ENVIRONMENTAL QUESTIONAIRE
FOR CORPS OF ENGINEERS PERMIT APPLICATIONS
PART I

PROJECT DESCRIPTION

A. General Site Location: *Accurately locate the project site with respect to State, county, or other subdivision, and in relation to streams and rivers.*

The Borough has identified an immediate need to re-nourish the area of its Atlantic Ocean beach between 9th Street and 16th Street using sand from the Borough's previously authorized northern borrow area between 32nd Street and 40th Street. The project site, including the scraping activity, the haul route to truck the sand, and the re-nourishment area is located on the beach from 9th street to 40th Street in the Borough of Avalon in Cape May County.

The Borough's eroded north-end beaches are within the USACE Townsends Inlet to Hereford Inlet Coastal Storm Reduction Project "engineered beach" design template initially constructed in 2003, which restored the beachfronts of Seven Mile Island (Avalon and Stone Harbor) to their full "engineered beach" profile. Based on guidance from the USACE for the Borough's 2016 backpassing project, a Section 408 Determination in support of the Borough of Avalon's plans to restore a portion of its beach in the spring of 2018 is not required.

B. Specific Site Locations: *Completely locate the project site with respect to cove, creek, property owner, plot number, etc.*

As illustrated on the U.S.G.S. Quadrangle for Cape May, NJ provided in **Appendix A (Figure 1),** the Latitude and Longitude of the northern extent of the beach renourishment activities is at 39°06'22.55" N 74°42'20.62" W. The southernmost extent of the project containing the borrow area is located at the end of 40th Street at 39°05'00" N 74°43'24.37" W. **Figure 2** depicts the general site location with adjacent roads. **Figure 3** identifies the project limits located on Block 80, Lot 1 and Block 81, Lot 1 on the Borough of Avalon Tax Map.

C. Description of Proposed Action: *Carefully describe the action proposed, including the method of construction, equipment, and materials to be used. Details in your description are important. Attach additional sheets if necessary.*

The recent March 2018 storm events caused extensive beach erosion and scarping of the dunes between 9th Street and 16th Street. The erosion has created an unacceptable loss of the beach berm, further exposing the dunes to erosion and creating unsafe conditions at the ends of beach paths, and reduced the carrying capacity of the dry beach above the high tide line. To remedy these conditions the Borough of Avalon proposes to re-nourish the beach via backpassing sand from a designated beach borrow area as soon as possible to prevent further damage to the dunes..

Borrow Area

The proposed beach renourishment project is depicted on the attached engineering plans titled, BOROUGH OF AVALON, CAPE MAY COUNTY, NEW JERSEY, 2018 BEACH

RENOURISHMENT PROJECT, Sheets 1 – 7. As depicted on the plan titled "North Borrow Area Site Plan', sheet 2, the backpassing project will utilize the previously scraped borrow area between 32nd Street and 40th Street. The sand scraping activities will take place between the mean low water line and the limit determined by the recovered beach berm elevations as shown on plan sheet and the profiles on plan sheets. The topographic survey performed on March 10, 2018 found the borrow area comprising an area of approximately 19.386 acres between the mean low water line (MLWL) and a line on the upper beach scrape limit. Of this area approximately 15.0 acres are below the High Tide Line (HTL). The area appears to be fully recovered from the last scraping activities in 2016. Based on the recent survey it is estimated that approximately 88,000 cubic yards of sand is available for harvesting above the floor elevation established and authorized by the USACE for the first borrow area scraping in 2012 and shown on the "North Borrow Areas Profiles", plan sheet 3. These plan profiles show the current beach surface elevations, the established base scrape depth, and the proposed 2018 scrape profile within the fully recovered borrow area.

