

Johnson, Sabrina O

From: Ray Oates <ray.oates@citrusbocc.com>
Sent: Monday, January 14, 2019 3:38 PM
To: SWD_Waste; Morgan, Steve; Fetrow, Chad
Cc: Randall S. Olney; Henry C. Norris; Susan Sullivan; Mark E. Schroder
Subject: 2018 Site Life Calculations Report, Citrus County Central Landfill, WACS ID#39859
Attachments: 2018 CCCLF Site Life Report.pdf

Dear Mr. Morgan:

Attached please find the 2018 Site Life Calculations Report for the Citrus County Central Landfill.

Should you have any questions regarding the Report, please do not hesitate to contact me.

Respectfully,

Ray Oates, PG
Solid Waste Compliance Manager
Citrus County Division of Solid Waste Management
230 W. Gulf to Lake Highway
Lecanto, FL 34461

Phone: 352-527-7679 Fax: 352-527-7672

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**Board of County Commissioners
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SOLID WASTE MANAGEMENT DIVISION**

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January 14, 2019

Mr. Steve Morgan
Manager, Air & Solid Waste Permitting
Florida Department of Environmental Protection
13051 North Telecom Parkway
Temple Terrace, FL 33637-0926

Re: Citrus County Central Class I Landfill (FDEP Permit No. 21375-025-SO-01)
Annual Site Life Calculation Transmittal for Phases 1/1A, 2 and 3

Dear Mr. Morgan:

Specific Condition # C.13.e. of the subject landfill operation permit requires that the annual landfill site life calculations be submitted no later than January 15th of each year. Enclosed please find the 2017 - 2018 Site Life Calculations Report and supporting documentation prepared by the Citrus County Division of Engineering.

If you should need additional information, please let me know.

Sincerely,

A handwritten signature in blue ink, appearing to read "H. C. Norris, Jr.", is written over the word "Sincerely,".

Henry C. Norris, Jr.
Director, Division of Solid Waste Management

cc: Randall Olney, P.E., Public Works Director

Submitted Electronically
SWD_Waste@dep
Addresses & cc
Date: 1/14/19
Initials RO

Scanned to E-Bridge
Date 1/14/19
Initials RO
Solid Waste Management



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CITRUS COUNTY CENTRAL LANDFILL
OCTOBER 2018 SITE LIFE CALCULATION ANNUAL REPORT

FDEP PERMIT NO.: 21375-025-S0-01
(Replaces Permit No.: 21375-018-SO-01)

WACS FACILITY ID NO.: 39859

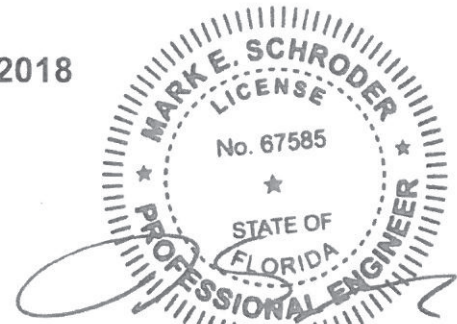
PHASES 1/1A, 2 and 3

Located in S1/T19S/R18E, Citrus County, Florida

Prepared for:

**Citrus County Department of Public Works
Solid Waste Management Division
Attn: Henry Norris, Director
230 W. Gulf-to-Lake Highway
Lecanto, FL 34461
(352) 527-7670**

Prepared on December 14, 2018



12/27/18
Mark E. Schroder, P.E.
FL. License No. 67585
Engineer I

Citrus County's Department of Public Works - Division of Engineering has calculated the remaining site life for Phases 1/1A, 2 and 3 of the Citrus County Central Landfill based on the past twelve months of data. The remaining site life was estimated using population projections, projections of future waste receipts and topographic survey efforts performed by the Citrus County Survey Section and Pickett & Associates. All topographic information is based on NAVD88 datum. The original design closure elevations were based on NGVD29 datum and have been converted to NAVD88 Datum for the purposes of this report

Phases 1/1A,2, and 3:

The airspace consumed from October 2017 to September 2018 was calculated by comparing the digitally generated surfaces from a Photogrammetric Surveys performed in September 2017 with an RTK survey performed in September 2018. The airspace consumed during the 2017-2018 time period was 128,690CY, as shown on sheet 1 of 3 in attachment A. Waste tonnage records supplied by Citrus County Solid Waste Management Division for the same period recorded 97,064 tons entering the landfill. This translates to an effective airspace consumption rate of 1,508 LB/CY or 1.33 CY/TN of waste disposed. The volume of the Cap was entered on the calculation as zero. For the calculations, the final closure surface has been lowered by two feet and the final 4' cap will be installed after 2' of settlement. Therefore the volume of the cap was entered into the calculations as 0CY assuming that the airspace will be available before placement.

