

## **ATTACHMENT 2: Preliminary Review of CWA Section 404(b)1 Alternatives**

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Version 1.0, prepared by Jacksonville District Regulatory Division, June 2014**

## **Preliminary Review of CWA Section 404(b)1 Alternatives**

### **1. Introduction**

This discussion of alternatives presents information required under the guidelines of the Clean Water Act, Section 404(b)1, for any project involving discharges of dredged or fill materials in waters of the United States. We have organized the discussion into the following sections:

#### **Section 1: This Introduction**

#### **Section 2: "Sirius Marina" - Project Description**

A description of the project and its components, based on information provided in the Army Corps Public Notice and other available documents

#### **Section 3: Regulatory Setting**

A brief overview of the relevant federal statutes and regulations governing the issuance of Department of the Army (DA) permits required for this project

#### **Section 4: The Applicant's Existing Alternatives Analysis**

Review of the limited information provided by the applicant on alternative

#### **Section 5: Impacts of the Preferred Alternative on Aquatic Resources**

Discussion of the project, as proposed by the applicant, and its impacts on aquatic resources and function

#### **Section 6: Project Need and Purpose**

A discussion of the "project need" and "basic purpose" and "overall purpose" which guide many aspects of the alternatives analysis

#### **Section 7: Identification of Reasonable and Practicable Alternatives**

Review of reasonable alternatives in light of overall project purpose, and narrowing down to a set of practicable alternatives

#### **Section 8: Analysis of Practicable Alternatives – Environmental Impacts**

The practicable alternatives, including Preferred Alternative, Offsite Alternatives, Onsite Alternatives, and No-Action alternatives are reviewed for the impacts to aquatic resources associated with each.

#### **Section 9: Identification of Least Environmentally Damaging Practicable Alternative**

Based on the foregoing analysis of practicability and environmental impact, identification of candidate alternatives for LEDPA.

#### **Section 10: Conclusions**

## 2. "Sirius Marina" – Project Description

The description of the proposed project differs between the Department of the Army Permit Application (June 2015), the applicant's Environmental Assessment Report (June 2015), and the Army Corps Public Notice (December 10, 2015). For the purpose of this analysis we will assume the project description contained in the Public Notice is correct and complete.

With that assumption, listed below are the components of the project proposed to be built pursuant to the DA permit application:

- 92-slip marina consisting of precast concrete decking panels of variable widths, supported by approximately 420 concrete piles;
- a steel sheet-pile bulkhead and concrete apron filling and extending the shoreline seaward;
- a concrete boat ramp at the eastern end of the fill area;
- a dredged boat basin seaward of the boat ramp;
- two queuing docks extending seaward at each side of the boat ramp;
- a boat lift;
- sewage pump-out facilities;
- fuel facilities including "underwater fuel tanks";
- a boat service yard;
- accommodations for transient boaters and dinghies;
- a dock master building with associated retail and provisioning;
- a parking area;
- a wastewater treatment plant;
- brackish wells with an R/O plant;
- a cistern;
- an emergency generator.

Several components of this project clearly involve discharge of dredge or fill materials in waters of the United States. These include, the boat ramp, the bulkhead, the concrete apron, the queuing docks, the boat basin and the dock pilings. Additional project components whose construction might constitute discharge of fill include the R/O discharge, the cistern, the waste water treatment plant, and the "underwater" fuel tanks (this may be a typographical error in the Public Notice).

### 3. Regulatory Setting

Note: The material in this section was excerpted from "Department of the Army File Number: SPL-2009-00971-MBS" and the Standard Operating Procedures for the Regulatory Program.

Any activity requiring an Individual Permit pursuant to Section 404 of the Clean Water Act (CWA) must undergo an analysis of alternatives in order to identify the Least Environmentally Damaging Practicable Alternative ("LEDPA") pursuant to the requirement of the guidelines established by the United States Environmental Protection Agency (EPA), known as the Section 404(b)(1) Guidelines (the "Guidelines"). The Section 404(b)(1) Guidelines prohibit discharges of dredged or fill material into waters of the U.S. ("WOTUS") if there is a "practicable alternative to the proposed discharge that would have less impact on the aquatic ecosystem, provided that the alternative does not have other significant environmental consequences" [40 C.F.R. § 230.10(a)]. An alternative is practicable "if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of the overall project purpose" [40 C.F.R. §§ 230.10(a) and 230.3(q)]. "If it is otherwise a practicable alternative, an area not presently owned by an Applicant which could reasonably be obtained, utilized, expanded or managed in order to fulfill the basic purpose of the proposed activity may be considered" [40 C.F.R. § 230.10(a)(2)].

If the proposed activity would involve a discharge into a special aquatic site such as a wetland, the Section 404(b)(1) Guidelines distinguish between those projects that are water dependent and those that are not. A water dependent project is one that requires access to or proximity to or siting within a special aquatic site to achieve its basic purpose. A non-water dependent project is one that does not require access to or proximity to or siting within a special aquatic site to achieve its basic purpose, such as a housing development or retail store.

The Section 404(b)(1) Guidelines establishes a double rebuttable presumption for non-water dependent projects that propose a discharge of fill into a special aquatic site, such as wetlands.

First, it is presumed that there are practicable alternatives to non-water dependent projects, "unless clearly demonstrated otherwise." [40 C.F.R. § 230.10(a)(3).] Second, "where a discharge is proposed for a special aquatic site, all practicable alternatives to the proposed discharge which do not involve a discharge into a special aquatic site are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise." [Id.] The thrust of the Guidelines is that Applicants should design proposed projects to meet the overall project purpose while avoiding and minimizing impacts to aquatic environments. This approach is emphasized in a Memorandum of Agreement between the EPA and the Corps Concerning the Determination of Mitigation Under the Clean Water Act Section 404(b)(1) Guidelines (1990) ("MOA") as modified by the Corps and EPA Final Mitigation Rule (33 CFR Parts 325 and 332 and 40 CFR Part 230). The MOA articulates the Guidelines "sequencing" protocol as first, avoiding impacts; second, minimizing impacts; and third, providing practicable compensatory mitigation for unavoidable impacts and no overall net loss of functions and services.

In addition to requiring the identification of the LEDPA, the Section 404(b)(1) Guidelines mandate that no discharge of dredged or fill material shall be permitted if it causes or contributes to violations of any applicable State water quality standard, 40 C.F.R. 230.10(b)(1), violates any applicable toxic effluent standard or prohibition, 40 C.F.R. § 230.10(b)(2), jeopardizes the continued existence of any endangered or threatened species (or destroy or adversely modify critical habitat),

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40 C.F.R. § 230.10(b)(3), or causes or contributes to significant degradation of waters of the U.S., 40 C.F.R. § 230.10(c).

#### 4. The Applicant's Existing Alternatives Analysis

We have reviewed the USACE Public Notice, the applicant's Environmental Assessment Report ("EAR", dated June 2015), and other documents written by the applicant and obtained through FOIA in order to ascertain what alternatives analysis has been performed, what criteria were utilized, and what alternative was identified as the LEDPA.

There is no information in the Public Notice regarding alternatives or LEDPA other than a statement that the application will be evaluated under the EPA 404(b) guidelines.

The EAR written by the applicant includes a "Section 9: Alternatives to Proposed Action" which, because of its brevity (less than one page) is copied in its entirety below:

##### ***Section 9.00 Alternatives to Proposed Action***

*In reviewing available land for a Marina, zoning is a major obstacle. A portion of Parcel 10A is zoned W-2 Waterfront Industrial and is the only area in Coral Bay to allow for Boat storage and repairs. Other than VI Government lands, there are no other parcels on St. John zoned W-2.*

*With over two-thirds of St. John designated as a National park, there is very little land suitable for a Marina that affords the protection that the Sirius Marina has.*

*Leaving the property in its present condition is not a viable alternative. The decrepit and environmentally unsound present operation is not viable. There are un-permitted docks on the property and no control of activities.*

*Within Coral Bay, the proposed location is the best area as it is well protected from waves and wind. A larger Marina would interfere with the proposed St. John marina and disturb more marine bottom.*

*Throughout the many studies and analyses that have been done in developing this plan, a common theme has been the interdependency of the elements. The land-side and marina each supports the other and would not be feasible otherwise.*

*A smaller Marina and support facilities would not be financially feasible.*

*A larger marina that would allow for mega-yachts would have a greater impact on the Coral Bay Infrastructure and possibly require extensive dredging and greater impact on the marine environment.*

Several observations should be immediately clear:

1. The applicant has not performed an alternatives analysis, as required by the 404(b)1 Guidelines because no alternative sites were identified or analyzed.
2. The "no-action" alternative, although briefly mentioned, was not objectively analyzed.
3. The claims of interdependency of the upland components with the marina, although asserted, is not supported by any evidence.
4. The claim that modifications to size are not financially feasible is not supported by any evidence – it is simply asserted.
5. This extremely brief "Alternatives to Proposed Action" does not meet any of the criteria or standards required for a 404(b)1 analysis under the applicable Guidelines.

## Preliminary Review of CWA Section 404(b)1 Alternatives and Identification of LEDPA

For these reasons we have undertaken the task of drafting a preliminary Section 404(b)1 Alternatives Analysis, which will ultimately be required of the applicant and/or the Corps pursuant to the Guidelines. The authors of this material are not professionals in wetlands regulation, or Section 404 permitting, however the information contained herein is based on local knowledge of the sites discussed, and experience in reviewing similar projects on St John and elsewhere. We formally request and expect that a complete Section 404(b)1 Analysis, as required by the EPA Guidelines, be completed by competent professionals and made available for public review and comment prior to any decision on the issuance of permits for this project.

## 5. Impacts of the Proposed Project on Aquatic Resources and Aquatic Functions

Based on the project description within the Public Notice, on the graphic attachments to the Public Notice, and on documents obtained directly from the applicant, we have analyzed the likely impacts of the project on aquatic resources and aquatic functions. This impact assessment is necessary so that the environmental damage of the proposed alternative (both before and after avoidance, minimization and mitigation) can be compared with the likely damage of other alternatives, which is required in order to determine the Least Environmentally Damaging Practicable Alternative (LEDPA).

### 5.1. Dredging – Impacts to Mangrove Habitat

The illustration below depicts the limits of dredging as described by the applicant in the Public Notice:

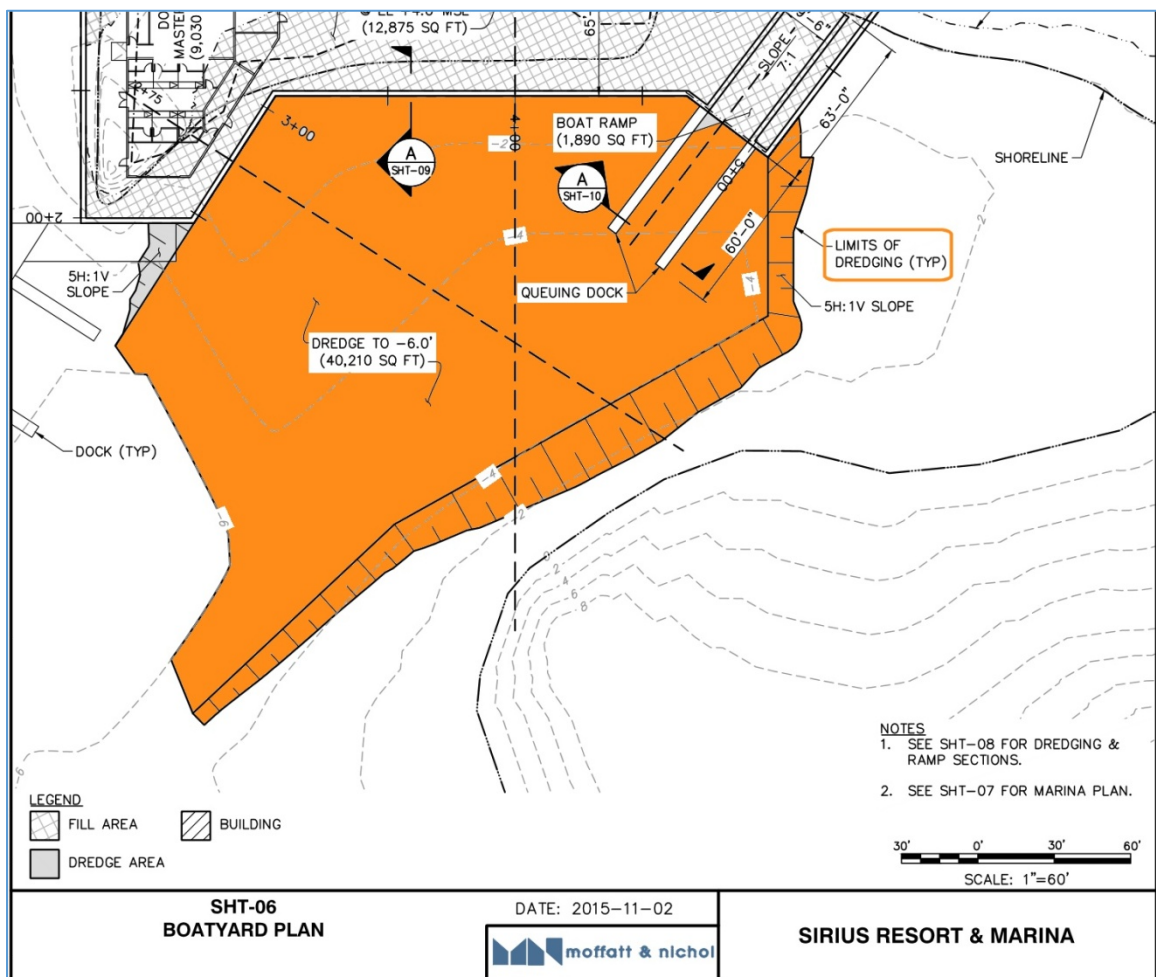


Figure 1: Limits of Proposed Dredging

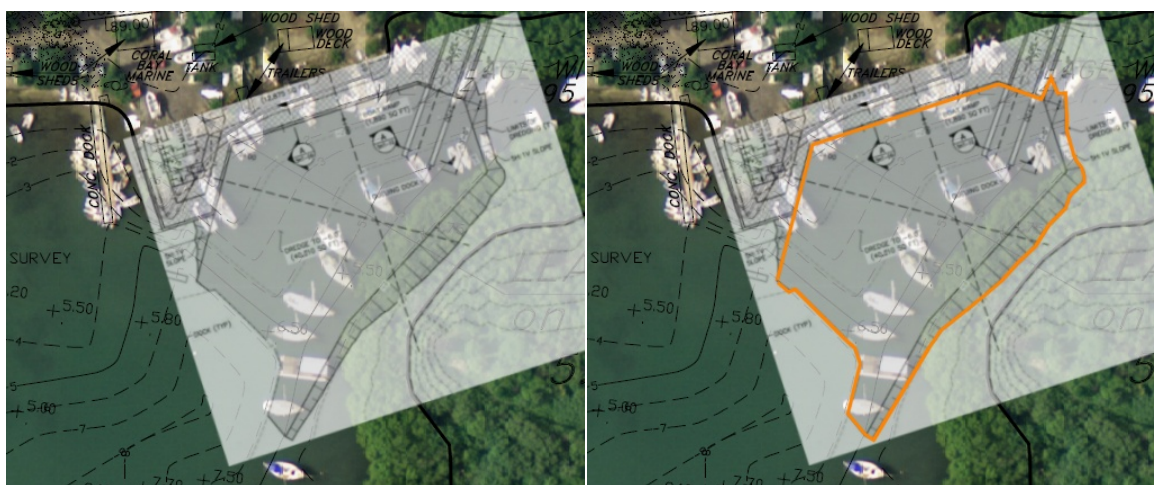
The next illustration is the 2014 Bathymetric Survey performed by the applicant and used as the base depth data for the dredge illustration above. In this image the shoreline is drawn as a solid black line, and the mangroves extend seaward of the shoreline along the southern and part of the northern edge of the "creek". Note that the fringing mangroves extend up to 60' from the shoreline in places.





Figure 2: Bathymetric Survey of Dredge Site

The next two illustrations first overlay the dredge plan with the bathymetric (aerial) plan above and then highlights the dredge zone as an orange outlined region.