Beach renourishment accomplished by backpassing sand from the 32nd Street borrow area has been performed in the past in accordance with the Borough's recently expired USACE beachfill permit CENAP-OP-R-2006-6389-24. In compliance with the "Borough of Avalon Beach Management Plan for the Protection of Federally and State Listed Species", no beach excavation will take place within the designated "Protected Zone" south of 40th Street to avoid disturbing the seasonal Piping Plover beach nesting bird habitat. As depicted on the "2018 Beach Recovery plan – North Borrow Area", sheet 6, the March 2018 survey demonstrates that the borrow area fully recovered from the 2016 scraping. Similar post construction surveys have demonstrated that the borrow area beach has recovered to pre-construction elevations after each of the previous scraping projects.

Beachfill Placement

The applicant proposes to place sand on the Borough's beaches between 9th Street and 16th Street. The source sand will be hauled from the borrow area using trucks. The haul route will be maintained on the firm sand below the rack line. The sand will be mechanically graded to the design template with bulldozers and front-end loaders as determined by the contractor. Dunes will be protected by limiting access to the beach by equipment, vehicles and workers to existing beach accesses at street ends between 10th and 15th Streets with an additional access at 32nd Street only. The work will include the restoration of the eroded fore dune and construction of a variable width beach berm at elevation 7.22 N.A.V.D. 88, with foreshore slopes of 20H: 1V to the new MLWL, then 12:1 from MLWL to the toe of the fill limits as practicable. The fill area will cover approximately 6.663 acres, including 5.286 acres below the HTL, with 5.143 acres between the HTL and the MLWL with another 0.143 acres below the MLWL. This template is consistent with the 2002 USACE "engineered beach" design template initially constructed in 2003. The fill template will taper to meet the existing beaches at the northerly and southerly limits of the re-nourishment area from 9th Street to 16th Street. As depicted on the attached engineering plans the toe of the foreshore slopes is indicated in the permit drawings as the seaward limit of fill. However, it is understood that waterward of this point, the fill will slope to the angle of repose natural to this location.

To ensure the hauled sand is placed within the permitted beach fill limits the Borough will monitor the placement and grading of sand throughout the construction process. Post-construction

surveys will be conducted to ensure that the desired template is obtained, and that the permitted beachfill limits are not exceeded.

The applicant is also requesting that the permit be authorized with a ten-year maintenance provision allowing the Borough to transfer scraped sand on a periodic basis as needed.

> ***D. Purpose of Proposed Action:*** *Define the purpose of the proposed structure or work. For example, the purpose of bulkheading may be to stabilize an eroding bank; whereas, the purpose for a pier may be for the mooring of a private boat, for access to a public or private facility, for a marina, or for another purpose.*

The March 2018 storm events were severe enough to cause extensive erosion of the beach berm and scarping of the dunes between 9th Street and 16th Street, which has created an unacceptable loss of the beach berm, further exposing the dunes to erosion and creating unsafe conditions at designated beach accesses, and reducing the carrying capacity of the dry beach above the high tide line. The purpose of the Borough of Avalon's proposed backpassing project is to restore a portion of its recreation beach as soon as possible to prevent further damage to the protective dunes.

> ***E.*** *Submit color photographs of the site, with explanations of the views shown (prints only). Photographs help us to better understand your project. The more photographs you provide, the easier it is to understand and process your application.*

Color photographs representing the project site are provided in **Appendix B.**

ENVIRONMENTAL IMPACT	YES	NO	QUALIFYING REMARKS
C. Culture			
1. Land Use		X	
2. Population Density and Trends		X	
3. Regional Development		X	
4. Historic Places		X	
5. Archaeological Sites		X	See below
6. Aesthetics		X	
7. Utilities		X	
8. Transportation Systems		X	
9. Recreation	X		See below
10. Public Health		X	
D. Other Factors			
1. Secondary Effects		X	
2. Controversiality		X	
3. Is Significant Dredge Involved		X	
4. Is Significant Fill Involved	X		See below

PART II – ENVIRONMENTAL IMPACT CHECKLIST
QUALIFYING REMARKS

A. Physical

1. Topography

The Borough's backpassing project will utilize the previously scraped borrow area between 32nd Street and 40th Street between the mean low water line (MLWL) and a line on the upper beach waterward of the dune toe comprising approximately 19.386 acres. A March 2018 topographic survey found the borrow area to be fully recovered from the last scraping activities performed in 2016. Based on the recent survey it is estimated that approximately 88,000 cubic yards of sand is available for harvesting at depths that will not exceed the floor elevation authorized under USACE permit CENAP-OP-R-2006-6389-24.

