

EXECUTIVE SUMMARY

Obtain a recommendation for approval of the 2016 Collier County Beach Renourishment Plan and make a finding that this item promotes Tourism.

OBJECTIVE: Obtain a recommendation for approval and concurrence to proceed with the 2016 Collier County Beach Renourishment Plan, which includes a five (5) year sand supply solicitation, a Request for Proposal (RFP) for engineering services to obtain a Florida Department of Environmental Protection (FDEP) Notice to Proceed (NTP) and concurrence of expected timing, costs and permit restrictions.

CONSIDERATIONS:

The 2016 Collier County Beach Renourishment Plan has been developed by staff and includes:

1. **2016 Beach Renourishment** - The physical beach surveys conducted in January/February 2016 indicated that the Vanderbilt Beach, the Park Shore Beach and parts of the Pelican Bay Beach need renourishment in 2016. The beach width measurements and three years of advanced renourishment placement was included in the calculations and indicate that Vanderbilt Beach (R22-R30) will require approximately 30,000 CY's (cubic yards) of renourishment; Park Shore Beach (R44-R53) will require 25,000 CY's to 30,000 CY's of renourishment; and the Pelican Bay Beach will require approximately 34,000 CY's of renourishment. No renourishment is recommended for the Naples Beach (R58- R79). The area south of Doctors Pass will be renourished when Doctors Pass is dredged when the installation of the Erosion Control Structures is complete. These quantities have been confirmed by an independent Peer Review consultation.

Preliminary discussions with the Beach Committee Chairman of the for the Pelican Bay Services Division indicated that a more realistic renourishment quantity that the Services Division is willing to compensate the County for would be approximately 7,500 CY's to 10,000 CY's. No sand will be placed on the Pelican Bay Beaches without an executed Memorandum of Understanding (MOU) outlining the terms and conditions of the Pelican Bay beach renourishment.

Based on this analysis, staff is recommending that the County proceed for planning purposes with a project to be built after November 1, 2016 using truck haul construction and either off road vehicle transport on the beach or sand fluidization and pipeline transport. The sand fluidization and pipeline transport placement approach is being considered to enhance public safety and will be bid as an option. Stated quantities will be used for planning and bidding purposes and will be adjusted prior to construction during the pre-construction survey that the contractor performs.

Cost to complete this work with engineering, sand supply, transport, beach placement, Construction Engineering Inspection (CEI) and certification is expected to be \$3M to \$4.5M after reimbursement of the Pelican Bay renourishments costs.

2. **Five (5) year Sand Supply Contract and engineering support** – Staff is recommending that the County bid a 5 year sand supply contract for supply of approximately 50,000 CY's per year for a total placement over a 5 year period of 250,000 CY's. The supply contract will be awarded based on "At-Beach" pricing utilizing a mine price per ton plus a specified transportation price of \$.20 per ton per one way haul miles. This will assure that Collier County receives the best overall price of sand delivered to our site. The average grain size will also be increased to .4mm from .33mm to utilize more commercially available sand that still meets the requirements of our FDEP permit. A larger grain size will also hold a steeper angle of repose and better withstand erosion.

An engineering Work Order (WO) not to exceed \$12,000 will be required to develop the specifications, Quality Assurance Plan and bid package to complete this work. Proceeding with the engineering to develop the sand supply contract is critical to completion of this task and recommended by staff.

3. **Engineering Services** – The renourishment of beaches in this plan will result in construction costs in excess of \$2M and require a RFP solicitation for engineering support. Staff will proceed with the development of an engineering services package to include design, specifications, construction drawings, procurement support, a Notice-to-Proceed, and project certification. Consultant selection will be based on qualifications however the estimated cost for this work is not expected to exceed \$130,000 and be reimbursable on a time and material basis. This cost is included in the \$3M to \$4.5M. This solicitation will be consistent with previous truck haul beach renourishment projects that the County has performed in the past.
4. **Sugden Park Lake renourishment** – The Sugden Park lake shoreline will be renourished with 10,000 CY of beach quality sand in the sailboat launch area, the main park beach and the water ski beach/stands area. Restoration of inland lakes may be funded with tourist development tax funds with a finding that the project promotes tourism. This project is part of the beach renourishment program and will be funded using Fund 195. To fund this project with Fund 183 funds would be inconsistent with the definition of beach park facilities and it has been defined by the County based on historical expenditures. Sugden Park is an inland lake and not a beach park as traditionally defined. Expected cost to be approximately \$400,000.
5. **Permit Restrictions** – Both the United State Army Corps of Engineers (USACE) and the FDEP permit restrict sand trucking activities on Corkscrew Road to daylight hours due to Fish and Wildlife Service (FWS) concerns of interference with Florida Panther foraging activities in the twilight hours. This may possibly restrict the number of truck trips a trucker can complete per day and increase costs. This will depend on the mine selected to provide sand and approved truck routes specified by the County.

