Regular Workshop – October 17, 2016
Agenda Item 8

Agenda Item: Canal Dredging Feasibility Study Update

Presenter: Town Manager and staff

Summary: The Town performed its first ever canal dredging project in 2003. In 2013, the Public Works Department performed manual soundings of approximately 40 canals throughout the Town. The results of that survey were presented to the Town Commission at the December 11, 2013 Workshop. The Town Commission then directed staff to initiate a more detailed survey and perform a full canal feasibility study of all Town canals.

Taylor Engineering (Jacksonville and Sarasota, FL) was engaged to perform the feasibility study that, among other things, included additional reconnaissance surveys, planning level dredging volumes and associated preliminary opinions of probable costs and potential funding options. Taylor Engineering will present interim findings at the October 17, 2016 Regular Workshop Meeting.

Attachments: 10-07-16 Memo, Public Works Director to Manager;
Taylor Engineering, Inc. Canal Feasibility Study.

Recommended Action: Pending discussion, provide direction to Manager.

M E M O R A N D U M

Date: October 10, 2016

TO: Dave Bullock, Town Manager

FROM: Juan Florensa, Public Works Director

SUBJECT: Canal Feasibility Study Update

The Town of Longboat Key is defined by its coastline. While the Gulf of Mexico waters that lap Town's shoreline are enjoyed by many visitors and residents, the Town's saltwater canal area is also an important component of the Town's coastal system. All of these canals are located along the eastern side of the Key and can be accessed from Sarasota Bay.

Some of the canals were excavated (dredged) by developers as the Town was built. The canals provided an attractive selling/marketing feature for new homes and condominiums. Over the last four decades the canals slowly silted in shoaling to the point of becoming difficult to navigate especially at low tide. In 2003, the Town performed its first ever canal dredging project. Thirty canals were dredged. Approximately 23,000 cubic yards of material was excavated and disposed of. The construction cost was $1.5 million. Dredging began in March 2003 and was completed in December 2003. The project was funded from the Town's General Fund (Ad Valorem), Infrastructure Surtax, and West Coast Inland Navigation District (WCIND) grants.

In 2013, the Public Works Department performed manual depth soundings of approximately 40 canals throughout the Town. The recorded depths were corrected to daily tide elevation. The results of that survey were presented to the Town Commission at the December 11, 2013 Regular Workshop Meeting. The survey confirmed there was generally good depth for navigation but certain areas had increased rates of shoaling. These specific areas were concentrated at the mouth of the canals or near stormwater drainage pipe outfalls.

The Town Commission directed staff to initiate a more detailed survey and perform a full feasibility study of all Town canals. In 2013, Taylor Engineering (Jacksonville and Sarasota, FL) was engaged to perform the feasibility study. Among the tasks Taylor was requested to perform were more detailed surveys, provide planning level dredging volumes and associated preliminary opinions of probable costs. Taylor was also asked to investigate funding options for canal dredging.

Taylor estimates that as much as 95,000 cubic yards of material will eventually need to be excavated at the current rate of shoaling to restore all canals to the State-permitted depths. Planning level construction cost estimate range is about $2.5 million to $6 million depending on the extent and timing of the work.

We currently have a fund balance of $517,399 in the canal dredging fund and another $700,000 available in the Infrastructure Surtax which competes with the cash balance available in the IST Fund for a total of $1,217,399.

If the Commission desires to move forward, staff has identified the following next steps and proposed timeline:

- FY 2016-2017 – Complete formal Bathymetric Survey of canals, prepare design and permitting documents; submit to Florida Department of Environmental Protection (FDEP) and US Army Corps of Engineers (USACE) for review and approval.
- FY 2017-2018 – Obtain permits from regulatory agencies. Formalize and enact the required legislation if all or part of the funding will be through special taxing district or other forms other than ad-valorem.
- FY 2018-2019 – Begin construction.

Taylor Engineering staff will be present at the October 17, 2016 Regular Workshop Meeting to review in detail the work performed to date. The attached PowerPoint presentation will be discussed as well.

Please contact me if you have any questions or require additional information.

