Coastal Management Program (CMP). The CCC is charged with adopting uniform goals and policies to guide decision-making by all entities regulating or managing natural resource use within the Texas coastal area. The CCC reviews significant actions taken or authorized by state agencies and subdivisions that may adversely affect coastal natural resources to determine their consistency with the CMP goals and policies. The CCC is chaired by the GLO and is comprised of members from various agencies and the public. Permitting agencies, such as the USACE and TCEQ, must perform the consistency review and then refer it to the CCC. The applicant must also provide a consistency assertion. Project consistency is generally obtained by compliance with the rules and permit conditions of the issuing agencies.

Design Alternatives

The proposed location of the Project site on South Padre Island is within the identified coastal zone. Issuance of a USACE and/or TCEQ permits would require a consistency review of the entire Project by the CCC.

3.4.2 Miscellaneous Easement

Miscellaneous Easements are issued on both coastal submerged lands and state-owned uplands for projects which require a right-of-way on, across, under, or over state-owned lands, pursuant to Texas Natural Resources Code §51.291. Miscellaneous Easement contracts cover activities such as oil and gas pipelines, power transmission lines, communication lines, roads, and certain other structures and uses. Components of the application package includes applicant information, location of the right-of-way, technical aspects of the pipeline, specifics on installation and any best management practices to be included.

Design Alternatives

The issuance of a Miscellaneous Easement would only apply to the portions of the Project involving installation of pipelines, roads, and power transmission lines that cross state lands.

Should other facilities such as lagoons, wells, etc. be located on state lands, other easements may be required.

3.5 Texas Department of Transportation

TxDOT is the state transportation agency charged with overseeing the state's transportation systems. Installations of pipelines in TxDOT right-of-way in Cameron County requires approval of a Utility Line request by the TxDOT Pharr District Engineer. The Utility Line request shall include plans that detail the design, proposed location, vertical elevations, and horizontal alignments of the project. The request also commits the applicant to use best management practices to minimize erosion and sedimentation, and require revegetation of the project area.

Design Alternatives

Construction of pipelines, transmission lines and other utilities as part of the Project within TxDOT right-of-way would require approval of a Utility Line request. Construction of the desalination plant and facilities also may require additional permits such as driveway access to a state highway or construction of an access road that connects to a state highway.

3.6 Cameron County

Depending on the specific location of the desalination plant and associated facilities, various Cameron County permits and requirements may be required. These permits could include zoning permits, conditional use permits, building permits, floodplain management requirements, and local road construction permits. According to Cameron County staff, there are no specific county ordinances or regulations regarding environmental restrictions such as vegetation or tree removal, noise, or air quality.

3.7 Town of South Padre Island

Depending on the specific location of the desalination plant and associated facilities, various Town of South Padre Island permits and requirements may be required. These permits could include zoning permits, conditional use permits, building permits, floodplain management requirements, beach and dune protection permits, and local road construction permits.

4.0 PERMITTING COSTS AND SCHEDULES

Obtaining regulatory approvals and permits for a project can be a lengthy and sometimes costly endeavor. It is anticipated the permitting process for a seawater desalination plant in Texas will be complex process. A seawater desalination plant has never been permitted before in Texas; therefore, the timelines and costs to obtain permits are based on typical times and order-of-magnitude costs to obtain similar permits for other similar-scale projects.

Table 4-1 presents a general schedule and order-of-magnitude costs required to obtain the federal, state, and local permits necessary to construct and operate a seawater desalination plant on the Brownsville Ship Channel. The costs estimated in Table 4-1 do not include costs for any mitigation or monitoring requirements imposed as a result of permitting or consultation. In addition, schedule estimates do not include additional meetings requested by the public or contested case hearings.

Table 4-1. General Costs and Schedules for Potential Permits

Permit/Approval	Agency	Schedule (months)	Cost (\$1000)	Intake Options		Treatment System	Finished Water System	Concentrate Discharge Options			Power Options	
				Beach Wells	Open Water Intake			Diffusion into Gulf of Mexico	Injection Wells	Diffusion into Laguna Madre	Existing Grid	Wave Buoy Supplement
Section 10/404 Nationwide Permit	USACE	4 – 8	20 – 35	✓ ¹	✓							
Section 10/404 Individual Permit	USACE	6 – 18	45 – 85					✓		✓		✓
NEPA – EA (excludes other permit costs)	USACE	6 – 18	50 – 250	✓ ¹	✓	✓ ²	✓ ²	✓		✓		✓
NEPA - EIS	USACE	12 – 36	500 – 3000	✓ ¹	✓ ¹	✓ ¹	✓ ¹	✓		✓		✓ ¹
ESA	USFWS	2 – 12	30 – 60	✓	✓	✓	✓	✓	✓	✓	✓	✓
ESA/Essential Fish Habitat	NMFS	2 – 12	35 – 70		✓			✓		✓		✓
Section 401 Certification	TCEQ	4 – 18	2 – 5	✓	✓			✓		✓		✓
TPDES – Industrial Wastewater Discharge Permit	TCEQ	13 – 18	20 – 75					✓		✓		
Underground Injection Control (UIC) Permit	TCEQ	13 – 18	75 – 150						✓			
TPDES – Hydrostatic Test Water Discharge Permit	TCEQ	1 – 2	5 – 15	✓	✓	✓	✓	✓	✓	✓		
TPDES – Construction Discharge Permit	TCEQ	1 – 2	5 – 15	✓	✓	✓	✓	✓	✓	✓	✓	✓
Land Application for Water Treatment Sludge	TCEQ	1 – 2	5 – 10			✓						
Water Rights Permit	TCEQ	8 – 24	10 – 50	✓	✓	✓	✓	✓	✓	✓	✓	✓
Public Water System Registration	TCEQ	3 – 12	10 – 15	✓	✓	✓	✓	✓	✓	✓	✓	✓
Petroleum Storage Tanks Registration	TCEQ	1 – 2	<1 – 2			✓	✓					
Air Permit by Rule	TCEQ	1 – 2	<1 – 2	✓	✓	✓	✓	✓		✓	✓	✓
New Source Review Permit	TCEQ	12 – 18	6 – 12						✓			
Protected Species Consultation	TPWD	2 – 6	10 – 20	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sand and Gravel Permit	TPWD	2 – 6	5 – 10		✓			✓		✓		✓
Antiquities Permit	THC	1 – 2	<1	✓	✓	✓	✓	✓	✓	✓	✓	✓
National Historic Preservation Act Section 106 Review and Compliance	THC	3 – 8	20 – 150	✓ ¹	✓	✓ ²	✓ ²	✓	✓ ²	✓	✓ ²	✓
Coastal Management Program	GLO	4 – 18	5 – 10	✓	✓	✓	✓	✓	✓	✓	✓	✓
Miscellaneous Easement	GLO	3 – 6	5 – 10	✓	✓	✓	✓	✓	✓	✓	✓	✓
Utility Line Request	TxDOT	1 – 3	1 – 4	✓	✓		✓	✓	✓	✓	✓	✓
Local Permits and Easements	Cameron County, Town of South Padre Island	1 – 12	5 – 20	✓	✓	✓	✓	✓	✓	✓	✓	✓

1 – Authorization possible but not likely; 2 – Permit or authorization not directly required by alternative, however, due to permits or authorizations issued for other components, impacts from the alternative would be evaluated as part of the entire Project scope

5.0 REFERENCES

Brownsville Public Utilities Board. (2008). *Final Pilot Study Report Texas Seawater Desalination Demonstration Project*. Austin, Texas.

Texas Commission on Environmental Quality. (2010a). *Texas Integrated Report for Clean Water Act Sections 305(b) and 303(d)*. Retrieved April 13, 2010, from http://www.tceq.state.tx.us/compliance/monitoring/water/quality/data/wqm/305_303.html

Texas Commission on Environmental Quality. (2010b). *Texas' Air Permitting Program Rulemaking*. Retrieved April 7, 2010, from http://www.tceq.state.tx.us/permitting/air/announcements/nsr_announce_12_10_09.html

Texas Water Development Board. (2010). *Laguna Madre Water District: Project Brief*. Retrieved April 13, 2010, from <http://www.twdb.state.tx.us/iwt/desal/studies/seawater/lagunamadre.html>

Texas Water Development Board. (2008). *Guidance Manual for Brackish Groundwater Desalination in Texas*. Austin, Texas

United States Environmental Protection Agency. (2010). *National Environmental Policy Act Basic Information*. Retrieved March 22, 2010, from <http://www.epa.gov/compliance/basics/nepa.html>

United States Fish and Wildlife Service. (2009a). *Wetlands Mapper*. Retrieved April 9, 2010, from <http://www.fws.gov/wetlands/Data/Mapper.html>

United States Fish and Wildlife Service. (2009b). *Critical Habitat Mapper*. Retrieved April 13, 2010, from United States Fish and Wildlife Service. (2009). *Wetlands Mapper*. Retrieved April 9, 2010, from <http://www.fws.gov/wetlands/Data/Mapper.html>

APPENDIX A

USACE NATIONWIDE PERMITS

significant” as defined under Executive Order 12866, and (2) concerns an environmental health or safety risk that we have reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, we must evaluate the environmental health or safety effects of the proposed rule on children, and explain why the regulation is preferable to other potentially effective and reasonably feasible alternatives.

The NWP's issued today are not subject to this Executive Order because they are not economically significant as defined in Executive Order 12866. In addition, these NWP's do not concern an environmental or safety risk that we have reason to believe may have a disproportionate effect on children.

Executive Order 13175

Executive Order 13175, entitled “Consultation and Coordination with Indian Tribal Governments” (65 FR 67249, November 6, 2000), requires agencies to develop an accountable process to ensure “meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications.” The phrase “policies that have tribal implications” is defined in the Executive Order to include regulations that have “substantial direct effects on one or more Indian tribes, on the relationship between the Federal government and the Indian tribes, or on the distribution of power and responsibilities between the Federal government and Indian tribes.”

The NWP's issued today do not have tribal implications. They are generally consistent with current agency practice and will not have substantial direct effects on tribal governments, on the relationship between the Federal government and the Indian tribes, or on the distribution of power and responsibilities between the Federal government and Indian tribes. Therefore, Executive Order 13175 does not apply to this proposal. Corps districts are conducting government-to-government consultation with Indian tribes to develop regional conditions that help protect tribal rights and trust resources, and to facilitate compliance with general condition 16, Tribal Rights.

Environmental Documentation

A decision document, which includes an environmental assessment and Finding of No Significant Impact (FONSI), has been prepared for each NWP. These decision documents are available at: <http://www.regulations.gov> (docket ID number COE-2006-0005). They are also available by contacting

Headquarters, U.S. Army Corps of Engineers, Operations and Regulatory Community of Practice, 441 G Street, NW., Washington, DC 20314-1000.

Congressional Review Act

The Congressional Review Act, 5 U.S.C. 801 et seq., as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. We will submit a report containing the final NWP's and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States. A major rule cannot take effect until 60 days after it is published in the **Federal Register**. The proposed NWP's are not a “major rule” as defined by 5 U.S.C. 804(2).

Executive Order 12898

Executive Order 12898 requires that, to the greatest extent practicable and permitted by law, each Federal agency must make achieving environmental justice part of its mission. Executive Order 12898 provides that each Federal agency conduct its programs, policies, and activities that substantially affect human health or the environment in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons (including populations) from participation in, denying persons (including populations) the benefits of, or subjecting persons (including populations) to discrimination under such programs, policies, and activities because of their race, color, or national origin.

The NWP's issued today are not expected to negatively impact any community, and therefore are not expected to cause any disproportionately high and adverse impacts to minority or low-income communities.

Executive Order 13211

The proposed NWP's are not a “significant energy action” as defined in Executive Order 13211, “Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use” (66 FR 28355, May 22, 2001) because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy.

Authority

We are issuing new NWP's, modifying existing NWP's, and reissuing NWP's without change under the authority of Section 404(e) of the Clean Water Act (33 U.S.C. 1344) and Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 401 et seq.).

Dated: March 1, 2007.

Don T. Riley,

Major General, U.S. Army, Director of Civil Works.

Nationwide Permits, Conditions, Further Information, and Definitions

A. Index of Nationwide Permits, Conditions, Further Information, and Definitions

Nationwide Permits

1. Aids to Navigation.
2. Structures in Artificial Canals.
3. Maintenance.
4. Fish and Wildlife Harvesting, Enhancement, and Attraction Devices and Activities.
5. Scientific Measurement Devices.
6. Survey Activities.
7. Outfall Structures and Associated Intake Structures.
8. Oil and Gas Structures on the Outer Continental Shelf.
9. Structures in Fleeting and Anchorage Areas.
10. Mooring Buoys.
11. Temporary Recreational Structures.
12. Utility Line Activities.
13. Bank Stabilization.
14. Linear Transportation Projects.
15. U.S. Coast Guard Approved Bridges.
16. Return Water From Upland Contained Disposal Areas.
17. Hydropower Projects.
18. Minor Discharges.
19. Minor Dredging
20. Oil Spill Cleanup.
21. Surface Coal Mining Operations.
22. Removal of Vessels.
23. Approved Categorical Exclusions.
24. Indian Tribe or State Administered Section 404 Programs.
25. Structural Discharges.
26. [Reserved].
27. Aquatic Habitat Restoration, Establishment, and Enhancement Activities.
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29. Residential Developments.
30. Moist Soil Management for Wildlife.
31. Maintenance of Existing Flood Control Facilities.
32. Completed Enforcement Actions.
33. Temporary Construction, Access, and Dewatering.
34. Cranberry Production Activities.
35. Maintenance Dredging of Existing Basins.
36. Boat Ramps.
37. Emergency Watershed Protection and Rehabilitation.
38. Cleanup of Hazardous and Toxic Waste.
39. Commercial and Institutional Developments.
40. Agricultural Activities.