The remaining life through build out of Phases 1/1A, 2 and 3 was estimated by multiplying the future projected quantities of waste by the current effective airspace consumption rate. Waste tonnage was assumed to increase each year at the same rate as the population. Population growth in Citrus County from 2017 to 2018 was higher than last year. This year, population growth has been estimated using the "Medium" projections published in the University of Florida Bureau of Economic Research (BEBR) population projections for Citrus County. The actual growth of the Citrus County population closely matched the Medium Growth rate published in Volume 51, Bulletin 180, January 2018 – Florida Population Studies. The projected waste tonnage for each year is multiplied by the effective airspace consumption rate to obtain the airspace volume consumed each year. This is then subtracted from the remaining airspace for each year until the available airspace is depleted. The calculations indicate that Phases 1/1A, 2, and 3 have approximately 1,595,283CY of available airspace as of the September 26, 2018 survey (Attachment #1, Sheet 2) and that this airspace could be completely utilized by July 2029. This assumes that waste will continue to be added to the landfill at the current generation rates and effective density. As Statutory Recycling is implemented waste generation rates should decrease thereby adding a factor of safety to the calculations. For quick reference, the previous Site Life Calculation Report prepared on December 1, 2017 estimated this date to be October 2032 using BEBR Medium projection.

Phases 1/1A, 2, and 3

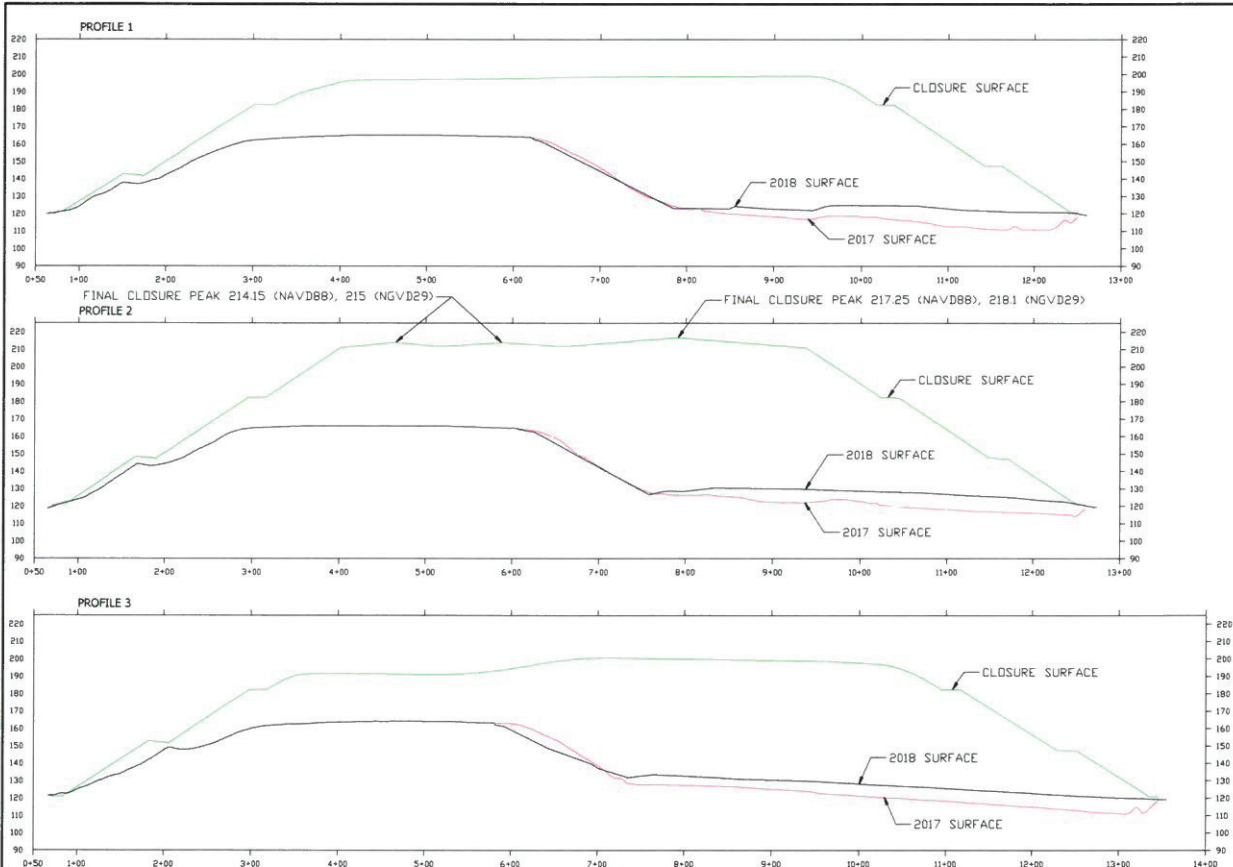
Landfill Side Slopes