In the final illustration, the outline of the dredge zone is clearly shown to overlap the mangroves by as much as 35 feet. Furthermore, it is unclear what impact the dredging might have on the subsurface root systems of the mangroves along Usher Cay. The yellow ellipse highlights the region of probable mangrove impact from the proposed dredging operation:

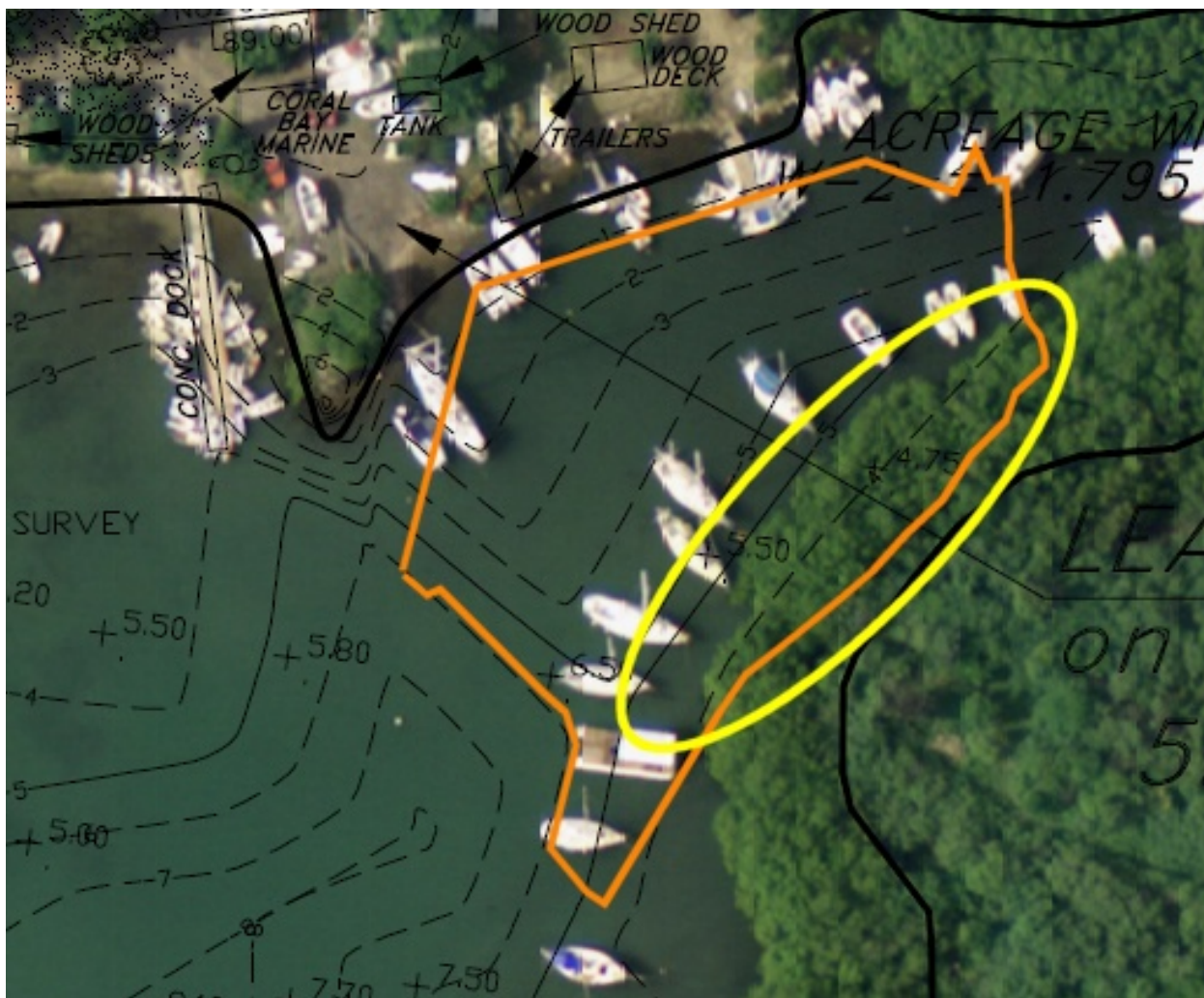


Figure 3: Impact of Proposed Dredging on Mangrove Habitat

#### 5.1.1. Impact of Dredging on Mangroves

The applicant has not identified any impacts on mangroves from the planned dredging. This is either due to use of the wrong habitat maps, or possibly an oversight on their part, however as illustrated above the dredging will impact a significant area (approximately 10,000 square feet) of dense, mature mangroves.

#### 5.1.2. Impact of Dredging on Mangrove Bird Habitat

The impacted mangroves identified above are a known roosting area for shorebirds. The proximity to multiple habitats (salt pond, shallow water, open water), the relatively protected location (as witnessed by the dense mangrove stands), and the lack of significant human development landward of that location, all contribute to its value as habitat for birds. Many species, including brown pelicans, various herons and egrets, other shorebirds and migratory species are often seen in this area. In fact, this is one of the locations which has been used by the St John Audubon Society for the annual bird count on St John.



In the January 9, 2016 edition of the Virgin Islands Daily News, National Park Ranger Laurel Brannick spoke about the bird habitat at this location. Here is an excerpt of the Daily News article:

*Brannick said gray kingbirds and Scaley-naped Pigeons, along with egrets, herons and warblers, were some of the species she personally observed from the Coral Bay Dock at sunrise.*

*"I know there is a lot of concern about Coral Bay with the marina plans. About 600 birds come out of the mangroves there each morning. It is a sight to see. When daylight starts, you hear them and then they rise up," Brannick said, "So I hope that is all considered when planning for how to use that area."*

*One of the most memorable sightings was a colorful Prothonotary Warbler - formerly called the Golden Swamp warbler - which Brannick observed during the week of the count, she said.*

*"It is bright yellow with some blue on its wings," Brannick said. "It is stunning."*

*Brannick said she did not see the bird on the actual day of the count, but she is able to say it lived in the area because she had seen it another day that week.*

*Many migratory birds also seek shelter in the National Park, as it provides a habitat that is free from development, feral cats and other threats, according to Brannick.*

*"We had a few colorful warblers that may come from as far away as Canada, and it is nice to know that they find a safe place to winter in Virgin Islands National Park," Brannick said.*

The combination of the dredging of the shallow wetland, the filling of shoreline habitat, the night time light pollution from a marina, air pollution from diesel exhaust, sound pollution from outboard motors, and the removal of mangrove habitat all present a clear threat to this important bird habitat.

## **5.2. Dredging – Impacts on Benthic Habitat (Submerged Aquatic Vegetation)**

The impact of dredging on benthic habitat, specifically Submerged Aquatic Vegetation ("SAV") will be throughout the entire dredge zone. The applicant has supplied a benthic survey of sea grasses which is included in the Public Notice and reproduced below with the limits of the survey zone highlighted in bright green. The caption indicates that the survey was for sea grasses only, and did not include other SAV such as macroalgae.

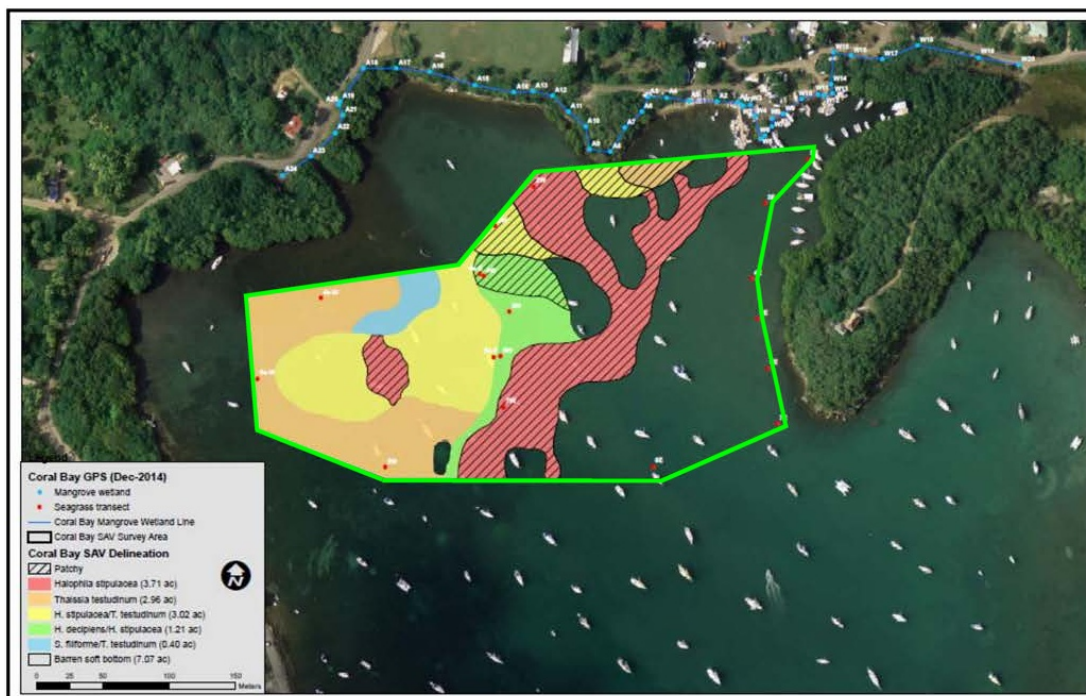


Figure 4: Limits of Coral Bay SAV Delineation

We have superimposed the limits of dredging on this map using an orange line to enclose the dredge zone. It is apparent that the applicant's survey of submerged aquatic vegetation (the illustration is entitled "Coral Bay SAV Delineation") only covered a very small portion of the proposed dredging zone.

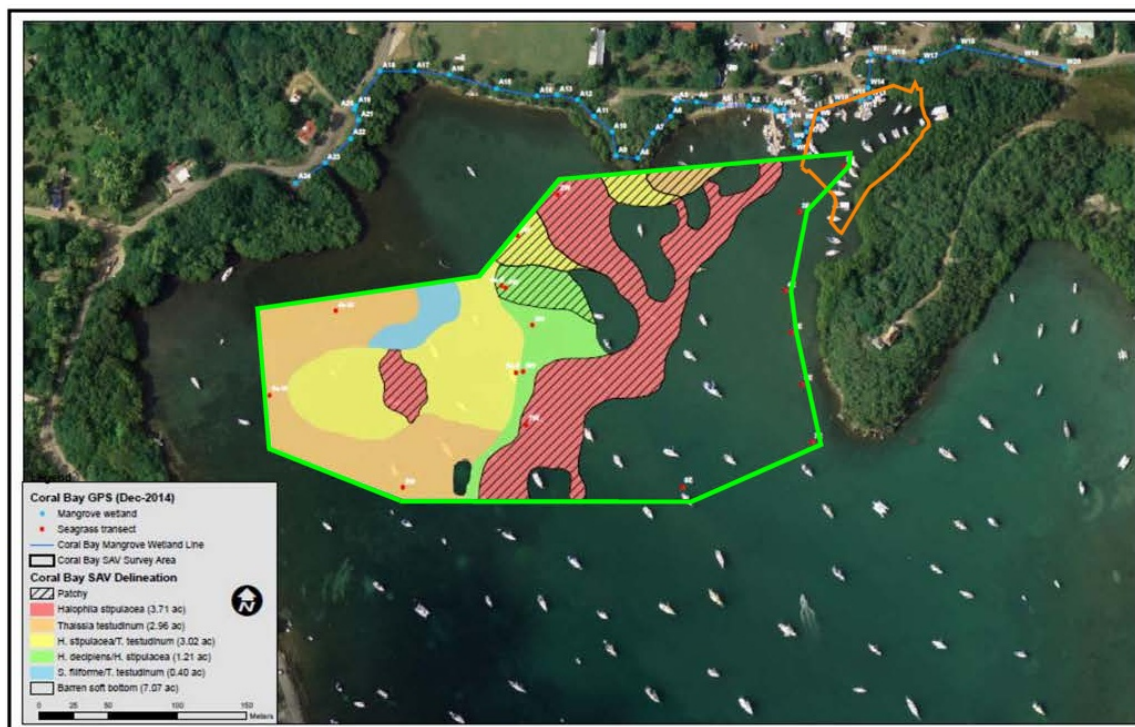


Figure 5: SAV Delineation and Dredge Boundary



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On January 16, 2016, I visited the shoreline at the northern boundary of the proposed dredge zone and photographed submerged aquatic vegetation in the shallow water. The photographs and their approximate location(as a yellow "X") are shown in the following illustrations.



Figure 6: Location of SAV Photographs Within Dredge Site

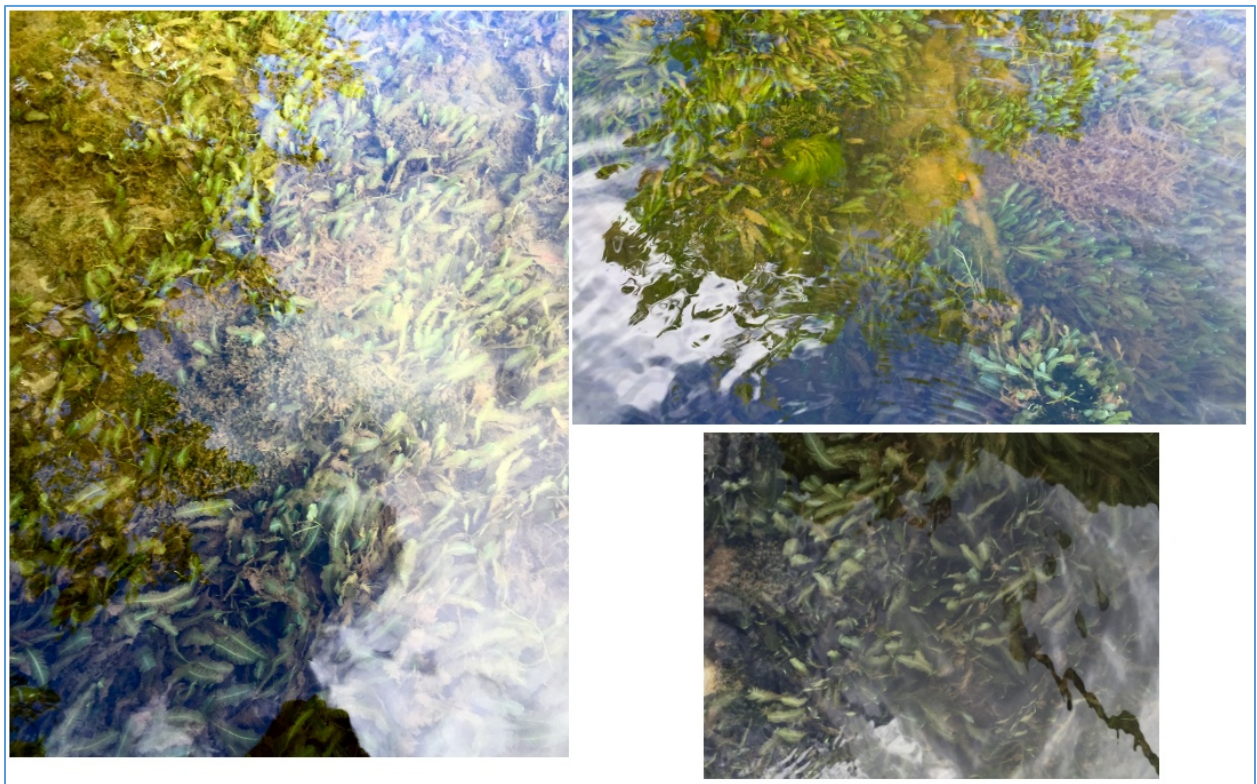


Figure 7: SAV Located Within Dredge Site (at Yellow X Locations)

I also observed a number of crabs, fish and anemone from the shoreline within the dredge and fill zones. It should be clear that without a survey of the benthic habitat that includes the entire dredging zone, the impact of dredging on the benthic environment cannot be properly assessed.

A reasonable assumption is that the dredging of the roughly 1 acre of seabed will eliminate 1 acre of mixed SAV consisting primarily of macro algae of unknown density (0-100% coverage).

It should be noted that the applicant has stated that the proposed dredging will have no impact on mangroves or benthic habitat. The Public Notice states (presumably based on information supplied by the applicant) that "3,890 cubic yards of sea floor material would be dredged from an area of 40,210 ft<sup>2</sup> of barren soft bottom habitat". It is our opinion that the dredged area includes significant SAV and mangroves.