GROWTH MANAGEMENT IMPACT: There is no impact to the Growth Management Plan related to this action.

FISCAL IMPACT: The Overall 2016 beach renourishment program as outlined will cost between \$3M to \$4.5M including Engineering and CEI services. The sand supply contract including the engineering to develop the RFP package will cost approximately \$750,000 per year for 5 years. The cost of the Pelican Bay beach renourishment is not included in the \$3M to \$4.5M specified costs and will be reimbursed by The Pelican Bay community. The renourishment of Sugden Park lake shoreline will be approximately \$400,000, is not included in the Renourishment estimate of \$3M to \$4.5M and will be paid via Fund 195.

ADVISORY COMMITTEE RECOMMENDATIONS: At the March 10, 2016 Coastal Advisory Committee meeting this item was unanimously recommended for approval by a 7 to 0 vote.

LEGAL CONSIDERATIONS: This item has been reviewed and approved as to form and legality. As discussed above, the “restoration of an inland lake to which there is public access as these uses relate to the physical preservation of the inland lake” is an authorized expenditure of tourist development funds. Based on the County’s Ordinance No. 92-60, as amended and Funding Policy Resolution No. 13-81, this project is eligible for funding using Fund 195 and not Fund 183 beach park facilities. Using Fund 183 would be an inconsistent expansion of the definition of beach park facilities based on the County’s historical expenditure. This item requires a finding that the expenditure promotes tourism and majority vote for approval. – CMG

RECOMMENDATION: Recommend approval of the 2016 Beach Renourishment Plan and make a . finding that this item promotes tourism.

Prepared By: J. Gary McAlpin, P.E., Coastal Zone Management, Capital Project Planning, Impact Fees and Program Management Division, Growth Management Department

Attachments:

- 1) 2016 Beach Renourishment Sand Analysis

**COLLIER COUNTY BEACH NOURISHMENT PROJECT
 METHODOLOGY**

**DEP PERMIT 0222355-001-JC Mod (012-JN)
 USACOE Permit SAJ-2003-12405 Mod (MOD-KS)**

COLLIER COUNTY

PREPARED BY
 HUMISTON & MOORE ENGINEERS
 FEBRUARY 2016

This report by Humiston & Moore Engineers (H&M) presents the analysis of a monitoring survey, conducted in January of 2016 used to estimate the immediate future sand renourishment requirements based on the design beach width standard established prior to the 2005/2006 project. This monitoring survey was conducted by Sea Diversified Inc. (SDI) between January 11th and January 26th 2016 subsequent to the December 2013 and 2014 truck haul renourishment projects for the Collier County Beach Nourishment Project. Vanderbilt and Pelican Bay beaches were surveyed prior to a storm impacting the area on the weekend of January 16th and 17th while the beaches south of Clam Pass were surveyed after the storm. In order to document the impact on Vanderbilt and Pelican Bay beaches, a wading depth survey was conducted on February 13, 2016. Project limits for this report were based on the monument range information provided in second and third columns of **Table 1** derived from the 2005/2006 nourishment project fill template.

Table 1. Project Monument Range – Design Standard

<i>Project Area Beach</i>	<i>North Limit of Project (Monument)</i>	<i>South Limit of Project (Monument)</i>	<i>Design Standard (Ft)</i>
<i>Vanderbilt</i>	<i>R-22</i>	<i>R-30.5</i>	<i>100</i>
<i>Pelican Bay</i>	<i>R-30.5</i>	<i>R-37</i>	<i>100</i>
<i>Park Shore</i>	<i>R-48.5</i>	<i>R-54</i>	<i>85</i>
<i>Naples</i>	<i>R-58A</i>	<i>R-79</i>	<i>100</i>

A *Design Standard* beach width and a corresponding fixed baseline were established prior to the 2006 project. The *Design Standard* for the beach width from the baseline is shown in the last column of **Table 1**. The baseline was set at the seawall, edge of vegetation, building line or equivalent, at each monument. The beach width was determined by the distance from the baseline to the mean high water elevation of +0.33 NAVD (+1.61 NGVD) at each DEP reference monument.