Once the scraped sand is hauled and placed in the fill area, the sand will be mechanically graded to the design template with bulldozers and front-end loaders as determined by the contractor. The work will include the restoration of any eroded fore dune and construction of a variable width

beach berm at elevation 7.22 N.A.V.D. 88, and foreshore slopes of 20H: 1V to the new MLWL, then 12:1 from MLWL to the toe of the fill limits as practicable. The fill area will cover approximately 6.663 acres, including 5.286 acres below the HTL, with 5.143 acres between the HTL and the MLWL with another 0.143 acres below the MLWL. This template is consistent with the USACE "engineered beach" design template initially constructed in 2003.

4. Transportation

The scraped sand from the 32nd Street borrow area will be hauled to the beachfill area on the beach using trucks. The haul route will be maintained on the firm sand below the rack line. The foreshore beach is more resilient to sand displacement (tire ruts) and compaction from vehicles than the upper beach, due to the area's high substrate compaction and moisture content. Utilizing a haul route below the wrack line will minimize impacts to this micro-habitat used by foraging shore birds.

8. Water Resources

b. Hydrography, Circulation, Littoral Drift

In 2008, the USACE evaluated the use of back-passing as part of the federal Townsends Inlet to Cape May Inlet Shore Protection Project. The report found "back-passing" to be a feasible alternative method to renourish Avalon's erosion hot spot, that could be implemented as a federal sponsored beachfill method to adequately maintain the eroded north end beach. The report recommended that 100,000 cy. of sand per year was a technically reasonable quantity to borrow from a 2.4-mile area of beach between 31st and 76th Streets, with minimal adjacent shoreline and environmental impacts.

Mott MacDonald performed a topographic survey of the borrow area on March 10, 2018. Plan sheet 6, titled "Beach Recovery Plan – North Borrow Area" depicts the borrow area on a colored map that demonstrates the borrow area to be fully recovered from the last scraping activities performed in 2016. Based on the documented recovery of the borrow area following past scraping activities, and the concurrent opinion of the USFWS in its 2011 Biological Opinion (pg. 15), it is anticipated that accretion will begin replacing the harvested sand in the borrow area immediately. Past observations of scraping in 2012, 2014, and 2016 found daily accretion of the scraped beach occurred before completion of the backpassing project.

B. Biological

1. Vegetation

a. Terrestrial

Potential impacts to dune vegetation will be avoided. Heavy equipment will be transported onto the beach to perform the beach fill activities using the existing beach access path at 13th Street. Trucks and other mechanical equipment used to harvest sand and haul the sand from the borrow area will use the existing 32nd street beach access. The proposed haul route will be maintained below the wrack line on the wet beach.

2. Fish and Wildlife

b. Birds

Some foraging birds may be temporarily displaced during project construction activities. Known beach nesting bird sites will be avoided. The previously authorized North Borrow Area, depicted on plan sheet 2, is outside of the Borough's Beach Management Plan "Protected Zone",

designated between 40th Street and 58th Street for protection of the beach historically used as nesting habitat by piping plovers. Another Protected Zone is designated between 8th Street and 9th Street, however piping plover have not nested in this zone in recent years. Annual beach erosion has likely impacted conditions for suitable habitat.