### 5.3. Bulkheads

The applicants proposes installing approximately (800') of steel sheet-pile bulkhead (shown in red below) and then back-filling the bulkhead with dredge spoil and extending the shoreline seaward (filled land in yellow). The new filled land and contiguous previously filled land will then be capped with a concrete apron approximately 50,200 square feet in area (shown in grey). These components are illustrated below:





The installation of the bulkheads, per se, will have only minimal direct impacts on aquatic function, since they will either be installed adjacent to a dredged area, within previously filled land, or within a mangrove wetland. The principal impact of the bulkhead stems from the filling operation inside the bulkhead, which will be discussed later.

However there are very significant indirect impacts on aquatic function and resources stemming from the bulkhead section to the east of the new boat ramp and the piers on either side of the boat ramp. The applicant provided the following illustration in their August 2014 Rezoning Request to VIDPNR. The illustration is entitled "PLANT COMMUNITY MAP OF PARCEL REM. 10A, AND 10A-1 ESTATE EMMAUS, CORAL BAY, ST. JOHN" and it delineates upland vegetation zones. The zone outlined in yellow is labeled "MC" and the legend defines MC as a "Mangrove tidal channel".

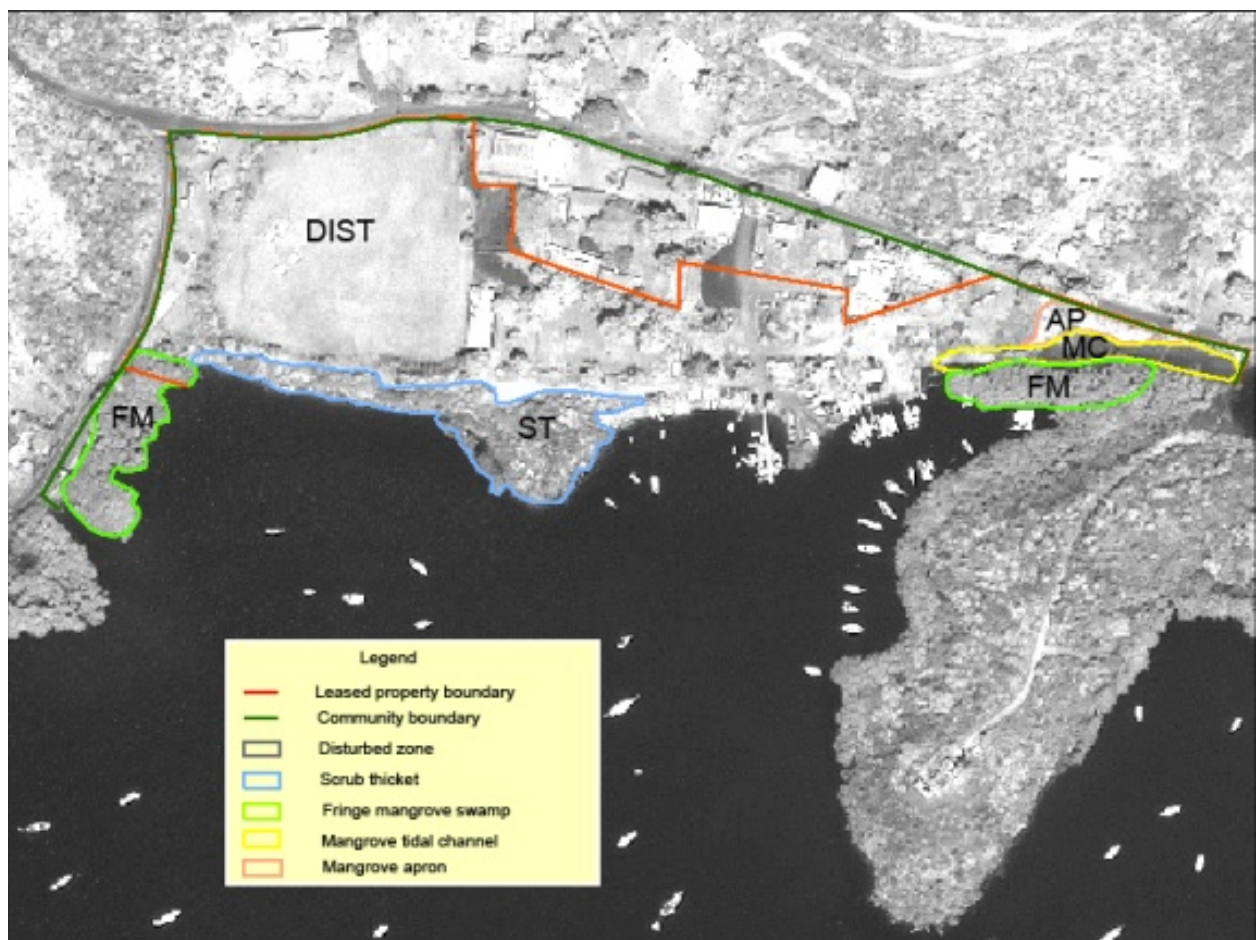


Figure 8: Upland Plant Community Delineation

We have expanded the Mangrove Tidal Channel section of the illustration above and overlaid on it the location of the proposed bulkheads. This is shown below:



**Figure 9: Location of Bulkheads in Mangrove Tidal Channel**

It is immediately apparent that the proposed bulkhead which extends above the mean high water line, runs completely across the Mangrove Tidal Channel depicted in the survey. By so doing it will prevent the exchange of sea water from the creek (Coral Bay) into and out of the adjacent salt pond. The aerial photograph below illustrates the salt pond, the channel, and the proposed bulkhead section.



**Figure 10: Salt Pond, Mangrove Tidal Channel and Bulkheads**



The location of this channel, which provides the primary water exchange mechanism between the salt pond and the bay, was confirmed by me on visual inspection of the site on January 17, 2016. Additionally, I have spoken with the owners of Usher Cay who confirm that they frequently observe water on the road at the specific location indicated by the channel, and there is evidence of a stone bridge or culvert that has since fallen down at that location.

I presented this information to the scientist who performed the terrestrial survey illustrated in the photographs above, and who identified the location of the mangrove tidal channel. I showed him the illustration with the bulkhead located on his plant community photograph and asked what impact it would have on the salt pond. His response was:

*"From the ecological perspective, the channel is integral to the pond itself.. These ponds are quite dynamic in their hydrology, and thus their ecology. Cutting the tidally based, surface exchange between the sea and the pond will critically alter pond ecology. As the seasons pass, wet season surface/subsurface freshwater inputs from the surrounding catchment lowers salinity and brings forth a distinctive biota, which is then modified by tidally influenced seawater flows through the channel. With the approaching dry season, salinities skyrocket and a very different suite of organisms colonize the pond. At higher trophic levels are the rotations in waterfowl species that feed whenever the pond is not bone-dry. There does appear to be an overland route of seawater during severe storms (perhaps hurricane surges) over the berm south of the pond separating it from the Ushers Key - Fortsberg inlet.. But these inputs would be so rare as to hold little influence on pond biota.*

*A vital element in the ecological discussion is underground flows, particularly from the sea to the pond, if any exist. Such questions can only be addressed by expensive hydrological investigations. My sense of it is that subsurface flow to and from the sea is not that significant, though the channel itself likely uses limited subsurface flow at the neck of the Ushers Key (now Peninsula), due to filling for road construction."*

*- private correspondence with Dr. Gary Ray, January 2016*

From this, we conclude that there is a substantial risk that the indirect impact of the proposed bulkhead would be to isolate an aquatic feature (the salt pond) resulting in isolation of WOTUS. This indirect impact, if verified, would require mitigation under the Section 404(b)1.

At this point in time we conclude that there is a high likelihood that the proposed bulkhead will isolate the adjacent salt pond (2.3 acres) resulting in loss of this aquatic feature and its wetland functions.

#### **5.4. Filling**

The applicant proposes to utilize the dredged material to backfill the bulkhead, which is located seaward of the present shoreline as well as in mangrove wetlands. Following the fill operation, the area will be paved with a concrete apron. The impact of the filling and paving on aquatic resources will be (a) elimination of mangrove wetlands, and (b) elimination of open waters of the United States.

#### 5.4.1. Filling of Mangrove Habitat and Wetlands

The applicant estimates the filling of mangrove wetlands will encompass an area of 0.1465 acres of direct impact. We believe in addition to the direct impacts, the secondary effect of the filled bulkhead may reduce water circulation to mangroves beyond the bulkhead, particularly in the mangrove tidal channel. This will require further scientific review and analysis. For the purpose of this report we will assume the minimum impact to mangrove wetlands from the fill operation is 0.1485 acres.

It should also be pointed out that the shoreline beneath the fill zone has hundreds of mangrove propagules along almost the entire shoreline. The loss of this future mangrove habitat has not been quantified. The photograph below was taken along the northern shoreline of the creek, in an area proposed for filling and capping with concrete:



Figure 11: Mangrove Propagules in Fill Area

#### 5.4.2. Filling of open water

In addition to the filling of mangrove habitat as described above, the applicant proposes to locate the bulkhead seaward of the current shoreline, backfill with dredge material, and cap with concrete, thereby creating new fast land where there previously was open water.

The area of open water lost through this operation is shown in the illustration below. It amounts to 14,923 sq ft (0.34 acre) and its future use will apparently be for boat parking and access to the service buildings.



#### 5.5. Dredge Disposal in Possible Wetlands

The Public Notice text and graphic attachments identify a dredge disposal area on Parcel 2, Estate Emmaus, located to the west of the marina site:

*"The remaining dredged material would be disposed of and spread out to a height of two feet over an upland area of 44,600 ft<sup>2</sup>, located to the west of the marina, just southwest of the intersection of Hwys. 10 and 17. Mechanical (crane/bucket, clam or backhoe) dredging equipment on a barge would be used to remove the material from the dredge area. The dredged material would be dewatered on the dredge barge, allowing excess water to return to the harbor, prior to its transport via trucks to the final disposal site."*

This location is shown in the map below:

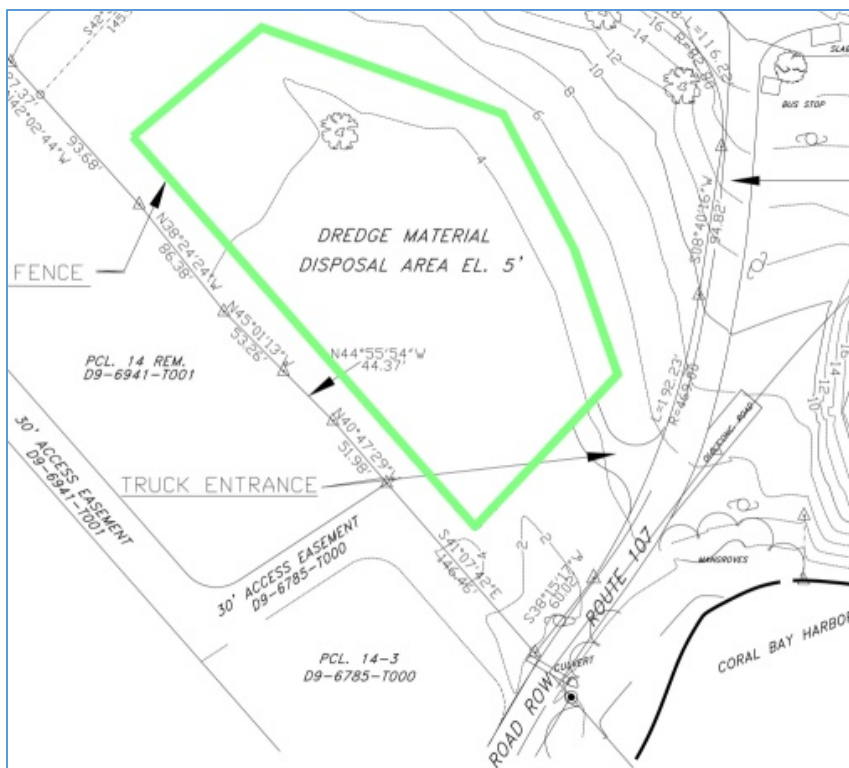
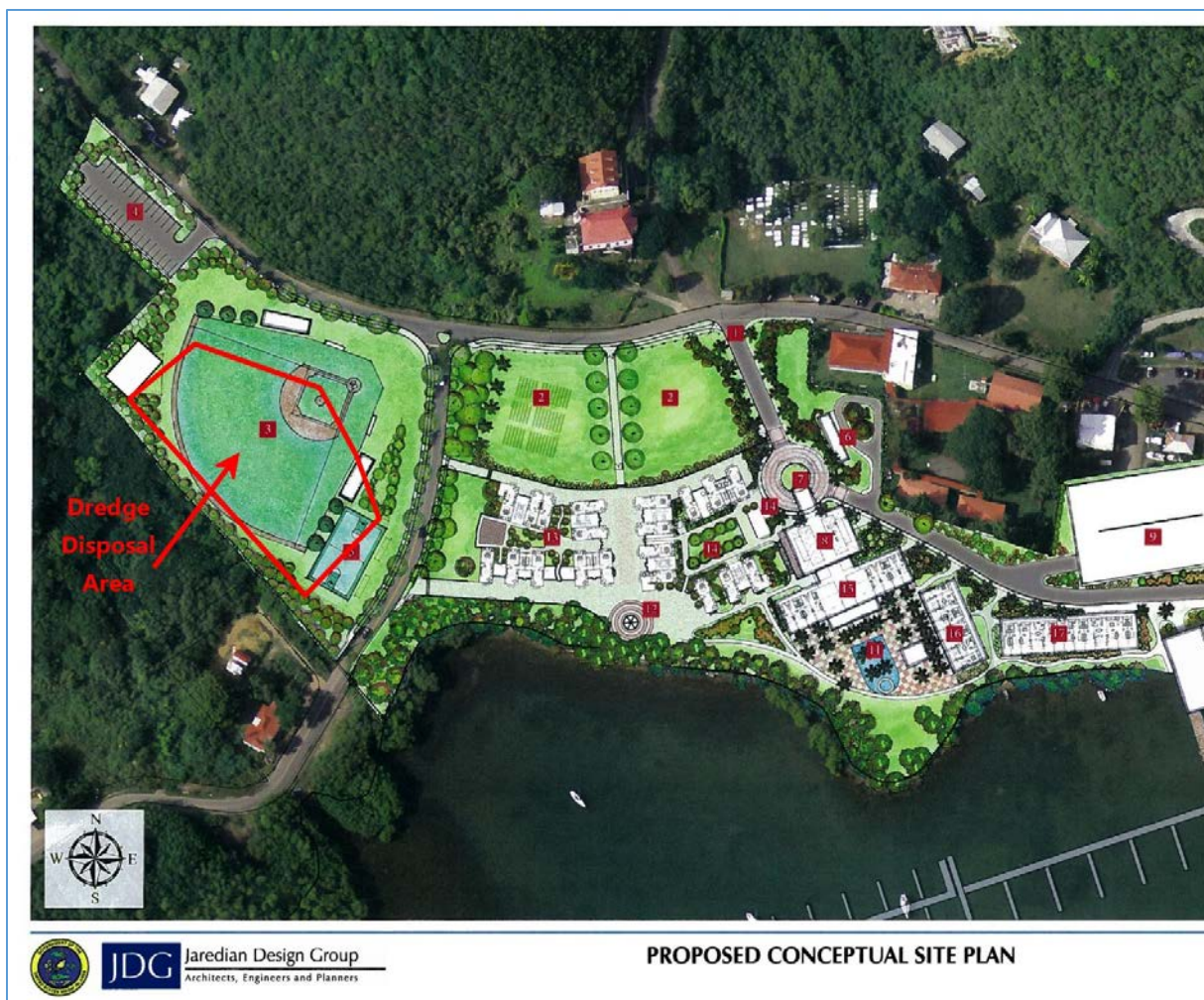


Figure 12: Topographic Map of Dredge Disposal Area

Although not stated in the Public Notice, multiple other documents obtained from the applicant indicate the intent to utilize the dredge disposal area as a public playground, to compensate for the loss of the existing playground when the hotel and resort are constructed. This is illustrated in the drawing below, with the dredge disposal area superimposed on the "new playground":





Having located the disposal site, we now discuss whether this disposal of dredge material might have any impacts on aquatic resources or functions and if so, whether they have been properly identified by the applicant and/or the Corps.