Projected erosion rates (shown as a negative number by convention) represent the amount of sand needed in addition to the design beach width to offset the background erosion anticipated in the respective project area to account for the time period between renourishment events in order to maintain a beach width equal to or greater than the *Design Standard*. These estimates shown in **Table 2** for one and three years were provided by CB&I; the three year rate is used in this analysis.

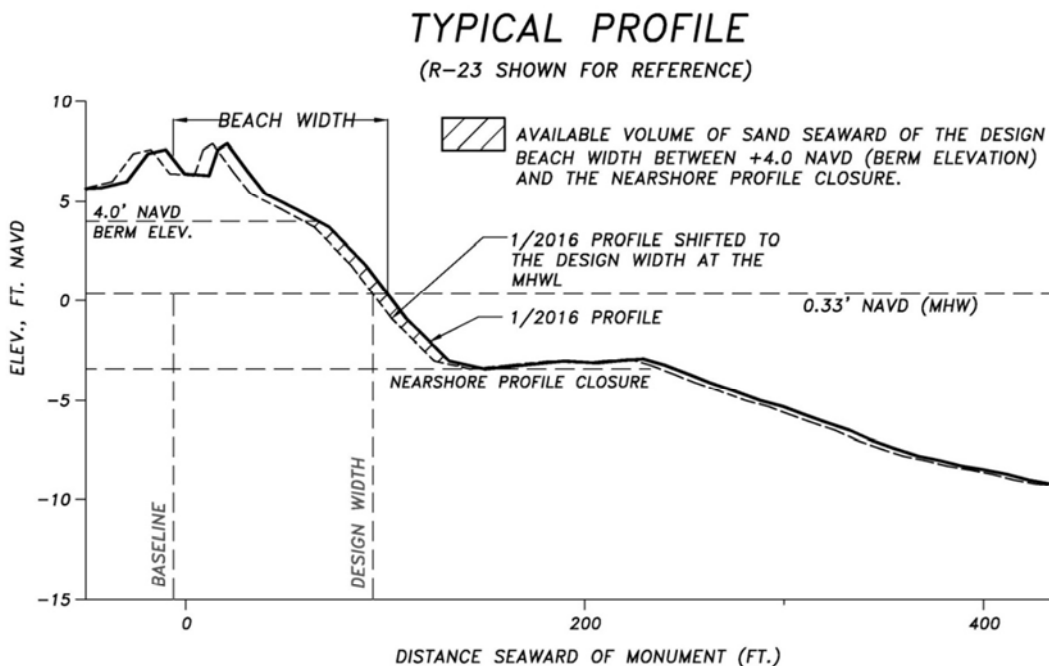
Table 2. Projected Erosion Rates

<i>Project Reach</i>	<i>*Annual Erosion (CY/Yr)</i>	<i>*3-Year Erosion (CY/3 Yrs)</i>
<i>Vanderbilt (R-22+300 to R-30.5)</i>	-9,702	-29,106
<i>Pelican Bay (R-30.5 to R-37)</i>	-3,331	-9,993
<i>Park Shore (R-43+650 to R-54+400)</i>	-11,138	-33,414
<i>Naples (R-58A to R-79)</i>	-27,069	-81,207

**Rates provided by CBI*

The sandy beach width from the baseline to the mean high water line was compared to the *Design Standard* for each project area to determine the advance volume remaining at each monument. This volume was calculated using the hatched area as shown in **Figure 1** for beach profiles having widths greater than the *Design Standard*, and the effective distance or the distance between the monuments. This volume was deducted from the 3-year erosion projection to determine the amount of sand needed to offset the projected erosion rate for a 3-year renourishment interval. In cases where the existing profile is landward of the design width at the mean high water line then this amount would be needed in addition to the three year projection.