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Town of Longboat Key
Project Update

Canal Dredging
Feasibility Study

October 17, 2016

Project Approach – Technical Elements

- Tasks 1 and 2: Start with common database for long-term consistency
  - Acquire/update Town's GIS
  - Integrate property appraiser's data
  - Framework for adding field data
- Task 3: Field Data Collection
  - Question of balancing cost vs. need
    - Bathymetry
    - Sediment
    - Resources
  - On-going monitoring program

Task 1: Data Collection and Review

2013 Soundings

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Task 1: Data Collection and Review

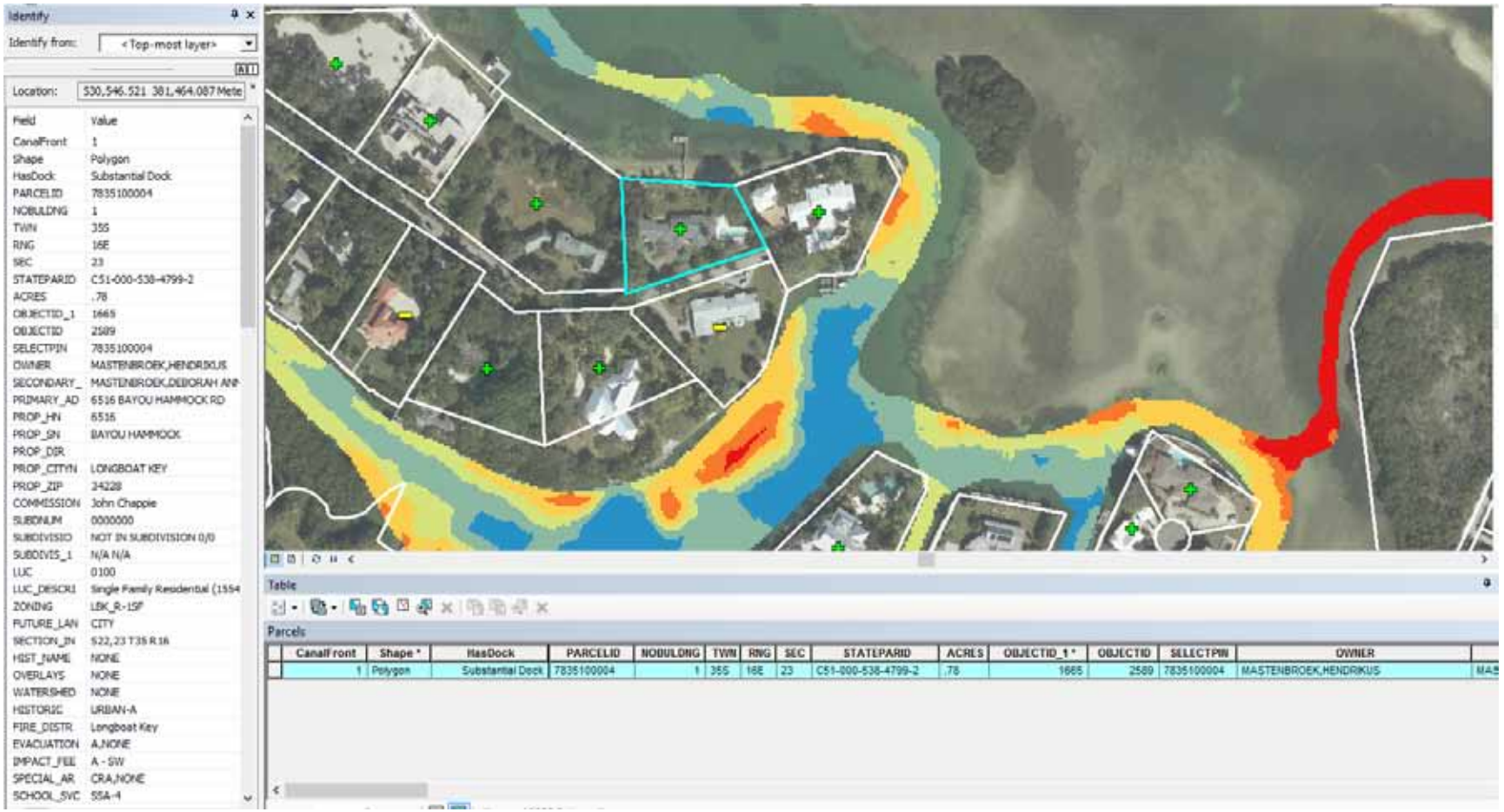
53 navigable canals have been inventoried by the Town.