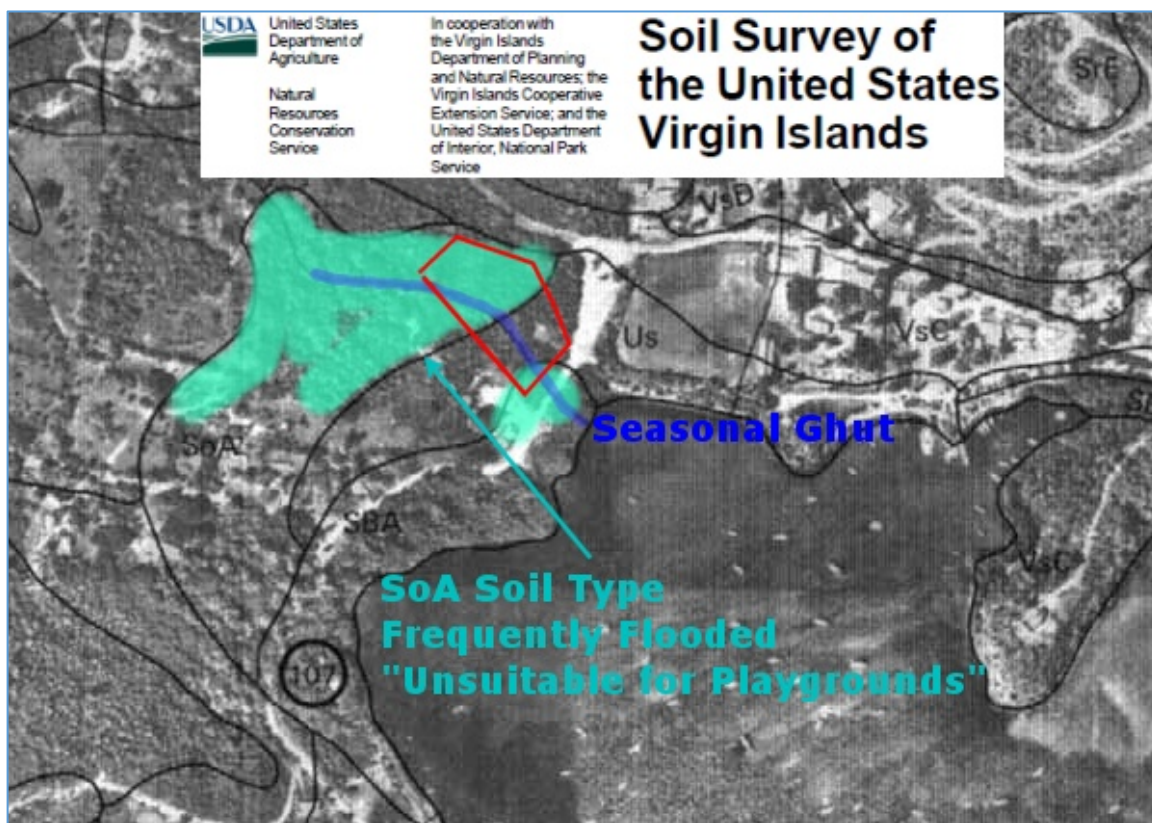
#### 5.5.1. Soil Conditions and Habitat in Dredge Disposal Site

I have personally visited the periphery of the proposed dredge disposal site on numerous occasions, during multiple seasons of the year. I have witnessed frequent flooding events, particularly following periods of heavy rainfall and concentrated on the southeastern portion of the parcel.

There appears to be a significant drainage gully running through portions of this disposal site, based on observed flood patterns over the past ten years. The portion of the public road to the west of the parcel and in front of the "Pickles Restaurant" just south of the parcel are known to have significant flood waters on them following heavy rains.

In addition to the natural drainage through this area, it receives additional rain runoff from the road culverts on Route 10 which transfer water from the road into the valley, eventually reaching this low point in the terrain.

We have researched the reported soil types and water features on this parcel, and have found that the soil type is identified as "Solitude A, frequently flooded" which is consistent with our observations. The USDA soil map for this parcel also indicates a drainage ghut passing through the disposal site, which is also consistent with our observations. The illustration below is taken from the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soil survey maps of St John, Western St John, Sheet Number 8.



**Figure 13: Soil Type and Drainage Ghut in Dredge Disposal Area**

The description of the "SoA" soil type states that it is subject to frequent periods of brief flooding during the months of April through December, to depths of 1.0 to 2.5 feet. It is a gravelly fine sandy loam, found on 0 to 2 percent slopes, frequently flooded. It is specifically identified as unsuitable for recreational uses, including playgrounds.

The USDA statement regarding uses of this soil type is as follows:

*"This map unit is used mainly as wildlife habitat.*

*This map unit is unsuited to cultivated crops. The wetness, frequent flooding, and slight to strong salinity are severe limitations.*

*This map unit is unsuited to pasture and hay. The flooding and salinity are severe limitations. The range site condition of this map unit is poor because less than 25*

*percent, by weight, of the present vegetation consists of the same species as the original or potential vegetation.*

*This map unit is unsuited to most urban uses. The flooding and wetness are severe limitations. This map unit is unsuited for recreational uses. The flooding and wetness are severe limitations.*

*This map unit is unsuited to use as freshwater wetland wildlife habitat. Salinity is a severe limitation. This map unit is suited to use as marine wetland wildlife habitat. The depth to water is a management concern."*

Based on these personal observations, coupled with the soil type identification on the USDA NRCS soil map, we conclude that the disposal of dredge material at the location selected by the applicant might constitute a discharge of dredge materials on a wetland, a Special Aquatic Site. Without further confirmation based on scientific field surveys of the flora, fauna, and soil conditions at the site, including a formal wetlands delineation, it appears appropriate to presume, until proven otherwise, that this disposal site is a wetland habitat and therefore the dredge disposal operation is resulting in an additional impact to wetlands of 44,600 sq ft, or 1.1 acres.

#### **5.6. Boat Ramp (Fill)**

The applicant proposes construction of a new boat ramp, at the extreme eastern end of the dredge site with two "queuing docks" located on either side of the ramp. It does not appear that either the applicant nor the Corps has computed the volume of the concrete fill that will be deposited in the creek for the construction of this component. All such concrete would constitute fill material in WOTUS and must be considered as a component of the aquatic impacts of the applicant's proposal.

The in-water dimension of the boat ramp, based on the applicant's drawings, appears to be approximately 20' wide by 60' long, or 1200 sq ft. The construction details for the boat ramp have not been specified, so assuming a typical concrete slab thickness of 8" the volume of the boat ramp is 800 ft<sup>3</sup> or roughly 30 cubic yards of concrete "fill material".

The two "queuing docks" appear to be roughly 4' wide by 60' long and extend from the bottom of the boat basin (-6') to 5' above the water surface. Taking the portion of the queuing docks below sea level only, this accounts for approximately 106 cubic yards (2 docks x 4' wide x 60' long x 6' high) of concrete fill material in WOTUS.

It was apparently an inadvertent omission not to include this element of discharge of fill material from the Public Notice.

#### **5.7. Shading Impacts from Marina Structures – Pilings**

The Public Notice states that the construction of the in-water marina will involve placement of 420 pilings, however the location of these pilings is not disclosed. We have been unable to find any information on the location or spacing of the pilings other than the drawings in the PN graphic attachment, which lack the dimensions necessary to understand the placement of the pilings.



The direct impact of the pilings – stemming from displacement of sea grasses within their footprint – is claimed to be 0.024 acre. We have no basis to independently verify that statement because we do not know the location of the pilings and so we will assume this figure is accurate.

#### **5.8. Shading Impacts from Marina Structures – Floating Docks**

Environmental guidelines for docks and piers constructed over sea grasses typically require a minimum elevation (4' – 5') and a grated decking material, in order to minimize shadows and allow sunlight to reach the vegetation below.

The applicant appears to be proposing use of a floating precast concrete dock for the majority of the in-water dock construction. With the exception of the elevated main pier, all of the secondary piers and finger piers are floating, solid surfaces.

The Public Notice states that 0.415 acres of sea grass will be impacted by shading from the dock structures. Given the fact that the dock structures are not permeable to sunlight, and given the elongation of shadows during many hours of the day, this figure appears to be an estimate of the minimum impact, not the expected impact.

Nonetheless, for the purpose of estimating impacts, we will assume that 0.415 acres of sea grass are directly impacted by shading from dock structures.

#### **5.9. Boat Shading**

The Public Notice, based on information supplied by the applicant, states that 0.797 acre of sea grasses will be impacted from boat shading. Again, we reiterate our concern that elongation of shadows could result in a significantly larger shadow than the exact footprint of a boat.

Taking the total sea grass impact (1.236 acres) as reported in the Public Notice, and dividing by the number of vessels served (92) yields a sea grass impact of 585 sq ft of sea grass impact per boat. When we discuss avoidance, minimization and mitigation, this figure will be compared with the average sea grass impact per boat from alternative designs, including moorings. The per boat impact on sea grasses stemming from the marina is equivalent to a mooring scar 28' in diameter per mooring, which vastly exceeds the actual impact of a mooring.



**5.10. Summary – Impacts to Aquatic Resources and Functions from Proposed Alternative**

The table below summarizes the impacts to aquatic resources and functions which have been discussed in the preceding section.

<b>Source of Impact</b>	<b>Type of Impact</b>	<b>Area or Volume Impacted</b>
Dredging	Mangrove Habitat	0.23 ac
Dredging	Submerged Aquatic Vegetation, unknown composition	0.92 ac
Bulkheads	Isolating salt pond, WOTUS	2.3 ac
Fill Operations	Fill of mangrove wetlands, WOTUS	0.15 ac
Fill Operations	Fill of open water, WOTUS	580 cubic yards fill 0.34 ac filled
Dredge Spoil Disposal	Discharge into Wetlands parcel	1.0 ac
Boat Ramp	Discharge of Fill in WOTUS	136 cubic yards fill
Marina Dock Shading + Pilings	Sea Grasses	0.44 ac
Boat Shading	Sea Grasses	0.80 ac
<b>TOTAL IMPACTS</b>		<b>6.18 acres</b>

## 6. Project Need and Purpose

We now move on to two key concepts which guide the selection of potential alternatives under the 404(b)1 Guidelines. These concepts are the "Basic Purpose" of the project (which is used to determine "water dependency") and the "Overall Purpose" (which governs the selection of potential alternative sites).

The following excerpt from the manual entitled "Army Corps of Engineers Standard Operating Procedures for the Regulatory Program" defines the "Basic Purpose" and "Overall Purpose" and offers some specific examples for guidance:

*The **basic purpose** of the project must be known to determine if a given project is "water dependent." For example, the purpose of a residential development is to provide housing for people. Houses do not have to be located in a special aquatic site to fulfill the basic purpose of the project, i.e., providing shelter. Therefore, a residential development is not water dependent. If a project is not water dependent, alternatives, which do not involve impacts to waters of the United States are presumed to be available to the applicant (40 CFR 320.10(a)(3)). **Examples of water dependent projects include, but are not limited to, dams, marinas, mooring facilities, and docks. The basic purpose of these projects is to provide access to the water.** Although the basic purpose of a project may be water dependent, a vigorous evaluation of alternatives under National Environmental Policy Act (NEPA) and the Guidelines will often be necessary due to expected impacts to the aquatic environment (e.g., a marina that involves substantial impacts to or the loss of marsh or sea grass bed).*

*The **overall project purpose** is more specific to the applicant's project than the basic project purpose. The overall project purpose is used for evaluating practicable alternatives under the Section 404(b)(1) Guidelines. **The overall project purpose must be specific enough to define the applicant's needs, but not so restrictive as to preclude all discussion of alternatives.** Defining the overall project purpose is the responsibility of the Corps, however, the applicant's needs must be considered in the context of the desired geographic area of the development, and the type of project being proposed.*

### 6.1. Basic Purpose

The Public Notice defines the "Basic Purpose" of the Sirius project as "Offshore Marina". We believe that, depending on the definition of "marina", this Basic Purpose may be too narrow.

The "Basic Purpose" in the Public Notice should be a statement of the need that is being addressed by the proposed activity. The "Overall Purpose" should describe how that need is being addressed.

In the case of the Sirius Marina, the application states that the Purpose is "to provide boating services ". This purpose could be addressed in any of several ways, and a wet-slip marina is only one of the ways. For example, another way to address this need might be a well managed mooring field with improved public docks (which may be a form of marina) or a dry-stack boat garage plus lifts.

By narrowing the statement of Basic Purpose to "Offshore Marina" the Corps has potentially limited the scope of alternatives, which is contrary to the objectives of NEPA. The list of

alternatives from which the LEDPA is selected is created after the basic purpose of the project is identified because only alternatives that meet the project's basic purpose need be considered.

Based on the foregoing, we believe that the correct statement of Basic Purpose should be **"recreational boating access."**

## 6.2. Overall Purpose

The Overall Purpose should describe, in general terms, the manner by which the need (Basic Purpose) is proposed to be met. The Corps has stated the Overall Purpose of this permit application as "Construct a private commercial offshore marina with ancillary facilities in adjacent uplands in St. John, USVI." We feel that this statement of overall purpose may impose excessive limits on the range of alternatives, and is directed too specifically at the goals of the applicant. Unless the "ancillary facilities" are ones that are crucial for recreational boating access (in which case they should be explicitly defined), then they do not belong in the statement of Overall Purpose. "Overall project purpose does not include secondary project purposes, site-specific secondary requirements, project amenities, desired size requirements, or desired return on an investment."

We believe that the correct statement of Overall Purpose should be **"The overall project purpose is to improve recreational boating access to St John."** In the 404(b)1 Alternatives Analysis we will use this statement of Overall Purpose to filter the set of possible alternatives.

## 6.3. Water Dependency and Special Aquatic Sites

Regardless of the accepted Basic Purpose – "offshore marina" or "recreational boating access" – it clear that at least some components of the project require access to water, although it is not at all clear that they need to be sited in a special aquatic site. The definition of "water dependency" stems from its use in the Clean Water Act:

*Where the activity associated with a discharge which is proposed for a special aquatic site (as defined in subpart E) **does not require access or proximity to or siting within the special aquatic site in question to fulfill its basic purpose** (i.e., is not "water dependent"), practicable alternatives that do not involve special aquatic sites are presumed to be available, unless clearly demonstrated otherwise. (40 CFR 230.10 - Restrictions on discharge)*

It should be clear that although an "Offshore Marina" requires access to the water, it does NOT require access or proximity to or siting within a mangrove wetland (a special aquatic site) or a vegetated shallow (a special aquatic site). The requirement of 40CFR230.10 is very clear – and we have parsed it below in the context of the proposed project:

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<b>Requirement of 40 CFR 230.10</b>	<b>Applicability to Sirius project</b>
"Where the activity associated with a discharge"	The Sirius marina is associated with a discharge of dredge material.
"which is proposed for a special aquatic site"	The discharge is proposed, in part, for a mangrove wetland.
"does not require access or proximity to or siting within the special aquatic site in question"	The activity can be distanced sufficiently from the mangrove wetland so that it does not require access, proximity to or siting within the wetland.
"to fulfill its basic purpose"	The basic purpose is an offshore marina and this purpose does not require siting in a wetland.
"practicable alternatives that do not involve special aquatic sites are presumed to be available."	<b>THEREFORE the rebuttable presumption applies.</b>

It is therefore our understanding and belief that, based on the requirements of 40CFR230.10 and the description of the project purpose, the applicant will be required to rebut the presumption that practicable alternatives exist if the applicant chooses to pursue their preferred alternative, which involves discharging dredge material in a special aquatic site.

Of course, regardless of how the Corps elects to interpret this requirement of the Clean Water Act, every project involving discharges of dredge or fill material in Waters of the US require that they be the least environmentally practicable alternative in order to receive a Section 404 permit.

## **7. Identification of Alternatives**

Army Corps guidelines for alternatives analysis require, at a minimum, evaluation of four types of alternatives:

- Applicant's Preferred Alternative
- No-Action Alternative(s)
- Offsite Alternative Locations
- Onsite Alternatives

We will look at each of these in turn with several examples where appropriate.

### **7.1. Criteria for Alternatives Evaluation**

The selection of alternative sites is based on a determination as to whether they are (a) practicable, and (b) meet the project overall purpose. Although we do not agree with the Corps' statement of Overall Purpose ("Construct a private commercial offshore marina with ancillary facilities in adjacent uplands in St. John, USVI.") , and we believe the Overall Purpose should be "improve recreational boating access to St John" for the purpose of this analysis we will use the Overall Purpose as stated by the Corps in the Public Notice.