Figure 1. Typical Profile – Available Advance Volume



Vanderbilt and Pelican Bay beaches were originally surveyed prior to a storm impacting the area on the weekend of January 9 and 10, 2016. A wading depth survey was conducted on February 13 at monuments R-23, R-24, R-26, R-30, R-32, R-34, and R-36 in order to document the nearshore changes as a consequence of the storm activity. The beach profiles for this survey follow a typical pattern showing upland loss as the profile slope decreased near the shoreline and there is indication the nearshore bar was impacted as shown in **Figure 3**. These upland losses were estimated (Column 10 of **Table 3**), added to the projected volumes calculated from the advance volume analysis depicted in **Figure 2** to update the projected sand requirements for 2016 shown in **Table 3**.

Figure 3. Typical Wading Depth Beach Profile - February 2016

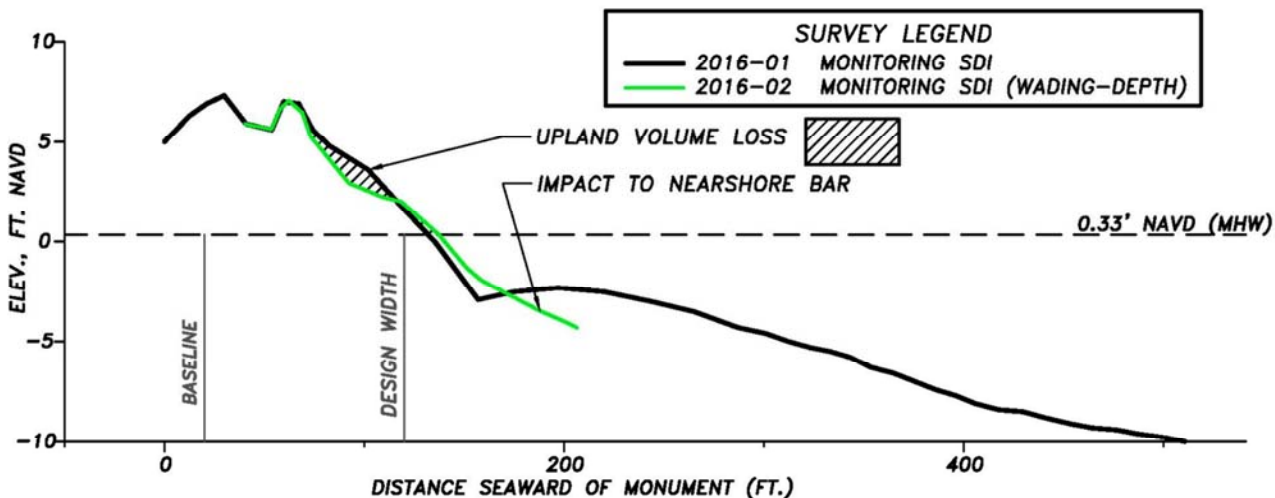


Table 3 shows the project area(s) shaded in light gray and the reaches with sand losses in excess of the projected 3-year erosion rate are shaded dark gray. The results of the advance volume analysis described in **Figure 2** are shown in **Table 3: Column 9**, and the results of the upland loss analysis described in **Figure 3** are shown in **Table 3: Column 10**. **Columns 11, 12 and 13** show the resultant sand losses by monument, the losses totaled by reach, and the projected beach width at each monument if the losses were to be replenished.

