ENVIRONMENTAL ASSESSMENT FORM
FOR
AIRPORT DEVELOPMENT ACTIONS

FEDERAL AVIATION ADMINISTRATION
ORLANDO AIRPORTS DISTRICT OFFICE
SOUTHERN REGION AIRPORTS DIVISION

Airport Name: Ormond Beach Municipal Airport

Proposed Action: Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On-and Off-Airport Obstruction Removal

This Environmental Assessment becomes a Federal document when evaluated and signed by the responsible FAA official.

Responsible FAA Official: ____________

Date: 3-22-2018

This Environmental Assessment (EA) Form is intended for use in the Federal Aviation Administration (FAA) Orlando Airports District Office (ORL/ADO) only, and with the approval of an ORL/ADO Environmental Protection Specialist (EPS). The Airport Sponsor must discuss the use of this EA Form with an ORL/ADO EPS before beginning the EA scoping and environmental analysis process. An electronic version of this EA Form is available upon request from an ORL/ADO EPS.

APPLICABILITY

The purpose of an EA is to determine whether a proposed action has the potential to significantly affect the human environment (see FAA Order 1050.1F, Paragraph 4-3 for more information on determining significance). An EA is a concise public document that briefly provides sufficient evidence and analysis for determining whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significance (FONSI). An EA, at a minimum, must be prepared when the proposed action does not normally require an EIS (see Paragraph 3-13, Actions Normally Requiring an Environmental Impact Statement) and:

1) Does not fall within the scope of a Categorical Exclusion (CATEX) (see FAA Order 1050.1F, Paragraph 5-6 *The Federal Aviation Administration's Categorical Exclusions*);

2) Falls within the scope of a CATEX, but there are one or more Extraordinary Circumstances (see FAA Order 1050.1F, Paragraph 5-2 *Extraordinary Circumstances*).

See FAA Order 1050.1F, Paragraph 3-1.2. Actions Normally Requiring an Environmental Assessment.

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INSTRUCTIONS

Introduction: This EA Form is based upon the guidance in FAA Order 1050.1F – *Environmental Impacts: Policies and Procedures*, and the related publication FAA Order 1050.1F Desk Reference (1050.1F Desk Reference). The Order provides the FAA policies and procedures to ensure agency compliance with the National Environmental Policy Act (NEPA) (42 United States Code [U.S.C.] §§ 4321-4335), the requirements set forth in the Council on Environmental Quality (CEQ), Title 40, Code of Federal Regulations (CFR), parts 1500-1508, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (CEQ Regulations), and Department of Transportation (DOT) Order 5610.1C, *Procedures for Considering Environmental Impacts*. The CEQ Regulations establish procedures for complying with NEPA. In accordance with 40 CFR § 1507.3 of the CEQ Regulations, the Order contains the FAA's implementing procedures, which supplement those regulations. The 1050.1F Desk Reference provides details on current guidance and updated technical information. This includes information about permits, licenses, consultations, and other forms of approval or review; up-to-date details on technical information such as FAA-approved tools for analyzing noise and air emissions; overviews of special purpose laws and requirements; and specific responsibilities and guidance for gathering data, assessing impacts, consulting other agencies, and involving the public.

Early Planning: Environmental issues should be identified and considered early in a proposed action's planning process to ensure efficient, timely, and effective environmental review. Preparation for any applicable permit application and other review process requirements should be part of the planning process to ensure that necessary information is collected and provided to the permitting or reviewing agencies in a timely manner. The Airport Sponsor should identify known environmental impact categories that the Action and alternatives (if any) could affect, including specially protected resources. These tasks should be completed at the earliest possible time during Action planning to ensure full consideration of all environmental impact categories and facilitate the FAA's NEPA process. Sufficient planning and Action justification must be available to support the environmental review.

******IMPORTANT******

The Airport Sponsor must contact their ORL/ADO Program Manager if the Proposed Action <u>is not</u> depicted on the Airport's conditionally-approved ALP. The ORL/ADO will determine if an update to the ALP is required. If an interim ALP update is required, coordination and approval can take up to 90 days and must be finalized prior to an environmental decision.

A Proposed Action's pre-application for federal funding (design or construction) <u>must</u> include an environmental finding in accordance with NEPA. Pre-applications are normally due in the ORL/ADO in January in order to receive a grant for the following fiscal year. The Airport Sponsor should allow 6-12 months prior to submitting a pre-application to the ORL/ADO for federal funding to complete the EA process.

1. PROPOSED ACTION LOCATION

Airport Name and Identifier:	Ormond Beach Municipal Airport (OMN)		
Airport Address:	770 Airport Road		
City:	Ormond Beach	**County:**	Volusia
State:	Florida	**Zip Code:**	32174

2. AIRPORT SPONSOR INFORMATION

Point of Contact:	Steven Lichliter, Airport Manager		
Address:	770 Airport Road / P.O. Box 277, Ormond Beach, FL 32175		
Business Phone:	(386) 615-7019	**Cell:**	(386) 212-8406
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3. PREPARER INFORMATION

Point of Contact:	Kimberly Peace, Senior Environmental Coordinator, Hoyle, Tanner & Associates, Inc.		
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4. PROPOSED ACTION

Describe the Proposed Action with sufficient detail in terms that are understandable to individuals who are not familiar with aviation or commercial aerospace activities. List and describe all components of the Proposed Action including all connected actions. Summarize how the Proposed Action fits into the Airport's ALP. Attach an exhibit of the Airport's conditionally approved ALP depicting the Proposed Action, and an exhibit of the Proposed Action on a recent airport aerial. Summarize costs, including any mitigation costs, if applicable. Discuss how the Proposed Action will be funded. Provide a timeframe identifying when the Proposed Action is to be constructed and operational.

Proposed Action

The Ormond Beach Airport (OMN) is located approximately three miles northwest, and within the boundary, of the City of Ormond Beach (City) in Volusia County, Florida (Figure 1: Location Map). The City owns and operates the airport. The FAA designates OMN as a General Aviation (GA) Reliever Airport in the National Plan of Integrated Airport Systems (NPIAS; 2013-2017). The FAA defines reliever airports in FAA Order 5090.3C, December 4, 2000, as "an airport designated by the FAA as having the function of relieving congestion at a commercial service airport and providing more general aviation access to the overall community."

General Aviation refers to all aircraft that are not classified as air carrier, commuter, or military in nature. A reliever airport pulls corporate, recreational, and training aircraft away from air carrier airports to reduce scheduled air traffic delays and increase safety at those airports. GA reliever airports are located strategically around the state to serve both metropolitan and rural areas. Thus, OMN serves an important role in the air carrier system of Florida by relieving the congestion at commercial service airports and by reducing the demand on those airports that have scheduled air carrier service.

The Proposed Action for this EA includes the following actions located at OMN:

- Extending Runway (RW) 8-26 from existing 4,004 feet to 5,005 feet on the RW 8 end;
- Extending the existing parallel Taxiway (TW) A and installing a bypass taxiway;
- Relocating runway end identifier light (REILs), Precision Approach Path Indicators (PAPI's), extending existing medium intensity runway and taxiway edge lights and remarking pavement;
- Acquiring avigation easements or purchasing properties to control the Runway Protection Zone (RPZ) per FAA Advisory Circular 150/5300-13A, Section 310, issued September 28, 2012, revised February 26, 2014; and
- Removing trees that are identified as obstructions to navigable airspace located within the new approach surfaces and the air traffic control tower line of sight.

These actions are depicted on Figure 2: Proposed Action.

The City must acquire necessary rights to control the land use beneath the RPZ, which entails either purchasing an avigation easement or purchasing the property in fee from the property owners.

Airport Layout Plan

FAA conditionally approved the Future Airport Layout Plan on September 28, 2016 (ALP; Attachment A) depicting the Proposed Action described above, as noted by the following comment arrows on the plan: identification of future RW 8 end, and acquire adequate property rights to control the RPZ. The City has conceptually depicted additional items on the Future ALP. This future development will require separate analysis in accordance with the National Environmental Policy Act (NEPA) and FAA regulations.

The City has prepared OMN Airport Master Plan Update in January 2016 that includes the Proposed Action as an important component to future development and economic stability for OMN.

Schedule

If the FAA has a favorable NEPA determination, then the FAA would consider the design of the project in fiscal year 2018.

Proposed Costs

The City estimates the project will cost approximately $3.8 to $4.4 million. The City is requesting federal funding on the proposed project, as well as state and local funding. Table 1 shows an approximate breakdown of these costs:

Table 1: Estimated Probable Costs, Ormond Beach Airport, RW 8-26 Extension Project

	Approximate 2018 Costs for Avigation Easement	Approximate 2018 Costs for Fee Simple Purchase
RW 8-26 lengthening	$1,553,000	$1,553,000
TW A extension*	$1,553,000	$1,553,000
Property Rights	$315,000	945,000
Obstruction Removal	$376,000	$376,000
Summary	$3,778,000	$4,409,000

*includes design, construction, pavement, lighting and marking

5. PURPOSE AND NEED

(1) Describe the underlying purpose and need for the Proposed Action. Present the problem being addressed, describe what the Airport Sponsor is trying to achieve with the Proposed Action, and take into account the FAA's primary mission to provide the safest, most efficient aerospace system in the world. The purpose and need of the Proposed Action must be clearly explained and stated in terms that are understandable to individuals who are not familiar with aviation or commercial aerospace activities. The purpose and need must be supported by recent data. To keep this section brief, incorporate by reference any supporting data, inventories, assessments, analyses, or studies. This can include but is not limited to FAA compliance or standard changes, letters from users showing need per FAA design standards, letters of commitment from current or prospective tenants, based aircraft data, fuel data, scheduled service, critical aircraft needs, TAF and Master Plan forecasts, capacity issues (actual use/need of aircraft or airline, or scheduled commercial service. IMPORTANT: If the Airport Sponsor intends to request Federal funding, the purpose and need for the Proposed Action must be justified by recent airport planning analysis and concurred with by ADO management before initiating the EA.

The City has identified a need to extend RW 8-26 at OMN in order to enhance safe, reliable and efficient general aviation operations. The length of RW 8-26 currently limits efficient use of the airport. Airport tenants, transient business and charter operators take a payload or weight penalty when operating from the relatively short runway; users have to reduce either the fuel or passenger load in order to remain within the takeoff and landing limits defined in the individual aircraft operating manuals, limiting their range and/or utility and existing business tenants have had to refuse work due to the existing length of RW 08-26 not being able to accommodate aircraft. The runway is too short for some of the critical airport reference code B-II business and charter aircraft to efficiently operate and as such creates a condition of limited use and growth for OMN.

The purpose of the project, in addressing this need, is to extend RW 8-26 to 5,005 feet to improve existing constrained operations, and ensure economic stability for OMN based on prevailing trends in aviation market forces and the commitment from the community and GA stakeholders.

Forecast

The City developed a Forecast for OMN during the 2016 Master Plan Update that reviewed existing operations data and projected aviation activity for three future time periods: near-term forecasts (2015-2019), intermediate-term forecasts (2020-2024), and long-term forecasts (2025-2034). Near-term forecasts (up to 5 years) justify near-term development and support operational planning and environmental improvement programs. Intermediate-term forecasts (from 6 to 10-years) are usually used in planning capital improvements. Long-term forecasts (beyond 10 years) provide information for general planning. The FAA approved this forecast on April 6, 2015 (Attachment B).

The forecast estimates with reasonable accuracy future aviation activity at OMN for the overall period from 2015-2034. GA airport forecasts are typically based on historical data and broadly accepted industry and governmental estimates of aviation activity, and the primary socio-economic drivers of GA activity. The basis for forecasting starts with the based aircraft and types as collected by the airport manager and submitted via the National Based Aircraft Inventory Program. Itinerant and local General Aviation operations counts are acquired from Air Traffic Control Tower operations counts for a base year and FAA accepted combined average annual growth rates are applied to produce the forecasts in the selected future years. The base year in Table 2 indicates there were almost 68,000 itinerant operations (aircraft not based at OMN) along with almost 57,000 local operations using the field. This means the runways are being used for transportation of people and materials as well as a significant amount of training flights. The FAA-approved Base + 5-year forecast grows that cumulative total by almost 7000 operations.

The City is providing this forecast as supporting evidence for the need for a longer runway at OMN; data is summarized herein, refer to the 2016 Master Plan Update for additional details on how the forecast was developed.

<u>Critical Aircraft</u>

Planning improvements to an existing airport requires the selection of one or more “design aircraft” or “critical aircraft”.

The critical aircraft is the most demanding aircraft that will make substantial use of the airport. Substantial use means either 500 or more annual itinerant operations, or scheduled commercial service (*Order 5080.3C Field Formulation of the National Plan of Integrated Airport Systems, Section 3-4*). The critical aircraft may be a single aircraft or a composite of the most demanding characteristics of several aircraft. The critical aircraft (or composite aircraft) is used to identify the appropriate Airport Reference Code for airport design criteria.

In most cases, the critical aircraft for the purposes of airport geometric design is a composite aircraft representing a collection of aircraft classified by three parameters: Aircraft Approach Category (AAC), Airplane Design Group (ADG), and Taxiway Design Group (TDG). With the exception of the single engine and light twin aircraft typically used for flight training, there is no aircraft model that currently meets the requirements of substantial use. However, a Cessna Citation 525 business jet (ARC B-II) is currently based at OMN.

Data from the FAA Enhanced Traffic Management System Counts (ETMSC) was used to review the existing fleet mix at OMN. The ETMSC provides information on traffic counts by airport for flights that operate under IFR and are captured by the FAA’s en route computers. Most VFR traffic is excluded from this system. In addition, a customized report was purchased from FlightAware™ which provides similar information to the ETMSC data. Based on the review of this data, the aircraft family with the most demanding aircraft characteristics (the critical aircraft) currently operating at OMN are the Cessna Citation C525, C550, and C560. These are all ARC B-II, TDG 1B aircraft.

Table 2: Forecast Summary, Ormond Beach Airport, RW 8-26 Extension Project

			Years				
		Base yr	Base +1 yr	Base +5 yr	Base +10 yr	Base +15 yr	Base +20 yr
		2014	**2015**	**2019**	**2024**	**2029**	**2034**
Based Aircraft							
Single Engine Piston		126	128	132	136	143	151
Multi Engine Piston		25	25	26	27	29	30
Multi Engine Turboprop		1	1	2	2	2	3
Jet		2	2	4	8	10	12
Rotorcraft		9	9	10	10	11	11
	Total	**163**	**165**	**174**	**183**	**195**	**207**
Itinerant Operations							
Air Carrier		0	0	0	0	0	0
Air Taxi		5	69	72	91	112	126
General Aviation		67,754	69,178	71,945	75,614	79,551	83,786
Military		5	4	4	4	4	5
	Sub-Total	**67,764**	**69,251**	**72,021**	**75,709**	**79,667**	**83,916**
Local Operations							
General Aviation		56,931	56,660	58,926	61,944	65,182	68,659
Military		0	0	0	0	0	0
	Sub-Total	**56,931**	**56,660**	**58,926**	**61,944**	**65,182**	**68,659**
	Touch and Go	22,772	22,664	23,570	24,778	26,073	27,464
Total Annual Operations		**124,695**	**125,911**	**130,947**	**137,653**	**144,849**	**152,575**

<u>Runway Length Required based on Airport Users Input</u>

Many general aviation (GA) airports have witnessed an increased use of their primary runway by privately owned and chartered business turboprops and jets. Business aircraft have proved themselves to be a tremendous asset to corporations by satisfying their executive needs for flexibility in scheduling, speed, and privacy. In response to these types of needs, GA and Reliever airports like Ormond Beach who receive or anticipate regular usage by airplanes over 12,500 pounds should provide a runway length to support those users. The extension of an existing runway can be justified at OMN because they have a documented need expressed by aircraft users to operate more capable airplanes on a frequent basis. During and after the recent Airport Master Planning process the City of Ormond Beach worked with local businesses and other airport users to better quantify their needs. The complete responses are included in Attachment C. A summary of the user needs, aircraft types used and operations annually expected are in the table below. A no-build scenario means these aircraft will not use the field or will use it less due to the runway length operational restriction and the airport and existing airport businesses would not get the revenue flow from the fuel and services that these additional aircraft operations require. With typical fuel capacities exceeding 800 gallons each and jet fuel burn between 140 and 225 gallons per flight hour the loss of future fuel sales revenue alone is significant. Just one hour flown by each of the 622 expected aircraft will require almost 100,000 gallons of jet fuel. Any of these aircraft that are based at OMN will also require additional services including hangars, maintenance, and other specialized services that support existing providers and create new job opportunities for others. The aircraft models for 622 expected operations (substantial use) support the ARC B-II critical aircraft determination.

Table 3: Runway needs based on users input, Ormond Beach Airport, RW 8-26 Extension Project

Airport User	Aircraft Owner	Aircraft Model(s) Used	Destinations	Approximate Current or Projected Annual OMN Operations	Comments
Lewis Heaster Properties	NetJets	C560, C680, C750, CL35, CL60, EMB 505, FT2H	TEB, MEI, CKB	30	Aircraft type and size varies with customer needs.
Gary Yoemans	Blue Skies Aviation of Daytona	C550	East Coast	110	Plans to acquire a larger aircraft when RWY 8 is extended. The company owns several aircraft currently based at DAB, but would move to OMN when the primary runway has been extended.
NETJETS	NetJets	C560, C680, C750, CL35, CL60, EMB 505, FT2H	LAX, MDLR	6	NetJets supports the proposed extension of RWY 8 and has customer demand at OMN. Annual operations would increase by NetJets when the primary runway has been extended.
Entech Controls	NetJets	C560, C680, C750, CL35, CL60, EMB 505	MKC, APA, BUR	70	Aircraft type and size varies with customer needs.
Command Medical Products	Command Medical	Citation V	MNMG	200	Annual operations expected to double with business expansion.

World Color International	World Color International	Westwind II		134	Currently based at FIN due to runway length, but business is in the OMN business park.
Sunrise Aviation	Sunrise Aviation	Cessna Citation	Charter/Flight Training	unspecified	Sunrise plans to expand their FBO operations to include turbine transition training and charter service using the Cessna Citation family of aircraft, pending extension of the primary runway at OMN.
Stonewood Holdings LLC	NetJets	C560, C680, C750, CL35, CL60, EMB 505,	PVD	72	Aircraft type and size varies with customer needs.
Wayne Luginbuhl	Corporate/Charter Pilot	CE500, CJII	East Coast, Europe, Russia	unspecified	Pilot also flies a CJ I with an Eagle modification to carry extra fuel. Pilot states that this aircraft, so equipped, faces operational restrictions at OMN.
Ormond Aircraft Brokers	Various	Various	N/A	unspecified	Tenant runs a paint shop; has had to turn away business due to lack of runway length.
Hangar Seven Aviation	Various	Various	N/A	unspecified	Tenant operates rental hangars; longer runway would support additional tenants and development.
	Total Proposed Operations			**622**	

<u>Runway Length Constraints</u>

The Ormond Beach Municipal Airport Runway Length Analysis developed by Hoyle, Tanner & Associates in 2017 (Attachment D) details the FAA's method for determining the appropriate runway length for an airport. As presented in that document, OMN's primary runway, RW 8-26 which is currently 4,005 feet, does not allow 75% of the fleet mix to operate at a 60% load. Reviewing the specific requirements of the aircraft using OMN supports the need for a longer runway length based on maximum allowable takeoff weights and highlights specific models that would have taken weight penalties to operate from OMN's existing runways.

Private, corporate and charter business aircraft are the most adversely impacted by limited runway length when operating to or from OMN as supported by the length analysis. Aircraft owners and operators pay penalties including limiting uploads in fuel, passengers or both when flying using shorter runways. With the weight penalties come reduced stage lengths, meaning landing earlier or prior to the ultimate destination to refuel. Shorter stage lengths with additional fuel stops extends the time required for the trip and increases the cycles on the airframe and engines, which adds additional maintenance costs for the operator.

The proposed additional runway pavement benefits the charter, corporate/business multiengine and turbine flight profiles. Based on user input and the FAA methodology an extension to between 4,770 to 6,770 feet would permit 75% of the fleet between 12,500 and 60,000 pounds to takeoff from OMN with between 60% and 90% useful load. These are the same small to mid-size B-II jets (approach speeds of 90-120 knots and wingspan between 49-78 feet) used extensively by the corporate and charter aircraft operators.

Economic Viability

OMN is major asset for the community and has the potential to become a more significant economic engine for the City of Ormond Beach and the surrounding communities. OMN is an effective transportation tool used by local businesses to increase the efficiency of their operations. The airport is home to two flight training facilities and may see an increased role as a provider of flight training services. GA operations by corporate and business users are common at the airport and are expected to increase with the ongoing development of two industrial parks adjacent to the airport. The City estimates that four percent of its annual GA operations are business-related; the City is anxious to see that use grow. The airport also attracts transient or visiting general aviation aircraft. While the airport does not have any based military aircraft, it does accommodate some transient military operations that account for a small amount of the total annual activity at the airport.

(2) Identify the Airport Sponsor's requested FAA Federal action in the space below. For the FAA Office of Airports (ARP), a Federal action may include one or more actions (See FAA Order 5050.4B, Paragraph 9.g.). Note: *The information provided in this EA Form allows the FAA to determine if a Finding of No Significant Impact (FONSI) can be issued because the proposed action's environmental impacts, with no additional mitigation, would not be significant, or a mitigated FONSI can be issued because the proposed action's environmental impacts, with additional mitigation, would not be significant (see FAA Order 1050.1F, Paragraph 6-2.3a). FAA environmental findings on an Action do not constitute FAA decisions or approvals regarding Federal funding of the Action.*

The requested federal action being considered by the FAA in this EA is unconditional approval of those portions of the Ormond Beach Municipal Airport ALP that depict the Proposed Action and its connected actions as identified in Section 4, Proposed Action. Other federal approvals include:

- The approval necessary to proceed with processing of an application for federal funding for those development items qualifying under the former Airport and Airway Improvement Act of 1982, as amended, and recodified at 49 U.S. Code (U.S.C.) 47101, et seq.;
- Revision of air traffic control procedures to reflect relocated runway thresholds;
- FAA determination of the Proposed Action's effects on the safe and efficient use of airspace.

Although future projects other than the Proposed Action are depicted on the ALP, the FAA is only considering federal environmental approval for the Proposed Action evaluated in this EA.

The City of Ormond Beach acknowledges that an environmental finding by FAA does not constitute funding approval. The City will apply for a funding grant for eligible portions of the Proposed Action after a favorable environmental finding.

6. ALTERNATIVES (INCLUDING THE PROPOSED ACTION)

There is no requirement for a specific number of alternatives or a specific range of alternatives to be included in an EA. Alternatives are to be considered to the degree commensurate with the nature of the proposed Action and agency experience with the environmental issues involved. The Sponsor's preferred alternative, if one has been identified, should be indicated. For alternatives considered but eliminated from further study, the EA should briefly explain why these were eliminated. Note: *An EA may limit the range of alternatives to the proposed action and no action when there are no unresolved conflicts concerning alternative uses of available resources. This means that you may limit the range of alternatives to the proposed action and no action if you can establish consensus based on input from interested parties that there are no unresolved conflicts, or if there are no reasonable alternatives that would be substantially different in design or effects. If you are able to do this, you must document the basis for concluding consensus and identify the parties that participated; and, you must discuss why there are no reasonable alternatives that would be substantially different in design or effects. This is why the Purpose and Need is important in helping define the range of alternatives.*

(1) Discuss in comparable format to that listed below the Proposed Action and alternatives. Discuss how the Proposed Action and alternatives were developed e.g. recent planning study or Master Plan Update. Attach figures for the Proposed Action and alternatives to aid in understanding the physical layout and differences in the alternative configurations.

For each alternative:

a. Discuss to what extent an alternative meets the Purpose and Need.

b. Discuss if an alternative is technically and economically feasible e.g. operational considerations/regulations, safety considerations, constructability, infrastructure requirements, property acquisition requirements, and costs.

c. Discuss potential social, socioeconomic, and/or environmental resource impacts for each alternative e.g. business or residential relocations, road relocations or closures, environmental resources protected under federal statutes (wetlands, floodplains, and listed species, and Section 4(f), or Section 106 resources).

d. For each alternative considered but eliminated from further study, summarize why it is not considered reasonable. Note: ***To be reasonable, an alternative must respond to the purpose and need, be technically and economically feasible, and be reasonably consistent with the land use plan for management of the area***

The City of Ormond Beach developed conceptual plans for three alternatives for improving the operational safety and reliability of the Airport to meet the purpose and need for the project. The City identified a Proposed Action after preliminary review of the overall impacts to the human and natural environment that is a reasonable and feasible alternative when compared to the other alternatives, as detailed below. The Alternatives Matrix Table at the end of this section compares the Proposed Action and no action based on their associated potential impacts and costs, and is provided as a decision matrix.

Alternative 2 would meet the runway length needs with limited environmental impacts, and for this reason is the Proposed Action.

Alternatives 1 and 3 meet the spirit of the purpose and need for the project but are not considered reasonable or feasible enough to merit additional analysis of impacts in this document, as noted below.

Alternative 1 (Figure 3) would extend Runway 8-26 by 400 feet to the east and 600 feet to the west. The width of Runway 8-26 would remain the same at 75 feet. This would increase the runway length from 4,005 feet to 5,005 feet. This alternative would extend the runway within the existing airport property limits. Runway 8 meets current FAA standards with minimal impacts to biotic resources. Vegetative clearing would be required for the new instrument approaches, which may require off-airport tree removal or obstruction lighting. This alternative would increase the development constraints caused by the ATCT line of sight and the Runway Visibility Zone (RVZ).

The existing RPZ land uses are grandfathered, therefore the proposed changes to the RPZ will need to meet current FAA standards (FAA 2012).

The RPZ for Runway 26 for this alternative envelops River Bend Golf Course and Airport Road which are classified by the FAA as incompatible land uses. In order to make this alternative compliant, the golf course would need to realign three holes. During the relocation construction, there would be an impact to the revenues generated by the golf course. All efforts to maintain the existing holes while the new holes are re-aligned would be made but the community should expect minor impacts over a probable 12-month period. The existing lease between the airport and the golf course would need to be amended to include the new footprint of the golf course. Airport Road would need to be realigned around the RPZ which would have significant impacts to the 100-year flood plain and biotic resources associated with the Tomoka River. Existing wetlands would need to be mitigated based on the new footprint of the realigned roadway. Also, it is expected based on the available soils data that a significant de-mucking would need to be accomplished under the new roadway to ensure a stable sub-base.

The new Runway 8 RPZ established by the extension would remain on airport property. The new Runway 26 RPZ established by the extension would remain on airport property as the airport property boundary extends beyond Airport Road and up to the Tomoka River's edge.

While Alternative 1 meets the runway length needs, it would create significant environmental impacts to the east of the airport and is the most expensive alternative. Therefore, this alternative is not considered reasonable.

Alternative 3 (Figure 4) would extend Runway 8-26 by 600 feet to the west. The width of Runway 8-26 would remain the same at 75 f. This would increase the runway length from 4,005 feet to 4,605 feet. This alternative would extend Runway 8 and the associated RPZ to the west but would remain within the existing airport property limits. This alternative does not satisfy the findings of the Runway Length Analysis. This alternative would have the same impacts as depicted in Alternative 1, less the impacts to the east caused by existing Runway 26 towards the golf course.

Alternative 3 does not meet runway length needs and therefore is not considered reasonable.

<u>RPZ Analysis</u>

An RPZ Analysis was submitted to FAA detailing the existing and proposed land use changes in the RPZ for the proposed alternatives (Attachment T). This document was approved by FAA on November 2, 2017. In summary, the City of Ormond Beach has complete ownership control over the existing RPZs, which are currently zoned as I-1 (Light Industrial). Current land use is consistent with current zoning. The existing RPZ associated with the Runway 08 end lies entirely on airport property and consists mainly of open space and some wooded area. The existing RPZ associated with the Runway 26 end also lies entirely on airport property. A small portion of the RPZ (approximately 2.1 acres) falls on the River Bend Golf Club course, which is located on airport property. The remaining portions of this RPZ consist of open space and some trees/vegetation.

The Proposed Action, extension of Runway 8-26 1,000 feet on the west side will push the future RPZ off airport property and over three adjacent homeowner parcels. No existing structures lie in the proposed RPZ. However, the residential use of the three parcels is not compatible with the RPZ standards and must be addressed through a restricted easement or purchase.

(2) Although the No Action alternative does not meet the purpose and need, NEPA, and it's implementing regulations requires consideration of the No Action alternative. The No Action alternative, when compared with other alternatives, enables the identification of the potential environmental impacts of the Proposed Action and alternatives. Describe the consequences of the No Action alternative e.g. what are the operational, safety, efficiency, economic effects, and environmental effects of taking no action.

The "No Action" alternative does not propose changes to the existing runway configuration. RW 8-26 would remain at 4,005 feet long and 75 feet wide.

No biotic resources would be impacted by this alternative, however it would influence the future economic development and efficiency of the airport and the surrounding community by limiting the size of aircraft that can conduct interstate commerce to and from the facility. This alternative would limit the airport to minor growth or could result in a decline in airport use; as businesses and users who desire to grow and expand relocate to facilities that meet their needs.

This alternative does not meet the needs of the airport; however, it does provide the lowest cost option when considering capital improvement costs alone, and not in combination with the potential economic impacts.

(3) You must provide a summary table depicting the alternatives analysis that compares the Proposed Action, alternatives considered, and the No Action alternative based on the screening criteria discussed in (1) a. through d.

See attached Table 4.

7. <u>AFFECTED ENVIRONMENT</u>

Succinctly describe the existing conditions in the Proposed Action's *direct impact area* (construction footprint) and airport vicinity (land use and cover, terrain features, level and type of urbanization, biotic resources, noise sensitive sites (residential, churches, schools, parks, recreational facilities, etc.)). This *indirect impact area* should be large enough to include the area within the composite DNL 65 dB noise contour for the Proposed Action and retained alternatives (if any). The discussion of the affected environment should be no longer than is necessary to understand the impacts of the alternatives; data and analyses should be presented in detail commensurate with the importance of the impact. Discuss any actions taken or issues raised by the local community or citizen groups pertinent to the Proposed Action. If not already provided, attach a graphic and recent aerial of the area with the Proposed Action's and retained alternatives direct and indirect impact areas clearly identified

Impact Area

Figure 2: Proposed Action, depicts the direct impact area of the Proposed Action. The indirect impact area, as described in the Noise subsection below, is only slightly larger than the direct impact area, as the DNL 65 dB noise contour for the Proposed Action remains within the existing airport boundary. The only location where the impact area extends beyond the existing airport boundary is to the west of the RW 8 extension where easements will be needed to remove vegetative obstructions, to clear the airport approach and departure surfaces, and gain control of the Runway Protection Zone (RPZ). The project site consists mainly of natural vegetation with adjacent land use consisting of vacant land in natural vegetation, single family home sites, and the Ormond Beach Airport.

FAA Order 1050.1F, effective July 16, 2015, serves as FAA's policy and procedures for compliance with the National Environmental Policy Act (NEPA) and implementing regulations issued by the Council on Environmental Quality (CEQ). This Order lists 14 environmental impact categories that may be relevant to FAA actions. The following categories are described in this Affected Environment section as there will be no consequences (impacts) to those resources from implementing the Proposed Action and such information would not be useful in determining the level of impact, as detailed in the Environmental Consequences section of this EA:

- Climate
- Coastal resources
- Department of Transportation Act, Section 4(f)
- Farmlands
- Hazardous materials, solid waste, and pollution prevention
- Natural resources and energy supply
- Socioeconomics, environmental justice, and children's environmental health and safety risks
- Visual effects (including light emissions)

The following categories will be affected by the project:

Air Quality and Noise

KB Environmental Sciences, Inc. (KBE), prepared an "Affected Environment: Air Quality, Climate and Noise" report (May 2017; Attachment E) containing detailed information on these three resources; information included in this section is excerpted from that report.

The management of air quality conditions in Florida, including the area around OMN, is the responsibility of federal, state, regional, and local governmental air quality regulatory agencies. Under the federal Clean Air Act (CAA), the U.S. Environmental Protection Agency (EPA) establishes the guiding principles and policies for protecting air quality conditions throughout the nation. EPA's primary responsibilities in this area include promulgating the National Ambient Air Quality Standards (NAAQS), which define ambient concentrations for criteria air pollutants that are considered safe for public health, welfare and the environment. EPA designates areas as either meeting (attainment) or not meeting (nonattainment) the NAAQS. An area with measured pollutant concentrations that exceed the NAAQS is designated as a nonattainment area.

OMN is located in Volusia County, which is currently an area designated as "attainment" for all NAAQS established by EPA.

KBE created existing noise contours using the Federal Aviation Administration (FAA) Aviation Environmental Design Tool (AEDT) version 2c depicted on Figure 5: 2016 DNL Contours. The areas within each DNL contour range are listed in Table 5. Notably, there are no residences, schools, churches or other noise sensitive land uses within the DNL 65 decibels (dB) contour.

Table 5: 2016 DNL Contour Areas, Ormond Beach Airport, RW 8-26 Extension Project

DNL (dB)	Area (acres)
65 to <70	88
70 to <75	49
75 and greater	24
Total	161

Biological Resources

Biological Consulting Services, Inc. (BCS) prepared an environmental assessment report (May 2017; Attachment F) detailing the site conditions. The site topography is relatively flat within the upland areas which gently slope toward the wetlands within the project site boundaries. Elevations range from the 30'.0 contour in the uplands down to the 22.0' contour within the wetlands on site. The project area was mapped utilizing the Florida Land Use, Cover and Forms Classification System (FLUCCS, FDOT, 1999). Nine land use and cover types were identified in and around the project site, as depicted on Figure 6: Land Use Cover Types:

310 Herbaceous (Dry Prairie)
411 Pine Flatwood
413 Sand Pine
510 Streams and Waterways (Ditch)
618 Willow and Elderberry
620 Wetland Coniferous Forest
621 Cypress
643 Wet Prairie
811 Airports

Listed Species

BCS reviewed the site to determine the presence of state and federally listed threatened and endangered species, to identify vegetative communities that occur on the property, and review the physical features (soils and topography). Pedestrian field surveys were conducted on April 6 and 21, 2017. When compiling a list and searching for potential state and federally-listed species, major emphasis was given to the protected species that might inhabit the vegetative cover types listed above.

A list of species with the potential for occurrence on-site and which are afforded protection by the Florida Fish and Wildlife Conservation Commission (FFWCC) and the U.S. Fish and Wildlife Service (USFWS) was compiled prior to the protected species survey, based on a literature review of geographic range and preferred habitat. The USFWS Information for Planning and Conservation (IPAC) online tool was used to generate a list of federal threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of the proposed project (Consultation Code: 04EF1000-2017-SLI-0049; Attachment G).

Of the plant and animal species that may utilize the site, as listed in the report in Attachment F, only the following listed species were identified either on-site or with potential habitat on-site:

Red-cockaded woodpecker (*Picoides borealis*), federally-endangered
Eastern indigo snake (*Drymarchon corais couperi*), federally-threatened
Florida sandhill crane (*Grus canadensis pratensis*), state-threatened
Southeastern American Kestrel (*Falco sparverius paulus*), state-threatened
Little blue heron (*Egretta caerulea*), state-threatened
Roseate spoonbill (*Ajaia ajaja*), state-threatened
Tricolored heron (*Egretta tricolor*), state-threatened
Gopher tortoises (Gopherus polyphemus), state-threatened
Erect prickly pear (*Opuntia stricta*), state-threatened
Florida beargrass (*Nolina atopocarpa*), state-threatened
Coontie (*Zamie* sp.), state commercially exploited

A search of the FFWCC Bald eagle (*Haliaeetus leucocephalus)* Nest Locator for documented bald eagle nesting territories revealed no documented nests are located within 660' of the project site. Additionally, no eagle nest was observed during the reviews of the site.

Review of the USFWS “Wood Stork (*Mycteria americana*) Core Foraging Areas” mapping determined that the proposed Runway 08 extension does not fall within a mapped foraging area for the Wood stork.

<u>Historical, architectural, archeological, and cultural resources</u>

Storm L. Richards & Associates, Inc. (SLRA) conducted a Cultural Resource Assessment Pedestrian Survey of Section 106 Resources and Evaluation of Cultural and Historic Resources within the area of potential effects (APE; Figure 2: Proposed Action) consistent with Chapters 267 and 373, Section 373.414, Florida Statutes, and implementing state regulations and pursuant to Section 106 (36CFR, Part 800) of the National Historic Preservation Act of 1966, as well as in compliance with the National Environmental Policy Act of 1969 (Attachment H). The purpose of the Cultural Resource Pedestrian Survey was to identify and evaluate any unrecorded prehistoric and historic archaeological sites and historic structures on the property as well as to evaluate all identified cultural resources for their potential eligibility for listing on the National Register of Historic Places (NRHP) based on criteria set forth in 36 CFR Section 60.4. Research was conducted using the Florida Master Site Files (FMSF), Florida Department of Environmental Protection (FDEP), aerial photographs, maps and interview with City representatives.

The APE has low potential to contain these types of resources due to the environmental conditions of upland poorly drained soils, low to no topographic relief and poor access to water resources.

A review of the FMSF data files showed no known sites listed or eligible for listing on the National Register of Historic Places (NRHP) or archaeological sites within the APE. The APE is not contained within a historic district or historic neighborhood. No cultural materials or evidence of historic structures were recovered during the pedestrian survey.

The FAA provided coordination letters to the Florida Division of Historical Resources (FDHR) as well as the federally-recognized tribes with site review authority in the APE per Federal

Executive Order 13175 “Consultation and Coordination with Indian Tribal Governments” and FAA’s Order 1210.20 “American Indian and Alaska Native Tribal Consultation Policy and Procedures”: the Miccosukee Tribe of Indians of Florida, the Muscogee (Creek) Nation, the Poarch Band of Creek Indians, the Seminole Tribe of Florida and the Seminole Nation of Oklahoma (Attachment I). No response was received from the Poarch Band of Creek Indians.

The Miccosukee Tribe of Indians of Florida responded with no concerns regarding the project.

The Seminole Tribe of Florida, the Seminole Nation of Oklahoma and the Muscogee (Creek) Nation requested that a Phase 1 Cultural Resources Survey be conducted and provided to them.

A Cultural Resources Assessment Survey including shovel testing was completed by SEARCH Inc. and submitted to the Seminole Tribe of Florida, the Seminole Nation of Oklahoma and the Muscogee (Creek) Nation, as well as SHPO/FHDR, on June 26, 2017 (Attachment J). This report states that of the 46 shovel tests conducted across the APE, none contained evidence of an archaeologic site. The report supported the FAA’s determination of no effect on cultural resources.

The Seminole Tribe of Florida responded on June 30, 2017 that they have no objections to the project but would like to be notified if any archaeological, historic or buried resources are inadvertently discovered (Attachment I). The Muscogee (Creek) Nation responded on June 28, 2017 with no concerns but requested that the construction plans include a note stating that work must be stopped and their office contacted immediately if any Native American cultural materials are encountered (Attachment I).

The Seminole Nation of Oklahoma responded on July 6, 2017 with a request for more detailed information on the affected plant communities, and that vegetation that is significant to native tribes be used to replant any disrupted or disturbed riparian or wetland areas, such as *Salix humulis, S. carolinia, Arundius gigantica, Ilex vomitoria* and others as requested (Attachment I).

The Seminole Nation of Oklahoma also requested that a listing of the flora in the affected area be provided, and that consideration be given to replanting of Tribally significant plants should wetlands/riparian areas be affected, where possible. The report prepared by BCS was submitted to the Nation on May 22, 2017, and the condition regarding replanting will be noted on project plans.

FDHR responded that OMN has been designated as 8VO9252 because the airport was built in 1943 as a naval aviation training field. FDHR stated “It is the opinion of this office that the proposed project is unlikely to affect historic properties. However, the permit, if issued, should include the following special condition regarding unexpected discoveries:

“If prehistoric or historic artifacts, such as pottery or ceramics, projectile points, dugout canoes, metal implements, historic building materials, or any other physical remains that could be associated with Native American, early European, or American settlement are encountered at any time within the project site area, the permitted project shall cease all activities involving subsurface disturbance in the vicinity of the discovery. The applicant shall contact the Florida Department of State, Division of Historical Resources, Compliance Review Section at (850)-245-6333. Project activities shall not resume without verbal and/or written authorization. In the event that unmarked human remains are encountered during permitted activities, all work shall stop immediately and the proper authorities notified in accordance with Section 872.05 of the Florida Statutes.”

In addition, FDHR requested that a FMSF Resources Group Form be used to document the potential for the airport to be eligible for listing on the NRHP because it is over 50 years old. SLRA completed the Resources Group Form and submitted it to FDHR for their evaluation on May 22, 2017.

Based on this information, the FAA made a determination that the proposed undertaking will have no effect on historic, cultural or archaeological resources on August 17, 2017. The Seminole Nation of Oklahoma concurred with this determination on November 7, 2017 (Attachment I).

<u>Water Resources</u>

Five wetland systems were identified and delineated on the project site totaling approximately nine acres with four surface water areas on site. Three of the surface water areas can be defined as man-made conveyances (ditches) and one area is a small existing farm pond. The total surface water area on site is approximately 1 acre (Figure 7: Wetlands and Floodplains).

The FEMA FIRM floodplain map does not show floodplains within the project area.

There are no Wild and Scenic Rivers within the project area.

<u>Land Use</u>

The Proposed Action will extend the RPZ off the existing airport boundary. The RPZ is a trapezoidal, two dimensional area located at ground level beyond the runway end to enhance the safety and protection of people and property on the ground. For each separate parcel where the RPZ extends beyond the existing airport boundary, avigation easements or a fee simple purchase of the property will be needed to gain control of the RPZ. Control will include Airport Access to conduct the clearing/trimming of trees, restrictions on incompatible land use including buildings and structures, recreational land use, or other places of public assembly, and the future construction of structures within the RPZ.

8. <u>ENVIRONMENTAL CONSEQUENCES –IMPACT CATEGORIES</u>

Environmental impact categories that may be relevant to FAA actions are identified below in sections (1) through (14). Construction and secondary (induced) impacts should be addressed within the relevant environmental impact category. FAA-specific requirements for assessing impacts are highlighted in FAA Order 1050.1F, Appendix B *Federal Aviation Administration Requirements for Assessing Impacts Related to Noise and Noise-Compatible Land Use and Section 4(f) of the Department of Transportation Act (49 U.S.C. § 303).* Methodologies for conducting the analyses are discussed in detail in the 1050.1F Desk Reference. The latest FAA-approved models must be used for both air quality and noise analysis. A list of approved models for each type of analysis is available in the 1050.1F Desk Reference.

Note: *The Desk Reference may be cited only as a reference for the methodologies and processes it contains, and may not be cited as the source of requirements under laws, regulations, Executive Orders, DOT or FAA directives, or other authorities. It further notes that you should cite the original source when citing requirements from laws, regulations, or other authorities.*

FAA Order 1050.1F, paragraph 4-3.3, Significance Thresholds and Exhibit 4-1, provide a significance determination table for the Proposed Action and retained alternatives (if any) based on the analysis in sections (1) through (14) below. Note: *Quantitative significance thresholds do not exist for all impact categories; however,*

consistent with the CEQ Regulations, the FAA has identified factors that should be considered in evaluating the context and intensity of potential environmental impacts.

*******IMPORTANT*******

Environmental impacts for the following categories must be calculated for the year of project implementation and the planning horizon year in this EA Form. The implementation year represents the first year in which the Proposed Action would be fully operational. The planning horizon year typically represents the implementation year plus five years. Sometimes if appropriate due to project phasing or if requested by a reviewing agency, impact analysis may need to be conducted for intermediate years. Coordinate with an FAA ORL-ADO environmental specialist before conducting an intermediate year impact analysis.

Significance determination table

Impact Category	Significance Threshold	Effects of Proposed Action
Air Quality	The action would cause pollutant concentrations to exceed one or more of the National Ambient Air Quality Standards (NAAQS)	The action will not cause NAAQS to be exceeded
Biological Resources (including fish, wildlife, and plants)	The USFWS or NMFS determines that the action would be likely to jeopardize the continued existence of a federally listed threatened or endangered species, or would result in the destruction or adverse modification of federally designated critical habitat.	There will be no effect on federally-listed species. Impacts to the state-threatened gopher tortoise will be mitigated via FWCC requirements.
Historical, Architectural, Archeological and Cultural Resources	The FAA has not established a significance threshold for Historical, Architectural, Archeological, and Cultural Resources.	There will be no effect on these resources, as none have been documented in the APE.
Noise and Noise-Compatible Land Use	The action would increase noise by DNL71.5 dB or more for a noise sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65 dB level due to a DNL 1.5 dB or greater increase, when compared to the no action alternative for the same timeframe.	The action will not increase noise for a noise sensitive area or receptor; the DNL 65 dB contour will not extend off the airport property.
Water Resources	Adversely affect a wetland or system, be incompatible with state wetland strategies, cause notable adverse impacts on floodplains.	Wetland impacts are unavoidable and will be mitigated per requirements of the St. Johns River Water Management District and the USACE. No impacts will occur to floodplains or wild and scenic rivers.
Land Use	The FAA has not established a significance threshold for land use, and the FAA has not provided specific factors to consider in making a significance determination for land use. While the NEPA document must include a discussion regarding consistency with state and/or local plans, an inconsistency by itself does not automatically result in a significant impact.	Three parcels currently zoned as Rural or Rural/Ag will either have easements placed over their entirety that will place restrictions on incompatible use such as buildings, structures recreational land use or other places of public assembly, or they will be purchased.

(1) AIR QUALITY

The FAA has a responsibility under NEPA to include in its EA’s sufficient analysis to disclose the extent of a project’s impact on the attainment and maintenance of the National Ambient Air

Quality Standards (NAAQS) and any applicable state air quality standards. Thus, a project's impact on air quality is assessed by evaluating whether it would cause a new violation of a NAAQS or contribute to a new violation in a manner that would increase the frequency or severity of the new violation. Very small projects sometimes can be evaluated qualitatively or by comparison to a previous project for which a quantitative air quality analysis is available. However, if a project requires the preparation of an EA, it is likely that a quantitative, project-specific air quality assessment would be needed. This can be accomplished by first identifying the emissions sources associated with a project, and then estimating the emissions for each retained alternative. Knowing the emissions may help to characterize a project's impact for the EA. The FAA's *Air Quality Handbook* provides information on how to conduct an air quality analysis.
https://www.faa.gov/regulations_policies/policy_guidance/envir_policy/airquality_handbook/

(a) Compared to the No Action alternative, will the Proposed Action or any of the retained alternatives cause or create a reasonably foreseeable increase in air emissions due to implementation? If the action will not cause a reasonably foreseeable emission increase, a *qualitative* air quality assessment is justifiable for disclosure purposes under NEPA. Provide an explanation of the conditions and rationale upon which this finding is based along with any supporting data, reasoning and/or justification. The assessment should explain how or why implementation of the Proposed Action or any of the retained alternatives will not cause or create a reasonably foreseeable increase in air emissions. **Note:** *Examples of projects and actions that will likely cause or create a reasonably foreseeable increase in emissions include those that will cause or create an increase in aircraft operations and/or ground access vehicle trips. Other projects such as runway/taxiway improvements, roadway modifications, and/or parking facility expansions, may cause or create reasonably foreseeable increases in emissions by changing aircraft and vehicle travel patterns. By comparison, examples of projects and actions that will not likely cause or create increases in emissions include land acquisition programs or the upgrading of airfield lighting systems.*

Discuss the potential for a reasonably foreseeable increase in air emissions:

KBE evaluated the potential for the Proposed Action to cause a reasonably foreseeable increase in short-term construction air emissions at OMN using the Airport Construction Emissions Inventory Tool (ACEIT); aircraft operational-related emissions were computed using the latest version of FAA's Aviation Environmental Design Tool (AEDT 2c Service Pack 2). The detailed analysis is included as Attachment K.

KBE determined that a temporary increase in emissions would occur to construct the facilities; however, this increase would not exceed the *de minimis* thresholds for any of the NAAQS. During operation, a small increase in aircraft emissions would occur when compared to the No Action Alternative due to the projected increase in operations.

(b) Is the Proposed Action located in a nonattainment or maintenance area for any of the NAAQS established under the Clean Air Act? If the Proposed Project is in a nonattainment or maintenance area, identify for what pollutant(s), and do not complete this EA Form without first contacting an ORL-ADO EPS for further guidance. **Note:** *To review the current list of areas designated nonattainment, see the U.S. Environmental Protection Agency reference book, The Green Book Nonattainment Areas for Criteria Pollutants at* www.epa.gov/oaqps001/greenbk/.

Document area status:

Volusia County is an attainment area for all NAAQS established by EPA.

(c) If the action is located in an attainment area and will cause a reasonably foreseeable emission increase, you must prepare an emissions inventory for NAAQS priority pollutants and Green House Gases (GHG's) and disclose the results. You must contact an ORL-ADO EPS before conducting an air quality analysis. **Note:** *As the Aviation Emissions and Air Quality Handbook explains, there are different types or components of an air quality analysis that can be undertaken depending on project/action type, the change(s) to the emission sources affected, and other relevant factors. There is no single, universal criterion for determining what type of analysis is appropriate for FAA-supported projects or actions. As an aid in selecting the appropriate air quality assessment methodology, see Figure 4-5 (Air Quality Assessment Examples) in the Aviation Emissions and Air Quality Handbook. Figure 4-5 identifies the types of air quality analyses (i.e., emissions inventory, dispersion modeling, etc.) that may be appropriate for FAA-supported projects and actions. Listed by project/action type, each assessment method is generally symbolized as High, Medium or Low in terms of the likely applicability of the analysis to the project/action type. Review the Aviation Emissions and Air Quality Handbook to understand how to prepare the analysis (including selecting the analysis years, identifying the emission types and emission sources of interest, obtaining and/or developing the necessary input data, and running the appropriate models and/or supplemental analyses.*

******IMPORTANT******

As of May 29, 2015, the FAA accepted modeling tool for predicting air emissions is the Aviation Environmental Design Tool (AEDT). The most current version of this model, currently AEDT2b *must* be used for any new analysis started after that date. Please contact an ORL-ADO Environmental Specialist if you have any questions regarding the emissions analysis or the current version of the model to use in your analysis.

Provide the emissions inventory for the No Action Alternative, Proposed Action and Retained Alternatives for the EA Study Years including both direct and indirect emissions that are reasonably foreseeable which includes operational as well as construction emissions.

Please see Attachment K for emissions inventory tables including operational and construction emission predicted results.

Discuss the results of the emissions inventory and make a determination if the impacts are considered significant.

Based on the results of the analysis, operational and construction-related emissions from the proposed action would not create a significant air quality impact. OMN is located in Volusia County, which is currently an area designated as attainment for all NAAQS established by EPA; the negligible emissions increase resulting from the Proposed Action would not result in a tendency towards a non-attainment designation.

(2) BIOLOGICAL RESOURCES (INCLUDING FISH, WILDLIFE, AND PLANTS)

(a) Using the Florida Land Use and Cover Classification System (FLUCCS), provide an assessment of the Proposed Action's and retained alternatives (if any) direct impact area (construction footprint) and indirect impact area (area indirectly impacted through facility lighting, noise contours, air emissions, and changes to water quality or quantity caused by construction equipment or facility operations). Attach a figure and table (for direct and indirect impact areas) with acreages per land use cover type to assist in the explanation.

Quantitatively discuss potential direct and indirect impacts:

The Proposed Action's direct impact area will affect the following land use cover types:

Pine Flatwoods- 26.0 acres;

Pine Flatwoods/Sand Pine- 7.7 acres;

Willow and Elderberry - 1.4 acres;

Wetland Coniferous Forests - 4.1 acres;

Cypress - 2.8 acres;

Wet Prairie - 0.4 acres; and,

Airports - 0.4 acres.

See Figure 6 for a spatial representation of the impacted land cover types.

No quantifiable indirect impacts are expected as a result of the Proposed Action.

(b) Describe the potential for the Proposed Action and retained alternatives (if any) to result in long-term or permanent loss of plant or wildlife species, to directly or indirectly affect plant communities, and/or involve the displacement of wildlife. Cross reference Category (14) Water Resources, if jurisdictional water bodies or wetlands are present.

Quantitatively discuss potential direct and indirect impacts:

Implementation of the Proposed Action will result in disturbance to the communities described in 2(a) above, however none of these communities are rare or unique to this area of Florida, and the impacts would not result in a permanent loss of significance to such cover types.

(c) Using U.S. Fish and Wildlife (FWS) and National Marine Fisheries Service (NMFS) flora and fauna species lists for the Action vicinity, describe the potential for the Proposed Action and retained alternatives (if any) to directly or indirectly affect any federally-listed or candidate species of flora or fauna or designated critical habitat protected under the Endangered Species Act (ESA), the Marine Mammal Protection Act (MMPA), or affect Essential Fish Habitat (EFH) identified under the Magnuson-Stevens Act. You must attach records of consultation with FWS and NMFS, as appropriate, in an appendix to the EA. **Note:** *If the Proposed Action and retained alternatives (if any) would potentially affect federally protected or candidate species, or designated critical habitat,* ***do not complete this EA*** *and contact an FAA ORL-ADO EPS.*

Quantitatively discuss the potential for the Proposed Action and retained alternatives to directly or indirectly impact federally-protected species and designated critical habitat:

A list of fourteen federally threatened or endangered species that may occur within the boundary of the Ormond Beach Municipal Airport property was obtained using the USFWS IPAC tool and can be found in the Attachment G. BCS assessed the potential for the Proposed Action to affect those listed species and concluded that of those listed species, habitat for only three species exists on-site: Red-cockaded woodpecker, Eastern indigo snake, and Okeechobee gourd.

Red-cockaded woodpecker

Limited quantities of appropriate habitat for the Red-cockaded woodpecker is available within the project boundary, but this habitat is not present in the project area nor were any individuals or indicators observed during field surveys. Typically, Red-cockaded woodpecker colonies are found in old growth pines, usually Long Leaf Pine, with open understory. Most colonies are found in live pine trees which are 60 years or older in age. This type of habitat is not present in the project area.

Eastern indigo snake

Minor habitat was also identified for the Eastern indigo snake, but no individuals were observed on the site. In xeric habitats it is closely associated with Gopher tortoise burrows which can provide shelter from winter cold and dessication, particularly in xeric sandhills (USFWS Recovery Plan, 1999). Per direction between USFWS and the Florida Fish and Wildlife Commission (FWC), if Best Management Practices are used during construction, and the USFWS Standard Indigo Snake Protection Measures are followed, the project will have no effect on this species.

The FAA submitted a Section 7 Consultation letter to the North Florida Ecological Services Office (ESO) of USFWS on May 10, 2017 stating there will be no effect on federally-listed species and requesting their concurrence. USFWS responded on June 14, 2017 that the proposed action is not likely to adversely affect listed species, concluding the required federal coordination (Attachment G).

(d) Using Florida Fish and Wildlife Commission (FWC) flora and fauna species lists for the Action vicinity, describe the potential for the Proposed Action and retained alternatives (if any) to directly or indirectly affect any state-listed species protected in the State of Florida. You must attach records of consultation with state jurisdictional agencies such as the FWC and Florida Department of Environmental Protection (DEP), as appropriate, in an appendix to the EA.

Quantitatively discuss the potential for the Proposed Action and retained alternatives to directly or indirectly impact state-protected species and designated critical habitat:

State-Listed Plants

BCS observed three state-listed plant species on-site during field reviews: Erect prickly pear, Florida beargrass and Coontie (Attachment F). Per Section 581.185 (8), Florida Statutes, certain exemptions apply to the clearing and removal of protected plant species on lands that will be utilized for silvicultural or agricultural uses, fire control measures, or required mining assessment work. The clearing or removal of regulated plants from canals, ditches, survey lines, building sites or roads or other right-of-ways by the landowner or his or her agent is also exempt on privately owned lands. On utility areas, the clearing of land by a public agency or a publicly or privately owned utility when acting in the performance of its obligation to provide a service to the public is also exempt. Listed plant species found on this site fall under one of the exemptions listed above and may be removed if needed.

State-Listed Wildlife

BCS observed numerous Gopher tortoise burrows and two individuals. The City will acquire a Gopher Tortoise Conservation Permit with off-site relocation. Relocating individuals during construction will prevent permanent loss of this wildlife population.

As a part of the FWC permitting process, a 100% burrow survey will be conducted on the property. This will determine how many Gopher tortoise burrows could potentially be affected by the Proposed Action. Once the burrow survey is completed and required relocation permit is applied for and issued by FWC it is valid for 1 year from the date of issuance and may be amended to extend the permit duration for up to 6 months if relocation activities have not been completed. The FWC also requires that a 100% gopher tortoise survey be conducted within 90 days of gopher tortoise capture and relocation. The City will demonstrate the need for a permit and provide such to the FWC in the form of preliminary or final subdivision plat, or master planned unit development approval; DRI development order; or authorization to commence clearing, grading or construction activities. The City will provide proof of local government approval of the project prior to commencing capture and relocation activities to FWC.

(e) Describe the potential for the Proposed Action and retained alternatives (if any) to directly or indirectly affect species protected under the Migratory Bird Act. You must attach a record of consultation with FWS in an appendix to the EA.

Quantitatively discuss the potential impacts:

OMN is not a known stop-over habitat for migratory birds. The Proposed Action will not affect species protected under the Migratory Bird Treaty Act.

(f) Discuss any operational, avoidance, minimization or mitigation measures (including construction mitigation measures) that have been considered in the siting of the Proposed Action and retained alternatives (if any) to mitigate impacts to biological resources. Identify all required federal, state or local permits. ***Note:*** *Analyses for undisturbed areas including water bodies must be conducted in consultation with FWS, other Federal agencies (NMFS, EPA, USACE), and state agencies (DEP, FWC, and water management districts), having expertise on potentially affected biotic resources and their habitats. Federal and state-listed species lists must be consulted and the potential for occurrence in the Proposed Action area must be documented. Include an analysis of construction impacts and measures to avoid and minimize impacts to ensure that this document properly addresses both permanent and temporary, constructed-related impacts on these resources.*

Quantitatively discuss any operational, avoidance, minimization or mitigation measures:

Note Gopher tortoise mitigation under 2(d) and Eastern indigo snake minimization measures under 2(c).

(3) CLIMATE

(a) Affected Environment - For airport actions, the study area is defined by the extent of the project changes (i.e., immediate vicinity of the airport) and should reflect the full extent of aircraft movements as part of the project changes. Consult the FAA's Air Quality Handbook for more information on defining the study area. As explained in the 1050.1F Desk Reference, analysis of GHG emissions should be quantitatively assessed in certain circumstances, but otherwise may be qualitatively assessed. Where the analysis is quantitative, the affected environment section for climate should provide the quantitative data for the existing condition, which provides the baseline of existing GHG emissions in the study area. The affected environment section should also discuss the current level of preparedness in the study area with respect to the impacts of climate change. This involves describing current measures that are in place within the study area to adapt to the impacts of climate change (e.g., sea level rise, stronger or more frequent storms, etc.). This discussion should be concise and may be quantitative or qualitative, depending on the nature of the project area.

Describe the current Climate and level of preparedness conditions in the Study Area:

Elevations at the Ormond Beach Municipal Airport range from 30 feet above sea level in the uplands down to 22 feet above sea level in the wetlands on site. There is currently no available information specifically describing the level of climate change preparedness on the property or within Volusia County.

(b) Environmental Consequences - If GHG's and climate are not relevant to the Proposed Action and alternative(s) (i.e., because there would be no GHG emissions), this should be briefly noted and no further analysis is required.

Qualitatively discuss the reasons that the Proposed Action and retained alternatives would not affect GHG's or Climate Change:

N/A

(c) Where the Proposed Action or alternative(s) *would not* result in a net increase in GHG emissions (as indicated by quantitative data or proxy measures such as reduction in fuel burn, delay, or flight operations), a brief statement describing the factual basis for this conclusion is sufficient and no further analysis is required.

Describe the basis for "no-effect" conclusion:

N/A

(d) Where the Proposed Action or alternative(s) *would* result in an increase in GHG emissions as *compared* to the No Action alternative for the same study year, the emissions should be assessed either qualitatively or quantitatively using the methodology described in FAA's 1050.1F Desk Reference, Section 3.3.2 (Data Analysis). **Note:** Contact an ORL-ADO EPS prior to undertaking a quantitative analysis.

Explain:

KBE computed GHG emissions associated with construction activities as well as the aircraft operations due to the proposed improvements at OMN for the Proposed Action. The emissions are presented in metric tons of CO_2 equivalent (CO_{2e}) in the Attachment K.

(e) Documentation - When CO2e is quantified, the metric tons (MT) CO2e results should be provided in a table or similar format that compares the alternatives directly. When fuel burn is computed, the MT CO2 equal to that fuel content should be documented and discussed. See Section 3.3.3 of 1050.1F. **Note:** *There are no significance thresholds for aviation or commercial space launch GHG emissions, nor has the FAA identified specific factors to consider in making a significance determination for GHG emissions. There are currently no accepted methods of determining significance applicable to aviation or commercial space launch projects given the small percentage of emissions they contribute. CEQ has noted that "it is not currently useful for the NEPA analysis to attempt to link specific climatological changes, or the environmental impacts thereof, to the particular project or emissions, as such direct linkage is difficult to isolate and to understand." Accordingly, it is not useful to attempt to determine the significance of such impacts. There is a considerable amount of ongoing scientific research to improve understanding of global climate change and FAA guidance will evolve as the science matures or if new Federal requirements are established.*

Provide a discussion of the analysis including data tables comparing the No Action and retained alternatives for each study year:

The estimated project-related annual CO_{2e} construction and operational emissions are presented in Attachment K. As shown, construction emissions are expected to range from 5,584 to 11,127 tons during the construction duration. Operational emissions are estimated to increase by 147 and 161 tons with the implementation of the Proposed Project in 2019 and 2024, respectively. Because there are no federal standards for aviation-related GHG emissions or NEPA requirements for their assessment, this GHG inventory was prepared for the Proposed Action for disclosure purposes.

(f) Reducing Emissions - Reduction of GHG emissions resulting from FAA actions contributes towards the U.S. goal of reducing aviation's impacts on climate. For NEPA reviews of proposed FAA actions that would result in increased emissions of GHGs, consideration should be given to whether there are areas within the scope of a project where such emissions could be reduced. GHG emission reduction can come from measures such as changes to more fuel efficient equipment, delay reductions, use of renewable fuels, and operational changes (e.g., performance-based navigation procedures). However, GHG emission reduction is not mandated and will not be possible in all situations.

Discuss measures to reduce emissions associated with the Proposed Action:

NA

(g) Climate Adaptation - The environmental consequences section should include a discussion of the extent to which the proposed action or alternatives(s) could be affected by future climate conditions, based on published sources applicable to the study area. For example, a project area's ability to sustain impacts caused by climate changes should be described (e.g., identify current robustness and height of seawalls for coastal airports). This discussion should include any considerations to adapt to forecasted climate change conditions.

Discuss potential climate conditions relevant to the Proposed Action:

No available public sources were found to inform a discussion about climate adaptation at OMN.

(4) COASTAL RESOURCES

(a) Is the Proposed Action located within the Coastal Barrier Resources System (CBRS), as delineated by the U.S. Fish and Wildlife Service (FWS) Official CBRS maps? If the Proposed Action is located within the CBRS, **do not complete this EA** and contact an FAA ORL-ADO EPS.

Explain:

The Proposed Action is not located within the CBRS (See Attachment G, USFWS IPAC report).

(b) The Florida Department of Environmental Protection (DEP), Florida State Clearinghouse, Office of Intergovernmental Programs, will coordinate a consistency review of the Proposed Action under the following authorities: Presidential Executive Order 12372; § 403.061 (42), Florida Statutes; the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended; and the National Environmental Policy Act, 42 U.S.C. §§ 4321-4347, as amended. The ORL-ADO EPS must review the Draft EA prior to submittal to the Clearinghouse for consistency review. The Airport Sponsor then submits the Draft EA to the Clearinghouse. Contact the Clearinghouse (850-245-2161) for the required number of copies and format. The Clearinghouse will make a determination of the Proposed Action's consistency with Florida's Coastal Management Program (FCMP) based on information contained in the Draft EA. ***Note:*** *The FCMP consistency review process normally takes 30 to 45 days and is conducted during the public and agency review of the Draft EA. The Clearinghouse will send a consistency determination letter with state comments to the Airport Sponsor. The Airport Sponsor must include a copy of the consistency letter and the Airport Sponsor's responses to any comments received from state agencies in an appendix to the Final EA submitted to the FAA ORL-ADO.*

Ensure that the Proposed Action is consistent with the enforceable policies of the FCMP (http://www.dep.state.fl.us/cmp/federal/). Acknowledge submittal of the Draft EA to the Clearinghouse for review.

The Draft EA was submitted to the Florida State Clearinghouse. A consistency determination letter was received on January 26, 2018 stating the project is consistent with the Florida Coastal Management Program (FCMP) and is included in Attachment U. The state's final concurrence of the project's consistency with the FCMP will be determined during the environmental permitting process in accordance with Section 373.428 of the Florida Statutes.

(5) DOT SECTION 4(f)

(a) Describe and identify on an attached figure all DOT Section 4(f) resources both on-airport and within the airport's vicinity (or area encompassed by the composite DNL 65 dBA noise contour for the Proposed Action, reasonable alternatives (if any) and No Action alternative). Resources that are protected by Section 4(f) are publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance; and publicly or privately owned land from an historic site of national, state, or local significance. Cross-reference Category (11) Noise and Compatible Land Use, as applicable.

Describe 4(f) resources and attach a figure if applicable:

No Section 4(f) resources outside the airport property fall within the DNL 65 dBA noise contour for the Proposed Action or will be directly or indirectly affected by the project. Refer to Section 8 for additional information on historic sites.

(b) Compared to the No Action alternative, would the Proposed Action and retained alternatives (if any) have a direct impact (physical use or "taking") or indirect impact (constructive use) on any of any Section 4(f) sites or facilities? To assess constructive use refer to *"FAR Part 150, Appendix "A", Table 1, Land Use Compatibility With Yearly Day-Night Average Sound Levels"* If **YES**, **do not complete this EA** and contact the FAA ORL-ADO EPS.

Discuss the results of the analysis:

The Proposed Action will have no impact on Section 4(f) sites or facilities.

(6) FARMLANDS--PRIME, UNIQUE OR STATE-SIGNIFICANT FARMLAND

(a) Compared to the No Action alternative does the Proposed Action and retained alternatives (if any) involve the acquisition of Prime, Unique or statewide and locally important farmland, or the conversion/use of these types of farmlands that are protected by the Federal Farmland Protection Policy Act (FPPA)? Contact the Florida Natural Resources Conservation Service (NRCS). For more information see: http://www.nrcs.usda.gov/wps/portal/nrcs/main/fl/soils/

If appropriate, attach record of coordination with the Florida NRCS, including a completed Form AD-1006. ***Note:*** *Farmland subject to FPPA requirements does not have to be currently used for cropland. It can be forest land, pastureland, cropland, or other land, but not land used for water storage or urban built-up land. Also, the "Part 523-Farmland Protection Policy Manual" notes that lands identified as "urbanized area" (UA) on Census Bureau maps are not subject to the provisions of the FPPA. See https://www.census.gov/geo/maps-data/maps/2010ua.html for Census Bureau maps.*

Discuss analysis and add tables and graphics as appropriate:

There are no such soils within the project area (Attachment L).

(7) HAZARDOUS MATERIALS, SOLID WASTE, AND POLLUTION PREVENTION

(a) Compared to the No Action alternative, would the Proposed Action and reasonable alternatives (if any) violate applicable Federal, state, tribal or local laws or regulations regarding hazardous materials and/or solid waste management?

Explain:

No

(b) Compared to the No Action alternative, would the Proposed Action and retained alternatives (if any) involve a contaminated site (including but not limited to a site listed on the National Priorities List)? Describe how the Proposed Action site was evaluated for hazardous substance contamination. Reference electronic database searches and attach in an appendix any record of consultation with appropriate expertise agencies (e.g., US Environmental Protection Agency (EPA), Florida DEP).

Explain:

A search of the Florida DEP Map Direct System for Brownfields, Petroleum, Superfund Sites, and Other Waste Cleanup sites yielded no results on the airport property. See Attachment M for the Contamination Locator Map and associated search results list.

(c) Does the Proposed Action include land acquisition? A qualified Environmental Professional must prepare an Environmental Due Diligence Audit (EDDA) in accordance with FAA Order 1050.19B, *Environmental Due Diligence Audits in the Conduct of FAA Real Property Transactions*. In particular, a Phase I EDDA must be conducted prior to the acquisition of real property. The Phase I EDDA must be attached to the EA.

Explain:

Should the City need to purchase the land parcels within the future RPZ to meet FAA requirements, a Phase 1 EDDA would be conducted at that time and submitted to the FAA.

(d) Compared to the No Action alternative would the Proposed Action and retained alternatives (if any) produce an appreciably different quantity or type of hazardous waste?

Explain:

No

(e) Compared to the No Action alternative, would the Proposed Action and retained alternatives (if any) generate an appreciably different quantity or type of solid waste or use a different method of collection or disposal and/or would exceed local capacity? If **YES**, are local disposal facilities capable of handling the additional volumes of solid waste resulting from the Action? A letter from the local waste management handling facility may be necessary.

Explain:

No

(f) Compared to the No Action alternative, would the Proposed Action and retained alternatives (if any) adversely affect human health and the environment with regards to hazardous materials or solid waste?