Longboat Key Canal Dredging Report
Canal Depth Table

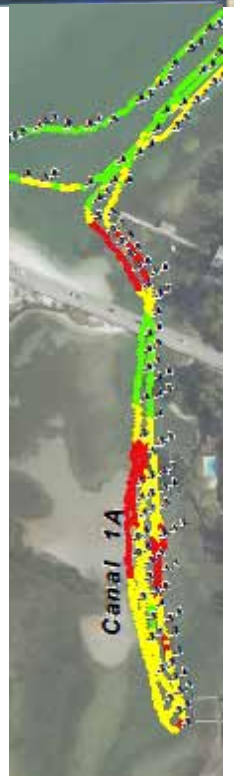
Canal Surveys	Street to North	Street to South	Corrected Depth	Permitted/Permit Exemption Depth
Canal 2 (Inc.Access)				
2 Marker 2 red			6.3	5.4
marker 3			5.6	5.4
marker 4-5			6.1	5.4
marker 7 green (missing day-lite)			5.8	5.4
marker 9	Bayou Hammock Road		6.4	5.4
no marker 6881 LB Dr S			4	5.4
no marker 6851 LB Dr S			4.7	5.4
Center run 6841 LB Dr S to Jackson Way		Whitney Beach Association	3.9	5.4
			3.9	5.4
			4.1	5.4
Canal 3	Shinbone Alley	Juan Anasco Drive	3	3.4
			3.5	3.4
			4	
Canal 4	Juan Anasco Drive	DeNarvez Drive	5.2	5.4
			5.9	5.4
			5.6	5.4
			4.8	5.4
			4	5.4
Canal 5	DeNarvez Drive	Bayview Drive	4.9	5.4
Canal 6	Bayview Drive	Lyons Lane	5.4	4.4

Task 2: Develop GIS Database

Parcel Information:



Task 3: Field Investigation



DateTimeZ	X	Z	Depth
2016-03-10T13:22:17Z	-82.68685	27.440046	-3.829
2016-03-10T13:22:17Z	-82.68686	27.440046	-3.754
2016-03-10T13:22:18Z	-82.68686	27.44003	-3.7215
2016-03-10T13:22:20Z	-82.68688	27.440014	-3.52867
2016-03-10T13:22:20Z	-82.6869	27.439998	-3.19414
2016-03-10T13:22:21Z	-82.68692	27.439982	-2.84729
2016-03-10T13:22:22Z	-82.68694	27.439982	-2.654
2016-03-10T13:22:24Z	-82.68694	27.439966	-2.721
2016-03-10T13:22:24Z	-82.68695	27.43995	-2.88075
2016-03-10T13:22:26Z	-82.68697	27.439934	-2.97333
2016-03-10T13:22:26Z	-82.68698	27.439934	-3.067
2016-03-10T13:22:28Z	-82.68698	27.439918	-3.18933
2016-03-10T13:22:28Z	-82.687	27.439902	-3.313
2016-03-10T13:22:30Z	-82.68702	27.439886	-3.42814
2016-03-10T13:22:30Z	-82.68703	27.439886	-3.82882
2016-03-10T13:22:32Z	-82.68705	27.43987	-3.81243
2016-03-10T13:22:32Z	-82.68705	27.439846	-3.91145
2016-03-10T13:22:33Z	-82.68707	27.439846	-3.8862
2016-03-10T13:22:35Z	-82.68708	27.43983	-3.8564
2016-03-10T13:22:35Z	-82.6871	27.439814	-3.78268
2016-03-10T13:22:37Z	-82.68712	27.439798	-3.72093
2016-03-10T13:22:37Z	-82.68713	27.439798	-3.76171
2016-03-10T13:22:38Z	-82.68713	27.439782	-3.58981
2016-03-10T13:22:39Z	-82.68715	27.439766	-3.50184
2016-03-10T13:22:41Z	-82.68717	27.439766	-3.71857
2016-03-10T13:22:41Z	-82.68717	27.43975	-3.48195
2016-03-10T13:22:42Z	-82.68719	27.43975	-3.69576
2016-03-10T13:22:44Z	-82.68719	27.439734	-3.37317
2016-03-10T13:22:44Z	-82.6872	27.439718	-3.31522
2016-03-10T13:22:46Z	-82.68721	27.439702	-3.39186
2016-03-10T13:22:48Z	-82.68723	27.439686	-3.392
2016-03-10T13:22:48Z	-82.68725	27.439686	-3.01657
2016-03-10T13:22:49Z	-82.68725	27.43967	-3.20729