The definition of "practicable" in the context of a 404(b)1 alternatives analysis means that the alternative is "available, and capable of being done after taking into consideration cost, existing technology, and/or logistics in light of the overall project purpose." (40 CFR 230.3(q))

Due to the significant amount of coastline that is within the Virgin Islands National Park and Coral Reef National Monument boundaries, we can apply an initial filter and limit the alternatives to those sites that are outside park boundaries. As shown below, this limits the alternatives to three broad regions: East End, Coral Bay, and Cruz Bay.

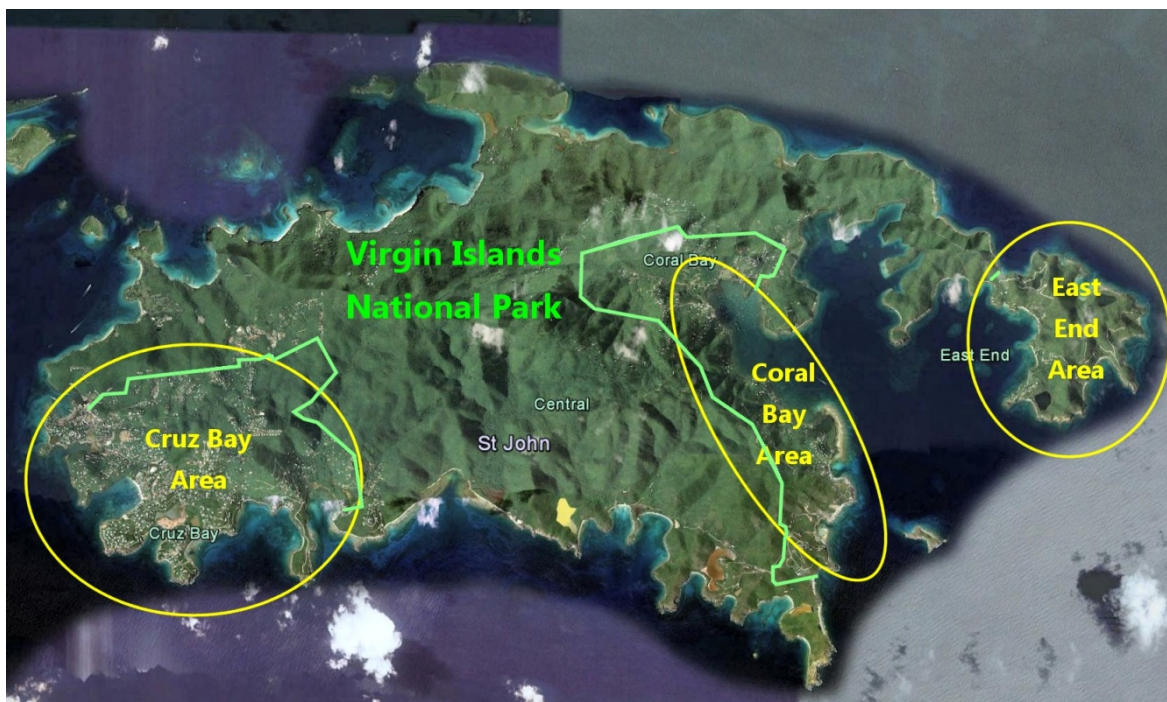


Figure 14: Regions of St John for Alternative Selection

Within these three broad regions, we can readily dismiss the "East End Area" due to its extreme isolation, distance from all amenities, inadequate road access and lack of adequate public safety (police, fire, medical) services. This leaves the "Coral Bay Area" and the "Cruz Bay Area" as potential candidates for alternative site analysis.

## 7.2. Potentially Available Sites

After applying initial filters for reasonable alternatives based on a high level view of the potential suitability of the site for fulfilling the project purpose, we have arrived at a list of alternatives to be further analyzed for practicability.

Listed below are the reasonable alternatives which will be considered in this analysis:

### 7.2.1. Applicant's Preferred Alternative

- Preferred Alternative - located at the northern shore of Coral Bay harbor

### 7.2.2. Offsite Alternatives

- Alternative 1: West Coral Bay – located on the western shore of Coral Bay harbor
- Alternative 2: Johnson's Bay – located on Johnson's Bay in greater Coral Bay
- Alternative 3: Great Cruz Bay – located in Great Cruz Bay in the vicinity of the Westin Resort
- Alternative 4: Enighed Pond – located in Enighed Pond in the vicinity of the car barge port
- Alternative 5: Cruz Bay Creek – located in Cruz Bay in the vicinity of the National Park dock



### 7.2.3. On-Site Alternatives

- On-Site Alternative 1 – modifications to preferred site plan to avoid all impacts to wetlands
- On-Site Alternative 2 – modifications to preferred site plan to reduce use of fixed dock structures and reduce impacts to sea grass

### 7.2.4. No-Action Alternatives

- No-Action Alternative 1 – an alternative involving moorings and day use dock that does not involve discharge of fill materials in WOTUS
- No-Action Alternative 2 – maintaining the status quo

The locations of each of these reasonable Off-Site Alternatives are shown in the map of St John, below. The "Preferred Alternative" is shown as "PA" and the Offsite Alternatives are numbered 1 – 5.



Figure 15: Location of Reasonable Alternative Sites

We have adopted the "Alternatives Comparison Matrix for Practicability" which is illustrated in the document entitled "Information for Preparing an Alternatives Analysis Under Section 404, Version 1.0, June 2014" and prepared by the Army Corps Jacksonville District Regulatory Division ([http://www.swf.usace.army.mil/Portals/47/docs/regulatory/Handouts/Preparing\\_An\\_Alternatives%20Analysis.FINAL.pdf](http://www.swf.usace.army.mil/Portals/47/docs/regulatory/Handouts/Preparing_An_Alternatives%20Analysis.FINAL.pdf)).

The summary conclusions based on that matrix are shown on the chart on the following page.

**Alternatives Comparison Matrix for Practicability**

Category	Practicability Factor	Applicant's Preferred Alternative	Alternative 1 West Coral Bay	Alternative 2 Johnsons Bay	Alternative 3 Great Cruz Bay	Alternative 4 Enighed Pond	Alternative 5 Cruz Bay Creek
<b>Availability</b>	Existing zoning appropriate or potential for zoning change?	YES	YES	YES	YES	YES	YES
	Available for acquisition?	YES	NO	Not presently	Unknown Possible partnership with Westin	YES	YES
<b>Cost</b>	Reasonable acquisition costs?	YES	N/A	N/A	N/A	YES	YES
	Costs feasible for mitigating impacts to historic and cultural resources found onsite?	YES	YES	YES	YES	YES	YES
	Other costs Feasible?	YES	YES	YES	YES	YES	YES
<b>Existing Technology</b>	Topography and other site conditions feasible for construction of project?	dredging required	Severe weather exposure	Undesirable Exposure	YES	YES	YES
<b>Logistics</b>	Sufficient parcel size?	YES	YES	YES	N/A	YES	YES
	Availability of utilities?	Potable water unavailable	Potable water unavailable	N/A	N/A	YES	YES
	Availability of access?	YES	YES	N/A	N/A	YES	YES
<b>Practicable?</b>		<b>YES</b>	<b>NO</b>	<b>MAYBE<sup>1</sup></b>	<b>MAYBE</b>	<b>YES</b>	<b>YES</b>

<sup>1</sup> The two alternatives labeled "MAYBE" are so identified because they could potentially become practicable alternatives if the availability of land were to change. In the case of Great Cruz Bay a joint venture with the Westin Resort is also an attractive possibility. However neither of these are further evaluated for practicability because the requisite parcels are not presently available.



### 7.3. Practicable Alternative Sites Discussion

The table on the preceding page summarizes practicability considerations for five alternative sites and concludes that two of the alternatives are practicable alternatives and need to be further evaluated, together with the Applicant's Preferred Alternative, On-Site Alternatives, and No-Action Alternative(s) in order to identify the Least Environmentally Damaging Practicable Alternative (the LEDPA).

In the remainder of this section we will discuss the considerations which gave rise to the conclusions summarized in the practicability matrix.

#### 7.3.1. Applicant's Preferred Alternative

Although the site selected by the applicant involves multiple environmental issues, including shallow water, vegetated bottom, and mangrove wetlands, since it is the applicant's "Preferred Alternative" it must be included within the list of "Practicable Alternatives" and compared with the other alternatives with respect to environmental impacts.

#### 7.3.2. Alternative Site 1 – West Coral Bay

The "West Coral Bay" site is the location of the proposed "Summer's End Group" marina. Although we believe this site is totally unsuited for a marina, we have included it in this analysis since it is a location under consideration by another developer.

Since some of the parcels required for a marina at this location are tied up with the Summer's End Group project, they are shown as NOT available for acquisition in the matrix. As a consequence the acquisition costs are not relevant.

The topography and site conditions here are unsuited for marina operations due to the severe weather exposure and dense sea grass beds.

**As a consequence of these considerations, the West Coral Bay location is not considered any further in the alternatives analysis.** An aerial view of the West Coral Bay site is shown below:



### 7.3.3. Alternative Site 2 – Johnsons Bay

The "Johnsons Bay" site is a small mooring area on the west shore of Coral Bay, currently utilized by approximately 20 boats on moorings.

The largest undeveloped parcel has extensive mangrove wetlands and would not be suitable for development. Two other parcels, each approximately 1.75 acres are undeveloped, however they are not currently available for purchase or lease. As a result their availability and costs are shown as unknown.

The site is partially protected from the open seas, leaving a relatively small area that could be considered for a marina. As a consequence the exposure is somewhat undesirable and the water parcel size may be inadequate.

**For these reasons, the Johnsons Bay location is not considered any further in the alternatives analysis.** The site is shown below:



Figure 16: Johnsons Bay Alternative Site

### 7.3.4. Alternative Site 3 – Great Cruz Bay

The alternative location in Great Cruz Bay appears to be well situated in terms of site conditions (sandy bottom, no wetlands) and logistics (excellent access to infrastructure, roads). There are several undeveloped large parcels on the shoreline with sufficient acreage to support the requisite upland facilities.

However it is unclear whether any of the land that would be required is available for purchase<sup>2</sup>, and if so whether the acquisition price would be economically feasible for the overall purpose of the project. **For this reason the Alternative Site 3 – Great Cruz Bay – has been deemed not practicable in this analysis.** The site is shown below for reference.

<sup>2</sup> There might be potential for a joint venture with the Westin Resort to build a commercial marina offshore of their extensive land holdings. This has not been explored further due to lack of information on commercial feasibility. It should be considered, however, as part of a formal alternatives analysis.



Figure 17: Great Cruz Bay Site

#### 7.3.5. Alternative Site 4 – Enighed Pond

The Enighed Pond site (Alternative Site 4) is well situated for logistics and infrastructure, being within the municipality of Cruz Bay. The land and water has been heavily disturbed as a result of having been dredged and filled in the construction of the Enighed Pond car barge terminal.

The shoreline is owned by the Virgin Islands Port Authority, and they have, in the past, entered into economically viable lease agreements for properties elsewhere in the Virgin Islands to be used for private marine infrastructure. In fact, the current project proponents – T-Rex St John – in a prior incarnation of their project, were lessees of land owned by the Port Authority.

**This alternative is available and logistically and technically practicable, so it has been included in the review of Practicable Alternative Sites.**

#### 7.3.6. Alternative Site 5 – Cruz Bay Creek

With similar ownership and availability considerations as the prior alternative, the site in Cruz Bay Creek is under the control of the Virgin Islands Port Authority and could become available under attractive economic terms. The location is excellent with access to infrastructure nearby.

There might be size issues to overcome, since the water is not used very efficiently at the moment. An ill-planned assortment of uses compete for space in the "creek" but there is sufficient space overall to accommodate a marina meeting the overall purposes of the project.

**Since this alternative is available and logistically and technically practicable, it has been included in the review of Practicable Alternative Sites.**

## **8. Analysis of Practicable Alternatives – Environmental Impact Factors**

The "practicable alternatives", consisting of the applicant's preferred alternative, two off-site alternatives identified above, on-site alternatives, and the no-action alternatives, are now evaluated for impacts on aquatic resources and aquatic functions.

Since more is known about the preferred alternative than the other alternatives, the comparison must be done at a relatively high level at this moment in time. It is anticipated that a final Section 404(b)1 Alternatives Analysis would delve into more detail and provide the same level of analysis of each of the practicable alternatives. However, even at the high level, some useful conclusions can be drawn about the project and its suitability for a Section 404 permit.

The factors that will be considered are:

- The need for dredging of vegetated sea bottom.
- The direct and indirect impact on wetlands.
- Disposal sites for any dredge or fill materials
- Presence of, and impacts to listed species and/or their critical habitat.

To the extent possible these impacts will be quantified for objective comparison.

### **8.1. Applicant's Preferred Alternative**

The environmental impacts of the Sirius Marina project, as proposed by the applicant (the "Applicant's Preferred Alternative") have already been discussed. These impacts are briefly summarized and then quantified below.

Because the applicant has situated fixed marina docks over vegetated bottoms (sea grass) the marina will cause impacts to sea grass from dock and boat shading.

Because the Preferred Alternative locates a boat ramp in shallow water, the project requires dredging of a vegetated bottom and impact to fringing mangroves.

Because the applicant has chosen to construct an extensive bulkhead seaward of the shoreline in order to provide access to upland buildings, the Preferred Alternative involves discharge of dredge material in a mangrove wetland and in open waters.

Because the primary dredge disposal site appears to be a wetland, the Preferred Alternative impacts this feature.

Finally, because the bulkhead structure will isolate an adjacent salt pond from its primary water exchange with Coral Bay, the Preferred Alternative also impacts this wetland feature.

The vicinity is a known habitat for endangered sea turtles and marine mammals are frequently observed in the general vicinity.

These impacts are summarized below in terms of the number of acres impacted:

Source of Impact	Type of Impact	Area Impacted
Dredging	Mangrove Habitat	0.23 acre
Dredging	Submerged Aquatic Vegetation, unknown composition	0.92 acre
Bulkheads	Isolating a salt pond, WOTUS	2.3 acre
Fill Operations	Fill of mangrove wetlands, WOTUS	0.15 acre
Fill Operations	Fill of open water, WOTUS	580 cubic yards fill 0.34 acre filled
Dredge Spoil Disposal	Discharge into Wetlands parcel	1.0 acre
Boat Ramp	Discharge of Fill in WOTUS	136 cubic yards fill
Marina Dock Shading + Pilings	Sea Grasses	0.44 acre
Boat Shading	Sea Grasses	0.80 acre
<b>TOTAL IMPACTS</b>		<b>6.18 acres</b>

Due to lack of sufficient information for analysis, we cannot comment on whether the proposed means of obtaining potable water – utilizing brackish wells plus reverse osmosis – will result in impacts to aquatic resources. The applicant has not disclosed how the brine waste water will be disposed of from this process.

Due to lack of information on the size and operation of the Waste Water Treatment Plant, it is impossible to assess whether the effluent from that facility will result in impacts to WOTUS.

These factors, if they result in impacts, must be factored into the Alternatives Analysis.

## 8.2. Onsite Alternative 1

As can be seen from the preceding discussion, the most significant impacts to aquatic resources in the Preferred Alternative are a consequence of the construction of the bulkhead with the dredging and filling associated with it. These impacts can almost all be avoided entirely through a minor reconfiguration of the project components, as illustrated in this section.

The two drawings below show the applicant's preferred configuration, on the left, and a modified configuration, on the right. The modification arises from utilizing an existing boat ramp (rather than constructing a new one in the shallowest part of the creek), and slightly rotating the marina dock structure so that the entrance to the main pier is east of the historic town dock.