Explain:

No

(g) Is there a sanitary landfill containing municipal solid waste (MSW) located within 10,000 feet of a runway serving turbo-powered aircraft, or 5,000 feet of a runway serving piston-powered aircraft? **Note:** *A sanitary landfill containing municipal solid waste (MSW) is incompatible with airport operations if the landfill is located within 10,000 feet of a runway serving turbo-powered aircraft, or 5,000 feet of a runway serving piston-powered aircraft. Refer to FAA Advisory Circular 150/5200.33 " Hazardous Wildlife Attractants on or Near Airports," and FAA Order 5200.5B, "Guidance Concerning Sanitary Landfills on or Near Airports."*

Explain:

No

(8) HISTORICAL, ARCHITECTURAL, ARCHEOLOGICAL, AND CULTURAL RESOURCES

(a) Describe and identify on an attached figure any *known* sites listed-in or eligible for listing on the National Register of Historic Places (NRHP) within the Proposed Action's and retained alternatives (if any) Area of Potential Effect (APE), which is defined as "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties". The APE includes the direct impact area (limits of ground disturbance) and as applicable the indirect impact area encompassed by the composite DNL 65 dBA noise contour of the Proposed Action, No Action, and retained alternatives (if any). Protected resources include historic sites, districts, objects, archaeological remains, historic structures, public parks, publicly-owned recreation areas, and wildlife or waterfowl refuges. Accomplish this review through searching the NRHP database, consultation with the Florida State Historic Preservation Officer (SHPO), local historic groups, local jurisdictions, federally recognized tribes in the State of Florida, and airport staff. Historic airport facilities (50 years or older) must be included. **Note:** *If any known listed or eligible NRHP sites are identified* *within the Proposed Action's APE (direct or indirect), you must immediately contact the ORL/ADO Environmental Specialist for further instruction regarding Section 106 of the National Historic Preservation Act (NHPA).*

Describe and identify on attached figure (as applicable) any known sites in the direct and indirect impacts APE:

Storm L. Richards & Associates, Inc. (SLRA) conducted a Cultural Resource Assessment Pedestrian Survey of Section 106 Resources and Evaluation of Cultural and Historic Resources within the area of potential effects (Attachment H), including review of the Florida Master Site Files. No known or potential sites were identified within the APE.

Florida DHR has designated the Ormond Beach Municipal Airport as 8VO9252 because it was built in 1943 as a naval aviation training field (Attachment I). At their request, a Resource Group Form has been completed and submitted on May 22, 2017.

(b) Consultation with the SHPO and tribes should be conducted early in the process and prior to submittal of the preliminary Draft EA to the ORL/ADO EPS. Discuss Florida SHPO and tribal consultation responses below. **Records of consultation with the Florida SHPO and federally recognized tribes and their responses must be included in an appendix to the EA**. All public out-reach efforts should apply to these groups as well. **Note:** *Letters to the Florida SHPO and federally recognized tribes must come from the FAA. Draft letters for FAA signature. Discuss the proposed action and attach a figure identifying the area of potential effect (APE) on a recent aerial. Include in the discussion whether a cultural resource assessment study (CRAS) has been done for the APE. Provide a written effects determination along with supporting documentation to the SHPO/THPO and the consulting parties (see 36 CFR § 800.5). Make one of the following conclusions: (1) no historic properties present in the APE; (2) no adverse effect on historic properties; or (3) adverse effect on historic properties. You must review http://www.dot.state.fl.us for a list of federally recognized tribes, contacts and addresses. If any known listed or eligible NRHP sites are identified within the Proposed Action's APE, you must immediately contact the ORL/ADO Environmental Specialist for further instruction regarding Section 106 of the National Historic Preservation Act (NHPA).*

Discuss Florida SHPO and tribal consultation responses.

The FAA has determined that the Proposed Action will have no effect on historic properties.

In a letter dated May 16, 2017, the Florida State Historic Preservation Officer (SHPO) presented his/her review of the Proposed Action for possible effects on historic properties listed, or eligible for listing, on the National Register of Historic Places. It is the opinion of the SHPO that the proposed project is unlikely to affect historic properties provided that the following condition regarding unexpected discoveries is followed, and pending their review of the Resource Group Form:

If prehistoric or historic artifacts, such as pottery or ceramics, projectile points, dugout canoes, metal implements, historic building materials, or any other physical remains that could be associated with Native American, early European, or American settlement are encountered at any time within the project site area, the permitted project shall cease all activities involving subsurface disturbance in the vicinity of the discovery. The applicant shall contact the Florida Department of State, Division of Historical Resources (FDHR), Compliance Review Section at (850)-245-6333. Project activities shall not resume without verbal and/or written authorization. In the event that unmarked human remains are encountered during permitted activities, all work shall stop immediately and the proper authorities notified in accordance with Section 872.05, Florida Statutes.

A Cultural Resources Assessment Survey including shovel testing was completed by SEARCH Inc. in accordance with FDHR guidelines for Phase 1 surveys and submitted to the Seminole Tribe of Florida, the Seminole Nation of Oklahoma and the Muscogee (Creek) Nation, as well as SHPO/FDHR, on June 27, 2017 (Attachment J). This report states that of the 46 shovel tests conducted across the undeveloped portions of the APE at 50-meter intervals, none contained evidence of an archaeologic site. The report supports the FAA's determination of no effect on cultural resources.

Please refer to Section 7 Affected Environment, Historic resources, for discussion of Tribal coordination. The FAA has determined at this time that the proposed action will have no effect on historic, cultural or archaeologic resources. However, in accordance with FAA regulations and guidance, if historic, cultural or archaeologic resources are discovered during construction, project construction will be immediately stopped in the vicinity of the discovered resources. The FAA will determine what actions can be taken to resolve any adverse effects. Within 48 hours of discovery, the FAA will notify the SHPO/THPO and any tribal organization or other relevant organizations in the area that might attach religious and cultural significance to the affected property, and the Advisory Council on Historic Preservation (ACHP). The notification will describe the actions proposed by the FAA to resolve the adverse effects. The relevant entity(s) and the ACHP shall respond within 48 hours of notification and the FAA will take into account their recommendations and carry out appropriate actions. The FAA will provide a report of the actions when completed.

(c) Compared to the No Action alternative, would the Proposed Action or retained alternatives (if any) result in *direct effects* (physical disturbance or destruction, damage, alteration, isolation of the property from its surroundings, or moving a property from its historic location), or *indirect effects* (introduction of visual, auditory, or atmospheric elements that are out of character with the property or that would diminish the integrity of the property's setting), on any NRHP property or NHRP-eligible property? Cross reference your response with other applicable impact categories such as noise and compatible land use, air quality and Section 4(f)/6(f) resources.

Discuss direct or indirect effects on NRHP or NHRP-eligible properties.

The proposed project will not affect NRHP or NHRP-eligible properties.

(9) LAND USE

(a) Compared to the No Action Alternative, would the Proposed Action and retained alternatives (if any) result in any impacts to off-airport land uses and/or require a change to the local comprehensive plan and zoning map?

Discuss any impacts to off-airport land uses or changes to a local comprehensive plan or zoning.

No changes in zoning or planning will be necessary as a result of the Proposed Action. See Attachment N for the local land use map generated for Ormond Beach Municipal Airport.

The RPZ will extend off the airport boundary, thus the three parcels in question, as depicted on the figures provided, will either be purchased fee simple or avigation easements will be obtained to gain control of the RPZ. Control should include Airport Access to conduct the clearing/trimming of trees, restrictions on incompatible land use including buildings and structures, lighting, recreational land use, or other places of public assembly, and the future construction of structures within the RPZ.

(b) Compared to the No Action alternative, would the Proposed Action and retained alternatives (if any) be located near or create a potential wildlife hazard as defined in FAA Advisory Circular 150/5200-33, "Wildlife Hazards on and Near Airports"?

Discuss potential wildlife hazards.

The Proposed Action will not create a potential wildlife hazard. There are wetlands on-site that will be filled (refer to Section 14 for details) resulting in a reduction in wildlife attraction within the OMN boundary.

(c) If the Airport Sponsor is filing a federal Airport Improvement Program (AIP) grant application for construction of the Proposed Action, an *executed* letter from the Airport Sponsor to the FAA with the land use assurance language noted below must be attached as an appendix to this EA.

> "Per 49 USC Section 47107(a)(10), that appropriate action, including adopting zoning laws, has been or will be taken to the extent reasonable, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including the landing and takeoff of aircraft."

Note: *The Sponsor's assurance letter must be related to existing and future planned land uses in the airport vicinity.*

Identify Draft EA Appendix that contains the Airport Sponsor's land use assurance letter or explain why one is not required.

See Attachment O.

(10) NATURAL RESOURCES AND ENERGY SUPPLY

(a) Identify suppliers of energy resources found in the area such as power plants, water utilities, sewage disposal utilities, and suppliers of natural gas and petroleum, as applicable. Identify the approximate amount of other resources such as water, asphalt, aggregate, and wood a project would use in the construction, operation, and maintenance of a project and identify where the suppliers are located.

N/A

(b) Compared to the No Action alternative, what effect would the Proposed Action and retained alternatives (if any) have on energy supplies or other natural resource consumption? Would demand exceed supply?

Explain:

N/A

(c) Identify whether the Proposed Action and retained alternatives (if any) would incorporate sustainable design features such as conservation of resources, use of pollution prevention measures, minimization of aesthetic effects, and address public (both local and traveling) sensitivity to these concerns.

Explain:

N/A

(11) NOISE AND COMPATIBLE LAND USE

(a) Determine if a noise analysis should be conducted per FAA Order 1050.1F, Appendix B. Airport operations must not exceed the threshold for both existing and forecast years (with and without the Proposed Action). If operations exceed the threshold, coordinate with the ORL/ADO EPS prior to conducting a noise analysis. **Note:** *No noise analysis is needed for projects involving Design Group I and II airplanes (wingspan less than 79 feet) in Approach Categories A through D (landing speed less than 166 knots) operating at airports whose forecast operations in the period covered by the NEPA document do not exceed 90,000 annual propeller operations (247 average daily operations) or 700 annual jet operations (2 average daily operations). These numbers of propeller and jet operations result in DNL 60 dB contours of less than 1.1 square miles that extend no more than 12,500 feet from start of takeoff roll. The DNL 65 dB contour areas would be 0.5 square mile or less and extend no more than 10,000 feet from start of takeoff roll. Also, no noise analysis is needed for projects involving existing heliports or airports whose forecast helicopter operations in the period covered by the NEPA document do not exceed 10 annual daily average operations with hover times not exceeding 2 minutes. These numbers of helicopter operations result in DNL 60 dB contours of less than 0.1 square mile that extend no more than 1,000 feet from the pad. Note that this rule applies to the Sikorsky S-70 with a maximum gross takeoff weight of 20,224 pounds and any other helicopter weighing less or producing equal or less noise levels. Airport forecasts must be consistent with the most recent FAA Terminal Area Forecast (TAF).*

Document the most recent TAF for the airport, the existing and forecast annual operations in the EA study years for the No Action alternative, the Proposed Action and any retained alternatives. Discuss whether the thresholds described above would be exceeded or not and whether a quantitative or qualitative noise analysis is appropriate for the Proposed Action.

Please see Table 2 for information regarding the TAF and the average daily operations for the Ormond Beach Municipal Airport. KBE completed a noise analysis for the Proposed Action, please see Attachment K.

(b) Aircraft noise screening may rule out the need for more detailed noise analysis if screening shows no potential for significant noise impacts. The Area Equivalent Method (AEM) can be used in evaluating proposed actions and alternative(s) at an airport which result in a general overall increase in daily aircraft operations or the use of larger/noisier aircraft, as long as there are no changes in ground tracks or flight profiles. If the AEM calculations indicate that the action would result in less than a 17 percent (approximately a DNL 1 dB) increase in the DNL 65 dB contour area, there would be no significant impact over noise sensitive areas and no further noise analysis would be required. If the AEM calculations indicate an increase of 17 percent or more, or if the action is such that use of the AEM is not appropriate, then the noise analysis must be performed using the Aviation Environmental Design Tool (AEDT) to determine if significant noise impacts would result. See the Area Equivalent Method (AEM) Version 7.0c User's Guide, October 2012 for further information on conducting an AEM screening procedure.

Note: *If more detailed noise analysis is required, the model must be used to determine if significant noise impacts would result from implementation of the Proposed Action. Information regarding the FAA's AEDT 2b can be found in the 1050.1F Desk Reference and at* https://aedt.faa.gov/ .

Explain the results of the AEM analysis if used.

N/A

(c) Describe the affected environment for noise and noise compatible land use. Refer to the 1050.1F Desk Reference section 11.2, Affected Environment, for necessary information. The steps generally required to describe the affected environment for noise and noise compatible land are as follows:

• *Determine the study area for noise analysis*. An airport environs study area must be large enough to include the area within the DNL 65 dB contour, and may be larger.

• *Identify noise sensitive areas in the study area and pertinent land use information*; A noise sensitive area is defined in Paragraph 11-5.b (8) of FAA Order 1050.1F.

• *Describe **current** noise conditions in the study area*. Noise exposure contours must include DNL 65, 70, and 75 dB levels. Identify the number of residences or people residing within each noise contour where aircraft noise exposure is at or above DNL 65 dB. Identify the location and number of noise sensitive uses in addition to residences (e.g., schools, hospitals, nursing homes, parks, recreation areas, historic structures) that could be significantly impacted by noise. Use recent aerial photographs, GIS mapping and other resources to depict land uses within the noise study area.

The 2016 DNL contours are provided in the Attachment K and shown on Figure 5. The total area within the DNL 65 dB and greater DNL contour is approximately 161 acres. Notably, there are no residences or other noise sensitive land uses within the existing DNL 65 dB contour, which is contained within the airport boundary.

(d) Describe the potential noise impacts of the proposed action and alternative(s), if any, for each timeframe evaluated. Use the AEDT to provide noise exposure contours for DNL 5 dB increments for the DNL 65, 70, and 75 dB levels. For all comparisons analyzed, the analysis needs to identify noise increases of DNL 1.5 dB or more over noise sensitive areas that are exposed to noise at or above the DNL 65 dB noise exposure level, ***or*** that would be exposed at or above the DNL 65 dB level due to a 1.5 dB or greater increase, when compared to the No Action alternative for the same timeframe. For each modeling scenario analyzed, disclose, quantify and discuss:

- number of residences or people residing within each noise contour interval where aircraft noise exposure is at or above DNL 65 dB,
- the net increase or decrease in the number of people or residences exposed to each increment of noise
- location and number of noise sensitive land uses in addition to residences (e.g., schools, hospitals, nursing homes, parks, recreation areas, historic structures) exposed to DNL 65 dB or greater

- when DNL 1.5 dB increases to noise sensitive land uses are documented within the DNL 65 dB contour, also identify the location and number of noise sensitive land uses within the DNL 60 dB contour that are exposed to aircraft noise levels at or above DNL 60 dB but below DNL 65 dB and are projected to experience a noise increase of DNL 3 dB or more
- noise impact on noise sensitive areas within the DNL 65 dB contour.

Use multiple graphics to depict the noise contours and land uses and noise sensitive resources within the noise contours for all alternatives. Include arrival, departure and touch and go flight tracks. Graphics should be scaled and sufficiently large and clear to be readily understood.

KBE analyzed the potential noise impacts for the Proposed Action for the years 2019 and 2024 (Attachment K; Figures 8 and 9). The methodology for assessing noise exposure included preparing DNL contours for the No Build and Build alternatives for the years 2019 and 2024. Noise contours were developed to assess if a significant noise impact would occur as a result of the Proposed Action by comparing the noise exposure levels of the future No Build and future Build conditions. No noise sensitive land uses are documented within the DNL 65 dB contour of both the No Build and future Build conditions. There will be no increase to the number of people or residences exposed to noise above DNL 65 dB.

(e) Discuss whether there is a significant noise impact for the Proposed Action and retained alternatives (if any) compared to the No Action alternative. FAA Order 1050.1F Exhibit 4-1 provides the FAA's significance threshold for noise i.e. *The action would increase noise by DNL6 1.5 dB or more for a noise sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level,* ***or*** *that will be exposed at or above the DNL 65dB level due to a DNL 1.5dB or greater increase, when compared to the no action alternative for the same timeframe.* For example, an increase from DNL 65.5 dB to 67 dB is considered a significant impact, as is an increase from DNL 63.5 dB to 65 dB. The determination of significance must be obtained through the use of noise contours and/or grid point analysis along with local land use information and general guidance contained in Appendix "A", Table 1 of 14 CFR part 150. If there is a potential significant noise impact for the Proposed Action, **do not** complete this EA and contact the ORL ADO/EPS for further guidance.

Explain:

As quantified in Table 6 and graphically depicted in Figures 8 and 9, the 2019 Proposed Action (Build) noise contours show an increase of 13 acres over the predicted 2019 No Build noise contours, and the 2024 Proposed Action (Build) noise contours show an increase of 14 acres over the predicted 2024 No Build noise contours. However, for both scenarios, there are no noise sensitive land uses within the proposed contours and the DNL 65 dB would not extend off-site.

Table 6: Comparison of Noise Contours, Ormond Beach Airport, RW 8-26 Extension Project

	Annual Operations[1]	**DNL area (acres)**			
		65 to <70	70 to <75	75 and greater	Total
2016 Existing	127,170	88	49	24	161
2019 No Build	130,947	90	50	25	165
Increase over 2016 Existing	3,777	2	1	1	4
2024 No Build	137,653	93	51	26	170
Increase over 2019 No Build	6,706	3	1	1	5
2019 Proposed Action (Build)	131,569	97	56	25	178
Increase over 2019 No Build	622	7	6	0	13
2024 Proposed Action (Build)	138,307	100	58	26	184
Increase over 2024 No Build	654	7	7	0	14

1 Operations forecast from the 2016 Master Plan Update, refer to Attachment K: Environmental Consequences: Air Quality, Climate and Noise for details

(f) For some noise analyses, it may be necessary to include noise sources other than aircraft departures and arrivals in the noise analysis. This can be determined by examining the action and determining the potential impacts caused by noise other than aircraft departures and arrivals. Some examples are engine run-ups, aircraft taxiing, construction noise, and noise from related roadway work and roadway noise. The inclusion of these sources should be considered on a case-by-case basis, as appropriate. Discuss whether the Proposed Action and retained alternatives (if any) have the potential to cause noise other than aircraft related noise. See 1050.1F Desk Reference, Section 11.5 for additional information.

Discuss if analysis of other noise sources is warranted. If it is, conduct the analysis and describe the results here.

Discussion of other noise sources in not warranted for the Proposed Action.

(g) Discuss any mitigation measures that are in effect at the time of the proposal or are proposed to be taken to mitigate significant impacts resulting from the Proposed Action and/or the retained alternatives. See 1050.1F Desk Reference, Section 11.6 for common operational measures to mitigate noise, common mitigation measures related to noise and noise-compatible land use, and common construction mitigation measures. Local land use actions are within the purview of local governments. The FAA encourages local governments to take actions to reduce and prevent land uses around airports that are not compatible with airport operations and aircraft noise. Airports receiving federal grant funding have a compatible land use obligation, as described in 1050.1F Desk Reference, Section 11.5.3 Airport Actions. Discuss what is being done regarding compatible land use by the local jurisdiction(s) with land use control authority.

FAA proposes no mitigation measures because no noise sensitive land uses are present within the proposed DNL 65 dB noise contour.

(12) SOCIOECONOMICS, ENVIRONMENTAL JUSTICE, AND CHILDREN'S ENVIRONMENTAL HEALTH AND SAFETY RISKS

(a) When compared to the No Action alternative, would the Proposed Project and retained alternatives (if any) change business and economic activity in the community; impact public service demands; induce shifts in population movement and growth, or other factors identified by the public, etc.? If **YES**, describe how these impacts would be minimized or mitigated.

Explain:

The City proposes this project, in part, as a way to increase business and economic activity, as well as retain existing businesses within and around the airport, but such growth would not likely impact public service demands, or induce shifts in population movement or growth.

(b) When compared to the No Action alternative, would the Proposed Project and retained alternatives (if any) result in the need to relocate any homes or businesses? If **YES**, **do not** complete this EA and contact the ORL/ADO EPS for further guidance.

Explain:

No

(c) Cause an alteration in surface traffic patterns, or cause a noticeable increase in surface traffic congestion or a decrease in Level of Service (LOS) on local roadways?

Explain:

No

(d) Would the Proposed Action and retained alternatives (if any) have the potential to lead to a disproportionately high and adverse impact to an environmental justice population, i.e., a low-income or minority population? Consider impacts in other environmental impact categories (noise, air); or impacts on the physical or natural environment that affect an environmental justice population in a way that the FAA would determine are unique to the environmental justice population and significant to that population. *See 1050.1F Desk Reference, Chapter 12 for guidance*. If **YES**, **do not** complete this EA and contact the ORL/ADO EPS for further guidance.

Explain:

The Proposed Action will not directly or indirectly affect an environmental justice population.

(e) Would the Proposed Action and retained alternatives (if any) result in any environmental health risks and/or safety risks that may disproportionately affect children? Environmental health risks and safety risks include risks to health or to safety that are attributable to products or substances that a child is likely to come in contact with or ingest, such as air, food, drinking water, recreational waters, soil, or products they might use or be exposed to. It may be beneficial to determine the number of schools, daycares, parks, and children's health clinics in the study area. Consider impacts to children's health and safety in the context of other impact categories (air, noise, water quality).

Explain:

The Proposed Action will not result in any environmental health risks and/or safety risks that may disproportionately affect children. No schools, daycares, parks, etc. are found within the project footprint or the affected area (the DNL 65 dB noise contour) of the Proposed Action.

(13) VISUAL EFFECTS INCLUDING LIGHT EMISSIONS

(a) Compared to the No Action alternative, describe any new lighting systems associated with the Proposed Action and retained alternatives (if any). Describe the new types of lighting, their intensity, height and direction of emissions that would be constructed and operational.

Explain:

The Proposed Action will include the relocation of the current Runway End Identifier Lights (REILs) approximately 1,000 feet to the west at the end of the extended RW 8. Medium intensity runway and taxiway edge lighting will be installed and Precision Approach Path Indicators (PAPI) will also be installed at a location to be determined during final design. FAA Advisory Circular 150/5345-51B, September 8, 2010, provides details regarding light emissions for REILs (Attachment P) and FAA Advisory Circular 150/5345-28G, September 29,

2011, provides details regarding PAPI systems (Attachment Q). These emissions will not extend off-site.

(b) Would the Proposed Action and retained alternatives (if any) have the potential to create annoyance or interfere with normal activities for nearby residential areas or other light-sensitive resources or affect the visual character of the area due to the light emissions, including the importance, uniqueness, and aesthetic value of the affected visual resources? If appropriate, provide a graphic depicting the location of residential areas or other light-sensitive resources in the airport vicinity in relation to the Proposed Action's and retained alternatives (if any) new lighting system.

Explain:

The Proposed Action would relocate the REILs and PAPIs westward and bring them closer to nearest off-airport residences in that direction. However, after construction, the nearest house would still be approximately 1,350 feet from any light source. This change will not interfere with normal activities for this residential neighborhood.

(c) Identify whether a local community, government or jurisdictional agency would consider visual effects from the Proposed Action's (and retained alternatives) lighting objectionable to people's properties and people's use of resources covered by DOT Section 4(f), LWCF Section 6(f), and the National Historic Preservation Act (NHPA) Section 106. Consider the potential extent the proposed action would have to: affect the nature of the visual character of the area, including the importance, uniqueness, and aesthetic value of the affected visual resources; contrast with the visual resources and/or visual character in the study area; and block or obstruct the views of visual resources, including whether these resources would still be viewable from other locations.

Explain:

No sensitive resources of this kind are located in the vicinity of the proposed REILs.

(14) WATER RESOURCES - WETLANDS, FLOODPLAINS SURFACE WATERS, GROUNDWATER, AND WILD AND SCENIC RIVERS

WETLANDS

(a) Compared to the No Action alternative, would the Proposed Action and retained alternatives (if any) impact federal or state jurisdictional and non-jurisdictional wetlands? If **YES**, provide an assessment of the Proposed Action and retained alternatives (if any) wetland impacts. **Quantify** *both* acreage and Functional Loss in accordance with U.S. Army Corps of Engineers (USACE) and state agency (water management district (WMD)) or Florida Department of Environmental Protection (FDEP) requirements. If protected species or habitat resources are affected, USFWS and FWC must be consulted and consultation must be attached as an appendix to this EA. Cross-reference with Category (2) Biotic Resources, as applicable.

Provide assessment of wetland impacts:

BCS delineated wetlands on the project site and provided an assessment of the functions and values of these wetlands (Attachment F; Figure 7). Wetland Areas 1 and 2 will fall within the RSA and/or the Runway Object Free Area (ROFA) associated with the extended Runway 08. Impacts to these wetland areas will be in the form of tree clearing, grubbing/root raking and

filling. The total area of wetlands expected to be directly impacted within the proposed RSA and/or the ROFA is 5.275 acres (229,800 sq. ft.). The functional loss resulting from impacts to these wetland areas is 3.693 FLU.

Additionally, the trees located within Wetland Areas 3, 4 and 5 will be felled as a part of the safety measures required for the extension of Runway 8 as well as for a visual clear zone within the "Tower Line of Sight" area. No grubbing/root raking, filling or other disturbances to the existing grades within these wetland areas is proposed. It is not anticipated that the safety measures proposed to occur within Wetland Areas 3, 4 and 5 will result in an impact to the wetland overall. No functional loss is expected to occur within these wetland areas.

Impacts to these wetlands will not affect protected species or habitat as detailed in Section 2.

(b) If the Proposed Action would unavoidably impact a wetland, explain why the wetland is the only practicable location for the Proposed Action. Consider the purpose and need, FAA design standards, engineering, environmental, economic, technical feasibility or any other applicable factor. FAA will consider this information in its independent evaluation of alternatives (see 40 CFR 1506.5.) **Note:** *Federal regulations require "that no discharge shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact to the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences" (per Memorandum of Agreement between The Department of the Army and Environmental Protection Agency, The Determination of Mitigation under the Clean Water Act Section 404 (b)(1) Guidelines, February 1990*.

Discuss:

The Proposed Action has been determined to be the only alternative that both meets the runway length needs and has the least impact to wetlands and other environmental resources. The impacts to wetlands are necessary to comply with FAA Grant Assurance number 20 – Hazard Removal and Mitigation, as well as meeting safety design standards.

(c) If the Proposed Action would affect federal and/or state jurisdictional wetlands, discuss all practicable means to avoid and minimize wetland impacts through modifications or permit conditions. FAA will consider this information in its independent evaluation of measures that will be used to minimize harm to wetlands (see 40 CFR 1506.5).

Discuss avoidance and minimization measures evaluated and unavoidable wetland impacts:

The Proposed Action will affect wetlands. Further avoidance and minimization are not possible given the specificity of the geometry requirements to meet FAA safety regulations for a runway. Impacts to wetlands 3, 4 and 5 will be minimized to the extent practicable by not grubbing, root raking or removing stumps from the wetlands.

(d) Discuss appropriate and practicable compensatory mitigation for unavoidable adverse impacts which remain after all appropriate and practicable minimization has been provided. Identify the location of proposed compensatory mitigation, including acreage, Functional Gain, and estimated cost. USACE and WMD or FDEP consultation must be attached in an appendix to this EA that includes acknowledgement of required permits and proposed mitigation.

Discuss compensatory mitigation and attach record of jurisdictional agency consultation:

The total area of wetlands expected to be directly impacted within the proposed RSA and/or the ROFA is 5.275 acres (229,800 sq. ft.). The functional loss resulting from impacts to these wetland areas is 3.693 FLU. These unavoidable impacts to the wetland areas on site will require a permit from the St. Johns River Water Management District (SJRWMD) as well as the City of Ormond Beach. The impacts to wetlands on site will result in a deficit in wetlands function, which will need to be offset. On- site mitigation is not a feasible option for the airport: wetland creation within the airport boundary would serve as a wildlife attractant, which is not compatible with the function of the airport; and conserving wetlands via a conservation easement is not compatible with the purpose of the airport property, which is to serve airport function and development. The purchase of mitigation credit from an approved mitigation bank will be required to fulfill the required amount of functional gain to offset impacts to wetlands resulting from the development plan. The Ormond Beach Municipal Airport is located within the Halifax River Basin (17) which currently has a number of banks with mitigation credit available for purchase. These banks are as follows:

Mitigation Bank	Cost per FLU
Lake Swamp Mitigation Bank	$120,000.00
Farmton Mitigation Bank	$145,000.00
Port Orange Mitigation Bank*	To be determined

*The Port Orange Mitigation Bank is currently undergoing a UMAM conversion process with the St. Johns River Water Management District. This bank currently has ratio credits available only. UMAM credits and pricing are expected to be available in the near future.

(e) List all required permits that will be obtained for wetland impacts (USACE Section 404, WMD, FDEP or local). USACE Standard Individual Permits require public notice. For NEPA purposes, this is conducted during public and agency review of the Draft EA. ***Note:*** *<u>Nationwide General Permits</u> authorize a category of activities throughout the U.S., Puerto Rico, and U.S. Virgin Islands that are similar in nature and cause only minimal individual and cumulative environmental impacts. Nationwide General Permits may authorize minor filling, roads, utility lines, maintenance of existing structures and other minor activities; they may require mitigation. <u>Standard Individual Permits</u> are required for activities which may cause more than minimal adverse effects to the aquatic environment and exceed the terms and conditions of a general permit; they require public notice and review by state and federal resource agencies; most require mitigation.*

List all wetland permits:

St. Johns River Water Management District, City of Ormond Beach

A USACE Section 404 is not anticipated as the wetlands on-site are isolated; should a USACE permit be required, the City will comply.

(f) Attach a statement from the Airport Sponsor committing to the implementation of a mitigation plan developed to the satisfaction of the USACE in consultation with state and local agencies having an interest in the affected wetland.

See Attachment R.

FLOODPLAINS

(a) Compared to the No Action alternative, would the Proposed Action and retained alternatives (if any) be located in, or encroach upon, any base/100-year floodplains, as designated by the Federal Emergency Management Agency (FEMA)? If **YES**, you must quantify the encroachment and attach the corresponding FEMA Flood Insurance Rate Map (FIRM) and proceed to (b) and (c).

Explain and quantify the floodplain encroachment and attach FEMA FIRM Map, if applicable:

Portions of the project area within floodplain as shown on Figure 7: Wetlands and Floodplains are within areas of required obstruction removal. Trees in these areas will be removed without soil disturbance, no stump removal, no grubbing. There will be no fill placed in the floodplain.

(b) In accordance with Executive Order 11988, explain why the Proposed Action and retained alternatives (if any) must be located in or affect the base/100-year floodplain. Include (1) a description of significant facts considered in making the decision to locate the Proposed Action in or to affect the floodplain, including alternative sites and actions; (2) a statement indicating whether the Proposed Action (and retained alternatives if any) conforms to applicable state or local floodplain protection standards; (3) a description of the design steps taken to modify the Proposed Action to minimize potential harm to or within the floodplain; and (4) a statement indicating how the Proposed Action affects the natural or beneficial values of the floodplain.

Explain:

Refer to the alternative analysis in Section 6 of this EA for discussion on why there is no alternative to removing the obstructions within the floodplain. Because there will be no fill placed in the floodplain, the project conforms to applicable state or local floodplain protection standards. The natural or beneficial values of the floodplain will remain unaffected by the Proposed Action.

(c) If the Proposed Action or retained alternative would cause an encroachment of a base/100-year floodplain, the Airport Sponsor must provide an opportunity for early public review during the EA process, in accordance with Section 2(a)(4) of Executive Order 11988 and Paragraph 7 of DOT Order 5650.2. For NEPA purposes, this is conducted during public and agency review of the Draft EA.

Discuss what actions were taken to make the Draft EA available for early public review and what notification of floodplain impacts was made.

NA

SURFACE WATERS AND GROUND WATERS

(a) When compared to the No Action alternative, will the Proposed Action and retained alternatives (if any) require a Section 401 water quality certificate (WQC) for construction activities or impacts to navigable waters, including jurisdictional wetlands? Explain the status of and/or any issues associated with obtaining this certificate. Attach any correspondence from the issuing agency. Cross reference your response with Wetlands, as applicable.

Explain:

At this time, it is uncertain whether a WQC will be required for the Proposed Alternative. If the US Army Corps of Engineers determines that the impacted wetlands are jurisdictional, the City will comply and obtain this certificate.

(b) Is a National Pollutant Discharge Elimination System (NPDES) permit required for the Proposed Action and retained alternatives (if any)? If **YES**, explain the status and attach any comments received from the issuing agency or a copy of the permit.

Explain:

A NPDES Construction General Permit will be required due to impacts over 1 acre from the project. This will be applied for during Final Design of the project.

(c) Would the Proposed Action and retained alternatives (if any) affect a public drinking water supply, a sole source aquifer, or a Comprehensive State Groundwater Protection Program (CSGWPP)? If **YES**, attach records of consultation with EPA and state, local or tribal water quality agencies responsible for protection programs.

Explain:

No

(d) Provide sufficient description of the mitigation measures the Airport Sponsor will carry out for the Proposed Action to: meet WQC terms or the conditions of any applicable NPDES permits; protect public drinking water supplies or comply with applicable CSGWPPs; develop response plans to contain any potential spills of oil or oil-based products associated with the Proposed Action; meet any other substantial water quality concerns that water quality agencies identify; or, use best management practices (BMPs) or best available technologies (BATs).

The City will commit to enacting any mitigation measures as required for the 401 WQC and NPDES permit when such information is available from the permitting agencies.

WILD AND SCENIC RIVERS

(a) Is the Proposed Action's project study area within any Wild and Scenic Rivers System (WSRS), study rivers, National Rivers Inventory (NRI), or otherwise eligible rivers or river segments under Section 5(d)? If no Wild and Scenic Rivers, study rivers, NRI, or Section 5(d) rivers are found within the study area, no further analysis is needed. If **YES**, contact an FAA ORL/ADO EPS for further guidance. **Note:** *The study area should be defined as the entire geographic area with the potential to be either directly or indirectly impacted by the proposed action and alternative(s). For example, if construction of a new facility is part of the proposed action or alternative(s), the study area should include any areas directly impacted through any visual, audible, or other type of intrusion that is out of character with the river or alters the* *outstanding features of the river's setting. The study area should also include any area indirectly impacted by the proposed action and alternative(s), such as rivers or river segments many miles downstream from the construction footprint of a project which may experience changes in water quality or quantity due to the proposed action and alternative(s). In addition, the default boundaries of Wild and Scenic Rivers as defined in the Wild and Scenic Rivers Act extend to a maximum of one-quarter mile from the ordinary high water mark on each side of the river (an average of not more than 320 acres per mile). As a result, be sure to consider any area within this boundary as part of the study area. Florida has two rivers designated as wild and scenic in accordance with the Wild and Scenic Rivers Act; the Loxahatchee River in southeast Florida, and the Wekiva River in central Florida. The NPS's NRI website at:* http://www.nps.gov/ncrc/programs/rtca/nri/ *provides a map which can assist in determining if any rivers in the study area are included on the NRI; and the National Wild and Scenic River's Designated Wild and Scenic Rivers website at:* http://www.rivers.gov/map.php *provides a list of all designated Wild and Scenic Rivers in the National System as well as all study rivers.*

Explain:

N/A

9. CUMULATIVE IMPACTS

Cumulative impacts are impacts that a proposed action and retained alternatives (if any) would have on a particular resource when added to impacts on that resource from past, present, and reasonably foreseeable future actions undertaken or proposed by the Airport Sponsor, the FAA, other Federal, state or local agencies, or a private entity. **Note:** *List all sources of information including projects shown on an airport's ALP or identified in an airport's master plan, on airport projects approved by the FAA, the airport's 5 year CIP, the local jurisdiction's approved land use map and long range transportation plan, and substantial locally approved development projects. Identify off-airport projects that are within the same political jurisdiction or within approximately 5 miles of the airport, and the existing and future 65 DNL noise contour. For wetland and biotic resource impacts consider water management district basin boundaries.*

(a) In order to determine whether the Proposed Action and retained alternatives (if any) would have a cumulative effect on any of the environmental impact categories discussed above, identify any on-airport projects that may have common timing and/or location; and any off-airport projects in the airport's vicinity outside of the Airport Sponsor or FAA's jurisdiction. Generally, use 3 years for past projects and 5 years for future foreseeable projects. For each past, present, and future project, you must discuss environmental impacts and any required permits.

Explain:

Previous projects completed at OMN include construction of Taxiway G in 2016, with wetland impacts of approximately 0.2 acres; these impacts were exempt from permitting from SJRWMD and USACE. Taxiway A was constructed in 2013, with wetland impacts of 0.18 acres, which were permitted and mitigated.

The City does not intend to complete additional runway projects at OMN within the foreseeable future other than renovating and reconstructing existing pavement. Additional aircraft storage hangars and Fixed Base Operator (FBO) service facilities may be built depending on public demand, as shown on the ALP in Attachment A. These activities are not expected to require a wetland permit or impact wetlands or surface waters, will not change the DNL noise contours, are not anticipated to affect SHPO or Section 4(f) resources, thus will not cumulatively add to the impacts proposed in this EA to the extent that a significance threshold would be exceeded. This future development will require separate analysis in accordance with the National Environmental Policy Act (NEPA) and FAA regulations.

The full build-out scenario shown on the ALP will not be completed within a 3-5 year window. The area surrounding OMN is currently sufficiently developed to meet the current economic situation of the residents, the City and the County, and no plans within the foreseeable future are available that would add cumulatively to the impacts from the Proposed Action.

(b) Considering the impacts of the Proposed Action (and retained alternatives if any) together with the environmental impacts of past, present, and future projects discussed in 12(a) above, discuss whether cumulative impacts would exceed a significant impact threshold where one is provided. If no threshold is provided, discuss whether potential cumulative impacts would be considered substantial by any Federal, state, or local agency, or the public. *Significant impact thresholds are provided in Exhibit 4-1 of FAA Order 1050.1F and in 5050.4B Table 7-1 for each resource category.*

Explain:

NA

10. MITIGATION MEASURES

(a) As defined in the CEQ Regulations at 40 CFR § 1508.20, mitigation includes avoiding the impact; minimizing the impact; rectifying the impact by repairing, rehabilitating, or restoring the environment; reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and compensating for the impact by replacing or providing substitute resources.

Summarize all mitigation measures discussed in the Environmental Impact Categories of this EA that will be taken to avoid creation of significant impacts to a particular resource as a result of the Proposed Action. Discuss any impacts that cannot be mitigated, or that cannot be mitigated below the threshold of significance. *Significant impact thresholds are provided in Exhibit 4-1 of FAA Order 1050.1F for each resource impact category and in 5050.4B Table 7-1.*

Impacts to wetlands, state-listed plants, Gopher tortoise and Eastern indigo snake will be appropriately mitigated at the direction of the agency of record and have been discussed in the prior sections of this EA.

11. PERMITS

List all required permits for the Proposed Action, including the lead agency, status, and responsible entity. Discuss coordination with appropriate agencies and the expected time frame for receiving identified permits. Indicate whether any difficulties are anticipated in obtaining required permits. ***Note:*** *Even though the Airport Sponsor has/shall obtain one or more permits from the appropriate Federal, state, and local agencies for the Proposed Action, initiation of any construction activities shall **NOT** begin until the FAA has issued its environmental determination based on the information in this EA.*

Wetlands

Unavoidable impacts to the wetland areas on site will require a permit from the St. Johns River Water Management District (SJRWMD) as well as the City of Ormond Beach. Impacts to wetland areas on site will result in a deficit in wetlands function (Functional Loss Units) which will need to be offset.

The City will initiate coordination with SJRWMD upon completion of the NEPA process and final design.

The City is aware of the project and will apply for a permit via the Planning Board upon completion of the NEPA process and final design.

The City will apply for a 401 Water Quality Certification from the USACE should it be determined that one is necessary. BCS does not believe the isolated wetlands on-site will be determined to be jurisdictional to the USACE.

Gopher Tortoises

During the site reviews, numerous Gopher tortoise burrows and two Gopher tortoises were observed. Since a gopher tortoise relocation permit was previously issued for the Ormond Beach Municipal Airport for another phase of construction, a Gopher Tortoise Conservation Permit with off-site relocation of tortoises will be required. The FWC requires that a mitigation contribution be made for all relocation permits and is based on the number of tortoises permitted for relocation.

FWC's current policy allows gopher tortoise relocations throughout the year. However, tortoises shall only be relocated when the low temperature at the recipient site is forecasted by the National Weather Service to be above 50º Fahrenheit for three consecutive days after release (including the day of relocation). Prior to any relocation effort, a permit from the St. Johns River Water Management District and all local permits must be obtained.

The City will apply for the Gopher Tortoise Conservation Relocation Permit once the construction commencement timeframe has been established and when it is known that impending construction is to occur within 90 days.

NPDES

A NPDES Construction General Permit (CGP) will be applied for when design has commenced to the point that construction is anticipated.

12. CONSISTENCY WITH APPROVED PLANS OR LAWS

(a) Is the Proposed Action consistent with existing environmental plans, laws, and administrative determinations of Federal, state, regional, or local agencies?

Explain:

Yes. The City intends to acquire avigation easements or purchase properties to control the Runway Protection Zone (RPZ) per FAA Advisory Circular 150/5300-13A, Section 310, issued September 28, 2012, revised February 26, 2014. The avigation easement shall allow the Airport Access to conduct the clearing/trimming of trees, restrictions on incompatible land use including buildings and structures, lighting, recreational land use, or other places of public assembly, and the future construction of structures within the RPZ.

(b) Are there any other Federal approvals or permits required?

Explain:

No.

(c) Is the Proposed Action consistent with plans, goals, policies, or controls that have been adopted for the area in which the airport is located?

Explain:

The project is consistent with local plans, goals, policies and controls for the City and Volusia County, including the Volusia County Dynamic Master Plan (2016). Impacts will not extend off-site.

13. PUBLIC AVAILABILITY

(a) Discuss whether any public meetings were held during development of the Draft EA. Provide a list of all agencies and persons consulted in the preparation of this EA. Discuss any input from local officials or public groups regarding the Proposed Action. Discuss whether a public hearing is warranted i.e. there is substantial environmental controversy concerning the Proposed Action or there is substantial interest in holding a hearing or another agency with jurisdiction over the action requests a public hearing.

The Airport Sponsor did not hold public meetings during development of the Draft EA. The Proposed Action will not result in significant environmental impacts. The FAA has directed the City of Ormond Beach to provide the opportunity for a public hearing for the proposed runway extension project should a request for a public hearing be submitted to the FAA within 15 days of advertisement of the public notice. No such request was received. No public meeting or hearing was held.

The Airport Sponsor and the FAA consulted with the following agencies during development of the Draft EA:

Jason Aldridge
Deputy State Historic Preservation Officer
Compliance and Review Section
Division of Historical Resources
Florida Department of State
500 South Bronough Street- 4th Floor
Tallahassee, FL 32399-0250

Mr. Fred Dayhoff
Section 106 and NAGPRA Coordinator
Miccosukee Tribe of Indians of Florida
HC 61
SR Box 68 Old loop Road
Ochopee, FL 34141

Bill Cypress, Chairman
Miccosukee Tribe of Indians of Florida
Tamiami Station
PO Box 440021
Miami, FL 33144

Historic and Cultural Preservation Department (email)
Muscogee (Creek) Nation Cultural Preservation
PO Box 580
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section106@MCN-NSN.gov

Mr. James Floyd
Principal Chief
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Office of the Administration
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Stephanie A. Bryan
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Mr. Robert Thrower
Acting Tribal Historic Preservation Officer
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Mr. Marcellus W. Osceola
Chairman
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Tribal Historic Preservation Office
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Seminole Nation of Oklahoma
PO Box 1498
Wewoka, OK 74884

Annie Dziergowski
U. S. Fish & Wildlife Service
North Florida Ecological Services Office
7915 Baymeadows Way, Suite 200
Jacksonville, FL 32256-7517

USFWS Information for Planning and Conservation (IPAC) online project review

(b) After review by the FAA ORL/ADO EPS, the EA must be issued by the Airport Sponsor as a Draft EA for a 30-day public and agency review period. Concurrent with the 30-day public review period, the Airport Sponsor must submit the Draft EA to the Florida State Clearinghouse and to Federal, state and local agencies (as determined by the ORL/ADO EPS). The Airport Sponsor must publish a notice of availability of the Draft EA for public review in the local newspaper and airport sponsor's website, if available. ***Note:*** *Certain special purpose environmental laws, regulations, or executive orders require public notice, and must be included as part of the Draft EA notice of availability. These include but are not limited to section 2(1)(4) of E.O. 11988, Floodplain Management, section 2(b) of E.O. 11990, Protection of Wetlands, Section 7 of the Endangered Species Act, Section 106 of the National Historic Preservation Act, and Order DOT 5610.2, Environmental Justice.*

Discuss and acknowledge submittal of a Draft EA for public and agency review.

The Draft EA was available for 30-day agency and public review beginning January 2, 2018 and ending February 2, 2018. The document was available for public review and comment at the following locations during normal business hours:

FAA Orlando Airport District Office
South Park Building
8427 South Park Circle, 5th Floor
Orlando, FL 32819
407.812.6331 ext. 127

Ormond Beach
City Hall
22 South Beach Street
Ormond Beach, FL 32174
386.615.7019

And was available for viewing on the Ormond Beach website at
www.ormondbeach.org/77/airport

Concurrent with the 30-day public review period, the Airport Sponsor submitted the Draft EA to the Florida State Clearinghouse. A response was received on January 26, 2018 (Attachment U).

The Airport Sponsor published a Notice of Availability of the Draft EA (Attachment S) for public review in the Daytona Beach News Journal.

(c) Comments on the Draft EA received from the Florida State Clearinghouse, Federal and state agencies, and the public must be attached to the Final EA. The Airport Sponsor must provide draft responses for FAA review by the ORL/ADO EPS.

Summarize comments received and identify an appendix to the EA within which the comments and responses are found.

The FAA received two comments on the Draft EA: the first was a letter received from the Florida State Clearinghouse, which is provided in Attachment U, stating that the project is consistent with the Florida Coastal Management Program (FCMP); the second was a letter of concurrence on the determination that the proposed action will have no effect on historic, cultural or archaeologic resources from the Muscogee (Creek) Nation (Attachment I).

14. LIST ALL ATTACHMENTS TO THIS EA

Tables

Figures

Attachments

15. PREPARER CERTIFICATION

I certify that the information I have provided above is, to the best of my knowledge, true and correct.

Signature:	Kimberly Peace
Name, Title:	Kimberly Peace, Senior Environmental Coordinator
Affiliation:	Hoyle, Tanner & Associates, Inc.
Date:	March 21, 2018
Phone Number:	603-669-5555 ext. 151
Email:	kpeace@hoyltanner.com

16. AIRPORT SPONSOR CERTIFICATION

I certify that the information I have provided above is, to the best of my knowledge, true and correct. I also recognize and agree that no construction activity, including but not limited to site preparation, demolition, or land disturbance, shall proceed for the above proposed action(s) until FAA issues a final environmental decision for the proposed action(s), and until compliance with all other applicable FAA approval actions (e.g., ALP approval, airspace approval, grant approval) has occurred and all appropriate Federal, state and local permits and certifications have been obtained.

Signature:	
Name, Title:	Steven R. Lichliter, Airport Manager
Affiliation:	Ormond Beach Municipal Airport
Date:	March 21, 2018
Phone Number:	386-615-7019
Email:	steven.lichliter@ormondbeach.org

END NOTES:

References

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Levine-Weinberg 2014. These Little Planes Are Going the Way of the Dodo Bird. February 2014. http://www.fool.com/investing/general/2014/02/16/these-little-planes-are-going-the-way-of-the-dodo.aspx

Table 4: Alternatives Analysis

	Action Summary	Purpose and Need	Cost[1]	RW 8-26 length	Off-site impacts	RPZ	Biotic Resources	Alternative Rejected?
Alternative 1	Extend RW to east 400 feet and to west 600 feet	Met	$7.34 M	5,005 feet	Vegetative clearing/tree removal or lighting on east and west ends	Expansion would envelop private property in non-compatible use, River Bend Golf Course and Airport Road	Impacts to 100-yr floodplain of Tomoka River, potential wetland impacts	Yes, the combined environmental impacts and higher costs make it unfeasible and unreasonable
Alternative 2 (Proposed Action)	Extend RW 8-26 to west 1,000 feet	Met	$3.8-4.4M[2]	5,005 feet	Vegetative clearing/tree removal or lighting on west end	Expansion would envelop private property in compatible use-avigation or easement or fee simple purchase of parcels would be required	No impacts to Tomoka River, potential wetland and wildlife impacts for tree removal	No
Alternative 3	Extend RW 8-26 to west 600 feet	Not Met-extending to 4,600 feet would not fully meet the purpose and need	$2.5M	4,605 feet	None	Would remain on-airport	Minimal potential impacts to wetlands and wildlife for tree removal	Yes, the inability to fully meet the purpose and need make it unreasonable
No Action	No Change	Not Met	$0	NA	NA	NA	NA	Yes, unable to meet purpose and need, OMN would continue to have runway constraints and reduced economic viability

[1] Costs are for 2018 construction.

[2] Varies due to cost of avigation easement or fee simple purchase for land in RPZ

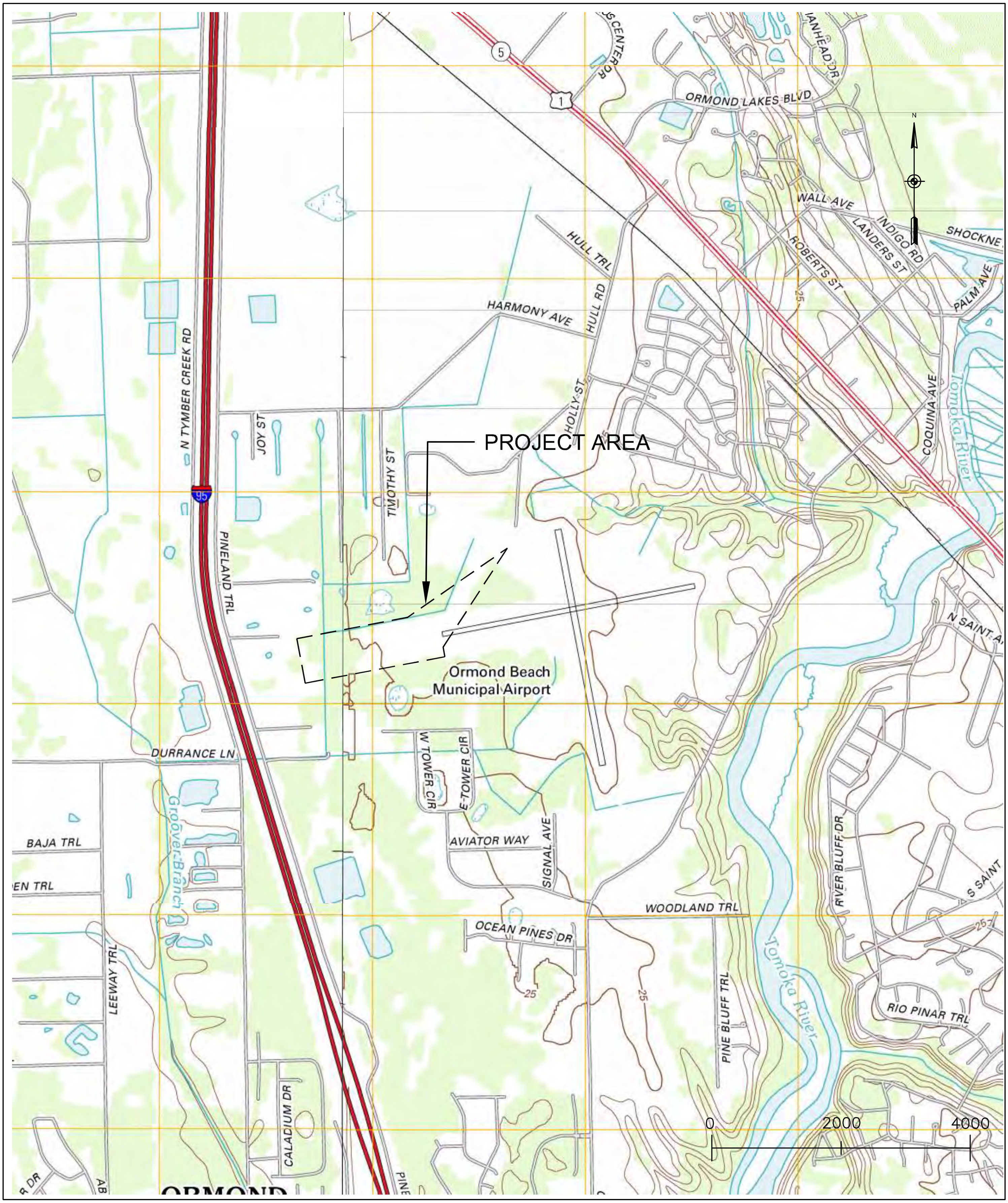
Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Figures

Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Figure 1

Drawing name: H:\307102 Ormond Beach\Dwgs\LOCATION-EA-8X11.dwg Apr 07, 2017 – 11:46am



Hoyle, Tanner & Associates, Inc.	150 Dow Street Manchester, NH 03101–1227 Tel 603–669–5555 Fax 603–669–4168 Web Page www.hoyletanner.com Hoyle Tanner & Associates 2017		ORMOND BEACH MUNICIPAL AIRPORT ORMOND BEACH, FLORIDA PROJECT AREA LOCATION PLAN	FIGURE 1
CHKD. BY KRP	DR. BY JLC	DES. BY KRP	DATE: APRIL, 2017	SCALE: AS SHOWN

Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Figure 2

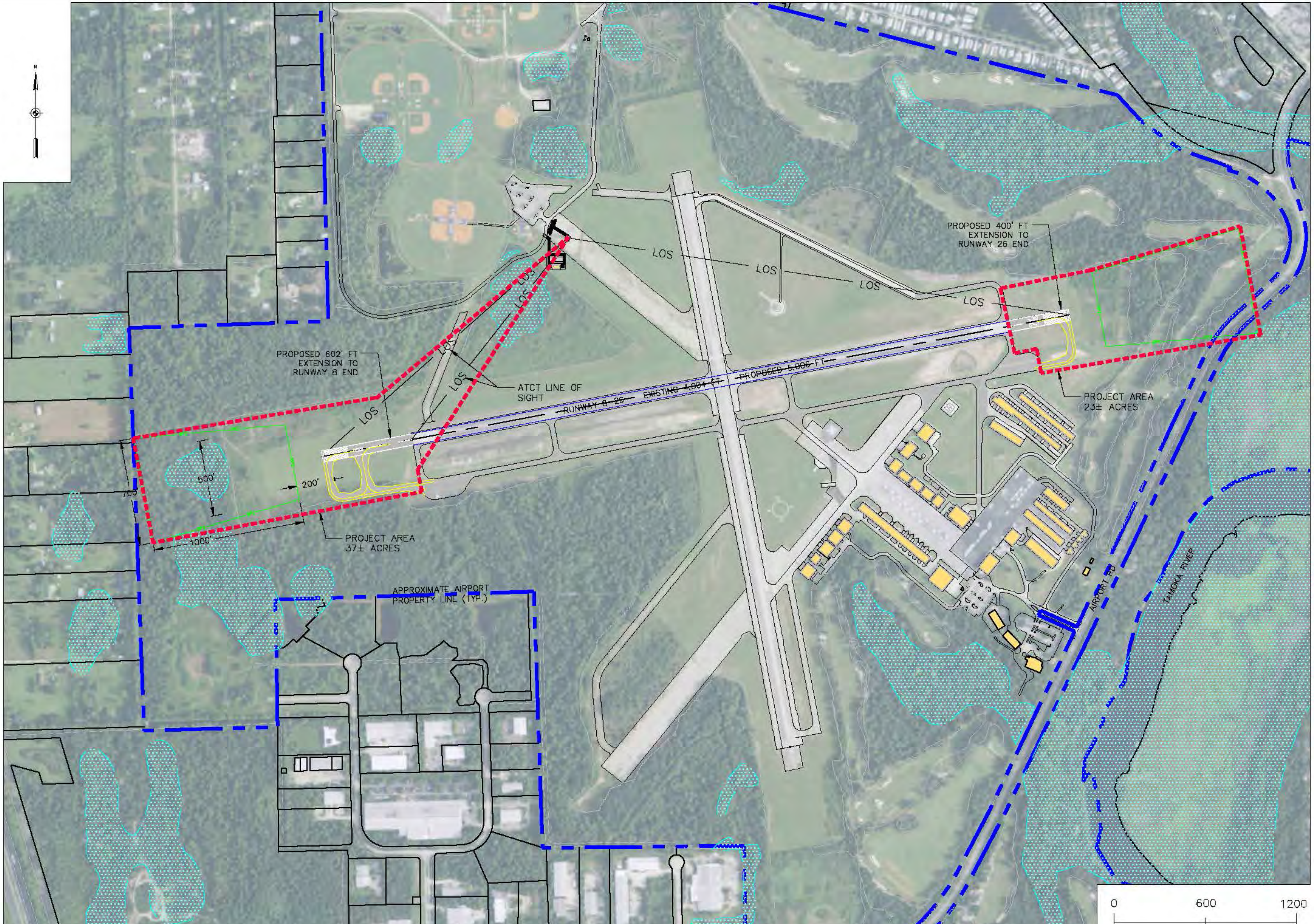
ORMOND BEACH MUNICIPAL AIRPORT
RUNWAY 8-26 EXTENSION
ALTERNATIVE #2

FIGURE 2

Drawing name: H:\30710\dwg\Exhibit\Exhibit-Future RW-Alt #2.dwg Nov 17, 2017 – 3:56pm

Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Figure 3



WETLAND DATA SOURCE PER FLORIDA GIS (WWW.FGDL.ORG). SEE WETLAND DRAWING FOR FIELD LOCATED WETLANDS.

REV.	DATE	DESCRIPTION	BY

PROJ. NO.: 307102
DRAWN: JLC
DESIGN: KRP
CHECKED: KRP
DATE: APRIL 2017

3
FIGURE

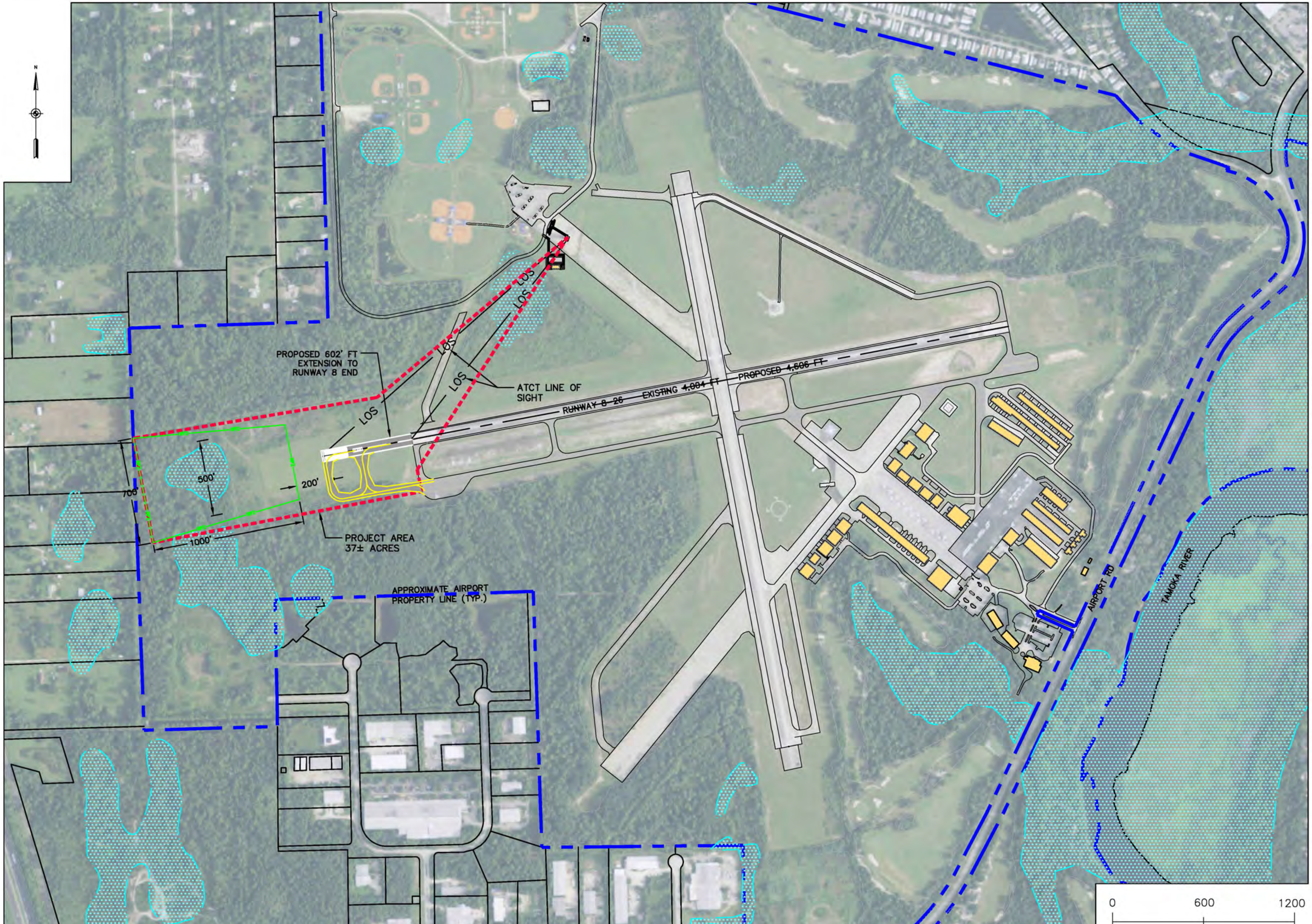
ORMOND BEACH MUNICIPAL AIRPORT
RUNWAY 8-26 EXTENSION
RUNWAY ALT# 1 EA

Hoyle, Tanner & Associates, Inc.

Drawing name: H:\307102 Ormond Beach\Dwgs\Figure 3 RUNWAY ALT#1 EA-11X17.dwg May 22, 2017 - 4:04pm

Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Figure 4



WETLAND DATA SOURCE PER FLORIDA GIS (WWW.FGDL.ORG). SEE WETLAND DRAWING FOR FIELD LOCATED WETLANDS.

Drawing name: H:\307102 Ormond Beach\Dwgs\Figure 4 RUNWAY ALT#3 EA-11X17.dwg May 22, 2017 - 4:03pm

REV.	DATE	DESCRIPTION	BY

PROJ. NO.: 307102
DRAWN: JLC
DESIGN: KRP
CHECKED: KRP
DATE: APRIL 2017

FIGURE 4

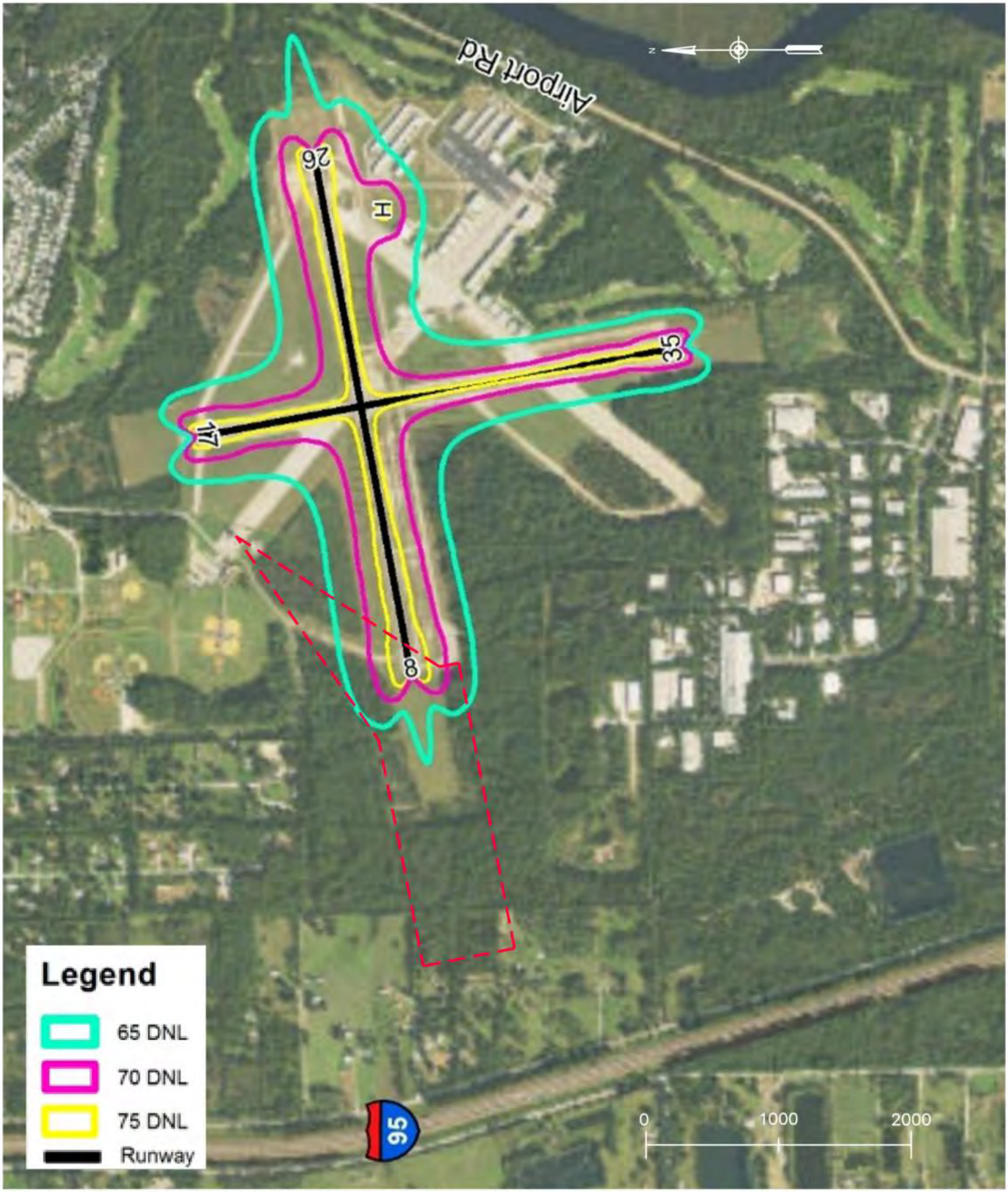
ORMOND BEACH MUNICIPAL AIRPORT
RUNWAY 8-26 EXTENSION
RUNWAY ALT# 3 EA

Hoyle, Tanner & Associates, Inc.

Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Figure 5

Drawing name: H:\307102 Ormond Beach\Dwgs\Figure 5 2016 DNL Contours-EA-8X11.dwg May 22, 2017 - 12:50pm



SOURCE: KB ENVIRONMENTAL SCIENCES, INC., 2017.

Hoyle, Tanner & Associates, Inc.			150 Dow Street Manchester, NH 03101-1227 Tel 603-669-5555 Fax 603-669-4168 Web Page www.hoyletanner.com Hoyle Tanner & Associates 2017		ORMOND BEACH MUNICIPAL AIRPORT ORMOND BEACH, FLORIDA 2016 DNL CONTOURS	FIGURE 5
CHKD. BY KRP	DR. BY JLC	DES. BY KRP	DATE: MAY, 2017	SCALE: AS SHOWN		

Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Figure 6

FLORIDA LAND USE, COVER AND FORMS CLASSIFICATION SYSTEM (F.L.U.C.C.S.)

- 310 - HERBACEOUS (DRY PRAIRIE)
- 411 - PINE FLATWOODS
- 413 - SAND PINE
- 510 - STREAMS AND WATERWAYS (DITCH)
- 618 - WILLOW AND ELDERBERRY
- 620 - WETLAND CONIFEROUS FORESTS
- 621 - CYPRESS
- 643 - WET PRAIRIE
- 811 - AIRPORTS

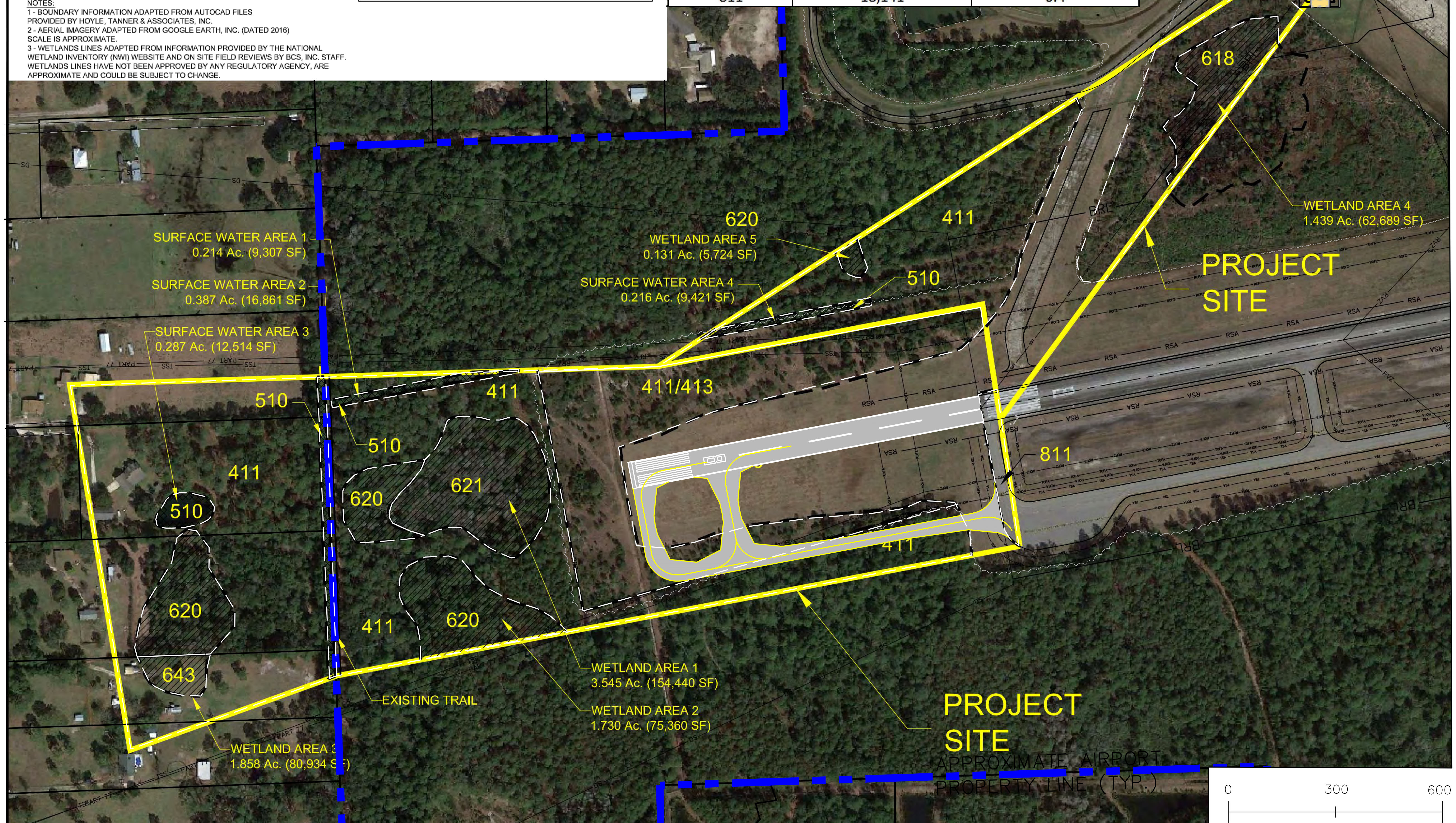
SITE ACREAGE BREAKDOWN

- WETLANDS ON SITE 8.704 Ac. (379,147 SF)
- SURFACE WATERS ON SITE 1.104 Ac. (48,103 SF)
- UPLANDS ON SITE 50.128 Ac. (2,183,571 SF)

TOTAL SITE AREA: 59.936 Ac. (2,610,821 SF)

CLASSIFICATION	AREA (sf)	ACRES
411	1,130,480	26.0
411/413	336,865	7.7
510	53,950	1.2
618	61,970	1.4
620	177,190	4.1
621	120,835	2.8
643	18,075	0.4
811	18,141	0.4

NOTES:
1 - BOUNDARY INFORMATION ADAPTED FROM AUTOCAD FILES PROVIDED BY HOYLE, TANNER & ASSOCIATES, INC.
2 - AERIAL IMAGERY ADAPTED FROM GOOGLE EARTH, INC. (DATED 2016) SCALE IS APPROXIMATE.
3 - WETLANDS LINES ADAPTED FROM INFORMATION PROVIDED BY THE NATIONAL WETLAND INVENTORY (NWI) WEBSITE AND ON SITE FIELD REVIEWS BY BCS, INC. STAFF. WETLANDS LINES HAVE NOT BEEN APPROVED BY ANY REGULATORY AGENCY, ARE APPROXIMATE AND COULD BE SUBJECT TO CHANGE.