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Task 3: Field Investigation - Continued

Reference Datums

What you “see” depends on your reference….!

MLLW

NGVD29

NAVD88

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Reference Datums - Continued

Regulatory Exemptions, Permits….

40D-4.051 Exemptions from Permitting.

The performance of maintenance dredging of existing manmade canals, channels, basins, berths […] to a depth of no more than 5 feet *below mean low water*.

Navigable Depth of Trafficsheds

Resources including:

- Regional Waterway Management System Reports, Robert Swett and Gustavo Antonini for Manatee County (2002) and Sarasota County (1998)
- Sarasota County Manatee Protection Plan (2011)

Navigable Depth Ranges for Typ. Vessel Drafts (ft)	Binned Bathy Depths
1.5 - 2.4	0 - 2 ft
2.5 - 3.4	2 - 3.9 ft
3.5 - >4	> 4 ft

Based on vessels surveyed with each county, nearly 78% of all vessels within County trafficshed have an average draft ranging between 1.5 to 3 feet

Task 4: Evaluation of Volumes

Assumptions

a) Navigable Depth – data ranges centered on average vessel drafts for shallow and medium draft vessels.

b) Field Data – collected depth data along 91 canals.

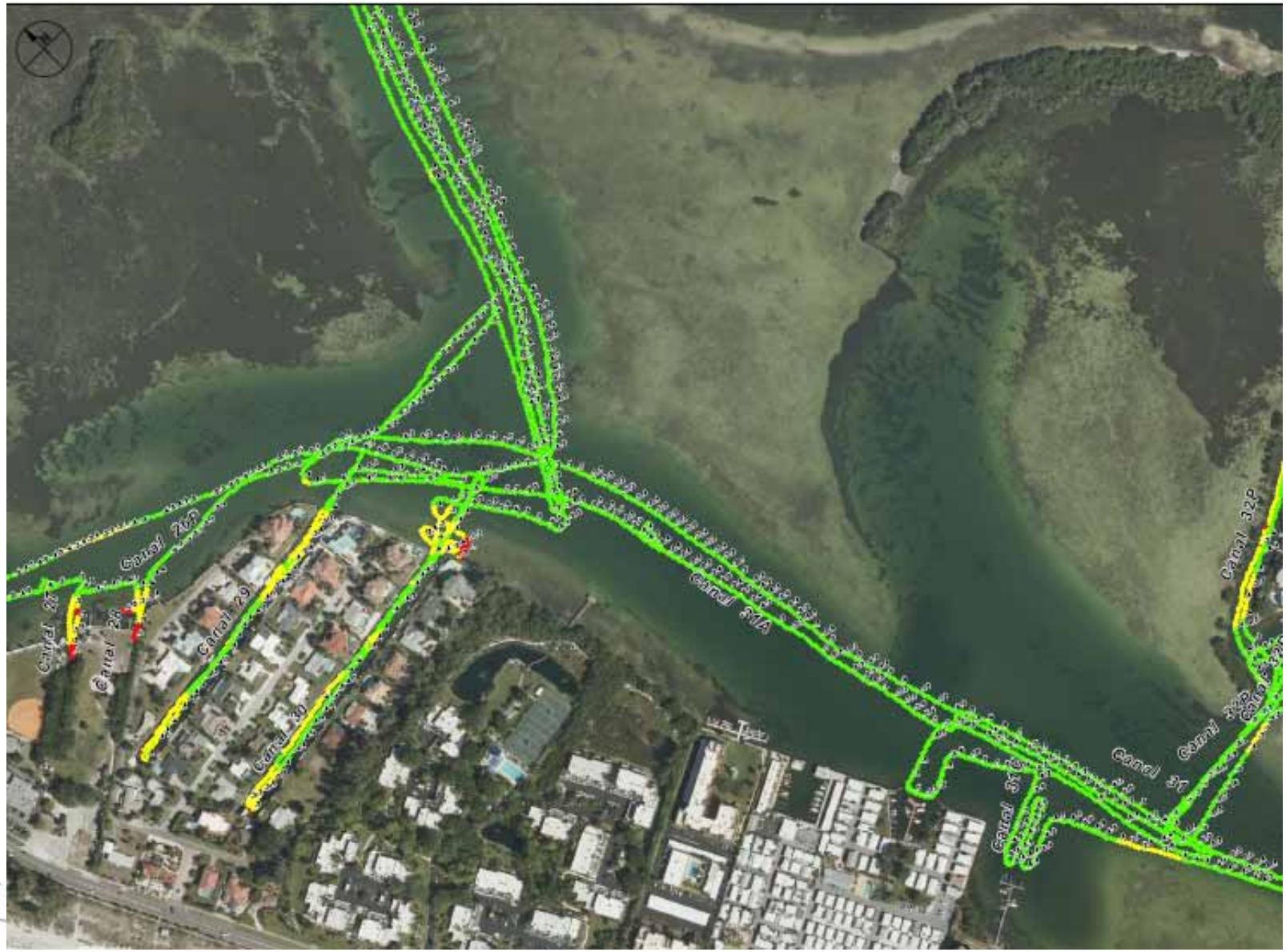
c) GIS Database – allows comparison of the 2016 depths to authorized or permitted depths;

