

POLK CITY

CITY COMMISSION WORKSHOP

April 17, 2017

Polk City Government Center
123 Broadway Boulevard SE

6:00 P.M.

AGENDA

CALL TO ORDER

Mayor Joe LaCascia

ROLL CALL

Sheandolen Dunn
Assistant to the City Manager

ESTABLISHMENT OF A QUORUM

ORDER OF BUSINESS

1. Reclaimed Water Reuse Planning

ADJOURNMENT

Hartman Consultants, LLC

www.hartmanconsultant.com

HC #14035.00

June 13, 2016

Revised April 14, 2017

Mrs. Patricia Jackson
City Manager
123 Broadway Boulevard, SE
Polk City, Florida 33868

RE: Reclaimed Water Planning Document

Dear Mrs. Jackson:

This letter along with the attachments provides the reclaimed water planning document for SR 33 Sprayfield relocation.

A.) Background

In 2010 an optimization plan was approved by the Commission which involved the consolidation of debt at a lower rate, improvements to the Cardinal Hill WWTP, and the decommissioning of the Mount Olive South WWTP as well as other items. This program reduced costs by operating one versus two wastewater plants. The five (5) potential reclaimed water reuse site were:

- 1.) Smith Road Site – 33.67 acres Rapid Infiltration Site (Land Only)
- 2.) Mount Olive South Perc Ponds – (RIB) 3.57 acres (Decommissioned)
- 3.) Cardinal Hill WWTP site of which only 9.5 acres were approved by FDEP for a Sprayfield with a capacity of 70,000 gpd (to be maintained).
- 4.) State Road 33 Sprayfield – 30.32 acres permitted for 115,000 gpd. Existing Permitted Capacity (within the Mud Lake Water Quality Protection Area)
- 5.) I-4 Percolation Ponds (Rapid Infiltration Basins) with an application area of 4.0 acres and a capacity of 100,000 gpd AADF.

The 39.82 acres of sprayfield has a capacity of 185,000 gpd or about 4,650 gpd per acre. In contrast the percolation ponds (RIB) has a capacity of 100,000 gpd on four (4.0) acres or 25,000 gpd per acre. The RIB site takes over 500% (5 times) the flow per acre.

The Cardinal Hill WWTP has a permitted capacity of 300,000 gpd AADF which is slightly greater than the existing total operational reuse sites. The existing plant can be rerated, based upon the historical performance, to 350,000 gpd AADF without capital improvements.

The effluent disposal capacity of 285,000 gpd is the limiting factor for the wastewater system.

See Figure 1 for a map of the existing effluent disposal system.

In 2010 the AADF in the City's Wastewater System was approximately 120,000 gpd AADF. Today the AADF is approximately 155,000 gpd AADF. This planning document resolves the effluent reuse capacity as follows:

- 1.) Matching or exceeding the proposed rerated Cardinal Hill WWTP;
- 2.) Meeting the Mud Lake environmental goals as set forth by FDEP's studies;
- 3.) Making the effluent reuse more efficient for the City.

B.) Preliminary Plan

- 1.) Possible Sites for Use.

The possible sites for use are summarized below:

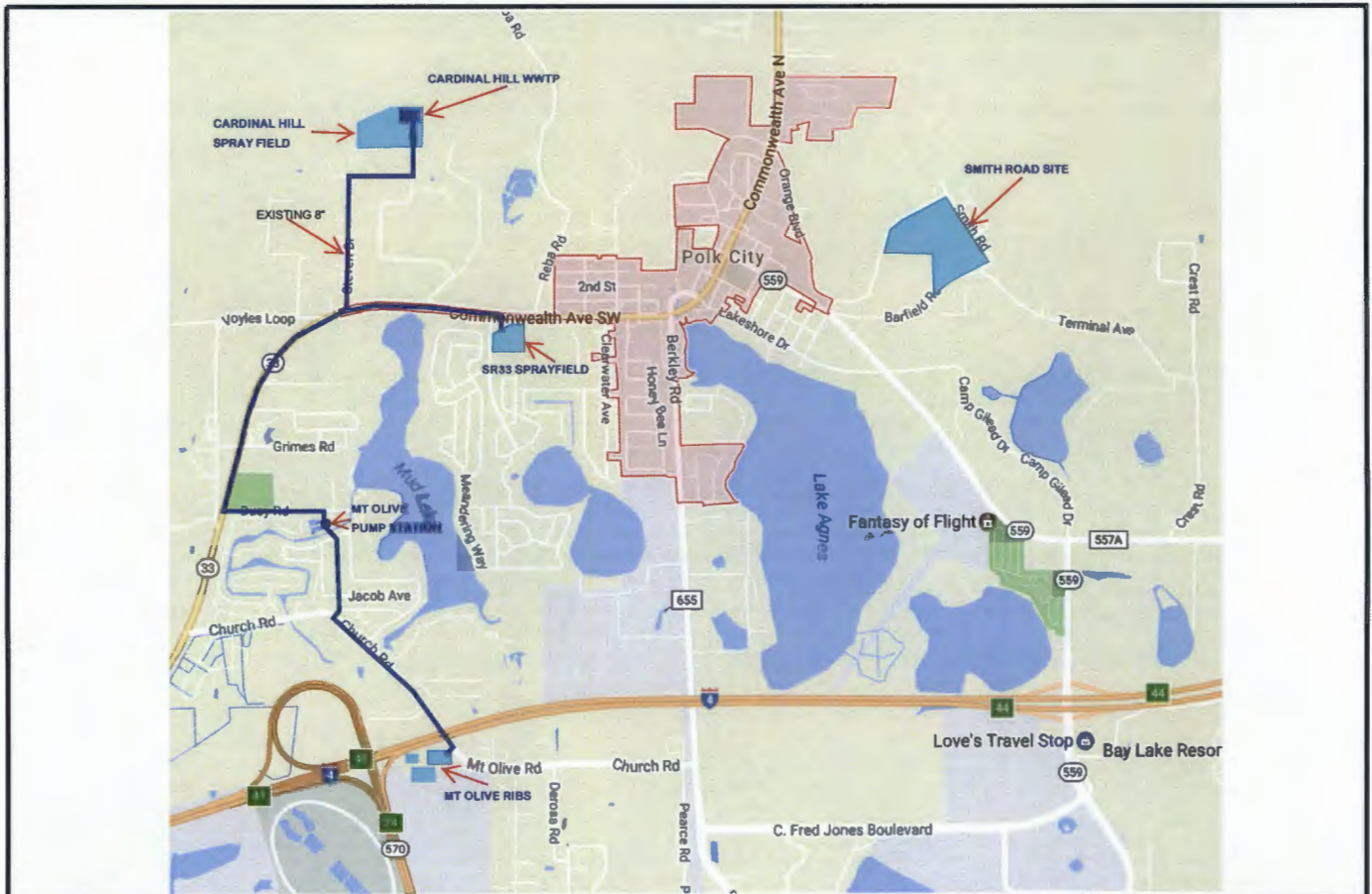


FIGURE 1

MAP OF EXISTING EFFLUENT DISPOSAL SYSTEM

a.) Cardinal Hill

Present capacity 70,000 gpd. Same site as WWTP and effluent wet weather pond (1 MG) for equalization. Site has a hard pan which is not conducive to rapid rate applications. Site has gopher tortoise habitat and holes. Site is considered in the Green Swamp Area (generalized region). Site has steep incline which is not appropriate for higher loading rates (effluent is not allowed to run-off or mix with stormwater discharging the site). This site cannot accommodate 350,000 gpd AADF.

b.) I-4 RIBS

Present capacity 100,000 gpd AADF. Relatively small areas 2 parcels, no future economy of scale. Must maintain and monitor and sample with compliance well network. Most efficient active site.

c.) Mount Olive South Percolation Ponds

This site does not meet FDEP regulations for setbacks from surface water/canal and was required to be closed. Presently inactive. Excess property except for on-site pumping station (requires easement). I-4 pond 6" force main is across the site (easement or abandon in place). No capacity available.

d.) SR 33 Sprayfield

Largest active site at 30.32 acres. Most energy intensive site (pressure for spray guns). A lot of maintenance on irrigation system. Low capacity for acreage (only 115,000 gpd AADF) and within Mud Lake TMDL drainage basin. Not good for Mud Lake. Most valuable property for development. Adjacent to successful development.