REV.	DATE	DESCRIPTION	BY

PROJ. NO.: 307102
DRAWN: JLC
DESIGN: KRP
CHECKED: KRP
DATE: APRIL 2017

FIGURE 6

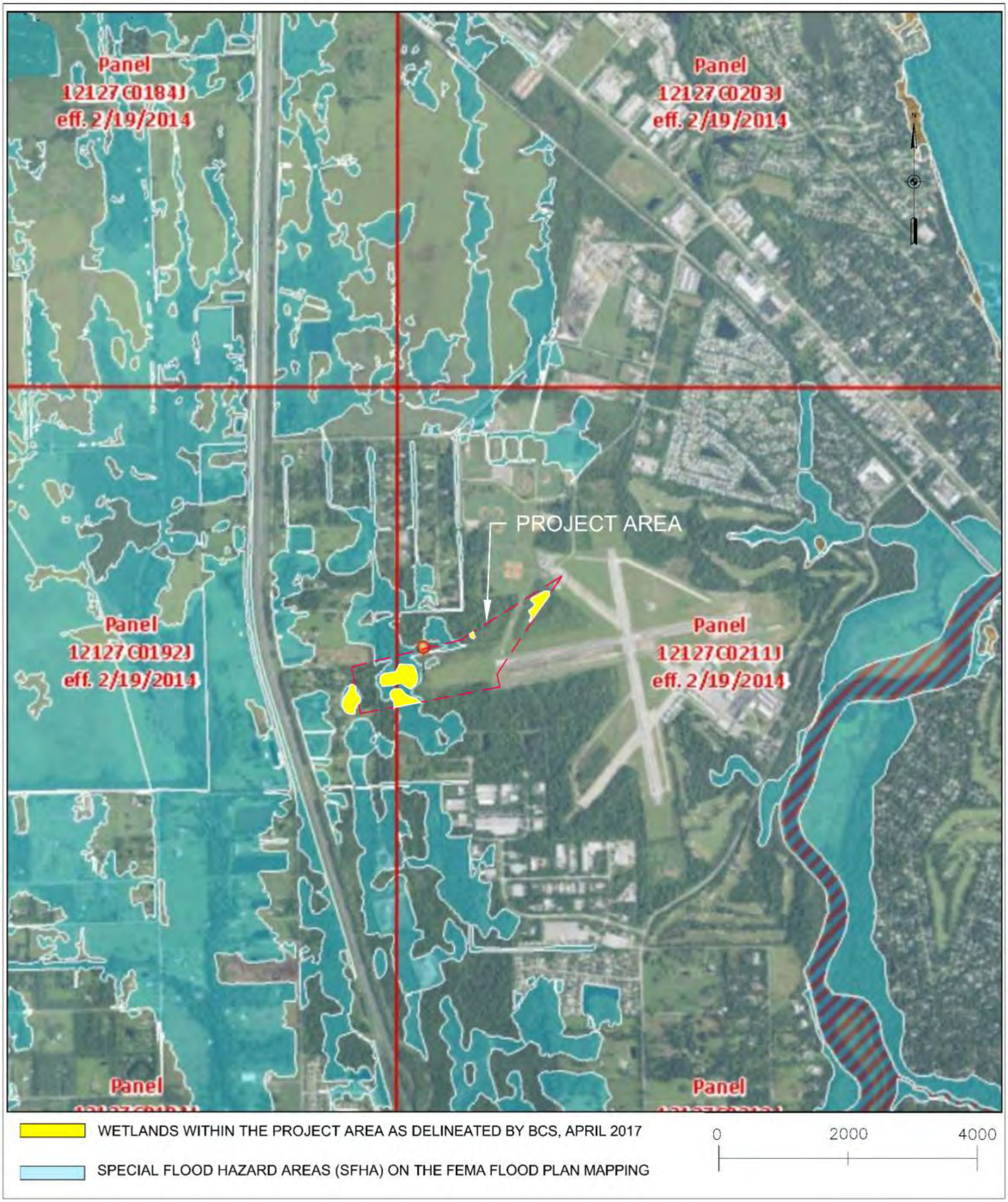
ORMOND BEACH MUNICIPAL AIRPORT
RUNWAY 8-26 EXTENSION
COVER CLASSIFICATION

Hoyle, Tanner & Associates, Inc.

Drawing name: H:\307102 Ormond Beach\Dwgs\Cover Classification RW-8-EA.dwg May 23, 2017 - 8:25am

Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Figure 7



Drawing name: H:\307102 Ormond Beach\Dwgs\Figure 7 WETLANDS AND FLOOD PLANS-EA-8X11.dwg Dec 07, 2017 - 1:44pm

Hoyle, Tanner & Associates, Inc.

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Tel 603-669-5555
Fax 603-669-4168
Web Page www.hoyletanner.com

CHKD. BY	DR. BY	DES. BY	DATE:	SCALE:
KRP	JLC	KRP	MAY, 2017	AS SHOWN

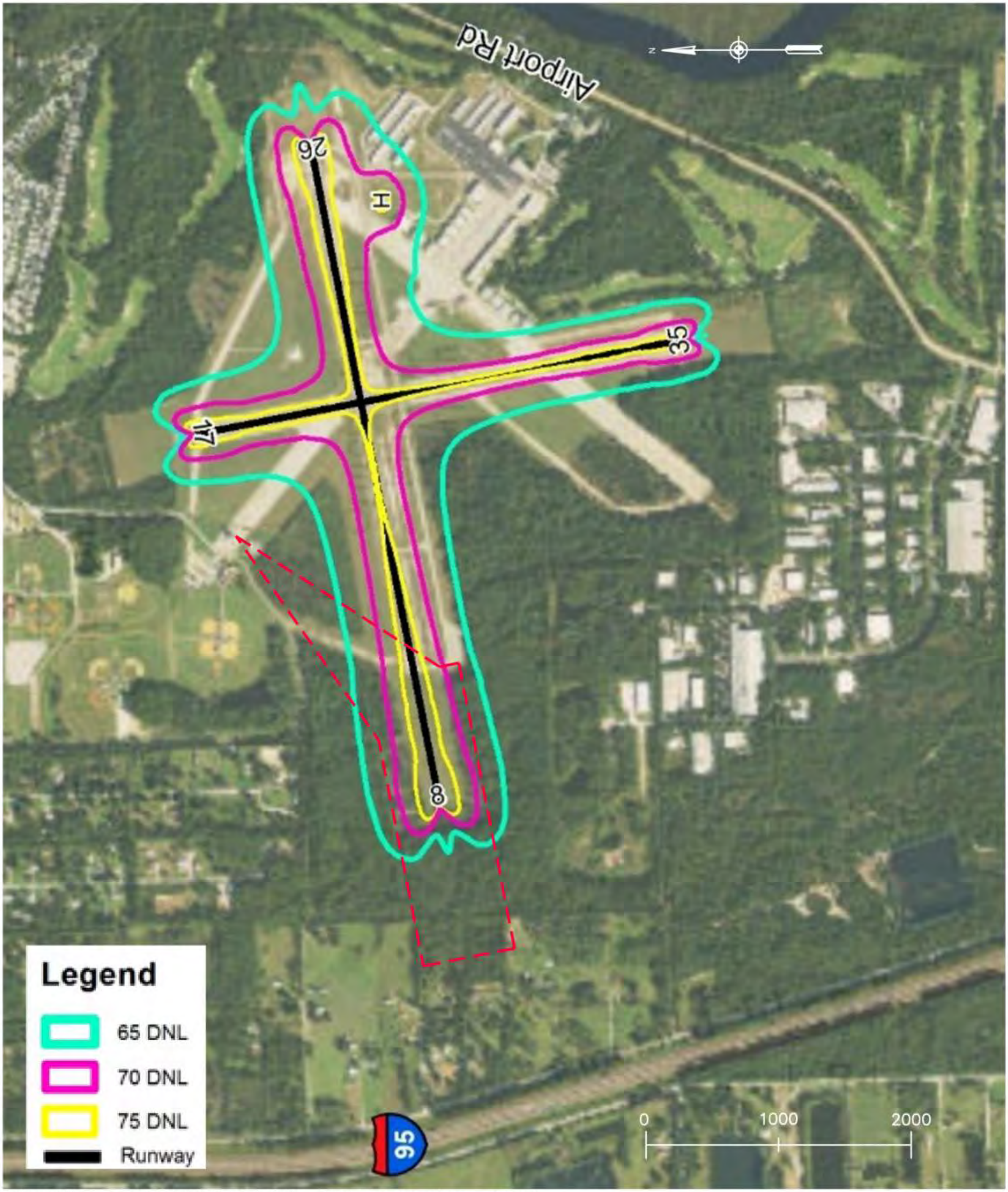
ORMOND BEACH MUNICIPAL AIRPORT
ORMOND BEACH, FLORIDA

WETLANDS AND FLOOD PLANS

FIGURE 7

Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Figure 8



SOURCE: KB ENVIRONMENTAL SCIENCES, INC., 2017.

Drawing name: H:\307102 Ormond Beach\Dwgs\Figure 8 2019 DNL Proposed Action Contours-EA-8X11.dwg May 22, 2017 - 12:51pm

Hoyle, Tanner & Associates, Inc.

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Manchester, NH 03101-1227
Tel 603-669-5555
Fax 603-669-4168
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CHKD. BY	DR. BY	DES. BY	DATE:	SCALE:
KRP	JLC	KRP	MAY, 2017	AS SHOWN

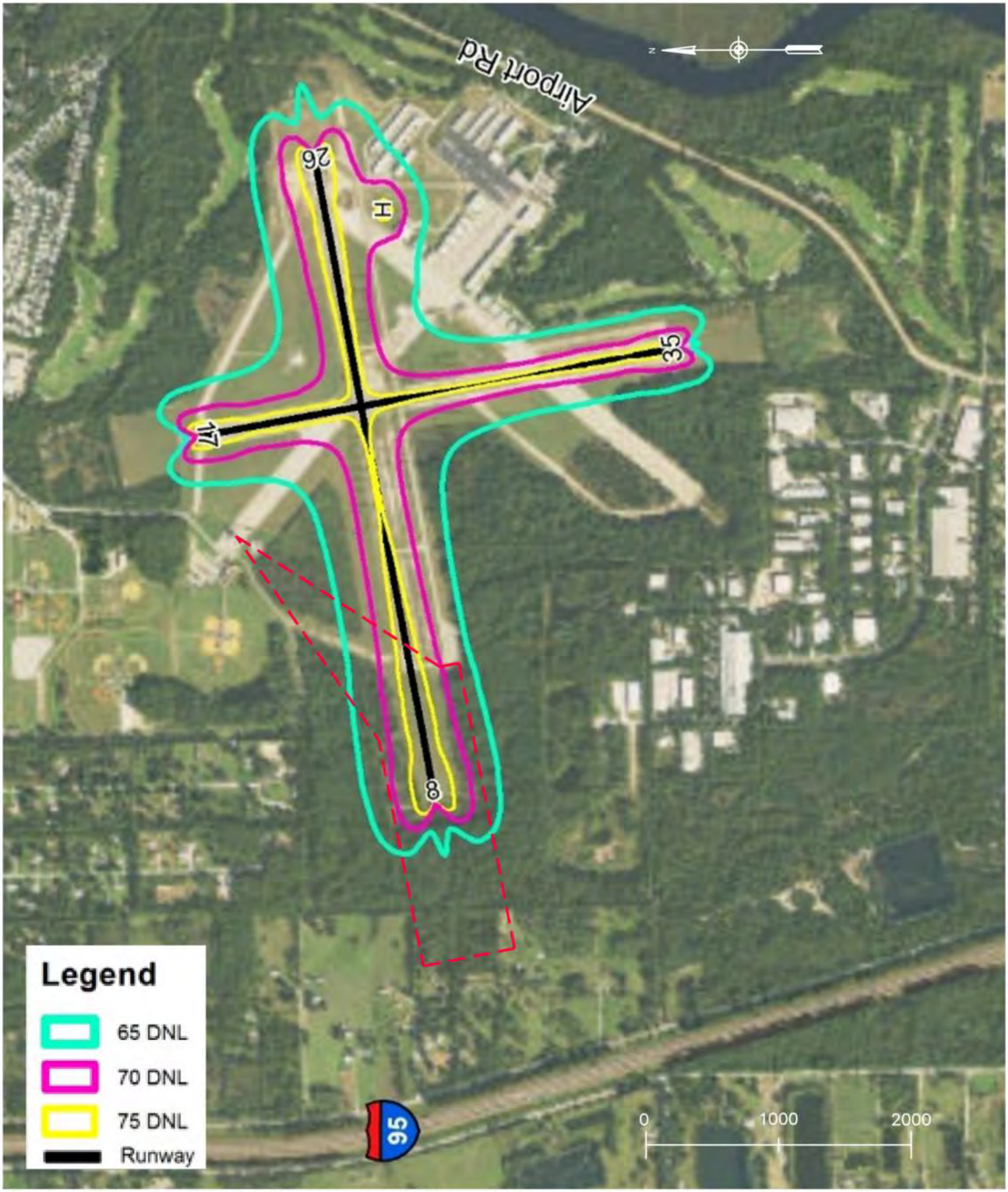
ORMOND BEACH MUNICIPAL AIRPORT
ORMOND BEACH, FLORIDA

2019 DNL PROPOSED ACTION CONTOURS

FIGURE 8

Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Figure 9



SOURCE: KB ENVIRONMENTAL SCIENCES, INC., 2017.

Drawing name: H:\307102 Ormond Beach\Dwgs\Figure 9 2024 DNL Proposed Action Contours -EA-8X11.dwg May 22, 2017 - 12:52pm

Hoyle, Tanner & Associates, Inc.

150 Dow Street
Manchester, NH 03101-1227
Tel 603-669-5555
Fax 603-669-4168
Web Page www.hoyletanner.com

ORMOND BEACH MUNICIPAL AIRPORT
ORMOND BEACH, FLORIDA

2024 DNL PROPOSED ACTION CONTOURS

FIGURE 9

CHKD. BY	DR. BY	DES. BY	DATE:	SCALE:
KRP	JLC	KRP	MAY, 2017	AS SHOWN

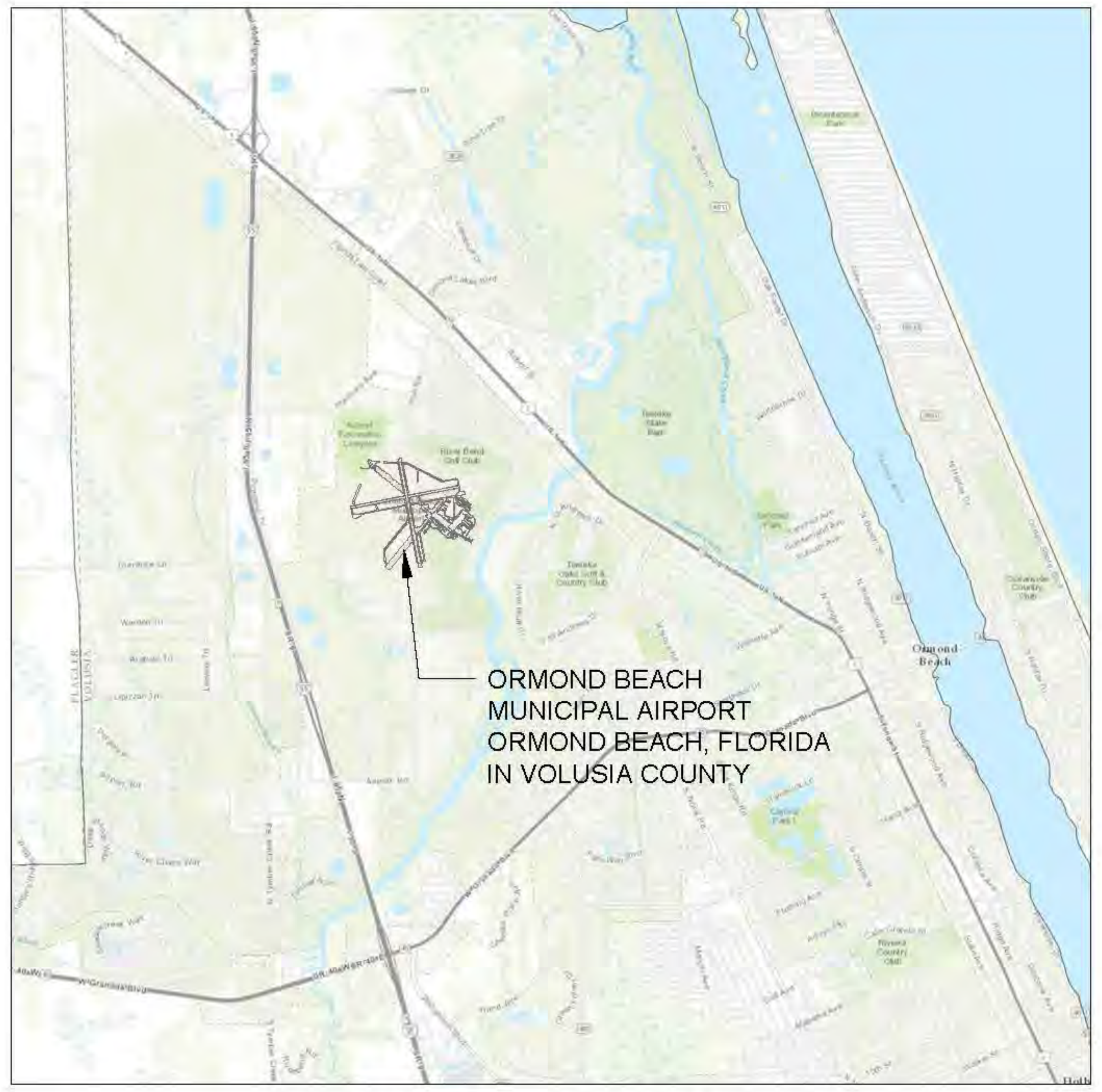
Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Attachments

Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Attachment A

CITY OF ORMOND BEACH
ORMOND BEACH MUNICIPAL AIRPORT
ORMOND BEACH, FLORIDA



VICINITY MAP

AIRPORT LAYOUT PLAN

LOCATION MAP

REVISIONS		
NO.	DESCRIPTION	DATE

AIRPORT OWNERSHIP AND MANAGEMENT

The ORMOND BEACH MUNICIPAL AIRPORT is owned by the City of Ormond Beach, Florida and operated under the management of the City of Ormond Beach, Airport Manager, Steven Lichliter

ORMOND BEACH MUNICIPAL AIRPORT

P.O. Box 277
Ormond Beach, FL 32175

FAA AIP# 3-12-0059-17-2014
January 2016

Airport Sponsor Approval
This Airport Layout Plan Is Hereby Approved
Signature: [signature] Date: 7-27-2016
Name
Title Joyce Shanahan, City Manager

CITY OF ORMOND BEACH CITY COMMISSIONERS

Mayor of the City of Ormond Beach Ed Kelley
Zone 1 Commissioner James Stowers
Zone 2 Commissioner Troy Kent
Zone 3 Commissioner Rick Boehm
Zone 4 Commissioner Bill Partington

SHEET NO	INDEX OF DRAWINGS	REVISIONS
1	TITLE SHEET	
2	DATA SHEET	
3	EXISTING FACILITIES AIRPORT LAYOUT PLAN	
4	FUTURE AIRPORT LAYOUT PLAN	
5	AIRPORT AIRSPACE PLAN	
6	AIRPORT AIRSPACE PROFILES	
7	INNER PORTION OF THE APPROACH SURFACE DRAWING RUNWAY 8	
8	INNER PORTION OF THE APPROACH SURFACE DRAWING RUNWAY 26	
9	INNER PORTION OF THE APPROACH SURFACE DRAWING RUNWAY 17	
10	INNER PORTION OF THE APPROACH SURFACE DRAWING RUNWAY 35	
11	TERMINAL AREA PLAN	
12	AIRPORT LAND USE	
13	EXHIBIT "A" AIRPORT PROPERTY INVENTORY MAP	
14	SIGN AND MARKING PLAN	

PLANS PREPARED BY:
Hoyle, Tanner & Associates, Inc.
95 E. Mitchell Hammock Road, Suite 200 Oviedo, FL 32765
Office PH: 407-380-1919 FaX: 407-380-1830

Drawing name: H:\307101\dwg\Contract\A.2 Title Sheet.dwg Jan 29, 2016 - 10:53am

Runway Data									
		Existing		Future		Existing		Future	
Runway Identification		Runway 8/26				Runway 17/35			
Runway Design Code (RDC)		B-II		B-II		B-II		B-II	
Approach Reference Code (APRC)		B/III/5000 & D/II/5000		B/III/5000 & D/II/5000		B/I(S)/5000		B/III/5000 & D/II/5000	
Departure Reference Code (DPRC)		B/III & D/II		B/III & D/II		B/I(S)		B/III & D/II	
Pavement Strength & Material Type		Bituminous Asphalt		Bituminous Asphalt		Bituminous Asphalt		Bituminous Asphalt	
Pavement Strength (x 1,000 LBS Wheel Loading.)		Single Wheel 30.0 / Dual Wheel 40.0		Single Wheel 30.0 / Dual Wheel 40.0		Single Wheel 30.0 / Dual Wheel 40.0		Single Wheel 30.0 / Dual Wheel 40.0	
Pavement Strength (PCN)		9/F/B/Y/U		9/F/B/Y/U		9/F/B/Y/U		9/F/B/Y/U	
Pavement Strength Surface Treatment		None		None		None		None	
Effective Runway Gradient (%)		0.32%		0.32%		0.13%		0.13%	
Percent (%) Wind Coverage		Refer to Wind Coverage Table		Refer to Wind Coverage Table		Refer to Wind Coverage Table		Refer to Wind Coverage Table	
Runway Dimensions (L x W)		4,005' X 75'		5,005' X 75'		3,704' X 100'		3,704' X 75'	
Displaced Threshold		None		None		None		None	
Runway Safety Area Dimensions		300' X 150'		300' X 150'		300' X 150'		300' X 150'	
		Runway 8	**Runway 26**	**Runway 8**	**Runway 26**	**Runway 17**	**Runway 35**	**Runway 17**	**Runway 35**
Runway End Coordinates	Latitude:	N 29° 18' 03.14"	N 29° 18' 10.57"	N 29° 18' 01.29"	N 29° 18' 10.57"	N 29° 18' 19.14"	N 29° 17' 43.12"	N 29° 18' 19.14"	N 29° 17' 43.12"
	Longitude:	W 081° 07' 12.84"	W 081° 06' 28.42"	W 81° 07' 07.94"	W 081° 06' 28.42"	W 81° 06' 52.56"	W 81° 06' 44.73"	W 81° 06' 52.56"	W 81° 06' 44.73"
	Elevation:	27.5	20.6	27.5	20.6	25.2	25.9	25.2	25.9
Runway Lighting Type		MIRL		MIRL		MIRL		MIRL	
Runway Protection Zone (RPZ) Dimensions		1,000 x 500 x 700 feet	1,000 x 500 x 700 feet	1,000 x 500 x 700 feet	1,000 x 500 x 700 feet	1,000 x 500 x 700 feet	1,000 x 500 x 700 feet	1,000 x 500 x 700 feet	1,000 x 500 x 700 feet
Runway Marking Type		Non-Precision		Non-Precision		Non-Precision		Non-Precision	
14 CFR Part 77 Approach Category		34:1	34:1	34:1	34:1	34:1	20:1	34:1	20:1
Approach Type		Non-Precision	Non-Precision	Non-Precision	Non-Precision	Non-Precision	Visual	Non-Precision	Visual
Visibility Minimums		5,000 RVR feet	5,000 RVR feet	5,000 RVR feet	5,000 RVR feet	5,000 RVR feet	N/A	5,000 RVR feet	N/A
Type of Aeronautical Survey Required for Approach		Vertically Guided	Vertically Guided	Vertically Guided	Vertically Guided	Vertically Guided	Non-Vertically Guided	Vertically Guided	Non-Vertically Guided
Runway Departure Surface		Yes	Yes	Yes	Yes	Yes	N/A	Yes	N/A
Runway Object Free Area		300' X 500'		300' X 500'		300' X 500'		300' X 500'	
Obstacle Free Zone		200' X 400'		200' X 400'		200' X 400'		200' X 400'	
Threshold Siting Surface (TSS)		Table 3-2 Type 4	Table 3-2 Type 4	Table 3-2 Type 4	Table 3-2 Type 4	Table 3-2 Type 4	Table 3-2 Type 3	Table 3-2 Type 4	Table 3-2 Type 3
Visual and Instrument NAVAIDS		GPS/REIL/PAPI-2	GPS/REIL/PAPI-2	GPS/REIL/PAPI-4	GPS/REIL/PAPI-4	GPS/REIL/PAPI-2	REIL/PAPI-2	GPS/REIL/PAPI-4	REIL/PAPI-4
Touch Down Zone Elevation		27.9	24.8	27.5	24.8	27.0	26.3	27.0	26.3
Taxiway Width		35'		25'		35'		35'	
Taxiway and Taxilane Safety Area Dimentions		79'		79'		79'		79'	
Taxiway and Taxilane Object Free Area		131'/115'		131'/115'		131'/115'		131'/115'	
Taxiway and Taxilane Separation		300'		300'		200'		300'	
Taxiway / Taxilane Lighting		MITL		MITL		MITL		MITL	
Horizontal and Vertical Datum		NAD 83 / NAD 88	NAD 83 / NAD 88	NAD 83 / NAD 88	NAD 83 / NAD 88	NAD 83 / NAD 88	NAD 83 / NAD 88	NAD 83 / NAD 88	NAD 83 / NAD 88
	Horizontal	NAD 83	NAD 83	NAD 83	NAD 83	NAD 83	NAD 83	NAD 83	NAD 83
	Vertical	NAD 88	NAD 88	NAD 88	NAD 88	NAD 88	NAD 88	NAD 88	NAD 88

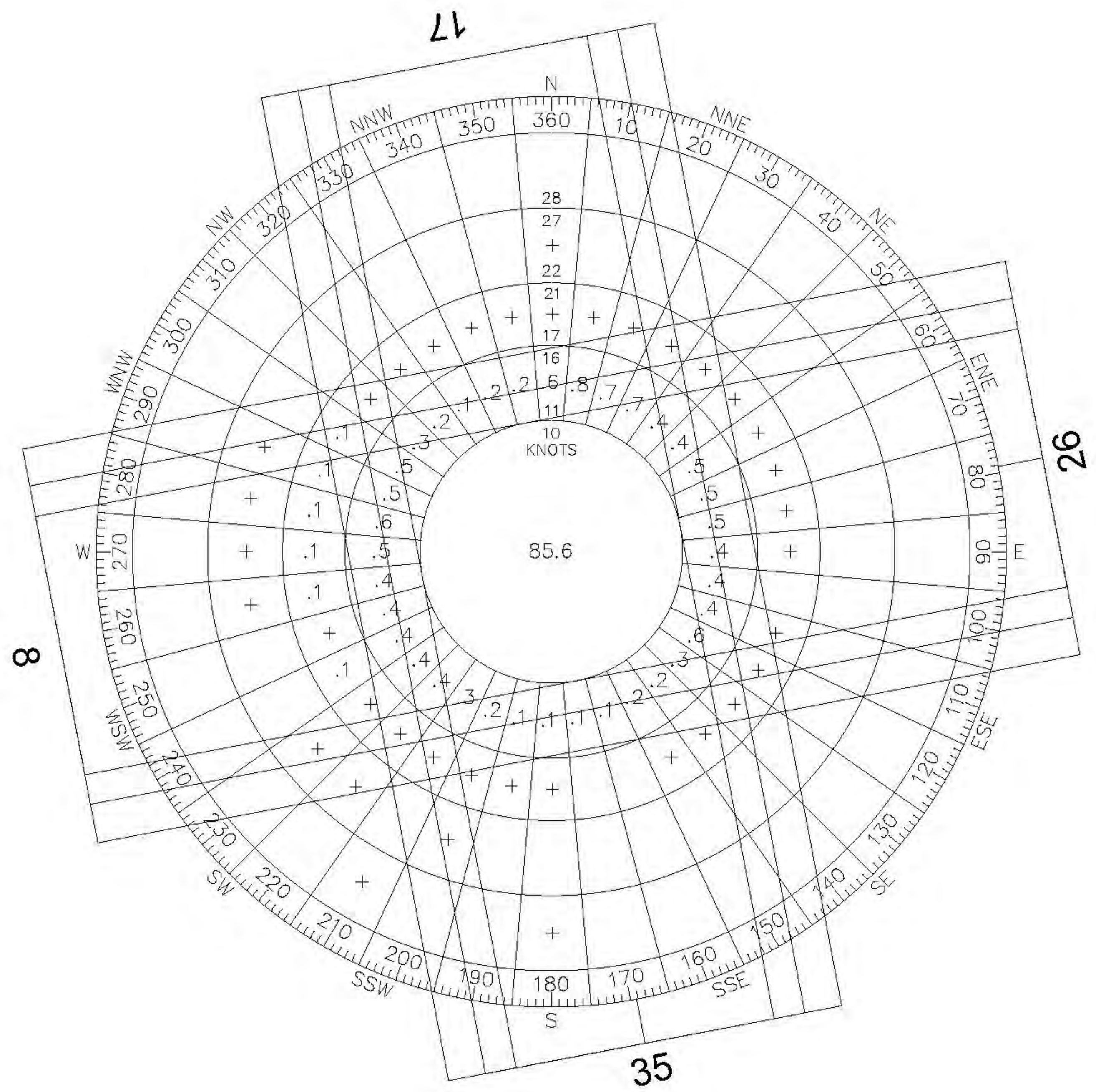
Note
Threshold Siting Surface (TSS) based on A/C 150/5300-13A. Type 3 refers to Approach end of runways expected to serve large airplanes (Visual day/night).
Type 4 refers to Approach end of runways expected to support Instrument night operations, serving approach Category A and B aircraft only.

Airport Control				
Type	Description	Latitude	Longitude	Elevation
PAC	ORMONDPORT	N29° 18' 08.09232"	W81° 06' 53.11439"	24.9
SAC	ORMAIR AZ MK	N29° 18' 15.30271"	W81° 06' 40.10682"	21.8
SAC	ORMONDPORT AZ MK	N29° 18' 05.18236"	W81° 07' 13.28376"	25.7

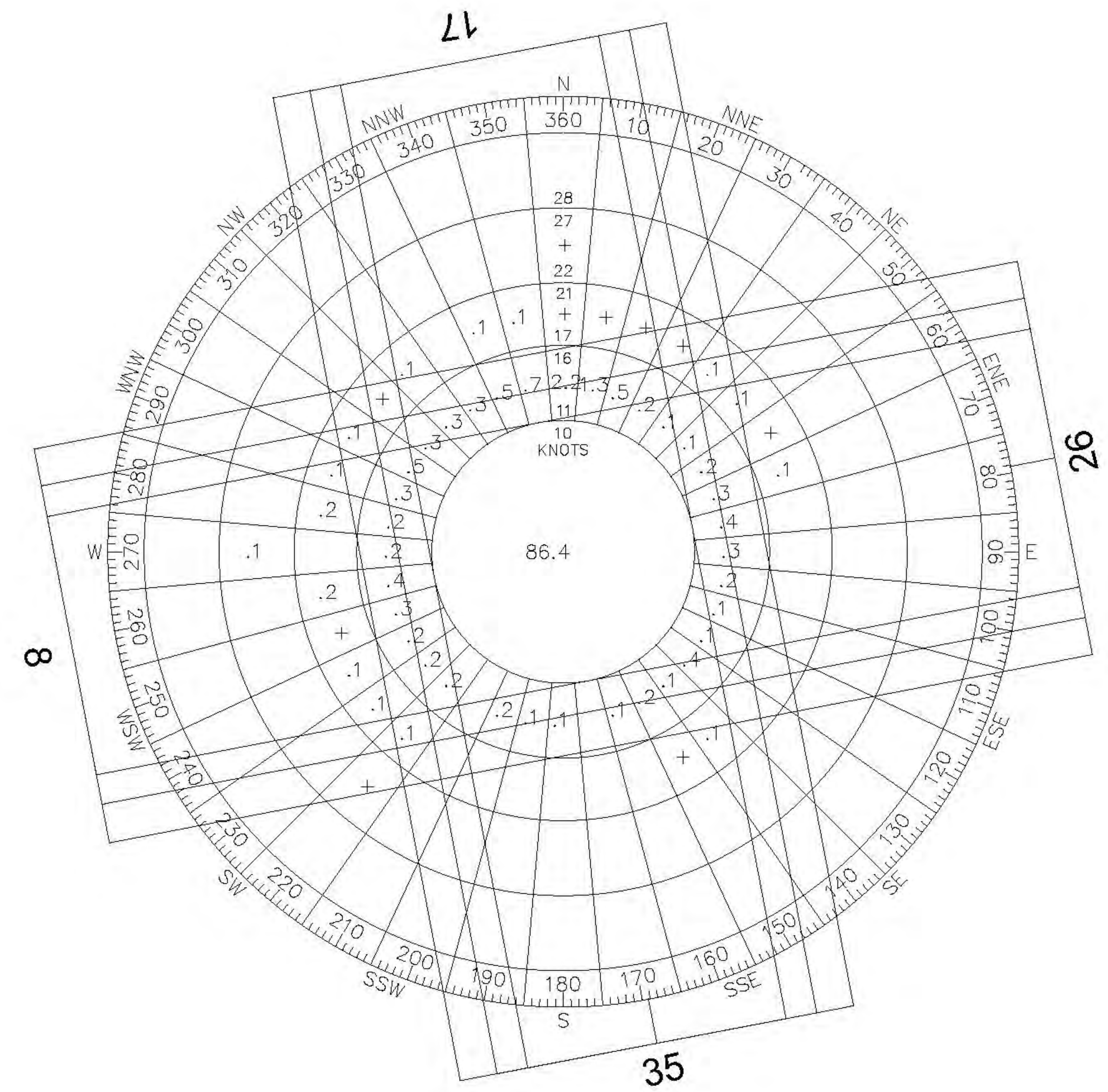
SURVEY DATUM HORIZONTAL: NAD83 2011 (FLORIDA EAST) VERTICAL: NAVD 88,
UNITS: SURVEY FOOT.
POINT INFORMATION BY: NGS/NOAA

HELIPAD	
TLOF Dimensions	48'
FATO Dimensions	68'
NORTHING	1805922.192
EASTING	621379.976
LATITUDE	N29° 18' 05.2516"
LONGITUDE	W81° 06' 32.9094"
ELEVATION	21' MSL

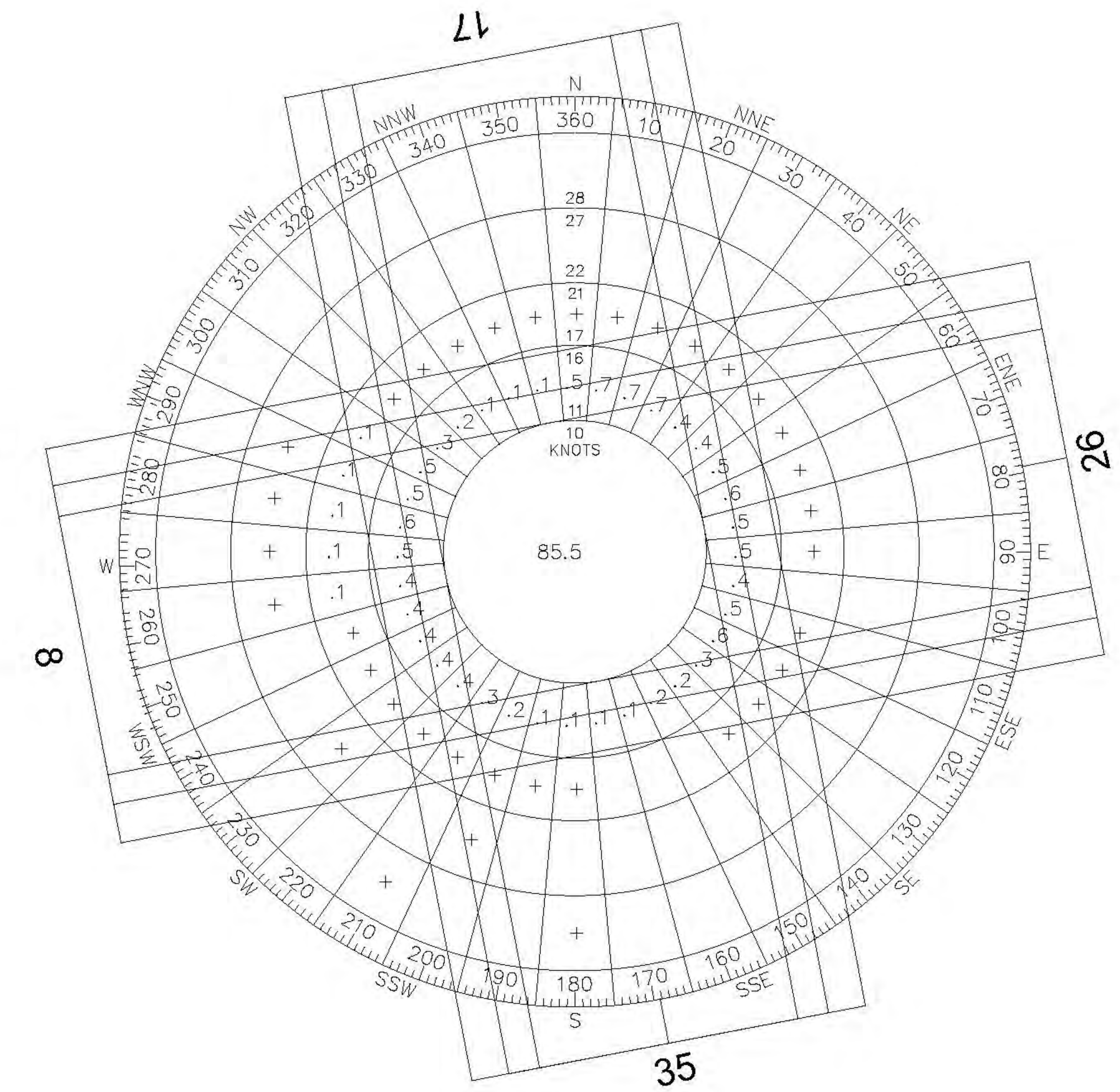
AIRPORT DATA TABLE		
Item	Existing	Future
Airport Reference Code (ARC)	B-II	B-II
Mean Max Temperature of Hottest Month	90.2° Fahrenheit / July	
Airport Elevation (MSL)	27.9 feet	
Airport Electronic NAVAIDS	VORTAC	
Airport Reference Point (NAD 83)		
Lattitude	N 29° 18' 04.1"	N 29° 18' 03.9"
Longitude	W 081° 06' 49.7"	W 081° 06' 53.0"
Miscellaneous Facilities	AWOS/Windcone w/ Segmented circle/MIRL/REIL/PAPI-2/MITL	AWOS/Windcone & Segmented circle/supplimental wind cone/MIRL/REIL/PAPI-4/MITL
Critical Aircraft	Beech KingAir 200	Cessna Citation Family
Wingspan	Group II	Group II
Approach Speed	Group B	Group B
Undercarriage	TDG 1B	TDG 1B
Magnetic Variation - 11/18/2014	06° 24' W	0° 05' W per year
NPIAS Service Level	GA-RL to DAB	
State Service Level / Asset Category	General Aviation	



ALL WEATHER



IFR WEATHER



VFR WEATHER

Meteorological Condition	Observations	Runway	Wind Coverage Crosswind 10.5	13	16
All-Weather	36,836	8/26	95.40%	98.00%	99.72%
		17/35	92.30%	96.11%	99.28%
		Combined	99.40%	99.92%	99.98%
Visual Meteorological Conditions (VMC)	34,447	8/26	95.61%	98.15%	99.75%
		17/35	92.12%	96.05%	99.31%
		Combined	99.41%	99.93%	99.99%
Instrument Meteorological Conditions (IMC)	2,389	8/26	92.31%	95.76%	99.23%
		17/35	95.00%	96.93%	98.86%
		Combined	99.31%	99.82%	99.95%

Source: NCDC. Station Ormond Beach Municipal (722341), year 2004 to 2015. (Years 2004 and 2015 partial data)
Percentages generated with the FAA Wind Analysis Tool: https://airports-gis.faa.gov

DECLARED DISTANCES				
Runway	TORA	TODA	ASDA	LDA
8	4,005	4,005	4,005	4,005
26	4,005	4,005	4,005	4,005
17	3,704	3,704	3,704	3,704
35	3,704	3,704	3,704	3,704

Modification to Standards Approval			
Approval Date	Airspace Case No.	Standard to be Modified	Description
			None Required

REV. NO.	DATE	DESCRIPTION	BY

DO NOT SCALE DRAWING

AIP NO.: 3-12-0059-17-2014
PROJ. NO.: 307101
DRAWN: JLC
DESIGN: MTO
CHECKED: ERM
DATE: JANUARY 2016

SHEET 2 OF 14

SHEET TITLE
DATA SHEET

CITY OF ORMOND BEACH
ORMOND BEACH MUNICIPAL AIRPORT
ORMOND BEACH, FLORIDA

Hoyle, Tanner & Associates, Inc.
95 E. Mitchell Hammock Road,
Suite 200 Oviedo, FL 32765
Office PH: 407-380-1919
FAX: 407-380-1830
www.hoyletanner.com

Airport Control				
Type	Description	Latitude	Longitude	Elevation
PAC	ORMONDPORT	N29° 18' 08.09232"	W81° 06' 53.11439"	24.9
SAC	ORMAIR AZ MK	N29° 18' 15.30271"	W81° 06' 40.10682"	21.8
SAC	ORMONDPORT AZ MK	N29° 18' 05.18236"	W81° 07' 13.28376"	25.7

SURVEY DATUM HORIZONTAL:NAD83 2011 (FLORIDA EAST) VERTICAL:NAVD 88, UNITS:.S. SURVEY FOOT.
POINT INFORMATION BY: NGS/NOAA

NOTE:
TRAVERSE ELEVATIONS ARE ACTUAL GROUND ELEVATIONS AND REQUIRE ADJUSTMENTS: 23' FOR RAILWAYS, 17' FOR INTERSTATE, 15' FOR OTHER PUBLIC ROADS, AND 10' FOR PRIVATE ROADS. UTILITY POLES ARE ASSUMED HEIGHT OF 35 FT ABOVE GROUND ELEVATION, ACTUAL HEIGHT AND ELEVATION UNVERIFIED.

ID#	Description
1	Club House & Restaurant
2	Golf Maintenance Facility
3	Golf Cart Barn
4	Airport Lighting Vault
5	Ormond Aircraft / RAMS Hangar
6	Ormond Airport Hangars
7	Aquasun Hangar
8	BETNR Hangar
9	Hangar 7 Aviation
10	Endeavor Aire Hangar
11	Morrow Hangar
12	Tomlinson Hangar
13	Tomlinson Hangar
14	Cavalier Hangar
15	Cassata Hangar
16	Manne/Christmas Hangar
17	RYHH Hangar
18	Searle Hangar
19	Blue Sky Hangar
20	Sunrise Aviation
21	Sunrise Aviation
22	MAC Hangars Condo No.1
23	Civil Air Patrol
24	Golf Course Pump House
25	T Hangar
26	T Hangar
27	T Hangar
28	T Hangar
29	Nested T-Hangars
30	Nested T-Hangars
31	Nested T-Hangars
32	MAC Hangars Condo No.2
33	Nested T-Hangars
34	Nested T-Hangars
35	VORTAC
36	Shuffle Board Court
37	Airport Traffic Control Tower

HELIPAD	
TLOF	48
FATO	68
NORTHING	1805922.192
EASTING	621379.976
LATITUDE	N29° 18' 05.2516"
LONGITUDE	W81° 06' 32.9094"

LEGEND

EXISTING	DESCRIPTION
	AIRPORT REFERENCE POINT
	PROPERTY LINE
RVZ	RUNWAY VISIBILITY ZONE
RSA	RUNWAY SAFETY AREA
ROFA	RUNWAY OBJECT FREE AREA
ROFZ	RUNWAY OBJECT FREE ZONE
TOFA	TAXIWAY OBJECT FREE AREA
RPZ	RUNWAY PROTECTION ZONES
PART 77	34:1 PART 77 APPROACH SURFACE
TSS	20:1 THRESHOLD SITING SURFACE
DS	40:1 DEPARTURE SURFACE
BRL	35 FT BUILDING RESTRICTION LINE
	TAXIWAY AND TAXILANE CENTERLINES
20	CONTOUR LINES
	PAVED AIRFIELD SURFACES
	PUBLIC ROADS
	FENCE
	ON-AIRPORT BUILDINGS
	THRESHOLD LIGHTS
	2 LIGHT PAPI
	RUNWAY END IDENTIFIER LIGHT (REIL)
3	BUILDING IDENTIFICATION
	SUPPLEMENTAL WIND CONE
	FWS DELINIATED WETLANDS

REV. NO.	DATE	DESCRIPTION	BY

AIP NO.: 3-12-0059-17-2014
PROJ. NO.: 307101
DRAWN: JLC
DESIGN: MTO
CHECKED: ERM
DATE: JANUARY 2016

SHEET 3 OF 14

DO NOT SCALE DRAWING

SHEET TITLE

EXISTING AIRPORT LAYOUT PLAN

CITY OF ORMOND BEACH
ORMOND BEACH MUNICIPAL AIRPORT
ORMOND BEACH, FLORIDA

Hoyle, Tanner & Associates, Inc.
95 E. Mitchell Hammock Road, Suite 200 Oviedo, FL 32765
Office PH: 407-380-1919
FaX: 407-380-1830
www.hoyletanner.com

ID#	Description
1	Club House & Restaurant
2	Golf Maintenance Facility
3	Golf Cart Barn
4	Airport Lighting Vault
5	Ormond Aircraft / RAMS Hangar
6	Ormond Airport Hangars
7	Aquasun Hangar
8	BETNR Hangar
9	Hangar 7 Aviation
10	Endeavor Aire Hangar
11	Morrow Hangar
12	Tomlinson Hangar
13	Tomlinson Hangar
14	Cavalier Hangar
15	Cassata Hangar
16	Manne/Christmas Hangar
17	RYHH Hangar
18	Searle Hangar
19	Blue Sky Hangar
20	Sunrise Aviation
21	Sunrise Aviation
22	MAC Hangars Condo No.1
23	Civil Air Patrol
24	Golf Course Pump House
25	T Hangar
26	T Hangar
27	T Hangar
28	T Hangar
29	Nested T-Hangars
30	Nested T-Hangars
31	Nested T-Hangars
32	MAC Hangars Condo No.2
33	Nested T-Hangars
34	Nested T-Hangars
35	VOR
36	Shuffle Board Court
37	Airport Traffic Control Tower

Future Apron Dimensions			
Apron	Length	Width	Ft Sq
A1 - Based Tiedowns	600	200	94,500
A2 - Based Tiedowns	600	200	91,900
A3 - Based Tiedowns	900	200	149,200
A4 - Based Tiedowns	800	200	111,600
A5 -Transient Apron	200	150	28,700
A6 -Based Tiedowns	1065	208	221,520
A7 -Based Tiedowns	275	200	55,000
A8 -Based Tiedowns	668	208	138,944
A9 -Based Tiedowns	735	208	152,880
A10 -Transient Apron	970	201	194,970
A11 -Transient Apron	200	70	14,000
A12 -Transient Apron	460	233	107,180

HELIPAD	
TLOF Dimensions	48' X 48'
FATO Dimensions	68' X 68'
NORTHING	1805922.192
EASTING	621379.976
LATITUDE	N29° 18' 05.2516"
LONGITUDE	W81° 06' 32.9094"
ELEVATION	21' MSL

LEGEND

EXISTING	PROPOSED	DESCRIPTION
		AIRPORT REFERENCE POINT
		PROPERTY LINE
RVZ	RVZ	RUNWAY VISIBILITY ZONE
RSA	RSA	RUNWAY SAFETY AREA
ROFA	ROFA	RUNWAY OBJECT FREE AREA
ROFZ	ROFZ	RUNWAY OBJECT FREE ZONE
RPZ	RPZ	RUNWAY PROTECTION ZONE
DS	DS	DEPARTURE SURFACE
TSS	TSS	THRESHOLD SITING SURFACE
TSA	TSA	TAXIWAY SAFETY AREA
TOFA	TOFA	TAXIWAY OBJECT FREE AREA
20	N/A	CONTOUR LINES
		PAVED AIRFIELD SURFACES
		8' FENCE
		ON-AIRPORT BUILDINGS
		THRESHOLD LIGHTS
		2 LIGHT PAPI / 4 LIGHT PAPI
		RUNWAY END IDENTIFIER LIGHT (REIL)
		WIND SOCK
N/A		EASEMENT
N/A		LAND RELEASE
N/A		PAVEMENT ABANDONED
N/A		AREA TO BE REMOVED OR OBSTRUCTIONS CLEARED*
	N/A	WETLANDS
#	#	GATE IDENTIFICATION
P	P	PERSONNEL GATE
		AWOS
7	N/A	BUILDING IDENTIFICATION
N/A		APRON IDENTIFICATION

* ADDITIONAL PART 77 APPROACH OBSTRUCTIONS DEPICTED ON SHEETS 6-10 TO REDUCE DETAILS ON THIS SHEET.

FAA Approval

CONDITIONALLY APPROVED
FEDERAL AVIATION ADMINISTRATION

This approval is subject to review as conditions change and is subject to the limitations contained in our letter

dated 9/28/16

Stephen Wilson 9/28/16

Orlando Airports District Office Date

Airport Sponsor Approval

This Airport Layout Plan Is Hereby Approved

Signature: [signature] Date: 9.13.2016

Name Joyce Shanahan

Title City Manager

Drawing name: H:\307101\dwg\Contract\A.4.2 Ultimate ALP.dwg Aug 16, 2016 – 7:56am

REV. NO.	DATE	DESCRIPTION	BY
1	8/16/2016	RW 8 FUTURE LAT LONG EDIT DO NOT SCALE DRAWING	JLC

AIP NO.: 3-12-0059-17-2014
PROJ. NO.: 307101
DRAWN: JLC
DESIGN: MTO
CHECKED: ERM
DATE: JANUARY 2016

SHEET 4 OF 14

SHEET TITLE

FUTURE AIRPORT LAYOUT PLAN

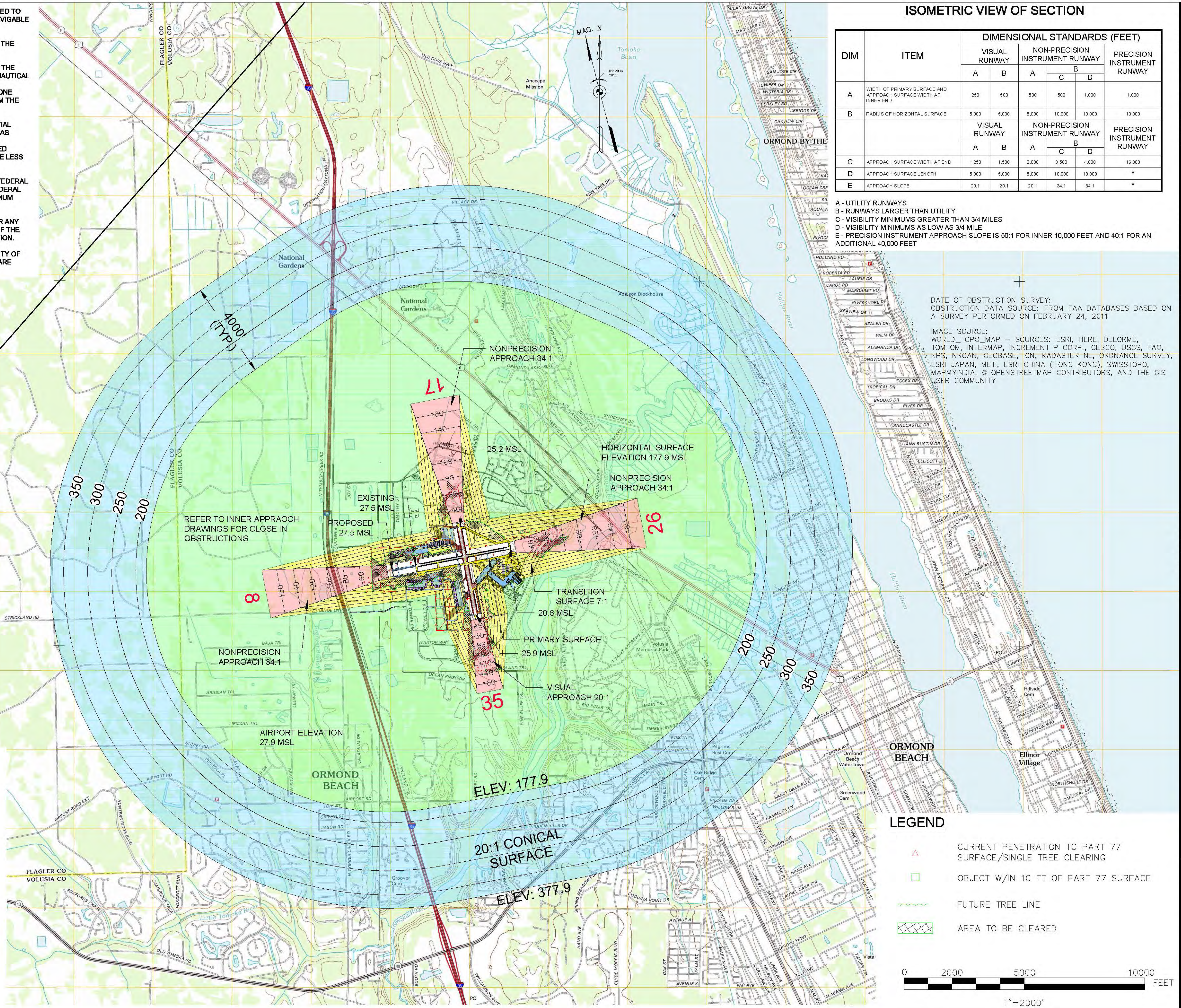
CITY OF ORMOND BEACH
ORMOND BEACH MUNICIPAL AIRPORT
ORMOND BEACH, FLORIDA

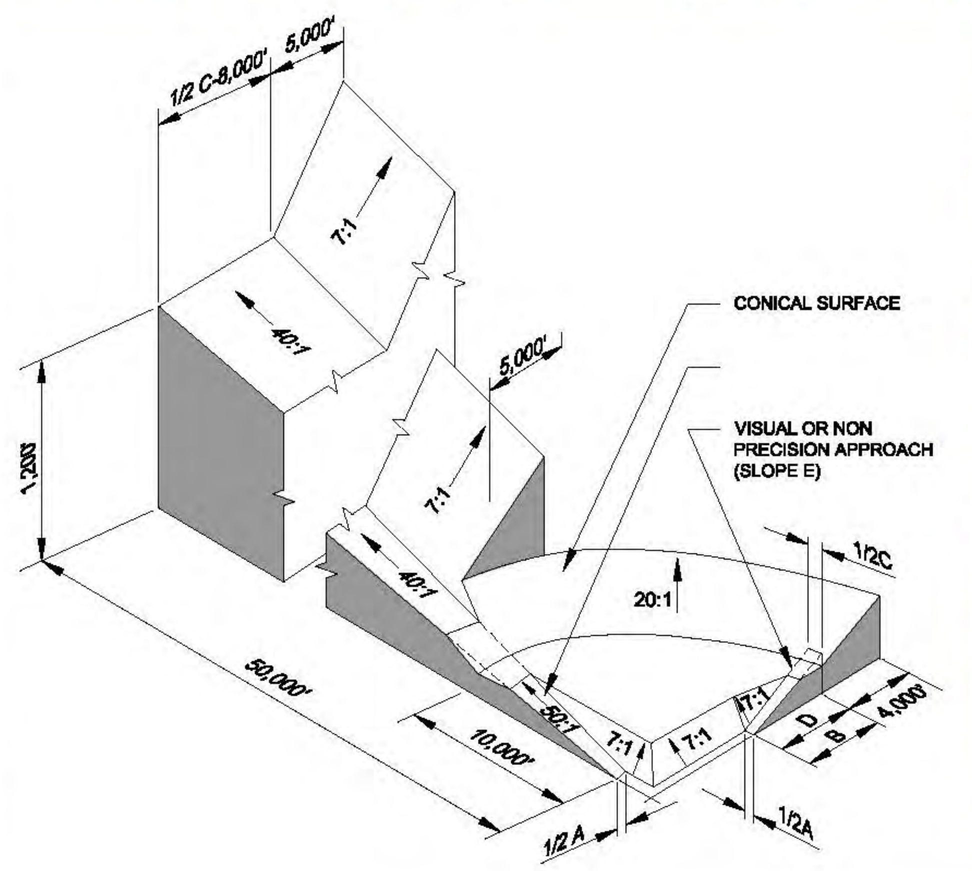
Hoyle, Tanner & Associates, Inc.
95 E. Mitchell Hammock Road, Suite 200 Oviedo, FL 32765
Office PH: 407-380-1919
FaX: 407-380-1830
www.hoyletanner.com

FEDERAL AVIATION REGULATIONS PART 77, STATES THAT A STRUCTURE IS PRESUMED TO HAVE A SUBSTANTIAL ADVERSE EFFECT UPON THE SAFE AND EFFICIENT USE OF NAVIGABLE AIRSPACE IF ITS HEIGHT EXCEEDS THE FOLLOWING STANDARDS:

1. A HEIGHT OF FIVE HUNDRED (500) FEET ABOVE GROUND LEVEL AT THE SITE OF THE OBJECT ANYWHERE IN THE STATE.
2. A HEIGHT THAT IS TWO HUNDRED (200) FEET ABOVE GROUND LEVEL OR ABOVE THE ESTABLISHED AIRPORT ELEVATION, WHICHEVER IS HIGHER, WITHIN THREE (3) NAUTICAL MILES OF THE ESTABLISHED REFERENCED POINT OF A PUBLIC-USE AIRPORT, EXCLUDING HELIPORTS, AND THE HEIGHT INCREASES IN THE PROPORTION OF ONE HUNDRED (100) FEET FOR EACH ADDITIONAL NAUTICAL MILE OF DISTANCE FROM THE AIRPORT UP TO A MAXIMUM OF FIVE HUNDRED (500) FEET.
3. A HEIGHT WITHIN A TERMINAL OBSTACLE CLEARANCE AREA, INCLUDING AN INITIAL APPROACH SEGMENT, A DEPARTURE AREA, AND A CIRCLING APPROACH AREA, AS DEFINED BY FEDERAL LAWS AND REGULATIONS, WHICH WOULD RESULT IN THE VERTICAL DISTANCE BETWEEN ANY POINT ON THE OBJECT AND AN ESTABLISHED MINIMUM INSTRUMENT FLIGHT ALTITUDE WITHIN THAT AREA OR SEGMENT TO BE LESS THAN THE REQUIRED OBSTACLE CLEARANCE.
4. A HEIGHT WITHIN AN EN ROUTE OBSTACLE CLEARANCE AREA, AS DEFINED BY FEDERAL LAWS AND REGULATIONS, INCLUDING TURN AND TERMINATION AREAS, OF A FEDERAL AIRWAY OR APPROVED OFF-AIRWAY ROUTE, THAT WOULD INCREASE THE MINIMUM OBSTACLE CLEARANCE ALTITUDE.
5. THE SURFACE OF A TAKEOFF AND LANDING AREA OF A PUBLIC-USE AIRPORT OR ANY IMAGINARY SURFACE AS ESTABLISHED BY FAR PART 77. HOWEVER, NO PART OF THE TAKEOFF OR LANDING AREA ITSELF WILL BE CONSIDERED TO BE AN OBSTRUCTION.

NOTE: FAR PART 77 IMAGINARY SURFACES ARE AS SHOWN ON THIS SHEET FOR CITY OF ORMOND BEACH ORMOND BEACH MUNICIPAL AIRPORT. THESE SURFACES ARE DEPICTED BASED UPON EXISTING AND ULTIMATE AIRPORT DEVELOPMENT.





ISOMETRIC VIEW OF SECTION

DIM	ITEM	DIMENSIONAL STANDARDS (FEET)					
		VISUAL RUNWAY		NON-PRECISION INSTRUMENT RUNWAY			PRECISION INSTRUMENT RUNWAY
		A	B	A	B		
					C	D	
A	WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE WIDTH AT INNER END	250	500	500	500	1,000	1,000
B	RADIUS OF HORIZONTAL SURFACE	5,000	5,000	5,000	10,000	10,000	10,000
		VISUAL RUNWAY		NON-PRECISION INSTRUMENT RUNWAY			PRECISION INSTRUMENT RUNWAY
		A	B	A	B		
					C	D	
C	APPROACH SURFACE WIDTH AT END	1,250	1,500	2,000	3,500	4,000	16,000
D	APPROACH SURFACE LENGTH	5,000	5,000	5,000	10,000	10,000	*
E	APPROACH SLOPE	20:1	20:1	20:1	34:1	34:1	*

A - UTILITY RUNWAYS
B - RUNWAYS LARGER THAN UTILITY
C - VISIBILITY MINIMUMS GREATER THAN 3/4 MILES
D - VISIBILITY MINIMUMS AS LOW AS 3/4 MILE
E - PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET

DATE OF OBSTRUCTION SURVEY:
OBSTRUCTION DATA SOURCE: FROM FAA DATABASES BASED ON A SURVEY PERFORMED ON FEBRUARY 24, 2011

IMAGE SOURCE:
WORLD_TOPO_MAP – SOURCES: ESRI, HERE, DELORME, TOMTOM, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), SWISSTOPO, MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY

LEGEND

CURRENT PENETRATION TO PART 77 SURFACE/SINGLE TREE CLEARING
OBJECT W/IN 10 FT OF PART 77 SURFACE
FUTURE TREE LINE
AREA TO BE CLEARED

0 2000 5000 10000 FEET
1"=2000'

Drawing name: H:\307101\dwg\Contract\A.5.1 Airport Airspace Plan.dwg Jul 12, 2016 – 12:43pm

AIP NO.:	3-12-0059-17-2014
PROJ. NO.:	307101
DRAWN:	JLC
DESIGN:	ERM
CHECKED:	HMD
DATE:	JANUARY 2016

SHEET 5 OF 14

REV. NO.	DATE	DESCRIPTION	BY

DO NOT SCALE DRAWING

SHEET TITLE
AIRPORT AIRSPACE PLAN

CITY OF ORMOND BEACH
ORMOND BEACH MUNICIPAL AIRPORT
ORMOND BEACH, FLORIDA

Hoyle, Tanner & Associates, Inc.
95 E. Mitchell Hammock Road, Suite 200 Oviedo, FL 32765
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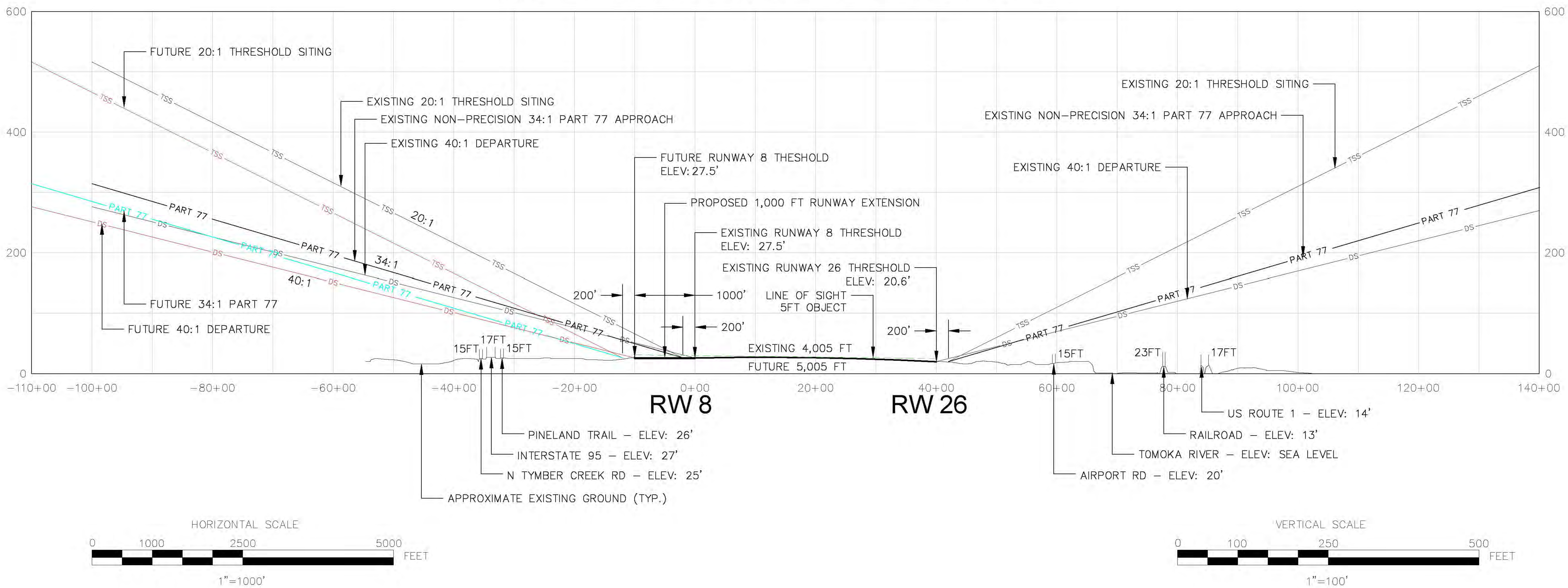
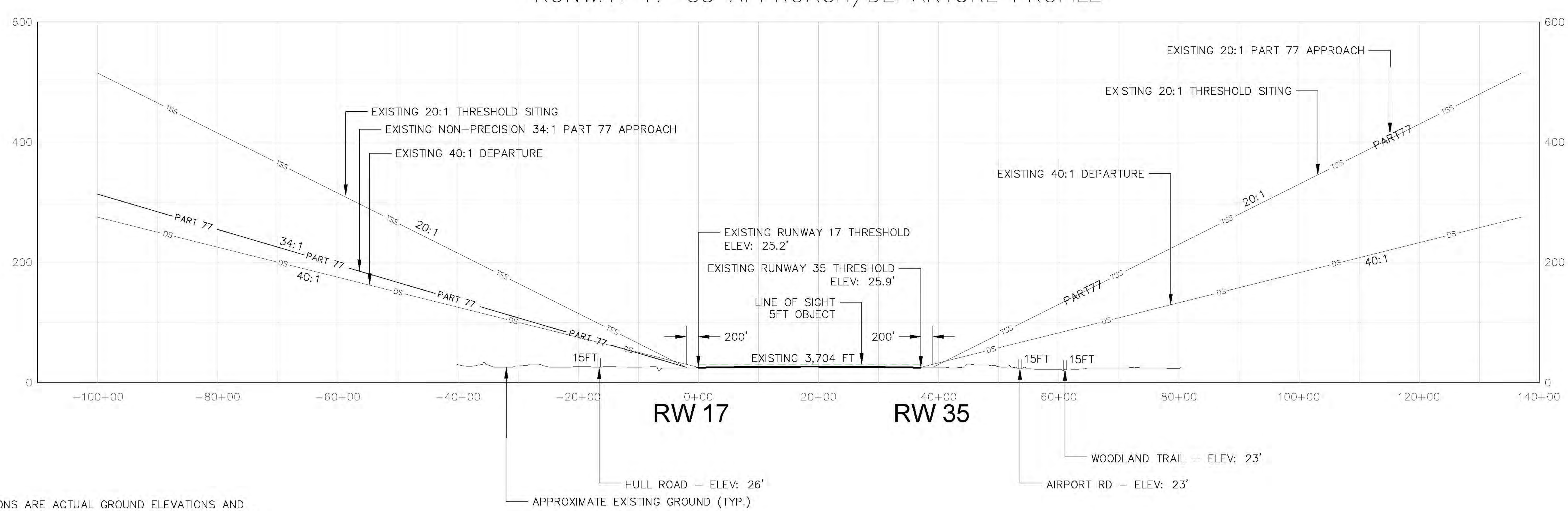
FaX: 407-380-1830
www.hoyletanner.com

RUNWAY 8–26 APPROACH/DEPARTURE PROFILE



RUNWAY 17–35 APPROACH/DEPARTURE PROFILE



NOTE:
TRAVERSE ELEVATIONS ARE ACTUAL GROUND ELEVATIONS AND REQUIRE ADJUSTMENTS: 23' FOR RAILWAYS, 17' FOR INTERSTATE, 15' FOR OTHER PUBLIC ROADS, AND 10' FOR PRIVATE ROADS.