d) Planning Template - 50% of canal width, rectangular cut along length of red and yellow shoaled areas; one way vs two way.

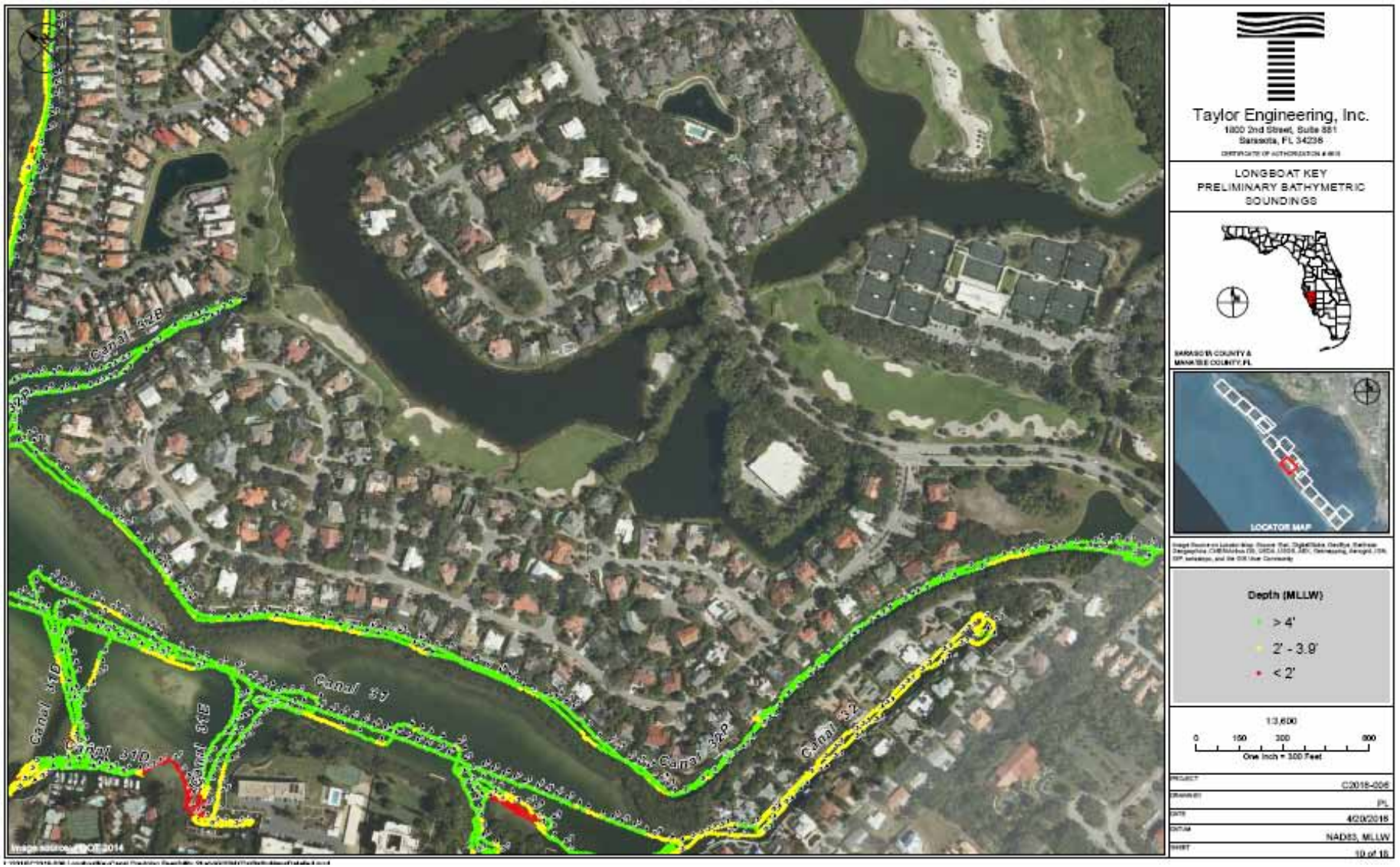
Objective: *Planning level estimates in order to establish a "baseline" for discussion purposes; NOT a design*

