

Appendix C

Public Facilities Analysis

C.1 Introduction

A detailed analysis of public facilities has been conducted utilizing the DSAP land use plan and associated development program to calculate maximum theoretical impacts. Impacts were analyzed for both short-term (5-yr) and long-term (build-out) conditions. For the purpose of calculating 5-yr impacts, a development program of 700 residential units and 31,000 square feet of non-residential uses were assumed. The full DSAP development program was assumed for estimation of impacts at build-out (2035).

Included in this analysis were the full range of public facilities as defined by 163.3164, Florida Statutes, including potable water, sanitary sewer, solid waste, drainage, schools and parks. Due to the detailed nature of transportation impact studies, an analysis of these facilities was handled separately. A full transportation impact analysis is contained in Appendix B.

The following analyses assumes that demand generated by the proposed Chester Road DSAP is in addition to projected increase in demand generated by population growth which would have occurred regardless of the DSAP. The approved East Nassau Employment Center DSAP is noted in JEA's FY 2015 Water Resource Master Plan and included in the noted projected demand. These projections overlap to an extent. It can be assumed that some portion of the already projected population increase will occur within the DSAP; therefore, the following impact analyses should be considered conservative and it may be presumed that actual impacts may less.

C.2 Potable Water

Nassau County is located within the St Johns River Water Management District (SJRWMD). Per SJRWMD's 2003 Water Supply Assessment, existing water supply sources and water supply development plans are considered reasonably adequate to meet Nassau County's projected needs while sustaining water quality and protecting wetland and aquatic systems. Therefore, neither the County nor the DSAP area is within a priority water resource caution area (PWRCA). Given SJRWMD's finding that adequate supplies exist to accommodate the area's

projected needs, Nassau County has not been required to prepare a water supply plan (WSP) or otherwise identify water resource development or water supply development projects to accommodate projected demand.

Jacksonville Electric Authority (JEA), a municipally owned utility, provides potable water service to the Chester Road DSAP site. JEA’s potable water system is made up of 135 artesian wells, tapping the Floridian Aquifer. 37 water treatment plants treat and distribute this water to users through more than 4,300 miles of water main in multiple service districts. The Chester Road DSAP is located within JEA’s District 7 – Nassau County Water Service Area. Currently, the District 7 water service area is served by four potable water treatment plants; Lofton Oaks, Otter Run, Nassau (Yulee) Regional, and West Nassau Regional.

C.2.1 Potable Water – 5-yr Projections

Potable water demand for the proposed 5-yr development program was calculated utilizing Nassau County’s adopted level of service (LOS) as identified in the Nassau County 2030 Comprehensive Plan. The adopted LOS for potable water service within Nassau County is 100 gallons per capita per day. This LOS is then multiplied by 2.32 persons per household to determine the GPD/household. 2.32 persons per household is the projected average household size for Nassau County in 2030, as identified in Table 5 of the Executive Summary of the Nassau County 2030 Comprehensive Plan. The Comprehensive Plan notes the source for this data as the Shimberg Center for Affordable Housing, University of Florida, US Census Bureau. For non-residential uses, the LOS requirements are based upon an Equivalent Residential Connection (ERC) to be calculated by the service provider, at the time of application. For the purposes of this study, an average value ERC of 0.1 gallons per day per square foot was applied to non-residential development. Using these values, Table C-2a estimates short term (5-yr) demand for potable water.

Table C-2a Estimated Potable Water Demand (5-Yr)

	Residential	Non-residential	Total Demand
DSAP (5-yr)	700 du	31,000 sq ft	0.17 MGD

The Chester Road DSAP is located in the Lofton Oaks Grid service area. The Lofton Oaks Grid included four treatment plants: Nassau Regional; Lofton Oaks; Otter Run; and, West Nassau Regional. Table C-2b provides projected available treatment capacity, current usage, 5-yr DSAP demand and resulting capacity.

Table C-2b Projected Potable Water Plant Capacity (5-Yr) (MGD)

Water Plant	Plant Capacity*	Projected Usage*	DSAP Demand	Remaining Capacity
Lofton Oaks Grid	6.69	3.36	0.17	3.16

*Source: JEA FY 2015 Annual Water Resource Master Plan.

JEA’s FY 2015 Annual Water Resource Master Plan indicates an expansion from 1 million to 5 million gallon capacity to the West Nassau Regional Water Treatment

Plant. This project is anticipated to help meet the growth of the surrounding area and design and construction is scheduled for FY2016 - FY2018.

Adequate capacity exists at the available treatment facilities to accommodate the proposed 5-yr development program.