AIP NO.:	3-12-0059-17-2014
PROJ. NO.:	307101
DRAWN:	JLC
DESIGN:	MTO
CHECKED:	ERM
DATE:	JANUARY 2016

SHEET 6 OF 14

REV. NO.	DATE	DESCRIPTION	BY

SHEET TITLE

AIRPORT AIRSPACE PROFILES
RUNWAY 8-26 AND RUNWAY 7-35

CITY OF ORMOND BEACH
ORMOND BEACH MUNICIPAL AIRPORT
ORMOND BEACH, FLORIDA

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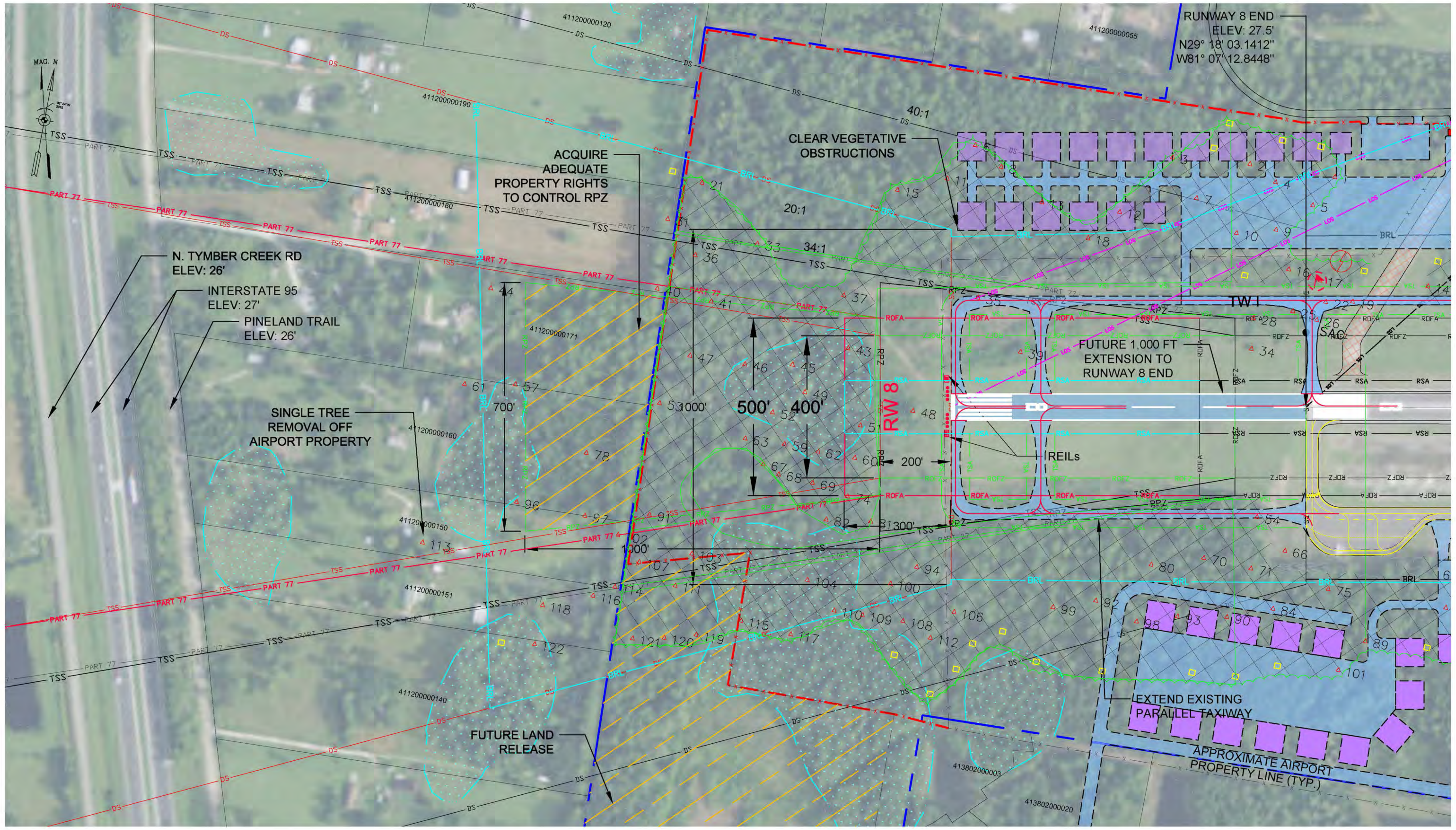


OBSTRUCTION TABLE

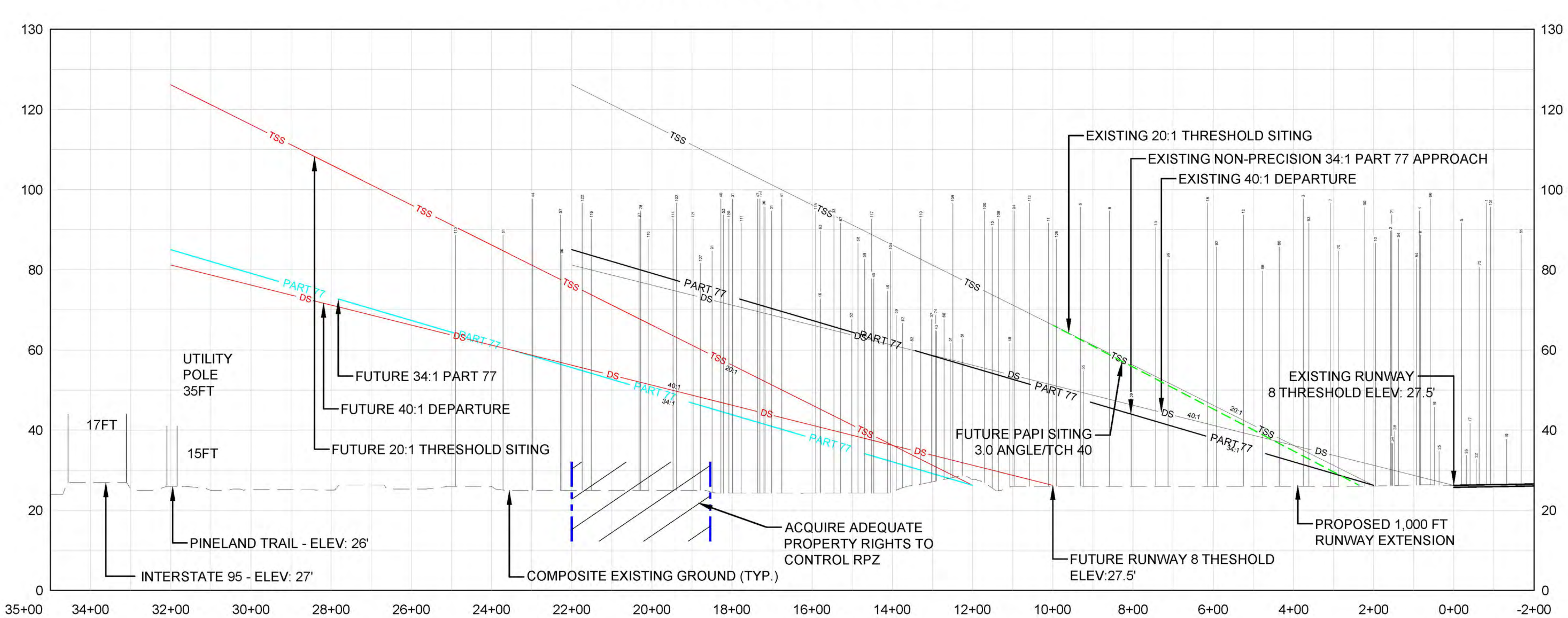
OBSTRUCTIONS ARE TO THE PART 77 NON–PRECISION 34:1 APPROACH SURFACE

Pt No	DESCRIPTION	OBJECT TOP ELEV. (MSL)	PART77 SURF. ELEV (MSL)	APPR. SURF. PENET. (FT)	PROPOSED MITIGATION
1	Tree	98	82.66	15.34	REMOVE
2	Tree	91	88.16	2.84	REMOVE
3	Tree	99	91.15	7.85	REMOVE
4	Tree	96	80.81	15.19	REMOVE
5	Tree	93	71.36	21.64	REMOVE
6	Tree	97	96.72	0.28	REMOVE
7	Tree	98	74.68	23.32	REMOVE
8	Tree	96	87.88	8.12	REMOVE
9	Tree	90	61.67	28.33	REMOVE
10	Tree	88	60.45	27.55	REMOVE
11	Tree	93	83.41	9.59	REMOVE
12	Tree	95	69.4	25.6	REMOVE
13	Tree	92	73.57	18.43	REMOVE
14	Tree	39	38.29	0.71	REMOVE
15	Tree	92	79.04	12.96	REMOVE
16	Tree	47	45.67	1.33	REMOVE
17	Tree	43	41.09	1.91	REMOVE
18	Tree	98	58.86	39.14	REMOVE
19	Tree	39	32.46	6.54	REMOVE
21	Tree	96	85.91	10.09	REMOVE
22	Tree	34	32.42	1.58	REMOVE
25	Tree	36	28.74	7.26	REMOVE
26	Tree	35	25.93	9.07	REMOVE
28	Tree	41	26.17	14.83	REMOVE
31	Tree	99	72.14	26.86	REMOVE
33	Tree	95	60.16	34.84	REMOVE
34	Tree	38	26.16	11.84	REMOVE
35	Tree	56	35.4	20.6	REMOVE
36	Tree	97	57.05	39.95	REMOVE
37	Tree	69	37.47	31.53	REMOVE
39	Tree	49	27	22	REMOVE
40	Tree	99	45.97	53.03	REMOVE
41	Tree	99	41.51	57.49	REMOVE
43	Tree	66	30.15	35.85	REMOVE
44	Tree	99	59.77	39.23	REMOVE
45	Tree	79	34.76	44.24	REMOVE
46	Tree	74	38.7	35.3	REMOVE
47	Tree	99	43.26	55.74	REMOVE
48	Tree	63	27.38	35.62	REMOVE
49	Tree	76	33.74	42.26	REMOVE
51	Tree	63	29.15	33.85	REMOVE
52	Tree	69	36.41	32.59	REMOVE
53	Tree	95	45.79	49.21	REMOVE
54	Tree	89	34.72	54.28	REMOVE
57	Tree	95	57.74	37.26	REMOVE
59	Tree	84	35.43	48.57	REMOVE
60	Tree	69	29.61	39.39	REMOVE
61	Tree	90	61.95	28.05	REMOVE
62	Tree	68	32.64	35.36	REMOVE
63	Tree	91	38.68	52.32	REMOVE
65	Tree	90	56.59	33.41	REMOVE
66	Tree	99	48.24	50.76	REMOVE
67	Tree	93	37.18	55.82	REMOVE
68	Tree	88	35.91	52.09	REMOVE
69	Tree	70	33.11	36.89	REMOVE
70	Tree	86	51.39	34.61	REMOVE
71	Tree	95	55.44	39.56	REMOVE
74	Tree	70	30.21	39.79	REMOVE
75	Tree	82	63.45	18.55	REMOVE
76	Tree	99	39.43	59.57	REMOVE
78	Tree	96	51.85	44.15	REMOVE
80	Tree	87	54.31	32.69	REMOVE

Pt No	DESCRIPTION	OBJECT TOP ELEV. (MSL)	PART77 SURF. ELEV (MSL)	APPR. SURF. PENET. (FT)	PROPOSED MITIGATION
81	Tree	64	38.07	25.93	REMOVE
82	Tree	63	38.31	24.69	REMOVE
84	Tree	84	71.6	12.4	REMOVE
89	Tree	90	84.37	5.63	REMOVE
90	Tree	97	75.13	21.87	REMOVE
91	Tree	86	46.62	39.38	REMOVE
92	Tree	87	68.91	18.09	REMOVE
93	Tree	93	75.04	17.96	REMOVE
94	Tree	96	56.1	39.9	REMOVE
96	Tree	85	57.64	27.36	REMOVE
97	Tree	94	51.97	42.03	REMOVE
98	Tree	81	77.19	3.81	REMOVE
99	Tree	84	71.8	12.2	REMOVE
100	Tree	96	62.85	33.15	REMOVE
101	Tree	97	96.06	0.94	REMOVE
102	Tree	98	49.22	48.78	REMOVE
103	Tree	99	55.1	43.9	REMOVE
104	Tree	86	62.99	23.01	REMOVE
106	Tree	89	74.12	14.88	REMOVE
107	Tree	83	59.58	23.42	REMOVE
108	Tree	94	77.86	16.14	REMOVE
109	Tree	98	75.96	22.04	REMOVE
110	Tree	94	74.73	19.27	REMOVE
111	Tree	93	68.3	24.7	REMOVE
112	Tree	98	84.57	13.43	REMOVE
113	Tree	90	65.43	24.57	REMOVE
114	Tree	94	70.16	23.84	REMOVE
115	Tree	96	80.98	15.02	REMOVE
116	Tree	89	74.26	14.74	REMOVE
117	Tree	94	85.29	8.71	REMOVE
118	Tree	94	79.16	14.84	REMOVE
119	Tree	97	87.65	9.35	REMOVE
120	Tree	94	89.59	4.41	REMOVE
121	Tree	94	90.51	3.49	REMOVE
122	Tree	98	95.03	2.97	REMOVE

Obstruction Removal Acreage - CFR Part 77*		
Location	Approach	Transition
08 Existing	12.4 AC.	20.1 AC.
08 Proposed	7.7 AC.	6.9 AC.
26 Existing	9.2 AC	2.7 AC.
17 Existing	5.6 AC.	6.5 AC.
35 Existing	6.2 AC.	11.0 AC.
Future Runway Visibility Zone	5.51 AC.	
VOR Critical Area	6.64 AC.	
* Acreage hatched requiring some level of clearing		

RUNWAY 8 END PROFILE



NOTES:

1. OBSTRUCTION DATA SOURCED FROM FAA DATABASES BASED ON A SURVEY PERFORMED ON FEBRUARY 24, 2011

2. BEGINNING OF SURFACES AREA BASED ON THE ASSUMED FUTURE EXTENDED RUNWAY END ELEVATION AND ARE FOR PLANNING PURPOSES ONLY

3. HORIZONTAL DATUM IS BASED ON THE FLORIDA STATE PLANE NAD 83 US FOOT. VERTICAL DATUM IS BASED ON NAVD 88.

4. TRAVERSE ELEVATIONS ARE ACTUAL GROUND ELEVATIONS AND REQUIRE ADJUSTMENTS: 23' FOR RAILWAYS, 17' FOR INTERSTATE, 15' FOR OTHER PUBLIC ROADS, AND 10' FOR PRIVATE ROADS.

5. UTILITY POLES ARE ASSUMED HEIGHT OF 35 FT ABOVE GROUND ELEVATION, ACTUAL HEIGHT AND ELEVATION UNVERIFIED.

6. PART 77 20:1 APPROACH SURFACES CONFIRMED CLEAR BASED ON EMAIL DATED 3/5/2015 FROM AIRPORT MANAGER TO FAA FLIGHT PROCEDURES EASTERN REGION.

LEGEND

101 CURRENT PENETRATION TO PART 77 SURFACE/SINGLE TREE CLEARING

OBJECT W/IN 10 FT OF PART 77 SURFACE

FUTURE TREE LINE

AREA TO BE CLEARED

1"= 200' HORIZONTAL
0 200 500 1000 FEET
0 4 8 10 20
1"= 20' VERTICAL

AIP NO.: 3-12-0059-17-2014
PROJ. NO.: 307101
DRAWN: JLC
DESIGN: MTO
CHECKED: ERM
DATE: JANUARY 2016
SHEET 7 OF 14

REV NO. | DATE | DESCRIPTION | BY

SHEET TITLE
INNER APPROACH PLAN
RUNWAY 8

CITY OF ORMOND BEACH
ORMOND BEACH MUNICIPAL AIRPORT
ORMOND BEACH, FLORIDA

Hoyle, Tanner & Associates, Inc.
95 E. Mitchell Hammock Road, Suite 200 Oviedo, FL 32765
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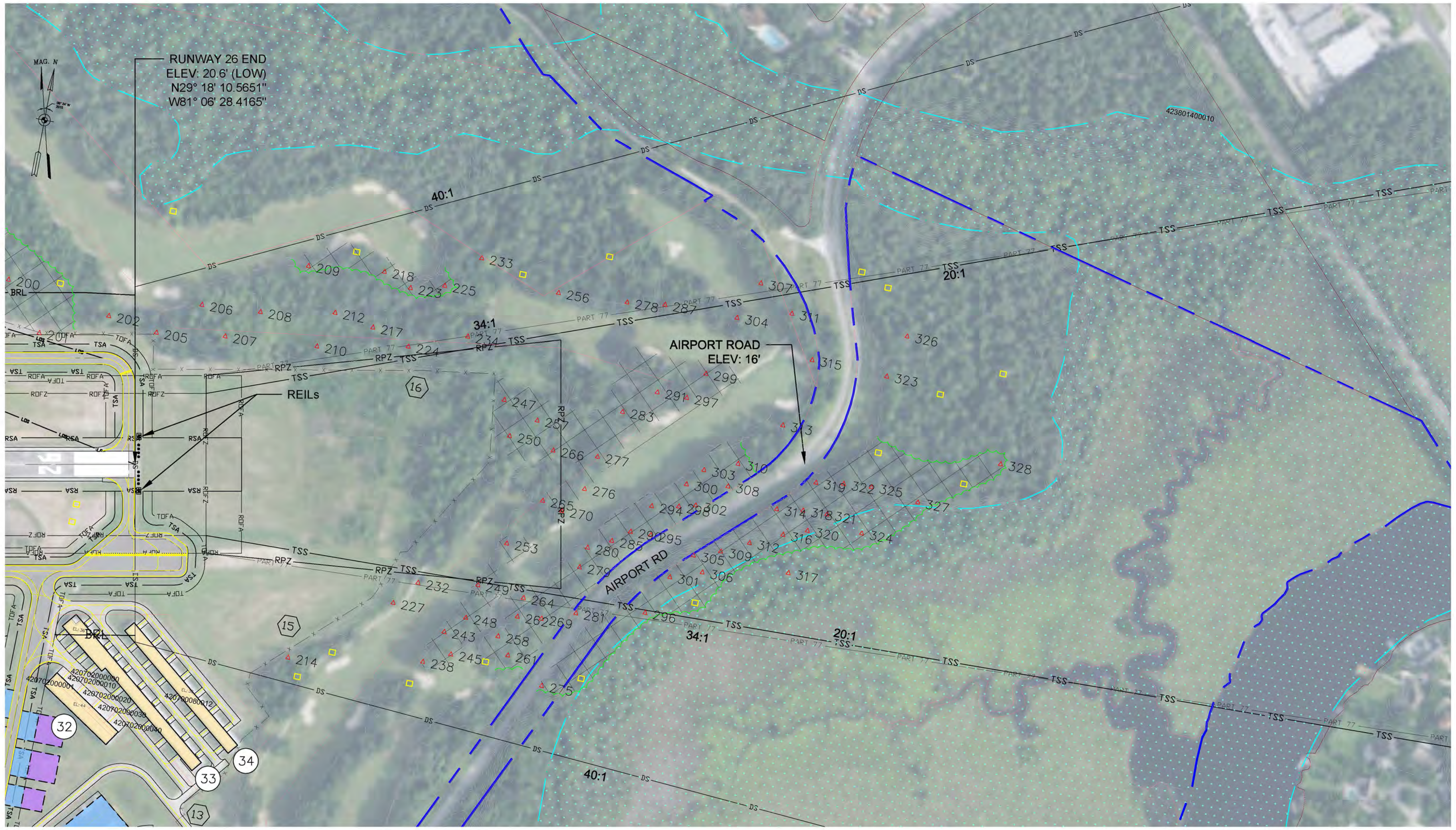
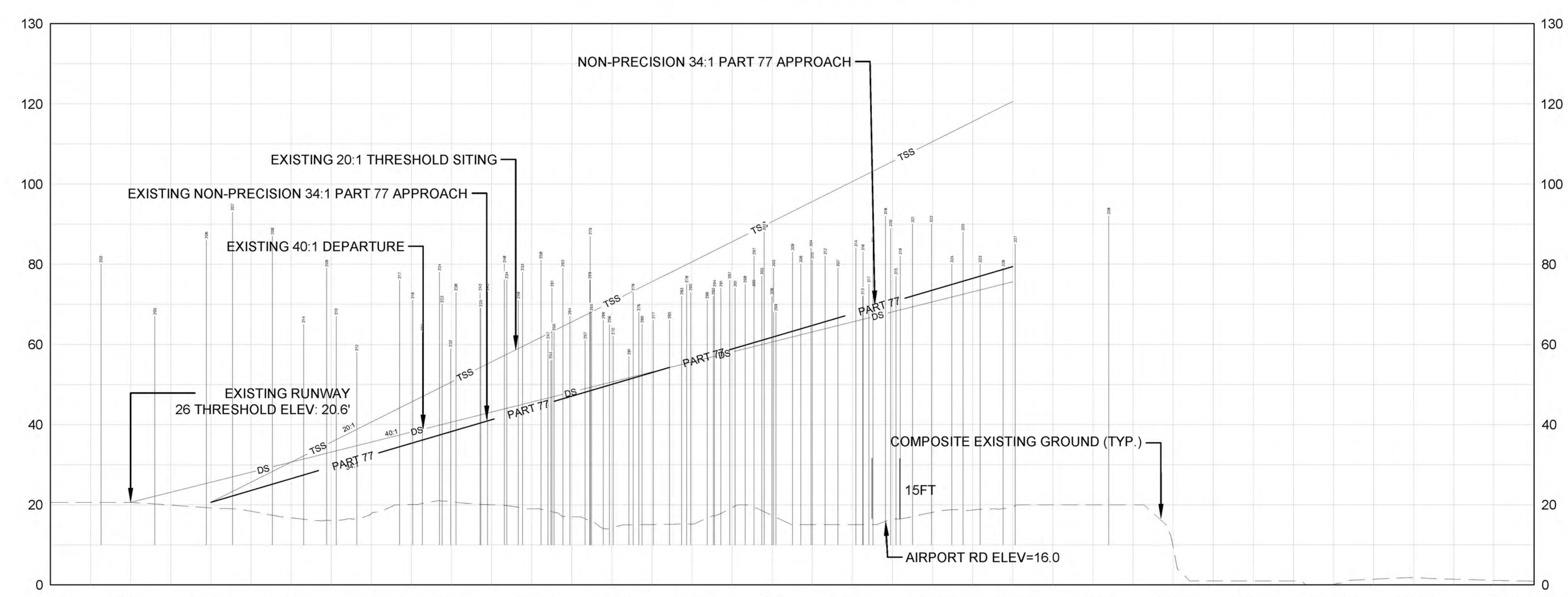


RUNWAY 26 END PROFILE



OBSTRUCTION TABLE

OBSTRUCTIONS ARE TO THE PART 77 NON–PRECISION 34:1 APPROACH SURFACE

Pt No	DESCRIPTION	OBJECT TOP ELEV. (MSL)	PART77 SURF. ELEV (MSL)	APPR. SURF. PENET. (FT)	PROPOSED MITIGATION
200	Tree	76	59.86	16.14	REMOVE
201	Tree	80	38.29	41.71	REMOVE
202	Tree	80	44.9	35.1	REMOVE
205	Tree	67	37.99	29.01	REMOVE
206	Tree	86	49.02	36.98	REMOVE
207	Tree	93	36.79	56.21	REMOVE
208	Tree	87	47.36	39.64	REMOVE
209	Tree	79	66.93	12.07	REMOVE
210	Tree	67	34.9	32.1	REMOVE
214	Tree	65	64.5	0.5	REMOVE
215	Tree	41	30.24	10.76	REMOVE
217	Tree	76	43.61	32.39	REMOVE
218	Tree	71	66.34	4.66	REMOVE
223	Tree	70	60.38	9.62	REMOVE
224	Tree	78	37.38	40.62	REMOVE
225	Tree	69	62.04	6.96	REMOVE
227	Tree	63	44.82	18.18	REMOVE
232	Tree	59	38.18	20.82	REMOVE
233	Tree	78	73.99	4.01	REMOVE
234	Tree	76	42.3	33.7	REMOVE
238	Tree	73	69.21	3.79	REMOVE
243	Tree	73	57.67	15.33	REMOVE
245	Tree	73	66.85	6.15	REMOVE
247	Tree	61	45.34	15.66	REMOVE
248	Tree	80	52.47	27.53	REMOVE
249	Tree	71	43.15	27.85	REMOVE
250	Tree	63	45.77	17.23	REMOVE
253	Tree	56	45.53	10.47	REMOVE
256	Tree	65	61.75	3.25	REMOVE
257	Tree	61	48.06	12.94	REMOVE
258	Tree	81	60.66	20.34	REMOVE
261	Tree	74	68.54	5.46	REMOVE
262	Tree	79	53.19	25.81	REMOVE
264	Tree	67	46.92	20.08	REMOVE
265	Tree	68	48.52	19.48	REMOVE
266	Tree	66	49.39	16.61	REMOVE
269	Tree	76	54.53	21.47	REMOVE
270	Tree	62	50.1	11.9	REMOVE
271	Tree	82	50.9	31.1	REMOVE
274	Tree	73	49.38	23.62	REMOVE
275	Tree	87	81.59	5.41	REMOVE
276	Tree	68	51.99	16.01	REMOVE
277	Tree	66	53.05	12.95	REMOVE
278	Tree	75	59.5	15.5	REMOVE
279	Tree	73	51.57	21.43	REMOVE
280	Tree	65	52.23	12.77	REMOVE
281	Tree	57	53.12	3.88	REMOVE
283	Tree	72	55.14	16.86	REMOVE
285	Tree	66	54.24	11.76	REMOVE
287	Tree	76	59.35	16.65	REMOVE
288	Tree	81	67.82	13.18	REMOVE
290	Tree	73	55.79	17.21	REMOVE
291	Tree	74	58.02	15.98	REMOVE
294	Tree	74	57.55	16.45	REMOVE
295	Tree	72	57.46	14.54	REMOVE

Pt No	DESCRIPTION	OBJECT TOP ELEV. (MSL)	PART77 SURF. ELEV (MSL)	APPR. SURF. PENET. (FT)	PROPOSED MITIGATION
296	Tree	71	57	14	REMOVE
297	Tree	82	60.45	21.55	REMOVE
298	Tree	75	59.8	15.2	REMOVE
299	Tree	68	62.05	5.95	REMOVE
300	Tree	74	60.44	13.56	REMOVE
301	Tree	74	59.05	14.95	REMOVE
302	Tree	88	61.19	26.81	REMOVE
303	Tree	79	61.88	17.12	REMOVE
304	Tree	84	64.63	19.37	REMOVE
305	Tree	77	61.01	15.99	REMOVE
306	Tree	72	61.75	10.25	REMOVE
307	Tree	79	70.17	8.83	REMOVE
308	Tree	80	63.88	16.12	REMOVE
309	Tree	83	63.28	19.72	REMOVE
310	Tree	81	64.71	16.29	REMOVE
311	Tree	85	69.17	15.83	REMOVE
312	Tree	82	65.66	16.34	REMOVE
313	Tree	72	68.42	3.58	REMOVE
314	Tree	84	67.92	16.08	REMOVE
315	Tree	77	70.86	6.14	REMOVE
316	Tree	83	68.44	14.56	REMOVE
317	Tree	75	68.87	6.13	REMOVE
318	Tree	92	70.1	21.9	REMOVE
319	Tree	82	71.17	10.83	REMOVE
320	Tree	89	70.47	18.53	REMOVE
321	Tree	90	72.08	17.92	REMOVE
322	Tree	90	73.46	16.54	REMOVE
323	Tree	80	77.04	2.96	REMOVE
324	Tree	80	74.96	5.04	REMOVE
325	Tree	88	75.77	12.23	REMOVE
326	Tree	79	78.73	0.27	REMOVE
327	Tree	85	79.61	5.39	REMOVE
328	Tree	92	86.47	5.53	REMOVE

Obstruction Removal Acreage - CFR Part 77*		
Location	Approach	Transition
08 Existing	12.4 AC.	20.1 AC.
08 Proposed	7.7 AC.	6.9 AC.
26 Existing	9.2 AC	2.7 AC.
17 Existing	5.6 AC.	6.5 AC.
35 Existing	6.2 AC.	11.0 AC.
Future Runway Visibility Zone	5.51 AC.	
VOR Critical Area	6.64 AC.	
* Acreage hatched requiring some level of clearing		

NOTES:

1. OBSTRUCTION DATA SOURCED FROM FAA DATABASES BASED ON A SURVEY PERFORMED ON FEBRUARY 24, 2011

2. BEGINNING OF SURFACES AREA BASED ON THE ASSUMED FUTURE EXTENDED RUNWAY END ELEVATION AND ARE FOR PLANNING PURPOSES ONLY

3. HORIZONTAL DATUM IS BASED ON THE FLORIDA STATE PLANE NAD 83 US FOOT. VERTICAL DATUM IS BASED ON NAVD 88.

4. TRAVERSE ELEVATIONS ARE ACTUAL GROUND ELEVATIONS AND REQUIRE ADJUSTMENTS: 23' FOR RAILWAYS, 17' FOR INTERSTATE, 15' FOR OTHER PUBLIC ROADS, AND 10' FOR PRIVATE ROADS.

5. UTILITY POLES ARE ASSUMED HEIGHT OF 35 FT ABOVE GROUND ELEVATION, ACTUAL HEIGHT AND ELEVATION UNVERIFIED.

6. PART 77 20:1 APPROACH SURFACES CONFIRMED CLEAR BASED ON EMAIL DATED 3/5/2015 FROM AIRPORT MANAGER TO FAA FLIGHT PROCEDURES EASTERN REGION.

LEGEND

101 CURRENT PENETRATION TO PART 77 SURFACE/SINGLE TREE CLEARING

OBJECT W/IN 10 FT OF PART 77 SURFACE

FUTURE TREE LINE

AREA TO BE CLEARED

1"= 200' HORIZONTAL
0 200 500 1000 FEET
0 4 8 10 20
1"= 20' VERTICAL

REV. NO.	DATE	DESCRIPTION	BY

DO NOT SCALE DRAWING

AIP NO.: 3-12-0059-17-2014
PROJ. NO.: 307101
DRAWN: JLC
DESIGN: MTO
CHECKED: ERM
DATE: JANUARY 2016

SHEET 8 OF 14

SHEET TITLE
INNER APPROACH PLAN
RUNWAY 26

CITY OF ORMOND BEACH
ORMOND BEACH MUNICIPAL AIRPORT
ORMOND BEACH, FLORIDA

CITY OF ORMOND BEACH FLORIDA

Hoyle, Tanner & Associates, Inc.
95 E. Mitchell Hammock Road, Suite 200 Oviedo, FL 32765
Office PH: 407-380-1919
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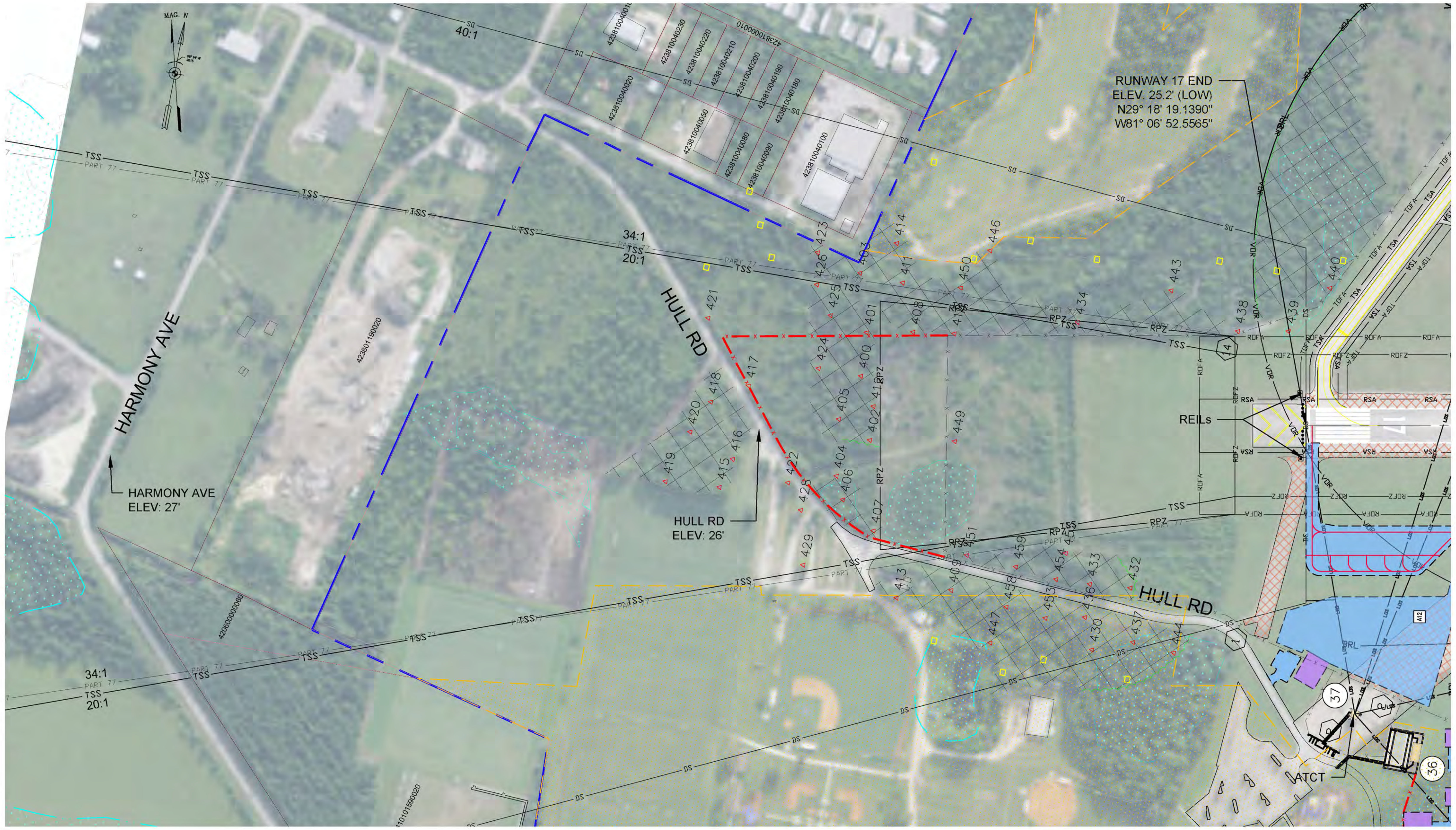
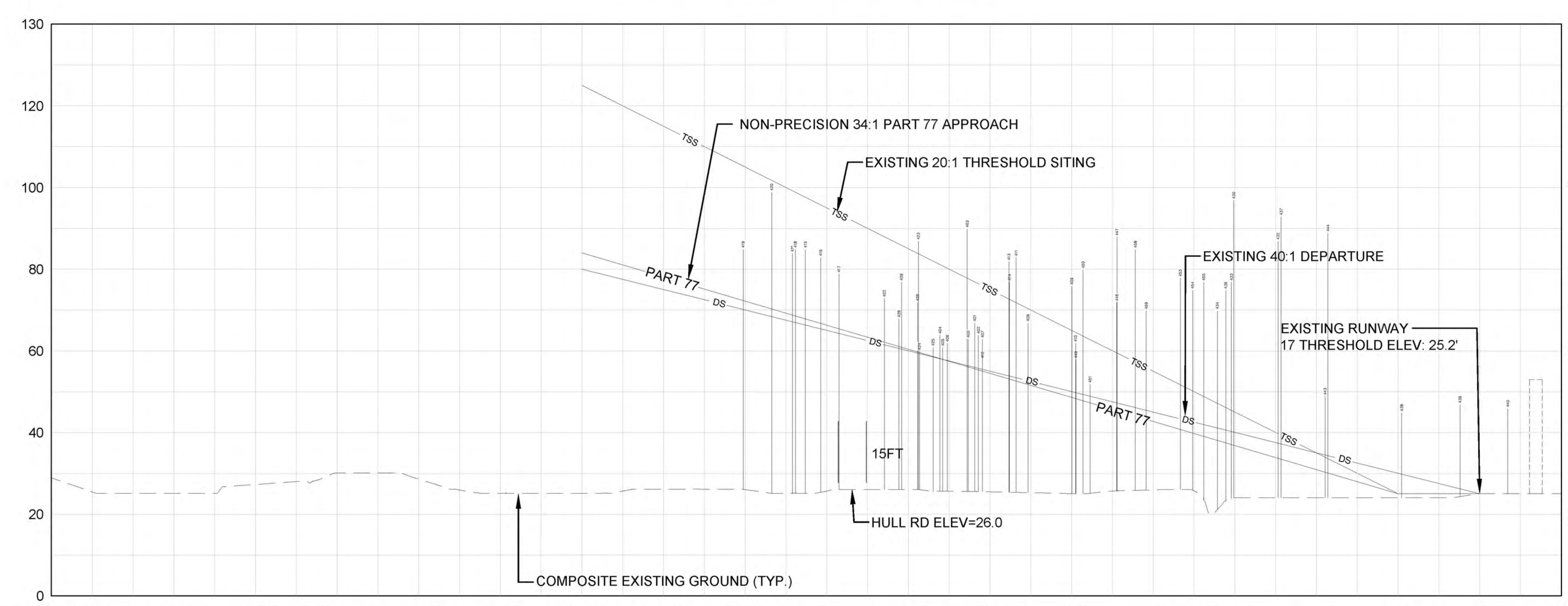


RUNWAY 17 END PROFILE



OBSTRUCTION TABLE

OBSTRUCTIONS ARE TO THE PART 77 NON–PRECISION 34:1 APPROACH SURFACE

Pt No	DESCRIPTION	OBJECT TOP ELEV. (MSL)	PART77 SURF. ELEV (MSL)	APPR. SURF. PENET. (FT)	PROPOSED MITIGATION
400	Tree	63	56.19	6.81	REMOVE
401	Tree	67	55.72	11.28	REMOVE
402	Tree	64	55.45	8.55	REMOVE
403	Tree	90	59.22	30.78	REMOVE
404	Tree	64	58.22	5.78	REMOVE
405	Tree	61	58.02	2.98	REMOVE
406	Tree	62	57.69	4.31	REMOVE
407	Tree	63	55.16	7.84	REMOVE
408	Tree	67	51.87	15.13	REMOVE
409	Tree	76	62.18	13.82	REMOVE
410	Tree	62	48.45	13.55	REMOVE
411	Tree	83	54.35	28.65	REMOVE
412	Tree	58	55.16	2.84	REMOVE
413	Tree	82	66.42	15.58	REMOVE
414	Tree	77	70.39	6.61	REMOVE
415	Tree	85	67.93	17.07	REMOVE
416	Tree	83	66.82	16.18	REMOVE
417	Tree	79	65.51	13.49	REMOVE
418	Tree	85	68.64	16.36	REMOVE
419	Tree	85	72.4	12.6	REMOVE
420	Tree	99	70.35	28.65	REMOVE
421	Tree	84	68.86	15.14	REMOVE
422	Tree	73	62.23	10.77	REMOVE
423	Tree	87	68.45	18.55	REMOVE
424	Tree	60	59.7	0.3	REMOVE
425	Tree	61	58.71	2.29	REMOVE
426	Tree	72	59.83	12.17	REMOVE
428	Tree	68	61.18	6.82	REMOVE
429	Tree	77	60.99	16.01	REMOVE
430	Tree	97	82.95	14.05	REMOVE
432	Tree	87	57.22	29.78	REMOVE
433	Tree	77	56.57	20.43	REMOVE
436	Tree	75	70.08	4.92	REMOVE
437	Tree	93	79	14	REMOVE
438	Tree	45	27.34	17.66	REMOVE
439	Tree	47	27.05	19.95	REMOVE
440	Tree	46	44.28	1.72	REMOVE
443	Tree	49	45.22	3.78	REMOVE
444	Tree	89	82.36	6.64	REMOVE
446	Tree	72	65.37	6.63	REMOVE
447	Tree	88	82.46	5.54	REMOVE
449	Tree	58	48.42	9.58	REMOVE
450	Tree	80	51.03	28.97	REMOVE
451	Tree	52	47.72	4.28	REMOVE
453	Tree	78	71.28	6.72	REMOVE
454	Tree	75	55.38	19.62	REMOVE
455	Tree	77	44.71	32.29	REMOVE
458	Tree	85	67.62	17.38	REMOVE
459	Tree	70	51.27	18.73	REMOVE

Obstruction Removal Acreage - CFR Part 77*		
Location	Approach	Transition
08 Existing	12.4 AC.	20.1 AC.
08 Proposed	7.7 AC.	6.9 AC.
26 Existing	9.2 AC	2.7 AC.
17 Existing	5.6 AC.	6.5 AC.
35 Existing	6.2 AC.	11.0 AC.
Future Runway Visibility Zone	5.51 AC.	
VOR Critical Area	6.64 AC.	
* Acreage hatched requiring some level of clearing		

NOTES:

1. OBSTRUCTION DATA SOURCED FROM FAA DATABASES BASED ON A SURVEY PERFORMED ON FEBRUARY 24, 2011
2. BEGINNING OF SURFACES AREA BASED ON THE ASSUMED FUTURE EXTENDED RUNWAY END ELEVATION AND ARE FOR PLANNING PURPOSES ONLY
3. HORIZONTAL DATUM IS BASED ON THE FLORIDA STATE PLANE NAD 83 US FOOT. VERTICAL DATUM IS BASED ON NAVD 88.
4. TRAVERSE ELEVATIONS ARE ACTUAL GROUND ELEVATIONS AND REQUIRE ADJUSTMENTS: 23' FOR RAILWAYS, 17' FOR INTERSTATE, 15' FOR OTHER PUBLIC ROADS, AND 10' FOR PRIVATE ROADS.
5. UTILITY POLES ARE ASSUMED HEIGHT OF 35 FT ABOVE GROUND ELEVATION, ACTUAL HEIGHT AND ELEVATION UNVERIFIED.
6. PART 77 20:1 APPROACH SURFACES CONFIRMED CLEAR BASED ON EMAIL DATED 3/5/2015 FROM AIRPORT MANAGER TO FAA FLIGHT PROCEDURES EASTERN REGION.

LEGEND

101 CURRENT PENETRATION TO PART 77 SURFACE/SINGLE TREE CLEARING

OBJECT W/IN 10 FT OF PART 77 SURFACE

FUTURE TREE LINE

AREA TO BE CLEARED

1" = 200' HORIZONTAL

0 200 500 1000 FEET

0 4 8 10 20

1" = 20' VERTICAL

REV NO.	DATE	DESCRIPTION	BY

AIP NO.: 3-12-0059-17-2014
PROJ. NO.: 307101
DRAWN: JLC
DESIGN: MTO
CHECKED: ERM
DATE: JANUARY 2016

SHEET 9 OF 14

SHEET TITLE

INNER APPROACH PLAN RUNWAY 17

CITY OF ORMOND BEACH
ORMOND BEACH MUNICIPAL AIRPORT
ORMOND BEACH, FLORIDA

CITY OF ORMOND BEACH ★ FLORIDA ★

Hoyle, Tanner & Associates, Inc.
95 E. Mitchell Hammock Road, Suite 200 Oviedo, FL 32765
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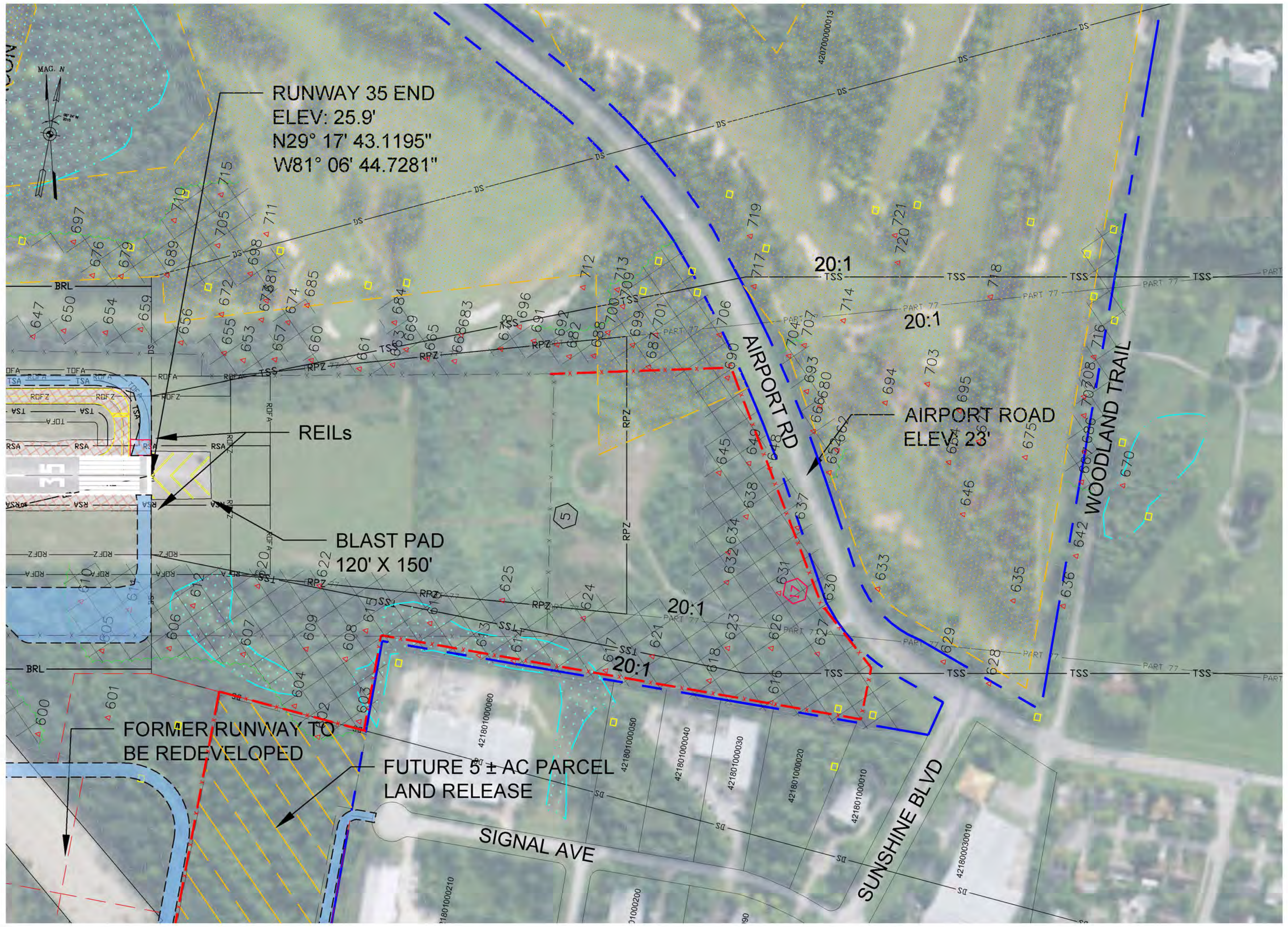
FAX: 407-380-1830
www.hoyletanner.com



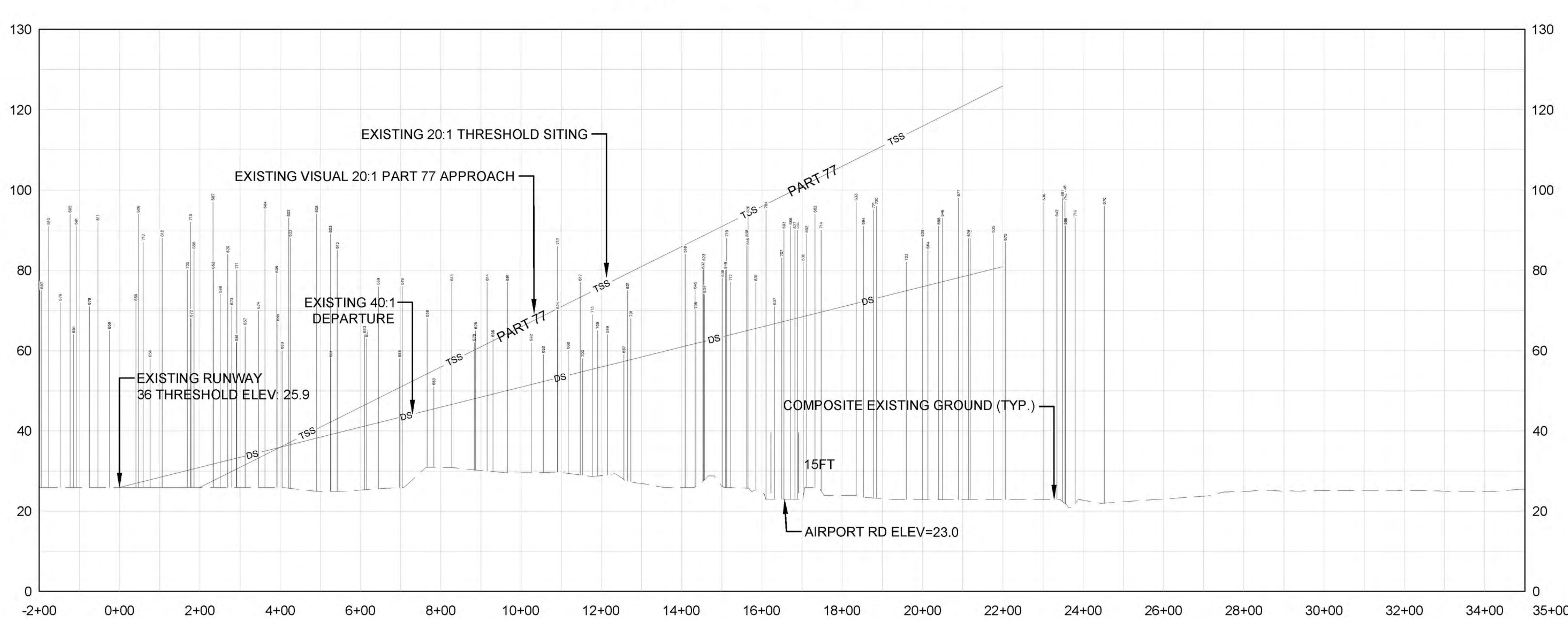
OBSTRUCTION TABLE

OBSTRUCTIONS ARE TO THE PART 77 NON–PRECISION 20:1 APPROACH SURFACE

Obstruction Removal Acreage - CFR Part 77*		
Location	Approach	Transition
08 Existing	12.4 AC.	20.1 AC.
08 Proposed	7.7 AC.	6.9 AC.
26 Existing	9.2 AC	2.7 AC.
17 Existing	5.6 AC.	6.5 AC.
35 Existing	6.2 AC.	11.0 AC.
Future Runway Visibility Zone	5.51 AC.	
VOR Critical Area	6.64 AC.	
* Acreage hatched requiring some level of clearing		

Pt No	DESCRIPTION	OBJECT TOP ELEV. (MSL)	PART77 SURF. ELEV (MSL)	APPR. SURF. PENET. (FT)	PROPOSED MITIGATION
600	Tree	86	83.33	2.67	REMOVE
601	Tree	91	77.47	13.53	REMOVE
602	Tree	93	92.37	0.63	REMOVE
604	Tree	95	79.12	15.88	REMOVE
605	Tree	94	53.3	40.7	REMOVE
606	Tree	94	52.48	41.52	REMOVE
607	Tree	97	55.91	41.09	REMOVE
608	Tree	94	66.73	27.27	REMOVE
609	Tree	79	59.6	19.4	REMOVE
610	Tree	91	35.33	55.67	REMOVE
611	Tree	92	38.41	53.59	REMOVE
612	Tree	88	37.12	50.88	REMOVE
615	Tree	85	58.39	26.61	REMOVE
619	Tree	76	61.5	14.5	REMOVE
620	Tree	84	32.61	51.39	REMOVE
622	Tree	88	38.01	49.99	REMOVE
625	Tree	65	60.25	4.75	REMOVE
647	Tree	66	39.64	26.36	REMOVE
650	Tree	68	41.88	26.12	REMOVE
653	Tree	80	32.77	47.23	REMOVE
654	Tree	64	41.33	22.67	REMOVE
655	Tree	85	34.18	50.82	REMOVE
656	Tree	58	37.88	20.12	REMOVE
657	Tree	66	35.89	30.11	REMOVE
659	Tree	65	42.63	22.37	REMOVE
660	Tree	60	38.87	21.13	REMOVE
661	Tree	58	42.2	15.8	REMOVE
663	Tree	64	46.41	17.59	REMOVE
665	Tree	58	50.77	7.23	REMOVE
668	Tree	68	54.21	13.79	REMOVE
669	Tree	76	51.33	24.67	REMOVE
671	Tree	94	90.05	3.95	REMOVE
672	Tree	68	48.15	19.85	REMOVE
673	Tree	71	49	22	REMOVE
674	Tree	70	50.47	19.53	REMOVE
676	Tree	72	62.07	9.93	REMOVE
678	Tree	62	60.06	1.94	REMOVE
679	Tree	71	61.82	9.18	REMOVE
681	Tree	62	56.32	5.68	REMOVE
684	Tree	63	59.97	3.03	REMOVE
685	Tree	67	58.35	8.65	REMOVE
689	Tree	72	62.29	9.71	REMOVE
691	Tree	77	65.92	11.08	REMOVE
697	Tree	75	74.21	0.79	REMOVE
698	Tree	74	64.6	9.4	REMOVE
705	Tree	80	72.99	7.01	REMOVE
710	Tree	87	82.02	4.98	REMOVE
715	Tree	92	91.31	0.69	REMOVE

RUNWAY 35 END PROFILE



NOTES:

1. OBSTRUCTION DATA SOURCED FROM FAA DATABASES BASED ON A SURVEY PERFORMED ON FEBRUARY 24, 2011

2. BEGINNING OF SURFACES AREA BASED ON THE ASSUMED FUTURE EXTENDED RUNWAY END ELEVATION AND ARE FOR PLANNING PURPOSES ONLY

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4. TRAVERSE ELEVATIONS ARE ACTUAL GROUND ELEVATIONS AND REQUIRE ADJUSTMENTS: 23' FOR RAILWAYS, 17' FOR INTERSTATE, 15' FOR OTHER PUBLIC ROADS, AND 10' FOR PRIVATE ROADS.

5. UTILITY POLES ARE ASSUMED HEIGHT OF 35 FT ABOVE GROUND ELEVATION, ACTUAL HEIGHT AND ELEVATION UNVERIFIED.

6. PART 77 20:1 APPROACH SURFACES CONFIRMED CLEAR BASED ON EMAIL DATED 3/5/2015 FROM AIRPORT MANAGER TO FAA FLIGHT PROCEDURES EASTERN REGION.

LEGEND

101 CURRENT PENETRATION TO PART 77 SURFACE/SINGLE TREE CLEARING

OBJECT W/IN 10 FT OF PART 77 SURFACE

FUTURE TREE LINE

AREA TO BE CLEARED

1"= 200' HORIZONTAL

0 200 500 1000 FEET

0 4 8 10 20

1"= 20' VERTICAL

REV. NO.	DATE	DESCRIPTION	BY

AIP NO.: 3-12-0059-17-2014
PROJ. NO.: 307101
DRAWN: JLC
DESIGN: ERM
CHECKED: HMD
DATE: JANUARY 2016

SHEET 10 OF 14

DO NOT SCALE DRAWING

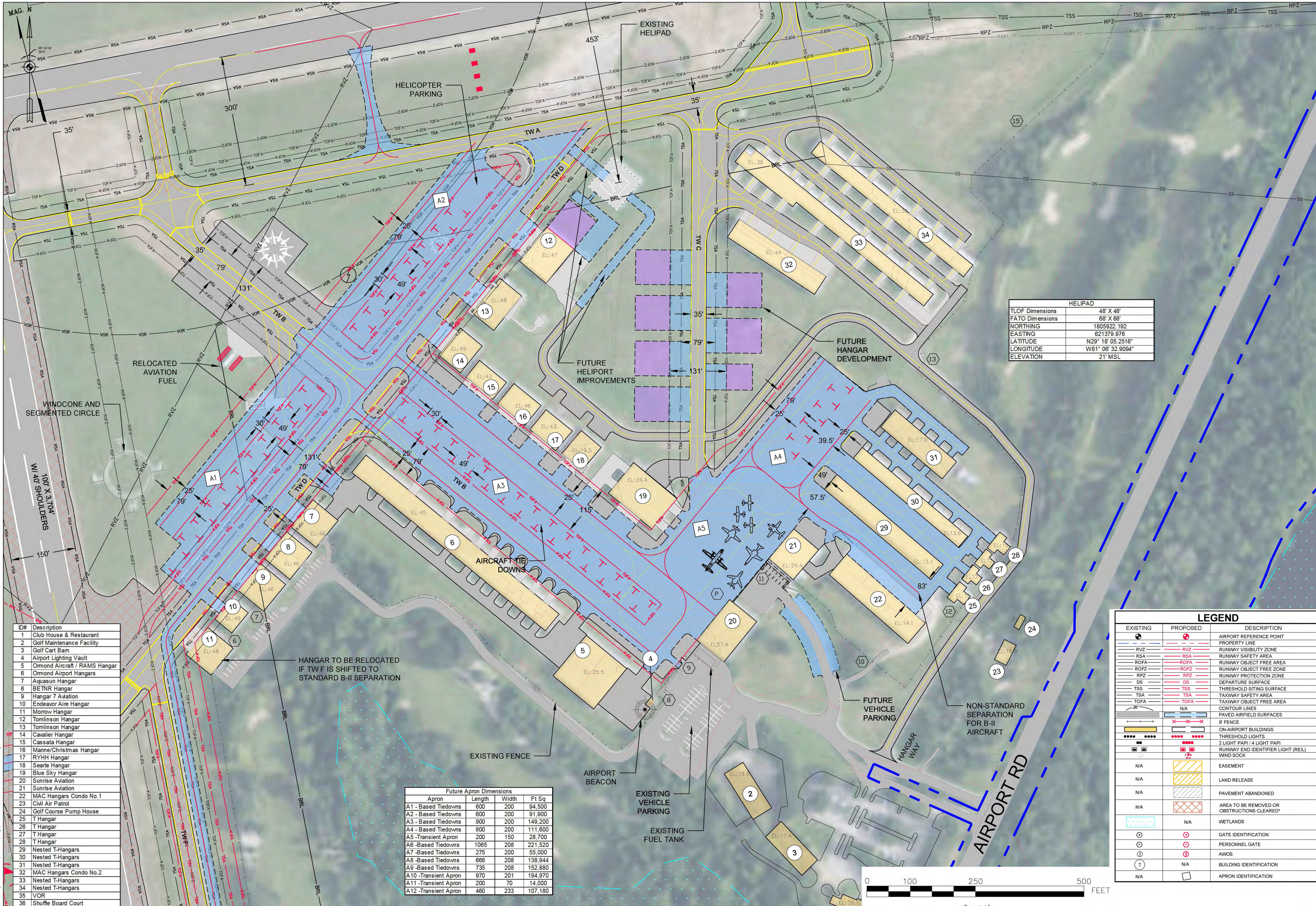
SHEET TITLE

INNER APPROACH PLAN RUNWAY 35

CITY OF ORMOND BEACH
ORMOND BEACH MUNICIPAL AIRPORT
ORMOND BEACH, FLORIDA

CITY OF ORMOND BEACH FLORIDA

Hoyle, Tanner & Associates, Inc.
95 E. Mitchell Hammock Road, Suite 200 Oviedo, FL 32765
Office PH: 407-380-1919
FAX: 407-380-1830
www.hoyletanner.com



HELIPAD	
TLOF Dimensions	48' X 48'
FATO Dimensions	68' X 68'
NORTHING	1805922.192
EASTING	621379.976
LATITUDE	N29° 18' 05.2516"
LONGITUDE	W81° 06' 32.9094"
ELEVATION	21' MSL

ID#	Description
1	Club House & Restaurant
2	Golf Maintenance Facility
3	Golf Cart Barn
4	Airport Lighting Vault
5	Ormond Aircraft / RAMS Hangar
6	Ormond Airport Hangars
7	Aquasun Hangar
8	BETNR Hangar
9	Hangar 7 Aviation
10	Endeavor Aire Hangar
11	Morrow Hangar
12	Tomlinson Hangar
13	Tomlinson Hangar
14	Cavalier Hangar
15	Cassata Hangar
16	Manne/Christmas Hangar
17	RYHH Hangar
18	Searle Hangar
19	Blue Sky Hangar
20	Sunrise Aviation
21	Sunrise Aviation
22	MAC Hangars Condo No.1
23	Civil Air Patrol
24	Golf Course Pump House
25	T Hangar
26	T Hangar
27	T Hangar
28	T Hangar
29	Nested T-Hangars
30	Nested T-Hangars
31	Nested T-Hangars
32	MAC Hangars Condo No.2
33	Nested T-Hangars
34	Nested T-Hangars
35	VOR
36	Shuffle Board Court
37	Airport Traffic Control Tower

Future Apron Dimensions			
Apron	Length	Width	Ft Sq
A1 - Based Tiedowns	600	200	94,500
A2 - Based Tiedowns	600	200	91,900
A3 - Based Tiedowns	900	200	149,200
A4 - Based Tiedowns	800	200	111,600
A5 -Transient Apron	200	150	28,700
A6 -Based Tiedowns	1065	208	221,520
A7 -Based Tiedowns	275	200	55,000
A8 -Based Tiedowns	668	208	138,944
A9 -Based Tiedowns	735	208	152,880
A10 -Transient Apron	970	201	194,970
A11 -Transient Apron	200	70	14,000
A12 -Transient Apron	460	233	107,180

LEGEND

EXISTING	PROPOSED	DESCRIPTION
		AIRPORT REFERENCE POINT
		PROPERTY LINE
RVZ	RVZ	RUNWAY VISIBILITY ZONE
RSA	RSA	RUNWAY SAFETY AREA
ROFA	ROFA	RUNWAY OBJECT FREE AREA
ROFZ	ROFZ	RUNWAY OBJECT FREE ZONE
RPZ	RPZ	RUNWAY PROTECTION ZONE
DS	DS	DEPARTURE SURFACE
TSS	TSS	THRESHOLD SITING SURFACE
TSA	TSA	TAXIWAY SAFETY AREA
TOFA	TOFA	TAXIWAY OBJECT FREE AREA
20	N/A	CONTOUR LINES
		PAVED AIRFIELD SURFACES
		8' FENCE
		ON-AIRPORT BUILDINGS
		THRESHOLD LIGHTS
		2 LIGHT PAPI / 4 LIGHT PAPI
		RUNWAY END IDENTIFIER LIGHT (REIL)
		WIND SOCK
N/A		EASEMENT
N/A		LAND RELEASE
N/A		PAVEMENT ABANDONED
N/A		AREA TO BE REMOVED OR OBSTRUCTIONS CLEARED*
	N/A	WETLANDS
		GATE IDENTIFICATION
		PERSONNEL GATE
		AWOS
	N/A	BUILDING IDENTIFICATION
N/A		APRON IDENTIFICATION

REV. NO.	DATE	DESCRIPTION	BY

AIP NO.: 3-12-0059-17-2014
PROJ. NO.: 307101
DRAWN: JLC
DESIGN: MTO
CHECKED: ERM
DATE: JANUARY 2016

SHEET 11 OF 14

DO NOT SCALE DRAWING

SHEET TITLE

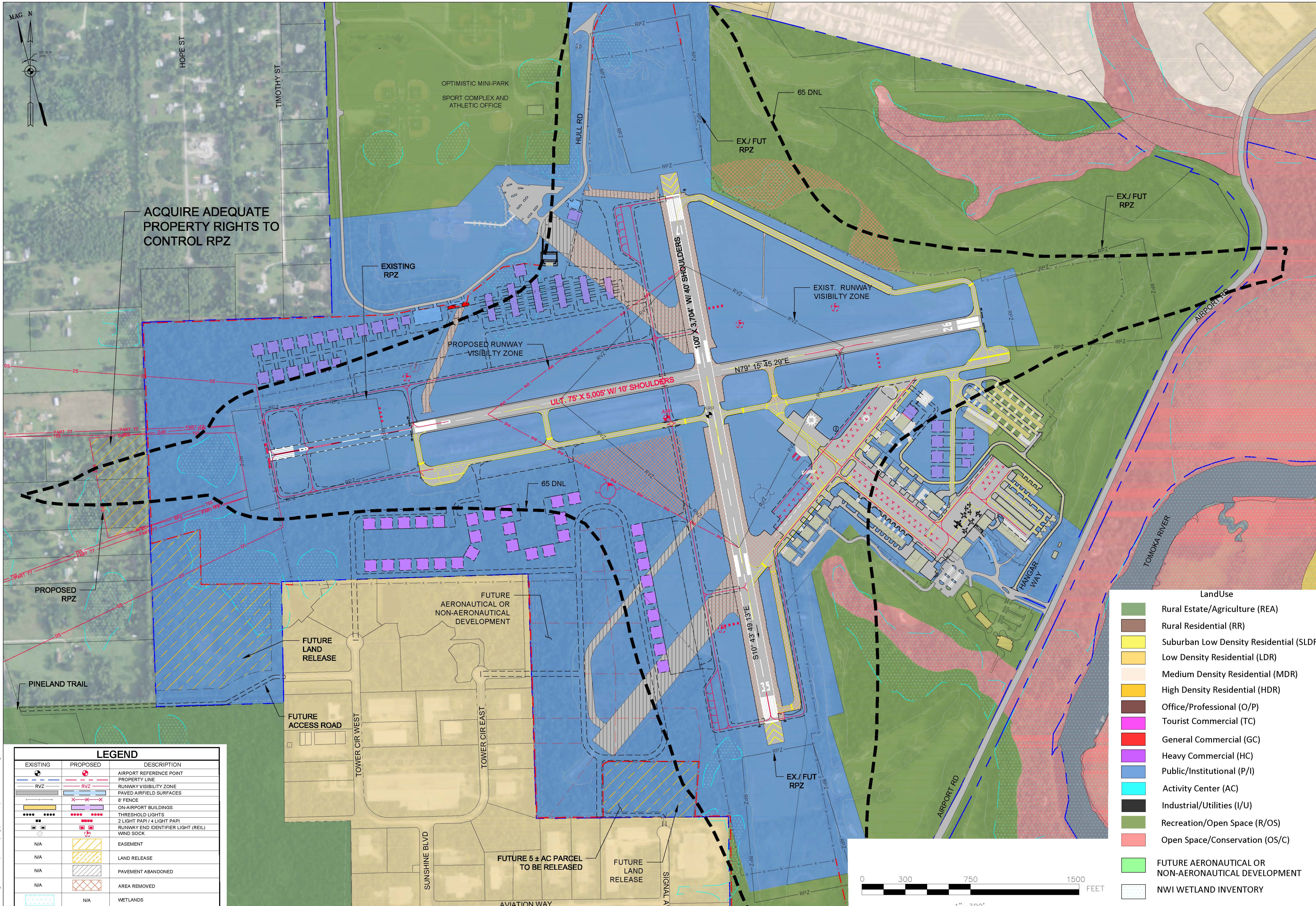
TERMINAL AREA PLAN

CITY OF ORMOND BEACH
ORMOND BEACH MUNICIPAL AIRPORT
ORMOND BEACH, FLORIDA

CITY OF ORMOND BEACH ★ FLORIDA ★

Hoyle, Tanner & Associates, Inc.
95 E. Mitchell Hammock Road, Suite 200 Oviedo, FL 32765
Office PH: 407-380-1919
FAX: 407-380-1830
www.hoyletanner.com

Drawing name: H:\307101\dwg\Contract\A.8.1 Terminal Area.dwg Jan 29, 2016 - 9:42am



AIP NO.: 3-12-0059-17-2014
PROJ. NO.: 307101
DRAWN: JLC
DESIGN: MTO
CHECKED: ERM
DATE: JANUARY 2016

SHEET 12 OF 14

REV. NO.	DATE	DESCRIPTION	BY

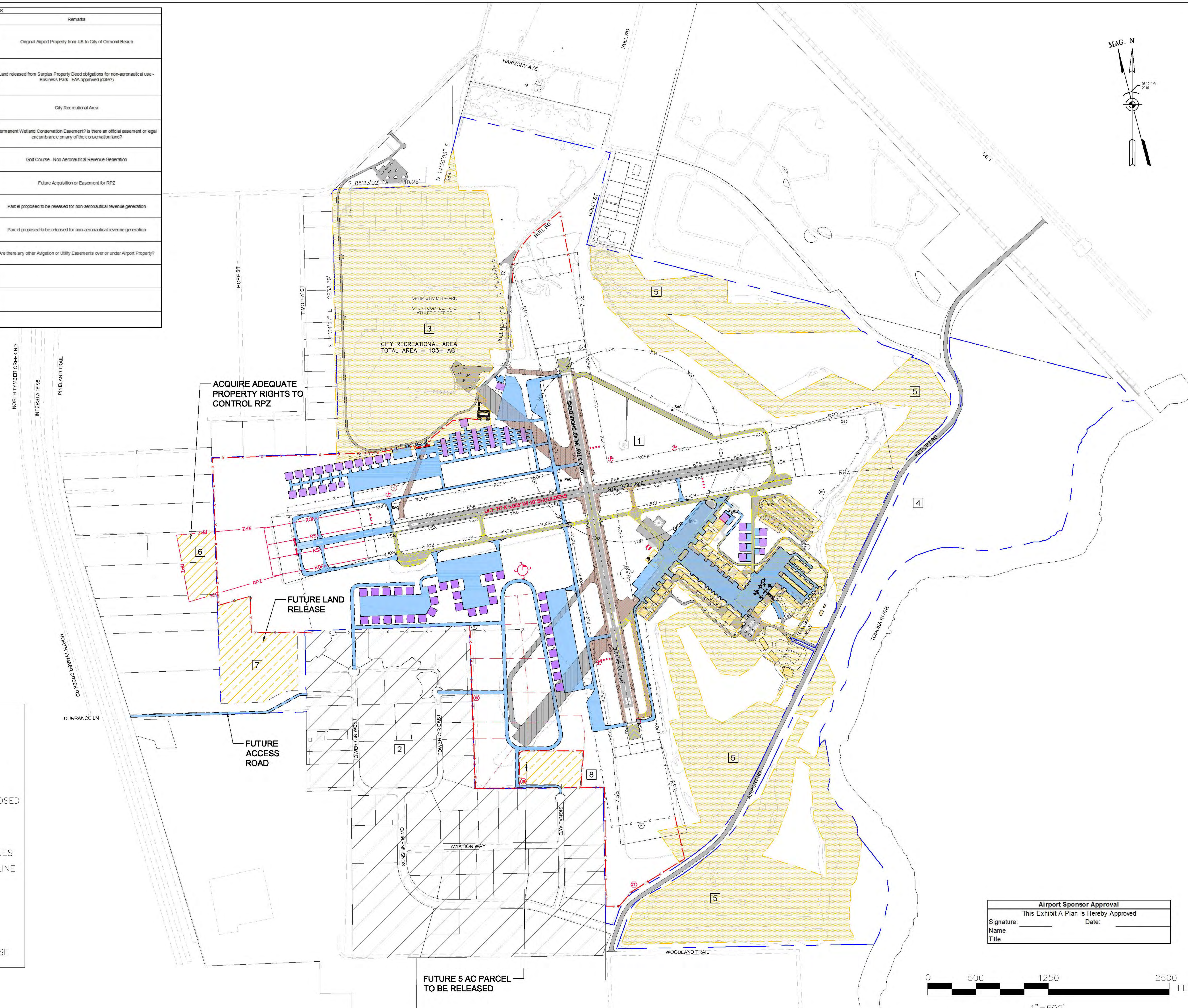
SHEET TITLE

AIRPORT LAND USE PLAN

CITY OF ORMOND BEACH
ORMOND BEACH MUNICIPAL AIRPORT
ORMOND BEACH, FLORIDA

Hoyle, Tanner & Associates, Inc.
95 E. Mitchell Hammock Road, Suite 200 Oviedo, FL 32765
Office PH: 407-380-1919
FAX: 407-380-1830
www.hoyletanner.com

LAND ACQUISITIONS, RELEASES AND EASEMENTS									
KEY	GRANTOR	GRANTEE	INSTRUMENT	FAA Grant #	RECORDED				Remarks
					DATE	BOOK	PAGE	ACREAGE	
1	United States of America	City of Ormond Beach	Excess Property Deed	N/A	6/30/1949	212	604	?	Original Airport Property from US to City of Ormond Beach
2	City of Ormond Beach	City of Ormond Beach	Deed	N/A	11/23/1959	253	451	174.8	Land released from Surplus Property Deed obligations for non-aeronautical use - Business Park. FAA approved (date?)
3	City of Ormond Beach	City of Ormond Beach	Non-Aeronautical Use Land Release	N/A	FAA release letter date	?	?	103.0	City Recreational Area
4	City of Ormond Beach	Who holds the easement?	Easement	N/A	Easement Date?	?	?	?	Permanent Wetland Conservation Easement? Is there an official easement or legal encumbrance on any of the conservation land?
5	City of Ormond Beach		Non-Aeronautical Use Land Release	N/A	FAA Release approval date?	?	?	?	Golf Course - Non Aeronautical Revenue Generation
6	TBD	City of Ormond Beach	Acquisition or Easement	TBD					Future Acquisition or Easement for RPZ
7	City of Ormond Beach	City of Ormond Beach	Non-Aeronautical Use Land Release	N/A					Parcel proposed to be released for non-aeronautical revenue generation
8	City of Ormond Beach	City of Ormond Beach	Non-Aeronautical Use Land Release	N/A				5.0	Parcel proposed to be released for non-aeronautical revenue generation
9	City of Ormond Beach		Easement						Are there any other Avigation or Utility Easements over or under Airport Property?