Table 3: Projected Sand Requirements

New Business 7-j

Project Area	*3-Year Erosion Rate	Longshore Distance	Erosion Rate x Distance(%)	Measured	(6)-Design Standard	Calculated Graphically	(5) + (8)	Calculated Graphically	(9)+(10)	Subtotal (11)	(11) / Shore Normal Unit Volume	
		Column #	4	5	6	7	8	9	10	11	12	13
		FDEP Mon.	**Fill Effective Distance (Feet)	Weighted 3 Year Erosion (CY/3 Yrs)	1/2016 Beach Width (Feet)	Width less Des. Std. (Feet)	***2016 Advance Volume (CY)	Net Advance Volume (CY)	Upland Volume Loss-Feb. (CY)	Total Volume Req'd (CY)	Project Volume Req'd (CY)	Projected Beach Width (Ft)
Vanderbilt Beach	-29,106	R-22	145	-506	105	5	173	-333	-182	-514		120
		R-23	1,013	-3,533	107	7	2,037	-1,496	-1,268	-2,764		116
		R-24	1,070	-3,732	112	12	3,210	-522	-1,427	-1,948		119
		R-25	1,033	-3,603	98	-2	-693	-4,296	-2,053	-6,349		116
		R-26	989	-3,449	117	17	5,058	1,609	-2,611	-1,002	-30,577	120
		R-27	1,095	-3,817	98	-2	-584	-4,401	-2,795	-7,196		123
		R-28	1,026	-3,577	108	8	2,203	-1,374	-2,530	-3,904		122
		R-29	942	-3,286	109	9	2,289	-997	-2,781	-3,778		124
		R-30	1,033	-3,603	113	13	4,033	430	-3,550	-3,121		123
Pelican Bay Beach	-9,993	R-31	1,022	-1,676	123	23	6,964	5,289	-3,584	1,704		
		R-32	1,012	-1,659	119	19	5,869	4,210	-3,621	589	2,294	
		R-33	1,022	-1,676	102	2	734	-942	-3,727	-4,669		115
		R-34	1,012	-1,659	94	-6	-1,911	-3,571	-3,759	-7,329		117
		R-35	998	-1,637	83	-17	-5,186	-6,823	-3,950	-10,773	-33,921	118
		R-36	764	-1,253	81	-19	-4,355	-5,607	-3,209	-8,816		119
		R-37	264	-434	91	-9	-790	-1,224	-1,110	-2,334		118
Clam Pass	N/A	R-38			102							
		R-39			107							
		R-40			115							
		R-41			146							
		R-42			53							
		R-43			47							
						Notes: *Provided by CBI **Based on the 2005/2006 Fill Template ***Based on the available volume seaward of the design beach width between +4 NAVD (2013 berm elevation) and the nearshore profile closure.						
Park Shore Beach	-33,414	R-44	438	-1,373	70	-15	-2,842	-4,215		-4,215		92
		R-45	1,078	-3,379	84	-2	-571	-3,950		-3,950	-12,514	94
		R-46	1,040	-3,262	82	-3	-1,087	-4,348		-4,348		95
		R-47	953	-2,989	104	19	4,505	1,516		1,516	1,948	
		R-48	1,000	-3,136	96	11	3,567	431		431		
		R-49	1,077	-3,376	90	5	1,910	-1,466		-1,466	-1,466	93
		T-50	1,208	-3,787	115	30	12,884	9,097		9,097	9,821	
		R-51	1,108	-3,473	97	12	4,197	724		724		
		R-52	967	-3,032	86	1	244	-2,788		-2,788	-3,128	96
		R-53	1,060	-3,322	96	11	2,982	-340		-340		97
		T-54	729	-2,286	114	29	6,610	4,324		4,324	4,324	
		U-55			121							
		R-56			153							
		T-57			167							
						North of Doctors Pass						
Naples Beach	-81,207	R-58A	517	-2,248	40	-60	-11,363	-13,611		-13,611		112
		R-58	790	-3,433	103	3	813	-2,620		-2,620		111
		R-59	1,033	-4,491	115	15	3,827	-664		-664	-8,701	118
		R-60	1,081	-4,700	98	-2	-717	-5,417		-5,417		116
		R-61	1,049	-4,559	138	38	11,463	6,904		6,904	6,904	
		T-62	1,015	-4,410	102	2	819	-3,591		-3,591		113
		R-63	967	-4,204	113	13	4,292	88		88	-9,649	113
		R-64	854	-3,713	91	-9	-2,433	-6,146		-6,146		113
		T-65	804	-3,495	112	12	3,860	365		365		
		R-66	813	-3,533	127	27	9,291	5,758		5,758		
		R-67	805	-3,497	171	71	21,627	18,129		18,129		
		R-68	810	-3,521	166	66	22,867	19,346		19,346		
		T-69	805	-3,498	137	37	12,457	8,960		8,960		
		R-70	800	-3,479	133	33	10,824	7,345		7,345	142,063	
		R-71	803	-3,491	139	39	13,933	10,442		10,442		
		R-72	808	-3,510	170	70	25,349	21,838		21,838		
		R-73	814	-3,537	178	78	27,381	23,844		23,844		
		R-74	803	-3,490	187	87	29,526	26,037		26,037		
		R-75	795	-3,456	115	15	2,118	-1,339		-1,339		124
R-76	799	-3,475	111	11	2,268	-1,207		-1,207	-2,545	116		
R-77	782	-3,399	119	19	4,099	699		699	699			
R-78	659	-2,866	101	1	188	-2,678		-2,678		114		
R-79	276	-1,202	89	-11	-1,040	-2,242		-2,242	-4,920	112		