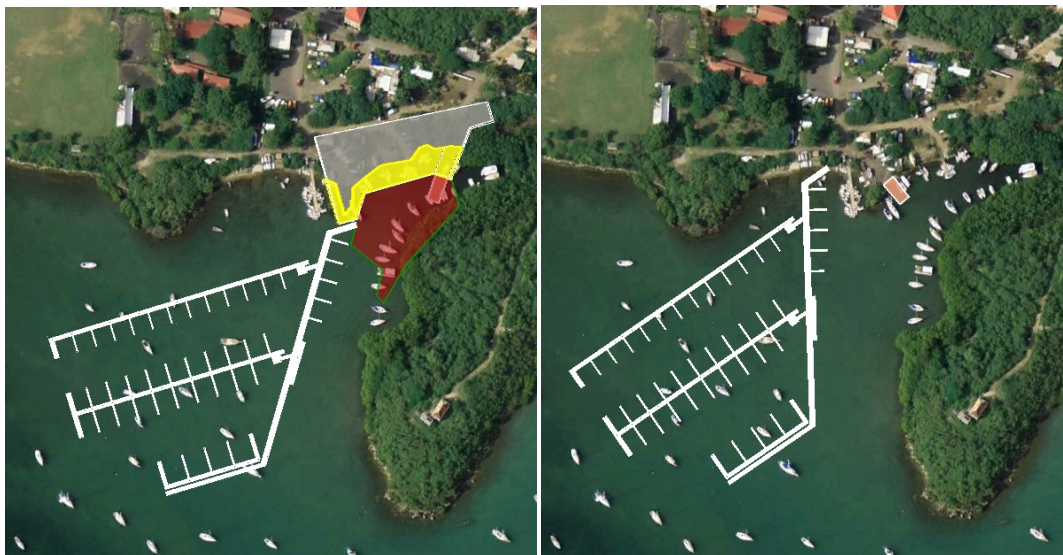


Figure 18: On-Site Alternative 1

The most critical region of impacts – the creek and surrounding mangrove wetlands, is shown in greater detail below and it should be apparent that by moving the boat ramp and the dock structures the environmental impacts are dramatically less since there is no dredging, no construction of a bulkhead, no filling of wetlands or open waters, no isolation of the salt pond, and no need to dispose of dredge materials in another wetland. The impacts to sea grasses from the marina and boat shading will be approximately the same since the dimensions have not changed. The upland amenities (parking, marina office, retail services, and marine services) can be located elsewhere on the upland parcel.

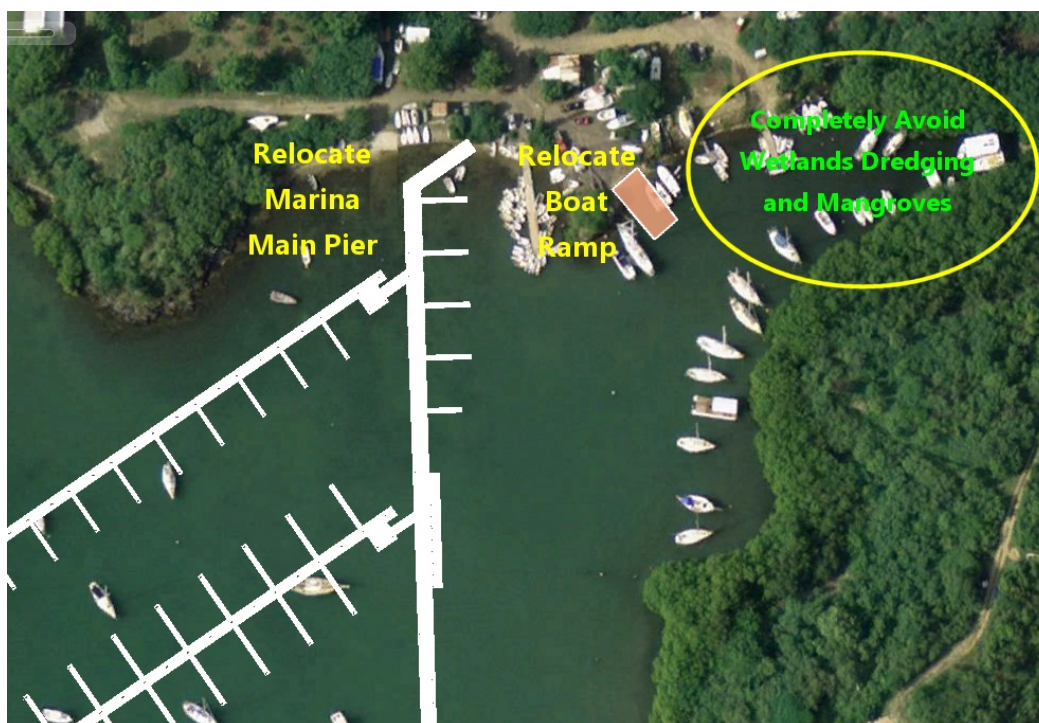


Figure 19: On-Site Alternative 1 Detail

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The impacts to aquatic resources stemming from this On-Site Alternative 1 are summarized in the table below:

Source of Impact	Type of Impact	Preferred Alternative Impacts	Impacts of On-Site Alternative 1
Dredging	Mangrove Habitat	0.23 acre	0 (no dredging)
Dredging	Submerged Aquatic Vegetation, unknown composition	0.92 acre	0 (no dredging)
Bulkheads	Isolating a salt pond, WOTUS	2.3 acre	0 (no bulkheads)
Fill Operations	Fill of mangrove wetlands, WOTUS	0.15 acre	0 (no filling)
Fill Operations	Fill of open water, WOTUS	580 cubic yards fill 0.34 acre filled	0 (no filling)
Dredge Spoil Disposal	Discharge into Wetlands parcel	1.0 acre	0 (no dredge disposal)
Boat Ramp	Discharge of Fill in WOTUS	136 cubic yards fill	136 cubic yards fill (same design)
Marina Dock Shading + Pilings	Sea Grasses	0.44 acre	0.44 acre
Boat Shading	Sea Grasses	0.80 acre	0.80 acre
<b>TOTAL IMPACTS</b>		<b>6.18 acres</b>	<b>1.24 acre</b>

### 8.3. Onsite Alternative 2: Moorings-based Marina and Improved Dock

The second Onsite Alternative involves the following components:

- A new and extended dock for daytime use - construct a dock that reaches sufficiently deep water to allow motorboats and sailboats to come alongside for passenger pickup and delivery.
- Water and pumpout – provide fresh water and pumpout services at the new dock
- A refurbished boat ramp – refurbish the existing boat ramp with pavement and piers for a travel lift.
- A managed private mooring field – install an appropriate number (20-40) of moorings to be used exclusively by transient boaters
- A dinghy pick-up/drop-off service – provide an on-call service to transport people to/from their moored vessels and the dock.

Even without analysis it should be clear that this alternative will eliminate all but *de minimus* impacts to the aquatic environment, while still providing enhanced access for recreational boaters.

In terms of the statement of "Overall Project Purpose" it should be noted that the term "marina" includes boating facilities based exclusively on moorings. The dictionary defines "marina" as "a specially designed harbor with moorings for pleasure craft and small boats." Based on that definition and the extensive use of mooring balls throughout St John, an onsite

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alternative consisting of managed moorings plus dock-based services fulfills the Overall Purpose of the project as defined by the Corps in the Public Notice ("Construct a private commercial offshore marina with ancillary facilities in adjacent uplands in St. John, USVI").

A representative configuration for this Onsite Alternative is shown below. The T-Dock is approximately 250' long with an area of approximately 6,000 sf (0.15 acre). The mooring circles are 120' diameter, which is illustrated for conceptual purposes only, and might accommodate an average 35' vessel. Although this configuration does not reach the 92 slip capacity of the applicants preferred alternative, no rationale or justification has been offered to explain why such a large slip capacity is required.

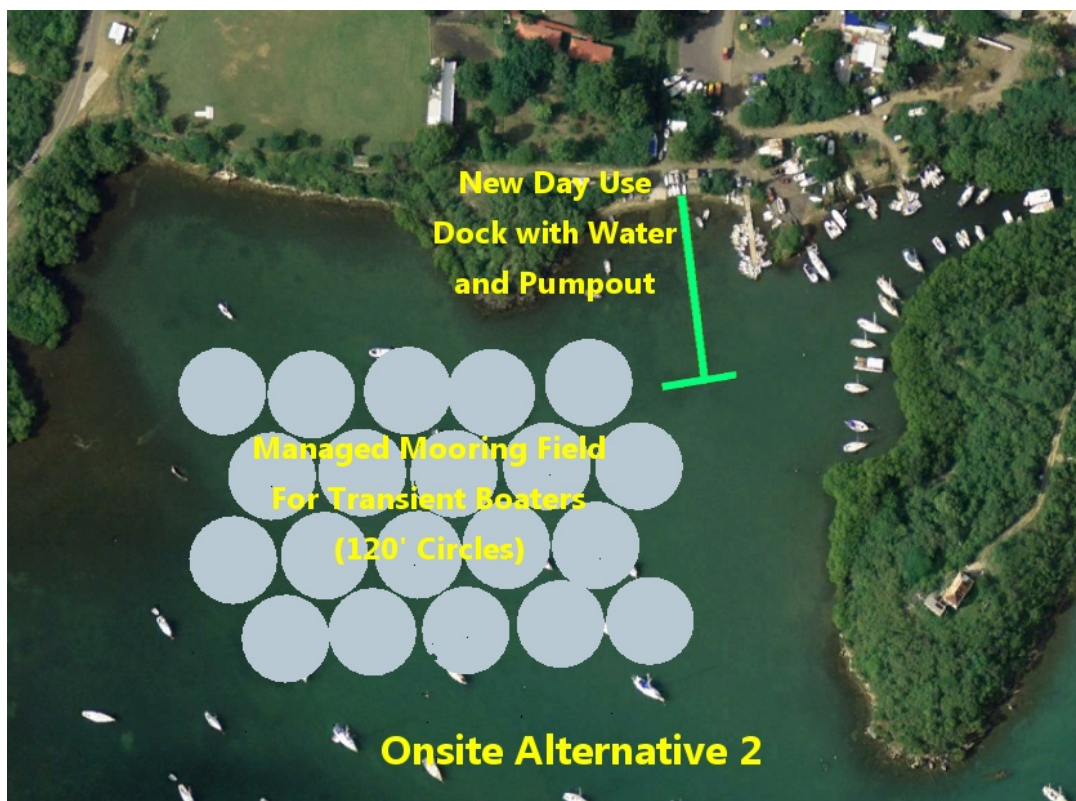


Figure 20: Onsite Alternative 2 Using Moorings and Day Dock

The aquatic impacts of this On-Site Alternative are shown below:

Source of Impact	Type of Impact	Preferred Alternative Impacts	Impacts of On-Site Alternative 2
Dredging	Mangrove Habitat	0.23 acre	0 (no dredging)
Dredging	Submerged Aquatic Vegetation, unknown composition	0.92 acre	0 (no dredging)
Bulkheads	Isolating a salt pond, WOTUS	2.3 acre	0 (no bulkheads)
Fill Operations	Fill of mangrove wetlands, WOTUS	0.15 acre	0 (no filling)
Fill Operations	Fill of open water, WOTUS	580 cubic yards fill 0.34 acre filled	0 (no filling)



Dredge Spoil Disposal	Discharge into Wetlands parcel	1.0 acre	0 (no dredge disposal)
Boat Ramp	Discharge of Fill in WOTUS	136 cubic yards fill	136 cubic yards fill (same design)
Marina Dock Shading + Pilings	Sea Grasses	0.44 acre	0.15 acre (est.)
Boat Shading	Sea Grasses	0.80 acre	0 acre (moorings)
<b>TOTAL IMPACTS</b>		<b>6.18 acres</b>	<b>0.15 acre</b>

#### 8.4. Offsite Alternative 4: Enighed Pond

The viability of an alternative location in Enighed Pond is reinforced by the fact that there is currently an active proposal to develop a marina in precisely that location. The proponent and the project have received wide publicity in local media, and so this is a real proposal and not simply a theoretical one.

An overview of the proposed marina in Enighed Pond is shown below. This was provided by the marina proponent and illustrates how the marina will fit into the existing commercial maritime uses of Enighed Pond as a car barge depot for transits to and from St Thomas.

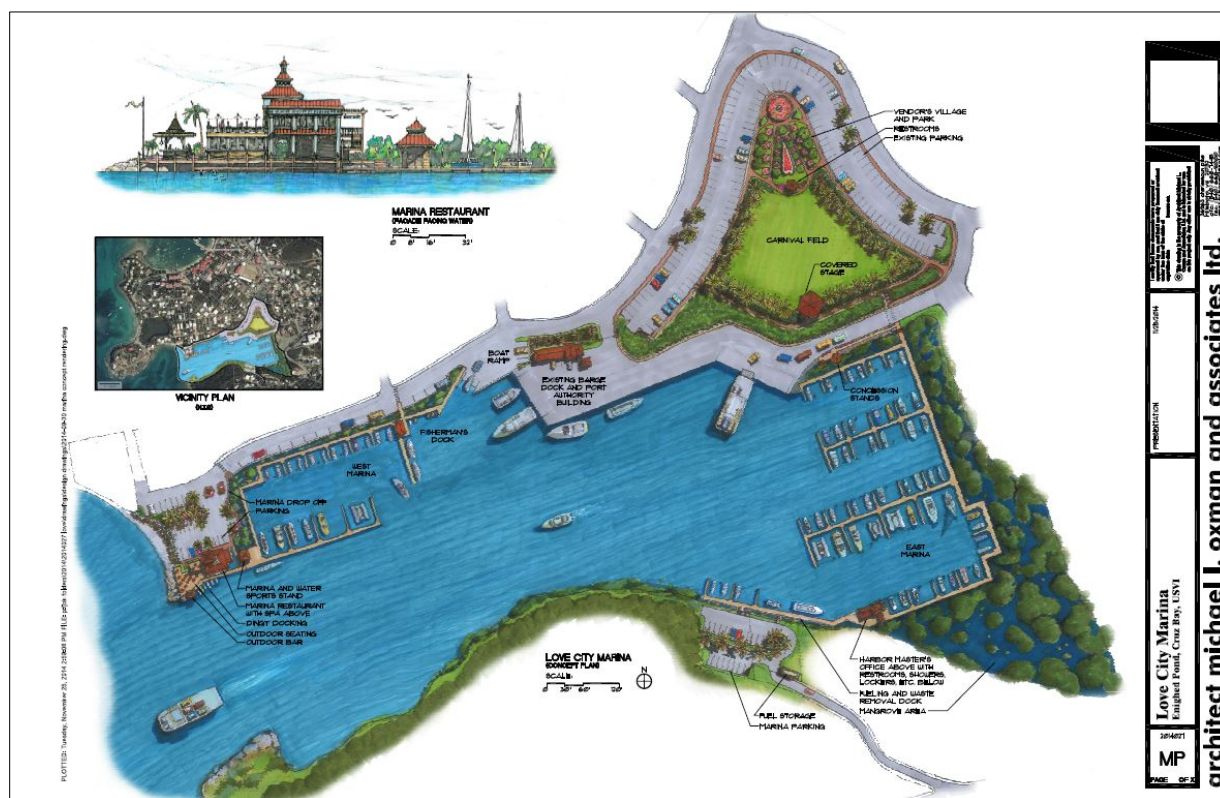


Figure 21: Offsite Alternative 4 - Artist Rendering

The entire site of Enighed Pond is highly disturbed – it was originally an enclosed salt pond but was opened to the sea and extensively dredged to provide facilities for commercial car barge service. The original plans included a marina, although this was never built. A portion of the currently proposed marina is shown as built in an existing mangrove wetland, however this was not a naturally occurring mangrove – it was constructed as part of the overall Enighed Pond terminal project approval as a component of compensatory mitigation.

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There are a number of highly attractive aspects to this alternative. First, all necessary infrastructure – potable water, sewage treatment, electric power – is readily available in close proximity to the site. Second, ample parking exists in the parking area surrounding the "Carnival Field". Third, the marina is within walking distance from the commercial amenities of Cruz Bay – restaurants, shops, entertainment. And finally, the existing Customs facility of Cruz Bay is within walking distance.

The impacts to aquatic resources from this Off-Site Alternative are minimized due to the fact that the entire aquatic environment was heavily disturbed by blasting a channel, dredging, and construction of bulkheads. The sketch proposal does disturb approximately one acre of immature mangroves which would require mitigation.