41. Reshaping Existing Drainage Ditches.
42. Recreational Facilities.
43. Stormwater Management Facilities.
44. Mining Activities.
45. Repair of Uplands Damaged by Discrete Events.
46. Discharges in Ditches.
47. Pipeline Safety Program Designated Time Sensitive Inspections and Repairs.
48. Existing Commercial Shellfish Aquaculture Activities.
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13. Removal of Temporary Fills.
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16. Tribal Rights.
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23. Regional and Case-by-Case Conditions.
24. Use of Multiple Nationwide Permits.
25. Transfer of Nationwide Permit Verifications.
26. Compliance Certification.
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28. Single and Complete Project.

Further Information

- Definitions.
- Best management practices (BMPs).
- Compensatory mitigation.
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- Ephemeral stream.
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- Stormwater management facilities.
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- Stream channelization.
- Structure.

- Tidal wetland.
- Vegetated shallows.
- Waterbody.

B. Nationwide Permits

1. *Aids to Navigation.* The placement of aids to navigation and regulatory markers which are approved by and installed in accordance with the requirements of the U.S. Coast Guard (see 33 CFR, chapter I, subchapter C, part 66). (Section 10)

2. *Structures in Artificial Canals.* Structures constructed in artificial canals within principally residential developments where the connection of the canal to a navigable water of the United States has been previously authorized (see 33 CFR 322.5(g)). (Section 10)

3. *Maintenance.* (a) The repair, rehabilitation, or replacement of any previously authorized, currently serviceable, structure, or fill, or of any currently serviceable structure or fill authorized by 33 CFR 330.3, provided that the structure or fill is not to be put to uses differing from those uses specified or contemplated for it in the original permit or the most recently authorized modification. Minor deviations in the structure's configuration or filled area, including those due to changes in materials, construction techniques, or current construction codes or safety standards that are necessary to make the repair, rehabilitation, or replacement are authorized. This NWP authorizes the repair, rehabilitation, or replacement of those structures or fills destroyed or damaged by storms, floods, fire or other discrete events, provided the repair, rehabilitation, or replacement is commenced, or is under contract to commence, within two years of the date of their destruction or damage. In cases of catastrophic events, such as hurricanes or tornadoes, this two-year limit may be waived by the district engineer, provided the permittee can demonstrate funding, contract, or other similar delays.

(b) This NWP also authorizes the removal of accumulated sediments and debris in the vicinity of and within existing structures (e.g., bridges, culverted road crossings, water intake structures, etc.) and the placement of new or additional riprap to protect the structure. The removal of sediment is limited to the minimum necessary to restore the waterway in the immediate vicinity of the structure to the approximate dimensions that existed when the structure was built, but cannot extend further than 200 feet in any direction from the structure. This 200 foot limit does not apply to maintenance

dredging to remove accumulated sediments blocking or restricting outfall and intake structures or to maintenance dredging to remove accumulated sediments from canals associated with outfall and intake structures. All dredged or excavated materials must be deposited and retained in an upland area unless otherwise specifically approved by the district engineer under separate authorization. The placement of riprap must be the minimum necessary to protect the structure or to ensure the safety of the structure. Any bank stabilization measures not directly associated with the structure will require a separate authorization from the district engineer.

(c) This NWP also authorizes temporary structures, fills, and work necessary to conduct the maintenance activity. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

(d) This NWP does not authorize maintenance dredging for the primary purpose of navigation or beach restoration. This NWP does not authorize new stream channelization or stream relocation projects.

Notification: For activities authorized by paragraph (b) of this NWP, the permittee must submit a pre-construction notification to the district engineer prior to commencing the activity (see general condition 27). Where maintenance dredging is proposed, the pre-construction notification must include information regarding the original design capacities and configurations of the outfalls, intakes, small impoundments, and canals. (Sections 10 and 404)

Note: This NWP authorizes the repair, rehabilitation, or replacement of any previously authorized structure or fill that does not qualify for the Clean Water Act Section 404(f) exemption for maintenance.

4. *Fish and Wildlife Harvesting, Enhancement, and Attraction Devices and Activities.* Fish and wildlife harvesting devices and activities such as pound nets, crab traps, crab dredging, eel pots, lobster traps, duck blinds, and

clam and oyster digging, and small fish attraction devices such as open water fish concentrators (sea kites, etc.). This NWP does not authorize artificial reefs or impoundments and semi-impoundments of waters of the United States for the culture or holding of motile species such as lobster, or the use of covered oyster trays or clam racks. (Sections 10 and 404)

5. *Scientific Measurement Devices.*

Devices, whose purpose is to measure and record scientific data, such as staff gages, tide gages, water recording devices, water quality testing and improvement devices, and similar structures. Small weirs and flumes constructed primarily to record water quantity and velocity are also authorized provided the discharge is limited to 25 cubic yards. (Sections 10 and 404)

6. *Survey Activities.* Survey activities, such as core sampling, seismic exploratory operations, plugging of seismic shot holes and other exploratory-type bore holes, exploratory trenching, soil surveys, sampling, and historic resources surveys. For the purposes of this NWP, the term "exploratory trenching" means mechanical land clearing of the upper soil profile to expose bedrock or substrate, for the purpose of mapping or sampling the exposed material. The area in which the exploratory trench is dug must be restored to its pre-construction elevation upon completion of the work. In wetlands, the top 6 to 12 inches of the trench should normally be backfilled with topsoil from the trench. This NWP authorizes the construction of temporary pads, provided the discharge does not exceed 25 cubic yards. Discharges and structures associated with the recovery of historic resources are not authorized by this NWP. Drilling and the discharge of excavated material from test wells for oil and gas exploration are not authorized by this NWP; the plugging of such wells is authorized. Fill placed for roads and other similar activities is not authorized by this NWP. The NWP does not authorize any permanent structures. The discharge of drilling mud and cuttings may require a permit under Section 402 of the Clean Water Act. (Sections 10 and 404)

7. *Outfall Structures and Associated Intake Structures.* Activities related to the construction or modification of outfall structures and associated intake structures, where the effluent from the outfall is authorized, conditionally authorized, or specifically exempted by, or that are otherwise in compliance with regulations issued under the National Pollutant Discharge Elimination System

Program (Section 402 of the Clean Water Act). The construction of intake structures is not authorized by this NWP, unless they are directly associated with an authorized outfall structure.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 27.) (Sections 10 and 404)

8. *Oil and Gas Structures on the Outer Continental Shelf.* Structures for the exploration, production, and transportation of oil, gas, and minerals on the outer continental shelf within areas leased for such purposes by the Department of the Interior, Minerals Management Service. Such structures shall not be placed within the limits of any designated shipping safety fairway or traffic separation scheme, except temporary anchors that comply with the fairway regulations in 33 CFR 322.5(l). The district engineer will review such proposals to ensure compliance with the provisions of the fairway regulations in 33 CFR 322.5(l). Any Corps review under this NWP will be limited to the effects on navigation and national security in accordance with 33 CFR 322.5(f). Such structures will not be placed in established danger zones or restricted areas as designated in 33 CFR part 334, nor will such structures be permitted in EPA or Corps designated dredged material disposal areas.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 27.) (Section 10)

9. *Structures in Fleeting and Anchorage Areas.* Structures, buoys, floats and other devices placed within anchorage or fleeting areas to facilitate moorage of vessels where the U.S. Coast Guard has established such areas for that purpose. (Section 10)

10. *Mooring Buoys.* Non-commercial, single-boat, mooring buoys. (Section 10)

11. *Temporary Recreational Structures.* Temporary buoys, markers, small floating docks, and similar structures placed for recreational use during specific events such as water skiing competitions and boat races or seasonal use, provided that such structures are removed within 30 days after use has been discontinued. At Corps of Engineers reservoirs, the reservoir manager must approve each buoy or marker individually. (Section 10)

12. *Utility Line Activities.* Activities required for the construction, maintenance, repair, and removal of utility lines and associated facilities in waters of the United States, provided the activity does not result in the loss

of greater than 1/2 acre of waters of the United States.

Utility lines: This NWP authorizes the construction, maintenance, or repair of utility lines, including outfall and intake structures, and the associated excavation, backfill, or bedding for the utility lines, in all waters of the United States, provided there is no change in pre-construction contours. A "utility line" is defined as any pipe or pipeline for the transportation of any gaseous, liquid, liquescent, or slurry substance, for any purpose, and any cable, line, or wire for the transmission for any purpose of electrical energy, telephone, and telegraph messages, and radio and television communication. The term "utility line" does not include activities that drain a water of the United States, such as drainage tile or french drains, but it does apply to pipes conveying drainage from another area.

Material resulting from trench excavation may be temporarily sidecast into waters of the United States for no more than three months, provided the material is not placed in such a manner that it is dispersed by currents or other forces. The district engineer may extend the period of temporary side casting for no more than a total of 180 days, where appropriate. In wetlands, the top 6 to 12 inches of the trench should normally be backfilled with topsoil from the trench. The trench cannot be constructed or backfilled in such a manner as to drain waters of the United States (e.g., backfilling with extensive gravel layers, creating a french drain effect). Any exposed slopes and stream banks must be stabilized immediately upon completion of the utility line crossing of each waterbody.

Utility line substations: This NWP authorizes the construction, maintenance, or expansion of substation facilities associated with a power line or utility line in non-tidal waters of the United States, provided the activity, in combination with all other activities included in one single and complete project, does not result in the loss of greater than 1/2 acre of waters of the United States. This NWP does not authorize discharges into non-tidal wetlands adjacent to tidal waters of the United States to construct, maintain, or expand substation facilities.

Foundations for overhead utility line towers, poles, and anchors: This NWP authorizes the construction or maintenance of foundations for overhead utility line towers, poles, and anchors in all waters of the United States, provided the foundations are the minimum size necessary and separate footings for each tower leg (rather than

a larger single pad) are used where feasible.

Access roads: This NWP authorizes the construction of access roads for the construction and maintenance of utility lines, including overhead power lines and utility line substations, in non-tidal waters of the United States, provided the total discharge from a single and complete project does not cause the loss of greater than 1/2-acre of non-tidal waters of the United States. This NWP does not authorize discharges into non-tidal wetlands adjacent to tidal waters for access roads. Access roads must be the minimum width necessary (see Note 2, below). Access roads must be constructed so that the length of the road minimizes any adverse effects on waters of the United States and must be as near as possible to pre-construction contours and elevations (e.g., at grade corduroy roads or geotextile/gravel roads). Access roads constructed above pre-construction contours and elevations in waters of the United States must be properly bridged or culverted to maintain surface flows.

This NWP may authorize utility lines in or affecting navigable waters of the United States even if there is no associated discharge of dredged or fill material (See 33 CFR part 322). Overhead utility lines constructed over section 10 waters and utility lines that are routed in or under section 10 waters without a discharge of dredged or fill material require a section 10 permit.

This NWP also authorizes temporary structures, fills, and work necessary to conduct the utility line activity. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if any of the following criteria are met: (1) The activity involves mechanized land clearing in a forested wetland for the utility line right-of-way; (2) a section 10 permit is required; (3) the utility line in waters of the United States, excluding overhead lines, exceeds 500 feet; (4) the utility line is placed within a

jurisdictional area (i.e., water of the United States), and it runs parallel to a stream bed that is within that jurisdictional area; (5) discharges that result in the loss of greater than 1/10-acre of waters of the United States; (6) permanent access roads are constructed above grade in waters of the United States for a distance of more than 500 feet; or (7) permanent access roads are constructed in waters of the United States with impervious materials. (See general condition 27.) (Sections 10 and 404)

Note 1: Where the proposed utility line is constructed or installed in navigable waters of the United States (i.e., section 10 waters), copies of the pre-construction notification and NWP verification will be sent by the Corps to the National Oceanic and Atmospheric Administration (NOAA), National Ocean Service (NOS), for charting the utility line to protect navigation.

Note 2: Access roads used for both construction and maintenance may be authorized, provided they meet the terms and conditions of this NWP. Access roads used solely for construction of the utility line must be removed upon completion of the work, accordance with the requirements for temporary fills.

Note 3: Pipes or pipelines used to transport gaseous, liquid, liquescent, or slurry substances over navigable waters of the United States are considered to be bridges, not utility lines, and may require a permit from the U.S. Coast Guard pursuant to Section 9 of the Rivers and Harbors Act of 1899. However, any discharges of dredged or fill material into waters of the United States associated with such pipelines will require a section 404 permit (see NWP 15).

13. Bank Stabilization. Bank stabilization activities necessary for erosion prevention, provided the activity meets all of the following criteria:

(a) No material is placed in excess of the minimum needed for erosion protection;

(b) The activity is no more than 500 feet in length along the bank, unless this criterion is waived in writing by the district engineer;

(c) The activity will not exceed an average of one cubic yard per running foot placed along the bank below the plane of the ordinary high water mark or the high tide line, unless this criterion is waived in writing by the district engineer;

(d) The activity does not involve discharges of dredged or fill material into special aquatic sites, unless this criterion is waived in writing by the district engineer;

(e) No material is of the type, or is placed in any location, or in any manner, to impair surface water flow

into or out of any water of the United States;

(f) No material is placed in a manner that will be eroded by normal or expected high flows (properly anchored trees and treetops may be used in low energy areas); and, (g) The activity is not a stream channelization activity.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if the bank stabilization activity: (1) Involves discharges into special aquatic sites; (2) is in excess of 500 feet in length; or (3) will involve the discharge of greater than an average of one cubic yard per running foot along the bank below the plane of the ordinary high water mark or the high tide line. (See general condition 27.) (Sections 10 and 404)

14. Linear Transportation Projects. Activities required for the construction, expansion, modification, or improvement of linear transportation projects (e.g., roads, highways, railways, trails, airport runways, and taxiways) in waters of the United States. For linear transportation projects in non-tidal waters, the discharge cannot cause the loss of greater than 1/2-acre of waters of the United States. For linear transportation projects in tidal waters, the discharge cannot cause the loss of greater than 1/3-acre of waters of the United States. Any stream channel modification, including bank stabilization, is limited to the minimum necessary to construct or protect the linear transportation project; such modifications must be in the immediate vicinity of the project.