e.) Smith Road RIBS

Largest site owned by the City. Restricted use as a sand mine or wastewater facility which includes effluent disposal. This site is unused by City, yet maintained and held for future wastewater use. The site can accommodate the full existing 300,000 gpd AADF, in the future the rerated 350,000 gpd AADF and in the distant future 500,000 gpd AADF. The site has low energy requirements (savings). Three (3) general effluent areas (four 4 parcels) could be eliminated in favor of this one (1) site and this site has at least double the capacity of the other 3 areas (SR 33 Sprayfield, Mount Olive South percolation ponds, and I-4 percolation ponds total 215,000 gpd versus 500,000 gpd Smith Road site buildout capacity).

2.) Selected Sites for Use

The best sites for use are the Cardinal Hill (since the plant is there) and the Smith Road RIB site. See Cardinal Hill WWTP permit as Attachment A.

3.) Required Improvements

Those required improvements to implement the plan are as shown on Figure 2. Generally, they are:

- a.) Approximately 15,200 Linear Feet of 8-inch force main at approximately \$600,000.
- b.) Smith Road Site improvements at approximately \$300,000.
- c.) Decommissioning the I-4, Mount Olive South and the SR 33 sites approximately \$50,000.
- d.) Construction Mgt/OH's - \$110,000.
- e.) Contingencies at \$100,000.
- f.) Engineering Final Design, Hydrogeological Studies and Final Permitting Cost is estimated at \$160,000.
- g.) Total Planning Construction Cost Estimate is \$1,320,000.

4.) Smith Road Site Capacity Confirmation

The Hydrogeological Conceptual work is shown in Attachment B.