The applicant recognizes that nesting activities begin around March 15th of each year and chick fledging occurs in August. The timing of the March 2018 storms and the detrimental effects they had on the north end beach requires that the beach be renourished as soon as possible. The applicant is requesting that the backpassing activities that are adjacent to the designated "Protection Zone" be authorized this year, understanding that scraping activities will be performed outside of the nesting area, and any buffer that the USFWS/USACE may apply to the nearest 2018 observed nesting activity. A similar request to perform backpassing without a timing restriction was granted to the Borough for its 2016 emergency backpassing project.

f. Shellfish

The proposed backpassing activities on Avalon's oceanfront is not an estuarine bay or river bottom that has a history of natural commercial shellfish production. The beach fill material will be obtained from the Borough's south-end beach, much of it below the HTL. The North Borrow Area is an accreting beach benefitting from a high rate of alongshore transport of sediment and with it, immigration of benthic invertebrates, including bivalve mollusks. It is anticipated that recovery of benthos populations will begin within days of the scraping activities.

g. Invertebrates

The beach ecosystem is characterized by dense populations of burrowing macro-invertebrates, whose high production is sustained by the wave energy which transports particulate foods to feeding animals in the swash zone. Temperate beaches are characterized by amphipods and isopods in the upper beach; coquina clams, mole crabs, and several species of polychaetes in the swash zone; and molluscs, polychaetes, amphipods, isopods, and other crustaceans in the shallow subtidal zone (Atlantic States Marine Fisheries Commission 2002). Mole crabs, bivalve mollusks, amphipods and polychaetes represent the dominant prey base for piping plover and other shorebirds. The distribution of macrofaunal animals on an individual beach exhibits patchiness, zonation, and fluctuations related to tidal and other migrations (Stephenson 1999). Patchy distribution results from passive sorting by waves and swash from localized food concentrations, variations in the permeability of the sand, and from active biological aggregations. The principal causes of zonation across a sandy beach are exposure, changing wave energy levels, and sand water content and stability (Stephenson, 1999).

It is anticipated that recovery of benthic invertebrate populations will begin within days of the scraping activities. Natural recruitment of benthos will occur in the swash zone as waves bring sediments to the shore. The Biological Opinion prepared by the USFWS dated December 2011 serving as Tier 2 formal consultation for "backpassing activities" determined that the USFWS does not expect adverse effects from the proposed activity appreciably different than those considered in the 2005 PBO for the effects of Federal beach nourishment, renourishment, stabilization and restoration activities in New Jersey.

3. Rare or Endangered Species

The ECOS-iPac website was consulted for a species list for threatened, endangered, proposed and candidate species that may occur in the proposed area of beach activities or that may be affected by the project. The generated species list provided in **Exhibit F** serves to fulfill the requirements of the U.S. Fish and Wildlife Service under Section 7 (c) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) The list contains three listed species, including

two birds - piping plover *Charadrius melodus,* and Red Knot *Calidris canutus rufa,* and one flowering plant – Seabeach amaranth *Amaranthus pumilus.*

The Biological Opinion prepared by the USFWS dated December 2011 served as a Tier 2 formal consultation pursuant to Section 7 of the Endangered Species Act, for the potential effects of "backpassing activities" on piping plover (*Charadrius melodus*) and seabeach amaranth (*Amaranthus pumilus*) (PBO; USFWS 2005). The BO determined that beach scraping in the proposed borrow area will not directly impact piping plovers or seabeach amaranth because there is no record of these species occurring in the beach front borrow area. The BO (pg.24-25) later determines that sand pushing and packpassing activities will not jeopardize the continued existence or recovery of seabeach amaranth or the New York – New Jersey Recovery Unit of the Atlantic Coast population of piping plovers.