This NWP also authorizes temporary structures, fills, and work necessary to construct the linear transportation project. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

This NWP cannot be used to authorize non-linear features commonly associated with transportation projects, such as vehicle maintenance or storage buildings, parking lots, train stations, or aircraft hangars.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if: (1) The loss of waters of the United States exceeds $\frac{1}{10}$ acre; or (2) there is a discharge in a special aquatic site, including wetlands. (See general condition 27.) (Sections 10 and 404)

Note: Some discharges for the construction of farm roads or forest roads, or temporary roads for moving mining equipment, may qualify for an exemption under Section 404(f) of the Clean Water Act (see 33 CFR 323.4).

15. *U.S. Coast Guard Approved Bridges.* Discharges of dredged or fill material incidental to the construction of bridges across navigable waters of the United States, including cofferdams, abutments, foundation seals, piers, and temporary construction and access fills, provided such discharges have been authorized by the U.S. Coast Guard as part of the bridge permit. Causeways and approach fills are not included in this NWP and will require a separate section 404 permit. (Section 404)

16. *Return Water From Upland Contained Disposal Areas.* Return water from an upland contained dredged material disposal area. The return water from a contained disposal area is administratively defined as a discharge of dredged material by 33 CFR 323.2(d), even though the disposal itself occurs on the upland and does not require a section 404 permit. This NWP satisfies the technical requirement for a section 404 permit for the return water where the quality of the return water is controlled by the state through the section 401 certification procedures. The dredging activity may require a section 404 permit (33 CFR 323.2(d)), and will require a section 10 permit if located in navigable waters of the United States. (Section 404)

17. *Hydropower Projects.* Discharges of dredged or fill material associated with hydropower projects having: (a) Less than 5000 kW of total generating capacity at existing reservoirs, where the project, including the fill, is licensed by the Federal Energy Regulatory Commission (FERC) under the Federal Power Act of 1920, as amended; or (b) a licensing exemption granted by the FERC pursuant to Section 408 of the Energy Security Act of 1980 (16 U.S.C. 2705 and 2708) and Section 30 of the Federal Power Act, as amended.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 27.) (Section 404)

18. *Minor Discharges.* Minor discharges of dredged or fill material

into all waters of the United States, provided the activity meets all of the following criteria:

(a) The quantity of discharged material and the volume of area excavated do not exceed 25 cubic yards below the plane of the ordinary high water mark or the high tide line;

(b) The discharge will not cause the loss of more than $\frac{1}{10}$ acre of waters of the United States; and

(c) The discharge is not placed for the purpose of a stream diversion.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if: (1) The discharge or the volume of area excavated exceeds 10 cubic yards below the plane of the ordinary high water mark or the high tide line, or (2) the discharge is in a special aquatic site, including wetlands. (See general condition 27.) (Sections 10 and 404)

19. *Minor Dredging.* Dredging of no more than 25 cubic yards below the plane of the ordinary high water mark or the mean high water mark from navigable waters of the United States (i.e., section 10 waters). This NWP does not authorize the dredging or degradation through siltation of coral reefs, sites that support submerged aquatic vegetation (including sites where submerged aquatic vegetation is documented to exist but may not be present in a given year), anadromous fish spawning areas, or wetlands, or the connection of canals or other artificial waterways to navigable waters of the United States (see 33 CFR 322.5(g)). (Sections 10 and 404)

20. *Oil Spill Cleanup.* Activities required for the containment and cleanup of oil and hazardous substances that are subject to the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR part 300) provided that the work is done in accordance with the Spill Control and Countermeasure Plan required by 40 CFR 112.3 and any existing state contingency plan and provided that the Regional Response Team (if one exists in the area) concurs with the proposed containment and cleanup action. This NWP also authorizes activities required for the cleanup of oil releases in waters of the United States from electrical equipment that are governed by EPA's polychlorinated biphenyl spill response regulations at 40 CFR part 761. (Sections 10 and 404)

21. *Surface Coal Mining Operations.* Discharges of dredged or fill material into waters of the United States associated with surface coal mining and reclamation operations provided the activities are already authorized, or are

currently being processed as part of an integrated permit processing procedure, by the Department of Interior (DOI), Office of Surface Mining (OSM), or by states with approved programs under Title V of the Surface Mining Control and Reclamation Act of 1977.

Notification: The permittee must submit a pre-construction notification to the district engineer and receive written authorization prior to commencing the activity. (See general condition 27.) (Sections 10 and 404)

22. *Removal of Vessels.* Temporary structures or minor discharges of dredged or fill material required for the removal of wrecked, abandoned, or disabled vessels, or the removal of man-made obstructions to navigation. This NWP does not authorize maintenance dredging, shoal removal, or riverbank snagging.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if: (1) The vessel is listed or eligible for listing in the National Register of Historic Places; or (2) the activity is conducted in a special aquatic site, including coral reefs and wetlands. (See general condition 27.) If condition 1 above is triggered, the permittee cannot commence the activity until informed by the district engineer that compliance with the "Historic Properties" general condition is completed. (Sections 10 and 404)

Note 1: If a removed vessel is disposed of in waters of the United States, a permit from the U.S. EPA may be required (see 40 CFR 229.3). If a Department of the Army permit is required for vessel disposal in waters of the United States, separate authorization will be required.

Note 2: Compliance with general condition 17, Endangered Species, and general condition 18, Historic Properties, is required for all NWPs. The concern with historic properties is emphasized in the notification requirements for this NWP because of the likelihood that submerged vessels may be historic properties.

23. *Approved Categorical Exclusions.* Activities undertaken, assisted, authorized, regulated, funded, or financed, in whole or in part, by another Federal agency or department where:

(a) That agency or department has determined, pursuant to the Council on Environmental Quality's implementing regulations for the National Environmental Policy Act (40 CFR part 1500 et seq.), that the activity is categorically excluded from environmental documentation, because it is included within a category of actions which neither individually nor

cumulatively have a significant effect on the human environment; and

(b) The Office of the Chief of Engineers (Attn: CECW-CO) has concurred with that agency's or department's determination that the activity is categorically excluded and approved the activity for authorization under NWP 23.

The Office of the Chief of Engineers may require additional conditions, including pre-construction notification, for authorization of an agency's categorical exclusions under this NWP.

Notification: Certain categorical exclusions approved for authorization under this NWP require the permittee to submit a pre-construction notification to the district engineer prior to commencing the activity (see general condition 27). The activities that require pre-construction notification are listed in the appropriate Regulatory Guidance Letters. (Sections 10 and 404)

Note: The agency or department may submit an application for an activity believed to be categorically excluded to the Office of the Chief of Engineers (Attn: CECW-CO). Prior to approval for authorization under this NWP of any agency's activity, the Office of the Chief of Engineers will solicit public comment. As of the date of issuance of this NWP, agencies with approved categorical exclusions are the: Bureau of Reclamation, Federal Highway Administration, and U.S. Coast Guard. Activities approved for authorization under this NWP as of the date of this notice are found in Corps Regulatory Guidance Letter 05-07, which is available at: <http://www.usace.army.mil/inet/functions/cw/cecwo/reg/rglindx.htm>. Any future approved categorical exclusions will be announced in Regulatory Guidance Letters and posted on this same Web site.

24. Indian Tribe or State Administered Section 404 Programs. Any activity permitted by a state or Indian Tribe administering its own section 404 permit program pursuant to 33 U.S.C. 1344(g)-(l) is permitted pursuant to Section 10 of the Rivers and Harbors Act of 1899. (Section 10)

Note 1: As of the date of the promulgation of this NWP, only New Jersey and Michigan administer their own section 404 permit programs.

Note 2: Those activities that do not involve an Indian Tribe or State section 404 permit are not included in this NWP, but certain structures will be exempted by Section 154 of Pub. L. 94-587, 90 Stat. 2917 (33 U.S.C. 591) (see 33 CFR 322.3(a)(2)).

25. Structural Discharges. Discharges of material such as concrete, sand, rock, etc., into tightly sealed forms or cells where the material will be used as a structural member for standard pile supported structures, such as bridges, transmission line footings, and

walkways, or for general navigation, such as mooring cells, including the excavation of bottom material from within the form prior to the discharge of concrete, sand, rock, etc. This NWP does not authorize filled structural members that would support buildings, building pads, homes, house pads, parking areas, storage areas and other such structures. The structure itself may require a section 10 permit if located in navigable waters of the United States. (Section 404)

26. [Reserved]

27. Aquatic Habitat Restoration, Establishment, and Enhancement Activities. Activities in waters of the United States associated with the restoration, enhancement, and establishment of tidal and non-tidal wetlands and riparian areas and the restoration and enhancement of non-tidal streams and other non-tidal open waters, provided those activities result in net increases in aquatic resource functions and services.

To the extent that a Corps permit is required, activities authorized by this NWP include, but are not limited to: the removal of accumulated sediments; the installation, removal, and maintenance of small water control structures, dikes, and berms; the installation of current deflectors; the enhancement, restoration, or establishment of riffle and pool stream structure; the placement of in-stream habitat structures; modifications of the stream bed and/or banks to restore or establish stream meanders; the backfilling of artificial channels and drainage ditches; the removal of existing drainage structures; the construction of small nesting islands; the construction of open water areas; the construction of oyster habitat over unvegetated bottom in tidal waters; shellfish seeding; activities needed to reestablish vegetation, including plowing or discing for seed bed preparation and the planting of appropriate wetland species; mechanized land clearing to remove non-native invasive, exotic, or nuisance vegetation; and other related activities. Only native plant species should be planted at the site.

This NWP authorizes the relocation of non-tidal waters, including non-tidal wetlands and streams, on the project site provided there are net increases in aquatic resource functions and services.

Except for the relocation of non-tidal waters on the project site, this NWP does not authorize the conversion of a stream or natural wetlands to another aquatic habitat type (e.g., stream to wetland or vice versa) or uplands. This NWP does not authorize stream channelization. This NWP does not

authorize the relocation of tidal waters or the conversion of tidal waters, including tidal wetlands, to other aquatic uses, such as the conversion of tidal wetlands into open water impoundments.

Reversion. For enhancement, restoration, and establishment activities conducted: (1) In accordance with the terms and conditions of a binding wetland enhancement, restoration, or establishment agreement between the landowner and the U.S. Fish and Wildlife Service (FWS), the Natural Resources Conservation Service (NRCS), the Farm Service Agency (FSA), the National Marine Fisheries Service (NMFS), the National Ocean Service (NOS), or their designated state cooperating agencies; (2) as voluntary wetland restoration, enhancement, and establishment actions documented by the NRCS or USDA Technical Service Provider pursuant to NRCS Field Office Technical Guide standards; or (3) on reclaimed surface coal mine lands, in accordance with a Surface Mining Control and Reclamation Act permit issued by the OSM or the applicable state agency, this NWP also authorizes any future discharge of dredged or fill material associated with the reversion of the area to its documented prior condition and use (i.e., prior to the restoration, enhancement, or establishment activities). The reversion must occur within five years after expiration of a limited term wetland restoration or establishment agreement or permit, and is authorized in these circumstances even if the discharge occurs after this NWP expires. The five-year reversion limit does not apply to agreements without time limits reached between the landowner and the FWS, NRCS, FSA, NMFS, NOS, or an appropriate state cooperating agency. This NWP also authorizes discharges of dredged or fill material in waters of the United States for the reversion of wetlands that were restored, enhanced, or established on prior-converted cropland that has not been abandoned or on uplands, in accordance with a binding agreement between the landowner and NRCS, FSA, FWS, or their designated state cooperating agencies (even though the restoration, enhancement, or establishment activity did not require a section 404 permit). The prior condition will be documented in the original agreement or permit, and the determination of return to prior conditions will be made by the Federal agency or appropriate state agency executing the agreement or permit. Before conducting any reversion activity the permittee or the appropriate Federal

or state agency must notify the district engineer and include the documentation of the prior condition. Once an area has reverted to its prior physical condition, it will be subject to whatever the Corps Regulatory requirements are applicable to that type of land at the time. The requirement that the activity result in a net increase in aquatic resource functions and services does not apply to reversion activities meeting the above conditions. Except for the activities described above, this NWP does not authorize any future discharge of dredged or fill material associated with the reversion of the area to its prior condition. In such cases a separate permit would be required for any reversion.

Reporting: For those activities that do not require pre-construction notification, the permittee must submit to the district engineer a copy of: (1) The binding wetland enhancement, restoration, or establishment agreement, or a project description, including project plans and location map; (2) the NRCS or USDA Technical Service Provider documentation for the voluntary wetland restoration, enhancement, or establishment action; or (3) the SMCRA permit issued by OSM or the applicable state agency. These documents must be submitted to the district engineer at least 30 days prior to commencing activities in waters of the United States authorized by this NWP.

Notification. The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity (see general condition 27), except for the following activities:

(1) Activities conducted on non-Federal public lands and private lands, in accordance with the terms and conditions of a binding wetland enhancement, restoration, or establishment agreement between the landowner and the U.S. FWS, NRCS, FSA, NMFS, NOS, or their designated state cooperating agencies;

(2) Voluntary wetland restoration, enhancement, and establishment actions documented by the NRCS or USDA Technical Service Provider pursuant to NRCS Field Office Technical Guide standards; or

(3) The reclamation of surface coal mine lands, in accordance with an SMCRA permit issued by the OSM or the applicable state agency.

However, the permittee must submit a copy of the appropriate documentation. (Sections 10 and 404)

Note: This NWP can be used to authorize compensatory mitigation projects, including mitigation banks and in-lieu fee programs.