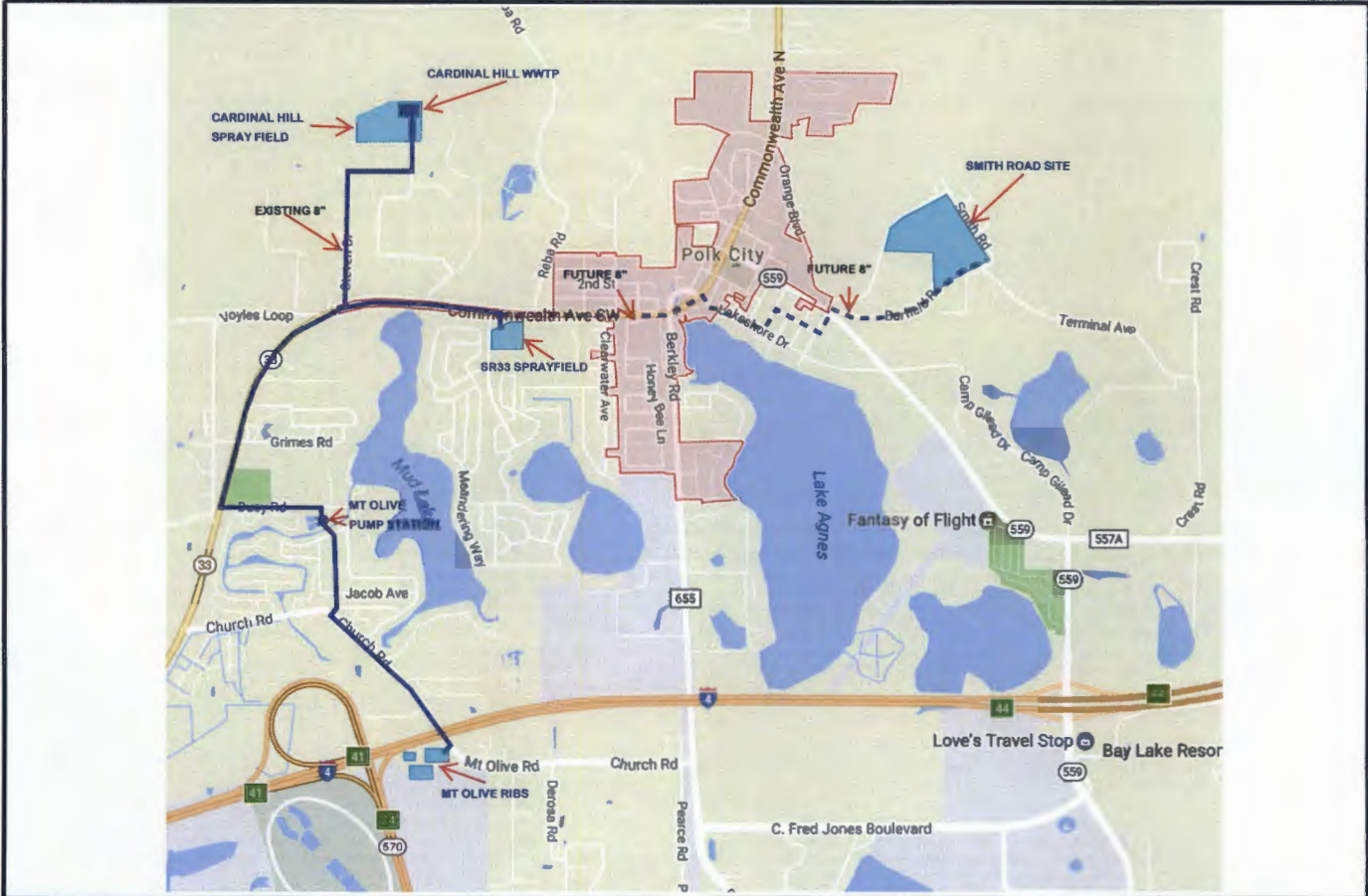


FIGURE 2 MAP OF RECOMMENDED IMPROVEMENTS TO EFFLUENT DISPOSAL SYSTEM

5.) Grant/Loan Application for Costs

Initial requests have been submitted in the two year process of FDEP funding. The planning document is the next requirement for the designs loan and grant which must be submitted to FDEP.

6.) Potential Benefits

Cost Saving Benefits

(a.)	Energy Savings approx.	Approx. \$ 5,700/yr.
(b.)	Monitoring/Reporting/FDEP	\$ 9,500/yr.
(c.)	Operational Savings	<u>\$ 25,500</u>
(d.)	Subtotal	\$ 40,700 ⁽¹⁾
(e.)	More Future Customers	No estimate
(f.)	More Taxable Property	No estimate
(g.)	Reducing Flows to Mud Lake (Environmental)	No estimate
(h.)	Less Stringent Effluent Requirements	No estimate
(i.)	Income from New Capacity (Phase 1 - 65,000 gpd) (Phase 2 - 150,000 gpd)	No estimate

Additional Benefits

7.) Annual Cost of Financing the Improvements

Without grant or low cost loans the annual cost of financing the improvements is estimated at \$76,500 per year (\$1,320,000 principal 30 yrs. payment @ 4%). If grant(s) or low cost loans are secured, then the annual cost of financing would be less.

C. Summary

The City's reuse/effluent disposal system can be improved. The new system would benefit the City as stated above.

⁽¹⁾ Present Value of Savings \$635,500 (\$40,700 @ 30 yrs. and interest @ 4%)

I believe the above is a synopsis of the Planning Document.

Very truly yours,

Hartman Consultants, LLC

**Gerald C. Hartman
Florida P.E. #27703
BCEE #88-10034
ASA #7542**

SECTION 2

**SECTION 2
COST COMPARISON**

2.1 Alternatives

The three alternatives are:

- a) No action
- b) Expand I-4 sites
- c) Smith Road Site

2.2 No Action

This alternative would require nutrient removal at the basic secondary extended aeration Cardinal Hill WWTP. An anoxic basin and a chemical feed system would be necessary.

The capital costs of these facilities as well as the monitoring systems is summarized below:

a) Yard Piping and Valves	\$ 49,600
b) Relocation of Flow Meter	\$ 8,800
c) Relocation of Sampling	\$ 1,500
d) Anoxic Tank and Appurtenances	\$ 375,000
e) Chemical Storage	\$ 30,000
f) Chemical Feed Systems	\$ 29,900
g) Contingencies	\$ 150,000
h) Construction OH/Mgt.	\$ 116,000
i) Engineering & Tech	\$ <u>160,000</u>
Total Capital	\$ 920,800

The additional operational and maintenance costs would include:

- a) \$40,700 higher energy costs and lab costs over Smith Road.
- b) 130,700 higher chemical costs.