C.2.2 Potable Water – Build-out Projections

Tables C-2c estimates the Chester Road DSAP’s potable water demand at build-out utilizing the same methodology as the 5-year development program.

Table C-2c Estimated Potable Water Demand (Build-out)

	Residential	Non-residential	Total Demand
DSAP (Build-out)	1,875 du	91,000 sq ft	0.44 MGD

Should the DSAP’s maximum development program be realized, total projected demand for potable water could be approximately 0.44 million gallons daily (MGD).

Table C-2d provides projected available treatment capacity, forecasted demand through 2035, DSAP demand at build-out and resulting capacity. Values reported consider the known plant capacity increase to the West Nassau facility, set to expand in 2016-2018 from 1.4 MGD to 5 MGD.

Table C-2d Projected Potable Water Capacity (2035) (MGD)

Water Plant	Plant Capacity*	Projected Usage*	DSAP Demand	Remaining Capacity
Lofton Oaks Grid	10.28	4.55	0.44	5.29

*Source: JEA FY 2015 Annual Water Resource Master Plan.

Adequate capacity exists within the Lofton Oaks Grid to accommodate the proposed development program through 2035. It should be noted that the preceding calculations are based upon average daily flow. Maximum daily flow or “peak hour” flow requires approximately twice the average daily flow capacity. Based on the projected usage provided by JEA, it is anticipated that demand may be accommodated under both average daily and maximum daily flow conditions at the build-out conditions of the proposed Chester Road DSAP.

C.3 Wastewater

JEA Service Area 7 is served by a single wastewater treatment plant, the Nassau Regional Sewer Treatment Facility. JEA is currently operating this facility at the permitted level of 1.55 MGD. Currently, average daily demand at this facility is 0.98 MGD. The Nassau Regional Sewer Treatment facility has a plant capacity of 2.0

MGD; but it currently limited by the permitted disposal capacity of 1.55 MGD. Scheduled sewer improvements beyond 2015 are limited to force main construction, in conjunction with roadway improvements and future development needs.

C.3.1 Wastewater – 5-yr Projections

Wastewater demand for the proposed 5-yr development program was calculated utilizing Nassau County’s adopted level of service (LOS) as identified in the Nassau County 2030 Comprehensive Plan. The adopted LOS for wastewater service within Nassau County is 100 gallons per capita per day. This LOS is then multiplied by 2.32 persons per household to determine the GPD/household. 2.32 persons per household is the projected average household size for Nassau County in 2030, as identified in Table 5 of the Executive Summary of the Nassau County 2030 Comprehensive Plan. The Comprehensive Plan notes the source for this data as the Shimberg Center for Affordable Housing, University of Florida, US Census Bureau. For non-residential uses, the LOS requirements are based upon an Equivalent Residential Connection (ERC) to be calculated by the service provider, at the time of application. For the purposes of this study, an average value ERC of 0.1 gallons per day per square foot was applied to non-residential development. Using these values, Table C-3a estimates short term (5-yr) demand for wastewater.

Table C-3a Estimated Wastewater Demand (5-Yr)

	Residential	Non-residential	Total Demand
5-YR DSAP	700 du	31,000 sq ft	0.17 MGD

Table C-3b provides projected available treatment capacity, current usage, 5-yr DSAP demand and resulting capacity.

Table C-3b Projected Wastewater Plant Capacity (5-Yr) (MGD)

Wastewater Plant	Plant Capacity*	Current Usage*	DSAP Demand	Remaining Capacity
Nassau Regional	1.55	0.98	0.17	0.40

*Source: JEA FY 2015 Annual Water Resource Master Plan.

Adequate capacity exists at the available treatment facilities to accommodate the proposed 5-yr development program.

C.3.2 Wastewater – Build-out Projections

Tables C-3c estimates the Chester Road DSAP’s wastewater demand at build-out utilizing the same methodology as the 5-year development program.

Table C-3c Estimated Wastewater Demand (Build-out)

	Residential	Non-residential	Total Demand
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DSAP (Build-out)	1,875 du	91,000 sq ft	0.44 MGD
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Should the DSAP’s maximum development program be realized, total projected demand for wastewater treatment would be approximately 0.44 million gallons daily (MGD).

The Nassau Regional Wastewater Plant currently has a permitted capacity of 1.55 MGD; however, it has a design capacity of 2.0 MGD. The *JEA FY2015 Annual Water Resource Master Plan* anticipates that the plant will be re-permitted to its full design capacity of 2.0 MGD in 2032. This Table C-3d provides projected available treatment capacity, forecasted demand through 2035, DSAP demand at build-out and resulting capacity.