However, this NWP does not authorize the reversion of an area used for a compensatory mitigation project to its prior condition, since compensatory mitigation is generally intended to be permanent.

28. Modifications of Existing Marinas. Reconfiguration of existing docking facilities within an authorized marina area. No dredging, additional slips, dock spaces, or expansion of any kind within waters of the United States is authorized by this NWP. (Section 10)

29. Residential Developments. Discharges of dredged or fill material into non-tidal waters of the United States for the construction or expansion of a single residence, a multiple unit residential development, or a residential subdivision. This NWP authorizes the construction of building foundations and building pads and attendant features that are necessary for the use of the residence or residential development. Attendant features may include but are not limited to roads, parking lots, garages, yards, utility lines, storm water management facilities, septic fields, and recreation facilities such as playgrounds, playing fields, and golf courses (provided the golf course is an integral part of the residential development).

The discharge must not cause the loss of greater than 1/2-acre of non-tidal waters of the United States, including the loss of no more than 300 linear feet of stream bed, unless for intermittent and ephemeral stream beds this 300 linear foot limit is waived in writing by the district engineer. This NWP does not authorize discharges into non-tidal wetlands adjacent to tidal waters.

Subdivisions: For residential subdivisions, the aggregate total loss of waters of United States authorized by this NWP cannot exceed 1/2 acre. This includes any loss of waters of the United States associated with development of individual subdivision lots.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 27.) (Sections 10 and 404)

30. Moist Soil Management for Wildlife. Discharges of dredged or fill material into non-tidal waters of the United States and maintenance activities that are associated with moist soil management for wildlife for the purpose of continuing ongoing, site-specific, wildlife management activities where soil manipulation is used to manage habitat and feeding areas for wildlife. Such activities include, but are not limited to, plowing or discing to impede succession, preparing seed beds, or establishing fire breaks. Sufficient

riparian areas must be maintained adjacent to all open water bodies, including streams to preclude water quality degradation due to erosion and sedimentation. This NWP does not authorize the construction of new dikes, roads, water control structures, or similar features associated with the management areas. The activity must not result in a net loss of aquatic resource functions and services. This NWP does not authorize the conversion of wetlands to uplands, impoundments, or other open water bodies. (Section 404).

Note: The repair, maintenance, or replacement of existing water control structures or the repair or maintenance of dikes may be authorized by NWP 3. Some such activities may qualify for an exemption under Section 404(f) of the Clean Water Act (see 33 CFR 323.4).

31. Maintenance of Existing Flood Control Facilities. Discharges of dredged or fill material resulting from activities associated with the maintenance of existing flood control facilities, including debris basins, retention/detention basins, levees, and channels that: (i) were previously authorized by the Corps by individual permit, general permit, by 33 CFR 330.3, or did not require a permit at the time they were constructed, or (ii) were constructed by the Corps and transferred to a non-Federal sponsor for operation and maintenance. Activities authorized by this NWP are limited to those resulting from maintenance activities that are conducted within the "maintenance baseline," as described in the definition below. Discharges of dredged or fill materials associated with maintenance activities in flood control facilities in any watercourse that have previously been determined to be within the maintenance baseline are authorized under this NWP. This NWP does not authorize the removal of sediment and associated vegetation from natural water courses except when these activities have been included in the maintenance baseline. All dredged material must be placed in an upland site or an authorized disposal site in waters of the United States, and proper siltation controls must be used.

Maintenance Baseline: The maintenance baseline is a description of the physical characteristics (e.g., depth, width, length, location, configuration, or design flood capacity, etc.) of a flood control project within which maintenance activities are normally authorized by NWP 31, subject to any case-specific conditions required by the district engineer. The district engineer will approve the maintenance baseline

based on the approved or constructed capacity of the flood control facility, whichever is smaller, including any areas where there are no constructed channels, but which are part of the facility. The prospective permittee will provide documentation of the physical characteristics of the flood control facility (which will normally consist of as-built or approved drawings) and documentation of the approved and constructed design capacities of the flood control facility. If no evidence of the constructed capacity exists, the approved capacity will be used. The documentation will also include best management practices to ensure that the impacts to the aquatic environment are minimal, especially in maintenance areas where there are no constructed channels. (The Corps may request maintenance records in areas where there has not been recent maintenance.) Revocation or modification of the final determination of the maintenance baseline can only be done in accordance with 33 CFR 330.5. Except in emergencies as described below, this NWP cannot be used until the district engineer approves the maintenance baseline and determines the need for mitigation and any regional or activity-specific conditions. Once determined, the maintenance baseline will remain valid for any subsequent reissuance of this NWP. This NWP does not authorize maintenance of a flood control facility that has been abandoned. A flood control facility will be considered abandoned if it has operated at a significantly reduced capacity without needed maintenance being accomplished in a timely manner.

Mitigation: The district engineer will determine any required mitigation one-time only for impacts associated with maintenance work at the same time that the maintenance baseline is approved. Such one-time mitigation will be required when necessary to ensure that adverse environmental impacts are no more than minimal, both individually and cumulatively. Such mitigation will only be required once for any specific reach of a flood control project. However, if one-time mitigation is required for impacts associated with maintenance activities, the district engineer will not delay needed maintenance, provided the district engineer and the permittee establish a schedule for identification, approval, development, construction and completion of any such required mitigation. Once the one-time mitigation described above has been completed, or a determination made that mitigation is not required, no

further mitigation will be required for maintenance activities within the maintenance baseline. In determining appropriate mitigation, the district engineer will give special consideration to natural water courses that have been included in the maintenance baseline and require compensatory mitigation and/or best management practices as appropriate.

Emergency Situations: In emergency situations, this NWP may be used to authorize maintenance activities in flood control facilities for which no maintenance baseline has been approved. Emergency situations are those which would result in an unacceptable hazard to life, a significant loss of property, or an immediate, unforeseen, and significant economic hardship if action is not taken before a maintenance baseline can be approved. In such situations, the determination of mitigation requirements, if any, may be deferred until the emergency has been resolved. Once the emergency has ended, a maintenance baseline must be established expeditiously, and mitigation, including mitigation for maintenance conducted during the emergency, must be required as appropriate.

Notification: The permittee must submit a pre-construction notification to the district engineer before any maintenance work is conducted (see general condition 27). The pre-construction notification may be for activity-specific maintenance or for maintenance of the entire flood control facility by submitting a five-year (or less) maintenance plan. The pre-construction notification must include a description of the maintenance baseline and the dredged material disposal site. (Sections 10 and 404)

32. Completed Enforcement Actions. Any structure, work, or discharge of dredged or fill material remaining in place or undertaken for mitigation, restoration, or environmental benefit in compliance with either:

(i) The terms of a final written Corps non-judicial settlement agreement resolving a violation of Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act of 1899; or the terms of an EPA 309(a) order on consent resolving a violation of Section 404 of the Clean Water Act, provided that:

(a) The unauthorized activity affected no more than 5 acres of non-tidal waters or 1 acre of tidal waters;

(b) The settlement agreement provides for environmental benefits, to an equal or greater degree, than the environmental detriments caused by the

unauthorized activity that is authorized by this NWP; and

(c) The district engineer issues a verification letter authorizing the activity subject to the terms and conditions of this NWP and the settlement agreement, including a specified completion date; or

(ii) The terms of a final Federal court decision, consent decree, or settlement agreement resulting from an enforcement action brought by the United States under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act of 1899; or

(iii) The terms of a final court decision, consent decree, settlement agreement, or non-judicial settlement agreement resulting from a natural resource damage claim brought by a trustee or trustees for natural resources (as defined by the National Contingency Plan at 40 CFR subpart G) under Section 311 of the Clean Water Act, Section 107 of the Comprehensive Environmental Response, Compensation and Liability Act, Section 312 of the National Marine Sanctuaries Act, Section 1002 of the Oil Pollution Act of 1990, or the Park System Resource Protection Act at 16 U.S.C. 19jj, to the extent that a Corps permit is required.

Compliance is a condition of the NWP itself. Any authorization under this NWP is automatically revoked if the permittee does not comply with the terms of this NWP or the terms of the court decision, consent decree, or judicial/non-judicial settlement agreement. This NWP does not apply to any activities occurring after the date of the decision, decree, or agreement that are not for the purpose of mitigation, restoration, or environmental benefit. Before reaching any settlement agreement, the Corps will ensure compliance with the provisions of 33 CFR part 326 and 33 CFR 330.6(d)(2) and (e). (Sections 10 and 404)

33. Temporary Construction, Access, and Dewatering. Temporary structures, work, and discharges, including cofferdams, necessary for construction activities or access fills or dewatering of construction sites, provided that the associated primary activity is authorized by the Corps of Engineers or the U.S. Coast Guard. This NWP also authorizes temporary structures, work, and discharges, including cofferdams, necessary for construction activities not otherwise subject to the Corps or U.S. Coast Guard permit requirements. Appropriate measures must be taken to maintain near normal downstream flows and to minimize flooding. Fill must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. The use of dredged

material may be allowed if the district engineer determines that it will not cause more than minimal adverse effects on aquatic resources. Following completion of construction, temporary fill must be entirely removed to upland areas, dredged material must be returned to its original location, and the affected areas must be restored to pre-construction elevations. The affected areas must also be revegetated, as appropriate. This permit does not authorize the use of cofferdams to dewater wetlands or other aquatic areas to change their use. Structures left in place after construction is completed require a section 10 permit if located in navigable waters of the United States. (See 33 CFR part 322.)

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity (see general condition 27). The pre-construction notification must include a restoration plan showing how all temporary fills and structures will be removed and the area restored to pre-project conditions. (Sections 10 and 404)

34. Cranberry Production Activities. Discharges of dredged or fill material for dikes, berms, pumps, water control structures or leveling of cranberry beds associated with expansion, enhancement, or modification activities at existing cranberry production operations. The cumulative total acreage of disturbance per cranberry production operation, including but not limited to, filling, flooding, ditching, or clearing, must not exceed 10 acres of waters of the United States, including wetlands. The activity must not result in a net loss of wetland acreage. This NWP does not authorize any discharge of dredged or fill material related to other cranberry production activities such as warehouses, processing facilities, or parking areas. For the purposes of this NWP, the cumulative total of 10 acres will be measured over the period that this NWP is valid.

Notification: The permittee must submit a pre-construction notification to the district engineer once during the period that this NWP is valid, and the NWP will then authorize discharges of dredge or fill material at an existing operation for the permit term, provided the 10-acre limit is not exceeded. (See general condition 27.) (Section 404)

35. Maintenance Dredging of Existing Basins. Excavation and removal of accumulated sediment for maintenance of existing marina basins, access channels to marinas or boat slips, and boat slips to previously authorized depths or controlling depths for ingress/ egress, whichever is less, provided the

dredged material is deposited at an upland site and proper siltation controls are used. (Section 10)

36. Boat Ramps. Activities required for the construction of boat ramps, provided the activity meets all of the following criteria:

(a) The discharge into waters of the United States does not exceed 50 cubic yards of concrete, rock, crushed stone or gravel into forms, or in the form of pre-cast concrete planks or slabs, unless the 50 cubic yard limit is waived in writing by the district engineer;

(b) The boat ramp does not exceed 20 feet in width, unless this criterion is waived in writing by the district engineer;

(c) The base material is crushed stone, gravel or other suitable material;

(d) The excavation is limited to the area necessary for site preparation and all excavated material is removed to the upland; and,

(e) No material is placed in special aquatic sites, including wetlands.

The use of unsuitable material that is structurally unstable is not authorized. If dredging in navigable waters of the United States is necessary to provide access to the boat ramp, the dredging may be authorized by another NWP, a regional general permit, or an individual permit.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if: (1) The discharge into waters of the United States exceeds 50 cubic yards, or (2) the boat ramp exceeds 20 feet in width. (See general condition 27.) (Sections 10 and 404)

37. Emergency Watershed Protection and Rehabilitation. Work done by or funded by:

(a) The Natural Resources Conservation Service for a situation requiring immediate action under its emergency Watershed Protection Program (7 CFR part 624);

(b) The U.S. Forest Service under its Burned-Area Emergency Rehabilitation Handbook (FSH 509.13);

(c) The Department of the Interior for wildland fire management burned area emergency stabilization and rehabilitation (DOI Manual part 620, Ch. 3);

(d) The Office of Surface Mining, or states with approved programs, for abandoned mine land reclamation activities under Title IV of the Surface Mining Control and Reclamation Act (30 CFR subchapter R), where the activity does not involve coal extraction; or

(e) The Farm Service Agency under its Emergency Conservation Program (7 CFR part 701).

In general, the prospective permittee should wait until the district engineer issues an NWP verification before proceeding with the watershed protection and rehabilitation activity. However, in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur, the emergency watershed protection and rehabilitation activity may proceed immediately and the district engineer will consider the information in the pre-construction notification any comments received as a result of agency coordination to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity (see general condition 27). (Sections 10 and 404)

38. Cleanup of Hazardous and Toxic Waste. Specific activities required to effect the containment, stabilization, or removal of hazardous or toxic waste materials that are performed, ordered, or sponsored by a government agency with established legal or regulatory authority. Court ordered remedial action plans or related settlements are also authorized by this NWP. This NWP does not authorize the establishment of new disposal sites or the expansion of existing sites used for the disposal of hazardous or toxic waste.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 27.) (Sections 10 and 404)

Note: Activities undertaken entirely on a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) site by authority of CERCLA as approved or required by EPA, are not required to obtain permits under Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act.

39. Commercial and Institutional Developments. Discharges of dredged or fill material into non-tidal waters of the United States for the construction or expansion of commercial and institutional building foundations and building pads and attendant features that are necessary for the use and maintenance of the structures.