Example 1 – Canal 1A

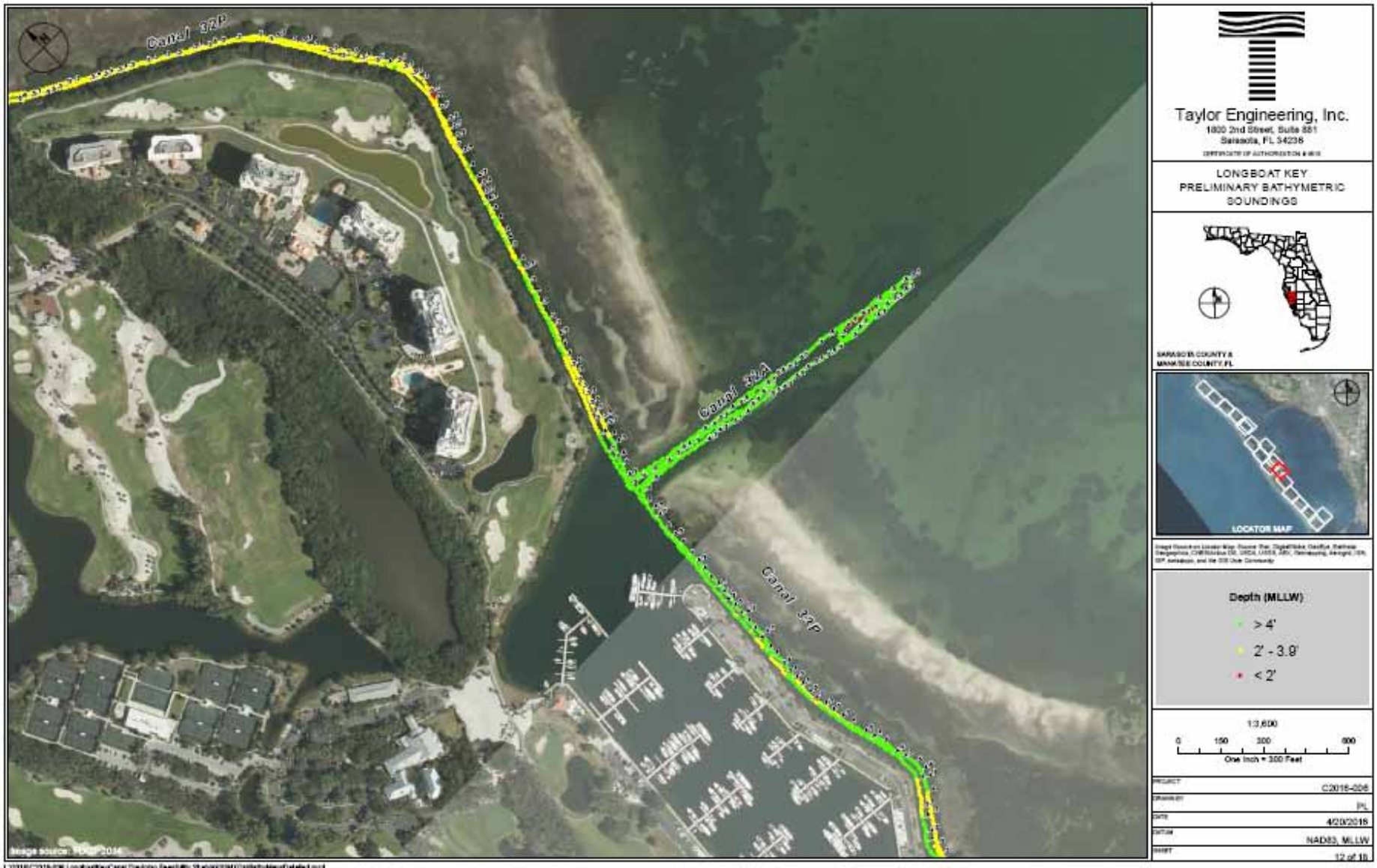
Example 2 – Canal 31 (Buttonwood Harbor)