Table C-3d JEA Wastewater Plant Availability (MGD) after Build-Out

Wastewater Plant	Plant Capacity*	Projected Usage*	DSAP Demand	Remaining Capacity
Nassau Regional	2.0	1.44	0.44	0.12

*Source: *JEA FY 2015 Annual Water Resource Master Plan*.

At this time, based on projected demands providing by JEA, adequate wastewater treatment capacity exists to accommodate the proposed Chester Road DSAP development program at build-out in 2035.

C.4 Solid Waste

Solid Waste service is provided to the region by Nassau County. Nassau County has an adopted solid waste Level of Service of 4.91 pounds per capita per day. Table C-4 provides an estimate of solid waste creation at build-out based upon the number of residential units and projected persons per household within the DSAP.

Table C-4a Estimated Solid Waste Demand at Build-out (lbs/capita/day)

Residential Units	Persons Per Household	Projected DSAP Population	LOS*	Total Demand (Tons per year)	Total Demand (lbs per day)
1,875	2.32	4,350	4.91	3,915	21,359

*Source: As identified in Table 5, Executive Summary, *Nassau County 2030 Comprehensive Plan*. The *Comprehensive Plan* notes the source for this data as the Shimberg Center for Affordable Housing, University of Florida, US Census Bureau.

Nassau County has agreements with Camden County Landfill Solid Waste Disposal Facility (Georgia) and with Chesser Island Road Landfill (Georgia). Both agreements signed in 2009 are for ten years with the option to renew for an additional five years.

Camden County Landfill Solid Waste Disposal Facility is located 30 miles northwest of the DSAP area. According to 2014 data available from the Georgia Environmental Protection Division, the Camden County Landfill currently receives an average of approximately 349 tons per day and has an available capacity of over 2.1 million tons. The life expectancy is 17 years.

Owned by Waste Management of Georgia, Chesser Island Road Landfill (CIRL) is located 35 miles to the northwest of the DSAP area. According to 2014 data available from the Georgia Environmental Protection Division, CIRL has a remaining capacity of over 56 million tons and receives approximately 3,292 tons per day on average. CIRL has a life expectancy of 54 years.

Table C-4b estimates the impact of the DSAP development program on the existing capacity of the Camden County and Chesser Island Road Landfills. The proposed DSAP contributes approximately 5.36 tons per day to each landfill, at final build-out. The resulting additional annual tonnage does not significantly reduce the estimated lifespan of either landfill.

Table C-4b Solid Waste Capacity

Provider	Current Annual Tonnage	Current Estimated Lifespan (yrs)	DSAP Annual Tonnage	Estimated Lifespan (yrs)
Camden County	127,385	17	3,915/2	17
Chesser Island	1,201,580	54	3,915/2	54

In summary, no improvements to solid waste facilities have been determined to be necessary to accommodate the proposed DSAP development programs.

C.5 Stormwater

Stormwater management system improvements for this region of Nassau County may be developed as regional systems accounting, where possible, for multiple areas of improved development. Efforts may be made to design stormwater treatment and attenuation systems, (i.e. wet and dry ponds, swales, underground chambers, ex-filtration trenches, etc.) and supporting conveyance pipes and swales as systems.

Stormwater systems will be permitted in accordance with the St. John’s River Water Management District (SJRWMD) discharge design criteria. Since the proposed stormwater management system will meet the requirements set forth by SJRWMD and Nassau County, the quality of the storm water leaving the site will meet state water quality standards. The ultimate receiving waters will be the St. Mary’s River or the St. John’s River.

The interconnected wetland systems serve as the method for conveying the treated runoff to the river. In locations where the wetland systems will be severed by

proposed roadways, storm drainage networks will be installed beneath the roadway to provide proper surface water flow between wetland areas.

Compared to the pre-existing condition, control structures within the designed ponds and conveyance systems will delay the release of excess stormwater, thereby allowing suspended solids, excess nutrients such as nitrogen and phosphorus, and other potential pollutants to be removed from the stormwater discharge. The proposed stormwater ponds will be designed at such a size in order to provide storage of stormwater run-off and limit post-development discharge from exceeding pre-development discharge from the project. Lastly, the modeling techniques and design applications will comply with SJRWMD requirements and incorporate best management practices in the treatment ponds and conveyance systems.

C.6 Schools

In 2008, Nassau County adopted a school concurrency system consistent with state statute. The details of this system are outlined in both an Interlocal Agreement (ILA) with the School Board of Nassau County and Nassau County’s Comprehensive Plan’s Public School Facilities Element (PSFE). These documents identify procedures for determining available capacity, identifying deficiencies and implementing improvements.