Drawing name: H:\307101\dwg\Contract\A.10.1 Exhibit A.dwg Jan 29, 2016 - 10:48am

REV. NO.	DATE	DESCRIPTION	BY

AIP NO.: 3-12-0059-17-2014
PROJ. NO.: 307101
DRAWN: JLC
DESIGN: MTO
CHECKED: ERM
DATE: JANUARY 2016
SHEET 13 OF 14

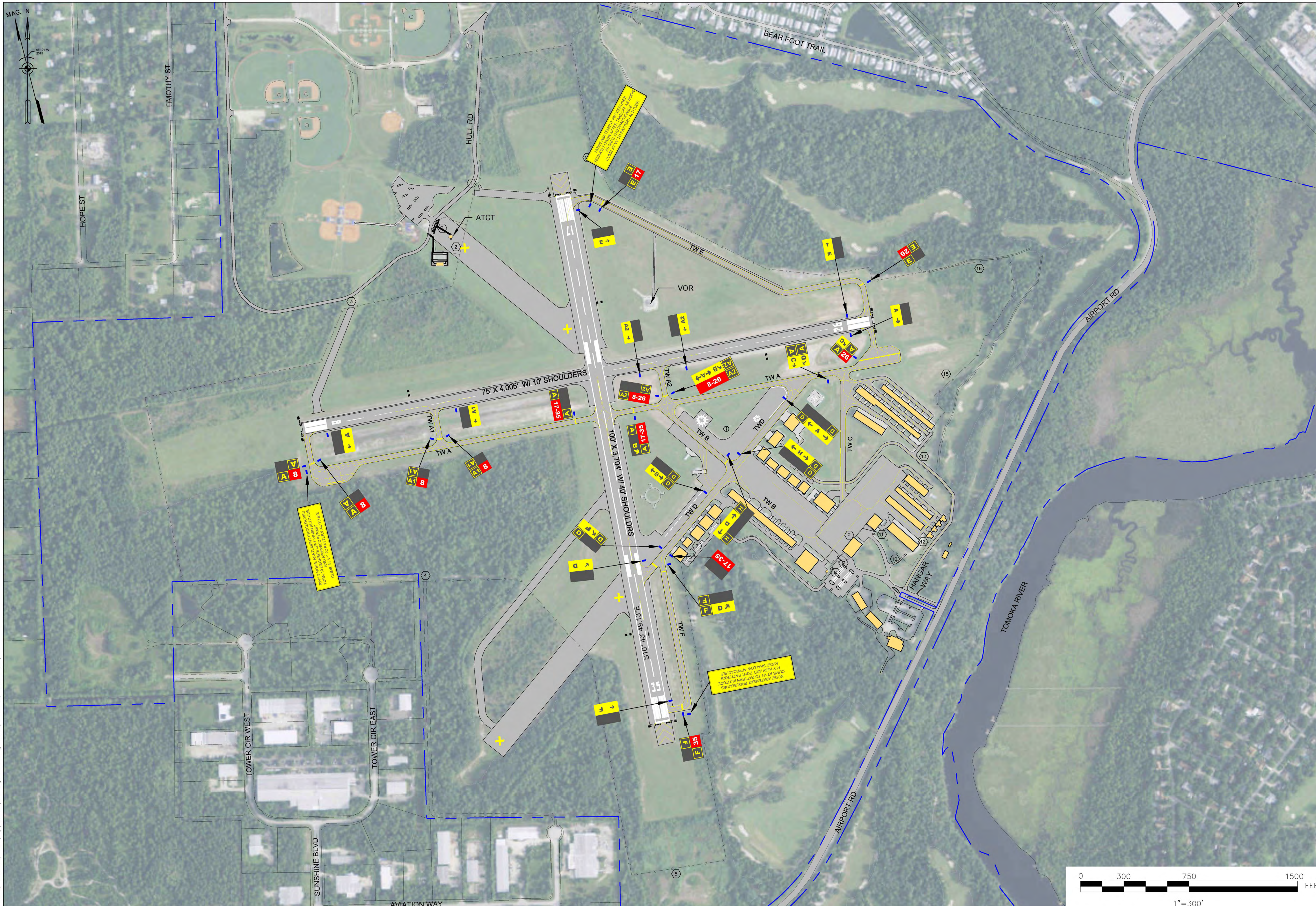
DO NOT SCALE DRAWING

SHEET TITLE

EXHIBIT "A" AIRPORT PROPERTY INVENTORY MAP

CITY OF ORMOND BEACH
ORMOND BEACH MUNICIPAL AIRPORT
ORMOND BEACH, FLORIDA

Hoyle, Tanner & Associates, Inc.
95 E. Mitchell Hammock Road, Suite 200 Oviedo, FL 32765
Office PH: 407-380-1919
FAX: 407-380-1830
www.hoyletanner.com



REV. NO.	DATE	DESCRIPTION	BY

DO NOT SCALE DRAWING

AIP NO.: 3-12-0059-17-2014
PROJ. NO.: 307101
DRAWN: JLC
DESIGN: MTO
CHECKED: ERM
DATE: JANUARY 2016

SHEET 14 OF 14

SHEET TITLE

SIGN AND MARKING PLAN

CITY OF ORMOND BEACH
ORMOND BEACH MUNICIPAL AIRPORT
ORMOND BEACH, FLORIDA

Hoyle, Tanner & Associates, Inc.
95 E. Mitchell Hammock Road,
Suite 200 Oviedo, FL 32765
Office PH: 407-380-1919
FaX: 407-380-1830
www.hoyletanner.com

Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Attachment B

U.S. Department
of Transportation
**Federal Aviation
Administration**

ORLANDO AIRPORTS DISTRICT OFFICE
5950 Hazeltine National Dr., Suite 400
Orlando, Florida 32822-5003
Phone: (407) 812-6331 Fax: (407) 812-6978

April 6, 2015

Mr. Steven R. Lichliter
Airport Manager
Ormond Beach Municipal Airport
22 South Beach Street
Ormond Beach, FL 32174

Dear Mr. Lichliter:

RE: Ormond Beach Municipal Airport, Ormond Beach, Florida
AIP 3-12-0059-017-2014
Approval of Airport Forecasts for Airport Master Plan Update

This letter responds to your submittal of the revised "Chapter 5: Forecast" for the Ormond Beach Municipal Airport dated April 2015. The based aircraft and operations forecasts shown in Table 5-13 of the report are approved to be used in your on-going master planning efforts.

If you have any questions, please feel free to contact me at (407) 812-6331, ext. 117.

Sincerely,

Original Signed By

Marisol C. Elliott
Program Manager/Community Planner

cc: Hans Dorries, Hoyle, Tanner & Associates, Inc.

Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Attachment C

Mr. Lewis M. Heaster
Lewis Heaster Properties
700 W. Granada Blvd.
Suite 103
Ormond Beach, Fl. 32174

Mr. Lichliter,

Thank you for the email. A few years ago my family was an owner in a Cessna Citation jet. We used KOMN many times, but eventually reverted to KDAB for access to larger FBO's and a longer runway for safety purposes.

Currently, my family flys with Netjets and uses Shelt Air at KDAB. The idea of increasing the length of the runway at KOMN would allow people like myself and others to safely fly in and out of KOMN. The additional flights to our City would allow operators such as Netjets and others to use our airport on a regular. The potential for increased business within our City could be phenomenal.

I hope you will take these comments into consideration with the future plans for he airport.

Regards,

Lewis M. Heaster

Lewis Heaster Properties
700 W. Granada Blvd.
Suite 103
Ormond Beach, Fl. 32174

Office: 386-673-6262
Cell: 386-566-6451
Lewis@LewisHeasterProperties.com

www.LewisHeasterProperties.com

Good morning,

We usually fly on a monthly basis.

The private air travel industry has exploded since the recession. I know that Netjets has expanded their fleet and customer base dramatically over the last few years. My contact at Netjets has told me in the past that many of their customers live in the Daytona/Ormond area.

My example is just one of many that an expanded runway can help the City. The possibilities are endless for additional air traffic and future business.

Thank you again for reaching out with your email.

Regards,

Lewis M. Heaster

Mr. Lichliter,

I understand that you spoke with NetJets and my salesman with their company. If you need any additional information from me to help with your email below please let me know.

As I mentioned to you in previous emails, our family flies with NetJets approximately 10-15 times per year. Each of our trips are flown on an aircraft mentioned below, (Citation Excel, X, Sovereign, Phenom, etc). Occasionally Netjets sends a larger jet due to the size of their fleet and when it is more convenience for them with scheduling.

Thank you again,

Lewis M. Heaster
Lewis Heaster Properties
700 W. Granada Blvd.
Suite 103
Ormond Beach, Fl. 32174

(386) 673-6262
(386) 673-1221 Fax
www.LewisHeasterProperties.com

From: Lewis Heaster [mailto:Lewis@lewisheasterproperties.com]
Sent: Wednesday, April 13, 2016 8:58 AM
To: Lichliter, Steven
Subject: Re: Update - Ormond Beach Runway Project

KTEB, KMEI or KCKB

Regards,

Lewis M. Heaster

Lewis Heaster Properties
700 W. Granada Blvd.
Suite 103
Ormond Beach, Fl. 32174

(386) 673-6262 Office
(386) 566-6451 Cell
www.lewisheasterproperties.com

Please excuse any errors!
Sent from my iPhone.

Mr. Gary Yoemans
Daytona Auto Mall
Blue Skies Aviation of Daytona, Inc.
Cessna 550 N782ST

Thanks for the info. When i set out to buy a aircraft I had to reduce the size in order to use OMN. I hope some day to increase the size of my aircraft. Of course as it is that's impossible based on the current runway length. I do know several owners of aircraft who have all relocated to Daytona or Flagler because of the length of Ormonds airport.

Our company owns several aircraft and is forced to fly into Daytona weekly to move people around to other Dealerships on the east coast and this business would immediately move to Ormond if a runway extension was completed.

I see nothing but growth for the area and to be left in the dark ages for access to our city because of a airport that has not been updated to current aviation requirements just seems silly. Not to mention a true safety issue for the larger aircraft that still use the airport.

Gary Yeomans

Gulfstream Aerospace

Dear Mr. Lichliter,

Good morning. I forwarded on your request to our marketing/sales engineers. I hope to have some material for you shortly.

Best Regards,

Erik Kauber

Erik Kauber
Flight Operations
Gulfstream Aerospace
+1 912 228 2033

Steven,

Here are the specs for our large cabin fleet and a Hanger Planning guide.   When it comes to runway length required for takeoff, 7500 ft would be the most required for a fully loaded G650ER SL. 103,600# at 97 f. The majority of operations would require much less runway, I would guess in the 5000- 6000ft range. From a pilot's perspective we obliviously like as much runway as possible.

Weight bearing on taxiways and ramps must also be considered.   Hope this helps. Let me know if I can be of further assistance.

NetJets

Dear Mr. Lichliter,

Attached is the NetJets letter of support for the runway extension project at Ormond Beach.

Al Ball
Manager, Operational Intelligence & Analysis

T. 614 239 4873
C. 614 208 6164
NetJets® Inc.

NetJets Inc.
4111 Bridgeway Avenue
Columbus OH 43219

T +1 614 239 5500

NETJETS®

Ormond Beach Municipal Airport
P.O. Box 277
Ormond Beach, FL 32175-0277

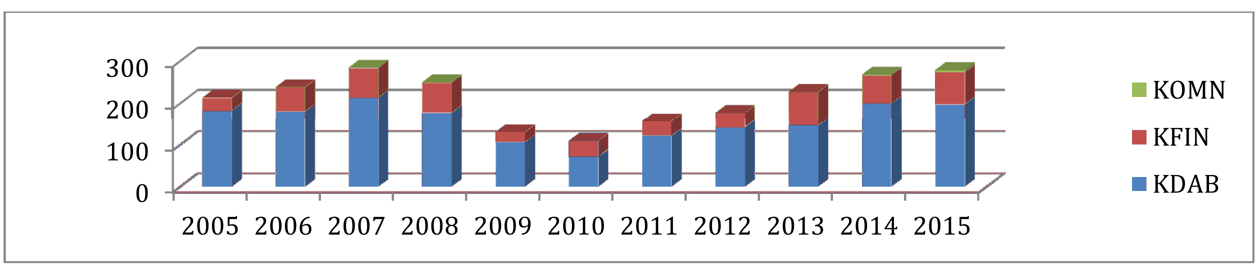
Dear Mr. Lichliter,

At your request, I have assembled some figures representative of the demand that currently exists for the Ormond Municipal Airport, FAA identified as KOMN.

Ormond Municipal Airport currently has as its longest runway, runway 8/26, which is 4005 feet in length and 75 feet in width. According to FAA records, (5010 airport data) this runway has a published weight rating of 30000 pounds for single wheel configured aircraft and 40000 pounds for dual wheel configured aircraft. In the NetJets Fractional Ownership fleet, runway 8/26 will accommodate and is approved for operations of the following aircraft:

- Cessna Citation Ultra, no longer operational in the NetJets fleet
- Cessna Citation Encore, CE560E – SW 16630 (MTOW)
- Cessna Citation Encore Plus, CE560EP – SW 16830
- Embraer Phenom 300, Signature Series, EMB505 – SW 18387
- Cessna Citation Excel, CE560XL – SW 20000
- Cessna Citation Excel-S, CE560XLS – SW 20200
- Cessna Citation Sovereign, CE680 – DW 30300
- Bombardier Challenger 350, Signature Series, CL350 – DW 40600 (performance limited beneath the MTOW)

For the purposes of this report, I analyzed NetJets flight operations data from 2005. Through the use of Google Earth I was able to determine that the airport's *runway* configuration in 2005 is identical to the configuration in 2014 (no newer imagery exists on Google Earth). Ormond Beach Municipal Airport is in competition to attract NetJets clients. Based upon its location, it competes with Flagler Executive Airport in the north with a long runway of 5000 feet, or Daytona Beach International in the south with a long runway of 10500 feet. Our clients generally choose the airport that is closest to their business and/or residence and supports the aircraft size and provides the convenience for the contract aircraft that they have purchased. Below is the charted flight activity of the three airports since 2005.



NETJETS

If Ormond Beach Municipal Airport was to extend the runway to 5000 feet and maintain the same weight bearing rating as the existing runway, NetJets clients of the following mid-sized cabin fleets would have access to the Ormond Beach geographic area. They are currently prohibited due to aircraft performance requirements and NetJets imposed minimum runway operating lengths:

- Cessna Citation Ten, CE-750
- Bombardier Challenger 650, Signature Series, CL605
- Dassault Falcon 2000, DA-2000
- Dassault Falcon 2000EX, DA2EASy
- Hawker 800XP, HS-125-800XP
- Hawker 900XP, HS-125-900XP

If Ormond Beach Municipal Airport was to extend the runway to 5000 feet and increase the weight bearing rating of the aircraft movement areas to accommodate large cabin aircraft (occasional use 75000 pounds DW), the remainder of the NetJets fleet, including Gulfstream 450/550 and Bombardier 5000/6000, could be approved for operations.

NetJets views a runway extension as a positive addition to our national aviation infrastructure allowing a larger portion of our clientele to access a geographic area that was previously unavailable to them. For this important reason, we support the runway extension project at Ormond Beach Municipal Airport.

Please feel free to contact me with any questions regarding this review.

Al Ball
Manager
Operational Intelligence & Analysis
614 239 4873
ball@netjets.com

Daytona Beach Airport (KDAB) NetJets Flight Activity

	CE-560	CE-560E	CE-560EP	CE-560XL	CE-560XLS	CE-680	CL-350S	EMB-505S	
2005	100	20		56	2	4			182
2006	109	14		45	12				180
2007	110	18		47	28	10			213
2008	53	16	13	38	34	23			177
2009	29	13	2	20	27	15			106
2010	22	6	10	8	16	9			71
2011	5	27	16	21	32	20			121
2012		14	19	43	48	18			142
2013		24	16	44	33	20		9	146
2014		33	11	51	51	21		32	199
2015		32	24	32	37	26	4	42	197
2016									
	428	217	111	405	320	166	4	83	1734

Al Ball
614 239 4873
ball@netjets.com

1/12/2016

Flagler Executive Airport (KFIN) NetJets Flight Activity

	CE-560	CE-560E	CE-560EP	CE-560XL	CE-560XLS	CE-680	EMB-505S	
2005	23	2		4		2		31
2006	28	6		18	6			58
2007	30	8		28	4			70
2008	36		2	23	10			71
2009	6			2	10	6		24
2010	2	4	2		8	22		38
2011	6	2	2	10	8	8		36
2012			7	6	10	12		35
2013		15	6	26	18	12	4	81
2014		12	2	18	23	2	10	67
2015		8	13	11	28	2	14	76
2016								
	131	57	34	146	125	66	28	587

Al Ball
614 239 4873
ball@netjets.com

1/12/2016

Ormond Beach Municipal Airport (KOMN) NetJets Flight Activity

	CE-560	CE-560XL	CE-560XLS	
2005				
2006				
2007	2			2
2008	2			2
2009				
2010				
2011				
2012				
2013				
2014		2		2
2015		2	4	6
2016				
	4	4	4	12

Al Ball
614 239 4873
ball@netjets.com

1/12/2016

Contact:
Al Ball
Manager, OIA
1 614 239 4873
ball@netjets.com

NetJets
Fleet Aircraft Resource

AIRCRAFT TYPE	RUNWAY SPECS: DRY ABSOLUTE MINIMUM	RUNWAY SPECS: MINIMUM RUNWAY WIDTH	RUNWAY SPECS: MINIMUM TAXIWAY WIDTH	AIRCRAFT SPECS: FAA DESIGN CATEGORY	AIRCRAFT SPECS: MAIN GEAR SPACING	AIRCRAFT SPECS: AIRCRAFT WINGSPAN	AIRCRAFT SPECS: AIRCRAFT TAIL HEIGHT	AIRCRAFT SPECS: OVERALL LENGTH	AIRCRAFT SPECS: ACN	AIRCRAFT SPECS: MAIN TIRE PRESSURE	OPERATING WEIGHTS: NJ BASIC OPERATING WEIGHT	OPERATING WEIGHTS: MAX ZERO FUEL WEIGHT	OPERATING WEIGHTS: MINIMUM RELEASE FUEL (LBS)	OPERATING WEIGHTS: MAX LANDING WEIGHT	OPERATING WEIGHTS: MAX TAKEOFF WEIGHT
EMB-505S	3500'	50'	30'	BII	9'4"	52'3"	16'9"	51' 3"	5/7.5	174	12287	14220	1880	17042	18387
CE-560 E	3500'	50'	35'	BII	13'4"	54' 9"	15' 5"	48' 10"	7	156	10865	12600	1643	15200	16630
CE-560 P	3500'	50'	35'	BII	13'4"	54' 9"	15' 4"	48' 10"	7	158	10954	12600	1539	15200	16830
CE-560 XL	3800'	50'	30'	BII	14' 11"	55' 9"	17' 3"	52' 8"	9/10	210	13117	15000	1972	18700	20000
CE-560 XLS	3800'	50'	30'	BII	14' 11"	55' 9"	17' 3"	52' 8"	9/10	210	13117	15200	1935	18700	20200
CE-680	4000'	70'	35'	BII	10' 1"	63' 2"	20'	63' 6"	10/11	160	18440	20300	2564	27100	30300
CE-680A	4000'	70'	35'	BII	10'	72' 4"	20' 10"	62' 3"	8/11	163		21200	2564	27575	30800
CE-750	4600'	75'	35'	CII	10' 7"	63' 8"	19' 2"	72' 4"	8/13	180	22139	24400	2968	31800	35700
HS-125/800 XPC	4500'	75'	35'	CII	9' 2"	51' 5"	17' 5"	51' 1"	4/9	135	17305	18450	2407	23350	28000
HS-125/900 XP	4500'	75'	35'	CII	9' 2"	54'4"	17' 5"	51' 1"	4/9	135	16647	18450	2407	23350	28000
G-200	4600'	75'	35'	CII	12' 6"	58' 1"	21' 5"	62' 3"	4/11	203	20296	24000	2977	28000	35450
CL-350	4000'	70'	35'	CII	10' 6"	69'	20' 6"	68' 8"	5/11.5	175	25095	28200	3060	34150	40600
CL-650	5000'	75'	35'	CII	10' 5"	64' 4"	20' 8"	68' 5"	6.5/17	177	27600	32000	4000	38000	48200
DA-2000 (33K)	4500'	75'	35'	CII	14' 6"	63' 5"	22' 9"	66' 4"	5/12	190	23186	28660	3033	33000	36500
DA-2000 (34.5K)	4500'	75'	35'	CII	14' 6"	63' 5"	22' 9"	66' 4"	5/13	190	23186	28660	3050	34500	36500
DA-2EASY	4500'	75'	35'	CII	14' 7"	63' 5"	23' 2"	66' 4"	5/15	229	24269	29700	3362	39300	42200
GIV-SP/450	4500'	75'	45'	CII	16'	77' 10"	24' 5"	89' 3"	10/26	189	43656	49000	3-5000	66000	74600
GV/550	4500'	75'	45'	CIII	17'	93' 6"	25' 10"	96' 4"	17/33	198	48348	54500	3-5000	75300	90500
GL5T	4500'	75'	50'	CIII	13' 4"	94'	25' 6"	96' 9"	15/31	182	51731	58000	4000	78600	92500
GLEX	4500'	75'	50'	CIII	13' 4"	94'	25' 6"	99' 5"	14/33	185	53373	58000	4000	78600	99500

ACN = empty wt/max wt; figure toward high end
NetJets pax wts - 221 Smr, 226 Wntr
** This document not valid for flight planning **

4/19/2016

Hi Steve,

This is what I can factually tell you: From our existing client base, the people that have been interested in Ormond Beach have shares in our Citation Excel program. Four aircraft from 2014 until yesterday have visited Ormond Beach.

NetJets has the following aircraft approved into your airport:

- Citation 560 Encore and Encore Plus
- Citation 560 Excel and XLS
- Citation 680 Sovereign
- Citation 680AS Latitude
- Embraer 505 Phenom
- Challenger 350

If your prospects are either clients with those aircraft or considering buying into the NetJets Fractional program, they could already be flying into Ormond Beach.

I do not have the capability to create range rings for you that would show the potential benefit of the additional 1000 feet of runway so the next best thing I can do for you is to let you know what clients from a similarly configured airport have done. Flagler Executive, KFIN, has 5000 feet of usable runway, similar temperatures, and 90000 pounds allowable weight bearing on the runway. Out of our active fleets, we have departed to these destinations:

- Citation 560E –TJSJ, San Juan
- Citation 560EP – KMMU, Morristown, NJ
- Citation 560XL – KEWR, Newark, NJ
- Citation 560XLS – KDAL, Dallas, TX
- Citation Sovereign – KBUR, Burbank, CA
- Citation Ten – KDAL, Dallas, TX
- Falcon 2000 – KHPN, White Plains, NY
- Falcon EASy – KHOU, Houston, TX
- Embraer Phenom – KGKY, Arlington, TX
- G200 – MPTO – Panama City, Panama
- GIV-SP – TIST – Saint Thomas, VI
- GL5000 – KFTY – Fulton County, GA
- GL6000 – KMIA – Miami, FL
- HS800XP – KACY – Atlantic City, NJ
- HS900XP – KAGS – Augusta, GA

Not all of these destinations use the full range capability of the aircraft, but they are the destinations that our clients have chosen.

I hope that this information is useful to you.

Al Ball
Manager, Operational Intelligence & Analysis

Alan D. Jorczak
President
Entech Controls Corporation

ENTECH
CONTROLS CORPORATION

8 West Tower Circle
Ormond Beach, Florida 32174
Phone: 386-672-7335 • FAX: 386-672-7233
Email: entechsales@cfl.rr.com
www.EntechControlsCorp.com

January 12, 2016

Steven R. Lichliter, Airport Manager
Ormond Beach Municipal Airport
P. O. Box 277
Ormond Beach, FL 32175

Dear Mr. Lichliter,

This letter is in response to your request for justification of the need to extend runway 8-26 to 5,000 feet. Entech Controls Corporation is a manufacturer of railroad equipment used in virtually all light rail and rapid transit systems operating in the United States. Besides the specific rail authorities that order and use our equipment we service orders for major multi-national corporations building integrated systems for the signaling and communication side of rail operations.

In view of the fact that some of the primary facilities we must call on (including the cities of Los Angeles, Portland, OR, Seattle, San Diego, Phoenix, Salt Lake City, Dallas, St. Louis, Minneapolis, Denver, Chicago, Louisville, Kansas City, MO, Atlanta, Miami, Washington, D.C., Baltimore, Philadelphia, Newark, Pittsburgh, New York City, Rochester, NY, Boston, etc.) are such a diverse geography, long distance point-to-point travel without stopping is very important.

Current efforts to reach these locations using commercial aircraft with terrible connecting schedules often means a trip is extended by one to two days just because of travel difficulties. We would use a service like NetJets if they could fly long distances right from Ormond Beach, however, our short runways lack the ability for them to operate the kind of equipment necessary to fulfill the specific travel mission.

I would estimate we could generate (at two to three trips per month depending on the number of projects in-house) up to 70 operations a year. Lost time due to having to connect through Charlotte or Atlanta is a huge operational burden for our type of business. Our business won't support purchasing the larger business aircraft and as you know even midsize twin-engine turbine aircraft are very payload weight limited when carrying full fuel which would be a necessity for the distances we have to travel.

Please feel free to provide our website address which will show the range of products we manufacture for the railroad industry. Speed of customer service is a critical aspect of our operations and unfortunately the Ormond Beach Airport does not have the infrastructure to support current day business requirements.

With kind regards,

Alan D. Jorczak

Alan D. Jorczak
President

ADJ/sdw

From: Sandra Walsh [mailto:entechsales@cfl.rr.com]
Sent: Wednesday, April 13, 2016 10:57 AM
To: Lichliter, Steven
Subject: FW: RUNWAY EXTENSION 1-12-2016

Mr. Lichliter,

As requested, Entech's response to trip lengths would be Kansas City with occasional trips to Los Angles and Denver.

Regards -

Sandra D. Walsh, C.P.B.
Office Manager

CONTROLS CORPORATION
8 West Tower Circle
Ormond Beach, FL 32174
entechsales@cfl.rr.com
386.672.7335 Tel / 386.672.7233 Fax

David Slick Sr, CEO
Command Medical Products

COMMAND
MEDICAL PRODUCTS

January 13, 2016

Steven R. Lichliter, Airport Manager
Ormond Beach Municipal Airport
P.O. Box 277
Ormond Beach, FL 32175

Dear Mr. Lichliter,

This letter is in response to your request for justification of the need to extend runway 8-26 to 5,000 feet. Command Medical Products has operating facilities here in Ormond Beach as well as Managua, Nicaragua. We also have customers spread out nearly all over the contiguous 48 states.

Due to our rapid growth, we need to be in direct contact with our customer on a weekly basis. Our engineers, quality managers, technicians and sales personnel are currently using very inefficient commercial flights. This sometimes requires one or two days travel for a meeting that may only last for a three hours. We are also moving personnel and supplies to and from our Nicaragua facility on a weekly basis.

We have more than doubled our size in the last 3 years and the travel activity has made it necessary to either contract with a NetJets type carrier or more likely acquire our own turbine airplane. We will be able to project from 50 to 100 operations a year.

The ability to continue our rapid growth is directly related to our ability to service our customers. Currently, NetJets will not service the Ormond Beach Airport because of inadequate runway length.

This same issue would hinder any midsize jet from being able to meet our requirements.

In short, we need a 5,000 foot runway to assure that we can continue our growth and stay in Ormond Beach.

Sincerely,
David Slick Sr, CEO
Command Medical Products

Command Medical Products, Inc.
15 Signal Avenue ▪ Ormond Beach, FL 32174
Phone: (386) 672-8116 ▪ Facsimile: (386) 677-7781
www.commandmedical.com

From: David Slick, Sr. [mailto:DavidSlick@commandmedical.com]
Sent: Friday, February 12, 2016 2:59 PM
To: Lichliter, Steven
Subject: turbine aircraft needing a 5,000 foot runway

Hi Steve,
I have been out of the area for a couple of weeks so I'm hoping that you received some comments on the types of turbine aircraft that would require the extra 1000 feet of runway.
Here is my input. Although there are many categories of business Jets, nearly all of the aircraft that would benefit from the runway Extension would be light or medium size turbines.
This would include the entry level Embraer Phenom series 100 and 300.
Also many versions of the Cessna Citation family of light jets, from the early model 500 series turbines up through the Citation V. This family comprises the most available aircraft and would be the models that we have an interest in researching.
There are also several other manufacturers such as Beechcraft or the French Line of Falcon jets that would be of interest to growing companies that will require turbine airplanes as legitimate business tools.
I'm missing some of the other turbines in this category but I think that any of the light jets would be of interest to companies looking for an efficient and effective way to help grow their businesses.
If you have any questions please feel free to contact me.

David Slick, Sr.

From: David Slick, Sr. [mailto:DavidSlick@commandmedical.com]
Sent: Friday, February 12, 2016 3:43 PM
To: Lichliter, Steven
Subject: RE: turbine aircraft needing a 5,000 foot runway

Our airplane of choice is a Citation V. By the time a runway extension is a reality we predict that we will be making two trips a week, one internationally an one in the US. My understanding is that a takeoff and landing is considered 2 operations. If that is the case then our projected operations would be a minimum of 200 annually. My own feeling is that it will probably be double that amount, based on the experiences of other companies that have added a turbine capability to their business assets.

David Slick, Sr.

From: David Slick, Sr. [mailto:DavidSlick@commandmedical.com]
Sent: Wednesday, April 13, 2016 9:57 AM
To: Lichliter, Steven
Subject: Re: turbine aircraft needing a 5,000 foot runway

Good morning Steven. What we are looking for is a citation V that can get us from our Ormond facility to Managua, Nicaragua. We also have clients in the northeast US and in and around Chicago. These are all 1000+NM destinations that will require full fuel and a 5000 foot runway. As we said originally we are forecasting 4 operations weekly.
Please let me know if you need additional information.
David Slick,Sr.

Sent from my iPhone

Mr. Steve Elston
President
World Color International, Inc.
10 Sunshine Blvd.
Ormond Beach, FL 32174

From: steve worldcolor.cc [mailto:steve@worldcolor.cc]
Sent: Tuesday, February 02, 2016 4:28 PM
To: Mannarino, Joe
Cc: matt worldcolor.cc
Subject: Re: Ormond Beach Airport runway extension justification

Hi Joe,

World Color owns a Westwind II

It is under E&F Aviation

We currently keep it in Flagler because of the runway length

We need 5200 feet to take off fully loaded

We use the plane about 2 to 3 times per month with each time consisting of 4 operations.

Steve Elston
President
World Color International, Inc.
10 Sunshine Blvd.
Ormond Beach, FL 32174
386.672.8388

Mr. L. Gale Lemerand

Stonewood Holdings LLC
810 Fentress Ct., Suite 130
Daytona Beach, FL 32117

Gale Management Services, Inc.
1128-C Beville Rd.
Daytona Beach, FL 32114-5748

Lichliter, Steven

From: Gale Lemerand [GLemerand@lglmanagement.com]
Sent: Tuesday, March 08, 2016 4:12 PM
To: Lichliter, Steven
Subject: Ormond Airport

This will confirm that I use the services of Net Jet 2-3 times per month and it would be much more convenient for me to use Ormond than Daytona.

If your runway is extended I will ask Net Jet to use Ormond

L. Gale Lemerand

From: Gale Lemerand [mailto:GLemerand@lglmanagement.com]
Sent: Thursday, April 14, 2016 2:33 PM
To: Lichliter, Steven
Subject: RE: Ormond Airport

From: Lichliter, Steven [mailto:Steven.Lichliter@ormondbeach.org]
Sent: Wednesday, April 13, 2016 8:45 AM
To: Gale Lemerand
Subject: RE: Ormond Airport
Importance: High

Good morning, Mr. Lemerand…

The FAA is evaluating our grant application for an environmental assessment and runway length analysis. They've asked us to provide some more specific information about the turbine aircraft operations that would come to OMN if the runway is extended.

What is the longest leg or trip you'd fly from OMN with NetJets? Rhode Island

Please try to respond as soon as possible. The FAA has scheduled a meeting with us next week to review all of the data and decide if they'll fund the assessment project.

Thanks very much for your help and support.

Best regards,

Steven Lichliter

Jeffrey Lefever
Owner
Sunrise Aviation

Sunrise Aviation

740 Airport Road • Ormond Beach, FL 32174-8755
(386) 677-5724 FAX (386) 677-9575

Wednesday, January 13, 2016

Mr. Steven R. Lichliter, Manager
Ormond Beach Municipal Airport
Post Office Box 277
Ormond Beach, Florida 32175

Dear Mr. Lichliter:

Sunrise Aviation, Inc. has served the general aviation needs of this community for over 32-years. As the airport's largest leaseholder and service provider, we are firmly supportive of the City's efforts to enhance the economic viability of the field through the proposed runway extension.

In addition to our FBO services, we also operate our subsidiary, Sunrise Flight Academy, from the Ormond Beach Municipal Airport – which generates over 20,000 flight hours annually in light training aircraft. The advent of the runway extension would permit us to include larger turbine aircraft in our training fleet – to include the planned addition of a Cessna Citation to our fleet for both turbine transition training and charter operations.

Our future business plans call for aggressive marketing of our Part 135 charter operation, offering on-demand and limited scheduled flights originating from Ormond Beach. Obviously, a key factor in the decision to expand our services is the extension of Runway 8-26 to 5,000'. The added length will permit our existing aircraft to operate at full capacity (full fuel and maximum load) which makes departing from KOMN a much more attractive option for regional business travelers.

Please add Sunrise Aviation, Inc. to the growing number of local and regional business interests supporting the proposed runway extension project.

Sincerely,

Jeffrey Lefever
Owner
Sunrise Aviation, Inc.

From: Greg [mailto:n8414y@aol.com]
Sent: Wednesday, April 13, 2016 6:39 PM
To: Lichliter, Steven
Subject: Lost Corrate Business

In 2003 Sunrise Aviation was flying executives of the Ginn Corp on our charter aircraft. As their business grew into a multi million dollar operation they purchased their own aircraft.
They started with a M2 followed by a King Air 200. They based each of the aircraft at Sunrise buying all of their base jet fuel from us and we had each of the aircraft in our corporate hangar. We provided all of their base support. We were selling them several thousand gallons of jet fuel monthly. To meet their need for faster long range transportation they purchased a CE650. However the sweep wing design of this aircraft, to allow it to cruise faster, increased the runway requirements. Bluntly it was marginal to operate off of Ormond's 4000' runways. They were now limited on fuel and passengers if they left from OMN. Mr. Ginn then instructed his pilots to depart OMN and fly to Flagler to pick him and the passengers up. There adequate fuel was loaded and the passenger load met his needs. Ultimately a multi million dollar hangar was built at Flagler to base the company's aircraft. While there the average fuel purchased per month was 32,000 gallons.
The fleet grew to a Falcon 900B, a CE650, 2- King Air 200s, a Beech 1900 and a PA31 350.

While Ginn was operating out of Flagler we hosted several large corporate fly ins and other events that show cased Flagler County. The period of time outlined above was from 2003-2010.

Greg Schamaun, Director of Operations, Sunrise Aviation
Former Facilities Manager and Corporate Pilot, The Ginn Corporation.

Sunrise Aviation

740 Airport Road • Ormond Beach, FL 32174-8755
(386) 677-5724 FAX (386) 677-9575

Wednesday, April 20, 2016

Mr. Steven R. Lichliter, Manager
Ormond Beach Municipal Airport
Post Office Box 277
Ormond Beach, Florida 32175

Dear Mr. Lichliter:

My previous correspondence detailed how our planned turbine flight training operations and our future plans to market and grow our Part 135 charter operation are largely dependent upon the extension of Runway 8-26 to at least 5,000 feet.

I feel compelled to point out, however, that our current FBO operations have suffered consistent and substantially negative impacts due to the absence of sufficient runway at OMN. During the course of the average year, and particularly during high-traffic periods such as the international auto racing events in the winter and mid-summer months, Sunrise Aviation receives multiple requests for service from operators of business jet aircraft. In many cases, we must turn away these requests for fuel, maintenance, and parking services because these aircraft cannot operate safely at OMN. Over the past two years, operators of the following aircraft types have been turned away from our facilities at OMN - Citation CJ3, Citation Sovereign, EMB-120, Falcon 20, Falcon 900, CE 650, Sabreliner 65, and Citation 550 Bravo.

The proximate cause of our inability to provide FBO services for these types of aircraft is solely the lack of sufficient runway at OMN. In addition to the negative impact on our business, the lost revenue to the airport, mostly in the form of fuel flowage fees, surely challenges the airport's ability to be self-sustaining.

Sunrise Aviation, Inc. fully supports the proposed runway extension project at OMN.

Sincerely,

Jeffrey Lefever

Jeffrey Lefever
Owner
Sunrise Aviation, Inc.

Devon Dorato
President
Hangar Seven Aviation, LLC

Hangar Seven Aviation LLC
770 Airport Rd
Suite 7
Ormond Beach, FL 32174

January 13, 2016

Steven Lichliter, Airport Manager
Ormond Beach Municipal Airport
P.O. Box 277
Ormond Beach, Florida 32175-0277

Subject: Runway Extension Project

Dear Steve:

Please accept this letter as evidence of Hangar Seven Aviation's strong support of the runway extension project at Ormond Beach Municipal Airport. As an airport-based business, we have a vested interest in improving infrastructure to enhance future operations, and this project is the perfect accompaniment to our future expansion plans.

In addition, the extension will improve the safety of existing uses while making the airport available to a wider range of private, corporate and government aviation operations.

For many years on-field interests have suffered from the limitations, stagnation and loss of revenue inherent to airports with runway lengths less than 5,000'. We have watched as opportunities literally passed overhead to more suitable destinations in the region.

By increasing the length of our primary runway to accommodate larger business aircraft, we immediately make Ormond Beach a more attractive destination for commercial interests looking to expand or relocate their operations to the Halifax Area. This not only benefits aviation-related businesses, but positively impacts the overall local economy as well.

Please contact me if there is anything more we can do to support your important efforts to improve the economic viability of our airport.

Sincerely,

Devon Dorato
President
Hangar Seven Aviation, LLC

CDR Wayne Luginbuhl, USCG (Ret.)
Corporate / Charter Pilot
OMN

From: Wayne Luginbuhl [mailto:wluginbuhl@gmail.com]
Sent: Tuesday, April 19, 2016 11:17 PM
To: Lichliter, Steven
Subject: Re: OMN Runway Extension Initiative

Stephen, as I said to you this morning, I am a retired USCG CDR and for the last 25 years since I retired I have been active as a charter pilot, flying for many well off clients in their Private aircraft. I currently still do contract pilot work for private sector owners. Currently, besides my own aircraft, I fly a CE500 Citation 1, a Citation II and a PA31P Piper Mojave and work into and out of many airports on the east coast and Mid west. I do Occasionally bring the Citation I into KOMN and the Mojave is based here. You can do the look up on operating a standard Citation I and the Mojave and you will find that at gross weights and hot calm days the Mojave is at 4200 feet for Balanced field length and the CI cannot be safely operated at gross be cause you are right at 4300 feet. Additionally this particular CI has an eagle modification which would allow me to carry extra fuel (less people but extra fuel) for longer non stop flights. It's not only the balance field length that's the only problem. Single engine climb gradient is not sufficient in either aircraft to clear the trees off of runway 8 or 26 and runway 17. What I'm saying is that if you loose the engine just after V1 you will probably hit the trees so just extending the runway will probably not be enough. The clear zones need to be address. The fuel cost at KOMN are a little High but I limit what I fuel the aircraft too not because of the cost but more the balanced field length limitations and the SE rate of climb problem. You can sit here at the airport and watch the larger twins struggle to clear the trees as we accelerate to a safe SE speed. Most of my clients are use to first class facilities Which we have none of. No FBO and for that matter No parking for transients, access to rental cars, Hotels etc. are very limited. For that matter non existent. If I have passengers, I will go to KDAB or Flagler County where my clients are more comfortable and then bring the aircraft here where I have some Hangar facilities available. I know that our airport is primarily a training facility, but if you ever want to improve the airport, some facility will have to be built to service commercial aviation. A increase in runway length will be helpful, topping some of the trees at the runway ends would help, but without some facility Ormand airport will never become much more than a training base....I am type rated in many first class jet aircraft and have flown all around the world. We will never be able to handle most of the modern Jet aircraft that are flown nor should try too. Jet noise and mixing larger jet aircraft with the small training aircraft is not ideal, so that shouldn't be the clientele that we should go after but large piston twins, small jets and turbo props would be very good base of operation.

Wayne E. Luginbuhl CDR USCG (ret)
ATP Multiengine and Single engine Land and Sea, commercial Helicopter Instrument, CFI, CFII MEI. A&P IA

Mr. Steven B. Searle, Jr.
Owner
Ormond Aircraft Brokers

Ormond Aircraft Brokers

72 Hangar Way
Ormond Beach, Florida 32174
Phone: (386) 672-4022
E-mail: roscoe@ormondaircraft.com
E-mail: searle3@ormondaircraft.com

April 26, 2016

Mr. Steven R. Lichliter
Airport Manager
Ormond Beach Municipal Airport
P.O. Box 277
Ormond Beach, FL 32175

Mr. Lichliter,

This correspondence is given in support of the proposed extension of Runway 8-26. As you know, I have made a very large investment to expand my business here at the airport. Just over three years ago, I invested over $300,000 to expand our paint shop and maintenance facilities in order to accommodate demand from operators of larger, business class aircraft. As a result, we now have a fully equipped paint booth and a separate maintenance hangar that can accommodate such aircraft. However, over the last three years I have had to turn down work on CJ3's, Falcon 20, and 550 Bravo aircraft due to the airport's inadequate runways. My lost revenue during that period is over $1,000,000. Thanks for your attention in this matter.

Sincerely,

St B Searle

Stephen B. Searle, Jr.

Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Attachment D

ORMOND BEACH MUNICIPAL (OMN) RUNWAY LENGTH ANALYSIS

Generalized FAA Runway Length Curves

The FAA's method for determining the appropriate runway length for an airport when considering non-air carrier aircraft less than 60,000 pounds at their maximum takeoff weight is to utilize the runway length curves published in FAA AC 150/5325-4B and then make any required adjustments to account for runway vertical geometry and/or contaminated runway conditions. The FAA provides runway length curves developed for a grouping of turbine-powered aircraft (turboprops and business jets) commonly flown in U.S. airspace. **Appendix A** is an extract from the Advisory Circular that identifies the individual aircraft the FAA has included in these groups and for which they have developed the runway length curves. In total, four runway length curves were developed by the FAA for these groupings of aircraft. One set of curves explores the runway length required for the best performing 75% of aircraft in this group at two different loading levels, 60% and 90%. Another set of curves explores the runway length required for 100% of aircraft in this group at the same loading levels, 60 and 90%. The mean maximum temperature at Ormond Beach of the hottest month is 90.2 degrees F and is used for these calculations.

Based on the assumptions outlined above, **Table 1** presents the required runway takeoff and landing length at OMN for both 75% and 100% of the turbine fleet at 60% and 90% useful load at standard sea level and temperature conditions. Adjustments for runway elevation gradients and wet landing conditions are also depicted in the table based on each of the FAA runway length curves for airport design established for turbine-powered aircraft between 12,500 pounds and 60,000 pounds when at their maximum takeoff weight. Takeoff runway length is increased by 70 feet due to the 7 feet of effective runway gradient between the low and high elevations on the existing Runway 8-16. A 15% additional length is added to the balanced field length up to 5500 feet for turbojet power airplanes in the 60% useful load curve and up to 7000 feet for those in the 90% useful load curve to allow for wet or slippery braking conditions during landing.

Table 1 Runway Length Requirements for Aircraft between 12,500 and 60,000 lbs.

	Balanced Field Length (Ft)	Runway Gradient Adjustment (Ft)	Takeoff Required Length at OMN (Ft)	Contaminated Runway Adjustment Multiplier	Contaminated Required Landing Length at OMN (Ft)
75 Percent of Fleet					
60% Useful Load	4,700	70	**4,770**	1.15	**5,405**
90% Useful Load	6,700	70	**6,770**	1.15	**7,705**
100 Percent of Fleet					
60% Useful Load	5,300	70	**5,360**	1.15	**6,095**
90% Useful Load	8,200	70	**8,270**	1.15	**9,430**

Source: Hoyle, Tanner & Associates, Inc. 2012.

OMN's primary runway, Runway 8-26, is currently 4,005 feet in length. **The current runway length does not allow 75 percent of these turbine aircraft to operate at a 60 percent load factor when the runway is uncontaminated. Based on the analysis presented above, a runway extension of 765 feet would be required to enable 75 percent of these aircraft to operate at a 60 percent load factor when the runway is uncontaminated.** A 2765-foot extension would be required to support the same aircraft at 90% useful load.

Runway Length Required based on Airport Users Input

Many general aviation (GA) airports have witnessed an increased use of their primary runway by privately owned and chartered business turboprops and jets. Business aircraft have proved themselves to be a tremendous asset to corporations by satisfying their executive needs for flexibility in scheduling, speed, and privacy. In response to these types of needs, GA and Reliever airports like Ormond Beach who receive or anticipate regular usage by airplanes over 12,500 pounds should provide a runway length to support those users. The extension of an existing runway can be justified at OMN because they have a documented need to accommodate heavier airplanes on a frequent basis. During and after the recent Airport Master Planning process the City of Ormond Beach worked with local businesses and other airport users to better quantify their needs. The complete responses are included in **Appendix B**. A summary of the user needs and requirements are in Table 2.

Table 2 Runway needs based on users input.

Airport User	Aircraft Owner	Aircraft Model(s) Used	Destinations	Approximate Current or Projected Annual OMN Operations	Comments
Lewis Heaster Properties	NetJets	C560, C680, C750, CL35, CL60, EMB 505, FT2H	TEB, MEI, CKB	30	Aircraft type and size varies with customer needs.
Gary Yoemans	Blue Skies Aviation of Daytona	C550	East Coast	110	Plans to acquire a larger aircraft when RWY 8 is extended. The company owns several aircraft currently based at DAB, but would move to OMN when the primary runway has been extended.
NETJETS	NetJets	C560, C680, C750, CL35, CL60, EMB 505, FT2H	LAX, MDLR	6	NetJets supports the proposed extension of RWY 8 and has customer demand at OMN. Annual operations would increase by NetJets when the primary runway has been extended.

Airport User	Aircraft Owner	Aircraft Model(s) Used	Destinations	Approximate Current or Projected Annual OMN Operations	Comments
Entech Controls	NetJets	C560, C680, C750, CL35, CL60, EMB 505	MKC, APA, BUR	70	Aircraft type and size varies with customer needs.
Command Medical Products	Command Medical	Citation V	MNMG	200	Annual operations expected to double with business expansion.
World Color International	World Color Internationa l	Westwind II		134	Currently based at FIN due to runway length, but business is in the OMN business park.
Sunrise Aviation	Sunrise Aviation	Cessna Citation	Charter/Flight Training	unspecified	Sunrise plans to expand their FBO operations to include turbine transition training and charter service using the Cessna Citation family of aircraft, pending extension of the primary runway at OMN.
Stonewood Holdings LLC	NetJets	C560, C680, C750, CL35, CL60, EMB 505,	PVD	72	Aircraft type and size varies with customer needs.
Wayne Luginbuhl	Corporate/ Charter Pilot	CE500, CJII	East Coast, Europe, Russia	unspecified	Pilot also flies a CJ I with an Eagle modification to carry extra fuel. Pilot states that this aircraft, so equipped, faces operational restrictions at OMN.
Ormond Aircraft Brokers	Various	Various	N/A	unspecified	Tenant runs a paint shop; has had to turn away business due to lack of runway length.
Hangar Seven Aviation	Various	Various	N/A	unspecified	Tenant operates rental hangars; longer runway would support additional tenants and development.
	Total Proposed Operations			**622**	

Runway Length Required per Recent Aircraft Usage

Table 3 identifies GA aircraft making substantial use of OMN airfield in the past two years. Reviewing the specific requirements of each of these aircraft adds value to the runway lengths determined using the FAA's generalized runway length curves for aircraft between 12,500 and 60,000 pounds at Maximum Takeoff Weight (MTOW). **Table 3** presents runway length requirements for the identified aircraft, based on maximum allowable takeoff weights and highlights specific models that would have taken weight penalties to operate from existing OMN runways. OMN could anticipate more of these types of corporate, charter, and business aircraft to support local economic development after a runway length increase.

Table 3 Multiengine and Turbine Aircraft using OMN

OMN Past 2 Years Significant Users

From 12/01/2015 To 11/30/2016 | Airport=OMN | Not Regional Jet

	Current Aircraft Model Usage	Max Takeoff Weight	Takeoff Distance Unadjusted for Temp	Landing Distance
	AEST - Piper Aero Star	6,315	2500	2500
	B350 - Beech Super King Air 350	14,991	3280	2690
	BE20 - Beech 200 Super King	12,500	1870	1771
	BE30 - Raytheon 300 Super King Air	13,889	3950	3950
	BE40 - Raytheon/Beech Beechjet 400/T-1	16,094	3937	3608
	BE9L - Beech King Air 90	10,950	4329	4329
	C208 - Cessna 208 Caravan	8,000	2420	2420
	C25B - Cessna Citation CJ3	12,375	3450	2985
	C303 - Cessna T303 Crusader	5,159	1750	1500
	C337 - Cessna Turbo Super Skymaster	4,400	2000	2000
	C414 - Cessna Chancellor 414	6,746	1706	2300
	C425 - Cessna 425 Corsair	8,598	2465	2132
	C500 - Cessna 500/Citation I	10,847	3275	1870
	C501 - Cessna I/SP	10,847	3275	1870
	C510 - Cessna Citation Mustang	8,645	2800	2800
	C525 - Cessna CitationJet/CJ1	10,399	3081	2750
	C550 - Cessna Citation II/Bravo	15,102	3281	3300
	C650 - Cessna III/VI/VII	30,997	5030	2952
	C56X - Cessna Excel/XLS	19,200	3461	2919
	EA50 - Eclipse 500	6,000	2668	2668
	E55P - Embraer Phenom 300	17,968	3400	3400
	LJ25 - Bombardier Learjet 25	14,991	3937	2953
	P180 - Piaggio P-180 Avanti	11,552	2953	2953
	PA27 - Piper Aztec	5,200	2500	2500
	PA31 - Piper Navajo PA-31	6,500	3000	3000
	PAY1 - Piper Cheyenne 1	9,000	3334	3334
	PAY2 - Piper Cheyenne 2	9,474	4186	4186
	PAYE - Cheyenne	9,000	3340	3340
	PC12 - Pilatus PC-12	9,921	1968	1804
	SH33 - Shorts 330	22,597	3610	3610

Report created on Tue Jan 10 13:21:05 EST 2017 *FAA TFMSC Database*

Air Taxi/Charter CFR Part 135 Operations

An additional important consideration during runway length analysis are the specific FAA regulations that the pilot and aircraft are subject to. General Aviation pilots and operators not flying for hire are usually operating under 14 CFR Part 91 (general operating and flights rules) and are less restricted by runway length than commercial operators providing air taxi and charter on-demand commercial service. Commercial operators providing air taxi and charter services for a fee are required to operate under standards outlined in their specific FAA approved operating certificate. The certificate is based on 14 CFR Part 135 and requires, in part, that to depart for a destination, the aircraft weight on arrival, allowing for normal consumption of fuel and oil in flight, would allow a full stop landing at the intended destination airport within 60 percent of the effective length of the runway from a point 50 feet above the intersection of the obstruction clearance plane and the runway. For Ormond Beach this means that charter and air taxi operators currently need to conduct flight and performance planning to ensure an ability to land to a full stop within 60% of the 4005 feet of runway or 2403 feet. Many of the aircraft operators in **Table 3** must plan to arrive with minimal fuel and lightly loaded to meet that requirement. In other words, they must forego carrying full fuel or paying customers or both. Extending the runway by 1000 feet will allow those operating under Part 135 rules to carry additional payload and still meet the rule to land within 60% of the proposed runway 5005-foot length.[1]

SUMMARY

This study shows that private, corporate and charter business aircraft are the most adversely impacted by limited runway length when operating to or from OMN. Reductions in fuel, payload or both are the penalties paid by aircraft owners and operators when flying to and from shorter runways. With the weight penalties come reduced stage lengths, meaning landing earlier or prior to the ultimate destination to refuel. Shorter stage lengths with additional fuel stops extends the time required for the trip and increases the cycles on the airframe, which adds additional maintenance costs for the operator. The proposed additional runway pavement will clearly benefit the charter/corporate/business multiengine and turbine flight profiles. **Based on user input and the FAA methodology an extension to between 4770 to 6770 feet is required to permit 75% of the fleet between 12,500 and 60,000 pounds to takeoff from OMN with between 60% and 90% useful load.**

[1] CFR Title 14, Chapter1, subchapter G, Part 135, Subpart I, para 135.398 https://www.ecfr.gov/cgi-bin/text-idx?SID=f5fc4bc4e48da8db719833d199b124b2&mc=true&node=sp14.3.135.i&rgn=div6

CHAPTER 3. RUNWAY LENGTHS FOR AIRPLANES WITHIN A MAXIMUM CERTIFICATED TAKEOFF WEIGHT OF MORE THAN 12,500 POUNDS (5,670 KG) UP TO AND INCLUDING 60,000 POUNDS (27,200 KG)

301. DESIGN GUIDELINES. The design procedure for this airplane weight category requires the following information: airport elevation above mean sea level, mean daily maximum temperature of the hottest month at the airport, the critical design airplanes under evaluation with their respective useful loads. Once obtained, apply either figure 3-1 or figure 3-2 to obtain a single runway length for the entire group of airplanes under evaluation. Finally, apply any landing or takeoff length adjustments, if necessary, to the resulting runway length to obtain the recommended runway length.

302. DESIGN APPROACH. The recommended runway length for this weight category of airplanes is based on performance curves (figures 3-1 and 3-2) developed from FAA-approved airplane flight manuals in accordance with the provisions of 14 Code of Federal Regulations Part 25, *Airworthiness Standards: Transport Category Airplanes*, and Part 91, *General Operating and Flight Rules*. If the airport is planned for operations that will include only turbojet-powered airplanes weighing under 60,000 pounds (27,200 kg) maximum certificated takeoff weight (MTOW) in conjunction with other small airplanes of 12,500 pounds (5,670 kg) or less, use the curves shown in either figures 3-1 or 3-2. To determine which of the two figures to apply, first use tables 3-1 and 3-2 to determine which one of the two "percentage of fleet" categories represents the critical design airplanes under evaluation. With that determination, then select either the "60 percent useful load" curves or the "90 percent useful load" curves on the basis of the haul lengths and service needs of the critical design airplanes. **Note:** at elevations over 5,000 feet (1,524 m) above mean sea level, the recommended runway length obtained for small airplanes from chapter 2 may be greater than those obtained by these figures. In this case, the requirements for the small airplanes govern. Finally, the curves of figures 3-1 and 3-2 apply to airport elevations up to 8,000 feet (2,439 m) above mean sea level. For higher elevations, consult the airplane manufacturer(s) for their recommendations.

303. PERCENTAGE OF FLEET AND USEFUL LOAD FACTOR. The curves in figure 3-1 and 3-2 are based on a grouping of only the turbojet-powered fleet (and business jets) according to performance capability as contained in the FAA-approved airplane manuals under an assumed loading condition. Interpolation is allowed only within *a single set of curves* (e.g., an elevation at 2,500 feet within the "75 percent of the fleet at 60 percent useful load" set of curves) but not valid *between sets of curves* (e.g., an 85 percent useful load between the set of curves "75 percent of the fleet at 60 percent useful load" and "75 percent of the fleet at 90 percent useful load.") The restriction is because each set assumed a specific, non-variable loading condition. Figures 3-1 and 3-2 contain a set of two curves based upon the percentage of the fleet and the percentage of useful load that can be accommodated by the runway lengths obtained from the curves. For example, the "75 percent fleet at 60 percent useful load" curve provides a runway length *sufficient to satisfy the operational requirements* of approximately 75 percent of the fleet at 60 percent useful load. This figure is to be used for those airplanes operating with no more than a 60 percent useful load factor. Both figures 3-1 and 3-2 provide examples that start with the horizontal temperature axis, then proceed vertically to the airport elevation curve, and finally proceed horizontally to the vertical axis to obtain the runway length. The final step is to apply any necessary length adjustments to the obtained length in accordance with paragraph 304 to determine the recommended runway length.

a. Percentage of Fleet.

(1) Tables 3-1 and 3-2. Table 3-1 provides the list of those airplanes that comprise the "75 percent of fleet" category and therefore can be accommodated by the runway lengths resulting from figure 3-1. Table 3-2, provides the remaining airplanes beyond that of table 3-1 that comprise the "100 percent of fleet" category and therefore can be accommodated by the resulting runway lengths from figure 3-2. The distinction between the tables is that airplanes listed in table 3-2 require at least 5,000-foot (1,524 m) runways at mean sea level and at the standard day temperature of 59° F (15° C) (see paragraph 403 and table 4-1 for an explanation of the concept.). Airplanes listed in table 3-1 require less than 5,000 feet (1,524 m) for the same conditions.

(2) Selecting Figures 3-1 or 3-2. The airport designer must determine from which list the airplanes under evaluation are found. Use figure 3-1 when the airplanes under evaluation are not listed in table 3-2. If a relatively few airplanes under evaluation are listed in table 3-2, then figure 3-2 should be used to determine the runway length. If no adjustments to this length are necessary as outlined above, then this becomes the recommended runway length.

b. Useful Load Factor.

(1) The term *useful load factor* of an airplane for this AC is considered to be the difference between the maximum allowable structural gross weight and the operating empty weight. A typical operating empty weight includes the airplane's empty weight, crew, baggage, other crew supplies, removable passenger service equipment, removable emergency equipment, engine oil, and unusable fuel. In other words, the useful load then consists of passengers, cargo, and usable fuel. It is noted that although o*perating empty weight* varies considerably with individual airplanes, the curves used in the figures were based on the average operating empty weights of numerous business jets.

(2) Figures 3-1 and 3-2 provide only two useful load percentages, namely "60 percent useful load" and "90 percent useful load." Curves are not developed for operations at "100 percent useful load" because many of the airplanes used to develop the curves in figures 3-1 and 3-2 were operationally limited in the second segment of climb. That is, the allowable gross takeoff weight is often limited by ambient conditions of temperature and elevation to an operating weight that is less than their maximum structural gross weight. Therefore, APMs contain climb limitations when required. Because of the climb limitation, the runway length resulting from the "90 percent useful load" curves are considered by this AC to approximate the limit of beneficial returns for the runway. A specific list of business jets were used to obtain an average operating empty weight, which in turn, was used to develop the curves.

c. Privately Owned Business Jets. Business jets that are privately owned are included in their respective 75 percent and 100 percent of fleet categories.

d. Air Carrier Regional Jets. As previously mentioned, the recommended runway lengths for regional jets for air carrier service are addressed in chapter 4.

304. RUNWAY LENGTH ADJUSTMENTS. The runway lengths obtained from figures 3-1 and 3-2 are based on no wind, a dry runway surface, and zero *effective runway gradient*. Effective runway gradient is defined as the difference between the highest and lowest elevations of the runway centerline divided by the runway length. Therefore, increase the obtained runway lengths from the figures to account for (1) takeoff operations when the effective runway gradient is other than zero and (2) landing operations of turbojet-powered airplanes under wet and slippery runway surface conditions. These increases are not cumulative since the first length adjustment applies to takeoffs and the latter to landings. After both adjustments have been independently applied, the larger resulting runway length becomes the recommended runway length. The procedures for length adjustments are as follows:

a. Effective Runway Gradient (Takeoff Only). The runway lengths obtained from figures 3-1 or 3-2 are increased at the rate of 10 feet (3 meters) for each foot (0.3 meters) of elevation difference between the high and low points of the runway centerline.

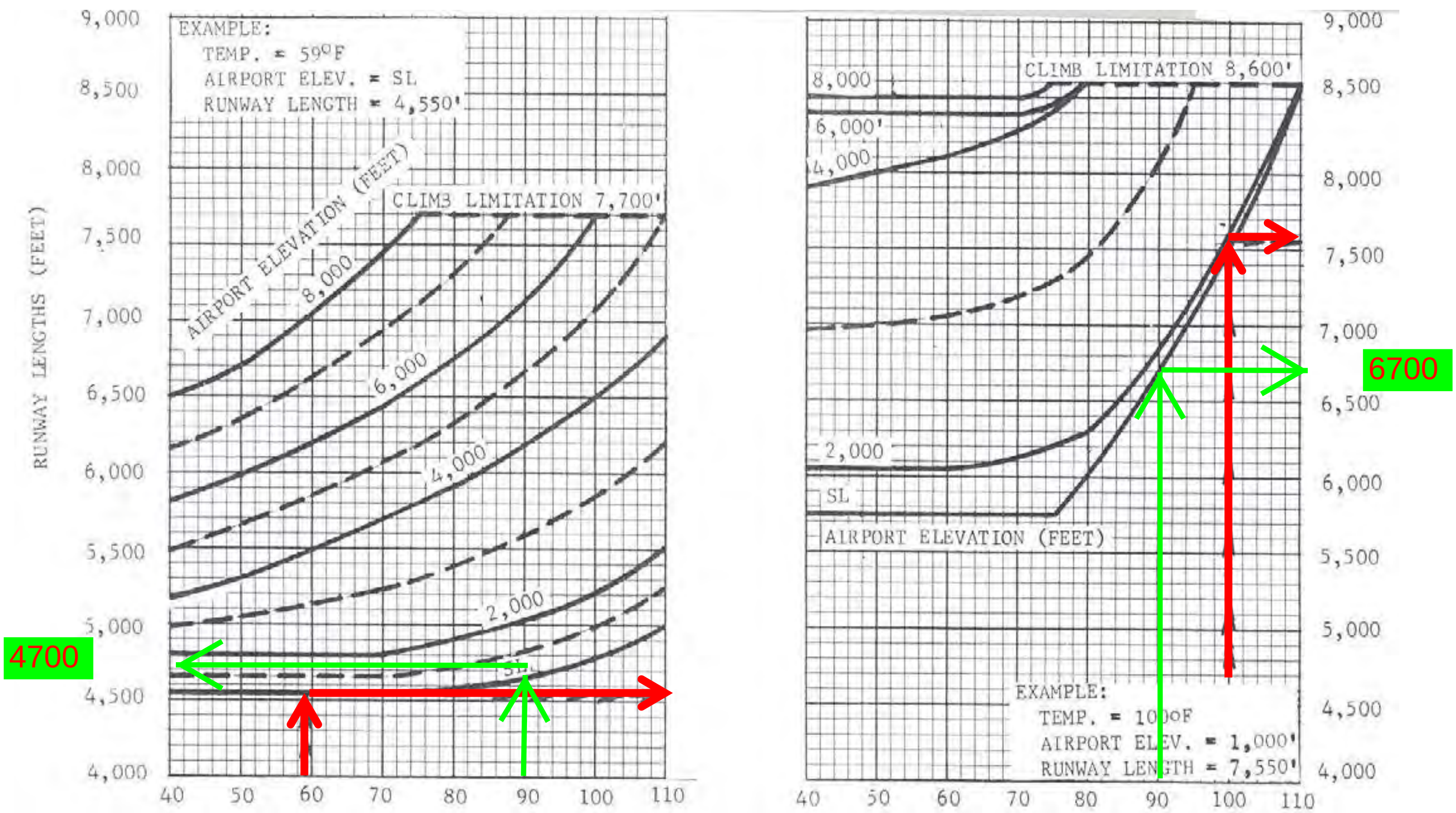
b. Wet and Slippery Runways (Applicable Only to Landing Operations of Turbojet-Powered Airplanes). By regulation, the runway length for turbojet-powered airplanes obtained from the "60 percent useful load" curves are increased by 15 percent or up to 5,500 feet (1,676 meters), whichever is less. By regulation, the runway lengths for turbojet powered airplanes obtained from the "90 percent useful load" curves are also increased by 15 percent or up to 7,000 feet (2,133 meters), whichever is less. No adjustment is necessary by regulation for turboprop-powered airplanes.

305. PRECAUTION FOR AIRPORTS LOCATED AT HIGH ALTITUDES. At elevations above 5,000 feet (1,524 m) mean sea level, the recommended runway length for *propeller* driven airplanes of 12,500 pounds (5,670 kg) MTOW or less found in chapter 2 may be *greater* than those determined in this chapter for turbojet-powered airplanes. In this case, the longer recommended runway length of the small airplane weight category must be provided.

306. GENERAL AVIATION AIRPORTS. General aviation (GA) airports have witnessed an increase use of their primary runway by scheduled airline service and privately owned business jets. Over the years business jets have proved themselves to be a tremendous asset to corporations by satisfying their executive needs for flexibility in scheduling, speed, and privacy. In response to these types of needs, GA airports that receive regular usage by large airplanes over 12,500 pounds (5,670 kg) MTOW, in addition to business jets, should provide a runway length comparable to non-GA airports. That is, the extension of an existing runway can be justified at an existing GA airport that has a need to accommodate heavier airplanes on a frequent basis.