Specific Condition C.13.f of the site's FDEP Permit (Permit No. 21375-008-S0/01) requires that the disposal capacity and site life calculations submitted each year be accompanied by a survey indicating that the actual above grade side slopes are no greater than the design slopes and that the top elevation does not exceed the design elevation. As shown in the cross-sections provided on Sheets 3 & 4 of Attachment #1, the side slopes appear to be less than or equal to the design slopes, and the design top elevation of the landfill has not been attained.

ATTACHMENT 1

VOLUME CALCULATION DRAWINGS

(Refer to 24"x36" Drawings)



ELEVATION DATUM NOTE

This Comparable Volume report for the period stated was calculated based on a comparison between an aerial topographic survey performed by Pickett and Associates in 2017 (updated with an RTX survey performed by the Citrus County Survey Section in 2018) and the Final Closure Design.

The original designed landfill closure surface was calculated and published utilizing NGVD29. The 2017 aerial survey and 2018 RTX surveys performed by the Citrus County Survey Section were collected in NAVD83. The closure surface has been adjusted -0.85' per NGS Vertical transformation, converting the NGVD29 elevations to NAVD83 elevations for relative volume calculations.

LEGEND AND ABBREVIATIONS

FINAL CLOSURE (CONVERTED TO NAVD83)
 SEPTEMBER 15, 2017 (AERIAL SURVEY BY PICKETT SURVEYING AND PHOTOGRAMMETRY, NAVD83)
 SEPTEMBER 26, 2018 (RTX SURVEY BY CITRUS COUNTY SURVEY SECTION, NAVD83)

PLAN VIEWS ARE ON SHEETS 1 AND 2

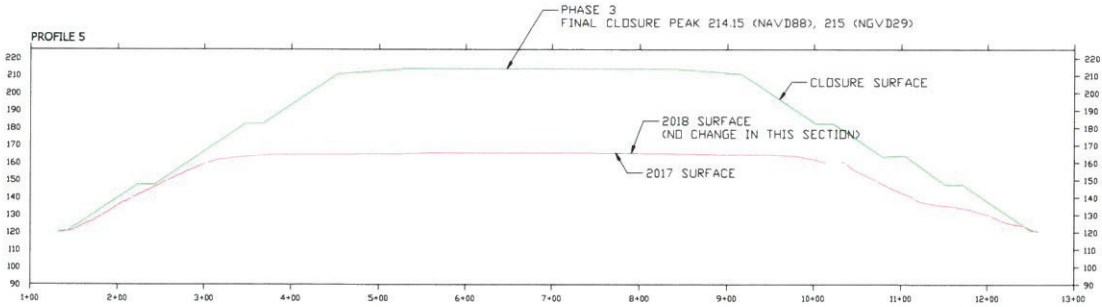
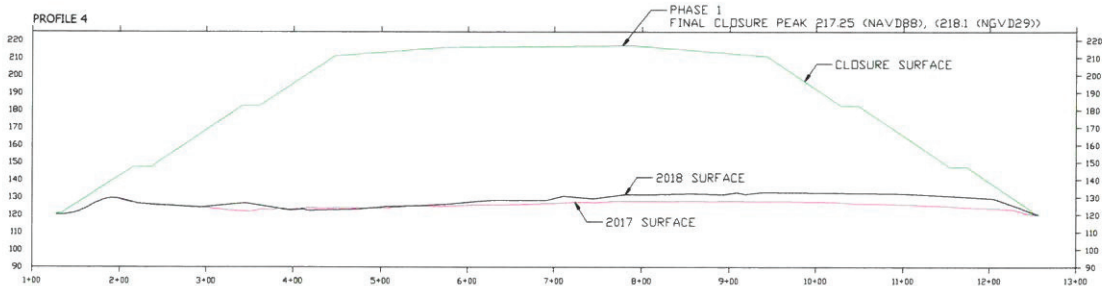
CITRUS COUNTY
 DEPARTMENT OF PUBLIC WORKS
 DIVISION OF ENGINEERING