For the purpose of determining existing and future capacity, the County was subdivided into eight (8) Concurrency Service Areas. These CSAs identify which schools may serve a proposed development project. The Chester Road DSAP is located within both the Yulee North and Yulee South CSAs. These CSAs are currently served by Yulee Primary School, Yulee Elementary School, Yulee Middle School and Yulee High School.

Via the Comprehensive Plan’s PSFE, Nassau County has adopted a Level of Service (LOS) of 95% of the permanent Florida Inventory of School Houses (FISH) capacity for elementary schools and 100% for middle and high schools. For the purpose of estimating DSAP impacts, an analysis was completed for both the 5-yr (2021) and build-out conditions.

C.6.1 Schools – 5-yr Projections

Table C-6a estimates short-term or 5-yr student generation for the Chester Road DSAP. Student generations rates for each school level were provided by Nassau County School Board Staff.

Table C-6a Estimated DSAP Student Generation (5-yr)

Residential Units	Student Generation Rates			Students by School Type		
	Elementary	Middle	High	Elementary	Middle	High
700	.25	.15	.17	176	103	119

*Source: 2015 student generation rates as provided by Nassau County School Board staff

Table C-6b is an estimate of 5-yr capacity available at the public schools serving the DSAP. The 2015-2016 Nassau County School Board 5-year Facilities Work Program was used to determine permanent FISH capacity and projected enrollment per school.

Table C-6b 5-yr School Capacity (Yulee CSA)

School	FISH Capacity	2018/19 Projected Enrollment	2016/2017 Projected LOS	Available Capacity
Yulee Primary	932	911	98%	21
Yulee Elementary	824	824	101%	-12
Yulee Middle	917	919	100%	-2
Yulee High	1,214	1,035	85%	179

*Source: 2015-2016 Nassau County School Board 5-yr Facilities Work Program

Per Table C-6b, a 5-year deficit is projected at Yulee Elementary and Yulee Middle schools. Adequate capacity does not exist at Yulee Primary School to accommodate the projected 176 elementary school students generated by the 5-yr development program. Adequate capacity is projected to exist at Yulee High School to accommodate the 5-yr development program. To address these existing issues, the 2015-2016 Nassau County School Board 5-yr Facilities Work Program identified the establishment of two new elementary schools and one new middle schools in the 10-year program.

In addition to the inclusion of programmed improvements, the ILA allows for the use of additional capacity contained in adjacent CSAs. Per the County’s PSFE, CSAs contiguous to Yulee North and South include, North Central Nassau, South Central Nassau and Fernandina. At this time, no schools exist in the North Central Nassau or South Central Nassau; therefore, no additional capacity may be had from these areas. The Fernandina Beach CSA contains four (4) schools including, Emma Love Hardee Elementary, Southside Elementary, Fernandina Beach Middle and Fernandina Beach Senior High.

Table C-6c is an estimation of 5-yr capacity available within the Fernandina Beach CSA.

Table C-6c 5-yr School Capacity (Fernandina CSA)

School	FISH Capacity	2018/19 Projected Enrollment	2018/19 Projected LOS	Available Capacity
ELH Elem	665	538	81%	127
Southside Elem	661	549	83%	112
Fernandina Middle	726	577	79%	149
Fernandina High	1,116	737	66%	379

*Source: 2015-16 Nassau County School Board 5-yr Facilities Work Program

Adequate capacity exists within the adjacent Fernandina CSA to accommodate the projected elementary level impacts of the DSAP 5-year development program; therefore, no amendment to the Nassau County Capital Improvements Plan (CIP) or School Board’s Educational Facility Plan is needed at this time.

C.6.2 Schools – Build-out Projections

Table C-6d estimates long-term or build-out student generation for the Chester Road DSAP.