Aircraft that typically require less than 5000 feet of Runway at standard Sea Level & 59 deg F. (table 3-1 aircraft)

Figure 3-1. 75 Percent of Fleet at 60 or 90 Percent Useful Load



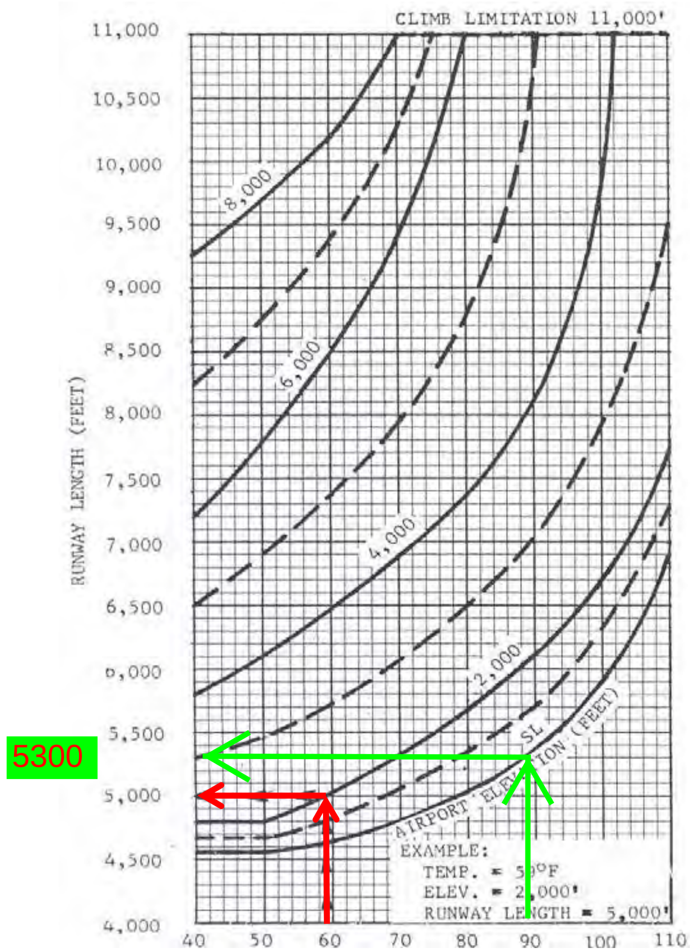
Green Arrows Are OMN at 90.2 degrees F.

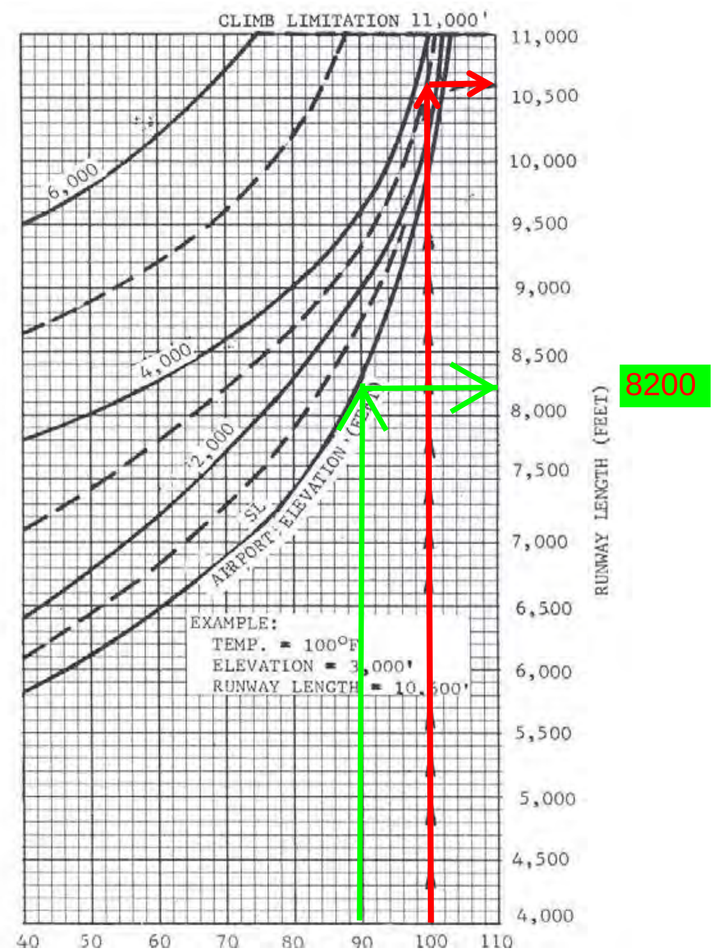
Mean Daily Maximum Temperature of Hottest Month of the Year in Degrees Fahrenheit

75 percent of feet at 60 percent useful load **75 percent of feet at 90 percent useful load**

Aircraft that typically require more than 5000 feet of Runway at standard Sea Level & 59 deg F. (Table 3-2 Aircraft)

Figure 3-2. 100 Percent of Fleet at 60 or 90 Percent Useful Load





Green Arrows are OMN at 90.2 degrees F.

Mean Daily Maximum Temperature of Hottest Month of the Year in Degrees Fahrenheit

100 percent of feet at 60 percent useful load **100 percent of feet at 90 percent useful load**

Table 3-1. Airplanes that Make Up 75 Percent of the Fleet

Manufacturer	Model	Manufacturer	Model
Aerospatiale	Sn-601 Corvette	Dassault	Falcon 10
Bae	125-700	Dassault	Falcon 20
Beech Jet	400A	Dassault	Falcon 50/50 EX
Beech Jet	Premier I	Dassault	Falcon 900/900B
Beech Jet	2000 Starship	Israel Aircraft Industries (IAI)	Jet Commander 1121
Bombardier	Challenger 300	IAI	Westwind 1123/1124
Cessna	500 Citation/501Citation Sp	Learjet	20 Series
Cessna	Citation I/II/III	Learjet	31/31A/31A ER
Cessna	525A Citation II (CJ-2)	Learjet	35/35A/36/36A
Cessna	550 Citation Bravo	Learjet	40/45
Cessna	550 Citation II	Mitsubishi	Mu-300 Diamond
Cessna	551 Citation II/Special	Raytheon	390 Premier
Cessna	552 Citation	Raytheon Hawker	400/400 XP
Cessna	560 Citation Encore	Raytheon Hawker	600
Cessna	560/560 XL Citation Excel	Sabreliner	40/60
Cessna	560 Citation V Ultra	Sabreliner	75A
Cessna	650 Citation VII	Sabreliner	80
Cessna	680 Citation Sovereign	Sabreliner	T-39

Table 3-2. Remaining 25 Percent of Airplanes that Make Up 100 Percent of Fleet

Manufacturer	Model
Bae	Corporate 800/1000
Bombardier	600 Challenger
Bombardier	601/601-3A/3ER Challenger
Bombardier	604 Challenger
Bombardier	BD-100 Continental
Cessna	S550 Citation S/II
Cessna	650 Citation III/IV
Cessna	750 Citation X
Dassault	Falcon 900C/900EX
Dassault	Falcon 2000/2000EX
Israel Aircraft Industries (IAI)	Astra 1125
IAI	Galaxy 1126
Learjet	45 XR
Learjet	55/55B/55C
Learjet	60
Raytheon/Hawker	Horizon
Raytheon/Hawker	800/800 XP
Raytheon/Hawker	1000
Sabreliner	65/75

Note: Airplanes in tables 3-1 and 3-2 combine to comprise 100% of the fleet.

Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Attachment E

ENVIRONMENTAL ASSESSMENT
ORMOND BEACH MUNICIPAL AIRPORT

Affected Environment Sections:

I. **Air Quality**
II. **Climate**
III. **Noise**

FINAL

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May 2017

Revision 2 (May 16, 2017)

KB Environmental Sciences

This document provides the affected environment sections for air quality, climate, and noise for the Environmental Assessment (EA) at Ormond Beach Municipal Airport (OMN). The proposed project involves the extension of Runway 8-26 by 1,000 feet to the west, as documented in the Airport's recent Master Plan. The analysis was conducted in accordance with Federal Aviation Administration (FAA) Order 1050.1F, *Environmental Impacts: Policies and Procedures* and the accompanying *1050.1F Desk Reference,* and the FAA *Aviation Emissions and Air Quality Handbook.*

I. AIR QUALITY

This section includes information on existing air quality conditions in the area surrounding the Airport, including (i.) the regulatory agencies involved in the management of air quality, (ii.) relevant air quality regulations, (iii.) the attainment/nonattainment status and (iv.) recently recorded air monitoring data. An assessment of the air quality effects associated with the proposed projects at OMN is discussed in the environmental consequences section of the EA.

a. Regulatory Agencies

The management of air quality conditions in Florida, including the area around OMN, is the responsibility of federal, state, regional, and local governmental air quality regulatory agencies. Under the federal Clean Air Act (CAA), the U.S. Environmental Protection Agency (EPA) establishes the guiding principles and policies for protecting air quality conditions throughout the nation. EPA's primary responsibilities in this area include promulgating the National Ambient Air Quality Standards (NAAQS), which define ambient concentrations for criteria air pollutants that are considered safe for public health, welfare and the environment, as well as approving State Implementation Plans (SIPs).

The Federal Aviation Administration (FAA) is the primary agency involved in, and responsible for, ensuring that air quality impacts associated with proposed airport projects adhere to the reporting and disclosure requirements of the National Environmental Policy Act (NEPA) as well as the General Conformity rule of the CAA.

On the state level, the Florida Department of Environmental Protection (FDEP) is responsible for enforcing the CAA including compliance with the NAAQS, the issuance of air emission source permits, monitoring of air quality conditions, and assisting in the preparation of the SIP. Volusia County falls under FDEP's Division of Air Resource Management for the Central District. EPA Region 4 also serves the state of Florida.

At the local level, Volusia County relies upon the designated state agency in charge of air quality, the Florida DEP, for leadership on matters of air quality. Volusia County also recognizes the roles of the EPA as a key agency in air quality regulations and improvements in the area.

b. National Ambient Air Quality Standards

Pursuant to the requirements of the CAA, the EPA establishes, enforces, and periodically reviews the NAAQS. The NAAQS are set to safeguard public health and environmental welfare against the detrimental effects of ambient air pollution and are defined as primary and/or secondary standards. Primary NAAQS are health-based standards geared toward protecting sensitive or at-risk portions of the population such as asthmatics, children, and the elderly. Secondary NAAQS are welfare oriented and are designed to prevent decreased visibility and damage to animals, vegetation, and physical structures. NAAQS have been established for six common air pollutants, referred to as criteria pollutants: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (particle pollution) with a diameter of 10 microns or less (PM_{10}) and a diameter of 2.5 microns or less ($PM_{2.5}$), and sulfur dioxide (SO_2). Nitrogen oxides (NO_x) and volatile organic compound (VOC) emissions are precursors to ozone formation. The NAAQS are listed in **Table 1**.

Table 1: National Ambient Air Quality Standards (NAAQS)

Pollutant		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)		Primary	8 hours	9 ppm	Not to be exceeded more than once per year
			1 hour	35 ppm	
Lead (Pb)		Primary and secondary	Rolling 3 month average	0.15 µg/m^3 (1)	Not to be exceeded
Nitrogen Dioxide (NO_2)		Primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		Primary and secondary	1 year	53 ppb (2)	Annual Mean
Ozone (O_3)		Primary and secondary	8 hours	0.070 ppm (3)	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution (PM)	**$PM_{2.5}$**	Primary	1 year	12.0 µg/m^3	annual mean, averaged over 3 years
		Secondary	1 year	15.0 µg/m^3	annual mean, averaged over 3 years
		Primary and secondary	24 hours	35 µg/m^3	98th percentile, averaged over 3 years
	PM_{10}	Primary and secondary	24 hours	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO_2)		Primary	1 hour	75 ppb (4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		Secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

Notes: ppm – parts per million and µg/m^3 – micrograms per cubic meter.
(1) In areas designated nonattainment for the lead standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m^3 as a calendar quarter average) also remain in effect.
(2) The level of the annual NO_2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.
(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standards additionally remain in effect in some areas. Revocation of the previous (2008) O_3 standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.
(4) The previous SO_2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which implementation plans providing for attainment of the current (2010) standard have not been submitted and approved and which is designated nonattainment under the previous SO_2 standards or is not meeting the requirements of a SIP call under the previous SO_2 standards (40 CFR 50.4(3)), A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the require NAAQS.
Source: EPA, NAAQS Table, https://www.epa.gov/criteria-air-pollutants/naaqs-table, 2017.

c. Attainment/Nonattainment Status

The EPA designates areas as either meeting (attainment) or not meeting (nonattainment) the NAAQS. An area with measured pollutant concentrations that exceed the NAAQS is designated as a nonattainment area. Once a nonattainment area meets the NAAQS and the additional re-designation requirements in the CAA, the EPA will designate the area as a maintenance area. Ozone nonattainment areas are further classified as extreme, severe, moderate, or marginal. An area is designated as unclassifiable when there is a lack of sufficient data to form the basis of an attainment status determination.

The CAA requires states to develop a general plan to attain and/or maintain the primary and secondary NAAQS in all areas of the country and to develop a specific plan to attain the standards for each area designated nonattainment for a NAAQS. These plans, known as SIPs, are developed by state and local air quality management agencies and submitted to the EPA for approval. OMN is located in Volusia County which is currently an area designated as “attainment” of all NAAQS established by EPA.

d. General Conformity Requirements

The General Conformity Rule of the federal CAA prohibits federal agencies (including the FAA) from permitting or funding projects that do not conform to an applicable SIP. The General Conformity Rule applies only to areas that are designated nonattainment or maintenance. Because OMN is located in Volusia County which is currently an area designated as “attainment” of all NAAQS established by EPA, General Conformity requirements outlined under the federal CAA do not apply to the proposed project and accordingly a General Conformity Applicability Analysis is not warranted. However, for disclosure purposes under NEPA an operational and construction emissions inventory associated with the proposed improvements at OMN is presented in the environmental consequences section of the EA.

e. Transportation Conformity Requirements

The CAA also contains a Transportation Conformity Rule that functions similarly to the General Conformity Rule. The Transportation Conformity Rule restricts federal funding to highway or transportation projects that do not conform to an applicable SIP. The responsibility of transportation conformity determination is vested in the Federal Highway Administration (FHWA) and state Department of Transportation (DOT). The proposed improvements to OMN are not subject to the Transportation Conformity Rule because it is not a roadway/highway project.

f. Air Quality Monitoring Data

The EPA and local state agencies maintain air quality monitoring stations throughout the United States. These monitors record concentrations of pollutants in the ambient (i.e., outdoor) air to gauge compliance with the NAAQS. Available data from the closest monitoring stations to OMN are presented in **Table 2.** For ease of reference, the applicable NAAQS for each monitored pollutant is included on the table as well as the distance from the airport. As shown, concentrations of all criteria pollutants were below the NAAQS for all three years.

Table 2: Air Monitoring Data						
Station Name/ID	Pollutant	Averaging Period	NAAQS	Year		
				2014	2015	2016
Winter Park Site ID: 12-095-2002 Morris Boulevard, Winter Park Distance: 51.5 miles	CO	8-hour	9 ppm	1.7	1.3	1.3
		1-hour	35 ppm	1.8	1.6	1.5
	SO_2	3-hour[1]	0.5 ppm	--	--	--
		1-hour	0.075 ppm	0.005	0.004	0.004
	NO_2	Annual	0.053 ppm	0.005	0.004	0.004
		1-hour	0.10 ppm	0.04	0.03	0.03
Daytona Blind Services Site ID: 12-127-5002 1185-A Dunn Avenue, Daytona Beach Distance: 7.4 miles	O_3	8-hour[2]	0.075 ppm	0.06	0.06	0.06
	$PM_{2.5}$	Annual[3]	12 µg/m^3	6	6	6
		24-hour[4]	35 µg/m^3	15	15	13
	PM_{10}	24-hour[5]	150 µg/m^3	49	46	41

Notes: ppm = parts per million; µg/m3 = micrograms per cubic meter; NAAQS = National Ambient Air Quality Standards.
(1) Value not available due to lack of air monitoring data within 35 miles of OMN.
(2) Standard based on the annual fourth-highest daily maximum 8-hour concentration, averaged over three years.
(3) Standard based on the annual mean, averaged over three years.
(4) Standard based on the daily 98th percentile, averaged over three years.
(5) Not to be exceeded more than once per year.
Source: USEPA AirData – http://www.epa.gov/airdata/, May 2017.

II. CLIMATE

Research has shown that the increase in atmospheric greenhouse gas (GHG) emissions is significantly affecting the Earth's climate. These conclusions are based upon a scientific record that includes substantial contributions from the United States Global Change Research Program (USGCRP)—a program mandated by Congress in the Global Change Research Act to "assist the Nation and the world to understand, assess, predict, and respond to human-induced and natural processes of global change.[1] In 2009, based primarily on the scientific assessments of the USGCRP, as well as the National Research Council (NRC) and the Intergovernmental Panel on Climate Change (IPCC), the EPA issued a finding that it was reasonable to assume that changes in our climate caused by elevated concentrations of GHG in the atmosphere endanger the public health and public welfare of current and future generations.[2] In 2015, EPA acknowledged more recent scientific assessments that "highlight the urgency of addressing the rising concentration of carbon dioxide (CO_2) in the atmosphere".[3]

The EPA and the FAA traditionally work within the standard-setting process of the International Civil Aviation Organization's (ICAO) Committee on Aviation Environmental Protection (CAEP) to establish

[1] Global Change Research Act of 1990, Pub. L. 101–606, Sec. 103 (November 16, 1990), http://www.globalchange.gov.
[2] Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66496 (Dec. 15, 2009).
[3] EPA, Final Rule for Carbon Pollution Emission Guidelines for Existing Stationary Sources Electric Utility Generating Units, 80 Fed. Reg. 64661, 64677 (Oct. 23, 2015).

international emission standards and related requirements, which individual nations later adopt into domestic law. At its meeting in February of 2016, ICAO/CAEP agreed on the first-ever international standards to regulate CO_2 emissions from aircraft.[4] In July of 2016 the EPA formally announced that GHG emissions from certain classes of aircraft engines contribute to climate change.

Notably, there are currently no standards for ambient concentrations of GHGs. The IPCC estimates that aviation accounted for 4.1 percent of world-wide transportation GHG emissions during the year 2013. The EPA data indicates that commercial aviation contributed to 6.4 percent of total CO_2 emissions in 2014, compared with other sources, including electric generation (30 percent), the remainder of the transportation sector (19.6 percent), industry (21 percent), commercial (7 percent), residential (6 percent), agricultural (9 percent) and U.S. territories (<1 percent).[5]

III. NOISE

This section presents the assessment of the affected environment for noise at OMN, including (a.) regulatory background, (b.) noise model input data, and (c.) noise exposure results.

a. Regulatory Background

The noise analysis was developed using the Federal Aviation Administration (FAA) Aviation Environmental Design Tool (AEDT) version 2c. The AEDT was developed by the FAA using methods and calculations from SAE International's Aerospace Information Report (AIR) 1845, *Procedure for the Calculation of Airplane Noise in the Vicinity of Airports*.

The AEDT produces aircraft noise contours that delineate areas of equal day-night average sound level (DNL). The AEDT works by defining a network of grid points at ground level around an airport. It then selects the shortest distance from each grid point to each flight track and computes the noise exposure generated by each aircraft operation, along each flight track. Corrections are applied for atmospheric acoustical attenuation, acoustical shielding of the aircraft engines by the aircraft itself, and aircraft speed variations. The noise exposure levels for each aircraft are then summed at each grid location. The cumulative noise exposure levels at all grid points are then used to develop noise exposure contours for selected values (e.g. DNL 65, 70 and 75 dB). Using the results of the grid point analysis, noise contours of equal noise exposure can then be plotted.

The DNL is a 24-hour time-weighted sound level that is expressed in A-weighted decibels and is abbreviated as dB(A) or dB. The FAA, and other federal agencies, use DNL as the primary measure of noise impact because: it correlates well with the results of attitudinal surveys regarding noise; it increases with the duration of noise events; and, it accounts for an increased sensitivity to noise at night by increasing each noise event that occurs during nighttime hours (i.e., 10:00 pm to 6:59 am) by 10 dB(A).

In Appendix A of 14 CFR Part 150, the FAA identifies, as a function of yearly (365-day average) DNL value, land uses which are compatible and land uses which are not compatible in an airport environs. As shown

[4] The ICAO intends to approve the standard in October of 2016 and to formally adopt the standards in March of 2017.
[5] EPA, GHG allocation by economic sector, Environmental Protection Agency (2016). Inventory of U.S. Greenhouse Gas Emission and Sinks: https://www3.epa.gov/climatechange/Downloads/ghgemissions/US-GHG_Inventory-2016-Main-Text.pdf. (January 2017).

in **Table 3**, the FAA considers all land uses to be compatible with aircraft noise if the DNL is less than 65 dB(A).

FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*[6] stipulates the following regarding the analysis and documentation of noise exposure:

> For proposed airport development and other actions in the immediate vicinity of an airport, the AEDT is used to provide noise exposure contours at the DNL 65, 70, and 75 dB levels (additional contours may be provided on a case-by-case basis). For all comparisons analyzed, the analysis will identify noise increases of DNL 1.5 dB or more over noise sensitive areas that are exposed to noise at or above the DNL 65 dB noise exposure level, or that would be exposed at or above the DNL 65 dB level due to a 1.5 dB or greater increase, when compared to the no action alternative for the same timeframe.

This section includes documentation of the existing 2016 DNL contours, the data used to develop the contours, and any noise sensitive sites located within the limits of the DNL 65 dB. Future no-build and build conditions are discussed in the environmental consequences section of the EA.

Table 3: Land Use Compatibility

Land Use	DNL expressed in dB(A)					
	Below 65	65–70	70–75	75–80	80–85	Over 85
Residential						
Residential, other than mobile homes and transient lodgings	Y	N(1)	N(1)	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N(1)	N(1)	N(1)	N	N
Public Use						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
Commercial Use						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail—building materials, hardware and farm equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade—general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	25	30	N	N
Manufacturing and Production						
Manufacturing, general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)

[6] Federal Aviation Administration Order 1050.1F, Appendix B, Section B-1.4. July 2015.

Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts and camps	Y	Y	Y	N	N	N
Golf courses, riding stables and water recreation	Y	Y	25	30	N	N

Notes: SLUCM=Standard Land Use Coding Manual. Y (Yes) = Land Use and related structures compatible without restrictions. N (No) = Land Use and related structures are not compatible and should be prohibited. NLR = Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
25, 30, or 35=Land use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated into design and construction of structure.
(1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.
(2) Measures to achieve NLR 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
(3) Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
(4) Measures to achieve NLR 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal level is low.
(5) Land use compatible provided special sound reinforcement systems are installed.
(6) Residential buildings require an NLR of 25.
(7) Residential buildings require an NLR of 30.
(8) Residential buildings not permitted.
Source: 14 CFR Part 150.

b. AEDT Input Data

In the development of DNL contours, the AEDT uses both default and airport-specific factors. The default factors include engine noise levels, thrust settings, aircraft arrival and departure flight profiles and aircraft speed. The airport-specific factors include the number of aircraft operations, the type of aircraft, runway use, the assignment of aircraft operations to flight tracks, operational time (day/night), and, for departures, the stage (i.e., trip) length. The following paragraphs describe these data.

The 2016 OMN annual operations were developed using data in the Airport's 2016 Airport Master Plan Update. The 2016 annual aircraft operations by category is provided in **Table 4.** As shown, in 2016 there were 127,170 annual operations (an average of approximately 348 operations per day).

Table 4: 2016 Annual Aircraft Operations

Year	Single Engine	Multi-Engine Piston	Turboprop	Jet	Helicopter	Military	Total
2016	97,060	19,360	3,257	1,130	6,359	4	127,170

Source: Airport Master Plan Update, January 2016, HTA, Inc; KB Environmental Sciences, Inc.

For the purposes of preparing DNL contours, operational data were segregated by aircraft type. The FAA's Traffic Flow Management System Count (TFMSC) for the calendar year 2016 was used to develop the 2016 AEDT aircraft fleet mix for OMN. TFMSC data provides information on traffic counts by airport and includes the aircraft types operating at that airport. The TFMSC data for OMN was reviewed and each aircraft type was assigned the corresponding AEDT aircraft type.

The 2016 average-day aircraft fleet of itinerant and local operations are provided in **Tables 5 and 6,** respectively. An itinerant operation is defined as an aircraft departure where the aircraft leaves the airport vicinity and lands at another airport, or an aircraft landing where the aircraft arrives from another airport. Local operations are aircraft touch-and-go training operations. A touch-and-go operation occurs when an aircraft departs an airport, lands on a runway and then departs again without stopping. For noise modeling purposes, OMN Air Traffic Control Tower (ATCT) staff estimated that approximately five percent operations at the airport occur during the nighttime hours (10:00 pm to 6:59 am).

Table 5: 2016 Average-Day Itinerant Operations

Aircraft Category	Aircraft Types	Daytime Operations	Nighttime Operations	Total Operations
Single Engine Piston	Cessna 172/182	78.264	4.119	82.384
	Cessna 150	10.786	0.568	11.353
	Piper PA-28	10.302	0.542	10.844
	Cirrus SR20	7.171	0.377	7.548
	Piper PA-32 Cherokee Six	4.638	0.244	4.882
	Cirrus SR22	3.134	0.165	3.299
	Mooney M20	2.590	0.136	2.726
	Cessna 206/210	0.843	0.044	0.888
	Piper PA-24/46 Malibu	0.843	0.044	0.888
Multi-Engine Piston	Piper PA-23 / 31	19.495	1.026	20.521
	Piper PA-44 Seminole	7.048	0.371	7.419
	Beech Baron 55/58/60	3.194	0.168	3.362
	Cessna 310/340	2.892	0.152	3.044
	Cessna 414/421	1.543	0.081	1.625
	Piper PA-34 Seneca	1.325	0.070	1.395
Turboprop	Super King Air 200/300	7.777	0.409	8.186
	Cessna 425 Conquest I	0.302	0.016	0.318
	King Air 90/100	0.200	0.011	0.211
	Pilatus PC-12	0.198	0.010	0.208
Jet	Cessna 550 Citation Bravo	1.944	0.102	2.047
	Cessna 500 Citation I	0.497	0.026	0.523
	Cessna 510 Citation Mustang	0.200	0.011	0.211
	Cessna 525/525B CitationJet	0.198	0.010	0.208
	Cessna 560 Excel/XLS	0.102	0.005	0.107

Table 5: 2016 Average-Day Itinerant Operations				
Aircraft Category	**Aircraft Types**	**Daytime Operations**	**Nighttime Operations**	**Total Operations**
Helicopter	Schweizer 300	16.551	0.871	17.422
Military	C-130	0.010	0.001	0.011
Total Average-Day Itinerant Operations:		182.046	9.581	191.627

Notes: (1) Totals may be subject to rounding.
Source: FAA TFMSC 2016; KB Environmental Sciences, Inc., 2017.

Table 6: 2016 Average-Day GA Local Operations				
Aircraft Category	**Aircraft Types**	**Daytime Operations**	**Nighttime Operations**	**Total Operations**
Single-Engine Piston	Cessna 172/182	86.445	4.550	90.995
	Cessna 150	11.923	0.628	12.551
	Piper PA-28	11.390	0.599	11.989
	Cirrus SR20	7.925	0.417	8.342
	Piper PA-32 Cherokee Six	5.986	0.315	6.301
	Cirrus SR22	3.464	0.182	3.647
	Mooney M20	3.758	0.198	3.956
	Cessna 206/210	3.160	0.166	3.326
Multi-Engine Piston	Piper PA-23 / 31	8.209	0.432	8.641
	Piper PA-44 Seminole	3.519	0.185	3.704
	Beech Baron 55/58/60	1.642	0.086	1.729
	Cessna 310/340/414/421	1.523	0.080	1.603
Total Average-Day Local Operations:		148.944	7.839	156.784

Notes: (1) Totals may be subject to rounding.
Source: FAA TFMSC 2016; KB Environmental Sciences, Inc., 2017.

c. Runway Layout and Use

OMN has two runways, Runway 8/26, which is 4,005 feet long and Runway 17/35 which is 3,704 feet long. The runway use by aircraft category for itinerant and local operations was based upon information provided by the OMN ATCT staff and is shown in **Table 7**.

Table 7: Percent Runway Use by Aircraft Category					
Itinerant					
Category	**Runway**				
	8	**26**	**17**	**35**	**Total**
Jet / Turboprop	50	30	10	10	100
Single Engine / Multi-Engine Piston	40	30	20	10	100
Local					
Single Engine / Multi-Engine Piston	40	30	20	10	100

Source: ATCT Staff, 2017.

d. Flight Tracks

The AEDT uses airport-specific ground tracks and vertical flight profiles to compute three-dimensional flight paths for each modeled aircraft. The "default" AEDT vertical profiles, which consist of altitude, speed, and thrust settings, are compiled from data provided by aircraft manufacturers.

The location of flight tracks is an important factor in determining the geographic distribution of noise on the ground. Flight tracks utilized by itinerant (arrivals and departures) and local (touch-and-go) at OMN were developed by ATCT staff. These tracks were input and modeled in the AEDT. The itinerant AEDT modeled flight tracks are shown on **Figures 1 and 2**, and the local touch-and-go modeled tracks are shown on **Figure 3**. Helicopter flight tracks are shown on **Figure 4**. The flight track use percentages provided by ATCT staff are included in **Tables 8 through 10**.

Table 8: Percent Flight Track Use by Aircraft Category - Departures				
Departures				
Runway	Track	Jet/Turboprop	Single Engine/Multi-Engine Piston	Helicopter
8	8D1	100%		
	8D2		40%	
	8D3		50%	
	8D4		10%	
	Total	**100%**	**100%**	
17	17D1	100%		
	17D2		10%	
	17D3		70%	
	17D4		20%	
	Total	**100%**	**100%**	
26	26D1	100%		
	26D2		70%	
	26D3		20%	
	26D4		10%	
	Total	**100%**	**100%**	
35	35D1	100%		
	35D2		80%	
	35D3		20%	
Total		**100%**	**100%**	
Helipad (H1)	HD1			50%
	HD2			40%
	HD3			10%
	Total			**100%**

Source: ATCT Staff, 2017.

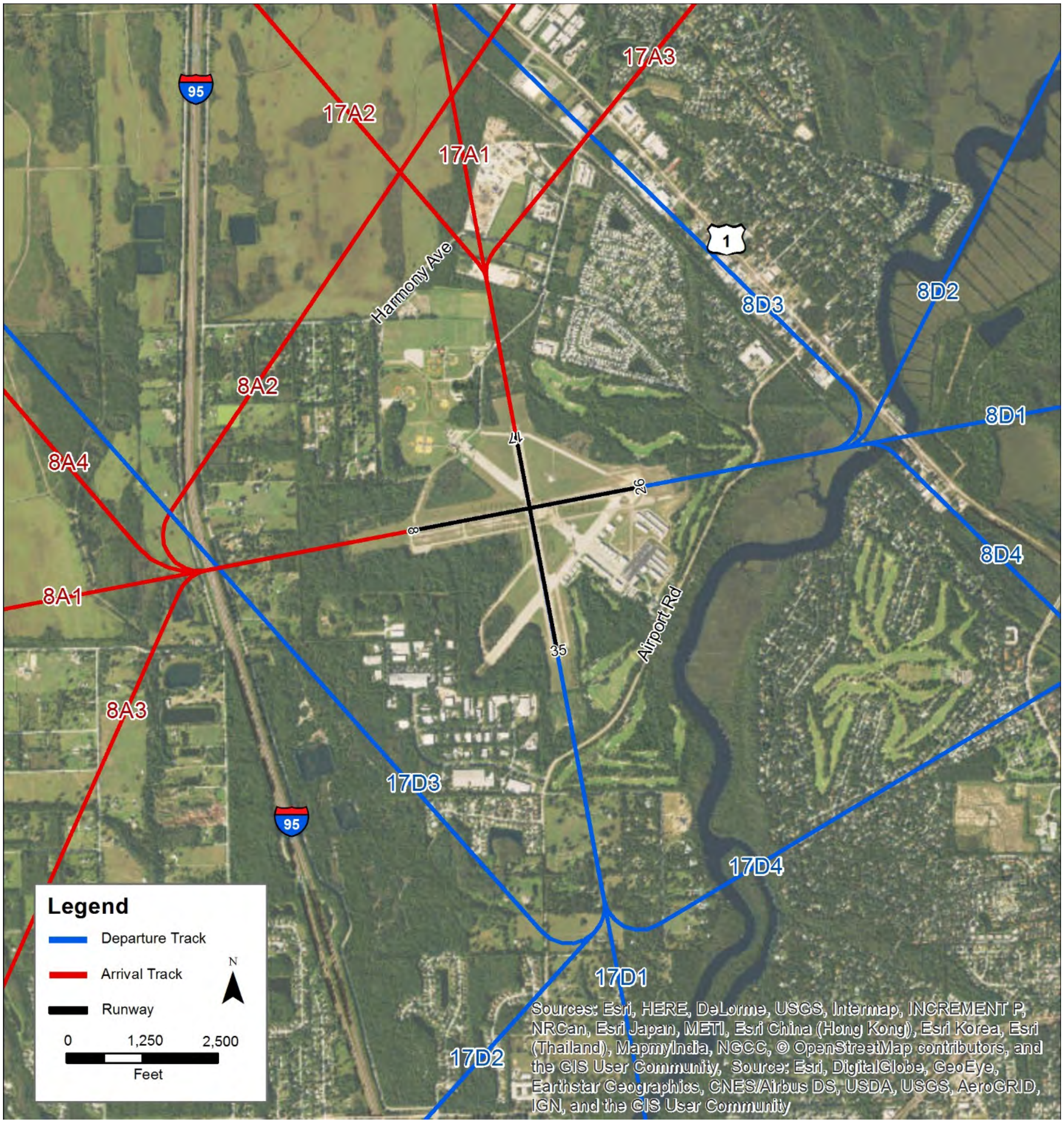
Table 9: Percent Flight Track Use by Aircraft Category - Arrivals				
Arrivals				
Runway	**Track**	**Jet/Turboprop**	**Single Engine/Multi-Engine Piston**	**Helicopter**
8	8A1	100%		
	8A2		40%	
	8A3		20%	
	8A4		40%	
	Total	**100%**	**100%**	
17	17A1	100%	40%	
	17A2		40%	
	17A3		20%	
	Total	**100%**	**100%**	
26	26A1	100%		
	26A2		30%	
	26A3		40%	
	26A4		30%	
	Total	**100%**	**100%**	
35	35A1	100%	30%	
	35A2		40%	
	35A3		30%	
Total		**100%**	**100%**	
Helipad (H1)	HA1			50%
	HA2			40%
	HA3			10%
	Total			**100%**

Source: ATCT Staff, 2017.

Table 10: Percent Flight Track Use by Aircraft Category – Touch-And-Go		
Touch-and-Go		
Runway	**Track**	**Single Engine/Multi-Engine Piston**
8	8T1	90%
	8T2	10%
	Total	**100%**
17	17T1	90%
	17T2	10%
	Total	**100%**
26	26T1	90%
	26T2	10%
	Total	**100%**
35	35T1	90%
	35T2	10%
Total		**100%**

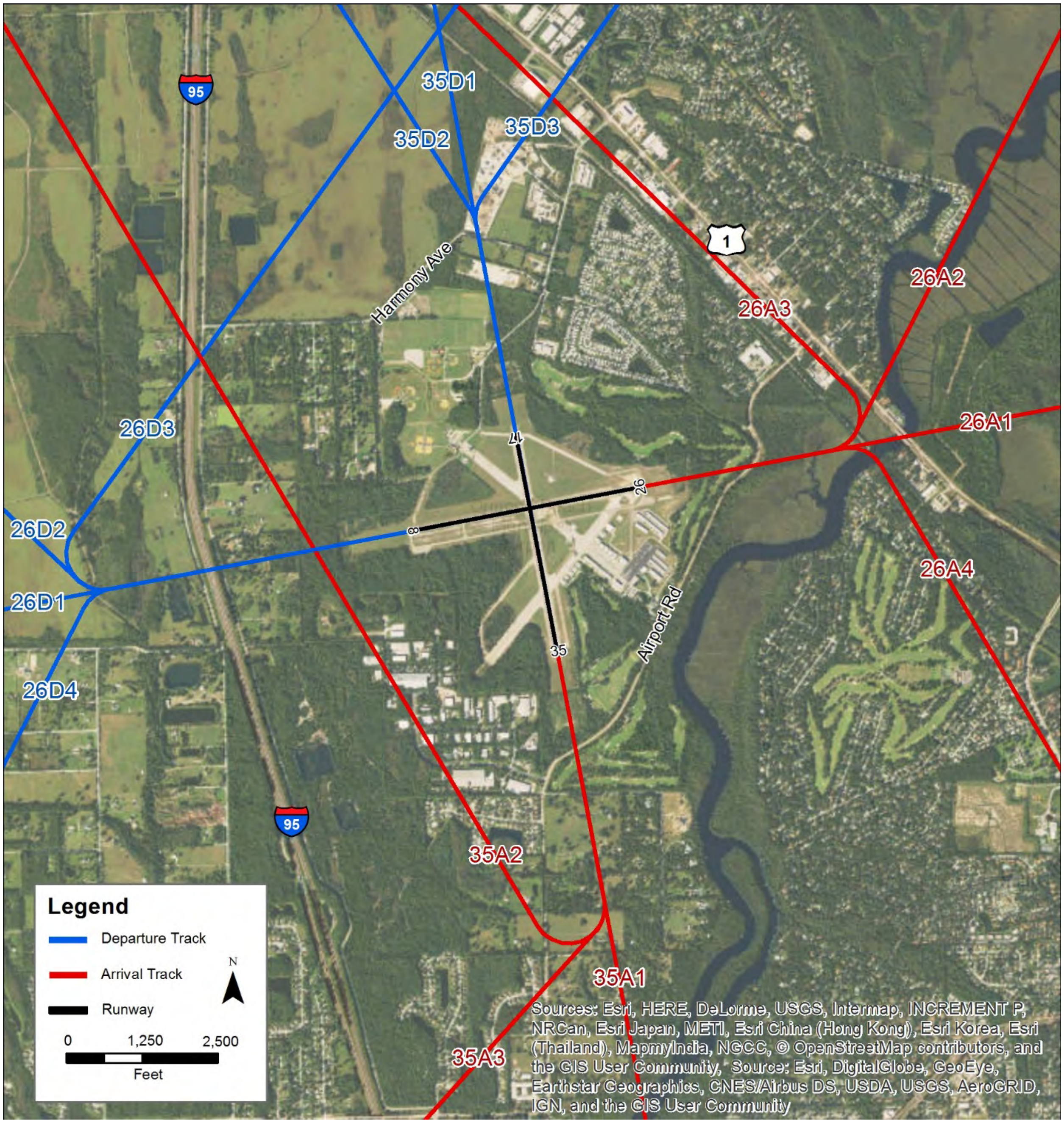
Source: ATCT Staff, 2017.

Figure 1: Modeled Itinerant Flight Tracks – East / South Flow



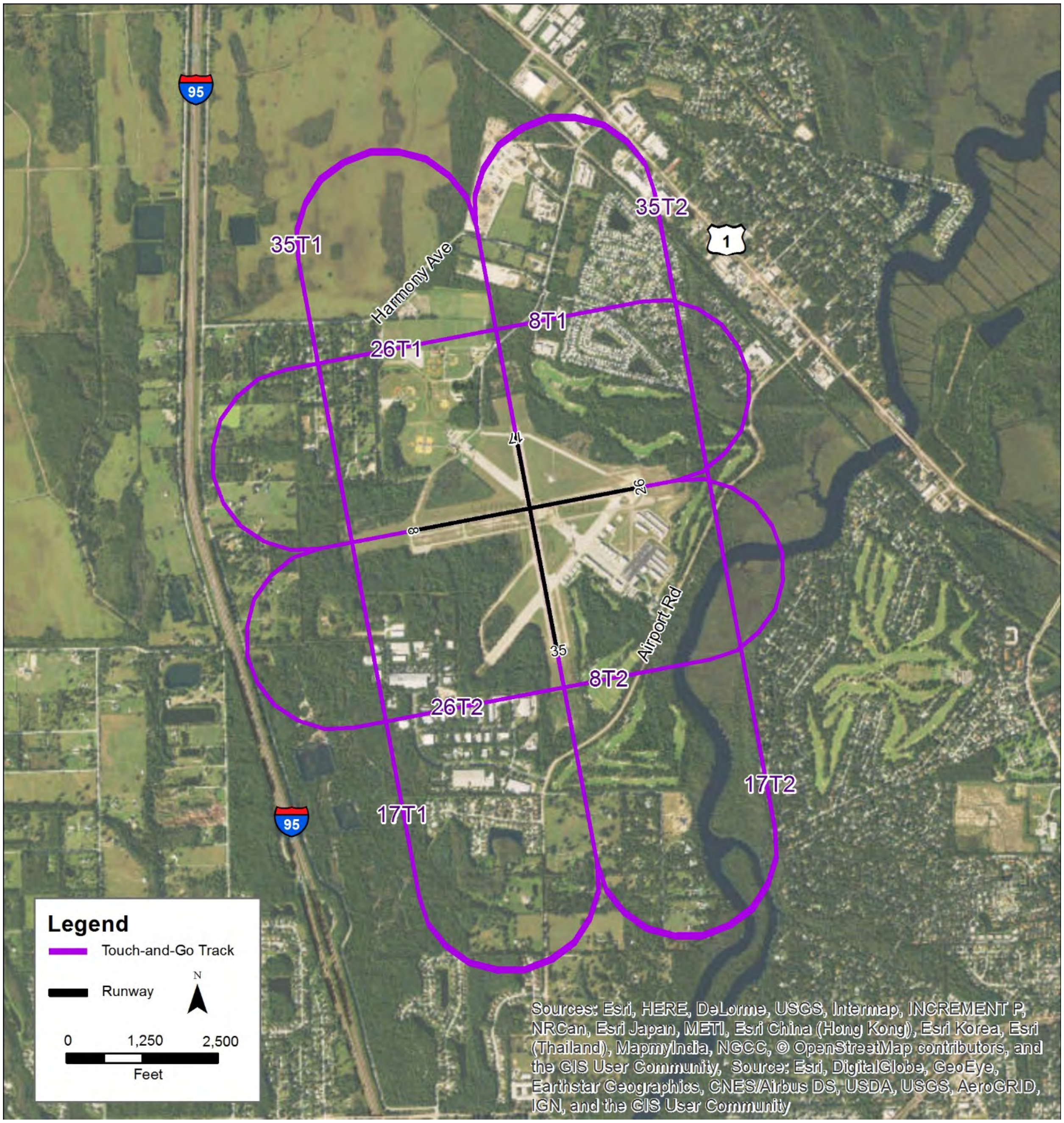
Source: ATCT Staff, 2017; KB Environmental Sciences, Inc.

Figure 2: Modeled Itinerant Flight Tracks – West / North Flow



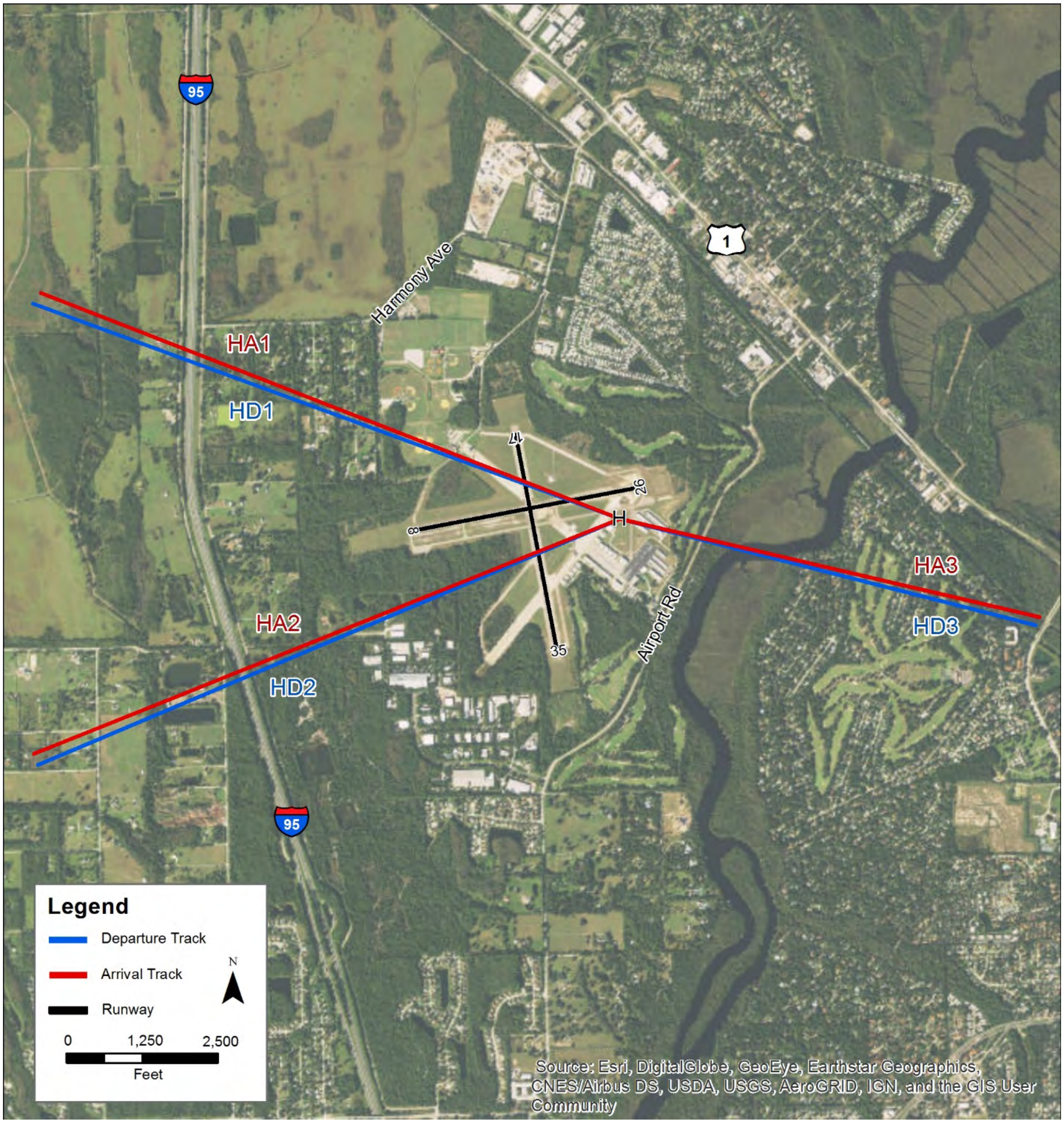
Source: ATCT Staff, 2017; KB Environmental Sciences, Inc.

Figure 3: Modeled Touch-and-Go Flight Tracks – All Runways



Source: ATCT Staff, 2017; KB Environmental Sciences, Inc., 2017.

Figure 4: Modeled Helicopter Flight Tracks

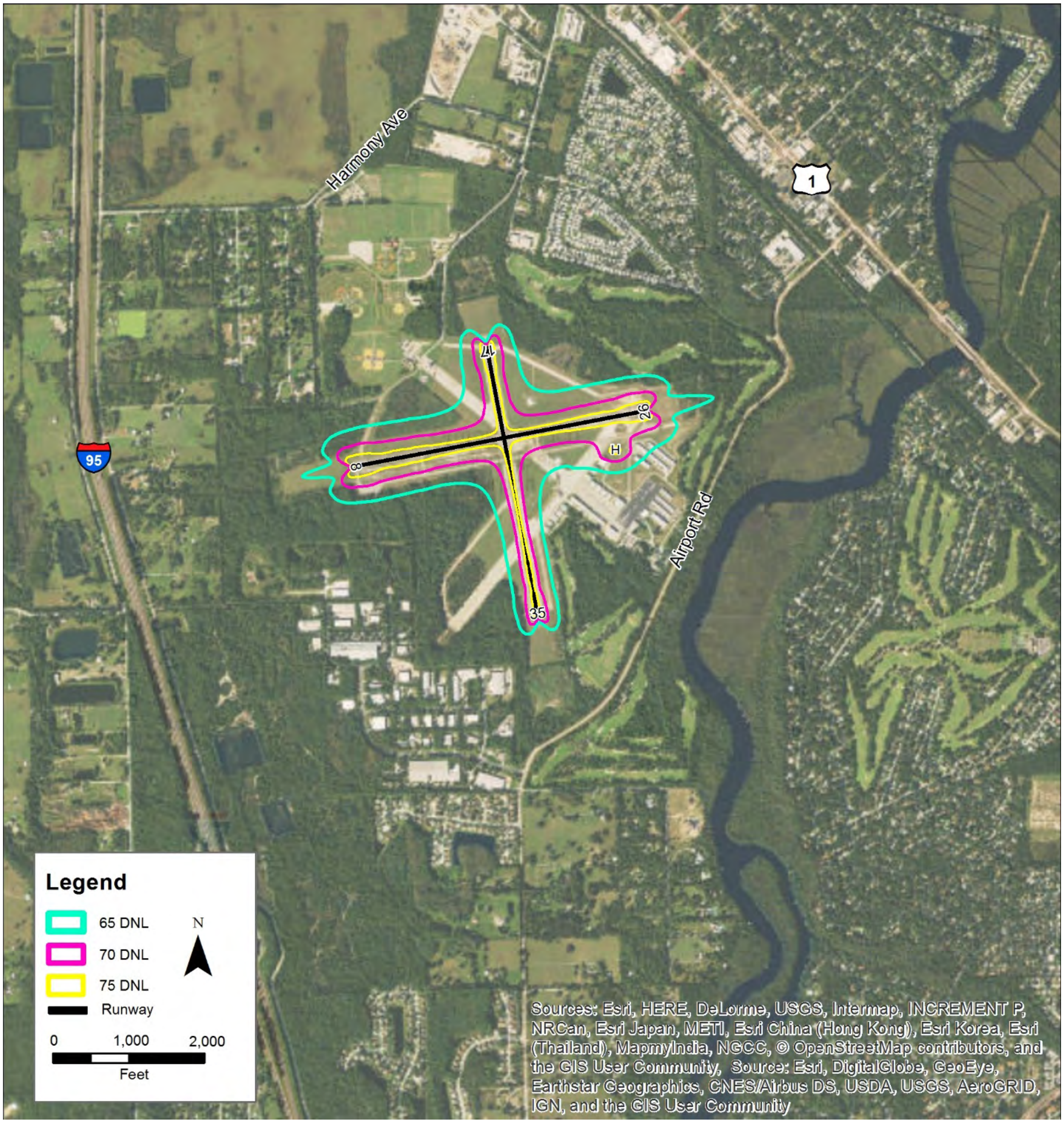


Source: ATCT Staff, 2017; KB Environmental Sciences, Inc., 2017.

e. Noise Contours

The 2016 DNL contours are provided on **Figure 5**. **Table 11** identifies the areas within the DNL contour ranges. As shown in the table, the total area within the 65 dB and greater DNL contour is approximately 161 acres. Notably, there are no residences or other noise sensitive land uses within the DNL 65 dB contour.

Figure 5: 2016 DNL Contours



Source: KB Environmental Sciences, Inc., 2017.

Table 11: DNL Contour Areas	
DNL (dB)	**Area (Acres)**
65 to <70	88
70 to <75	49
75 and greater	24
Total	161

Source: KB Environmental Sciences, Inc., 2017.

Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Attachment F

BIOLOGICAL CONSULTING SERVICES, INC.

ENVIRONMENTAL ASSESSMENT REPORT

ORMOND BEACH AIRPORT
Runway 08-26 Extension

For Submittal to:

City of Ormond Beach
22 South Beach Street
Ormond Beach, FL 32714

Prepared for:

Hoyle, Tanner & Associates, Inc.
95 East Mitchell Hammock Road
Suite 200
Oviedo, Florida 32765

By:

Biological Consulting Services, Inc.
208 Rush Street
New Smyrna Beach, FL 32168

May 2017

Joe H. Young III, President
Principal Field Biologist

208 Rush Street • New Smyrna Beach, FL 32168 • 386-423-3402
Web: biologicalconsultingservices.com • Email: biocon@bellsouth.net

INDEX

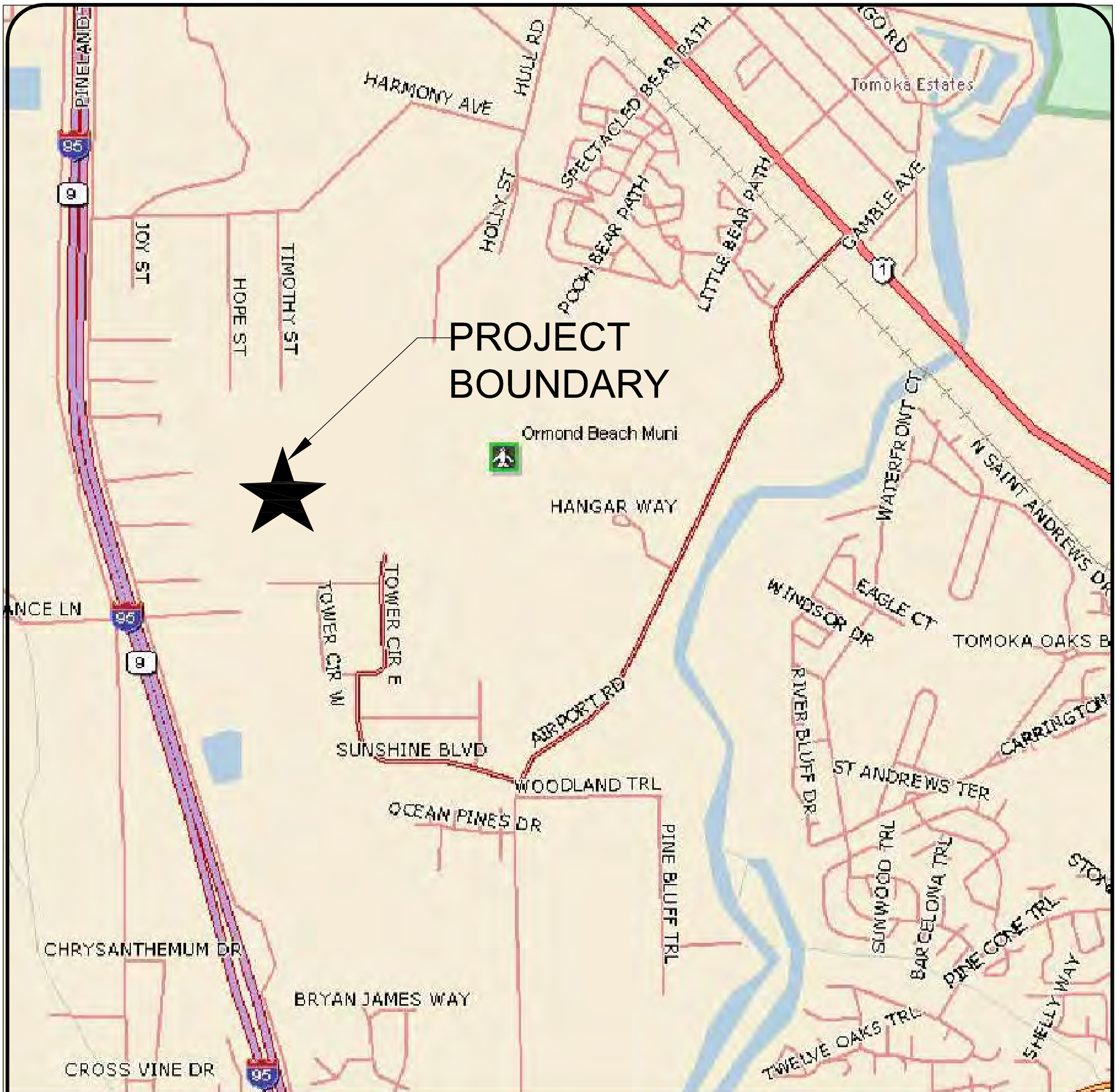
1.0 SITE LOCATION AND DESCRIPTION

The Runway 08-26 Extension project site is located within the Ormond Beach Municipal Airport, east of I-95, north of the Airport Business Park (off Sunshine Boulevard), south of Harmony Avenue and west of Airport Road in Sections 12 & 38, Township 14 South, and Range 31 East in Volusia County, Florida.

The proposed project is for the extension and improvement of the existing Runway 08-26 (specifically the west end at Runway 08) by implementing Federal Aviation Administration standards for overall runway length as well as improving the adjacent Runway Safety Area (RSA) and the Runway Object Free Area (ROFA) that are associated with the proposed runway extension as well as obstruction removal for the "Tower Line of Sight" for the runway extension. Currently, Runway 08-26 does not meet FAA standards for these safety areas and the proposed improvements will need to occur in order to bring the runway up to FAA standards for federally controlled airports. The improvements include the 1000'+/- extension of the current runway on the west end of Runway 08 and the clearing and grading of an associated RSA area at the west end of the new runway extension terminus. The proposed project area consists of approximately 59.936± acres.

The site is mainly in natural vegetation with adjacent land use consisting of vacant land in natural vegetation, single family home sites and the Ormond Beach Airport. The site topography is characterized as being relatively flat within the upland areas which gently slope toward the wetlands within the project site boundaries. Elevations range from the 30'.0 contour in the uplands down to the 22.0' contour within the wetlands on site.

The site was reviewed to determine the potential occurrence of wetlands and the quality of wetlands observed on site, the presence of state and federally listed threatened and endangered species, to identify vegetative communities that occur on the property, and review the physical features (soils and topography). Pedestrian field surveys were conducted on April 6 and 21, 2017. Plant communities were subsequently mapped and community types were classified utilizing the Florida Land Use, Cover and Forms Classification System (FLUCCS) (Florida Department of Transportation, 1999).



N

SCALE: 1" = 2000'

0 500' 1000' 2000'

GRAPHIC SCALE

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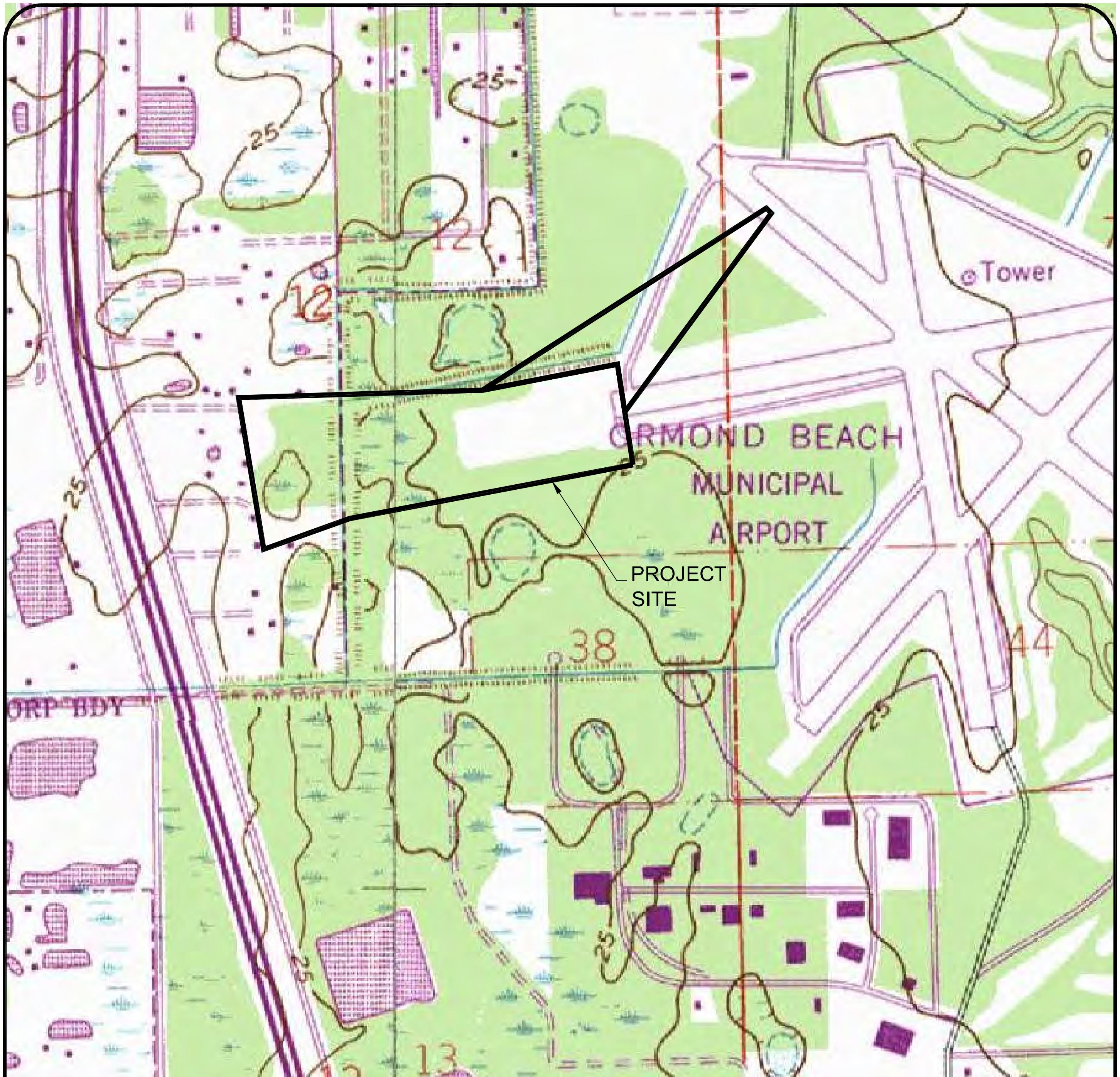
BIOLOGICAL CONSULTING SERVICES, INC.

drawn	JPC
date	04/24/17
scale (size A)	1"= 2000'
job no.	17-03019

LOCATION MAP

ORMOND BEACH AIRPORT
RUNWAY 08-26 EXTENSION



N

SCALE: 1" = 1000'

0 250' 500' 1000'

GRAPHIC SCALE

MAP ADAPTED FROM
DIGITAL QUAD MAP

ORMOND BEACH, FL
1956
REVISED 1993

SCALE MAY
VARY SLIGHTLY

PROJECT LOCATED IN
SEC. 12 & 38 TWP. 14 S. RNG 31 E.

APPROXIMATE CENTER OF SITE
LAT. 29° 18' 1.50" N.,
LONG. 81° 7' 18.82" W.

SITE AREA = 59.936 ±ACRES

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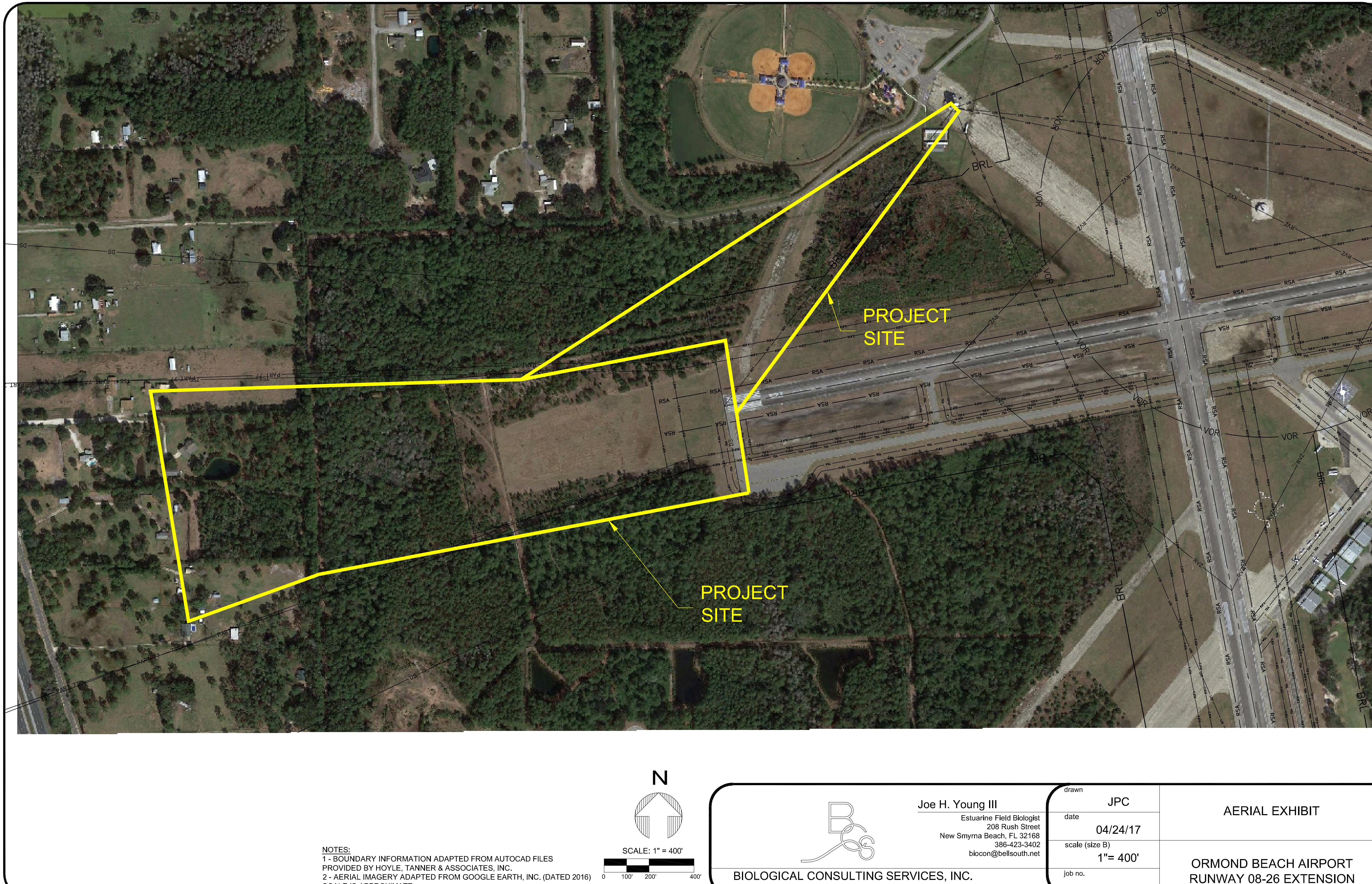
date	04/24/17
scale (size A)	1"= 1000'
job no.	17-03019

QUADRANGLE MAP

ORMOND BEACH AIRPORT
RUNWAY 08-26 EXTENSION



NOTES:
1 - BOUNDARY INFORMATION ADAPTED FROM AUTOCAD FILES PROVIDED BY HOYLE, TANNER & ASSOCIATES, INC.
2 - AERIAL IMAGERY ADAPTED FROM GOOGLE EARTH, INC. (DATED 2016) SCALE IS APPROXIMATE.

Joe H. Young III Estuarine Field Biologist 208 Rush Street New Smyrna Beach, FL 32168 386-423-3402 biocon@bellsouth.net BIOLOGICAL CONSULTING SERVICES, INC.	drawn JPC date 04/24/17 scale (size B) 1"= 400' job no. 17-03019	AERIAL EXHIBIT ORMOND BEACH AIRPORT RUNWAY 08-26 EXTENSION

3.0 SOIL SURVEY

The Natural Resources Conservation Service Web Soil Survey (websoilsurvey.nrcs.usda.gov) indicates that the following soil types are found in this area. Normally vegetation within these soil types indicates hydric *(wetland)* or non-hydric *(non-wetland)* characteristics.

8	Basinger Fine Sand, Depressional (hydric)
13	Cassia Fine Sand (non-hydric)
30	Immokalee Sand, Depressional (hydric)
32	Myakka Fine Sand (non-hydric)
33	Myakka Fine Sand, Depressional (hydric)

The soil survey is fairly accurate in the typing of soils; however, boundaries of the soils are sometimes poorly indicative of site conditions. Please review the Soils Map for soil type boundaries and the chart below for soil type/vegetation correlation for this site.

UPLAND SOILS	WETLAND SOILS
13 – Cassia Fine Sand	8 – Basinger Fine Sand
32 – Myakka Fine Sand	30 – Immokalee Sand, Depressional
	33 – Myakka Fine Sand, Depressional

Basinger Fine Sand soil (8) is defined as a poorly drained, nearly level sandy soil typically found in depressions and in a few poorly defined drainage ways in the Flatwoods. The water table is within 30 inches of the surface during dry periods and above the surface for several months. Permeability is very rapid throughout. **Category: Hydric**

Cassia fine sand (13) is characterized as a somewhat poorly drained sandy soil typically found in elevated areas within flatwoods or in lower areas within sandhill communities. Generally, the water table is between depths of 15 and 40 inches for approximately 6 months during most years. During dry seasons the water table may recede to below 40 inches. Permeability is moderately rapid in the subsoil but very rapid in the other horizons. **Category: Non-hydric**

Immokalee sand, depressional soil (30) is a poorly drained, nearly level sandy soil which occurs in shallow intermittent ponds and sloughs in the flatwoods. The water table is within 10 inches of the surface for about 6 months in most years. Water stands above the surface for long periods after heavy rain. Permeability is moderate or moderately rapid in the subsoil and rapid in the other layers. **Category: Hydric**

Myakka fine sand soil (32) is characterized as a nearly level, poorly drained soil, typically found in flatwoods. The water table is within 12 inches of the surface from June to November and typically within 40 inches of the surface the rest of the year. Permeability is rapid in the surface layer and moderate in the subsoil layers. **Category: Non-hydric**

Myakka Fine Sand, Depressional (33) soils are characterized as a nearly level, poorly drained soil typically found in flatwoods, freshwater marshes and ponds. The water table is within 10 inches of the surface from May to November and typically within 24 inches of the surface the rest of the year. Permeability is rapid in the surface layer and moderate in the subsoil layers. **Category: Hydric**

The hydric soils listed for this site are the Basinger fine sand, depressional (8), Immokalee sand, depressional (30) and Myakka fine sand, depressional (33) soils types. The other soils types showed upland characteristics and upland vegetation was the dominant cover, indicating non-hydric conditions.