Present worth of higher O&M costs (ie. \$54,400 annual (w/o escalation) @ 4% for 30 years) is \$871,300.

Total of Capital and PV of O&M Cost is \$1,792,100.

2.3 Expand I-4 Sites

This alternative requires a booster station at Mt. Olive and the purchase of 32 acres around the existing I-4 perc. pond site.

The capital costs are summarized below:

a)	32 acres at SE corner of I-4 and Polk Parkway 32 x \$17,000/acre	\$	544,000
b)	Excavation and Berming for site	\$	290,000
c)	Yard Piping etc.	\$	40,000
d)	Site Acquisition Costs	\$	50,000
e)	Booster Pump Station	\$	110,000
f)	Contingencies	\$	360,000
g)	Construction OH/Mgt.	\$	100,000
h)	Engineering & Tech Serv.	\$	160,000
		Total	\$ 1,654,000

The additional operational and maintenance costs versus the Smith Road site would include:

Booster Pump Station @ \$5,100/year.

The present worth of the higher O&M costs @ 4% for 30 years is \$88,200.

The Total Capital and PV of O&M cost is: \$ 1,742,200.

2.4 Smith Road Site

The Smith Road Site is an area previously approved by FDEP for wastewater facilities, is zoned for the same and previously approximately a decade ago, was purchased for wastewater facilities development. The 33.67 acre site is owned by the City of Polk City. The site is an abandoned sand mine with good percolation soils. See Attachment B-Preliminary Assessment of Smith Road site by Ardaman and Associates, Inc. The preliminary assessment is that the site will accommodate at least 350,000 gpd and probably up to 500,000 gpd AADF. The site would have at least 50 MG of storage (wet weather) and reduce the reliance on the Cardinal Hill wet weather storage and recycle pond.

Since the site is an old sand mine, the complete site has been disturbed and no endangered flora, fauna, threatened or endangered plants or animals, no surface water bodies, prime agricultural lands, wetlands or undistributed areas are on-site. A rural residential area surrounds the site.

The existing 8" diameter force main at the SR 33 Sprayfield near Mud Lake would be extended east north east to the Smith Road site. The construction cost estimate is:

a)	15,200 LF Rural 8-inch Force Main	\$ 600,000
b)	Smith Road Site Improvements	\$ 300,000
c)	Decommission I-4, Mount Olive South, and SR 33 Sites	\$ 50,000
d)	Construction OH/Mgt.	\$ 110,000
e)	Contingencies	\$ 100,000
f)	Engineering Final Design, Hydrogeological Studies (Modeling) and Design and Permitting	\$ <u>160,000</u>
	Total Planning Construction Cost Estimate	\$ 1,320,000

The additional operation and maintenance is \$0 due to this alternative having the lowest energy, chemical, labor and environmental monitoring costs.

Total Construction Cost and Present Value of Additional O&M cost is: \$1,320,000.

2.5 Cost Comparison Summary

<u>Alternative</u>	<u>Total Cost ⁽¹⁾</u>
No Action	\$ 1,792,100
Expand I-4 Site	\$ 1,742,200
Smith Road Site	\$ 1,320,000

⁽¹⁾ Capital and Present Worth of Additional O&M.

SECTION 3

SECTION 3 ENVIRONMENTAL EFFECTS

The environmental benefits of the project include:

- 1) Removing Secondary Effluent from the Múd Lake proposed TMDL basin.
- 2) Recharging the Floridan Aquifer (See Ardaman Preliminary Assessment Report).
- 3) Reduces energy consumption by transferring from spray irrigation to ROB's.
- 4) Utilizes an existing wastewater facilities site and reclaims an old sand mine.

Since the Smith Road site is a disturbed area, this project will not disturb an undisturbed area. Since the site was cleared and heavy construction vehicles used, there are no flora, fauna, threatened or endangered plant or animal species on the site. A rural settlement, rural residential area surrounds the old sand mine/Smith Road site. The area surrounding the site is disturbed. The site is surrounded by three (3) roadways covering the boundaries namely Orange Blvd, Smith Road and Barfield Road. See Figure 3-1.