CITRUS COUNTY
 CENTRAL LANDFILL
 2018 SITE
 LIFE CALCULATION
 REPORT



CITRUS COUNTY
 CENTRAL LANDFILL
 FINAL CLOSURE
 06/26/2018 SURVEY
 09/15/2017 SURVEY
 PROFILES

DATE	10-09	SHEET	3
SCALE	1"=50'	OF	4



LEGEND AND ABBREVIATIONS

FINAL CLOSURE (CONVERTED TO NAVD88)
 SEPTEMBER 15, 2017 (AERIAL SURVEY BY PICKETT SURVEYING AND PHOTOGRAMMETRY, NAVD88)
 SEPTEMBER 26, 2018 (RTK SURVEY BY CITRUS COUNTY SURVEY SECTION, NAVD88)

PLAN VIEWS ARE ON SHEETS 1 AND 2

ELEVATION DATUM NOTE

This Comparative Volume report for the period stated was calculated based on a comparison between an aerial topographic survey performed by Pickett and Associates in 2017 (updated with an RTK survey performed by the Citrus County Survey Section in 2018) and the Final Closure Design.

The original designed Landfill closure surface was calculated and published utilizing NGVD29. The 2017 aerial survey and 2018 RTK surveys performed by the Citrus County Survey Section were collected in NAVD88. The closure surface has been adjusted -0.80' per NGVD version transformation, converting the NGVD29 elevations to NAVD88 elevations for relative volume calculations.

CITRUS COUNTY
DEPARTMENT OF PUBLIC WORKS
DIVISION OF ENGINEERING

CITRUS COUNTY
CENTRAL LANDFILL
2018 SITE
LIFE CALCULATION
REPORT



CITRUS COUNTY
CENTRAL LANDFILL
FINAL CLOSURE
06/24/2018 SURVEY
09/15/2017 SURVEY

PROFILES

SHEET NO. 1 OF 1	
DATE: 09/15/2017	
DRAWN BY: J. L. LEE	
CHECKED BY: J. L. LEE	
SCALE: 1" = 50' H	
PROJECT NO. 18-089	
SHEET NO. 4	

ATTACHMENT 2

SITE LIFE CALCULATIONS

**CITRUS COUNTY SOLID WASTE MANAGEMENT DIVISION
CENTRAL LANDFILL SITE LIFE CALCULATION
DECEMBER 2018 REPORT**

Objective: Calculate the 2018 remaining site life for Phases 1/1a, 2 & 3 using waste tonnage records from Citrus County and calculated waste generation projections.

Approach:

1. Calculate the available airspace as of the most recent survey.
2. Calculate the "Effective Density" using volume consumed between October 2017 through September 2018.
3. Use the effective density to calculate the remaining life of the available airspace.