The depth to water table attribute of these soils was analyzed using the Natural Resource Conservation Service Web Soil Survey for this site (www.websoilsurvey.usda.nrcs.gov). The depth to water table is defined as the distance below grade that the saturated zone of the soil can be found within a specific soil type. Below is a chart that lists the existing soils on site and the corresponding depth to water table.

SOILS ON SITE	**DEPTH TO WATER TABLE**
8 – Basinger Fine Sand	0 cm (0 feet)
13 – Cassia Fine Sand	46 cm (1.51 feet)
30 – Immokalee Sand, Depressional	0 cm (0 feet)
32 – Myakka Fine Sand	31 cm (1.02 feet)
33 – Myakka Fine Sand, Depressional	0 cm (0 feet)

SOIL MAP - VOLUSIA COUNTY

N

SCALE: 1" = 600'

0 150' 300' 600'

GRAPHIC SCALE

SOIL TYPE ON SITE:

8 BASINGER FINE SAND, DEPRESSIONAL-hydric
13 CASSIA FINE SAND-non-hydric
30 IMMOKALEE SAND, DEPRESSIONAL-hydric
32 MYAKKA FINE SAND-non-hydric
33 MYAKKA FINE SAND, DEPRESSIONAL-hydric

NOTES:
1 - SOILS MAPPING ADAPTED FROM INFORMATION FOUND ON THE NATURAL RESOURCES CONSERVATION SERVICE WEB SOIL SURVEY. (websoilsurvey.nrcs.usda.gov)

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BIOLOGICAL CONSULTING SERVICES, INC.

drawn JPC	SOILS MAP
date 04/27/17	
scale (size A) 1"= 600'	ORMOND BEACH AIRPORT RUNWAY 08-26 EXTENSION
job no. 17-03019	

3.0 FLORIDA LAND USE COVER & FORMS CLASSIFICATION SYSTEM

The vegetative communities and land uses on the project site were field verified, and the site was mapped utilizing the Florida Land Use, Cover and Forms Classification System (FLUCCS, FDOT, 1999). Nine (9) land use and cover types were identified in and around the project site.

310	Herbaceous (Dry Prairie)
411	Pine Flatwood
413	Sand Pine
510	Streams and Waterways (Ditch)
618	Willow and Elderberry
620	Wetland Coniferous Forest
621	Cypress
643	Wet Prairie
811	Airports

The following section presents a brief description of the land use and cover classes mapped for the project area.

3.1 VEGETATIVE COMMUNITIES

The vegetative communities encountered on the site with the dominant vegetative cover are listed below:

#310 – Herbaceous (Dry Prairie): This category includes upland prairie grasses, sedges and rushes which occur on non-hydric soils and are located within the open areas west of the existing Runway 08. These grasslands are generally treeless with a variety of vegetation types dominated by **Bahia Grass** *(Paspalum notatum).*

#411 – Pine Flatwoods: This community is found over a portion of the uplands on site, and is dominated by **Slash pine** (*Pinus elliottii*) in the canopy. The subcanopy consists of a mix of **Wax myrtle** (*Myrica cerifera*), **Cabbage palm** (*Sabal palmetto*), and juvenile canopy species. The groundcover is dominated by **Saw Palmetto** (*Serenoa repens*), with other components of **Gallberry** (*Ilex glabra*), **Bracken fern** (*Pteridium aquilinum*), and juvenile canopy and subcanopy species.

#413 - Sand Pine: This community is found in combination with the Pine Flatwoods community described above on the north side of the site and is dominated by **Sand pine** (*Pinus clausa*) and **Slash pine** (*Pinus elliottii*) in the canopy. The subcanopy consists of **Sand Live oak** (*Quercus geminata*), **Myrtle oak** (*Quercus myrtifolia*), **Live oak** (*Quercus virginiana*), **Staggerbush** (*Lyonia ferruginea*), **Wax myrtle**, and juvenile **Sand**

pine. The groundcover consists of **Broomsedge** (*Andropogon virginicus*), **Saw palmetto**, **Yaupon holly** (*Ilex vomitoria*), and juvenile subcanopy species.

#510 – Streams and Waterways (Ditch): This category is found within the existing ditching areas located within the project area. These areas are man-made water conveyance features with the primary function of storm water conveyance.

#618 – Willow and Elderberry: This community is found over a small portion of the wetland areas on site and is primarily dominated by **Carolina Willow** (*Salix caroliniana)* with a minor component of **Cabbage palm** (*Sabal palmetto*), **Wax myrtle** (*Myrica cerifera*) and **Broom-sedge** *(Andropogon virginicus).*

#620 - Wetland Coniferous Forests: This community is found within a portion of the wetland areas on site. The canopy is dominated by **Slash pine** with minor amounts of young **Cypress**, and the subcanopy is dominated by young **Slash pine** mixed with **Wax myrtle**. The groundcover mainly consists of **St. Johns wort** *(Hypericum fasciculatum),* **Blue maidencane** *(Amphicarpum muhlenbergianum),* **Red root** *(Lachnanthes caroliniana),* **Bog buttons** *(Eriocaulon spp.),* and **Yellow-eyed grass** *(Xyris spp.).*

#621 - Cypress: This community occurs in the deeper parts of the wetlands, and is dominated by Cypress in the canopy, with juvenile **Cypress**, **Tupelo** *(Nyssa sylvatica),* **Dahoon holly** *(Ilex cassine),* and **Wax myrtle** in the subcanopy. The groundcover is dominated by a mix of various wetland plants including several species of **Rushes** *(Juncus spp.),* **Sedges** *(Carex spp.),* **Panic grasses** *(Panicum spp.),* **Beakrushes** *(Rhynchospora spp.),* **St. Johns wort** *(Hypericum spp.),* and other supporting wetland species.

#643 – Wet Prairie: This community is found over a small portion of the wetland areas on site and currently being used as pasture lands. This area is primarily dominated by **Bahia Grass** *(Paspalum notatum)* with a minor component of **Soft Rush** *(Juncus effusus)*, **Spikerush** *(Eleocharis baldwinii)* and **Broom-sedge** *(Andropogon virginicus)*

#811 – Airports: This classification is for the active runway, non-active runway and taxiway areas.

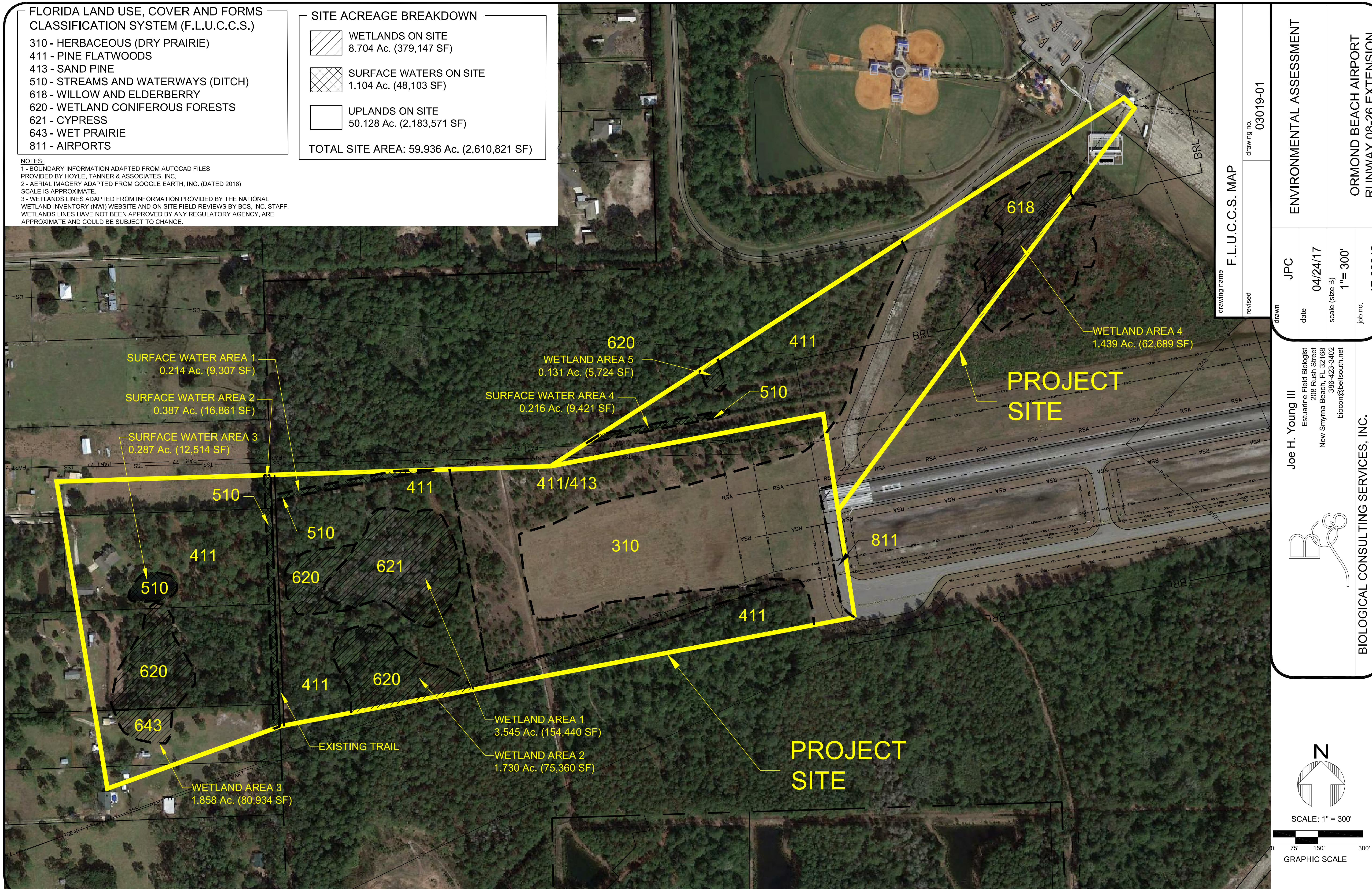
4.0 WETLANDS and SURFACE WATER DESCRIPTION

The wetlands on site can be found in five (5) systems. **Wetland Area 1** (3.545 acres; 154,440 sq. ft.) is centrally located within the project site, approximately 1,200' from west end of Runway 08. This wetland area is considered isolated within the landscape. **Wetland Area 2** (1.730 acres; 75,360 sq. ft.) is located along the southern project boundary and continues offsite to the south. **Wetland Area 3** (1.858 acres; 80,934 sq. ft.) is located on the far west side of the project site, approximately 2200' from the west end of Runway 08. This wetland area is considered isolated within the landscape. **Wetland Area 4** (1.439 acres; 62,689 sq. ft.) is located within the "Tower Line of Sight" on the northeast side of the project site and continues offsite to the south. This wetland area is isolated within the landscape. **Wetland Area 5** (0.131 acres; 5,724 sq. ft.) is located within the "Tower Line of Sight" on the north side of the project site and continues offsite to the north. This wetland area is isolated within the landscape.

The total wetland area on site is **8.704 acres (379,147 sq. ft.)**.

There are a total of four (4) surface water areas on site. Three (3) areas can be defined as man-made conveyances (ditches) and one (1) area is a small existing farm pond. **Surface Water Area 1** (0.214 acres; 9,307 sq. ft.), **Surface Water Area 2** (0.387 acres; 16,861 sq. ft.) and **Surface Water Area 4** (0.216 acres; 9,421 sq. ft.) make up the man-made conveyances that are found within the project site. **Surface Water Area 3** (0.287 acres; 12,514 sq. ft.) is located on the west of the project site and is an existing farm pond. The total surface water area on site is **1.104 acres (48,103 sq. ft.).**

The wetlands and surface water limits shown on the exhibits and described in this report were determined from information obtained from the National Wetlands Inventory (NWI) website and from on site field reviews conducted by BCS, Inc. staff on April 6 and 21, 2017. These wetland and surface water areas have not been reviewed or approved by any state or federal regulatory agency and their locations are approximate.


FLORIDA LAND USE, COVER AND FORMS CLASSIFICATION SYSTEM (F.L.U.C.C.S.)
310 - HERBACEOUS (DRY PRAIRIE)
411 - PINE FLATWOODS
413 - SAND PINE
510 - STREAMS AND WATERWAYS (DITCH)
618 - WILLOW AND ELDERBERRY
620 - WETLAND CONIFEROUS FORESTS
621 - CYPRESS
643 - WET PRAIRIE
811 - AIRPORTS
NOTES:
1 - BOUNDARY INFORMATION ADAPTED FROM AUTOCAD FILES PROVIDED BY HOYLE, TANNER & ASSOCIATES, INC.
2 - AERIAL IMAGERY ADAPTED FROM GOOGLE EARTH, INC. (DATED 2016) SCALE IS APPROXIMATE.
3 - WETLANDS LINES ADAPTED FROM INFORMATION PROVIDED BY THE NATIONAL WETLAND INVENTORY (NWI) WEBSITE AND ON SITE FIELD REVIEWS BY BCS, INC. STAFF. WETLANDS LINES HAVE NOT BEEN APPROVED BY ANY REGULATORY AGENCY, ARE APPROXIMATE AND COULD BE SUBJECT TO CHANGE.
SITE ACREAGE BREAKDOWN
WETLANDS ON SITE 8.704 Ac. (379,147 SF)
SURFACE WATERS ON SITE 1.104 Ac. (48,103 SF)
UPLANDS ON SITE 50.128 Ac. (2,183,571 SF)
TOTAL SITE AREA: 59.936 Ac. (2,610,821 SF)
SURFACE WATER AREA 1 0.214 Ac. (9,307 SF)
SURFACE WATER AREA 2 0.387 Ac. (16,861 SF)
SURFACE WATER AREA 3 0.287 Ac. (12,514 SF)
WETLAND AREA 5 0.131 Ac. (5,724 SF)
SURFACE WATER AREA 4 0.216 Ac. (9,421 SF)
WETLAND AREA 4 1.439 Ac. (62,689 SF)
WETLAND AREA 1 3.545 Ac. (154,440 SF)
WETLAND AREA 2 1.730 Ac. (75,360 SF)
WETLAND AREA 3 1.858 Ac. (80,934 SF)
EXISTING TRAIL
PROJECT SITE
PROJECT SITE
618
620
411
510
411/413
411
510
510
411
620
621
310
811
510
411
620
620
411
643
BRL
RSA
drawing name F.L.U.C.C.S. MAP
drawing no. 03019-01
revised
ENVIRONMENTAL ASSESSMENT
ORMOND BEACH AIRPORT RUNWAY 08-26 EXTENSION
drawn JPC
date 04/24/17
scale (size B) 1"= 300'
job no. 17-03019
Joe H. Young III
Estuarine Field Biologist
208 Rush Street
New Smyrna Beach, FL 32168
386-423-3402
biocon@bellsouth.net
BIOLOGICAL CONSULTING SERVICES, INC.
N
SCALE: 1" = 300'
0 75' 150' 300'
GRAPHIC SCALE

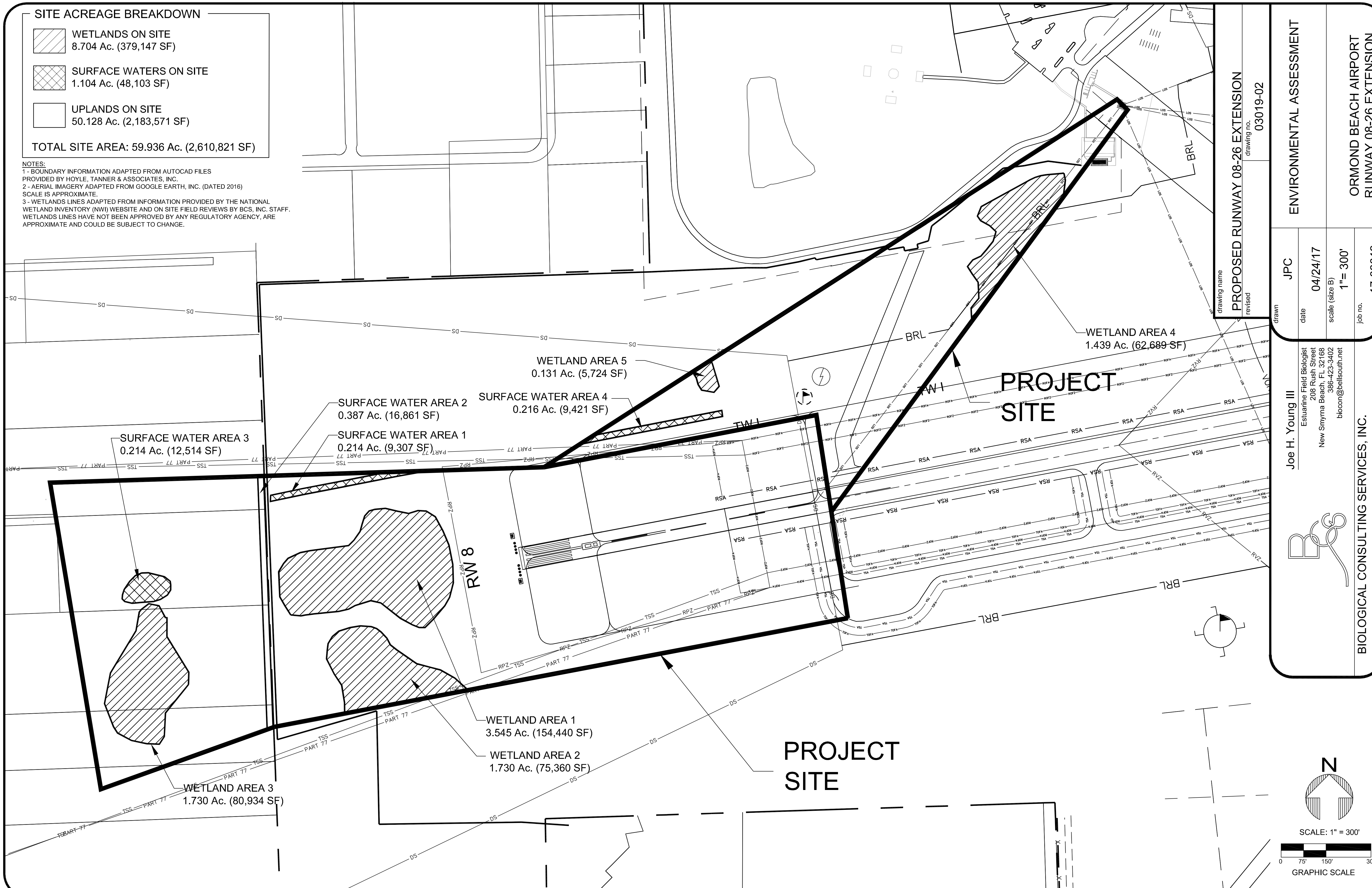
5.0 WETLANDS and SURFACE WATER IMPACT ANALYSIS

The proposed project is for the extension and improvement of the existing Runway 08-26 (specifically the west end at Runway 08) by implementing Federal Aviation Administration standards for overall runway length as well as improving the adjacent Runway Safety Area (RSA) and the Runway Object Free Area (ROFA) that are associated with the proposed runway extension as well as obstruction removal for the "Tower Line of Sight" for the runway extension. The improvements include the 1000'+/- extension of the current runway on the west end of Runway 08 and the clearing and grading of an associated RSA area at the west end of the new runway extension terminus. As a result of the proposed Runway 08 extension and associated Runway Safety Area (RSA) improvements it is likely that impacts to the wetland areas on site will occur.

As a part of the improvements, Wetland Area 1 and 2 will fall within the RSA and/or the Runway Object Free Area (ROFA) associated with the extended Runway 08. Impacts to these wetland areas will be in the form of tree clearing, grubbing/root raking and filling. The total area of wetlands expected to be directly impacted within the proposed RSA and/or the ROFA is 5.275 acres (229,800 sq. ft.). The functional loss resulting from impacts to these wetland areas is 3.693 FLU. Additionally, the trees located within Wetland Area 3, 4 and 5 will be felled as a part of the safety measures required for the extension of Runway as well as for a visual clear zone within the "Tower Line of Sight" area. No grubbing/root raking, filling or other disturbances to the existing grades within these wetland areas is proposed to occur at this time. It is not anticipated that the safety measures proposed to occur within Wetland Area 3, 4 and 5 will result in an impact to the wetland overall. No functional loss is expected to occur within these wetland areas.

At this time, no impacts to surface waters are proposed to occur as a result of the proposed Runway 08 extension.

Wetland Area	Total Acreage	Direct Wetland Impacts	Relative Functional Loss	Total Functional Loss
Wetland Area 1	3.545 acres	3.545 acres	0.700	2.482
Wetland Area 2	1.730 acres	1.730 acres	0.700	1.211
Wetland Area 3	1.858 acres	0 acres	No direct impacts proposed to occur in this area.	
Wetland Area 4	1.439 acres	0 acres	No direct impacts proposed to occur in this area.	
Wetland Area 5	0.131 acres	0 acres	No direct impacts proposed to occur in this area.	
Totals:	**8.704 acres**	**5.275 acres**	**0.700 RFL**	**3.693 FLU**


SITE ACREAGE BREAKDOWN
WETLANDS ON SITE
8.704 Ac. (379,147 SF)
SURFACE WATERS ON SITE
1.104 Ac. (48,103 SF)
UPLANDS ON SITE
50.128 Ac. (2,183,571 SF)
TOTAL SITE AREA: 59.936 Ac. (2,610,821 SF)
NOTES:
1 - BOUNDARY INFORMATION ADAPTED FROM AUTOCAD FILES PROVIDED BY HOYLE, TANNER & ASSOCIATES, INC.
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3 - WETLANDS LINES ADAPTED FROM INFORMATION PROVIDED BY THE NATIONAL WETLAND INVENTORY (NWI) WEBSITE AND ON SITE FIELD REVIEWS BY BCS, INC. STAFF. WETLANDS LINES HAVE NOT BEEN APPROVED BY ANY REGULATORY AGENCY, ARE APPROXIMATE AND COULD BE SUBJECT TO CHANGE.
WETLAND AREA 5
0.131 Ac. (5,724 SF)
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0.216 Ac. (9,421 SF)
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0.214 Ac. (12,514 SF)
WETLAND AREA 4
1.439 Ac. (62,689 SF)
PROJECT SITE
RW 8
WETLAND AREA 1
3.545 Ac. (154,440 SF)
WETLAND AREA 2
1.730 Ac. (75,360 SF)
WETLAND AREA 3
1.730 Ac. (80,934 SF)
PROJECT SITE
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SCALE: 1" = 300'
0 75' 150' 300'
GRAPHIC SCALE
drawing name
PROPOSED RUNWAY 08-26 EXTENSION
drawing no.
03019-02
revised
ENVIRONMENTAL ASSESSMENT
ORMOND BEACH AIRPORT
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6.0 POTENTIAL ENDANGERED AND THREATENED SPECIES DISTRIBUTION

The vegetative composition on site mainly consists of the Herbaceous (Dry Prairie) (#310), Pine Flatwoods (#411), Sand Pine (#413), Willow and Elderberry (#618), Wetland Coniferous Forests (#620), Cypress (#621) and Wet Prairie (#643) vegetative communities. Major emphasis was given to the protected species that might inhabit this vegetative cover type.

A list of species with the potential for occurrence on-site and which are afforded protection by the Florida Fish and Wildlife Conservation Commission (FFWCC) and the U.S. Fish and Wildlife Service (USFWS) was compiled prior to the protected species survey, based on a literature review of geographic range and preferred habitat. The US Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPAC) online tool was used to generate a list of federal threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of the proposed project. The protected species distribution chart contains the designated status of protected wildlife species with the potential for occurrence on this project.

6.1 VOLUSIA COUNTY PROTECTED SPECIES DISTRIBUTION CHART

The following protected species could potentially utilize the site:

COMMON NAME	***SCIENTIFIC NAME***	**STATUS**	**POTENTIAL OF OCCURRENCE**
MAMMALS			
Southeastern Beach Mouse	*Peromyscus polionotus niveiventris*	FT	Habitat does not occur on site
West Indian Manatee	*Trichechus manatus*	FE	Habitat does not occur on site
BIRDS			
Everglade Snail Kite	*Rostrhamus sociabilis plumbeus*	FE	Habitat does not occur on site
Florida Scrub Jay	*Aphelocoma coerulescens*	FT	Habitat does not occur on site
Piping Plover	*Charadrius melodus*	FT	Habitat does not occur on site
Red Knot	*Calidris canutus rufa*	FT	Habitat does not occur on site
Red-cockaded Woodpecker	*Picoides borealis*	FE	Minor habitat available not observed on site
Wood Stork	*Mycteria americana*	FT	Minor habitat available not observed on site
Florida Sandhill Crane	*Grus canadensis pratensis*	ST	Minor habitat available not observed on site
Little Blue Heron	*Egretta caerulea*	ST	Minor habitat available not observed on site
Peregrine Falcon	*Falco peregrinus tundrius*	delisted	Minor habitat available not observed on site
Roseate Spoonbill	*Ajaia ajaja*	ST	Minor habitat available not observed on site
Southeastern American Kestrel	*Falco sparverius paulus*	ST	Minor habitat available not observed on site
Tricolored Heron	*Egretta tricolor*	ST	Minor habitat available not observed on site
AMPHIBIANS & REPTILES			
Eastern Indigo Snake	*Drymarchon corais couperi*	FT	Minor habitat available not observed on site
Atlantic Salt Marsh Snake	*Nerodia clarkia taeniata*	FT	Habitat does not occur on site
Hawksbill Sea Turtle	*Eretmochelys imbricata*	FE	Habitat does not occur on site
Leatherback Sea Turtle	*Dermochelys coriacea*	FE	Habitat does not occur on site
Florida Pine Snake	*Pituophis melanoleucus mugitus*	ST	Minor habitat available not observed on site
Gopher Tortoise	*Gopherus polyphemus*	ST	Minor habitat available observed on site

COMMON NAME	*SCIENTIFIC NAME*	STATUS	POTENTIAL OF OCCURRENCE
PLANTS		**FDACS (FWS)**	
Ashe's savory	*Calamintha ashei*	T	Minor habitat available not observed on site
Auricled spleenwort	*Asplenium erosum*	E	Minor habitat available not observed on site
Bird's nest spleenwort	*Asplenium serratum*	E	Minor habitat available not observed on site
Blue flowered butterwort	*Pinguicula caerulea*	T	Minor habitat available not observed on site
Brittons Beargrass	*Nolia brittoniana*	E (FE)	Minor habitat available not observed on site
Catesby's lily	*Lilium catesbaei*	T	Minor habitat available not observed on site
Celestial lily	*Nemastylis floridana*	E	Minor habitat available not observed on site
Chapman's sedge	*Carex chapmanii*	T	Minor habitat available not observed on site
Cinnamon Fern	*Osmunda cinnamomea*	CE	Minor habitat available not observed on site
Common wild pine	*Tillandsia fasciculata*	E	Minor habitat available not observed on site
Coontie (all native species)	*Zamia spp.*	CE	Minor habitat available observed on site
Curtiss' milkweed	*Asclepias curtissii*	E	Minor habitat available not observed on site
Easter-lily	*Zephyranthes treatiae*	T	Minor habitat available not observed on site
Erect prickly pear	*Opuntia stricta*	T	Minor habitat available observed on site
Flatwoods sunflower	*Helianthus carnosus*	E	Minor habitat available not observed on site
Florida beargrass	*Nolina atopocarpa*	T	Minor habitat available observed on site
Florida butterfly orchid	*Encyclia tampensis*	CE	Minor habitat available not observed on site
Florida jointtail grass	*Coelorachis tuberculosa (Manisuris tuberculosa)*	T	Minor habitat available not observed on site
Florida lantana	*Lantana depressa*	E	Minor habitat available not observed on site
Florida mountain-mint	*Pycnanthemum floridanum*	T	Minor habitat available not observed on site
Garberia	*Garberia heterophylla*	T	Minor habitat available not observed on site
Giant orchid	*Pteroglossaspis ecristata (Eulophia ecristata)*	T	Minor habitat available not observed on site
Godfrey's sandwort	*Minuartia godfreyi*	E	Minor habitat available not observed on site

COMMON NAME	*SCIENTIFIC NAME*	STATUS	POTENTIAL OF OCCURANCE
PLANTS continued		**FDACS (FWS)**	
Great wild pine	*Tillandsia utriculata*	E	Minor habitat available not observed on site
Green-fly orchid	*Epidendrum conopseum*	CE	Minor habitat available not observed on site
Hand Fern	*Ophioglossum palmatum*	E	Minor habitat available not observed on site
Hartwrightia	*Hartwrightia floridana*	T	Minor habitat available not observed on site
Hooded pitcherplant	*Sarracenia minor*	T	Minor habitat available not observed on site
Indian plantain	*Arnoglossum diversifolium*	T	Minor habitat available not observed on site
Okeechobee gourd	*Cucurbita okeechobeensis ssp. okeechobeensis*	E (FE)	Minor habitat available not observed on site
Lace-lip ladies' tresses	*Spiranthes laciniata*	T	Minor habitat available not observed on site
Large flowered rosemary	*Conradina grandiflora*	T	Minor habitat available not observed on site
Leafless beaked orchid	*Stenorrhynchos lanceolatus (Spiranthes lanceolata)*	T	Minor habitat available not observed on site
Low pepperomia	*Peperomia humilis*	E	Minor habitat available not observed on site
Nodding club-moss	*Lycopodium cernuum (Lycopodiella cernua)*	CE	Minor habitat available not observed on site
Pine pinweed	*Lechea divaricata*	E	Minor habitat available not observed on site
Pineland butterfly pea	*Centrosema arenicola*	E	Minor habitat available not observed on site
Plume polypody	*Polypodium plumula*	E	Minor habitat available not observed on site
Rainlily	*Zephyranthes atamasca*	T	Minor habitat available not observed on site
Rose pogonia	*Pogonia ophioglossoides*	T	Minor habitat available not observed on site
Royal fern	*Osmunda regalis*	CE	Minor habitat available not observed on site
Sand dune spurge	*Chamaesyce cumulicola*	E	Minor habitat available not observed on site
Scrub pinweed	*Lechea cernua*	T	Minor habitat available not observed on site
Simpson zephyr lily	*Zephyranthes simpsonii*	T	Minor habitat available not observed on site
Small ladies tresses	*Spiranthes brevilabris*	E	Minor habitat available not observed on site
Snowy orchid	*Platanthera nivea (Habenaria nivea)*	T	Minor habitat available not observed on site

COMMON NAME	*SCIENTIFIC NAME*	STATUS	POTENTIAL OF OCCURRENCE
PLANTS continued		**FDACS (FWS)**	
Southern tubercled orchid	*Platanthera flava*	T	Minor habitat available not observed on site
Swamp plume polypody	*Polypodium ptilodon*	E	Minor habitat available not observed on site
Tampa vervain	*Verbena tampensis (Glandularia tampensis)*	E	Minor habitat available not observed on site
Water sundew	*Drosera intermedia*	T	Minor habitat available not observed on site
Widespread polypody	*Polypodium dispersa*	E	Minor habitat available not observed on site
Yellow flowered butterwort	*Pinguicula lutea*	T	Minor habitat available not observed on site
Yellow fringed orchid	*Platanthera ciliaris*	T	Minor habitat available not observed on site
Rugel's pawpaw	*Deeringothamnus rugelii*	E (FE)	Minor habitat available not observed on site
Yellow star anise	*Illicium parviflorum*	E	Minor habitat available not observed on site

LEGAL STATUS LEGEND

STATE AND FEDERAL STATUS (FAUNA ONLY)

CODE	DEFINITION
FE	Federally-designated Endangered
FT	Federally-designated Threatened
FXN	Federally-designated Threatened Nonessential Experimental Population
FT(S/A)	Federally-designated Threatened species due to similarity of appearance
ST	State-designated Threatened
SSC	State-designated Species of Special Concern

FDACS STATUS (FLORA ONLY)

CODE	DEFINITION
E	Endangered
T	Threatened
CE	Commercially Exploited

7.0 ENDANGERED AND THREATENED SPECIES FOR FFWCC

7.1 Mammals

The endangered **Florida Panther** *(Felis concolor coryi)* is found in a wide variety of habitat types, but requires a large range and substantial food source to survive. This site does not offer a substantial food source or range for the panther.

7.2 Amphibians and Reptiles

The threatened **Gopher Tortoise** (*Gopherus polyphemus*) was a species of concern because some of the site could potentially provide habitat for this species. During the review, Gopher Tortoises and Gopher Tortoise burrows were observed within the project site. A number of commensal species are known to inhabit Gopher Tortoise burrows such as the threatened **Eastern Indigo Snake** (*Drymarchon corais couperi*) and the threatened **Florida Pine Snake** (*Pituophis melanoleucus mugitus*).

No protected amphibians or reptiles or signs of their utilization were noted on the site during the review, other than the Gopher Tortoise and the Gopher Tortoise Burrows.

7.3 Invertebrates

Very few invertebrates are listed by the State of Florida as Endangered or Threatened, and of the species listed, none occur within the habitat found on this project site.

7.4 Fish

No protected fish species were observed on the site in the area of proposed impact due to the lack of their specific habitat type.

7.5 Birds

There are a moderate number of birds that could potentially utilize the habitat available on the site. The herbaceous and Pine Flatwoods communities could provide foraging and nesting habitat for the threatened **Audubon's Crested Caracara** *(Polyborus plancus audubonii)*, the threatened **Florida Sandhill Crane** *(Grus canadensis pratensis),* the threatened **Southeastern American Kestrel** (*Falco sparverius paulus*), the endangered **Red-cockaded Woodpecker** *(Picoides borealis)* and the **Bald Eagle** (*Haliaeetus leucocephalus*). A search of the FFWCC Bald Eagle Nest Locator for documented bald eagle nesting territories revealed no documented nests are located within 660' of the project site. Additionally, no eagle nest was observed during the reviews of the site.

The wetland communities on site could provide foraging and nesting habitat for the threatened **Little Blue Heron** *(Egretta caerulea)*, the threatened **Roseate Spoonbill** *(Ajaia ajaja),* the threatened **Tricolored Heron** (*Egretta tricolor*) and the threatened **Wood Stork** *(Mycteria americana)*. A review of the

U.S. Fish and Wildlife Service "Wood Stork Core Foraging Areas" mapping determined that the proposed Runway 08 extension does not fall within a mapped foraging area for the Wood stork.

7.6 Plants

During the field reviews three (3) listed species were observed on-site during the reviews due to the managed nature of the site. The species observed are as follows: **Erect Prickly Pear** *(Opuntia stricta),* **Florida Beargrass** *(Nolina atopocarpa)* and **Coontie** *(Zamie sp.)*. According to Section 581.185 (8), Florida Statutes, certain exemptions apply to the clearing and removal of protected plant species on lands that will be utilized for silvicultural or agricultural uses, fire control measures, or required mining assessment work. The clearing or removal of regulated plants from canals, ditches, survey lines, building sites or roads or other right-of-ways by the landowner or his or her agent is also exempt on privately owned lands. On utility areas, the clearing of land by a public agency or a publicly or privately owned utility when acting in the performance of its obligation to provide a service to the public is also exempt. Listed plant species found on this site fall under one of the exemptions listed above and may be removed if needed.

7.7 U.S. Fish and Wildlife Service Consultation (Code 04EF1000-2017-SLI-0049)

A list of fourteen (14) federally threatened or endangered species that may occur within the boundary of the Ormond Beach Municipal Airport property was obtained using the USFWS IPAC tool and can be found in Appendix B (November 14, 2016 - Consultation Code 04EF1000-2017-SLI-0049). Each of the listed species, their listing status, comments and any observations made during the site inspections within the boundary of the Runway 08-26 Extension Project are described below:

BIRDS:

Everglade Snail Kite *(Rostrhamus sociabilis plumbeus)*: Endangered; no habitat occurs within the project site.

Florida scrub-jay *(Aphelocoma coerulescens)*: Threatened; no habitat occurs within the project site.

Piping Plover *(Charadrius melodus)*: Threatened; no habitat occurs within the project site.

Red Knot *(Calidris canutus rufa)*: Threatened; no habitat occurs within the project site.

Red-cockaded Woodpecker *(Picoides borealis)*: Endangered; minor habitat available within the project boundary; no individuals or indicators observed. Typically, Red-cockaded woodpecker colonies are found in old growth pines, usually Long Leaf Pine, with open understory. Most colonies are found in live pine trees which are 60 years or older in age. This type of habitat is not present in the project area. We would not expect any impact to this species from the proposed construction activity.

Wood Stork *(Mycteria Americana)*: Threatened; a review of the US Fish and Wildlife Service "Wood Stork Core Foraging Areas" mapping determined that the proposed Runway 08 extension does not fall within a mapped foraging area for the Wood stork.

PLANTS:

Okeechobee gourd *(Cucurbita okeechobeensis spp. okeechobeensis*): Endangered; minor habitat available; not observed on site.

Rugel's pawpaw *(Deeringothamnus rugelii)*: Endangered; minor habitat available; not observed on site.

MAMMALS:

Southeastern Beach Mouse *(Peromyscus polionotus niveiventris)*: Threatened; no habitat occurs on site

West Indian Manatee *(Trichechus manatus)*: Endangered; habitat not available on site

REPTILES:

Atlantic Salt Marsh Snake *(Nerodia clarkia taeniata)*: Threatened; habitat not available on site

Eastern Indigo Snake *(Drymarchon corais couperi)*: Threatened; minor habitat available on site; not observed on site. Fewer than 25 gopher tortoise burrows are expected within the project area and using of the USFWS Eastern Indigo Snake Progammatic Effect Key, if best management practices are used during construction and the Standard Indigo Snake Protection Measures are followed, a "no effect" determination would typically be granted by the USFWS.

Hawksbill Sea Turtle *(Eretmochelys imbricata)*: Endangered; habitat not available on site

Leatherback Sea Turtle *(Dermochelys coriacea)*: Endangered; habitat not available on site

SITE ACREAGE BREAKDOWN

SUITABLE GOPHER TORTOISE HABITAT
29.439 Ac. (1,282,348 SF)

TOTAL SITE AREA: 45.678 Ac. (1,989,785 SF)

NOTES:
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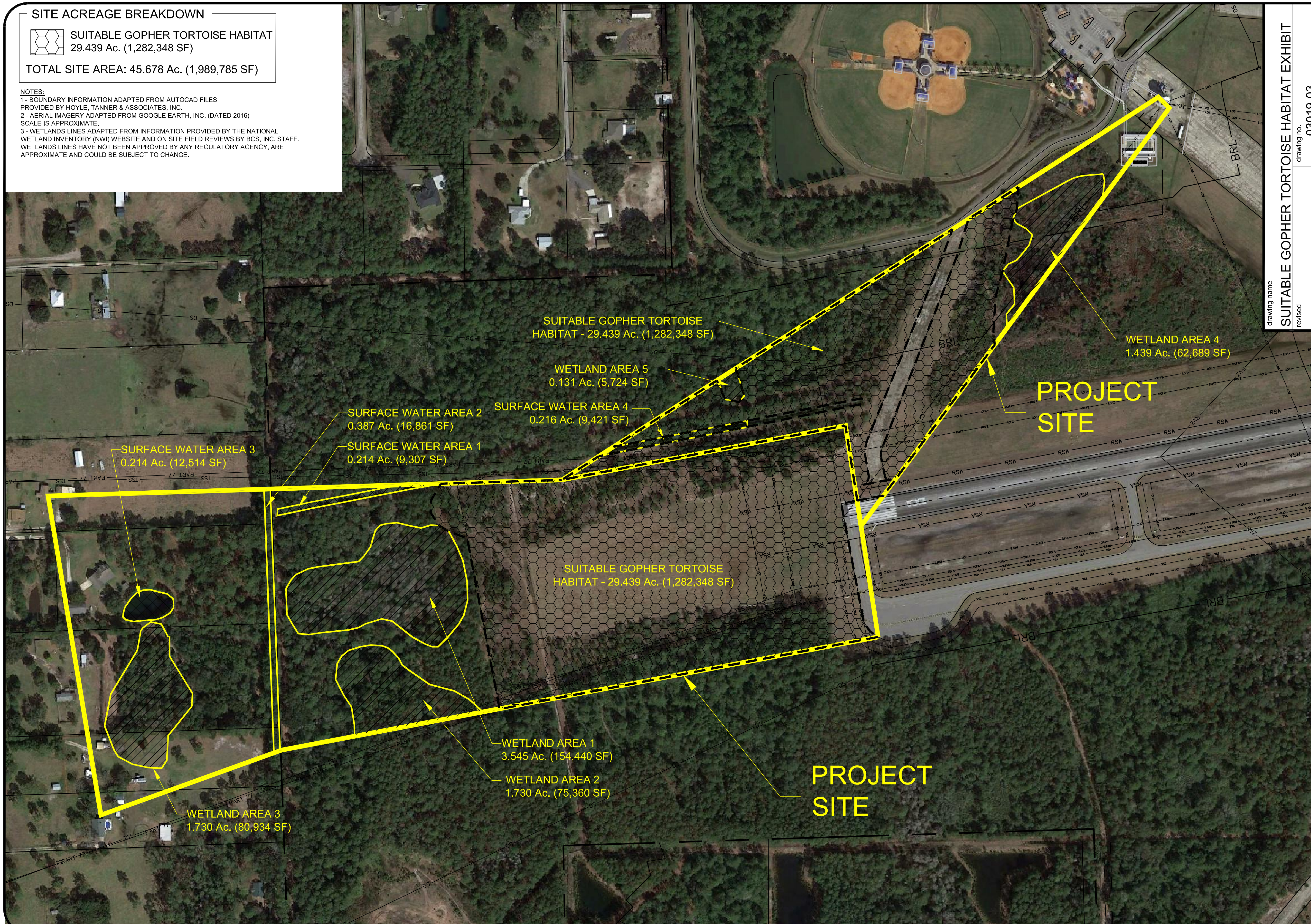

drawing name
SUITABLE GOPHER TORTOISE HABITAT EXHIBIT
revised
drawing no.
03019-03

ENVIRONMENTAL ASSESSMENT

ORMOND BEACH AIRPORT
RUNWAY 08-26 EXTENSION

drawn
JPC
date
04/24/17
scale (size B)
1"= 300'
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8.0 CONCLUSIONS AND RECOMMENDATIONS

In conclusion, the two items that need to be addressed are the existing wetland areas that will likely be impacted from the proposed runway extension and the gopher tortoise burrows within the project area. No impacts are expected to occur to the Red-cockaded woodpecker or Indigo snake, however, it is recommended that best management practices be used during construction and the USFWS Standard Indigo Snake Protection Measures be followed.

Unavoidable impacts to the wetland areas on site will require a permit from the St. Johns River Water Management District (SJRWMD) as well as the City of Ormond Beach. It is expected that impacts to wetland areas on site will result in a deficit in wetlands function (Functional Loss Units) which will need to be offset. There are several ways this can be accomplished either by on site mitigation, through the purchase of mitigation credit from an approved mitigation bank or a combination of both methods. On site mitigation is typically accomplished through the recording of a conservation easement over an area of wetlands and uplands preservation, wetlands creation or wetlands restoration. However, due to the amount of functional loss that would need to be offset from the proposed project, it is likely that large amounts of wetlands and uplands would need to be preserved, created or restored in order to achieve the required functional gain needed. If this mitigation approach is selected, the amount of area would need to be explored to determine if this route is an available option as well as a cost effective solution for the Ormond Beach Municipal Airport. If onsite mitigation is not an available option or not a complete solution to offset the functional loss on site from the runway extension, the purchase of mitigation credit from an approved mitigation bank is an option available to fulfill the required amount of functional gain to offset impacts to wetlands resulting from the development plan. The Ormond Beach Municipal Airport is located within the Halifax River Basin (17) which currently has a number of banks with mitigation credit available for purchase. These banks are as follows:

Mitigation Bank	**Cost per FLU**
Lake Swamp Mitigation Bank	$120,000.00
Farmton Mitigation Bank	$145,000.00
Port Orange Mitigation Bank*	To be determined

*The Port Orange Mitigation Bank is currently undergoing a UMAM conversion process with the St. Johns River Water Management District. This bank is currently has ratio credits available only. UMAM credits and pricing are expected to be available in the near future.

During the site reviews, numerous Gopher Tortoise burrows and two (2) Gopher Tortoises were observed. There are four available options to address the presence of gopher tortoises on lands slated for development: avoid development in the area occupied by tortoises, develop as to avoid gopher tortoise burrows by avoiding concentrations of burrows altogether and/or staying at least 25 feet from entrances of individual gopher tortoise burrows, relocate the gopher tortoises out of the way of construction either on-site or relocate the gopher tortoises off-site.

The avoidance of the burrows requires a buffer with a 25’ radius from the mouth of the burrow to be preserved. This option often limits development plans to the extent that it is not feasible.

Since a gopher tortoise relocation permit was previously issued for the Ormond Beach Municipal Airport for another phase of construction, a Gopher Tortoise Conservation Permit with off-site relocation of tortoises will be required. The FFWCC requires that a mitigation contribution be made for all relocation permits and is based on the number of tortoises permitted for relocation.

As a part of the FFWCC permitting process, a 100% burrow survey will need to be conducted on the property. This will determine how many Gopher Tortoise burrows could potentially be affected by the development plan. Once the burrow survey is completed and required relocation permit is applied for and issued by the FFWCC it is valid for 1 year from the date of issuance and may be amended to extend the permit duration for up to 6 months if relocation activities have not been completed. The FFWCC also requires that a 100% gopher tortoise survey be conducted within 90 days of gopher tortoise capture and relocation. Demonstration of need for a permit must be provided to the FFWCC in the form of preliminary or final subdivision plat, or master planned unit development approval; DRI development order; or authorization to commence clearing, grading or construction activities. Prior to commencing capture and relocation activities, proof of local government approval for clearing, grading or construction activities must be provided to the FFWCC.

The Florida Fish and Wildlife Conservation Commission’s current policy allows gopher tortoise relocations throughout the year. However, tortoises shall only be relocated when the low temperature at the recipient site is forecasted by the National Weather Service to be above 50º Fahrenheit for three consecutive days after release (including the day of relocation). Prior to any relocation effort, a permit from the St. Johns River Water Management District and all local permits must be obtained.

Once the construction commencement timeframe has been established and when it is known that impending construction is to occur within 90 days, it is recommended that a Gopher Tortoise Conservation Relocation Permit be applied for.

9.0 REGULATIONS AND ENFORCEMENT OF TAKING OF GOPHER TORTOISE BY DEVELOPMENT ACTIVITIES UNDER EXISTING RULES OF THE FLORIDA GAME AND FRESH WATER FISH COMMISSION

Chapter 68A-27.003 Designation of Endangered Species; Prohibitions

Subparagraph 68A-27.003 (2)(d)3 F.A.C. states: *The gopher tortoise (Gopherus polyphemus) is hereby declared to be State-designated Threatened Species and shall be afforded the protective provisions specified in this subparagraph. No person shall take, attempt to take, pursue, hunt, harass, capture, possess, sell or transport any gopher tortoise or parts thereof or their eggs, or molest, damage, or destroy gopher tortoise burrows, except as authorized by Commission permit or when complying with Commission approved guidelines for specific actions which may impact gopher tortoises and their burrows. A gopher tortoise burrow is a tunnel with a cross-section that closely approximates the shape of a gopher tortoise. Permits will be issued based upon whether issuance would further management plan goals and objectives.*

There are four available options to address the presence of gopher tortoises on lands slated for development:

1. Avoid developing in the area occupied by tortoises;
2. Develop as to avoid gopher tortoise burrows by avoiding concentrations of burrows altogether and/or staying at least 25 feet from entrances of individual burrows, provided that such activities do not harm gopher tortoise or violate rules protecting gopher tortoises;
3. Relocate tortoises on-site (permit required); or
4. Relocate tortoises off-site (permit required).

10.0 REFERENCES

1. Florida's Endangered Species, Threatened Species, and Species of Special Concern, Updated January 2017, Florida Game and Fresh Water Fish Commission
2. 26 Ecological Communities of Florida, Soil Conservation Service
3. Web Soil Survey, United States Department of Agriculture, National Resources Conservation Service, http://websoilsurvey.nrcs.usda.gov
4. Ecology and Habitat Protection Needs of Gopher Tortoise Populations, James Cox, et al., December 1987.
5. Rare and Endangered Biota of Florida, Volume I., Mammals, Edited by Stephen R. Humphrey, Ray E. Ashton, Jr., SERIES EDITOR
6. Rare and Endangered Biota of Florida, III, Amphibians and Reptiles, Edited by Paul E. Moler, Ray E Ashton, Jr., SERIES EDITOR
7. Rare and Endangered Biota of Florida, Volume IV, Invertebrates, Edited by Mark Deyrup and Richard Franz, Ray E. Ashton, Jr., SERIES EDITOR
8. Rare and Endangered Biota of Florida, Volume V, Birds, Edited by James A. Rodgers, Jr., Herbert W. Kale II and Henry T. Smith, Ray E. Ashton, Jr., SERIES EDITOR
9. Rare and Endangered Biota of Florida, Volume Five, Plants, Edited by Daniel B. Ward, Peter C.H. Pritchard, SERIES EDITOR
10. Florida Land Use, Cover and Forms Classification System, Florida Department of Transportation, 1999.
11. County Distribution and Habitats of Rare and Endangered Species in Florida, Florida Natural Areas Inventory, March 1997.
12. Notes on Florida's Endangered and Threatened Plants, Florida Department of Agriculture and Consumer Services, Division of Plant Industry, Nancy Coile and Mark A. Garland, 2003.
13. Gopher Tortoise Permitting Guidelines, Florida Fish and Wildlife Conservation Commission, April 2008 (Revised January 2017).
14. Atlas of Florida Vascular Plants, University of South Florida, Institute for Systemic Botany, http://www.plantatlas.usf.edu.

APPENDIX

UMAM Summary

Eagle Nest Locator Search Results

U.S. Fish and Wildlife Service Consultation – November 14, 2016

Project: Ormond Beach Airport - Runway 08 Ext **Date:04/27/17**

Impacts	Habitat type	Location and Landscape Support before	Location and Landscape Support after	Water Environment before	Water Environment after	Community Structure before	Community Structure after	Acres	Functional loss	Total Impact Acres	Total Wet Pres Provided	Total Creation Acres	Total Enhancement Provided	Upland Acres Provided
Wetland 1	620/621	7	0	7	0	7	0	3.545	2.4815	5.275	0	0	0	0
Wetland 2	620	7	0	7	0	7	0	1.73	1.2110					
									0.0000					
									0.0000					
									0.0000					
									0.0000					
									0.0000	Total		Total		
									0.0000	Functional		Functional		
									0.0000	Loss		Gain		
									0.0000	3.693		0.000		

Mitigation

Wetland Preservation	Habitat Type	Location and Landscape Support w/o CE	Location and Landscape Support w/ CE	Water Environment w/o CE	Water Environment w/ CE	Community Structure w/o CE	Community Structure w/ CE	time lag	risk factor	Preservation Adjustment Factor	Relative Functional Gain	Acres Provided	Functional Gain Units
								1	1.00	0.5	0.0000		0.0000
								1	1.00	0.5	0.0000		0.0000
								1	1.00	0.5	0.0000		0.0000
								1	1.00	0.5	0.0000		0.0000
								1	1.00	0.4	0.0000		0.0000
								1	1.00	0.2	0.0000		0.0000
Creation		before	after	before	after	before	after						
								1.07	1.25	1	0.0000		0.0000
								1.07	1.25	1	0.0000		0.0000
								1.07	1.25	1	0.0000		0.0000
								1.07	1.25	1	0.0000		0.0000
								1.07	1.25	1	0.0000		0.0000

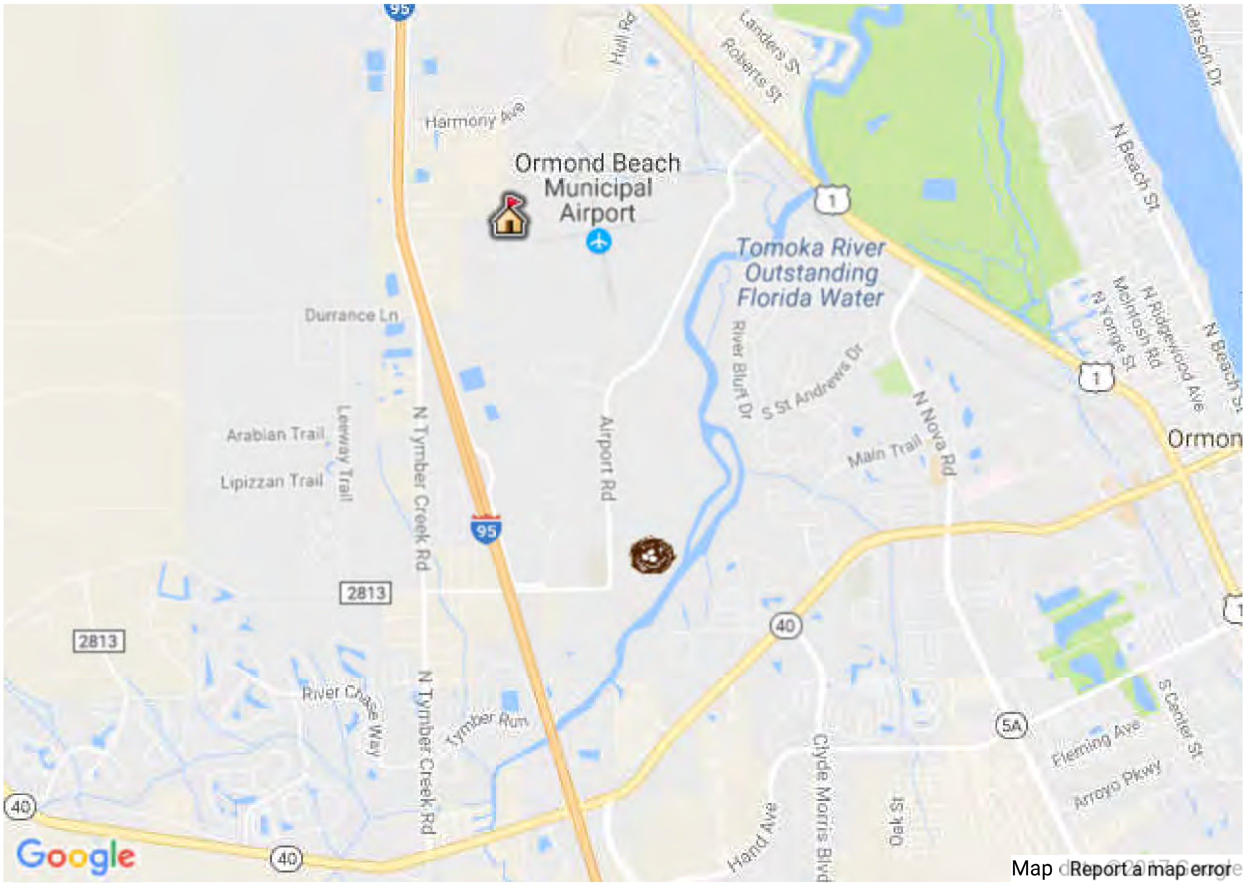
Enhancement	Habitat Type	Location and Landscape Support before w/o CE	Location and Landscape Support after w/ CE	Water Environment before w/o CE	Water Environment after w/ CE	Community Structure before w/o CE	Community Structure after w/ CE	time lag	risk factor	Preservation Adjustment Factor	Relative Functional Gain	Acres Provided	Functional Gain Units
								1	1.00	1	0.0000		0.0000
								1	1.00	1	0.0000		0.0000
								1	1.00	1	0.0000		0.0000
								1	1.00	1	0.0000		0.0000
Uplands Preservation		w/o CE	w/ CE	w/o CE	w/ CE	w/o CE	w/ CE						
				x	x			1	1.00	0.3	0.0000		0.0000
				x	x			1	1.00	0.3	0.0000		0.0000
				x	x			1	1.00	0.3	0.0000		0.0000

This report was generated using the bald eagle nest locator at https://public.myfwc.com/FWRI/EagleNests /nestlocator.aspx on 4/27/2017 11:40:37 AM.

Search Entered: Within 3 miles of latitude 29.3004166666667 and longitude -81.1218944444444; All Search Results

1 record(s) were found; 1 record(s) are shown

Bald Eagle Nest Map:



Bald Eagle Nest Data Search Results:

Results per page: All

Nest ID	County	Latitude	Longitude	Town-ship	Ran-ge	Sec-tion	Gaz Page	Last Known Active	Last Sur-veyed	Act 12	Act 13	Act 14	Act 15	Act 16	Dist. (Mi)
VO115	Volusia	29 16.52	81 06.55	14S	32E	19	75	2012	2012	*	Y	*	*	*	1.89

"Y" denotes an active nest
"N" denotes an inactive nest
"-" denotes an unobserved nest
"U" denotes a nest that was visited but status was undetermined
"*" denotes a nest that was not surveyed

United States Department of the Interior

FISH AND WILDLIFE SERVICE
North Florida Ecological Services Field Office
7915 BAYMEADOWS WAY, SUITE 200
JACKSONVILLE, FL 32256
PHONE: (904)731-3336 FAX: (904)731-3045

Consultation Code: 04EF1000-2017-SLI-0049 November 14, 2016
Event Code: 04EF1000-2017-E-00046
Project Name: Ormond Beach Municipal Airport - Runway Expansion

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at:
http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm;
http://www.towerkill.com; and
http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment

Official Species List

Provided by:

North Florida Ecological Services Field Office
7915 BAYMEADOWS WAY, SUITE 200
JACKSONVILLE, FL 32256
(904) 731-3336

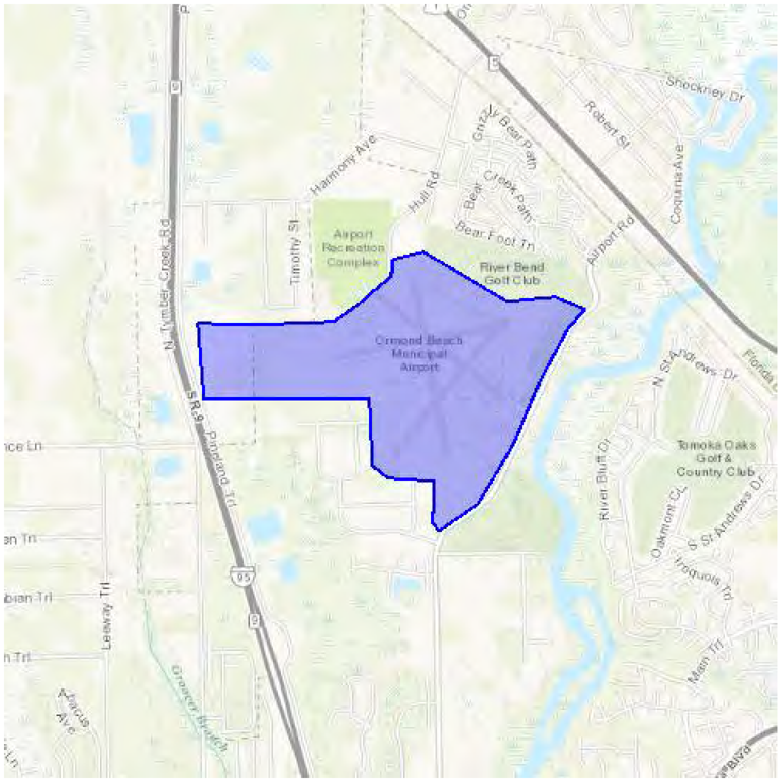
Consultation Code: 04EF1000-2017-SLI-0049
Event Code: 04EF1000-2017-E-00046

Project Type: ** OTHER **

Project Name: Ormond Beach Municipal Airport - Runway Expansion
Project Description: Ormond Beach Municipal Airport proposes to expand Runway 8-26 by 1,000 feet in order to improve safety and accessibility for larger payload aircraft.

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.

Project Location Map:



Project Coordinates: MULTIPOLYGON (((-81.11847209773259 29.30423653891254, -81.12029170937603 29.303038976688104, -81.12595653481547 29.302889280422264, -81.1299047464854 29.302919219236166, -81.12938976235455 29.298308468791788, -81.11781978659565 29.298338408948982, -81.11751079559325 29.294236463951243, -81.11651515908306 29.293457974318848, -81.11315059766639 29.29324837844871, -81.11328792467248 29.290673325664347, -81.11287593841553 29.290254124349048, -81.11009502463276 29.29187103292228, -81.10762309923302 29.295583836620253, -81.10563182621263 29.29950608650571, -81.10381221980786 29.302619826133746, -81.10264491930138 29.303787454724713, -81.10473919019569 29.30459580506878, -81.10803508810932 29.304326355284616, -81.11397457018029 29.307350134832326, -81.11610317282612 29.306841187899497, -81.11624049983219 29.30582328699181, -81.11737346596783 29.30507482388218, -81.11847209773259 29.30423653891254)))

Project Counties: Volusia, FL

Endangered Species Act Species List

There are a total of 14 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Birds	Status	Has Critical Habitat	Condition(s)
Everglade Snail kite *(Rostrhamus sociabilis plumbeus)* Population: Wherever found	Endangered	Final designated	
Florida scrub-jay *(Aphelocoma coerulescens)* Population: Wherever found	Threatened		
Piping Plover *(Charadrius melodus)* Population: except Great Lakes watershed	Threatened	Final designated	
Red Knot *(Calidris canutus rufa)* Population: Wherever found	Threatened		
Red-Cockaded woodpecker *(Picoides borealis)* Population: Wherever found	Endangered		
Wood stork *(Mycteria americana)* Population: AL, FL, GA, MS, NC, SC	Threatened		
Flowering Plants			
Okeechobee gourd *(Cucurbita okeechobeensis ssp. okeechobeensis)*	Endangered		

Population: Wherever found			
Rugel's pawpaw *(Deeringothamnus rugelii)* Population: Wherever found	Endangered		
Mammals			
Southeastern Beach mouse *(Peromyscus polionotus niveiventris)* Population: wherever found	Threatened		
West Indian Manatee *(Trichechus manatus)* Population: Wherever found	Endangered	Final designated	
Reptiles			
Atlantic Salt Marsh snake *(Nerodia clarkii taeniata)* Population: Wherever found	Threatened		
Eastern Indigo snake *(Drymarchon corais couperi)* Population: Wherever found	Threatened		
Hawksbill sea turtle *(Eretmochelys imbricata)* Population: Wherever found	Endangered	Final designated	
Leatherback sea turtle *(Dermochelys coriacea)* Population: Wherever found	Endangered	Final designated	

Critical habitats that lie within your project area

There are no critical habitats within your project area.

Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Attachment G

United States Department of the Interior

FISH AND WILDLIFE SERVICE
North Florida Ecological Services Field Office
7915 BAYMEADOWS WAY, SUITE 200
JACKSONVILLE, FL 32256
PHONE: (904)731-3336 FAX: (904)731-3045

Consultation Code: 04EF1000-2017-SLI-0049 November 14, 2016
Event Code: 04EF1000-2017-E-00046
Project Name: Ormond Beach Municipal Airport - Runway Expansion

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

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The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

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A Biological Assessment is required for construction projects (or other undertakings having

U.S. Department
of Transportation
**Federal Aviation
Administration**

FWS Log No 2017-I-0376
The proposed action is not likely to adversely affect resources protected by the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) provided the standard protection measures for the eastern indigo snake are incorporated into the project plan. This finding fulfills the requirements of the Act.

for Annie Dziergowski 6-14-17
Jay B. Herrington **Date**
Field Supervisor

May 10, 2017

Annie Dziergowski
U. S. Fish & Wildlife Service
North Florida Ecological Services Office
7915 Baymeadows Way, Suite 200
Jacksonville, FL 32256-7517

RE: Section 7 Consultation for Activities Associated with Lengthening Runway 08/26 by 1000 feet, Acquiring Easements and Completing Off Airport Obstruction Removal at Ormond Beach Municipal Airport (OMN), Ormond Beach, FL
IPAC Consultation Code: 04EF1000-2017-SLI-0049

Dear Ms. Dziergowski:

The Federal Aviation Administration (FAA) in cooperation with the City of Ormond Beach, owner and operator of the Ormond Beach Municipal Airport, is preparing an Environmental Assessment (EA) per the requirements of the National Environmental Policy Act (NEPA) and FAA implementing regulations for proposed changes as depicted on the federally-approved airport layout plan (ALP). FAA is acting as the lead federal agency for the U.S. Department of Transportation for this project. Federal actions associated with the proposed project comprise FAA's approval of the EA and unconditional approval of updates to the ALP to reflect the proposed project.

The purpose of this letter is to describe the proposed project and to fulfill FAA's consultation obligations with the U.S. Fish and Wildlife Service (i.e., the Service) pursuant to Section 7 of the Endangered Species Act of 1973 (ESA). The airport location and project action areas are depicted on the graphics in the attached Environmental Assessment Report prepared by Biological Consulting Services, Inc.

Description of the Proposed Project

The proposed project for the EA includes the following actions located at OMN:

- Extending Runway 8-26 from existing 4,004 feet to 5,005 feet;
- Extending the existing parallel taxiway and installing a bypass taxiway;
- Relocating runway end identifier light (REILs), Precision Approach Path Indicators (PAPI's) and remarking pavement;
- Acquiring necessary avigation easements or purchasing properties to control the Runway Protection Zone (RPZ) per FAA requirements; and
- Removing trees that are identified as obstructions to navigable airspace located within the new approach surfaces and the air traffic control tower line of sight.

similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

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Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

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We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

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Official Species List

Provided by:

North Florida Ecological Services Field Office
7915 BAYMEADOWS WAY, SUITE 200
JACKSONVILLE, FL 32256
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Consultation Code: 04EF1000-2017-SLI-0049
Event Code: 04EF1000-2017-E-00046

Project Type: ** OTHER **

Project Name: Ormond Beach Municipal Airport - Runway Expansion
Project Description: Ormond Beach Municipal Airport proposes to expand Runway 8-26 by 1,000 feet in order to improve safety and accessibility for larger payload aircraft.

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United States Department of Interior
Fish and Wildlife Service

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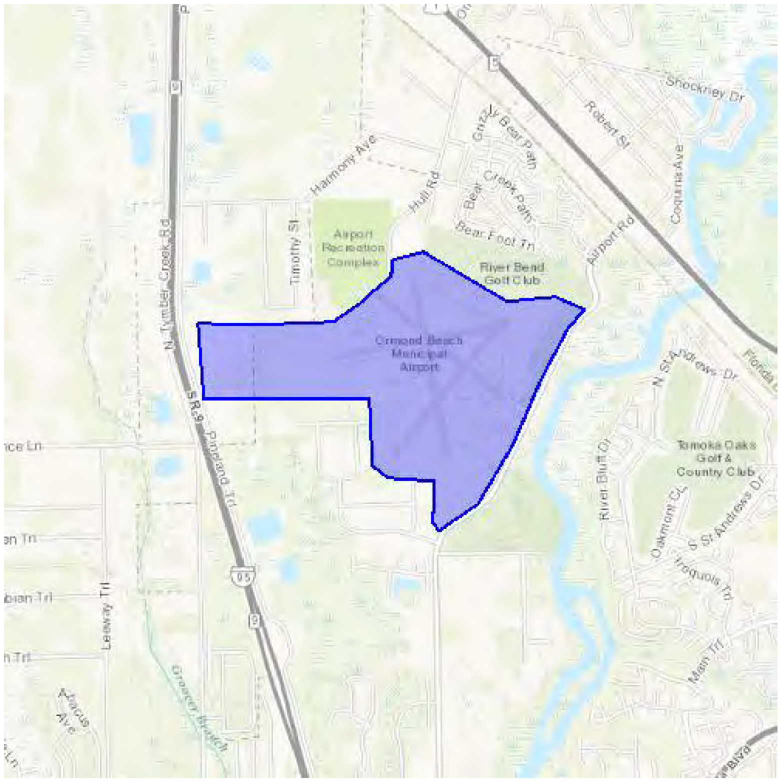

Project Coordinates: MULTIPOLYGON (((-81.11847209773259 29.30423653891254, -81.12029170937603 29.303038976688104, -81.12595653481547 29.302889280422264, -81.1299047464854 29.302919219236166, -81.12938976235455 29.298308468791788, -81.11781978659565 29.298338408948982, -81.11751079559325 29.294236463951243, -81.11651515908306 29.293457974318848, -81.11315059766639 29.29324837844871, -81.11328792467248 29.290673325664347, -81.11287593841553 29.290254124349048, -81.11009502463276 29.29187103292228, -81.10762309923302 29.295583836620253, -81.10563182621263 29.29950608650571, -81.10381221980786 29.302619826133746, -81.10264491930138 29.303787454724713, -81.10473919019569 29.30459580506878, -81.10803508810932 29.304326355284616, -81.11397457018029 29.307350134832326, -81.11610317282612 29.306841187899497, -81.11624049983219 29.30582328699181, -81.11737346596783 29.30507482388218, -81.11847209773259 29.30423653891254)))

Project Counties: Volusia, FL

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Birds	Status	Has Critical Habitat	Condition(s)
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Leatherback sea turtle *(Dermochelys coriacea)* Population: Wherever found	Endangered	Final designated	

Critical habitats that lie within your project area

There are no critical habitats within your project area.

Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Attachment H

STORM L. RICHARDS & ASSOCIATES, INC.
ENVIRONMENTAL ASSESSMENTS, FEASIBILITY STUDIES, & PERMITTING
1804 MAPLE AVENUE
SANFORD, FLORIDA 32771-3358
Email: slra@bellsouth.net
(407) 323-9021 FAX: (803) 547-3093

DR. JEANNE FILLMAN-RICHARDS, President
DR. STORM L. RICHARDS, Principal

CULTURAL RESOURCE PEDESTRIAN SURVEY OF LEVEL SECTION 106 AND EVALUATION OF CULTURAL AND HISTORIC RESOURCES WITHIN THE AREA OF POTENTIAL EFFECTS (APE) OF THE PROPOSED ORMOND BEACH MUNICIPAL AIRPORT RUNWAY 08-26 EXTENSION SITE

LOCATED EAST OF I-95, NORTH OF THE AIRPORT BUSINESS PARK (OFF SUNSHINE BLVD.), SOUTH OF HARMONY AVENUE, WEST OF AIRPORT ROAD, IN SECTIONS 12 & 38, TOWNSHIP 14 SOUTH, RANGE 31 EAST, ORMOND BEACH, VOLUSIA COUNTY, FLORIDA

By

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INTRODUCTION

This Ormond Beach Municipal Airport Runway 08-26 Extension Cultural Resource Pedestrian Survey was conducted by **Storm L. Richards & Associates, Inc.**, of Sanford, Florida. This survey complies and is consistent with Chapters 267 and 373, Section 373.414, *Florida Statutes*, and implementing state regulations. The site known as the proposed Ormond Beach Municipal Airport Runway 08-26 Extension Site, is located East of I-95, North of the Airport Business Park, South of Harmony Avenue, West of Airport Road, in Sections 12 & 38, Township 14 South, Range 31 East, Ormond Beach, Volusia County, Florida.