Attendant features may include, but are not limited to, roads, parking lots, garages, yards, utility lines, storm water management facilities, and recreation facilities such as playgrounds and playing fields. Examples of commercial developments include retail stores, industrial facilities, restaurants,

business parks, and shopping centers. Examples of institutional developments include schools, fire stations, government office buildings, judicial buildings, public works buildings, libraries, hospitals, and places of worship. The construction of new golf courses, new ski areas, or oil and gas wells is not authorized by this NWP.

The discharge must not cause the loss of greater than 1/2-acre of non-tidal waters of the United States, including the loss of no more than 300 linear feet of stream bed, unless for intermittent and ephemeral stream beds this 300 linear foot limit is waived in writing by the district engineer. This NWP does not authorize discharges into non-tidal wetlands adjacent to tidal waters.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 27.) (Sections 10 and 404)

40. Agricultural Activities. Discharges of dredged or fill material into non-tidal waters of the United States for agricultural activities, including the construction of building pads for farm buildings. Authorized activities include the installation, placement, or construction of drainage tiles, ditches, or levees; mechanized land clearing; land leveling; the relocation of existing serviceable drainage ditches constructed in waters of the United States; and similar activities.

This NWP also authorizes the construction of farm ponds in non-tidal waters of the United States, excluding perennial streams, provided the farm pond is used solely for agricultural purposes. This NWP does not authorize the construction of aquaculture ponds.

This NWP also authorizes discharges of dredged or fill material into non-tidal waters of the United States to relocate existing serviceable drainage ditches constructed in non-tidal streams.

The discharge must not cause the loss of greater than 1/2-acre of non-tidal waters of the United States. This NWP does not authorize discharges into non-tidal wetlands adjacent to tidal waters. This NWP does not authorize the relocation of greater than 300 linear feet of existing serviceable drainage ditches constructed in non-tidal streams, unless for drainage ditches constructed in intermittent and ephemeral streams, this 300 linear foot limit is waived in writing by the district engineer.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 27.) (Section 404)

Note: Some discharges for agricultural activities may qualify for an exemption under Section 404(f) of the Clean Water Act (see 33 CFR 323.4). This NWP authorizes the construction of farm ponds that do not qualify for the Clean Water Act Section 404(f)(1)(C) exemption because of the recapture provision at Section 404(f)(2).

41. Reshaping Existing Drainage Ditches. Discharges of dredged or fill material into non-tidal waters of the United States, excluding non-tidal wetlands adjacent to tidal waters, to modify the cross-sectional configuration of currently serviceable drainage ditches constructed in waters of the United States, for the purpose of improving water quality by regrading the drainage ditch with gentler slopes, which can reduce erosion, increase growth of vegetation, and increase uptake of nutrients and other substances by vegetation. The reshaping of the ditch cannot increase drainage capacity beyond the original as-built capacity nor can it expand the area drained by the ditch as originally constructed (i.e., the capacity of the ditch must be the same as originally constructed and it cannot drain additional wetlands or other waters of the United States). Compensatory mitigation is not required because the work is designed to improve water quality.

This NWP does not authorize the relocation of drainage ditches constructed in waters of the United States; the location of the centerline of the reshaped drainage ditch must be approximately the same as the location of the centerline of the original drainage ditch. This NWP does not authorize stream channelization or stream relocation projects.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity, if more than 500 linear feet of drainage ditch will be reshaped. (See general condition 27.) (Section 404)

42. Recreational Facilities. Discharges of dredged or fill material into non-tidal waters of the United States for the construction or expansion of recreational facilities. Examples of recreational facilities that may be authorized by this NWP include playing fields (e.g., football fields, baseball fields), basketball courts, tennis courts, hiking trails, bike paths, golf courses, ski areas, horse paths, nature centers, and campgrounds (excluding recreational vehicle parks). This NWP also authorizes the construction or expansion of small support facilities, such as maintenance and storage buildings and stables that are directly related to the recreational activity, but it

does not authorize the construction of hotels, restaurants, racetracks, stadiums, arenas, or similar facilities.

The discharge must not cause the loss of greater than 1/2-acre of non-tidal waters of the United States, including the loss of no more than 300 linear feet of stream bed, unless for intermittent and ephemeral stream beds this 300 linear foot limit is waived in writing by the district engineer. This NWP does not authorize discharges into non-tidal wetlands adjacent to tidal waters.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 27.) (Section 404)

43. Stormwater Management Facilities. Discharges of dredged or fill material into non-tidal waters of the United States for the construction and maintenance of stormwater management facilities, including the excavation of stormwater ponds/facilities, detention basins, and retention basins; the installation and maintenance of water control structures, outfall structures and emergency spillways; and the maintenance dredging of existing stormwater management ponds/facilities and detention and retention basins.

The discharge must not cause the loss of greater than 1/2-acre of non-tidal waters of the United States, including the loss of no more than 300 linear feet of stream bed, unless for intermittent and ephemeral stream beds this 300 linear foot limit is waived in writing by the district engineer. This NWP does not authorize discharges into non-tidal wetlands adjacent to tidal waters. This NWP does not authorize discharges of dredged or fill material for the construction of new stormwater management facilities in perennial streams.

Notification: For the construction of new stormwater management facilities, or the expansion of existing stormwater management facilities, the permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 27.) Maintenance activities do not require pre-construction notification if they are limited to restoring the original design capacities of the stormwater management facility. (Section 404)

44. Mining Activities. Discharges of dredged or fill material into non-tidal waters of the United States for mining activities, except for coal mining activities. The discharge must not cause the loss of greater than 1/2-acre of non-tidal waters of the United States. This NWP does not authorize discharges into

non-tidal wetlands adjacent to tidal waters.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 27.) If reclamation is required by other statutes, then a copy of the reclamation plan must be submitted with the pre-construction notification. (Sections 10 and 404)

45. *Repair of Uplands Damaged by Discrete Events.* This NWP authorizes discharges of dredged or fill material, including dredging or excavation, into all waters of the United States for activities associated with the restoration of upland areas damaged by storms, floods, or other discrete events. This NWP authorizes bank stabilization to protect the restored uplands. The restoration of the damaged areas, including any bank stabilization, must not exceed the contours, or ordinary high water mark, that existed before the damage occurred. The district engineer retains the right to determine the extent of the pre-existing conditions and the extent of any restoration work authorized by this NWP. The work must commence, or be under contract to commence, within two years of the date of damage, unless this condition is waived in writing by the district engineer. This NWP cannot be used to reclaim lands lost to normal erosion processes over an extended period.

Minor dredging is limited to the amount necessary to restore the damaged upland area and should not significantly alter the pre-existing bottom contours of the waterbody.

Notification: The permittee must submit a pre-construction notification to the district engineer (see general condition 27) within 12-months of the date of the damage. The pre-construction notification should include documentation, such as a recent topographic survey or photographs, to justify the extent of the proposed restoration. (Sections 10 and 404)

Note: Uplands lost as a result of a storm, flood, or other discrete event can be replaced without a section 404 permit, if the uplands are restored to the ordinary high water mark (in non-tidal waters) or high tide line (in tidal waters). (See also 33 CFR 328.5.)

46. *Discharges in Ditches.* Discharges of dredged or fill material into non-tidal ditches that are: (1) Constructed in uplands, (2) receive water from an area determined to be a water of the United States prior to the construction of the ditch, (3) divert water to an area determined to be a water of the United States prior to the construction of the ditch, and (4) are determined to be

waters of the United States. The discharge must not cause the loss of greater than one acre of waters of the United States.

This NWP does not authorize discharges of dredged or fill material into ditches constructed in streams or other waters of the United States, or in streams that have been relocated in uplands. This NWP does not authorize discharges of dredged or fill material that increase the capacity of the ditch and drain those areas determined to be waters of the United States prior to construction of the ditch.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 27.) (Section 404)

47. *Pipeline Safety Program Designated Time Sensitive Inspections and Repairs.* Activities required for the inspection, repair, rehabilitation, or replacement of any currently serviceable structure or fill for pipelines that have been identified by the Pipeline and Hazardous Materials Safety Administration's Pipeline Safety Program (PHP) within the U.S. Department of Transportation as time-sensitive (see 49 CFR parts 192 and 195) and additional maintenance activities done in conjunction with the time-sensitive inspection and repair activities. All activities must meet the following criteria:

(a) Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable when temporary structures, work and discharges, including cofferdams, are necessary for construction activities or access fills or dewatering of construction sites;

(b) Material resulting from trench excavation may be temporarily sidecast into waters of the United States for no more than three months, provided that the material is not placed in such a manner that it is dispersed by currents or other forces. The district engineer may extend the period of temporary side casting for no more than a total of 180 days, where appropriate. The trench cannot be constructed or backfilled in such a manner as to drain waters of the United States (e.g., backfilling with extensive gravel layers, creating a french drain effect);

(c) Temporary fill must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate;

(d) In wetlands, the top 6 to 12 inches of the trench should normally be backfilled with topsoil from the trench so that there is no change in preconstruction contours;

(e) To the maximum extent practicable, the restoration of open waters must be to the pre-construction course, condition, capacity, and location of the waterbody;

(f) Any exposed slopes and stream banks must be stabilized immediately upon completion of the project;

(g) Additional maintenance activities done in conjunction with the time-sensitive inspection or repair must not result in additional losses of waters of the United States; and,

(h) The permittee is a participant in the Pipeline Repair and Environmental Guidance System (PREGS).

Reporting: The permittee must submit a post construction report to the PHP within seven days after completing the work. The report must be submitted electronically to PHP via PREGS. The report must contain the following information: Project sites located in waters of the United States, temporary access routes, stream dewatering sites, temporary fills and temporary structures identified on a map of the pipeline corridor; photographs of the pre- and post-construction work areas located in waters of the United States; and a list of best management practices employed for each pipeline segment shown on the map. (Section 10 and 404)

Note: Division engineers may modify this NWP by adding regional conditions to protect the aquatic environment, as long as those regional conditions do not require pre-construction notification or other actions that would delay time sensitive inspections and repairs. Examples of appropriate regional conditions include best management practices.

48. *Existing Commercial Shellfish Aquaculture Activities.* This NWP authorizes the installation of buoys, floats, racks, trays, nets, lines, tubes, containers, and other structures necessary for the continued operation of the existing commercial aquaculture activity. This NWP also authorizes discharges of dredged or fill material necessary for shellfish seeding, rearing, cultivating, transplanting, and harvesting activities. Rafts and other floating structures must be securely anchored and clearly marked.

This NWP does not authorize new operations or the expansion of the project area for an existing commercial shellfish aquaculture activity. This NWP does not authorize the cultivation of new species (i.e., species not previously cultivated in the waterbody). This NWP

does not authorize attendant features such as docks, piers, boat ramps, stockpiles, staging areas, or the deposition of shell material back into waters of the United States as waste.

Reporting: For those activities that do not require pre-construction notification, the permittee must submit a report to the district engineer that includes the following information: (1) The size of the project area for the commercial shellfish aquaculture activity (in acres); (2) the location of the activity; (3) a brief description of the culture method and harvesting method(s); (4) the name(s) of the cultivated species; and (5) whether canopy predator nets are being used. This is a subset of the information that would be required for pre-construction notification. This report may be provided by letter or using an optional reporting form provided by the Corps. Only one report needs to be submitted during the period this NWP is valid, as long as there are no changes to the operation that require pre-construction notification. The report must be submitted to the district engineer within 90 days of the effective date of this NWP.

Notification: The permittee must submit a pre-construction notification to the district engineer if: (1) The project area is greater than 100 acres; or (2) there is any reconfiguration of the aquaculture activity, such as relocating existing operations into portions of the project area not previously used for aquaculture activities; or (3) there is a change in species being cultivated; or (4) there is a change in culture methods (e.g., from bottom culture to off-bottom culture); or (5) dredge harvesting, tilling, or harrowing is conducted in areas inhabited by submerged aquatic vegetation. (See general condition 27.) (Sections 10 and 404)

Note: The permittee should notify the applicable U.S. Coast Guard office regarding the project.

49. Coal Remining Activities.

Discharges of dredged or fill material into non-tidal waters of the United States associated with the remining and reclamation of lands that were previously mined for coal, provided the activities are already authorized, or are currently being processed as part of an integrated permit processing procedure, by the Department of Interior (DOI) Office of Surface Mining (OSM), or by states with approved programs under Title IV or Title V of the Surface Mining Control and Reclamation Act of 1977. Areas previously mined include reclaimed mine sites, abandoned mine land areas, or lands under bond

forfeiture contracts. The permittee must clearly demonstrate to the district engineer that the reclamation plan will result in a net increase in aquatic resource functions. As part of the project, the permittee may conduct coal mining activities in an adjacent area, provided the newly mined area is less than 40 percent of the area being remined plus any unmined area necessary for the reclamation of the remined area.

Notification: The permittee must submit a pre-construction notification to the district engineer and receive written authorization prior to commencing the activity. (See general condition 27.) (Sections 10 and 404)

50. *Underground Coal Mining Activities.* Discharges of dredged or fill material into non-tidal waters of the United States associated with underground coal mining and reclamation operations provided the activities are authorized, or are currently being processed as part of an integrated permit processing procedure, by the Department of Interior (DOI), Office of Surface Mining (OSM), or by states with approved programs under Title V of the Surface Mining Control and Reclamation Act of 1977.

This NWP does not authorize discharges into non-tidal wetlands adjacent to tidal waters. This NWP does not authorize coal preparation and processing activities outside of the mine site.

Notification: The permittee must submit a pre-construction notification to the district engineer and receive written authorization prior to commencing the activity. (See general condition 27.) If reclamation is required by other statutes, then a copy of the reclamation plan must be submitted with the pre-construction notification. (Sections 10 and 404)

Note: Coal preparation and processing activities outside of the mine site may be authorized by NWP 21.