Table C-6d Estimated DSAP Student Generation (build-out)

Residential Units	Student Generation Rates			Students by School Type		
	Elementary	Middle	High	Elementary	Middle	High
1,875	.25	.15	.17	471	276	319

**Source: 2015 student generation rates as provided by Nassau County School Board staff*

Build-out of the DSAP development program could result in the addition of 471 elementary school students, 276 middle school students and 319 high school students. Utilizing the school districts prototypical school sizes as outlined in the ILA, it can be assumed that the equivalent of 0.59 elementary schools, 0.23 middle schools and 0.21 high schools would be needed to accommodate the projected DSAP student generation at build-out. The School Board’s 2015-2016 Work Plan contains two new Yulee area elementary schools and one new Yulee area middle school within the 10-year work plan. The 2015-2016 Work Plan also identifies one new elementary school and one new middle school in the Yulee area in the 20-year capacity plan, in addition to the schools contains in the 10-year work plan within if built, these schools would address projected deficits at the existing Yulee area elementary and middle schools and accommodate the projected DSAP student generation at build-out. During the approval of the East Nassau Employment Center DSAP, the developer donated 27 acres to the Nassau County School Board for the construction of an elementary school within the ENCPA. Additional high school improvements may need to be included in future School Board Work Plans to accommodate projected impacts at those levels.

C.7 Recreation and Open Space

Nassau County has adopted a tiered recreation and open space level of service (LOS) standard based upon acreage per 1,000 residents. These LOS standards are identified in Nassau County’s 2030 Comprehensive Plan and summarized in Table C-7a.

Table C-7a Nassau County Recreation and Open Space LOS

Type	Service Radius	Minimum Size	Acres/1,000 Residents
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Community Parks	1-2 Miles	10 Acres	3.35
Regional Parks - General	County-wide	30 Acres	10
Regional Parks – Beach Access	County-wide	Variable	.25
Regional Parks – Boat Facility	County-wide	Variable	.40

Source: Nassau County 2030 Comprehensive Plan

C.7.1 Recreation and Open Space – 5-yr Projections

Table C-7b estimates short-term or 5-yr recreation and open space demand for the Chester Road DSAP. It assumes a standard 2.32 persons per household (PPH) for the 700 residential units proposed in the 5-yr development program. The 2.32 PPH is the projected average household size for Nassau County in 2030 as identified in Table 5 of the Executive Summary of the Nassau County 2030 Comprehensive Plan. The Comprehensive Plan notes the source for this data as the Shimberg Center for Affordable Housing, University of Florida, US Census Bureau.

Table C-7b Estimated DSAP recreation and open space demand (5-yr)

Type	Projected 5-yr Population*	Acres/1,000 Residents	Projected 5-yr Demand
Community Parks	1,624	3.35	5.4
Regional Parks - General	1,624	10	16.2
Regional Parks – Beach Access	1,624	.25	0.4
Regional Parks – Boat Facility	1,624	.40	0.6

* 700 dwelling units x 2.32 persons per household = residents

C.7.2 Recreation and Open Space – Build-out Projections

Table C-7c estimates long-term or build-out recreation and open space demand for the Chester Road DSAP. As with the 5-yr projections, the build-out projections assume a standard 2.32 persons per household (PPH) for the 1,875 residential units proposed at build-out.

Table C-7c Estimated DSAP recreation and open space demand (build-out)

Type	Projected Buildout Population*	Acres/1,000 Residents	Projected Buildout Demand
Community Parks	4,350	3.35	14.6
Regional Parks - General	4,350	10	43.5
Regional Parks – Beach Access	4,350	.25	1.1
Regional Parks – Boat Facility	4,350	.40	1.7

*1,875 dwelling units x 2.32 persons per household = 4,350 residents

Currently, Nassau County is deficient in all types of recreation and open space facilities. The proposed DSAP 5-yr and build-out programs are estimated to increase demand by approximately 22.6 acres and 60.9 acres, respectively. This demand is being met through the provision of significant open space and an extensive multi-use trail system.

The proposed DSAP land use plan includes approximately 553.6 acres of open space in the form of interconnected wetlands, surface waters and upland preserves forming a Conservation Habitat Network (CHN). This open space system is intended to serve both the residents and employees of the Chester Road DSAP as well as the remainder of the County. The significant open space system provided by the DSAP is capable of not only accommodating DSAP impacts but also addressing a County wide deficiency in regional parks through 2030.

At build-out, the Chester Road will contain over 4 miles of multi-use trails. Assuming an average width of ten feet, this trail system would provide over 4.8 acres of recreational facilities and connect neighborhoods and employment centers to the extensive open space network.

In addition to both the CHN and multi-use trail system, ENCPA policies require the inclusion of neighborhood parks, plazas and playfields. At build-out, these facilities are anticipated to exceed the projected demand created by the DSAP development program and assist significantly in addressing the County's overall deficiency in recreation and open space acreage.

C.7 Summary

In conclusion, adequate potable water, sanitary sewer, solid waste, public school and recreational facilities exist to accommodate the proposed DSAP 5-yr development program. Future improvements may be necessary to accommodate the DSAP's projected wastewater and public school impacts at build-out.