Since geographically situated along the mid-Atlantic coast, Red Knots may use the Borough's beaches during migration as a short stopover site for feeding or roosting activities. However, review of the report titled "Rufa Red Knot Background Information and Threats Assessment - Supplement to Endangered and Threatened Wildlife and Plants; Final Threatened Status for the Rufa Red Knot (Calidris canutus rufa)" [Docket No. FWS–R5–ES–2013–0097; RIN AY17] prepared by the USFWS – 2014, identifies the Delaware Bay as one of the primary spring stopover areas or staging sites along the Atlantic coast where red knots typically arrive from late April through late May or early June (Cohen et al. 2009, p. 941; Niles et al. 2008, p.15, USFWS 2014), when individual birds feed on horseshoe crab eggs for about 10 to 14 days (Niles et al. 2008, p. 15) before flying overland directly northwest to the central Canadian breeding grounds (Bimbi et al. 2014, pp. 29–31; Niles et al. 197–200; Niles et al. 2010a, pp. 125–126; Cohen et al. 2009, p. 943; Niles et al. 2008, pp. 20, 24; Morrison and Harrington 1992, p. 79; USFWS 2014, p.54).

As discussed in the USFWS report, "some authors have equated staging sites with sites that attract large concentrations (many thousands) of birds, a definition that others have expanded to include long stopover durations and significant rates of refueling on predictable, abundant prey. Several authors have defined stopover sites as any areas where birds rest and feed during migration (Warnock 2010, p. 621; Pompei and Cuthbert 2004, p. 3; USFWS 2014, p.49). Warnock (2010, p. 621) has argued that further classification of stopover sites is of ecological and conservation value and proposed that staging areas should be defined as those stopover sites with abundant, predictable food resources where birds prepare for an energetic challenge (usually a long flight over a barrier such as an ocean or a desert) requiring substantial fuel stores and physiological changes without which significant fitness costs are incurred (Warnock 2010, p. 621; USFWS 2014, p.49). The report suggests, there are probably relatively few true staging sites in the world (e.g., Delaware Bay), and there can be profound individual and population-level consequences for birds when these sites are lost or degraded (Warnock 2010, p. 624 USFWS 2014, p.49).

The 2014 USFWS report indicates that red knots have been observed using several suitable habitats within a stopover complex. The report states that, "some red knots that feed primarily in Delaware Bay during the spring stopover regularly fly 10 to 50 mi (16 to 81 km) across the Cape May Peninsula to use the extensive sandy beach, mud flats, and salt marshes in the vicinity of Stone Harbor, New Jersey for both foraging and roosting (Clark et al. 2009, pp. 87, 89; Niles et al. 2008, p. 44; Sitters 2005, p. 6; Sitters 2001, p. 2; Harrington 1996, p. 76; USFWS 2014, p.).

The proposed beach renourishment activities on the Avalon beach are not located in the identified Delaware Bay primary feeding or roosting habitat for Red Knots, nor is the project of a scale that would be expected to directly impact Red Knot spring migration habits. The sand scraping activities will be conducted on the beach in the northern portion of seven-mile island.

The North Borrow Area is an 8-block long section of the Borough's 72 block beach, that has been historically used for harvesting sand for past beach renourishment projects. Observations of sand scraping in the North Borrow Area in 2012, 2014, and 2016 found daily accretion of the scraped beach occurred before completion of the backpassing project. The recovery of benthic invertebrate populations is expected to begin within days of the scraping activities. Natural recruitment of benthos will occur in the swash zone as waves bring sediments to the shore.

C. Cultural

5. Archaeological Sites

The proposed beach scraping activities will not impact any archaeological sites. The maximum scrape depth was established and authorized in 2012 under CENAP-OP-R-2006-6389-24 based on the historical elevation of the beach, whereby no evidence of shipwreck debris was exposed.

9. Recreation

The loss of the beach berm and scarping of the dunes between 9th Street and 16th Street has created unsafe conditions at USACE constructed beach access paths, and reduced the carrying capacity of the dry beach above the high tide line. The purpose of the Borough of Avalon's proposed backpassing project is to repair the dune scarps, rebuild the access paths and restore a portion of its recreation beach as soon as possible to protect the dunes from further damage. The proposed activities will reestablish public access to the bathing beach and the reestablishment of the beach berm will enhance the carrying capacity of the beach for summer recreation activities.