C. Nationwide Permit General Conditions

Note: To qualify for NWP authorization, the prospective permittee must comply with the following general conditions, as appropriate, in addition to any regional or case-specific conditions imposed by the division engineer or district engineer. Prospective permittees should contact the appropriate Corps district office to determine if regional conditions have been imposed on an NWP. Prospective permittees should also contact the appropriate Corps district office to determine the status of Clean Water Act Section 401 water quality certification and/or Coastal Zone Management Act consistency for an NWP.

1. *Navigation.* (a) No activity may cause more than a minimal adverse effect on navigation.

(b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.

(c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

2. *Aquatic Life Movements.* No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. Culverts placed in streams must be installed to maintain low flow conditions.

3. *Spawning Areas.* Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

4. *Migratory Bird Breeding Areas.* Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

5. *Shellfish Beds.* No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48.

6. *Suitable Material.* No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).

7. *Water Supply Intakes.* No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement

of public water supply intake structures or adjacent bank stabilization.

8. *Adverse Effects From Impoundments.* If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

9. *Management of Water Flows.* To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization and storm water management activities, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

10. *Fills Within 100-Year Floodplains.* The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

11. *Equipment.* Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. *Soil Erosion and Sediment Controls.* Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow.

13. *Removal of Temporary Fills.* Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

14. *Proper Maintenance.* Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety.

15. *Wild and Scenic Rivers.* No activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official

study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency in the area (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service).

16. *Tribal Rights.* No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

17. *Endangered Species.* (a) No activity is authorized under any NWP which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which "may affect" a listed species or critical habitat, unless Section 7 consultation addressing the effects of the proposed activity has been completed.

(b) Federal agencies should follow their own procedures for complying with the requirements of the ESA. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements.

(c) Non-federal permittees shall notify the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species or designated critical habitat, the pre-construction notification must include the name(s) of the endangered or threatened species that may be affected by the proposed work or that utilize the designated critical habitat that may be affected by the proposed work. The district engineer will determine whether the proposed activity "may affect" or will have "no effect" to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps' determination within 45 days of receipt of a complete pre-construction notification. In cases where the non-Federal applicant has identified listed

species or critical habitat that might be affected or is in the vicinity of the project, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification the proposed activities will have "no effect" on listed species or critical habitat, or until Section 7 consultation has been completed.

(d) As a result of formal or informal consultation with the FWS or NMFS the district engineer may add species-specific regional endangered species conditions to the NWPs.

(e) Authorization of an activity by a NWP does not authorize the "take" of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the U.S. FWS or the NMFS, both lethal and non-lethal "takes" of protected species are in violation of the ESA. Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the U.S. FWS and NMFS or their world wide Web pages at <http://www.fws.gov/> and <http://www.noaa.gov/fisheries.html> respectively.

18. *Historic Properties.* (a) In cases where the district engineer determines that the activity may affect properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

(b) Federal permittees should follow their own procedures for complying with the requirements of Section 106 of the National Historic Preservation Act. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if the authorized activity may have the potential to cause effects to any historic properties listed, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties may be affected by the proposed work or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of or potential for the presence of historic resources can be sought from the State

Historic Preservation Officer or Tribal Historic Preservation Officer, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based on the information submitted and these efforts, the district engineer shall determine whether the proposed activity has the potential to cause an effect on the historic properties. Where the non-Federal applicant has identified historic properties which the activity may have the potential to cause effects and so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects or that consultation under Section 106 of the NHPA has been completed.

(d) The district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA Section 106 consultation is required. Section 106 consultation is not required when the Corps determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR 800.3(a)). If NHPA section 106 consultation is required and will occur, the district engineer will notify the non-Federal applicant that he or she cannot begin work until Section 106 consultation is completed.

(e) Prospective permittees should be aware that section 110k of the NHPA (16 U.S.C. 470h-2(k)) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of Section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, explaining the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate

Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

19. *Designated Critical Resource Waters.* Critical resource waters include, NOAA-designated marine sanctuaries, National Estuarine Research Reserves, state natural heritage sites, and outstanding national resource waters or other waters officially designated by a state as having particular environmental or ecological significance and identified by the district engineer after notice and opportunity for public comment. The district engineer may also designate additional critical resource waters after notice and opportunity for comment.

(a) Discharges of dredged or fill material into waters of the United States are not authorized by NHPAs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, and 50 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

(b) For NHPAs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, and 38, notification is required in accordance with general condition 27, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NHPAs only after it is determined that the impacts to the critical resource waters will be no more than minimal.

20. *Mitigation.* The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that adverse effects on the aquatic environment are minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating) will be required to the extent necessary to ensure that the adverse effects to the aquatic environment are minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed $\frac{1}{10}$ acre and require pre-construction notification, unless the district engineer determines in writing that some other form of mitigation would be more environmentally appropriate and provides a project-

specific waiver of this requirement. For wetland losses of $\frac{1}{10}$ acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in minimal adverse effects on the aquatic environment. Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, wetland restoration should be the first compensatory mitigation option considered.

(d) For losses of streams or other open waters that require pre-construction notification, the district engineer may require compensatory mitigation, such as stream restoration, to ensure that the activity results in minimal adverse effects on the aquatic environment.

(e) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NHPAs. For example, if an NHPA has an acreage limit of $\frac{1}{2}$ acre, it cannot be used to authorize any project resulting in the loss of greater than $\frac{1}{2}$ acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that a project already meeting the established acreage limits also satisfies the minimal impact requirement associated with the NHPAs.

(f) Compensatory mitigation plans for projects in or near streams or other open waters will normally include a requirement for the establishment, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, riparian areas may be the only compensatory mitigation required. Riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland

compensatory mitigation for wetland losses.

(g) Permittees may propose the use of mitigation banks, in-lieu fee arrangements or separate activity-specific compensatory mitigation. In all cases, the mitigation provisions will specify the party responsible for accomplishing and/or complying with the mitigation plan.

(h) Where certain functions and services of waters of the United States are permanently adversely affected, such as the conversion of a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse effects of the project to the minimal level.

21. *Water Quality.* Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA Section 401, individual 401 Water Quality Certification must be obtained or waived (see 33 CFR 330.4(c)). The district engineer or State or Tribe may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

22. *Coastal Zone Management.* In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). The district engineer or a State may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

23. *Regional and Case-By-Case Conditions.* The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

24. *Use of Multiple Nationwide Permits.* The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United

States for the total project cannot exceed $\frac{1}{3}$ -acre.

25. *Transfer of Nationwide Permit Verifications.* If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:

“When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.”

(Transferee)

(Date)

26. *Compliance Certification.* Each permittee who received an NWP verification from the Corps must submit a signed certification regarding the completed work and any required mitigation. The certification form must be forwarded by the Corps with the NWP verification letter and will include:

(a) A statement that the authorized work was done in accordance with the NWP authorization, including any general or specific conditions;

(b) A statement that any required mitigation was completed in accordance with the permit conditions; and

(c) The signature of the permittee certifying the completion of the work and mitigation.

27. *Pre-Construction Notification.* (a) *Timing.* Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, as a general rule, will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review

process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity:

(1) Until notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or

(2) If 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 17 that listed species or critical habitat might be affected or in the vicinity of the project, or to notify the Corps pursuant to general condition 18 that the activity may have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that is “no effect” on listed species or “no potential to cause effects” on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or Section 106 of the National Historic Preservation (see 33 CFR 330.4(g)) is completed. Also, work cannot begin under NWPs 21, 49, or 50 until the permittee has received written approval from the Corps. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee cannot begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) *Contents of Pre-Construction Notification:* The PCN must be in writing and include the following information:

(1) Name, address and telephone numbers of the prospective permittee;

(2) Location of the proposed project;

(3) A description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause; any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. The description should be sufficiently detailed to allow the district engineer to

determine that the adverse effects of the project will be minimal and to determine the need for compensatory mitigation. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the project and when provided result in a quicker decision.);

(4) The PCN must include a delineation of special aquatic sites and other waters of the United States on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters of the United States, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many waters of the United States. Furthermore, the 45 day period will not start until the delineation has been submitted to or completed by the Corps, where appropriate;

(5) If the proposed activity will result in the loss of greater than $\frac{1}{10}$ acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

(6) If any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, for non-Federal applicants the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work. Federal applicants must provide documentation demonstrating compliance with the Endangered Species Act; and

(7) For an activity that may affect a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, for non-Federal applicants the PCN must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property. Federal applicants must provide documentation demonstrating compliance with Section 106 of the National Historic Preservation Act.

(c) *Form of Pre-Construction Notification:* The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is a PCN and must include all of

the information required in paragraphs (b)(1) through (7) of this general condition. A letter containing the required information may also be used.

(d) *Agency Coordination:* (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the project's adverse environmental effects to a minimal level.

(2) For all NWP 48 activities requiring pre-construction notification and for other NWP activities requiring pre-construction notification to the district engineer that result in the loss of greater than $\frac{1}{2}$ -acre of waters of the United States, the district engineer will immediately provide (e.g., via facsimile transmission, overnight mail, or other expeditious manner) a copy of the PCN to the appropriate Federal or state offices (U.S. FWS, state natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Office (THPO), and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will then have 10 calendar days from the date the material is transmitted to telephone or fax the district engineer notice that they intend to provide substantive, site-specific comments. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame, but will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

(3) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by Section 305(b)(4)(B) of the

Magnuson-Stevens Fishery Conservation and Management Act.

(4) Applicants are encouraged to provide the Corps multiple copies of pre-construction notifications to expedite agency coordination.

(5) For NWP 48 activities that require reporting, the district engineer will provide a copy of each report within 10 calendar days of receipt to the appropriate regional office of the NMFS.

(e) *District Engineer's Decision:* In reviewing the PCN for the proposed activity, the district engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. If the proposed activity requires a PCN and will result in a loss of greater than $\frac{1}{10}$ acre of wetlands, the prospective permittee should submit a mitigation proposal with the PCN. Applicants may also propose compensatory mitigation for projects with smaller impacts. The district engineer will consider any proposed compensatory mitigation the applicant has included in the proposal in determining whether the net adverse environmental effects to the aquatic environment of the proposed work are minimal. The compensatory mitigation proposal may be either conceptual or detailed. If the district engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse effects on the aquatic environment are minimal, after considering mitigation, the district engineer will notify the permittee and include any conditions the district engineer deems necessary. The district engineer must approve any compensatory mitigation proposal before the permittee commences work. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the district engineer will expeditiously review the proposed compensatory mitigation plan. The district engineer must review the plan within 45 calendar days of receiving a complete PCN and determine whether the proposed mitigation would ensure no more than minimal adverse effects on the aquatic environment. If the net adverse effects of the project on the aquatic environment (after consideration of the compensatory mitigation proposal) are determined by the district engineer to be minimal, the district engineer will provide a timely written response to the applicant. The response will state that the project can proceed under the terms and conditions of the NWP.

If the district engineer determines that the adverse effects of the proposed work are more than minimal, then the district engineer will notify the applicant either: (1) That the project does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (2) that the project is authorized under the NWP subject to the applicant's submission of a mitigation plan that would reduce the adverse effects on the aquatic environment to the minimal level; or (3) that the project is authorized under the NWP with specific modifications or conditions. Where the district engineer determines that mitigation is required to ensure no more than minimal adverse effects occur to the aquatic environment, the activity will be authorized within the 45-day PCN period. The authorization will include the necessary conceptual or specific mitigation or a requirement that the applicant submit a mitigation plan that would reduce the adverse effects on the aquatic environment to the minimal level. When mitigation is required, no work in waters of the United States may occur until the district engineer has approved a specific mitigation plan.

28. *Single and Complete Project.* The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

D. Further Information

1. District Engineers have authority to determine if an activity complies with the terms and conditions of an NWP.

2. NWPs do not obviate the need to obtain other federal, state, or local permits, approvals, or authorizations required by law.

3. NWPs do not grant any property rights or exclusive privileges.

4. NWPs do not authorize any injury to the property or rights of others.

5. NWPs do not authorize interference with any existing or proposed Federal project.

E. Definitions

Best management practices (BMPs): Policies, practices, procedures, or structures implemented to mitigate the adverse environmental effects on surface water quality resulting from development. BMPs are categorized as structural or non-structural.

Compensatory mitigation: The restoration, establishment (creation), enhancement, or preservation of aquatic resources for the purpose of compensating for unavoidable adverse impacts which remain after all

appropriate and practicable avoidance and minimization has been achieved.

Currently serviceable: Useable as is or with some maintenance, but not so degraded as to essentially require reconstruction.

Discharge: The term "discharge" means any discharge of dredged or fill material and any activity that causes or results in such a discharge.

Enhancement: The manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area.

Ephemeral stream: An ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

Establishment (creation): The manipulation of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site. Establishment results in a gain in aquatic resource area.

Historic Property: Any prehistoric or historic district, site (including archaeological site), building, structure, or other object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria (36 CFR part 60).

Independent utility: A test to determine what constitutes a single and complete project in the Corps regulatory program. A project is considered to have independent utility if it would be constructed absent the construction of other projects in the project area. Portions of a multi-phase project that depend upon other phases of the project do not have independent utility. Phases of a project that would be constructed even if the other phases were not built can be considered as separate single and complete projects with independent utility.

Intermittent stream: An intermittent stream has flowing water during certain

times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow.

Loss of waters of the United States: Waters of the United States that are permanently adversely affected by filling, flooding, excavation, or drainage because of the regulated activity. Permanent adverse effects include permanent discharges of dredged or fill material that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody. The acreage of loss of waters of the United States is a threshold measurement of the impact to jurisdictional waters for determining whether a project may qualify for an NWP; it is not a net threshold that is calculated after considering compensatory mitigation that may be used to offset losses of aquatic functions and services. The loss of stream bed includes the linear feet of stream bed that is filled or excavated. Waters of the United States temporarily filled, flooded, excavated, or drained, but restored to pre-construction contours and elevations after construction, are not included in the measurement of loss of waters of the United States. Impacts resulting from activities eligible for exemptions under Section 404(f) of the Clean Water Act are not considered when calculating the loss of waters of the United States.