Available Airspace Calculation:

Airspace available from Sep 2018 to Final Grade = 1,595,283 CY (From Surveys)

Air volume consumed Oct 2017 through September 2018 = 128,690 CY (Calculated)

Effective Density Calculation:

Waste Disposed of between 10/2017 through 09/2018 = 97,064 tons (From Landfill Records)

Effective Density= $\frac{97,064 \text{ ton}}{128,690 \text{ CY}} \times \frac{2,000 \text{ lbs}}{1 \text{ ton}} = \frac{1,508 \text{ lbs}}{1 \text{ CY}}$

Effective Airspace Consumption Rate= $\frac{128,690 \text{ CY}}{97,064 \text{ ton}} \times \frac{1 \text{ ton}}{2,000 \text{ lbs}} = 1.33 \text{ CY/ton}$

Assuming the waste will be filled up to the final capacity and allowed to settle before placing the cover soil.

Cap Volume = 0 CY

Subtract Cap Volume from air volume (airspace available) to determine useable waste volume for site life calculation.

Remaining Volume= 1,595,283 CY - 0 CY = 1,595,283 CY

Site Life Calculation

The site life calculation is based on Citrus County waste tonnage records and population projections from the University of Florida Bureau of Business and Economic Research (BEER). The historic population growth trends have been in between the BEER Low and Medium estimates. This year population growth rate was just above the BEER Medium estimate growth rates. The Medium population projection was used for this year's estimate.

FISCAL YEAR	TONNAGE	VOLUME CONSUMED (CY)	NET REMAINING AIRSPACE (CY)
2017-2018	97,064	128,690	1,595,283
2018-2019	98,065	130,017	1,465,266
2019-2020	98,316	130,349	1,334,917
2020-2021	99,035	131,303	1,203,614
2021-2022	99,754	132,257	1,071,357
2022-2023	100,474	133,210	938,147
2023-2024	101,193	134,164	803,983
2024-2025	101,913	135,118	668,865
2025-2026	102,539	135,948	532,917
2026-2027	103,165	136,778	396,138
2027-2028	103,791	137,608	258,530
2028-2029	104,417	138,438	120,091
2029-2030	105,043	139,269	-19,177
2030-2031	105,563	139,957	-159,135
2031-2032	106,082	140,646	-299,781
2032-2033	106,602	141,335	-441,116
2033-2034	107,121	142,024	-583,140
2034-2035	107,641	142,713	-725,853
2035-2036	108,067	143,278	-869,131
2036-2037	108,494	143,843	-1,012,974
2037-2038	108,920	144,408	-1,157,383

CONCLUSION: Estimated Phases 1/1A, 2 & 3 Fill Completion Date = July 2029

**CITRUS COUNTY CENTRAL LANDFILL
WASTE TONNAGE PROJECTION**

Year	*Population (BEBR Medium Estimate)	% Change in Population	Tons/Year
2015⁽¹⁾	141,501		82,992
2016 ⁽¹⁾	143,054	1.10%	88,186
2017 ⁽¹⁾	143,801	0.52%	91,890
2018⁽¹⁾	145,721	1.34%	97,064
2019	147,224	1.03%	98,065
2020	147,600	0.26%	98,316
2021	148,680	0.73%	99,035
2022	149,760	0.73%	99,754
2023	150,840	0.72%	100,474
2024	151,920	0.72%	101,193
2025	153,000	0.71%	101,913
2026	153,940	0.61%	102,539
2027	154,880	0.61%	103,165
2028	155,820	0.61%	103,791
2029	156,760	0.60%	104,417
2030	157,700	0.60%	105,043
2031	158,480	0.49%	105,563
2032	159,260	0.49%	106,082
2033	160,040	0.49%	106,602
2034	160,820	0.49%	107,121
2035	161,600	0.49%	107,641
2036	162,240	0.40%	108,067
2037	162,880	0.39%	108,494
2038	163,520	0.39%	108,920
2039	164,160	0.39%	109,346
2040	164,900	0.45%	109,839
2041	165,440	0.33%	110,199
2042	166,080	0.39%	110,625
2043	166,720	0.39%	111,051
2044	167,360	0.38%	111,478
2045	168,000	0.38%	109,764

*Population projection data for Citrus County originated from the University of Florida Bureau of Economic and Business Research (BEBR) Florida Population Studies (Volume 51, Bulletin 180, January 2018). A linear interpolation for yearly population increase was performed between the years in bold.

⁽¹⁾ Annual Population reported in the BEBR Bulletins for the year.

The "Tons/Year" amount is based on scale house data (monthly collection reports over the previous year) as supplied by the Waste Management Department.