D. Other Factors

4. Is Significant Filling Involved

The beachfill area will cover approximately 6.663 total acres, including 5.266 acres below the HTL, with 5.143 acres between the HTL and the MLWL with another 0.143 acres below the MLWL. The beach fill area is within the USACE 2002 "engineered beach" template.

PART III

CONSIDERATIONS OF A DREDGING PROPOSAL

A. Described characteristics and locations of the proposed dredge material disposal site. Provide photographs.

N/A

B. Is there a comprehensive plan for disposal sites that takes into account the accumulative effect over time and the decreasing amount of suitable sites for disposal?

N/A

C. Describe the present land use of the disposal site.

N/A

D. Describe characteristics of the material to be disposed, including: N/A

1. *Physical source of material (i.e. sand, silt, clay, etc.) Give percentages of the various fractions if available.*

2. *Chemical composition of material: Many areas, especially marinas, highly industrialized areas, etc., have sediments with high concentrations of pollutants (chemicals, organic material, etc.). These materials may be re-suspended or reintroduced into the water and result in serious environmental damage. If your proposed dredging is in an area such as described above, a chemical analysis of the material to be dredged should be provided.*

3. *Dewatering properties of the material to be disposed.*

4. *Compactability of material and settling rates of material to be disposed.*

5. *Dredging and disposal schedule to insure that operations do not degrade water quality during times of anadromous fish migration.*

E. When the project involves land disposal, discuss the following: N/A

1. *Method of disposal to be utilized, i.e., pipeline discharge, barge, hopper (underway or stationary).*

2. *Describe method of dredged material containment (i.e. embankment, behind bulkhead, etc.)*

3. *What type of leachates will be produced from the spoil material and what is planned for protection of the groundwater?*

4. *Methods to insure that spoil water does not adversely affect water quality, both during construction and after completion of the project.*

5. *Provisions for monitoring during discharge: water quality, sediment transport, and precautions to prevent "short-circuiting" dumping.*

F. Consider and discuss the following for water disposal: N/A

1. *Describe methods to be used for water disposal, including volumes and site selection.*

2. *Describe the existing water characteristics at the site, including chemical analysis for water quality.*

G. ***Discuss the frequency and amount of maintenance dredging which will be required; discuss the resulting impacts.*** N/A

H. ***Alternatives.*** N/A

1. *Discuss all alternatives to the project, including the "no action" alternative.*

2. *Discuss alternative types and methods of dredging and disposal*, such as pipeline discharge, barging, or hopper method.

3. *Discuss alternatives to dredging.*

4. *Discuss alternative areas of sites for spoil disposal.*

5. *Discuss impact of port docking patterns upon the demand for dredging. Can alternative patterns reduce the amount of dredging required to support port operations?*

6. *Support alternative means of construction that would prevent or minimize water quality degradation using EPA standards for guidance.*

7. *State in detail impacts resulting in alternative locations for the proposed project.*

Part IV

CONSIDERATIONS OF A FILLING PROPOSAL:

A. ***Describe in detail the existing characteristics of the area proposed for filling (i.e. aquatic area, marsh, mudflat, swamp, etc.). In your description, be sure to include the types of vegetation present and the types of animals that use the area. Provide photographs.***

The oceanfront beach between 9th Street and 16th Street is a maintained recreational beach where beach raking is authorized by the Borough's NJDEP Beach Maintenance permit, and in accordance with the Borough's federally coordinated "2009 BEACH MANAGEMENT PLAN FOR the PROTECTION OF FEDERALLY and STATE–LISTED SPECIES". The beach has been severely eroded from the effects of a series of March 2018 storms. At present, there is no vegetation present on the eroded beach.

Adjacent to the proposed beach nourishment area are primary and secondary vegetated dunes between the beach and residential development that exists along the length of the project. The dune system contains existing USACE constructed fenced beach access paths that typically begin from the Borough's paved street ends and extend to the recreational beach.