Source of Impact	Type of Impact	Impact of Offsite Alternative 4
Marina Construction	Mangrove Habitat	1.0 acre
Bulkheads for new marina	Same as above	n/a
Dredging in front of bulkheads	Minimal – previously dredged and filled	n/a
Marina Dock Shading + Pilings	Minimal – barren seabed	n/a
Boat Shading	Minimal – barren seabed	n/a
<b>TOTAL IMPACTS</b>		<b>1.0 acres</b>

#### 8.5. Offsite Alternative 5: Cruz Bay Creek

The body of water just north of the main Cruz Bay harbor, and separated from it by a promontory known as the Battery, is locally called "Cruz Bay Creek." This location has been utilized for maritime services for many years, however its use has not been optimized. The photograph below illustrates the relationship between Cruz Bay Creek and Cruz Bay harbor proper:



Figure 22: Cruz Bay Creek Vicinity

If the existing uses of Cruz Bay Creek were reorganized, a commercial marina accommodating a wide range of vessel types could be implemented, in a number of configurations. Slips for boats from 30' up to 150' could be provided, as illustrated in the conceptual sketch below:

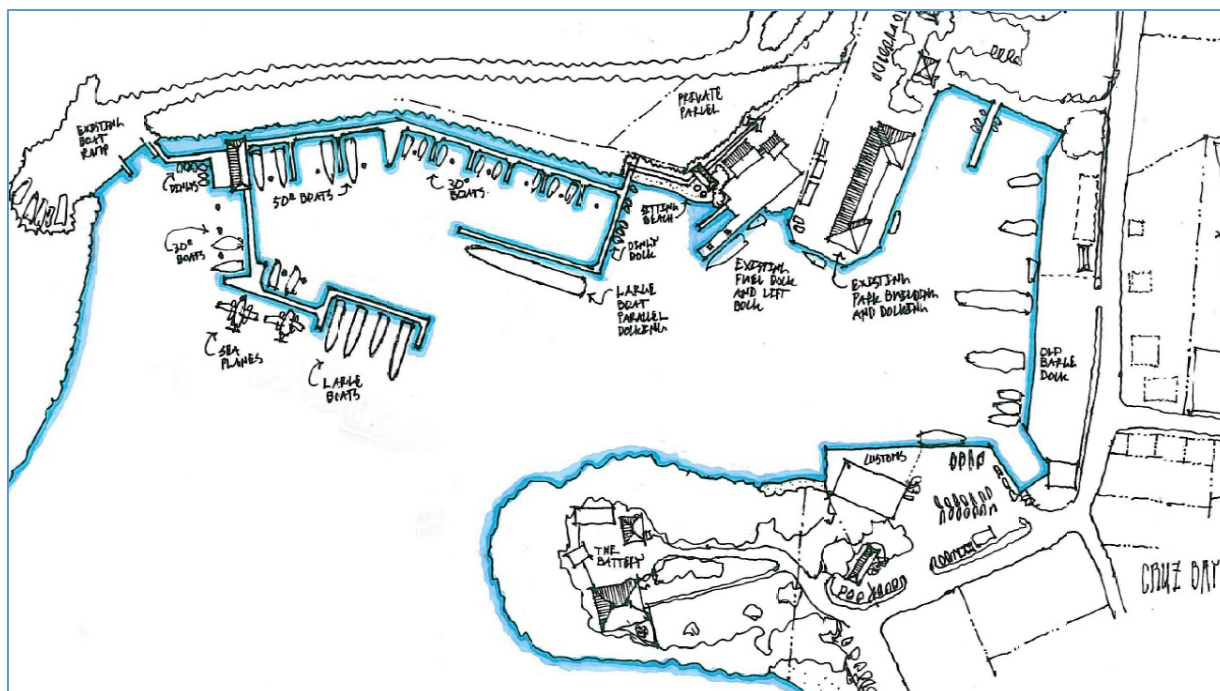


Figure 23: Cruz Bay Creek Alternative Conceptual Sketch

In terms of environmental impacts, and particularly impacts to special aquatic sites, this alternative has only very minimal impacts. The entire area of Cruz Bay Creek has been heavily utilized for marine traffic for many years, and the construction of a commercial marina in this location would not cause any further material impacts.

All requisite commercial amenities – fuel, power, water, sewage treatment – are readily available, as is ample parking and transportation. This site is in closest proximity to the National Park facilities, which would make it highly attractive to transient visitors.

The amount of slip space available after reorganizing this maritime area is unclear, and it may not meet the expectations of the applicant.

The wetland impacts of this alternative appear to be nil, since it is built entirely within a highly disturbed environment.

Source of Impact	Type of Impact	Impact of Offsite Alternative 5
Bulkheads for new marina	Same as above	n/a
Dredging in front of bulkheads	Minimal – previously dredged and filled	n/a
Marina Dock Shading + Pilings	Minimal – barren seabed	n/a
Boat Shading	Minimal – barren seabed	n/a
<b>TOTAL IMPACTS</b>		<b>0</b>



### 8.6. No-Action Alternative 1: Day Use Dock Plus Moorings

The Jacksonville District Regulatory Division provides the following description of No-Action Alternatives and how they are used in a Section 404(b)1 Alternatives Analysis:

*The "No-Action" alternative comprises one or more alternatives that would not involve a discharge of dredged or fill material into WOTUS, which could involve reconfiguring the project to avoid all wetlands on the site, siting the project entirely in uplands offsite, or no-action, i.e. not implementing the project. Although the "No-Action" alternative might not seem reasonable initially, it must always be included in the analysis. The no-action alternative can serve several purposes. First, it may be a reasonable alternative, especially for situations where the impacts are great and the need is relatively minor. Second, it can serve as a benchmark, enabling decision makers to compare the magnitude of the environmental effects of the action alternatives.)*

The Overall Project Purpose, stated in the Public Notice, is "Construct a private commercial offshore marina with ancillary facilities in adjacent uplands in St. John, USVI." As we stated earlier we believe that, depending on the definition of "marina," this may be an overly restrictive statement of overall purpose. We prefer to state the overall purpose as **"The overall project purpose is to improve recreational boating access to St John."** The reason for this distinction will become clear in the discussion of this No-Action Alternative.

First, it is important to understand that a marina constructed of fixed docks is only one of several ways to improve recreational boating access. Alternatives such as moorings and docks are widely used in places where fixed marina structures are inappropriate. We believe that is the case in Coral Bay due to the extensive vegetated sea bed with algal plains and sea grass meadows throughout most of the project site.

Looking **solely** at the impacts to sea grasses from boat shading and fixed marina structures we compute that the impact to the vegetated seabed amounts to 585 square feet per vessel (average over 92 vessels). This area is equivalent to a circle with a diameter of 27 feet.

1.236	acres of seagrasses impacted from pilings, dock shading, vessel shading
53,840	sq ft of seagrass impacts
92	total vessels served
585	sq ft seagrass impact per vessel
27	ft diameter circle

**Figure 24: Computation of Sea Grass Impact Per Vessel**

What this means is that the Preferred Alternative results in a net INCREASE in sea grass impacts compared to correct mooring practices for the same number of vessels. Even under present Coral Bay conditions, there are very few boats creating mooring scars, and those scars that do exist are typically less than 15' in diameter. The 2006 aerial image, below, shows the diameter of several of the prominent mooring scars in 2006, many of which no longer exist. Only one of the barren patches was over 27' in diameter.

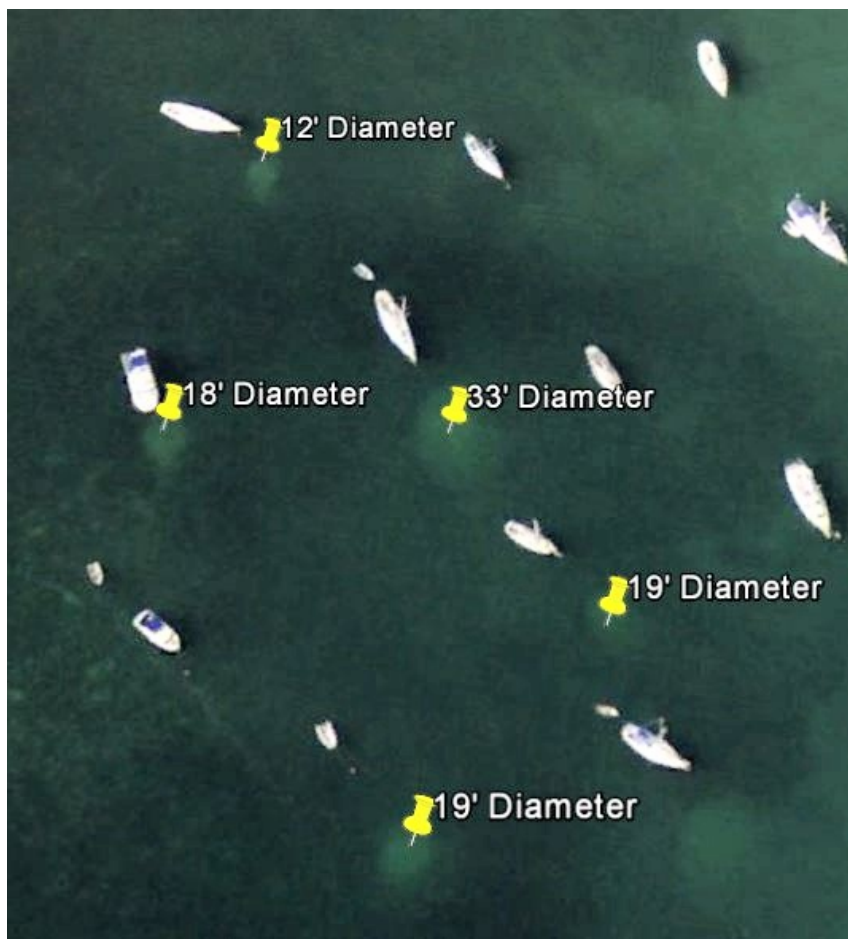


Figure 25: Mooring Scar Diameters (2006 Aerial)

A properly designed mooring has no impact whatsoever on submerged aquatic vegetation. By avoiding use of chains or other lines dragging the bottom, the sea grasses can grow up to and around the entire mooring site. This is one of the reasons why moorings are used exclusively within the boundaries of the Virgin Island National Park.

"No-Action Alternative 1" consists of the following actions, none of which involve discharge of dredge or fill materials in WOTUS and therefore should not require DA permits:

- Construct a managed mooring field for transient boaters with 20-40 moorings dedicated to providing access for vessels visiting for less than 2 weeks duration (i.e. no permanent or long term use).
- Improve management of the historic town dock (the "dinghy dock") to ensure that transient boaters can be picked up and dropped off by dinghy.
- Possibly investigate and construct minor floating extensions to the dock for seasonal use, designed in such a way as to avoid all impacts to benthic habitat.
- Provide launch pick service for transient boats on moorings to transport passengers to and from their vessels.
- Provide other shoreline amenities requested by transient boaters and not requiring any DA permitting.

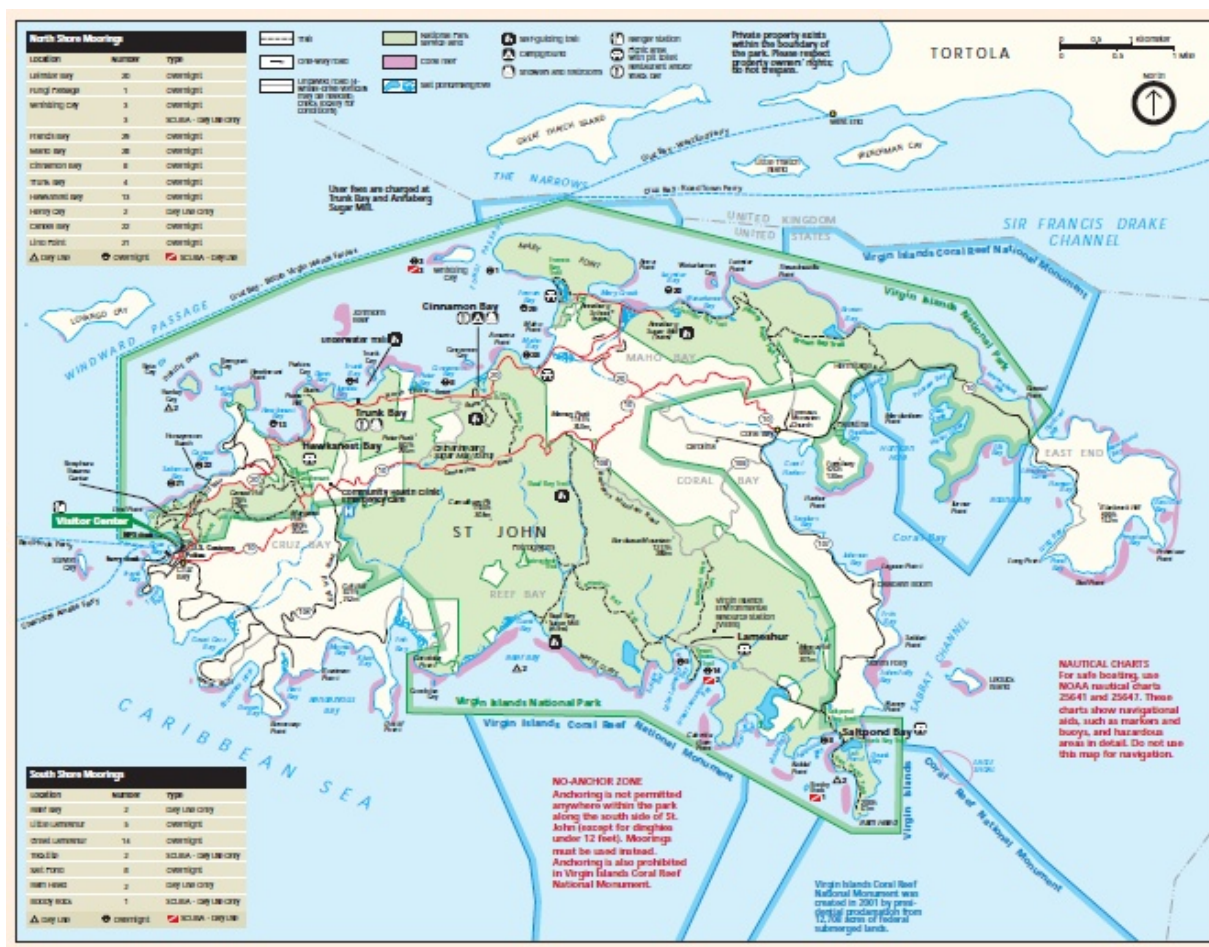


Although this may seem overly simplistic, it is probably the most sensible way to improve recreational boating access to St John without taking any action requiring a Section 10 or Section 404 permit.

### 8.7. No-Action Alternative 2: Status Quo

If literally nothing is done to provide additional marine infrastructure, it does not mean that boaters cannot visit St John. Maintaining the status quo does not result in an impediment for yachts to visit St John. The reality is that motor yachts and mega yachts do visit St John, in good numbers, during the prime Caribbean yachting season. These yachts typically either pick up one of the roughly 210 National Park mooring balls (for yachts of up to 100 feet), or anchor offshore in designated areas. The charter guests on the mega yachts rarely come ashore in their tenders and dinghies, since they have purchased “all inclusive” vacations focusing on the amenities and catered food of the yacht, enjoyed in the pristine surroundings of the national park and a new bay – a new view – each day. If they do wish to visit the National Park beaches, or go shopping and explore land, there are designated dinghy channels on many beaches for this purpose, near parking areas where they can hire taxis.

The mooring system of the Virgin Islands National Park is shown below and can be found here - <http://www.nps.gov/viis/planyourvisit/upload/MooringGuide.pdf> :



**9. Identification of Least Environmentally Damaging Practicable Alternative**

Having identified the Practicable Alternatives and assessed the impacts on aquatic resources stemming from each alternative, including the Preferred Alternative, Off-Site Alternatives, On-Site Alternatives, and No-Action Alternatives, we are now in a position to rank these alternatives and identify the Least Environmentally Damaging Practicable Alternative (the LEDPA).

To do this we will utilize the ranking matrix illustrated in the document previously cited: "Information for Preparing an Alternatives Analysis Under Section 404, June 2014" issued by the Jacksonville District Regulatory Division. The matrix is shown on the following page.

If sufficient data had been available on each of the alternatives, then a single LEDPA could be identified from the collection of alternatives. However, due to time and information constraints, we have only been able to approximate the impacts from the alternative sites.

The approximation is adequate, however, to conclude that **the applicant's Preferred Alternative is clearly NOT the Least Environmentally Practicable Alternative which still meets the project's Overall Purpose.**

## 10. Conclusions

On this basis of this analysis of alternatives demonstrating that there are less environmentally damaging practicable alternatives to the applicant's proposal, and according to 40 CFR 230.10 which states, in part, that "**no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences**" the discharge of dredged material proposed by T-Rex St John for the Sirius Marina in Coral Bay cannot be permitted. The table on the following page summarizes these findings.