Non-tidal wetland: A non-tidal wetland is a wetland that is not subject to the ebb and flow of tidal waters. The definition of a wetland can be found at 33 CFR 328.3(b). Non-tidal wetlands contiguous to tidal waters are located landward of the high tide line (i.e., spring high tide line).

Open water: For purposes of the NWPs, an open water is any area that in a year with normal patterns of precipitation has water flowing or standing above ground to the extent that an ordinary high water mark can be determined. Aquatic vegetation within the area of standing or flowing water is either non-emergent, sparse, or absent. Vegetated shallows are considered to be open waters. Examples of "open waters" include rivers, streams, lakes, and ponds.

Ordinary High Water Mark: An ordinary high water mark is a line on the shore established by the fluctuations of water and indicated by physical characteristics, or by other appropriate means that consider the characteristics of the surrounding areas (see 33 CFR 328.3(e)).

Perennial stream: A perennial stream has flowing water year-round during a typical year. The water table is located above the stream bed for most of the year. Groundwater is the primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow.

Practicable: Available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

Pre-construction notification: A request submitted by the project proponent to the Corps for confirmation that a particular activity is authorized by nationwide permit. The request may be a permit application, letter, or similar document that includes information about the proposed work and its anticipated environmental effects. Pre-construction notification may be required by the terms and conditions of a nationwide permit, or by regional conditions. A pre-construction notification may be voluntarily submitted in cases where pre-construction notification is not required and the project proponent wants confirmation that the activity is authorized by nationwide permit.

Preservation: The removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in a gain of aquatic resource area or functions.

Re-establishment: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area.

Rehabilitation: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area.

Restoration: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: Re-establishment and rehabilitation.

Riffle and pool complex: Riffle and pool complexes are special aquatic sites under the 404(b)(1) Guidelines. Riffle and pool complexes sometimes characterize steep gradient sections of streams. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a coarse substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. A slower stream velocity, a streaming flow, a smooth surface, and a finer substrate characterize pools.

Riparian areas: Riparian areas are lands adjacent to streams, lakes, and estuarine-marine shorelines. Riparian areas are transitional between terrestrial and aquatic ecosystems, through which surface and subsurface hydrology connects waterbodies with their adjacent uplands. Riparian areas provide a variety of ecological functions and services and help improve or maintain local water quality. (See general condition 20.)

Shellfish seeding: The placement of shellfish seed and/or suitable substrate to increase shellfish production. Shellfish seed consists of immature individual shellfish or individual shellfish attached to shells or shell fragments (i.e., spat on shell). Suitable substrate may consist of shellfish shells, shell fragments, or other appropriate materials placed into waters for shellfish habitat.

Single and complete project: The term "single and complete project" is defined at 33 CFR 330.2(i) as the total project proposed or accomplished by one owner/developer or partnership or other association of owners/developers. A single and complete project must have independent utility (see definition). For linear projects, a "single and complete project" is all crossings of a single water of the United States (i.e., a single waterbody) at a specific location. For linear projects crossing a single waterbody several times at separate and distant locations, each crossing is considered a single and complete project. However, individual channels in a braided stream or river, or individual arms of a large, irregularly shaped wetland or lake, etc., are not separate waterbodies, and crossings of such features cannot be considered separately.

Stormwater management: Stormwater management is the mechanism for controlling stormwater runoff for the purposes of reducing downstream erosion, water quality degradation, and flooding and mitigating the adverse

effects of changes in land use on the aquatic environment.

Stormwater management facilities: Stormwater management facilities are those facilities, including but not limited to, stormwater retention and detention ponds and best management practices, which retain water for a period of time to control runoff and/or improve the quality (i.e., by reducing the concentration of nutrients, sediments, hazardous substances and other pollutants) of stormwater runoff.

Stream bed: The substrate of the stream channel between the ordinary high water marks. The substrate may be bedrock or inorganic particles that range in size from clay to boulders. Wetlands contiguous to the stream bed, but outside of the ordinary high water marks, are not considered part of the stream bed.

Stream channelization: The manipulation of a stream's course, condition, capacity, or location that causes more than minimal interruption of normal stream processes. A channelized stream remains a water of the United States.

Structure: An object that is arranged in a definite pattern of organization. Examples of structures include, without limitation, any pier, boat dock, boat ramp, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, artificial island, artificial reef, permanent mooring structure, power transmission line, permanently moored floating vessel, piling, aid to navigation, or any other manmade obstacle or obstruction.

Tidal wetland: A tidal wetland is a wetland (i.e., water of the United States) that is inundated by tidal waters. The definitions of a wetland and tidal waters can be found at 33 CFR 328.3(b) and 33 CFR 328.3(f), respectively. Tidal waters rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by other waters, wind, or other effects. Tidal wetlands are located channelward of the high tide line, which is defined at 33 CFR 328.3(d).

Vegetated shallows: Vegetated shallows are special aquatic sites under the 404(b)(1) Guidelines. They are areas that are permanently inundated and under normal circumstances have rooted aquatic vegetation, such as seagrasses in marine and estuarine systems and a variety of vascular rooted plants in freshwater systems.

Waterbody: For purposes of the NWP, a waterbody is a jurisdictional

water of the United States that, during a year with normal patterns of precipitation, has water flowing or standing above ground to the extent that an ordinary high water mark (OHWM) or other indicators of jurisdiction can be determined, as well as any wetland area

(see 33 CFR 328.3(b)). If a jurisdictional wetland is adjacent—meaning bordering, contiguous, or neighboring—to a jurisdictional waterbody displaying an OHWM or other indicators of jurisdiction, that waterbody and its adjacent wetlands are considered

together as a single aquatic unit (see 33 CFR 328.4(c)(2)). Examples of “waterbodies” include streams, rivers, lakes, ponds, and wetlands.

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APPENDIX B

USACE NATIONWIDE PERMIT GENERAL CONDITIONS

Nationwide Permit General Conditions

The following general conditions must be followed in order for any authorization by an NWP to be valid:

1. **Navigation**. No activity may cause more than a minimal adverse effect on navigation.
2. **Proper Maintenance**. Any structure or fill authorized shall be properly maintained, including maintenance to ensure public safety.
3. **Soil Erosion and Sediment Controls**. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date.
4. **Aquatic Life Movements**. No activity may substantially disrupt the movement of those species of aquatic life indigenous to the waterbody, including those species which normally migrate through the area, unless the activity's primary purpose is to impound water. Culverts placed in streams must be installed to maintain low flow conditions.
5. **Equipment**. Heavy equipment working in wetlands must be placed on mats, or other measures must be taken to minimize soil disturbance.
6. **Regional and Case-By-Case Conditions**. The activity must comply with any regional conditions which may have been added by the division engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the State or tribe in its Section 401 water quality certification and Coastal Zone Management Act consistency determination.
7. **Wild and Scenic Rivers**. No activity may occur in a component of the National Wild and Scenic River System; or in a river officially designated by Congress as a "study river" for possible inclusion in the system, while the river is in an official study status; unless the appropriate Federal agency, with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation, or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency in the area (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service).
8. **Tribal Rights**. No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.
9. **Water Quality**. (a) In certain States and tribal lands an individual 401 water quality certification must be obtained or waived (See 33 CFR 330.4(c)).
(b) For NWPs 12, 14, 17, 18, 32, 39, 40, 42, 43, and 44, where the State or tribal 401 certification (either generically or individually) does not require or approve a water quality management plan, the permittee must include design criteria and techniques that will ensure that the authorized work does not result in more than minimal degradation of water quality. An important component of a water quality management plan includes stormwater management that minimizes degradation of the downstream aquatic system, including water quality. Refer to General Condition 21 for stormwater management requirements. Another important component of a water quality management plan is the establishment and maintenance of vegetated buffers next to open waters, including streams. Refer to General Condition 19 for vegetated buffer requirements for the NWPs.
10. **Coastal Zone Management**. In certain states, an individual state coastal zone management consistency concurrence must be obtained or waived (see Section 330.4(d)).
11. **Endangered Species**. (a) No activity is authorized under any NWP which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act, or which will destroy or adversely modify the critical habitat of such species. Non-federal permittees shall notify the District Engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project, or is located in the designated critical habitat and shall not begin work on the activity until notified by the District Engineer that the requirements of the Endangered Species Act have been satisfied and that the activity is authorized. For activities that may affect Federally-listed endangered or threatened species or designated critical habitat, the notification must include the name(s) of the endangered or threatened species that may be affected by the proposed work or that utilize the designated critical habitat that may be affected by the proposed work. As a result of formal or informal consultation with the FWS or NMFS, the District Engineer may add species-specific regional endangered species conditions to the NWPs.
(b) Authorization of an activity by a nationwide permit does not authorize the "take" of a threatened or endangered species as defined under the Federal Endangered Species Act. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the U.S. Fish and Wildlife Service or the National Marine Fisheries Service, both lethal and non-lethal "takes" of protected species are in violation of the Endangered Species Act. Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the U.S. Fish and Wildlife Service and National

Marine Fisheries Service or their world wide web pages at <http://www.fws.gov/r9endspp/endspp.html> and http://www.nfms.gov/prot_res/esahome.html, respectively.

12. **Historic Properties.** No activity which may affect historic properties listed, or eligible for listing, in the National Register of Historic Places is authorized, until the DE has complied with the provisions of 33 CFR Part 325, Appendix C. The prospective permittee must notify the District Engineer if the authorized activity may affect any historic properties listed, determined to be eligible, or which the prospective permittee has reason to believe may be eligible for listing on the National Register of Historic Places, and shall not begin the activity until notified by the District Engineer that the requirements of the National Historic Preservation Act have been satisfied and that the activity is authorized. Information on the location and existence of historic resources can be obtained from the State Historic Preservation Office and the National Register of Historic Places (see 33 CFR 330.4(g)). For activities that may affect historic properties listed in, or eligible for listing in, the National Register of Historic Places, the notification must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property.

13. **Notification.**

(a) Timing: Where required by the terms of the NWP, the prospective permittee must notify the District Engineer with a preconstruction notification (PCN) as early as possible. The District Engineer must determine if the PCN is complete within 30 days of the date of receipt and can request the additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the District Engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the District Engineer. The prospective permittee shall not begin the activity:

(1) Until notified in writing by the District Engineer that the activity may proceed under the NWP with any special conditions imposed by the District or Division Engineer; or

(2) If notified in writing by the District or Division Engineer that an individual permit is required; or

(3) Unless 45 days have passed from the District Engineer's receipt of the complete notification and the prospective permittee has not received written notice from the District or Division Engineer. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) Contents of Notification: The notification must be in writing and include the following information:

(1) Name, address, and telephone numbers of the prospective permittee;

(2) Location of the proposed project;

(3) Brief description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause; any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity; and

(4) For NWPs 7, 12, 14, 18, 21, 34, 38, 39, 40, 42, and 43, the PCN must also include a delineation of affected special aquatic sites, including wetlands, vegetated shallows (e.g., submerged aquatic vegetation, seagrass beds), and riffle and pool complexes (see paragraph 13(f));

(5) For NWP 7, Outfall Structures and Maintenance, the PCN must include information regarding the original design capacities and configurations of those areas of the facility where maintenance dredging or excavation is proposed.

(6) For NWP 14, Linear Transportation Crossings, the PCN must include a compensatory mitigation proposal to offset permanent losses of waters of the United States and a statement describing how temporary losses of waters of the United States will be minimized to the maximum extent practicable.

(7) For NWP 21, Surface Coal Mining Activities, the PCN must include an Office of Surface Mining (OSM) or state-approved mitigation plan.

(8) For NWP 27, Stream and Wetland Restoration, the PCN must include documentation of the prior condition of the site that will be reverted by the permittee.

(9) For NWP 29, Single-Family Housing, the PCN must also include:

(i) Any past use of this NWP by the individual permittee and/or the permittee's spouse;

(ii) A statement that the single-family housing activity is for a personal residence of the permittee;

(iii) A description of the entire parcel, including its size, and a delineation of wetlands. For the purpose of this NWP, parcels of land measuring 1/4 acre or less will not require a formal on-site delineation. However, the applicant shall provide an indication of where the wetlands are and the amount of wetlands that exists on the property. For parcels greater than 1/4 acre in size, a formal wetland delineation must be prepared in accordance with the current method required by the Corps. (See paragraph 13(f));

(iv) A written description of all land (including, if available, legal descriptions) owned by the prospective permittee and/or the prospective permittee's spouse, within a one mile radius of the parcel, in any form of

ownership (including any land owned as a partner, corporation, joint tenant, co-tenant, or as a tenant-by-the-entirety) and any land on which a purchase and sale agreement or other contract for sale or purchase has been executed;

(10) For NWP 31, Maintenance of Existing Flood Control Projects, the prospective permittee must either notify the District Engineer with a PCN prior to each maintenance activity or submit a five year (or less) maintenance plan. In addition, the PCN must include all of the following:

(i) Sufficient baseline information so as to identify the approved channel depths and configurations and existing facilities. Minor deviations are authorized, provided the approved flood control protection or drainage is not increased;

(ii) A delineation of any affected special aquatic sites, including wetlands; and,

(iii) Location of the dredged material disposal site.

(11) For NWP 33, Temporary Construction, Access, and Dewatering, the PCN must also include a restoration plan of reasonable measures to avoid and minimize adverse effects to aquatic resources.

(12) For NWPs 39, 43, and 44, the PCN must also include a written statement to the District Engineer explaining how avoidance and minimization of losses of waters of the United States were achieved on the project site.

(13) For NWP 39, Residential, Commercial, and Institutional Developments, the PCN must include a compensatory mitigation proposal that offsets unavoidable losses of waters of the United States or justification explaining why compensatory mitigation should not be required.