At the time of this application, other than commonly observed foraging shorebirds. there are no other animals believed to use the area. Photographs of the beach are provided in **Appendix B.**

B. ***Give the following information in regard to the project size:***

1. *Total area to be filled.*

The fill area will cover approximately 6.663 acres, including 5.266 acres below the HTL. The fill template will taper to meet the existing beaches at the northerly and southerly limits of the re-nourishment area from 9th Street to 16th Street.

2. *Size of underwater area to be filled.*

Approximately 0.143 acres of sand will be placed below the MLWL. As depicted on the attached engineering plans the toe of the foreshore slopes is indicated in the permit drawings as the seaward limit of fill. However, it is understood that waterward of this point, the fill will slope to the angle of repose natural to this location.

3. *Area of intertidal zone to be filled.*

Approximately 5.143 acres will be filled between the HTL and the MLWL.

4. *Area of wetlands to be filled.*

None

9. *Proposed height of fill.*

The restored beach will have a variable width beach berm at elevation 7.22 N.A.V.D. 88.

6. *Volume of material that will be used in filling.*

The topographic survey performed on March 10, 2018 found the north borrow area comprising an area of approximately 19.386 acres between the mean low water line (MLWL) and the landward excavation limit. Of this area approximately 5.286 acres are below the High Tide Line (HTL). The area appears to be fully recovered from the last scraping activities in 2016. Based on the recent survey it is estimated that approximately 88,000 cubic yards of sand is available for harvesting. Scraping depths will not exceed the floor elevation established during the first borrow area scraping in 2012 as shown on the plan profiles. These plans depict the original beach surface elevations, the initial 2012 excavation depth limitss, the present surface sand elevations, and the proposed 2018 scrape depths within the fully recovered borrow area.

C. Describe in detail the material to be used as fill including as follows:

1. *Type of fill to be used (sand, stone, rubble, etc.). If the material is a composite (i.e., rubble), list the types of materials it will contain.*

   The sand to be mined from the 32nd Street to 40th Street beach will be of suitable grain size compatible with the existing beach to be nourished.

2. *Give the specific location of the source of this material.*

   The backpassing project will utilize the previously scraped borrow area between 32nd Street and 40th Street. The sand scraping activities will take place between the mean low water line and a ten-foot offset from the toe of the dune.

3. *What types of leachates will be produced from the fill material and what is planned for protection of surface and groundwater?*

1. *Discuss the "no action" alternative and how this would affect your present and future plans for the development of the area.*

   The "no action" alternative would result in Atlantic Ocean wave driven waters to continue to erode the beach and existing dune complex. Eroded beaches jeopardize the integrity of adjoining dunes putting the adjacent properties and public safety in jeopardy. Beach loss also negatively impacts the amount of available "recreation beach" and Federally threatened and State endangered shore bird nesting habitats.