Furthermore, since the applicant proposes to discharge dredged material into a Special Aquatic Site (a mangrove wetland), and has not demonstrated that the activity associated with the discharge requires "access or proximity to or siting within the special aquatic site in question to fulfill its basic purpose" then "**practicable alternatives that do not involve special aquatic sites are presumed to be available.**"

We conclude that the Section 404 Permit requested by the applicant T-Rex St John for the Sirius Marina pursuant to the Clean Water Act, must be denied.

Environmental Factors	Preferred Alternative	Offsite Alternative Enighed Pond	Offsite Alternative Cruz Bay Creek	Onsite Alternative 1 Relocate Docks and Use Existing Ramp	Onsite Alternative 2 Moorings and New Dock
Wetland Impacts (acres)	6.18 acre	1.0 acre	Minimal	1.24 acre	0.15 acre
Loss in Wetland Function	3.3 acre (salt pond plus disposal area)	1.0 acre	None	None	None
Impacts to Federally Listed Threatened or Endangered Species	Sea turtle habitat Sonic impacts to marine mammals	None	None	Sea turtle habitat Sonic impacts to marine mammals	Sea turtle habitat
<b>LEDPA</b>	<b>NO</b>	<b>Possible</b>	<b>Possible</b>	<b>Possible</b>	<b>Possible</b>

David Silverman, President, Save Coral Bay, Inc.  
22 January 2016

# **Appendix A**

**"Information for Preparing an Alternatives Analysis Under Section 404"**

**Version 1.0**

**Jacksonville District Regulatory Division, June 2014**



## Information for Preparing an Alternatives Analysis Under Section 404

June 2014

In its evaluation of permit applications to discharge dredged or fill material into waters of the U.S. (WOTUS), including wetlands, the U.S. Army Corps of Engineers (Corps) is required to analyze alternatives to the proposed project that could achieve its purpose and need. The Corps conducts this analysis pursuant to two main requirements - the 404(b)(1) Guidelines (Guidelines)<sup>i</sup> and the National Environmental Policy Act (NEPA)<sup>ii</sup>. The Corps must evaluate alternatives that accomplish the overall project purpose, and that are reasonable and practicable. A permit cannot be issued if a practicable alternative exists that would have less adverse impact on the aquatic ecosystem, provided that alternative does not have other significant adverse environmental impacts.

The Guidelines include two rebuttable presumptions. The first presumption states that if a project does not need to be in a special aquatic site, such as a wetland, to meet its basic purpose (i.e., the project is not "water-dependent"), it is presumed that alternatives that do not affect special aquatic sites are available. The second presumption states that if a project involves a discharge of dredged or fill material into a special aquatic site, a practicable alternative located in uplands is presumed to have less adverse impact on the aquatic ecosystem. **It is the applicant's responsibility to clearly demonstrate to the Corps that both of these presumptions have been rebutted in order to pass the alternatives portion of the Guidelines.** This document will assist a permit applicant in formatting this information into an "Alternatives Analysis" that includes the key items that must be addressed. The level of detail in an alternatives analysis should be commensurate with the scale of the adverse environmental effects of the project. Analysis of projects proposing greater adverse environmental effects should be more detailed and explore a wider range of alternatives than projects proposing lesser effects.

Below are suggested steps to follow in providing the necessary information for the Corps to consider in the alternatives analysis:

### **Step 1: Define Purpose and Need**

At the beginning of an alternatives analysis, the applicant should clearly state the overall project purpose and need (examples are below). Significant thought should be applied when developing the project purpose as it will drive much of the alternatives analysis. The overall project purpose must be specific enough to define a permit applicant's needs, but not so restrictive to preclude other alternatives. It should also not be too wide-ranging without consideration for the applicant's real needs, as the geographic boundaries in the purpose define the scope of the analysis. For example:

- a. *To develop a 225-lot single-family residential development at the southeast intersection of Interstate 10 and Toledo Blade Boulevard.*

This example is too restrictive because there are no alternative sites to consider. It also unnecessarily details the exact number of lots, which can reduce the number of reasonable or practicable alternatives.

- b. *To develop a residential development in Northwest Florida.*

This example is too wide in scope if the applicant is actually focusing on a certain portion of a certain city or county to locate the project. This would also create an unmanageable number of alternatives.

- c. *To develop a single-family residential subdivision near Interstate 10 in Crestview, Florida, to meet local demand for this type of housing.*

This is an appropriate overall project purpose as it narrows the geographic scope to a reasonable and manageable size. It clearly defines what the project involves (single-family residences rather than “housing” that could also mean townhouses or apartments), the actual target market area (near Interstate 10 in Crestview), and the need for the project (local demand).

The applicant’s proposed overall project purpose will be carefully considered, but if the Corps cannot concur with it as submitted, the Corps is required to modify it. Once the Corps has placed the project on public notice, the applicant must use the overall project purpose as stated in that public notice or the overall project purpose as provided back to the applicant if the Corps has modified their original project purpose. If the applicant has already performed an alternative analysis using a project purpose the Corps cannot concur with, (e.g., it is too restrictive or too broad in geographic scope), the analysis may need to be revised to accurately include reasonable and practicable alternatives.

Additional information about the proposed overall project purpose should also be provided, including details about the relevant market conditions and area, location, history, and other factors that influence or constrain the intended nature, size, level of quality, price class, or other characteristics of the project. Information that further describes why particular geographic boundaries were chosen also will assist the Corps in its review.

## **Step 2: Identify Alternatives**

The applicant must list and briefly describe alternatives that could meet the overall project purpose. This list, at a minimum, must include the information noted below.

- a. the applicant's preferred alternative (the project proposed in the permit application)
- b. alternatives that would involve no discharges of dredged or fill material into WOTUS (The "No-Action" alternative comprises one or more alternatives that would not involve a discharge of dredged or fill material into WOTUS, which could involve reconfiguring the project to avoid all wetlands on the site, siting the project entirely in uplands offsite, or no-action, i.e. not implementing the project. Although the "No-Action" alternative might not seem reasonable initially, it must always be included in the analysis. The no-action alternative can serve several purposes. First, it may be a reasonable alternative, especially for situations where the impacts are great and the need is relatively minor. Second, it can serve as a benchmark, enabling decision makers to compare the magnitude of the environmental effects of the action alternatives.)
- c. alternative offsite locations, including those that might involve less adverse impact to WOTUS
- d. onsite alternatives that would involve less adverse impact to WOTUS (These include modifications to the alignments, site layouts, or design options in the physical layout and operation of the project to reduce the amount of impacts to WOTUS.)
- e. alternatives that would involve greater adverse impact to WOTUS but avoid or minimize other significant adverse environmental consequences including offsite and onsite options (Alternatives that meet these criteria are uncommon.)

Alternatives that are clearly unreasonable should be identified and eliminated (not evaluated further). For example, alternative sites that are far too small to accommodate the project or that lie outside the geographic boundaries identified in the overall project purpose can be eliminated. This step of the analysis is not intended to rule out alternatives that are "unreasonable" according to the applicant, but those that would be considered "unreasonable" to an objective third-party. The Corps will verify that the criteria used for screening alternatives are objective and not so restrictive that they eliminate actual reasonable alternatives. The applicant must list the alternatives that were initially considered then eliminated from further study because the applicant feels they failed to pass this first round of screening. The Corps will review this list and determine if elimination of these alternatives is appropriate.

The maximum number of reasonable alternatives to study further will vary and depends on the nature and scope of the proposed project; however, there typically should be multiple alternatives to consider. The number of alternatives listed should be greater for

projects involving greater impacts. This is the preliminary list of reasonable alternatives; alternatives that are not practicable will be eliminated from further consideration in the later stages of the analysis.

In many instances, there will be alternatives determined to be both unreasonable and impracticable, as these terms can be nearly synonymous when used in these analyses. Regardless of whether the applicant identifies an alternative as unreasonable or as impracticable, it is imperative the applicant describe, in the context of the overall project purpose and need for the project, why each alternative should be eliminated from further analysis. The Corps must be able to independently review and verify this information and each step in the applicant's alternative analysis.

### **Step 3: Describe and Analyze Alternatives for Practicability**

This step also addresses onsite and offsite alternatives and determines which are practicable and which are not. Practicable is defined here as meaning the alternative is available, is able to achieve the overall project purpose, and is feasible considering cost, existing technology, and/or logistics in light of the overall project purpose.

Alternatives should be clearly listed and numbered for ease of reference and comparison. *At a minimum*, the following information for each alternative site examined should be provided:

#### *1. General site information:*

- a. specific parcel information including, but not limited to; parcel ID numbers, aerial photos, location maps , FLUCCS codes and GPS coordinates;
- b. presence, quantity and quality of wetlands or other WOTUS;
- c. County/City zoning designation;
- d. the presence of any federally-listed threatened or endangered species or their critical habitat, and/or the presence of any historical properties or resources; and,
- e. site infrastructure (Will the site require new access roads/infrastructure? What are the potential impacts associated with these improvements?).

#### *2. The practicability of each alternative:*

- a. Practicability: alternatives that are practicable are those that are available and capable of being done by the applicant after considering the following (in light of the project purpose):
  - Cost (For example, the costs associated with various infrastructure components such as roadways or utilities, including upgrades to existing infrastructure components or the need to establish new infrastructure components, may affect the viability of a particular alternative. A location far from all existing infrastructure (roads, water,



sewer, and/or electricity) might not be practicable considering the costs associated with upgrading/establishing the infrastructure necessary to use that site. However, just because one alternative costs more than another, this does not mean that the more expensive alternative is entirely impracticable. Cost is analyzed in the context of the overall cost of the project and whether it is unreasonably expensive or exorbitant. In addition, cost is an objective, industry-neutral inquiry that does not consider an individual applicant's financial standing. The data used for any cost or financial feasibility analysis must be current with respect to the time of the alternatives analysis.);

- Existing Technology (The alternatives examined should consider the limitations of existing technology yet incorporate the most efficient/least-impacting construction methods currently available. For example, alternatives to mining limestone or other minerals may not be practicable considering a lack of technology to allow replacement of that mineral resource in the mass-production of concrete; however, engineered retaining walls can be incorporated into an alternative that substantially minimizes wetland impacts by eliminating fill slopes.); and,
  - Logistics (The alternatives examined may incorporate an examination of various logistics associated with the project, i.e., placement of facilities within a required distance, utilization of existing storage or staging areas, and/or safety concerns. Examples of alternatives that may not be practicable considering logistics are a land-locked parcel that cannot be accessed by public roads or a site that is too small to meet the overall project purpose.
- b. Availability: The Guidelines state that if it is otherwise a practicable alternative, an area not presently owned by the applicant that could reasonably be obtained, utilized, expanded, or managed in order to fulfill the overall purpose of the proposed activity can still be considered a practicable alternative. In other words, if an applicant does not own an alternative parcel, that does not rule that parcel out as a practicable alternative. **The applicant should consider and anticipate alternatives available during the timeframe that the Corps conducts its alternatives analysis.** An evaluation of availability for purchase and projected cost of such a purchase may be incorporated into this discussion.
- c. Other information: any other information that conveys the practicability of the alternatives reviewed in consideration of the overall project purpose should be included.

*An alternatives comparison matrix (example on next page) is an effective way to present and compare the main parameters that were considered during the evaluation.*

To allow for an objective evaluation, the comparison of the plan(s) for the proposed and alternative sites should be framed for “yes” or “no” answers. A narrative should accompany the matrix defining the practicability factors chosen and further explaining any “no” answers with objective and verifiable data. Practicability of the “no-action” alternative also must be addressed in this narrative and, if applicable, also included in the matrix. The information should explain the consequences on the applicant and the public if the project is not implemented. Any remaining alternatives that are found to be practicable will move on to the next and final step.

If an alternative can be easily documented to be a more environmentally damaging alternative and this can be clearly described within the narrative and matrix, then this step and the following step can be combined. This will save the applicant time and expense; however, it is only appropriate for alternatives where this distinction is clear.

***Example Alternative Comparison Matrix for Practicability***

Category	Practicability Factor	Alternative 1 Applicant's Preferred Alternative	Alternative 2	Alternative 3	Alternative 4	Alternative 5
<b>Availability</b>	Existing Zoning Appropriate or Potential for Zoning Change?	YES  Zoned for this project type	YES  Zoned for this project type	YES  Zoned for this project type	YES  Zoned for agriculture but County has expressed support for the project	YES  Zoned for this project type
	Available for Acquisition?	YES Applicant owns the parcel	YES	YES	YES	YES
<b>Cost</b>	Reasonable Acquisition Costs?	YES Applicant owns the parcel	YES	YES	YES	NO  Seller will only sell all 350 acres without subdividing
	Costs feasible for mitigating impacts to historic and cultural resources found onsite?	YES  No historic or cultural resources found onsite	YES  No historic or cultural resources found onsite	YES  No historic or cultural resources found onsite	NO  If impacts to historic resources onsite allowed, costs to mitigate those impacts will increase project costs from \$xxxx to \$xxxx	YES  No historical or cultural resources found onsite

	Other Costs Feasible?	YES	YES Additional costs for extensive retaining walls	YES	NO Costs to connect to utilities will increase project costs from \$xxxx to \$xxxx	NO Extensive use of retaining walls, and construction of two bridges increase project costs from \$xxxx to \$xxxx
<b>Existing Technology</b>	Topography and other Site Conditions Feasible for Construction of Project?	YES	YES With extensive use of engineered retaining walls and drainage systems	YES	YES	YES With extensive use of retaining walls, and bridges over Clear Creek
<b>Logistics</b>	Sufficient Parcel Size?	YES 40 acres	YES 48 acres	NO 21 acres	NO 17 acres	YES 350 acres
	Availability of Utilities?	YES	YES	YES	NO 6 miles to existing water, sewer and power	YES
	Availability for Access?	YES County right-of-way on east property boundary	YES County right-of-way to northwest property corner	NO Landlocked by private parcels and request for an easement was denied	NO Landlocked by private parcels and request for an easement was denied	YES County right-of-way to west side of property

#### **Step 4: Identify the Least Environmentally Damaging Practicable Alternative**

1. The Guidelines require that the Least Environmentally Damaging Practicable Alternative (LEDPA) be selected. Therefore, using the same numbering system from the step above, identify the environmental impacts for each remaining practicable alternate site. For each remaining site:
  - a. describe the impacts (beneficial or adverse) to the aquatic ecosystem associated with each of the remaining alternatives
  - b. describe the overall (beneficial or adverse) environmental impacts associated with each of the remaining alternatives
  - c. be specific and quantitative in the identification of impacts (Rather than "Alternative A would result in a large impact to low quality wetlands and ditches that are sparsely vegetated and impact some wildlife." use "Alternative A would result in the discharge of fill material over 2.1 acres of fire-suppressed wet pine flatwoods wetland and 1.2 acres of wet ditches that contain scattered emergent wetland vegetation. Using the Uniform Mitigation Assessment Method, the function and value of the flatwoods wetland and ditch system have been calculated at 0.6 and 0.2,

respectively. Work affecting 0.7-acre of potential flatwoods salamander habitat would also result from siting the project at this location."

2. If multiple practicable alternatives remain, and/or many environmental/relevant factors are involved, another matrix that contains only environmental/relevant parameters (e.g., wetland functional units, listed species, high value upland habitat, historic properties) can be used to assist in illustrating the proposed LEDPA. Emphasis should be placed on impacts to the aquatic environment through functional unit loss of wetlands or other WOTUS that would be affected or eliminated by each alternative. An example matrix is below.

*Example Environmental Factor Matrix*

<b>Environmental Factors</b>	<b>Alternative 1 Applicant's Preferred Alternative</b>	<b>Alternative 2</b>
<b>Wetland Impacts (Acres)</b>	2.0	6.0
<b>Loss in Wetland Function (UMAM Functional Units)</b>	1.4	3.9
<b>Impacts to Federally Listed Threatened or Endangered Species</b>	No	No
<b>LEDPA</b>	Yes	No

3. Conclude the alternatives analysis with a description of the alternative proposed to be the LEDPA, reiterating the rationale for this determination.

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<sup>i</sup> The 404(b)(1) Guidelines (Guidelines) are associated with the Clean Water Act of 1972, and are found in the Federal Register under 40 CFR Part 230

<sup>ii</sup> The Corps' Implementation Procedures for the National Environmental Policy Act (NEPA) of 1969 are found in the Federal Register under 33 CFR Part 325, Appendix B