(14) For NWP 40, Agricultural Activities, the PCN must include a compensatory mitigation proposal to offset losses of waters of the United States.

(15) For NWP 43, Stormwater Management Facilities, the PCN must include, for the construction of new stormwater management facilities, a maintenance plan (in accordance with State and local requirements, if applicable) and a compensatory mitigation proposal to offset losses of waters of the United States.

(16) For NWP 44, Mining Activities, the PCN must include a description of all waters of the United States adversely affected by the project, a description of measures taken to minimize adverse effects to waters of the United States, a description of measures taken to comply with the criteria of the NWP, and a reclamation plan (for aggregate mining activities in isolated waters and non-tidal wetlands adjacent to headwaters and any hard rock/mineral mining activities).

(17) For activities that may adversely affect Federally-listed endangered or threatened species, the PCN must include the name(s) of those endangered or threatened species that may be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work.

(18) For activities that may affect historic properties listed in, or eligible for listing in, the National Register of Historic Places, the PCN must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property.

(19) For NWPs 12, 14, 29, 39, 40, 42, 43, and 44, where the proposed work involves discharges of dredged or fill material into waters of the United States resulting in permanent, above-grade fills within 100-year floodplains (as identified on FEMA's Flood Insurance Rate Maps or FEMA-approved local floodplain maps), the notification must include documentation demonstrating that the proposed work complies with the appropriate FEMA or FEMA-approved local floodplain construction requirements.

(c) Form of Notification: The standard individual permit application form (Form ENG 4345) may be used as the notification but must clearly indicate that it is a PCN and must include all of the information required in (b) (1)-(19) of General Condition 13. A letter containing the requisite information may also be used.

(d) District Engineer's Decision: In reviewing the PCN for the proposed activity, the District Engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. The prospective permittee may, optionally, submit a proposed mitigation plan with the PCN to expedite the process and the District Engineer will consider any proposed compensatory mitigation the applicant has included in the proposal in determining whether the net adverse environmental effects to the aquatic environment of the proposed work are minimal. If the District Engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse effects on the aquatic environment are minimal, the District Engineer will notify the permittee and include any conditions the District Engineer deems necessary.

Any compensatory mitigation proposal must be approved by the District Engineer prior to commencing work. If the prospective permittee is required to submit a compensatory mitigation proposal with the PCN, the proposal may be either conceptual or detailed. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the District Engineer will expeditiously review the proposed compensatory mitigation plan. The District Engineer must review the plan within 45 days of receiving a complete PCN and determine whether the conceptual or specific proposed mitigation would ensure no more than minimal adverse effects on the

aquatic environment. If the net adverse effects of the project on the aquatic environment (after consideration of the compensatory mitigation proposal) are determined by the District Engineer to be minimal, the District Engineer will provide a timely written response to the applicant stating that the project can proceed under the terms and conditions of the nationwide permit.

If the District Engineer determines that the adverse effects of the proposed work are more than minimal, then he will notify the applicant either: (1) that the project does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (2) that the project is authorized under the NWP subject to the applicant's submission of a mitigation proposal that would reduce the adverse effects on the aquatic environment to the minimal level; or (3) that the project is authorized under the NWP with specific modifications or conditions. Where the District Engineer determines that mitigation is required in order to ensure no more than minimal adverse effects on the aquatic environment, the activity will be authorized within the 45-day PCN period, including the necessary conceptual or specific mitigation or a requirement that the applicant submit a mitigation proposal that would reduce the adverse effects on the aquatic environment to the minimal level. When conceptual mitigation is included, or a mitigation plan is required under item (2) above, no work in waters of the United States will occur until the District Engineer has approved a specific mitigation plan.

(e) Agency Coordination: The District Engineer will consider any comments from Federal and State agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the project's adverse effects on the aquatic environment to a minimal level.

For activities requiring notification to the District Engineer that result in the loss of greater than 1/2 acre of waters of the United States, the District Engineer will, upon receipt of a notification, provide immediately (e.g., via facsimile transmission, overnight mail, or other expeditious manner), a copy to the appropriate offices of the Fish and Wildlife Service, State natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO), and, if appropriate, the National Marine Fisheries Service. With the exception of NWP 37, these agencies will then have 10 calendar days from the date the material is transmitted to telephone or fax the District Engineer notice that they intend to provide substantive, site-specific comments. If so contacted by an agency, the District Engineer will wait an additional 15 calendar days before making a decision on the notification. The District Engineer will fully consider agency comments received within the specified time frame, but will provide no response to the resource agency, except as provided below. The District Engineer will indicate in the administrative record associated with each notification that the resource agencies' concerns were considered. As required by Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act, the District Engineer will provide a response to National Marine Fisheries Service within 30 days of receipt of any Essential Fish Habitat conservation recommendations. Applicants are encouraged to provide the Corps multiple copies of notifications to expedite agency notification.

(f) Wetlands Delineations: Wetland delineations must be prepared in accordance with the current method required by the Corps. For NWP 29 see paragraph (b)(9)(iii) for parcels less than 1/4 acre in size. The permittee may ask the Corps to delineate the special aquatic site. There may be some delay if the Corps does the delineation. Furthermore, the 45-day period will not start until the wetland delineation has been completed and submitted to the Corps, where appropriate.

14. **Compliance Certification.** Every permittee who has received a Nationwide permit verification from the Corps will submit a signed certification regarding the completed work and any required mitigation. The certification will be forwarded by the Corps with the authorization letter. The certification will include: a.) A statement that the authorized work was done in accordance with the Corps authorization, including any general or specific conditions; b.) A statement that any required mitigation was completed in accordance with the permit conditions; and c.) The signature of the permittee certifying the completion of the work and mitigation.

15. **Use of Multiple Nationwide Permits.** The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3 acre.

16. **Water Supply Intakes.** No activity, including structures and work in navigable waters of the United States or discharges of dredged or fill material, may occur in the proximity of a public water supply intake except where the activity is for repair of the public water supply intake structures or adjacent bank stabilization.

17. **Shellfish Beds.** No activity, including structures and work in navigable waters of the United States or discharges of dredged or fill material, may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWP 4.

18. **Suitable Material.** No activity, including structures and work in navigable waters of the United States or discharges of dredged or fill material, may consist of unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.)

and material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).

19. **Mitigation.** The project must be designed and constructed to avoid and minimize adverse effects to waters of the United States to the maximum extent practicable at the project site (i.e., on site). Mitigation will be required when necessary to ensure that the adverse effects to the aquatic environment are minimal. The District Engineer will consider the factors discussed below when determining the acceptability of appropriate and practicable mitigation necessary to offset adverse effects on the aquatic environment that are more than minimal.

(a) To be practicable, the mitigation must be available and capable of being done considering costs, existing technology, and logistics in light of the overall project purposes. Examples of mitigation that may be appropriate and practicable include, but are not limited to: reducing the size of the project; establishing and maintaining wetland or upland vegetated buffers to protect open waters such as streams; and replacing losses of aquatic resource functions and values by creating, restoring, enhancing, or preserving similar functions and values, preferably in the same watershed;

(b) The District Engineer will require restoration, creation, enhancement, or preservation of other aquatic resources in order to offset the authorized impacts to the extent necessary to ensure that the adverse effects on the aquatic environment are minimal. An important element of any compensatory mitigation plan for projects in or near streams or other open waters is the establishment and maintenance, to the maximum extent practicable, of vegetated buffers next to open waters on the project site. The vegetated buffer should consist of native species. The District Engineer will determine the appropriate width of the vegetated buffer and in which cases it will be required. Normally, the vegetated buffer will be 25 to 50 feet wide on each side of the stream, but the District Engineer may require wider vegetated buffers to address documented water quality concerns. If there are open waters on the project site and the District Engineer requires compensatory mitigation for wetland impacts to ensure that the net adverse effects on the aquatic environment are minimal, any vegetated buffer will comprise no more than 1/3 of the remaining compensatory mitigation acreage after the permanently filled wetlands have been replaced on a one-to-one acreage basis. In addition, compensatory mitigation must address adverse effects on wetland functions and values and cannot be used to offset the acreage of wetland losses that would occur in order to meet the acreage limits of some of the NWP (e.g., for NWP 39, 1/4 acre of wetlands cannot be created to change a 1/2 acre loss of wetlands to a 1/4 acre loss; however, 1/2 acre of created wetlands can be used to reduce the impacts of a 1/3 acre loss of wetlands). If the prospective permittee is required to submit a compensatory mitigation proposal with the PCN, the proposal may be either conceptual or detailed.

(c) To the extent appropriate, permittees should consider mitigation banking and other appropriate forms of compensatory mitigation. If the District Engineer determines that compensatory mitigation is necessary to offset losses of waters of the United States and ensure that the net adverse effects of the authorized work on the aquatic environment are minimal, consolidated mitigation approaches, such as mitigation banks, will be the preferred method of providing compensatory mitigation, unless the District Engineer determines that activity-specific compensatory mitigation is more appropriate, based on which is best for the aquatic environment. These types of mitigation are preferred because they involve larger blocks of protected aquatic environment, are more likely to meet the mitigation goals, and are more easily checked for compliance. If a mitigation bank or other consolidated mitigation approach is not available in the watershed, the District Engineer will consider other appropriate forms of compensatory mitigation to offset the losses of waters of the United States to ensure that the net adverse effects of the authorized work on the aquatic environment are minimal.

20. **Spawning Areas.** Activities, including structures and work in navigable waters of the United States or discharges of dredged or fill material, in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., excavate, fill, or smother downstream by substantial turbidity) of an important spawning area are not authorized.

21. **Management of Water Flows.** To the maximum extent practicable, the activity must be designed to maintain preconstruction downstream flow conditions (e.g., location, capacity, and flow rates). Furthermore, the activity must not permanently restrict or impede the passage of normal or expected high flows (unless the primary purpose of the fill is to impound waters) and the structure or discharge of dredged or fill material must withstand expected high flows. The activity must, to the maximum extent practicable, provide for retaining excess flows from the site, provide for maintaining surface flow rates from the site similar to preconstruction conditions, and must not increase water flows from the project site, relocate water, or redirect water flow beyond preconstruction conditions. In addition, the activity must, to the maximum extent practicable, reduce adverse effects such as flooding or erosion downstream and upstream of the project site, unless the activity is part of a larger system designed to manage water flows.

22. **Adverse Effects From Impoundments.** If the activity, including structures and work in navigable waters of the United States or discharge of dredged or fill material, creates an impoundment of water, adverse effects on the

aquatic system caused by the accelerated passage of water and/or the restriction of its flow shall be minimized to the maximum extent practicable.

23. **Waterfowl Breeding Areas**. Activities, including structures and work in navigable waters of the United States or discharges of dredged or fill material, into breeding areas for migratory waterfowl must be avoided to the maximum extent practicable.

24. **Removal of Temporary Fills**. Any temporary fills must be removed in their entirety and the affected areas returned to their preexisting elevation.

25. **Designated Critical Resource Waters**. Critical resource waters include, NOAA-designated marine sanctuaries, National Estuarine Research Reserves, National Wild and Scenic Rivers, critical habitat for Federally listed threatened and endangered species, coral reefs, State natural heritage sites, and outstanding national resource waters or other waters officially designated by a State as having particular environmental or ecological significance and identified by the District Engineer after notice and opportunity for public comment. The District Engineer may also designate additional critical resource waters after notice and opportunity for comment.

(a) Except as noted below, discharges of dredged or fill material into waters of the United States are not authorized by NWP 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, and 44 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters. Discharges of dredged or fill materials into waters of the United States may be authorized by the above NWPs in National Wild and Scenic Rivers if the activity complies with General Condition 7. Further, such discharges may be authorized in designated critical habitat for Federally listed threatened or endangered species if the activity complies with General Condition 11 and the U.S. Fish and Wildlife Service or the National Marine Fisheries Service has concurred in a determination of compliance with this condition.

(b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, and 38, notification is required in accordance with General Condition 13, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The District Engineer may authorize activities under these NWPs only after he determines that the impacts to the critical resource waters will be no more than minimal.

26. **Fills Within 100-Year Floodplains**. For purposes of this general condition, 100-year floodplains will be identified through the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps or FEMA-approved local floodplain maps.

(a) **Discharges Below Headwaters**. Discharges of dredged or fill material into waters of the United States resulting in permanent, above-grade fills within the 100-year floodplain at or below the point on a stream where the average annual flow is five cubic feet per second (i.e., below headwaters) are not authorized by NWPs 29, 39, 40, 42, 43, and 44. For NWPs 12 and 14, the prospective permittee must notify the District Engineer in accordance with General Condition 13 and the notification must include documentation that any permanent, above-grade fills in waters of the United States within the 100-year floodplain below headwaters comply with FEMA or FEMA-approved local floodplain construction requirements.

(b) **Discharges in Headwaters** (i.e., above the point on a stream where the average annual flow is five cubic feet per second).

(1) **Flood Fringe**. Discharges of dredged or fill material into waters of the United States resulting in permanent, above-grade fills within the flood fringe of the 100-year floodplain of headwaters are not authorized by NWPs 12, 14, 29, 39, 40, 42, 43, and 44, unless the prospective permittee notifies the District Engineer in accordance with General Condition 13. The notification must include documentation that such discharges comply with FEMA or FEMA-approved local floodplain construction requirements.

(2) **Floodway**. Discharges of dredged or fill material into waters of the United States resulting in permanent, above-grade fills within the floodway of the 100-year floodplain of headwaters are not authorized by NWPs 29, 39, 40, 42, 43, and 44. For NWPs 12 and 14, the permittee must notify the District Engineer in accordance with General Condition 13 and the notification must include documentation that any permanent, above grade fills proposed in the floodway comply with FEMA or FEMA-approved local floodplain construction requirements.