There are no undisturbed areas.

There are no surface water bodies or prime agricultural lands.

On the site or adjacent or surrounding the site there are no wetlands. To the North and East some distance away there are wetlands.

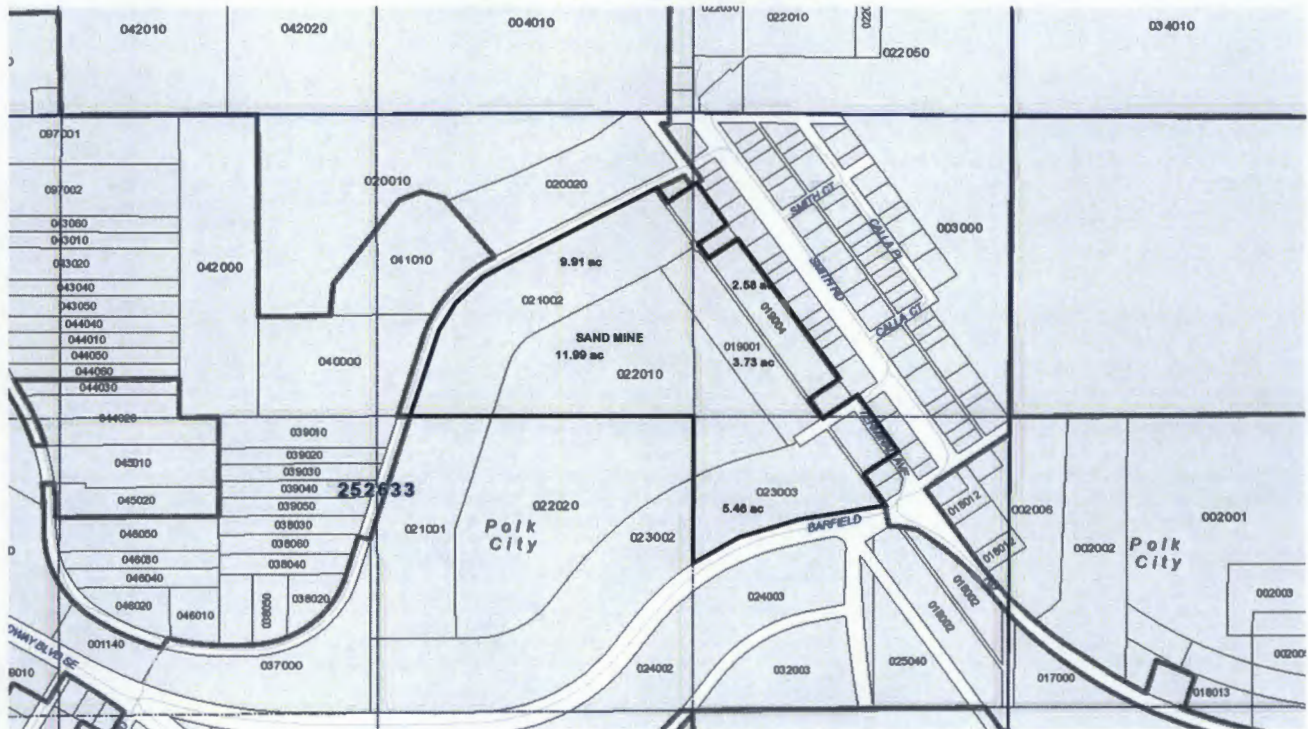
At the end of this section is the US Fish and Wildlife project area review.

There will be no new human health or environmental effects on minority or low income communities. See City Manager's letter concerning Polk City at the end of this section following the US Fish and Wildlife response.

A preliminary assessment of the project area was accomplished by Ardaman and Associates, Inc. (See Attachment B).

The 100 year floodplain in the project area is shown on Figure 3-2. Adding three feet to that elevation shows the project area is not within a floodplain.

☐ SITE - AREA 33.67 ACRES



LOCATION: - ORANGE BLVD NE INTERSECTION WITH SMITH ROAD
- SMITH ROAD/TERMINAL AVE INTERSECTION WITH BARFIELD ROAD

FIGURE 3-1 POLK COUNTY TAX ASSESSOR PARCEL NUMBERS