2. *Discuss alternative locations for the proposed fill.*

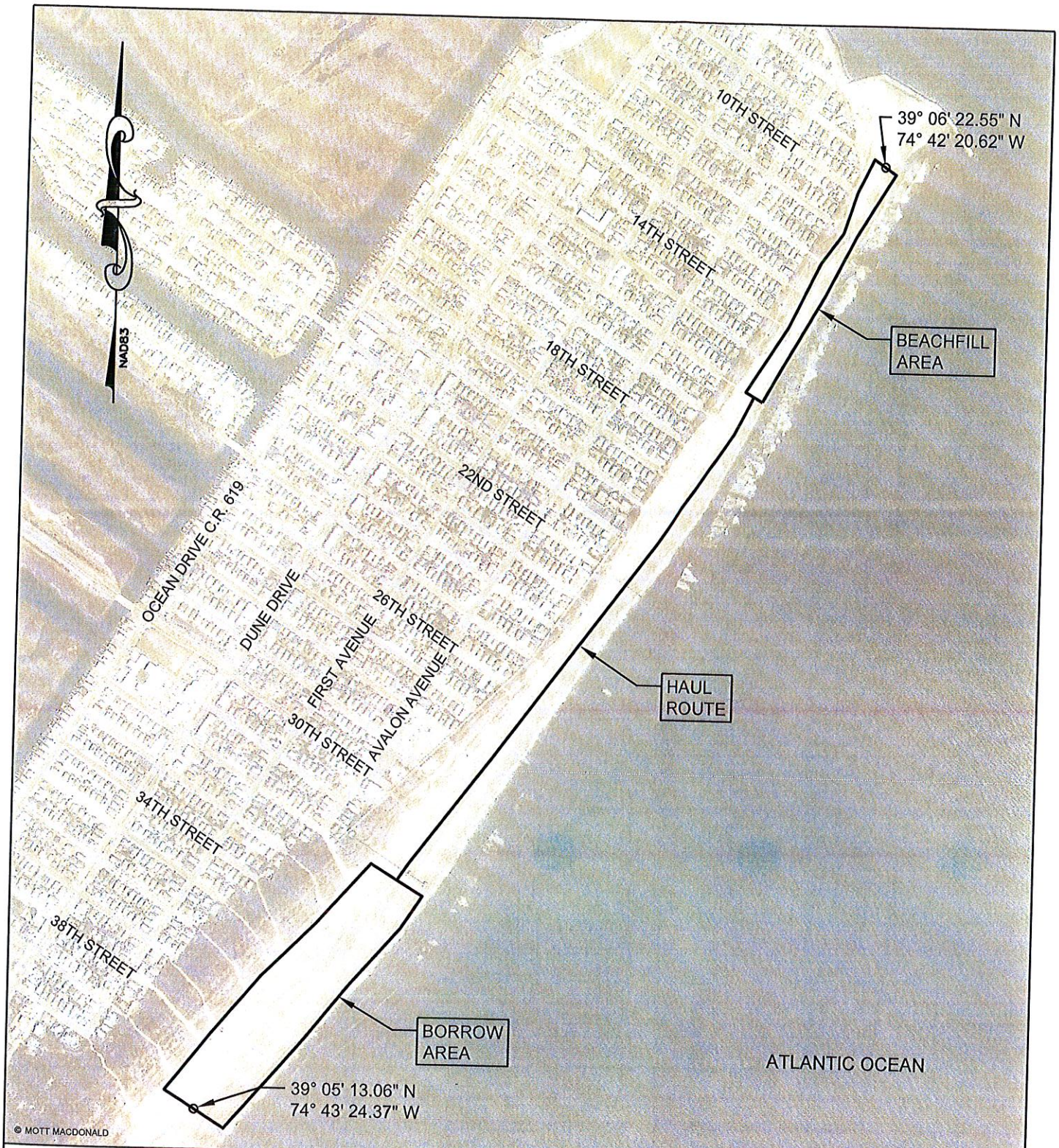
   Discussion of alternative locations for fill is not relevant, since the project is being undertaken for the purpose of restoring the eroded beaches.

3. *Discuss the use of elevated structures (i.e. causeways, elevated platforms, etc.) in place of the proposed fill.*

   Not Applicable

4. *Discuss any other alternatives you have considered prior to formulating the presently submitted proposal.*

   Considering the time sensitivity of the project, backpassing allows the emergency renourishment of the eroded beach to be completed within the desired timeframe. Harvesting sand from the ocean borrow site via hydraulic dredging is neither a practical alternative time wise nor economically feasible for the size of the project. Trucking sand from an inland borrow pit is neither economically practicable nor would it have the least impact on the community and its roads.



Title

BOROUGH OF AVALON
CAPE MAY COUNTY, NEW JERSEY
2018 BACKPASSING PROJECT

FIGURE 2 - ROAD MAP

MOTT MACDONALD

211 Bayberry Drive, Suite 1A
Cape May Court House, NJ 08210
Certificate No. 24GA28016600

T +1 (609) 465 9377
F +1 (609) 465 5270
W www.mottmac.com/americas

Date	Drawn	Checked	Approved	Scale at ANSI A
3/19/2018	SJM	SCM	SCM	1" = 1,000'