Example 2 – Canal 31 (Buttonwood Harbor)



Example 3 - Canal 32P (Key Club Moorings)



Example 4 – Canals 36-47 (Country Club Shores)

Task 4: Summary of Existing Conditions

- We evaluated 91 canals/waterways, totaling ~147,000 feet (almost 28 miles).
- We found 18 canals with some degree of “hot spot” shoaling, using our < 2 ft depth (MLLW, Red).
- Our assessment indicates these hot spots result in ‘restricted access’ during MLLW along length of about 12,500 feet (~2.4 miles), or 9% of total.
- Result in conservative estimate based only on GIS measurements and assumed boating patterns.
- Deeper draft boats would be a concern for areas in Yellow….added to Red would be about 33% of entire length.

Task 4: Evaluation of Volumes

Volume of “Hot Spot” Shoaling:

a) Red (Depths from 0 to 2 ft MLLW): ~ 37,000 Cubic Yards

Volume of “Potentially Restricted” Shoaling:

b) Yellow (Depths from 2 to 4 ft MLLW): ~ 58,200 Cubic Yards

Total Volume in Red & Yellow = ~ *95, 200 CY*

Example of Limited Volume Project

***Canals 1A, 1 and portion of bridge shoal*:**

Total Volume in Red & Yellow (plus bridge) = ~ *11,000 Cubic Yards*

Order of Magnitude Cost: ~$750,000.

Possibility to use dredged material for "beneficial use" on Beer Can Island

Example of Limited Volume Project

***Country Club Shores, Canal #s 34– 52 (19 canals)*:**

Total volume in Red & Yellow = *~ 20,000 Cubic Yards*

Order of Magnitude cost: ~$1,300,000.

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Next Steps…

- Refine conceptual cost:
  - Location/type of potential dredged material dewater/transfer sites significantly drives cost
    - ID potential upland sites
    - Pursue beneficial use options (Beer Can Island?)
  - Follow up on resources (seagrasses, oysters)
  - Policy direction/confirmation of thresholds/canal priority
- Stakeholder input & funding scenarios
- Develop the project design
  - Potential future bathymetry survey in FY 2017
  - Refine dredge template (addressing presence of structures)
  - Verify regulatory status/requirements

THANK YOU

Questions?

End of Agenda Item