The proposed project is for the extension and improvements of the existing Runway 08-26, specifically the West end at Runway 08 by implementing Federal Aviation Administration Standards of overall runway length as well as improving the adjacent Runway Safety Area (RSA) and the Runway Object-Free Area (ROFA) are associated with the proposed runway extension as well as obstruction removal for the Tower Line of Sight for the Runway Extension. The improvements include extension of the Runway on the West end of the Runway 08 and the clearing and grading of an associated RSA at the West end of the new runway extension terminus. The proposed project area consists of approximately 59.936 acres with only a small portion concreted with runway construction activity (HTA Ormond Beach Municipal Airport 08-26 Extension Report, May 2017).

The purpose of the Cultural Resource Pedestrian Survey was to identify and evaluate any unrecorded prehistoric and historic archaeological sites and historic structures on the property as well as to evaluate all identified cultural resources for their potential eligibility for listing on the *National Register of Historic Places (NRHP)* based on criteria set forth in 36 CFR Section 60.4.

Research was conducted using the Florida Master Site Files (FMSF), Florida Department of Environmental Protection (FDEP), aerial photographs, maps and interview with current property owner. Background research of **Storm L. Richards & Associates, Inc.** developed a systematic surface reconnaissance survey of the project area. The purpose of the survey was to identify and assess the significance of potential archaeological resources within the 59.9 acre property.

Based on **Storm L. Richards & Associates, Inc.** reviews of the site and an evaluation of environmental conditions, the pedestrian survey was developed to review elevated areas of better drained soils in proximity to potential water sources. The property area is currently both cleared and forested. The project tract was classified as low potential overall due to the environmental conditions of upland poorly drained soils, low to no topographic relief and poor access to water resources.

A review of the Florida Master Site File data files showed no structures were recorded, *National Register* listings, or archaeological sites within the project tract. No cultural materials were recovered during the pedestrian survey and no evidence of historic structures were recovered within the Ormond Beach Municipal Airport Runway 08-26 Extension area. It is **Storm L. Richards & Associates, Inc.**'s professional opinion that the development will have no effect on Section 106 resources. If development reveals any archaeological resources, the Seminole Tribe of Oklahoma and FDHR will be contacted directly for consultation. All State of Florida and Federal laws will be complied with.

A reconnaissance-level Section 106 survey and evaluation of cultural and historical resources within the one mile Area of Potential Effects (APE) of the proposed project site was conducted by **Storm L. Richards & Associates, Inc.** Pursuant to Section 106 (36CFR, Part 800) of the *National Historic Preservation Act of 1966*, as well as in compliance with the *National Environmental Policy Act of 1969* (implemented by 47CFR1.1307 [a] [4], this Section 106 assessment to located and to assess archaeological and historic properties (for the presence of ceremonial, religious, or cultural significance to Native American Tribes), if present within the APE, and to assist in determining the proposed Ormond Beach Municipal Airport Runway 08-26 Extension for impacts upon these properties.

Such historic properties would include sites, buildings, structures, districts, or objects that are listed, determined eligible, or are potentially eligible for listing in the *National Register of Historic Places*. According to federal guidelines, those properties potentially significant in American history, architecture, archaeology, engineering, or culture possess integrity of location, design, setting, materials, workmanship, feeling, and association, and meet at least one of the following four criteria: (A) association historic events that have made significant contributions to the broad pattern of national or regional history; (B) association with persons significant to national or regional history; (C) potential for yielding intact, contextual, or datable artifacts or structures of high quality of workmanship that embody the distinctive characteristics of a type, period, or method of construction; and (D) likely to yield data needed for refining or interpreting local or regional prehistory (36CFR, Part 60).

The proposed undertaking is for the Runway 08-26 Extension and improvements of the existing runway. A survey using this Methodology was used for the assessment of potential effects upon historic properties (Appendix A—FMSF: Survey Log Sheet of Proposed 160-foot American Electronics Company Wireless Telecommunications Tower).

ENVIRONMENTAL SETTING

The environmental setting is a brief description of the physical geography and environment of the project area located in Volusia County as well as overviews of the regional prehistory and history. This information provides a context for evaluating cultural resources identified during the survey.

Physical Environment

The current environmental setting evaluation for the Ormond Beach Municipal Airport Runway 08-26 Extension Site located in Sections 12 & 38, Township 14 South, Range 31 East, is helpful for reconstruction of past conditions. Geological features existing today can give an indicator of past conditions. For example, higher elevation areas with access to water resources are important considerations today for early uses of historic and prehistoric sites.

Environmental and ecological factors through time had a direct influence on the choice of sites chosen for occupation by prehistoric populations and early historic settlers. Geological, hydrologic, and meteorologic processes, especially in areas affected by major lakes such as Lake Tohopekaliga as well as other small lakes have affected the survey area and its biotic resources which are elements in the evaluation of a settlement/subsistence model for prehistoric and early historic peoples. Current environmental variables can be used for partial reconstruction of potential past conditions that may have influenced early human occupation within the corridor and are thus included in this study. Vegetative communities within the proposed Ormond Beach Municipal Airport Runway 08-26 Extension area historically would have been diverse. Watts (1971) has indicated that the vegetation associated with this area of Florida has remained stable since the last major environmental change, which started roughly five thousand years ago. The oak-pine vegetation complex and its associated faunal community would have provided numerous resources for the aboriginal inhabitants. The range of habitats within the area of the proposed Ormond Beach Municipal Airport Runway 08-26 Extension Development site could have supported a wide and abundant range of resources.

The proposed Ormond Beach Municipal Airport Runway 08-26 Extension Development project area is located in the Central Highlands physiographic province. Current features associated with this province include a number of wetlands in the area. The project area lies within the Ormond Beach USGS Volusia County corridor.

Water resources consist of both ground and surface water. The principal groundwater aquifer is the Floridan which occurs under artesian conditions with slowly permeable clays and sands forming a confining layer that effectively prevents the vertical movement of water from the surficial to the groundwater aquifer. Outflow from the Floridan occurs by spring discharge, seepage into the St. Johns River, and by outflow to other areas including the Atlantic Ocean (Scott 1978). A secondary artesian aquifer occurs in the undifferentiated surface sediments and in the Hawthorne Formation. (FDOT 1998:7)

CULTURAL HISTORY

Paleo-Environment and Macro-Vegetational Change

The prehistoric environment of the study area was probably stable after the last major environmental change, about 3,000 years ago (Watts 1971). Prior to this time, however, the environment of Florida was much different than today. Therefore, a discussion of the paleo-environment of the project area is considered to be important for understanding prehistoric aboriginal settlement patterns. (FDOT 1998:9)

Since the close of the Pleistocene at the end of the Wisconsin glaciation, roughly 13,000 years ago, Florida has undergone significant climatic and environmental change. Changes in climate, vegetation, and fauna often required that human groups alter their adaptive strategies. This results in changes in subsistence adaptation, settlement and seasonal movement patterns, foraging strategies, and hunting patterns. These changes in social behavior are reflected in archaeological record as changes in site patterning, changes in midden composition or refuse disposal patterns, or changes in the kinds of stone tools manufactured or the kinds of pottery made. (FDOT 1998:9-10)

An exhaustive paleo-environmental reconstruction is beyond the scope of this report; however, a description of the gross climatic and hydrologic conditions since 33,000 Before Present (B.P.) is summarized from published accounts. This description, drawn primarily from the work of W. A. Watts (1969, 1971, 1975, 1980; Watts and Hansen 1988), considers only large-scale environmental change. Carbone (1983) has suggested the reconstruction of local paleo-environments, or small-scale environmental change, with an effort towards developing regional paleo-environmental mosaics. Animals and vegetation, humans included, adapt to local areas, or micro-habitats. The descriptions given here cannot be used with any confidence to predict the specific pre-modern micro-habitats that may have existed within the project area. They can, however, provide a general indication of the natural surroundings confronting prehistoric groups, particularly the environmental limitations that would have influenced prehistoric settlement strategies. (FDOT 1998:10)

Paleo-botanical evidence (Watts 1969, 1975, 1980; Watts and Struiver 1980; Watts and Hansen 1988) has documented that the cypress swamp/mesic hammock environs that presently exist in the drainage basins of central Florida are a recent phenomenon (post-3000 B.P.). Prior to 3,000 years ago, the human groups inhabiting this region were adapted to environmental situations which have no analogue on the Florida peninsula today (Wright 1971, 1981; Long 1974; Carbone 1983). Since the beginning of the Holocene (ca. 13,000 years ago), the changes in climate and topography have been dramatic; both the environment and human exploitation of the environment have been in a continual state of change (Edwards and Merrill 1977). (FDOT 1998:10)

Although glaciers never extended into the southern latitudes, the effects of glacial conditions and the extension of the Laurentide ice sheets affected the paleo-climate of Florida. Paleo-botanical evidence suggests that during the period 33,000 B.P. to 13,500 B.P. Florida was dry, windy, and cool (Whitehead 1973). Pollen analyses on lake sediment cores performed by Watts (1969, 1971, 1975, 1980) suggest a mosaic of herb prairie and oak savanna covered central Florida at this time. Rosemary (*Ceratiola ericodes*), ragweed (*Ambrosia*), other composites, and grasses covered the dune ridges. Scattered stands of sclerophyllous oak scrub grew in the lower, more water-retentive areas. Pine were rare in Florida 35,000 years ago (Watts 1975:345), but increased in abundance toward the close of the Pleistocene (Watts 1980:400). Drier conditions are suggested by hiatuses in lake sediment cores obtained from Mud Lake in north-central Florida (Watts 1969), Lake Louise in southern Georgia, Scott Lake in west-central Florida (Watts 1971), and Sheelar Lake in north-central Florida (Watts and Struiver 1980). (FDOT 1988:10)

These breaks in the sedimentary record are the result of lower average rainfall and depression of the Floridan Aquifer and surficial (water table) aquifer. A lower mean sea level was partially responsible for the depression of these aquifers. Shallow perched lakes dried up, leaving only solution lakes with sufficient depth to tap water contained within the depressed Florida Aquifer. Examples of such solution lakes (cenotes or sinkholes) include Lake Anne in Highlands County (Watts 1975), Warm Mineral Springs (Clausen et al. 1975), Little Salt Springs (Clausen et al. 1979) in Sarasota County, and Devil's Den in Levy County (Martin and Webb 1974). (FDOT 1988:10-11)

Evidence of cooler and drier conditions at the maximum of the Wisconsin Glaciation (18,500 B.P.) is also provided by Gates (1976). Using CLIMAP data, Gates has estimated the mean July temperature in the southeastern U.S. to be as much as 7°C to 10°C cooler than present mean July temperatures. (FDOT 1998:11)

Roughly 13,500 years ago, the climate in central Florida has warmed and rainfall was probably more abundant. The shallow perched lakes again contained water. Watts (1980:400) states that by 10,400 years B.P., oak pollen reached its highest levels. Pollen from dune cover vegetation, primarily rosemary, ragweed, and grasses, became less well-represented in the pollen record. This indicates that the dunes were then stabilized by oak scrub, and local sclerophyllous oak forests had developed. Pines became more common, but large areas of open prairie-like vegetation still remained (Watts 1980:400). Temperatures were probably warmer than present (Wright 1971; Watts 1975, 1980). Rainfall was probably greater at this time than during the preceding period (33,000 to 13,500 B.P.), but conditions were still drier than today. (FDOT 1998:11)

By convention the beginning of the Holocene has been set at roughly 10,000 B.P. (Whitehead 1965); however, recent palynological data have modified this view. Kukla (1969) postulates that the Holocene began as early as 13,500 B.P. He has suggested that a series of minor climatic fluctuations has occurred since that time beginning with a warming trend which lasted until 4600 B.P., reaching a post-glacial climatic optimum at roughly 6000 B.P. Cooling trends are suggested for the periods 4600 to 4000 B.P., 3450 to 2700 B.P., 2100 to 1600 B.P. and 750 to 60 B.P. (Kukla 1969:315). Associated with these cooler periods are drops in sea level from two and one-half to four meters below present levels. Warming trends are suggested for the periods 4000 to 3450 B.P., 2700 to 2100 B.P., and 1600 to 750 B.P. The most recent warming trend (1600 to 750 B.P.) is considered to have been slightly warmer than the others, and has been called the "little climatic optimum" (Kukla 1969:316). A rise in sea levels to 0.5 meters above present levels has been associated with this last period. (FDOT 1998:11)

After 5000 B.P., the environment in west central Florida began to take on a more modern appearance. Large stands of slash pine (*Pinus elliottii*) became established, probably at the expense of oak in the wetter, low-lying areas. Rainfall increased and sea levels rose, creating wetter conditions. At Lake Annie, (Watts 1980:400) reports that the pollen from bald cypress (*Taxodium distichum*) does not occur with any frequency until 2630 B.P. The development of cypress swamps, bayheads, and mesic hammocks has occurred over the last 3,000 years. (FDOT 1998:11)

The availability of water to the aboriginal inhabitants of central Florida involved two groundwater systems: the Floridan Aquifer and the surficial aquifer. The Floridan Aquifer exists in Miocene and earlier age limestone, which lie beneath the Hawthorn Formation. This is the source of fresh water for many of the present-day inhabitants of this region. The surficial aquifer lies within the Recent age deposits, separated from the lower limestones by semi-permeable clays and sandy clays. (FDOT 1998:11)

Water from the Floridan Aquifer is available in sinkholes, springs, and other natural openings where the lower limestones are not covered by Recent age materials. Water from the surficial aquifer is available in perched water ponds. Perched water ponds are generally shallow bodies of water, fed by rainfall and the surficial aquifer, that remain near the ground surface because of the almost impermeable clay stratus. The base level of both aquifers is greatly influenced by sea level (Dunbar 1982:77-80). (FDOT 1998-12)

Because the level of the Florida Aquifer is partially dependent on sea level, the projected level of the aquifer at any point in prehistory will depend largely on which of the Holocene sea levels curves are used (Dunbar 1984) suggests the use of the sea level curve developed by Stapor and Tanner (1977). This sea level prediction is similar to those suggested by Fairbridge (1960, 1961, 1974) and Morner (1969). What is important is the pattern of sea level fluctuations, not the absolute values of the measures above or below present sea level. (FDOT 1998:12)

People in Florida during the Paleoindian and Early Archaic stages obtained a permanent water supply from solution lakes and ponds and a seasonal water supply from perched water ponds. Shallow water ponds and rivers fed by the Floridan Aquifer were dry during this period because of insufficient rainfall and the depressed level of the aquifer. Settlement appears to have been limited, or "tethered", to areas around sinkholes (Clausen et al. 1975, 1979), or areas within the Central Gulf Coast karst region, where both solution lakes and perched water were available (Dunbar and Waller 1983). (FDOT 1998:12)

By 10,000 B.P., the previously dry perched water systems began to retain water for longer periods of time as rainfall levels increased. By 8500 B.P., the water levels in the perched water systems approached modern levels, but the level of the Floridan Aquifer remained lower because of lower sea levels. Potable water was less restricted, but only available as perched water ponds and lakes and in some deep sinkholes. Some of the larger, spring-fed rivers probably flowed intermittently, but for much of the period, these rivers were probably reduced to a series of discontinuous shallow ponds or pools. (FDOT 1998:12)

By 6000 B.P., the Floridan Aquifer reached modern levels (Dunbar 1982:98). This resulted in fresh water discharge from springs, and spring-fed rivers. Arid conditions caused many of the perched water ponds to dry up, restricting potable water to springs, rivers, and sinkholes (Dunbar 1982:98). Surface water was abundant during the period between 6000 to 5000 B.P., as the Floridan Aquifer was about 1.5 meters above current levels (Dunbar 1982:101). (FDOT 1998:12)

During the period from 5000 B.P. to 2500 B.P., the level of the Floridan Aquifer fluctuated roughly three meters, from 1.5 meters above current levels at 5000 years B.P. to 1.5 meters below present levels at 4200 years B.P. (Dunbar 1982;102). This probably resulted in a decreased surface discharge from the aquifer, but increased rainfall maintained the levels in the perched water systems. From 2500 B.P. to 250 B.P., the rainfall conditions, probably resulted in seasonal flooding of low-lying regions (Dunbar 1982:102). Potable water was abundant during this period. Site location was probably more dependent on the proximity of plant and animal resources than on the availability of water. (FDOT 1998:12-13)

The climatic fluctuations that have occurred over the past 13,000 years have affected the way human groups were able to exploit the resources found within the Osceola County area. The Paleoindian and Early Archaic inhabitants would have found the area drier, and access to water restricted, possibly only seasonally available at perched water ponds, or in solution lakes (sinkholes). Mixed forests of oak and pine probably dominated the lower, water-retentive areas, with the higher, drier locations covered with grasses and rosemary scrub. (FDOT 1998:13)

Prehistory

The proposed Ormond Beach Municipal Airport Runway 08-26 Extension project area is located in the East and Central Lakes archaeological region, as defined by Milanich and Fairbanks (1980:22; Milanich 1994:xix). The area was occupied prehistorically by aboriginal groups sharing similar customs, traditions, and technologies. Although regional variations in cultural practices existed, there are enough similarities between these different groups to enable archaeologists to classify the region as a single culture area (Russo et al. 1989).

The East and Central Lakes archaeological region extends from the St. Mary’s River on the north to the vicinity of the Vero Beach on the Atlantic Coast, and includes the St. Johns River drainage system and most of the coastal lagoon. Although the southern interior boundary is rather vague, recent investigations (Austin 1987, 1997, & 1996) suggest that it is in the vicinity of Lake Tohopekaliga in Osceola County, which would include the proposed Ormond Beach Municipal Airport Runway 08-26 Extension site.

Paleoindian Stage

The Paleoindian stage of prehistoric cultural development dates from the time humans first arrived in Florida, about 10-12,000 B.C. until about 6500 B.C. Research suggests that the climate of the region was cooler and drier than at present and the level of the sea was as much as 35 meters (115 ft.) lower (Milanich & Fairbanks 1980:37). The greatest density of known Paleoindian sites in Florida is associated with rivers in the north-central part of the state, although rising sea levels have probably inundated early coastal sites making their discovery difficult (Rouse 1951:21-30; Scholl et al. 1969; Ruppe 1980).

Archaeological data suggest Paleoindian existence was based on the uniformity of the known stone tool assemblage and the small size of many of the known sites is that of a nomadic lifestyle with subsistence activities based on hunting and gathering (Milanich and Fairbanks 1980:35-42). Recent excavations in Hillsborough County, however, indicate that some Paleoindian groups may have practiced a more sedentary lifestyle than had previously been believed (Daniel and Wisenbaker 1987; Daniel 1985:264).

There are early aboriginal sites located on the coastal strand southeast of the subject proposed Ormond Beach Municipal Airport Runway 08-26 Extension Development site—Site 8BR44 in Melbourne and Site 8IR9 in Vero Beach—where at both sites human remains were reported in association with bones of extinct Pleistocene animals (Janus Research/Miller-Sellen Associates, Inc. 1996:12; Gidley and Loomis 1926; Sellards 1940). Hrdlicka (1907, 1918) and later Rouse (1950, 1951:223) disputed this association feeling the human remains to be intrusive into the Pleistocene stratum (Janus Research/Miller-Sellen Associates, Inc. 1996:12). More recent examination of the human crania (Milanich and Fairbanks 1980:5) along with comparisons with those from the Warm Mineral Springs site in Sarasota County seem supportive of a Paleoindian period date for the Melbourne and Vero Beach finds (cockerel and Murphy 1978:7-8). These sites are not representative of the subject Ormond Beach Municipal Airport Runway 08-26 Extension Development.

No Paleoindian sites have been excavated in the region. A Paleoindian tool assemblage, including lanceolate-shaped projectile points, has been recovered from the Lake Hell 'n Blazes site located near the headwaters of the St. Johns River (Edwards 1954). Isolated finds of lanceolate-shaped projectile points have been reported in the region including a Suwannee projectile point recovered during dredging of Soldier's Creek in Seminole County (Stewart & Dreves 1980). The relative lack of Paleoindian sites in Central Florida has been linked to environmental constraints imposed by a lower sea level and drier climate and not representative of the Ormond Beach Municipal Airport Runway 08-26 Extension Development.

Archaic Stage

The Archaic stage of cultural development was characterized by a change in adaptive strategies stimulated by the end of the Pleistocene and the establishment of increasingly modern climate and biota. It is generally believed to have begun in Florida around 6500 B.C. (Milanich and Fairbanks 1980:48). This stage is further characterized by an efficient, seasonal exploitation of a wider range of food resources including deer and other small game, hardwood nuts, and mollusks, and a larger but less carefully worked stone tool assemblage. Archaic native groups are thought to have used a more restricted territory than their Paleoindian predecessors, with some groups leading at least a semi-sedentary existence. Archaic site types include base camps, hunting camps, butchering sites, quarries, and cemeteries. In Central Florida Early Archaic components are present at the Zellwood site on the shore of Lake Apopka (Dreves 1974) and at the Nalcrest site at Lake Weohyakapka in Polk County (Bullen and Beilman 1973).

An important Early Archaic site in east central Florida is the Windover site near Titusville in Brevard County. This site consists of a prehistoric cemetery in a small pond and is the most thoroughly excavated early site in east central Florida. In addition to well preserved human remains, normally perishable items of bone, wood, shell, and fabric were also preserved. Radiocarbon dates indicate that the interments were made roughly 8,000 years ago, 6000 B.C. (Doran and Dickel 1988). This site is not representative of the Ormond Beach Municipal Airport Runway 08-26 Extension Development.

Orange Period, 2,000-1,000 B.C.

The Orange Period represents the first appearance of ceramics in the southeast. These first ceramics were primarily slab construction and tempered with plant fibers. Decoration includes incising and punctuation. Other than the ceramics, the artifact assemblages for this period are quite similar to the preceding Late Archaic/Mt. Taylor Period (Milanich and Fairbanks 1980).

Subsistence patterns during this period show an increase in, or shift towards exploitation of coastal resources, particularly the coquina found in coastal lagoons. Coastal sites are distinguished by extensive coquina shell middens containing fiber tempered ceramics (Milanich and Fairbanks 1980).

Transitional Period, 1,000-500 B.C.

The Transitional Period marks the beginning of distinctive regional cultural groups in Florida. It also marks the change from slab construction fiber tempered ceramics to coil construction and sand tempering. The most common ceramic for this period in the East and Central Lake District is the chalky St. Johns Incised ware. It is believed that this period represents a gradual shift from a hunter-gatherer subsistence pattern to a more sedentary pattern which may have been based on exploitation of cultigens (Milanich and Fairbanks 1980).

St. Johns 1,500 B.C.-A.D. 800

Goggin neatly summarizes the St. Johns Tradition as “a pottery using mound building, semi-sedentary complex probably with agriculture” (Goggin 1952:68). The St. Johns Tradition is divided into two archaeological periods and several subperiods, and is noted for its chalky ware ceramics.

The St. Johns I Period is subdivided into St. Johns I, Ia, and Ib. The St. Johns I subperiod (500 B.C.-A.D. 100) is characterized by the presence of plain and incised St. Johns ceramics in the village areas. However, burial mounds may contain Deptford pottery characteristic of cultural groups to the north and west. This implies an exchange of goods and perhaps ideas between the two groups. The Deptford wares represented in mounds include Deptford Linear Check Stamped, Deptford Bold Check Stamped, and Deptford Simple Stamped. The St. Johns type known as Dunns Creek Red is also present in burial mounds (Milanich and Fairbanks 1980).

During the St. Johns Ia subperiod (A.D. 100-500) evidence of the Hopewellian-Yent complex characteristic of societies to the northwest begins to appear in burial mounds. This complex evidences increased burial ceremonialism with the presence of elbow pipes, cut mica, galena, shell gorgets, and copper ornaments, many of this trade goods from the north and central United States. Village pottery remains dominated by St. Johns Plain, but mounds contain Dunns Creek Red, Deptford, Swift Creek, and, during the latter part of the subperiod, Weeden Island types (Milanich and Fairbanks 1980).

St. Johns Ib (A.D. 500-800) is marked by the appearance of Weeden Island influences from the west, although the village pottery remained St. Johns Plain. The total number of sites which can be identified with this subperiod represents an increase over previous subperiods, suggesting a large population increase during this time (Milanich and Fairbanks 1980).

St. Johns II, A.D. 800-1565

The St. Johns II Period is marked by the appearance of checked stamped pottery. Like the previous period, St. Johns II has been divided into three subperiods based on changes in the artifact types.

St. Johns IIa (A.D. 800-1300) is marked by an increased use of burial mounds and the presence of the distinctive St. Johns Check Stamped pottery. Weeden Island pottery continues to appear in mounds and some mounds contain caches of ceramics (Milanich and Fairbanks 1980).

St. Johns IIb (A.D. 1300-1513) sites begin to display Mississippian influences with the presence of Southeastern Ceremonial Cult copper items in the mounds. Although Check Stamped pottery dominates the sites, there are some Fort Walton and Safety Harbor ceramics represented, indicating contact with the west coast of Florida. Mounds became larger and more complex during this period, indicating an increasingly sedentary and stratified society. The Indians of this period were probably organized in hereditary chiefdoms and priesthoods (Milanich and Fairbanks 1980).

St. Johns IIc (A.D. 1513-1565) is the final prehistoric stage in Florida during which European contact occurred. Although St. Johns Check Stamped ceramics and burial mounds are still present, European artifacts began to appear in the sites. The population of this period suffered severe reductions as a result of the introduction of European diseases (Milanich and Fairbanks 1980).

In general, the St. Johns II period represents a continuance of the subsistence patterns of previous periods, with a heavy dependence on marine and estuarine resources, particularly coquina, oyster and clam. Some shell middens along the coast were over 25 feet high, indicating the presence of large populations (Milanich and Fairbanks 1980).

At the time of European contact, the Indians of the study area were described as the Freshwater (or Agua Dulce) and Acuera groups of the Timucuan people. These are probably the least known of the Timucuan groups due to limited contact with the early Spanish settlers. They were described as agriculturalists who grew corn, beans, and tobacco, but also relied heavily on hunting, fishing, and gathering wild plant foods. Social organization was based on ranked class headed by chiefs. Polygamy was common, and the people were described as tall and often tattooed. Extensive rituals were practiced in association with warfare and burials (Milanich and Fairbanks 1980).

St. Augustine Period, A.D. 1650-1715

European contact would result in the virtual destruction and elimination of the native Indians of Florida within a hundred year period, primarily through the introduction of European diseases. Native ways of life were altered through the introduction of European goods and agricultural practices. The native religious practices were largely supplanted by the introduction of Catholicism through the Spanish mission system. Ceramics of the contact period also reflect European influences, particularly in their shapes. These ceramics are known as San Marcos types in eastern Florida (Milanich and Fairbanks 1980).

The English raids of the early 18th century led to the final extermination of the Timucua and their culture. After 1715, the Spaniards encouraged Creek Indians from Georgia and Alabama to migrate to Florida, where they became known as the Seminole.

Historic Period, A.D. 1715 to present

After the decimation of the native Indians, the Creek Indians moved into northern Florida during the period described by Fairbanks (1978) as Colonization, 1716-1763. The Creeks in Florida appear to have abandoned the Creek town pattern with its central square in favor of a more dispersed pattern of separated farmsteads. This may reflect their increasing dependence on exploitation of the cattle herds introduced by the Spaniards. Seminole sites in north Florida are marked by the presence of Chattahoochee Brushed ceramics as well as European trade goods. Although the Seminole traded with the Spaniards, there was little additional contact and apparently no attempt to reintroduce the mission system.

Fairbanks (1978) characterizes the period from 1763 to 1790 as Separation. The British acquisition of Florida in 1763 led to a well-defined Indian policy which centered on increasing attempts to control the Indians. The Indians, in turn, extended their isolation from their homeland to an attempt at isolation from the British. This isolation was accompanied by increasing hostility towards the British. At the same time, the Seminole were harboring runaway slaves from Georgia and the Carolinas which promoted their distrust of white settlers as well as hostility on the part of those settlers. The British did establish a number of trading posts among the Seminole, thus increasing the presence of European goods on Indian sites.

The third Seminole period is characterized as Resistance and Removal, 1790-1840 (Fairbanks 1978). This was the period of the First and Second Seminole Wars. After the Spaniards regained Florida, they allowed the British and Americans to continue to trade with the Seminoles. Perhaps as a result of increasing frontier tensions, Seminole sites became even more dispersed. After the Creek Indian War, large numbers of Indians migrated to Florida increasing the Seminole population. At the same time, American settlers continued to move into the same areas, resulting in increased friction between the two groups. This led to the First Seminole War of 1818. Although this war was rather limited and brief, it did influence the cession of Florida to the United States in 1819. The 1823 Treaty of Moultrie Creek attempted to confine the Seminole to the area south of Ocala. This led to the Seminole presence in the Central Lakes area of Florida, but also to increased friction between the two groups.

The new Seminole reservation did not offer the same resource base as the area previously occupied. At the same time, the increased friction between Indians and American settlers had resulted in reduced access to trade goods. In 1835, this friction erupted into the Second Seminole War. During this war, a number of military outposts and highways were established in Central Florida (Mahon 1985).

The end of the Second Seminole War brought the fourth stage of the Seminole Period, Withdrawal, 1840-1880 (Fairbanks 1978). At this time, the Seminole who remained in Florida withdrew into the reaches of the Everglades of South Florida, leaving North and Central Florida open to American settlement. The Armed Occupation Act, offering homestead rights to settlers, led to an increased movement into the state, but had little impact on the project area. A few scattered ranches were located in the Kissimmee area by 1850, but Osceola County's oldest permanent settlement was not established until 1878 at Whittier east of Lake Marian. Small farmers and cattlemen were the primary settlers of this part of Osceola County after the Second Seminole War, and the cattle industry flourished in this area during the Civil War. By 1880, Kissimmee was a trading post with a population of less than 100 residents (Estabrook 1989; Moore-Wilson 1935).

HISTORICAL REVIEW

The intent of the historical documentary review was to identify the possible locations of any historic sites within the project area and to determine the potential historical significance of any such sites.

When the Europeans arrived in Florida in the 16th century they encountered the Timucuan Indians loving along the northeast coast of Florida. The area south of St. Augustine to Daytona Beach along the coastal lagoons was the territory of the Agua Dulce tribe. The Timucuan culture was little changed from that of a thousand years previous, but in a short hundred years warfare and disease brought about by contact with the Europeans decimated the Indians (Deagan 1978:89-90).

The first attempts of colonizing Florida were made by the Spanish, but when the expeditions of Ponce De Leon, Narvaez, and De Soto all met with failure, the crown was prepared to admit defeat and concentrate their efforts elsewhere. French encroachment into Florida brought about a swift reversal in policy and in 1565 Pedro Aviles Menendez was sent from Spain to challenge Ribauld's settlement at Fort Caroline. In September of that year Menendez founded St. Augustine and for the first time Spain was successful in establishing a permanent colony in Florida. St. Augustine became his base of operations from which he launched an attack on Fort Caroline (Tebeau 1771:34). Some of the French survivors escaped and traveled south to the area of Cape Canaveral where they attempted to build a fort to defend themselves. Menendez, notified of this by friendly Indians, pursued the French and destroyed their fort and boat, capturing all but the captain and a few others who escaped to the woods (Rouse 1951:50).

Menendez swiftly put into action his plan to control the aboriginal population of Florida. In 1566 he entreated Jesuit missionaries to come to Florida to assist in the religious conversion of the Indians and build missions which were also to serve as a lien of defense against English and French encroachment (Gannon 1965). Menendez was most successful in the conversion of the Apalachee and northern Timucuan, tribes which had an agrarian tradition (Milanich 1978). Southern Florida tribes, the Calusa, Ais and Tequesta, rejected Spanish attempts to locate missions in their territory and eventually missionaries were no longer sent to that region.

In 1572 the Jesuits abandoned their missionary effort but they were soon replaced by the Franciscans who were much more successful and who helped to bring about "The Golden Age of the Florida Missions" during the period 1606-1675 (Gannon 1965). It was the Franciscans who built San Antonio de Encape in present-day Volusia County (Schene 1976:3). The location of the mission is reportedly in Township 13 South, Range 32 East, Section 39. In the early 19th century the Dummitt Sugar Mill (FMSF #8Vo241) was built upon its ruins (Stanton 1949:5). This site is located approximately 2 miles north of the Riverbend project area.

The Spanish missions lasted until 1703 when raids by the English brought about the collapse of the system. Many Indians were taken as slaves or killed during the foray and this final assault brought about the decimation of a culture whose numbers had already dwindled to a few. The void left by Florida's aboriginal population would eventually be filled by a new group of Indians from Georgia, Alabama and the Carolinas, who were to become known as the Seminoles.

At the end of the First Spanish Period of occupation (1763) there were few settlements in Florida. Outside of Pensacola, St. Marks and St. Augustine, the Spanish could credit themselves with little in the way of development after 200 years of occupation. The British acquired the province through the Treaty of Paris and entrepreneurs began to take an interest in Florida, especially the region along the northeast coast where it was believed that the crops of indigo, cotton and sugar could be grown. Enticed by the offer of generous land grants, Britishers as well as many wealthy planters who had already established themselves in Charlestown and Savannah, built plantations in Florida (Stanton 1949; Schene 1976:5-7).

One of the first large land grants was awarded to Dr. Andrew Turnbull and his partner Sir William Duncan. They each received 20,000 acres with the stipulation that the tracts were to be colonized within a few years or the land would revert to the crown (Schene 1976:7). Turnbull recruited immigrants from Greece, Italy and Corsica, people who would be skilled in the cultivation of cotton and silk. Unfortunately, from the beginning the enterprise was beset with problems. Many sickened during the voyage over and the loss of a ship carrying slaves to the colony created further problems. In 1777, nine years after the New Smyrna colony was founded, Governor Patrick Tonyn set the settlers free and they left the area (Schene 1976:9).

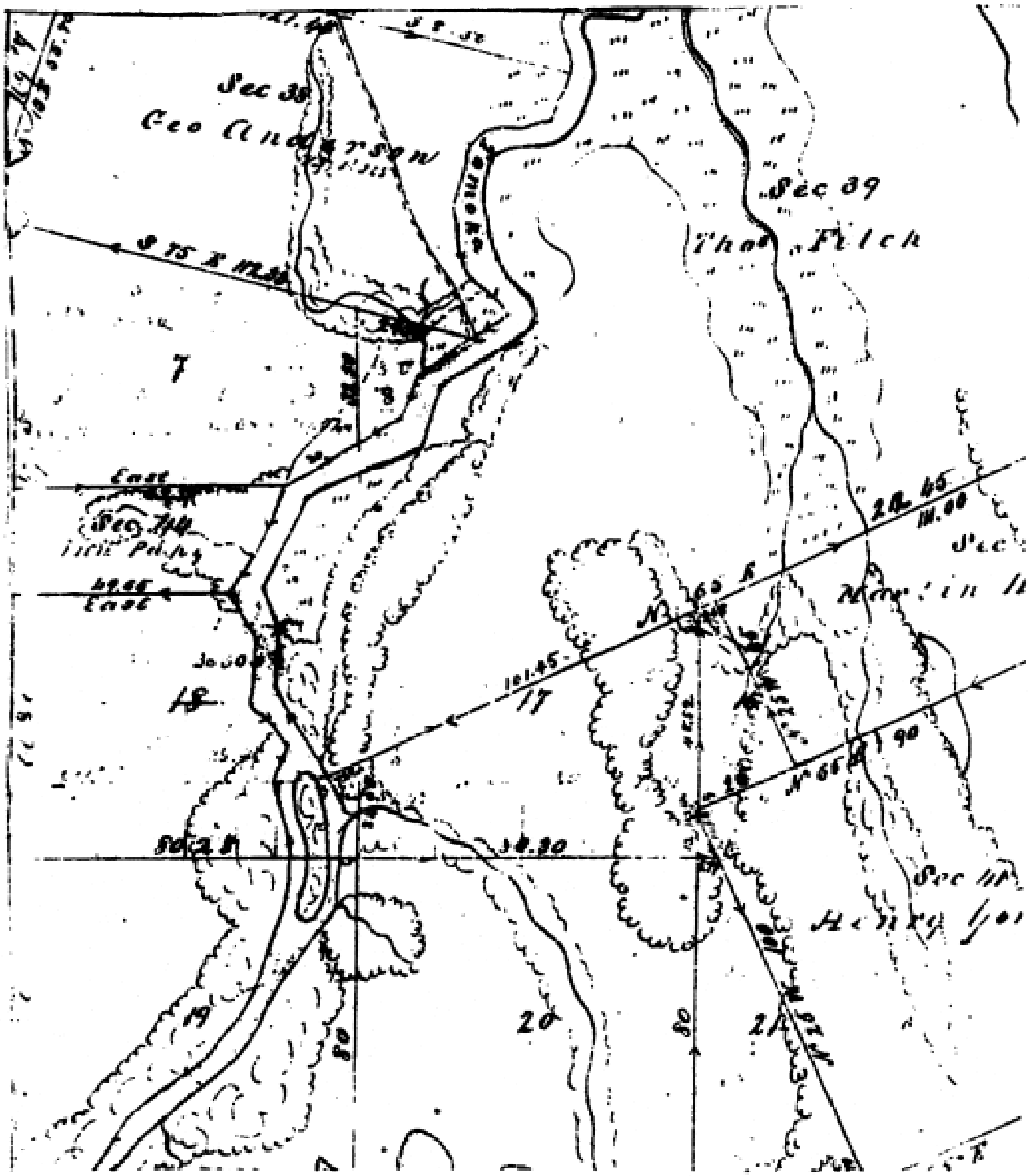
Other planters received grants and some of them were more successful than Turnbull in their endeavors. Captain Robert Bisset settled along the confluence of the Indian and Hillsborough Rivers. Richard Oswald received in 1766 a grant of 20,000 acres situated at the intersection of the Tomoka and Halifax Rivers. He divided this tract into four plantations: Mount Oswald, Ferry Settlement, Swamp Settlement and Alda. At Mount Oswald land was cleared and structures were built to house the overseer and slaves. Rice was the main crop grown and approximately 400 acres were cleared and 100 properly equipped with an irrigation system (Schene 1976:9). South of Mount Oswald rice was also cultivated at the Ferry Settlement, and indigo was grown at the Swamp Settlement (Schene 1976:9). Stanton (1949) describes the Oswald grant as being located from the Hernandez grant (Section 40 of T14S, R32E) north to the Tomoka River, an area which today contains the Riverbend project area.

The Treaty of Paris, 1783, gave Florida back to Spain as reward for their support of the American Colonies in the Revolutionary War. Most of the British, not wishing to become Spanish subjects, left Florida and the large plantations in northeast Florida were abandoned. Spain lost little time in awarding these very same lands to the its own subjects in an attempt to repopulate Florida with people loyal to the Spanish crown. Although Spain had possession of Florida, the amount of power it wielded in the area was minimal. British trading companies like Panton, Leslie and Company (later Forbes and Company) had tremendous influence in the region and Spain was forced to let them remain (Coker 1986). Also, by this time American settlers began to stream over the border creating further problems for the Spanish governor.

The 1850 plat map of Township 14 South, range 32 East indicates that within the township several tracts of land were apportioned to loyalists. Section 44, which contains the Riverbend Tract was a land grant awarded to Gastar Papy on June 3, 1797 (see Figure 3). Papy received 200 acres (Section 44 consists of 141.74 acres) for the purposes of agriculture and cattle raising (Spanish Land Grant Records, Vol. 4, Confirmed Claims p. 165-166). For several years farms along the Halifax River prospered form the cultivation of cotton, rice, indigo, corn and sugarcane, but by 1812 political problems, interruption of trade by French privateers, and domestic violence had exacted their toll and forced the abandonment of many of the plantations (Schene 1976:17). At the end of the second decade of the 19^{th} century Spain entered into negation with the United States to effect the transfer of Florida to that new nation.

The Adam-Onis Treaty of 1821 gave Florida status as a United States Territory. One of the first matters to be attended to were the Spanish land grants. Owners of grants were allowed to petition the U.S. Court to receive clear title to their land. The Papy grant was confirmed to Gastar Papy's widow Ann in June 1827 (Spanish Land Grants in Florida, Conformed Claims, Vol. 4, pp. 165-166).

The second most pressing problem was the Seminole Indians. By 1821 the Seminoles were firmly established in north Florida with well-developed villages and farms and for many years they had exerted a good deal of influence due to the important part they played in the trade business the British developed in Florida. The American settlers, however, were not interested in fostering the same type of relationship and found the Seminoles to be a hindrance to expansion. Also, slave owners in other states were angry that slaves were running to Florida and being taken in by the Seminoles. They began to petition the United States government to do something about the Indians.



1850 Map of Township 14 South, Range 32 East showing location of Ann Papy Land Grant (Section 44).

PIPER ARCHAEOLOGY St. Petersburg, FL

In response to settlers' demands, the Treaty of Moultrie Creek (1824) was drafted. It restricted the Seminoles to approximately 4 million acres of land in the middle of Florida, running south from Micanopy to just north of the Peace River (Mahon 1965:Rear fold-out map). This treaty was unpopular with the Seminoles and they were reluctant to move from their established home sot an area which they felt could not be cultivated. Equally unpopular were the later treaties of Payne's Landing (1832) and Fort Gibson (1833) which called for Seminole emigration to the western territories (Mahon 1967:75-76, 82-83). The above treaties all served to foster Seminole resentment and the outbreaks of hostility which finally culminated in the Second Seminole War in 1835.

Planters in the Halifax River region soon felt the effects of the war. Fear of Seminole retaliation caused residents to construct fortifications such as blockhouses and small forts. At Bulowville, plantation owner John Bulow built a substantial fort from palmetto logs which he intended to man with his slaves (Schene 1976:41). The Addison Blockhouse Ruin (8Vo193) located in Section 40, T13S, R32E approximately 2 miles northeast of the survey area, has been subject to speculation concerning its origin. The most credent explanation is that the blockhouse was the focal point of Fort McRae, a small fortification constructed at the beginning of the war. The fort, on property owned by Duncan McRae (formerly the Addison Plantation called Carrickfergus), actually consisted of only the blockhouse and a surrounding breastwork and moat. Brief fighting occurred there in 1836 and it was subsequently destroyed along with other structures in the area (Florida Master Site File Records for 8Vol93).

In 1836 there were 16 thriving plantations along the Halifax River but by the war's end in 1842 none were left standing. Residents fled from the Indian depredations to safety in St. Augustine and unfortunately, because economic recovery was impossible for the majority, the area declined (Stantion 1949).

The end of the Second Seminole War saw the majority of Florida's Seminole Indians relocated in the western territories. A few, under the leadership of Billy Bowlegs, sought refuge in the recesses of the Everglades and the U.S. Government, after considering the efficiency of prolonging the war to affect their removal, allowed them to stay.

The Armed Occupation Act was passed at the end of the Second Seminole War in 1842 as a means of encouraging homesteading in the uninhabited regions of Florida. Homesteaders came to claim grants and settle in Volusia County (then called Mosquito County). Coastal development lagged, however, because most of the prime tracts along the Tomoka and Halifax Rivers were privately owned and buyers were scarce (Schene 1976:54). Some of the new homesteaders were successful in cultivating crops, but many could not withstand the hardships and left the area.

In the 1830s and 40s the timber resources of the county were exploited and planters along the Halifax and Tomoka Rivers were able to sell their timber for a good price. William, Rodolphus and Obed Swift, brothers from New England, worked a large timber operation along the Halifax River (Schene 1976:55-56). The U.S. had laws against cutting timber on public lands, but a shortage of manpower made enforcement difficult, and many contractors disregarded the law.

In 1845 Florida became a state and the new state assembly changed the name of Mosquito County to Orange and moved the county seat form New Smyrna to Mellonville. More settlers moved into the interior regions along the St. Johns but the economic malaise still persisted. Another setback occurred in 1849 when a band of outlaw Indians killed a settler near Ft. Pierce and once again homesteaders had to leave their property and seek safety in hastily constructed forts.

The Third Seminole War was not as severe a conflict as the one which preceded it, one reason being that the Seminole population was considerably reduced. But the series of skirmishes did manage to disrupt an already depressed economy and deter settlers from coming to Florida. The army once again sent troops into Florida to capture and deport the Seminoles. At the end of this foray in 1858 only about 200 Indians remained in the far recesses of the Everglades (Tebeau 1966:50).

In 1854 Volusia County was created. In 1855 it is estimated that there were probably less than 300 people (and 318 slaves) living in the county. In the next few years before the onset of the Civil War there was a tripling in population. Most of the residents living in the wilderness areas but a few inhabited the fledgling towns of New Smyrna, Enterprise, Volusia and Sand Point (Scheme 1976:59). The majority were farmers, and they continued to struggle to overcome the adverse economic climate which had prevailed in Florida since the territorial days. The final blow was to come with the Civil War.

The Halifax region was already sparsely populated at the beginning of the war for the plantation economy never successfully recovered from the destruction of the Indian Wars. Confederate deserters found the area an ideal place to hide and they formed bands which terrorized the few remaining residents (Schene 1976:71-72). The Civil War exacted a high price in terms of human life and suffering for both the Union and Confederacy. When the war ended in 1865 the Confederacy was bankrupt and many Southerners were without homes or livelihood. The plantation system, dependent upon large quantities of free labor, was never revived and people turned to subsistence farming to survive. The large plantations along the Halifax were deserted and all that remains today are the ruins of these once large enterprises.

It was twenty years before the east coast of Florida experienced an economic boom. In the 1880s citrus crops began to replace subsistence farming and Northerners with available capital became interested in the area. Better transportation also improved conditions. Before the advent of steamboat travel along the coastal areas in the 1880s residents were isolated form one another and it was difficult to get crops to market. The network of rivers formed important transportation routes for the early residents and steamboats improved travel and communication. This mode of travel also opened the area to a new commercial market—tourism.

In 1879-80 George Barbour accompanied Senator Seth French on a tour of the southern and middle regions of Florida. Traveling on the steamer, *Volusia*, the party made their way along the St. Johns River, finally arriving at Titusville and the Indian River. He visited the Halifax region and commented on residents of the surrounding towns as being "from all sections of the Union, generally prosperous and anxiously awaiting the opening of the canal, and the consequent impetus to the general industries of the country" (Barbour 1962:178). The canal Barbour mentions was a proposal to connect the various waterways along the east coast. As travelers like

Barbour returned to the North praising Florida's climate and hunting and fishing resources more people began to visit the region. Many returned to settle and build homes and farms.

The State of Florida Tract Book records indicate that the land in Section 7 of T14S, R32E was transferred from the state to private owners in 1883. James C. L. Bennett received Lots 1 and 8 on August 13, 1883. James A. Parker received Lots 2 and 7 on June 20, 1883 and the Florida Land and Improvement Company took possession of the remaining Lots 3, 4, 5 and 6 on December 15, 1883.

The most influential developer in south Florida, especially on the east coast, was Henry Morrison Flagler. Flagler, a partner of John D. Rockefeller in the Standard Oil Company, was already a wealthy man when he first visited Florida in 1787. After his first wife died in 1881 he remarried and returned to the Jacksonville-St. Augustine area in 1883. During this visit Flagler apparently began to set in motion plans for his new Florida railroad and hotel enterprises (Tebeau 1971:284). His interest was first centered in the St. Augustine are and later spread to more southerly portions of Florida. By February 1893 Flagler had extended his railroad to Titusville. In January 1894 a person could travel along the east coast of Florida to the southern portion of Brevard County by rail (Heller 1965:261).

The railroad provided impetus to new commerce and trade. However, economic prosperity received a setback in December 1894 and February 1989 when Florida experienced two disastrous freezes which wiped out citrus and vegetable crops. Most of the groves in Volusia and south along the Indian River were destroyed. Some farmers never recovered and left the area, but many remained to replant and try again.

Throughout the 20th century the area encompassing the Riverbend Golf Course project site has been utilized primarily for agriculture and timbering. Today the property is owned by the City of Ormond Beach and contains the Ormond Beach Municipal Airport.

Based on the above historical documentary review, the Riverbend Golf Course project area was considered to have a high probability for containing significant historical resources. The project location is in an area that experienced settlement as early as the 17th century when the Spanish mission of San Antonio de Encape was established along the Tomoka River. The area was also the focus of British and Spanish settlement in the 18th and 19th centuries when large plantations were established in the Halifax region. Thus, there was a possibility that cultural remains associated with these activities might be present on the Riverbend property (Piper Archaeological Research, Inc. 1989:10-20).

METHODOLOGY

Site Location Model

The designation of zones of archaeological site potential was based on previous research conducted within the East and Central Lakes archaeological region and discussions with the State of Florida Division of Historical Resources staff archaeologists. Four environmental factors were used in predicting site model: soil type (soil drainage), distance to fresh (potable) water, environmental factors, and relative elevation. Soil type and relative elevation deal with the water drainage pattern found in a particular area. Soils have perched water tables, with underlying marl or clays, and with slow to moderate internal drainage tend to retain water or be inundated. Areas with a low elevation relative to perched water systems tend to be wet or inundated. Wet areas can contain abundant wildlife and plant resources, they make poorer habitation areas when better drained locations are available.

Freshwater is an important resource for prehistoric aboriginals, as the need for water is universal. This variable would have been of greater importance during the Paleoindian and Early Archaic Periods (14000 to 6000 B.C.), when the perched water system was much more restricted. Access to water during these early periods would have been from sinkholes and aquifer-fed rivers.

Diverse ecological habitats including hardwood hammocks (hydric, mesic, or xeric) provide a variety of resources which would have been exploited by the aboriginal inhabitants of this region. Hydric hardwood hammocks can contain abundant animal and plant life, particularly a variety of tubers. Mesic hardwood hammocks contain hickory and cabbage palms which produce edible results, also ash and elm, woods that are known to have been used for specific purposes, i.e., bows, canoes, mortars, dart shafts (cf., Newsom and Purdy 1983). Often areas of higher relative elevation correspond with better drained soils or the presence of hardwood hammocks (xeric and mesic).

The proposed Ormond Beach Municipal Airport Runway 08-26 Extension Development site has a low site probability in the area associated with Runway 08-26 West. No previous Cultural Resource Assessment on adjacent property suggests little direct evidence of archaeological sites on this 59.9 acre site.

Field Methods

During the field survey, surface inspection was employed to locate and evaluate archaeological sites. The absence of artifacts found on the subject site is due to the highly disturbed nature of the development footprint of the Ormond Beach Municipal Airport Runway 08-26 Extension Development project. It should be clearly understood that the site has had pervasive, significant, and historic disturbance including but not limited to clearing. The soil was root raked, contoured, and altered significantly both onsite and offsite for other developments. No artifacts were recovered.

The area was pedestrian surveyed and no cultural resources were located.

Laboratory Procedures

No artifacts were recovered during the Pedestrian Survey including walking the site, especially in areas of exposed soil.

No significant and archaeological/cultural materials, historical resources, or human remains were noted during field review of the site. No lithic materials were recovered by excavation and/or field review.

RESULTS

The Cultural Resource Pedestrian Survey of the proposed Ormond Beach Municipal Airport Runway 08-26 Extension Development site resulted in no archaeological/cultural materials, human resources, or significant historic structures being noted on the site. The past disturbance of the site also minimized the potential for sites, but no significant artifacts were recovered during the pedestrian survey. There are portions of the site that have exposed soil and previous earth work, which did not yield artifacts either lithic or ceramic.

CONCLUSIONS

The Cultural Resource Pedestrian Survey was conducted on the proposed Ormond Beach Municipal Airport Runway 08-26 Extension Site located in Sections 12 & 38, Township 14 South, Range 31 East, Volusia County, Florida. The survey resulted in no archaeological or significant historic structures recorded. Florida Master File Sites were reviewed and were not found to be significant to the subject site because of distance from the site, the disturbed nature of the proposed Ormond Beach Municipal Airport Runway 08-26 Extension Site and condition of the identified sites as described in this report. Resources on the subject site do not show archaeological or historic significance.

All future and proposed development will comply with the Seminole Tribe of Oklahoma and State of Florida procedures following the Discovery of an Unmarked Human Burial (See Appendix E).

Based on the information collected during this survey, it is the recommendation of **Storm L. Richards & Associates, Inc.** that the proposed Ormond Beach Municipal Airport Runway 08-26 Extension project site should not be considered a regionally significant cultural resource at this time. If archaeological/cultural materials, historic resources, or human remains are recovered during construction, a Registered Professional Archaeologist will be contacted to provide guidance if additional systematic excavation is required. The Seminole Tribe of Oklahoma and State of Florida Division of Historical Resources will be notified regarding any modification of findings presented in this report. In the opinion of **Storm L. Richards & Associates, Inc.**, development of this site would have no effect on cultural resources eligible for listing on the *National Register of Historic Places*. Also, the Unanticipated Discoveries and Florida Laws (Appendix E) as specified in this Cultural Resource Pedestrian Survey will be adhered to regarding human remains, along with Florida Statutes Chapters 267 and 373.

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APPENDIX A

Florida Master Site Files:

Resource Group Form for Ormond Beach Municipal Airport

Archaeological Form for Ormond Beach Municipal Airport Runway 08-26 Extension

Survey Log Sheet for American Electronics

Survey Log Sheet for Riverbend Golf Course

☐ Original
☐ Update

RESOURCE GROUP FORM
FLORIDA MASTER SITE FILE
Version 4.0 1/07

Site #8________________
Recorder# ______________
Field Date _____/_____/____
Form Date _____/_____/____

NOTE: Use this form to document districts, landscapes and building complexes as described in the box below. Cultural resources contributing to the Resource Group should also be documented individually at the Site File. **Do not use this form for National Register multiple property submissions** (MPSs). National Register MPSs are treated as Site File manuscripts and are associated to the individual resources included under the MPS cover using the Site File manuscript number.

Check ONE box that best describes the Resource Group:

- ☐ **Historic district** (NR category "district"): buildings and NR structures only: NO archaeological sites
- ☒ **Archaeological district** (NR category "district"): archaeological sites only: NO buildings or NR structures
- ☐ **Mixed district** (NR category "district"): includes more than one type of cultural resource (example: archaeological sites and buildings)
- ☐ **FMSF building complex** (NR category usually "building(s)"): multiple buildings in close spatial and functional association
- ☐ **Designed historic landscape** (NR category usually "district" or "site"): can include multiple resources (see *National Register Bulletin #18*, page 2 for more detailed definition and examples: e.g. parks, golf courses, campuses, resorts, etc.)
- ☐ **Rural historic landscape** (NR category usually "district" or "site"): can include multiple resources and resources not formally designed (see *National Register Bulletin #30, Guidelines for Evaluating and Documenting Rural Historic Landscapes* for more detailed definition and examples: e.g. farmsteads, fish camps, lumber camps, traditional ceremonial sites, etc.)
- ☐ **Linear resource** (NR category usually "structure"): Linear resources are a special type of rural historic landscape and can include canals, railways, roads, etc.

Resource Group Name Ormond Beach Municipal Airport _____________ Multiple Listing [DHR only] ______________________________
Project Name Ormond Beach Municipal Airport ______________________________ FMSF Survey #___________
National Register Category (please check one): ☐ building(s) ☐ structure ☒ district ☐ site ☐ object
Linear Resource Type (if applicable): ☐ canal ☐ railway ☐ road ☐ other (describe): ______________________________
Ownership: ☐private-profit ☐private-nonprofit ☐private-individual ☐private-nonspecific ☒city ☐county ☐state ☐federal ☐Native American ☐foreign ☐unknown

LOCATION & MAPPING

Address (if applicable, include N,S,E,W; #; St., Ave., etc.) ______________________________
City/Town (within 3 miles) _Ormond Beach_________________ In Current City Limits? ☐yes ☒ no ☒ unknown
County or Counties (do not abbreviate) Volusia ______________________________
Name of Public Tract (e.g., park) Ormond Beach Municipal Airport ______________________________
1) Township 14 South Range _31 East Section _12 & 38 ¼ section: ☐NW ☐SW ☐SE ☐NE ☐Irregular-name: ______________
2) Township _______ Range _______ Section _______ ¼ section: ☐NW ☐SW ☐SE ☐NE ☐Irregular-name: ______________
3) Township _______ Range _______ Section _______ ¼ section: ☐NW ☐SW ☐SE ☐NE ☐Irregular-name: ______________
4) Township _______ Range _______ Section _______ ¼ section: ☐NW ☐SW ☐SE ☐NE ☐Irregular-name: ______________
USGS 7.5' Map Name(s) & Date(s) (boundaries must be plotted on attached photocopy of map; label with map name and publication date) ______________________________
Plat, Aerial, or Other Map (map's name, originating office with location) U.S.G.S. map, Aerial Location Map
Landgrant ______________________________
Verbal Description of Boundaries (description does not replace required map) See map of Ormond Beach Municipal Airport ______________

DHR USE ONLY	OFFICIAL EVALUATION	DHR USE ONLY
NR List Date ____/____/______ ☐ Owner Objection	SHPO – Appears to meet criteria for NR listing: ☐yes ☐no ☐insufficient info Date ____/____/______ Init.________ KEEPER – Determined eligible: ☐yes ☐no Date ____/____/______ NR Criteria for Evaluation: ☐a ☐b ☐c ☐d (see *National Register Bulletin 15*, p. 2)	

RESOURCE GROUP FORM

Site #8______________

HISTORY & DESCRIPTION

Construction date: 1943 Exactly_______(year) Approximately_______(year) Earlier than_______(year) Later than_______(year)
Architect/Designer(last name first): U.S. Navy **B**uilder(last name first): U.S. Navy
Total number of individual resources included in this Resource Group: # of contributing None # of non-contributing _______
Time period(s) of significance (for prehistoric districts, use archaeological phase name and approximate dates; for historical districts, use date range(s), e.g. *1895-1925)*
World War II era
Narrative Description (*National Register Bulletin 16A* pp. 33-34; fit a summary into 3 lines or attach supplementary sheets if needed)
Outlying field, Ormond Beach Airport

RESEARCH METHODS (check all that apply)

- ☒ FMSF record search (sites/surveys)
- ☐ FL State Archives/photo collection
- ☐ property appraiser / tax records
- ☐ cultural resource survey
- ☐ library research
- ☐ city directory
- ☐ newspaper files
- ☐ historic photos
- ☐ building permits
- ☐ occupant/owner interview
- ☐ neighbor interview
- ☐ interior inspection
- ☐ Sanborn maps
- ☐ plat maps
- ☐ Public Lands Survey (DEP)
- ☐ HABS/HAER record search
- ☒ other methods (specify) Cultural Resource Survey / Pedestrian Survey, May 2017

Bibliographic References (use Continuation Sheet, give FMSF Manuscript # if relevant)

OPINION OF RESOURCE SIGNIFICANCE

Potentially eligible individually for National Register of Historic Places? ☐yes ☒ no ☐insufficient information
Potentially eligible as contributor to a National Register district? ☐yes ☒ no ☐insufficient information
Explanation of Evaluation (required, see *National Register Bulletin 16A* p. 48-49. Attach longer statement, if needed, on separate sheet.)
No historic structures, no remnants of historic Ormond Beach Municipal Airport

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. “architecture”, “ethnic heritage”, “community planning & development”, etc.)
No areas of historical significance

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field & analysis notes, photos, plans, other important documents that are permanently accessible: For each separately maintained collection, describe (1) document type(s),* (2) maintaining organization,* (3) file or accession nos., and (4) descriptive information.

RECORDER INFORMATION

Recorder Name Dr. Storm L. Richards, Ph.D., R.P.A.
Recorder Contact Information (Address / Phone / Fax / Email) 1804 Maple Avenue, Sanford, FL 32771 / 407-323-9021 Phone / 407-366-8620 Fax
Email: SLRA@bellsouth.net
Recorder Affiliation Storm L Richards & Associates, Inc.

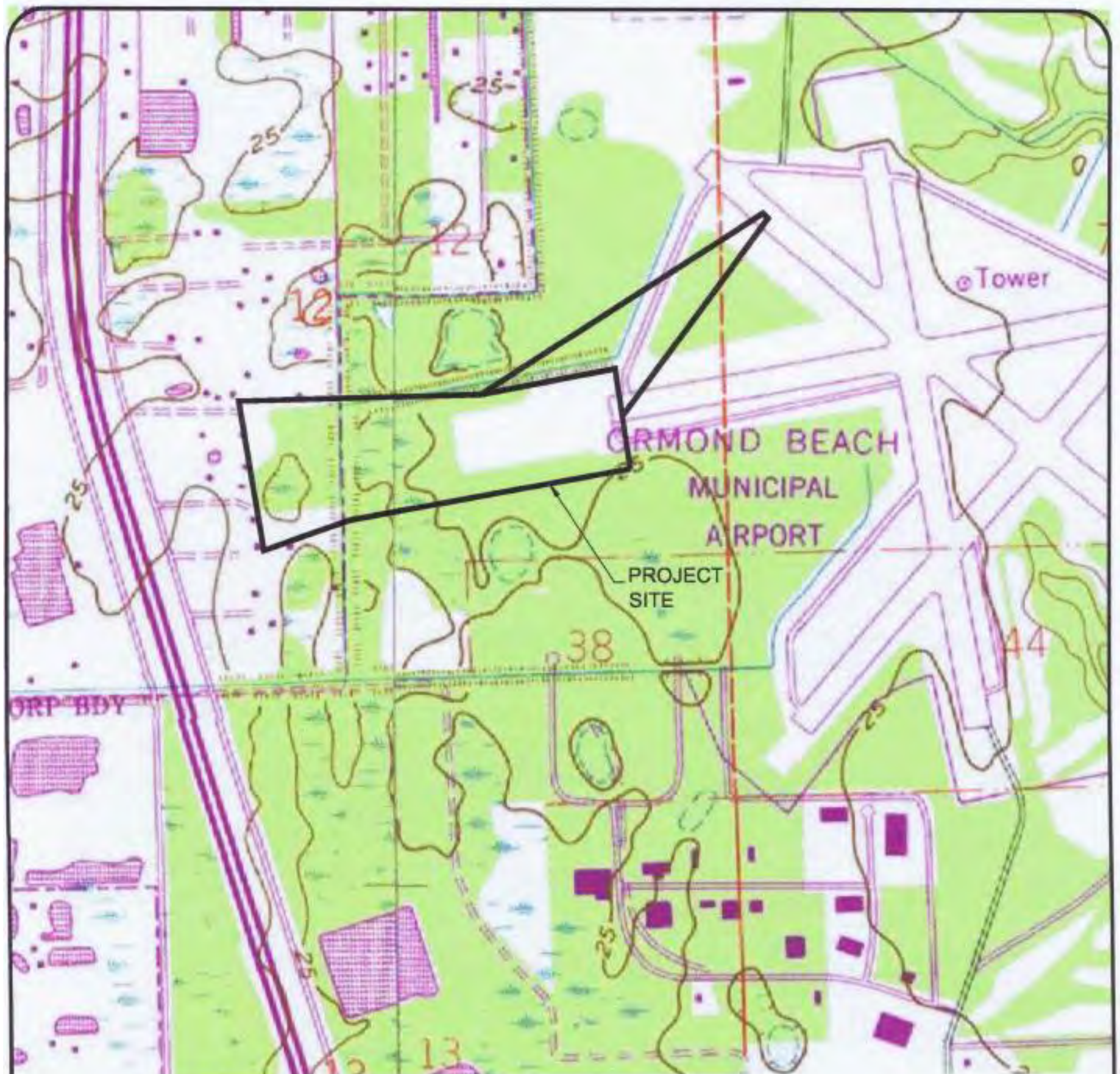
Required Attachments

∂ **PHOTOCOPY OF USGS 7.5’ MAP WITH DISTRICT BOUNDARY CLEARLY MARKED**

• **LARGE SCALE STREET, PLAT OR PARCEL MAP WITH RESOURCES MAPPED & LABELED**

÷ **TABULATION OF ALL INLCUDED RESOURCES** (name, FMSF #, contributing? Y/N, resource category, street address or township-range-section if no address)

≠ **PHOTOS OF GENERAL STREETSCAPE OR VIEWS (Optional: aerial photos, views of typical resources)**
Photos may be archival B&W prints OR digital image files. If submitting digital image files, they must be included on disk or CD AND in hard copy format (plain paper is acceptable). Digital images must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.



N

SCALE: 1" = 1000'

0 250' 500' 1000'
GRAPHIC SCALE

MAP ADAPTED FROM
DIGITAL QUAD MAP

ORMOND BEACH, FL
1956
REVISED 1993

SCALE MAY
VARY SLIGHTLY

PROJECT LOCATED IN
SEC. 12 & 38 TWP. 14 S. RNG 31 E.

APPROXIMATE CENTER OF SITE
LAT. 29° 18' 1.50" N.,
LONG. 81° 7' 18.82" W.

SITE AREA = 59.936 ±ACRES

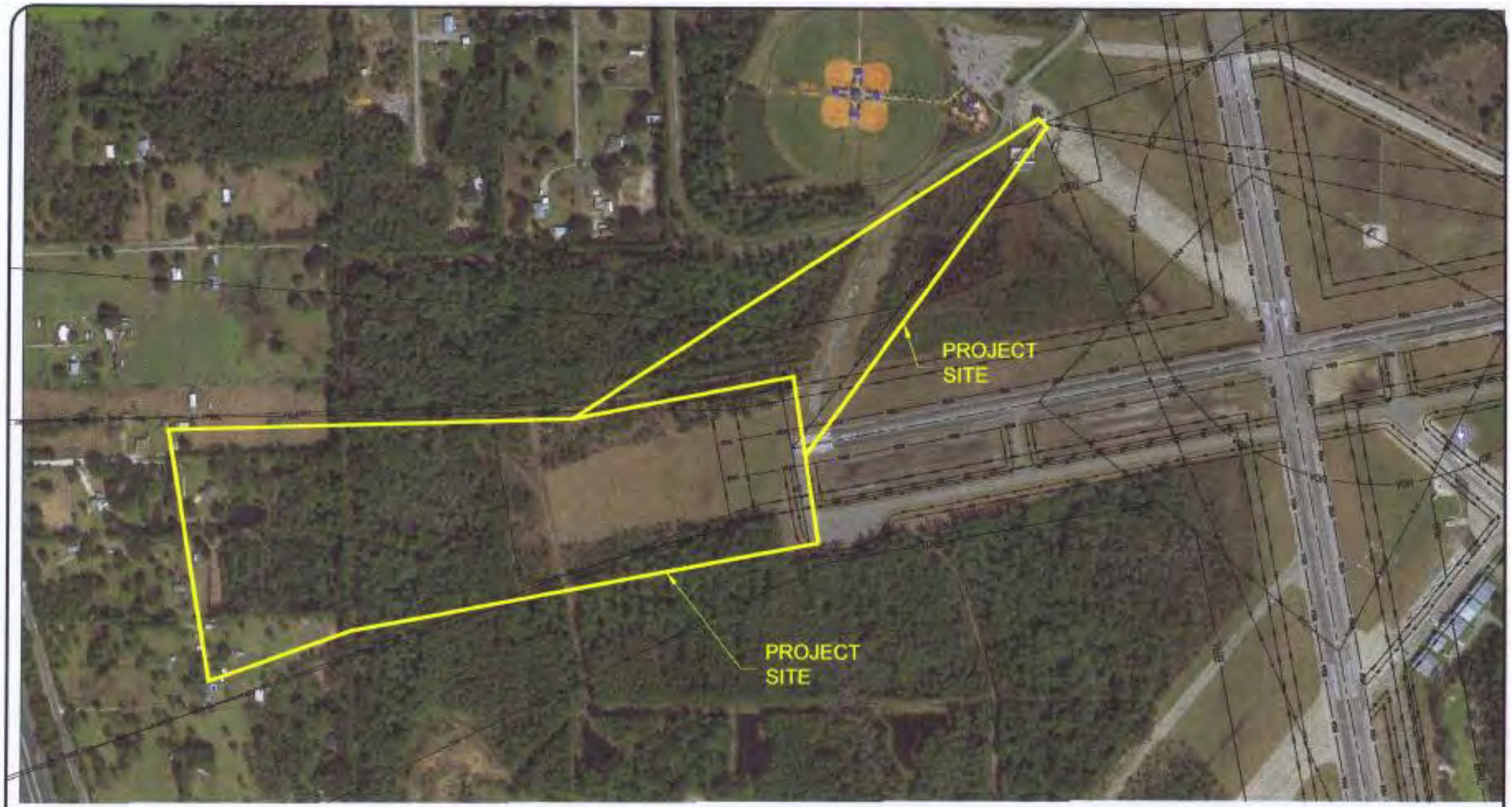
Joe H. Young III
Estuarine Field Biologist
208 Rush Street
New Smyrna Beach, FL 32168
386-423-3402
biocon@bellsouth.net

BIOLOGICAL CONSULTING SERVICES, INC.

drawn	JPC
date	04/24/17
scale (size A)	1"= 1000'
job no.	17-03019

QUADRANGLE MAP

ORMOND BEACH AIRPORT
RUNWAY 08-26 EXTENSION



NOTES:
1 - BOUNDARY INFORMATION ADAPTED FROM AUTOCAD FILES PROVIDED BY HOYLE, TANNER & ASSOCIATES, INC.
2 - AERIAL IMAGERY ADAPTED FROM GOOGLE EARTH, INC. (DATED 2016) SCALE IS APPROXIMATE.

N

SCALE: 1" = 400'

GRAPHIC SCALE

Joe H. Young III Estuarine Field Biologist 208 Rush Street New Smyrna Beach, FL 32168 386-423-3402 bioconr@bellsouth.net	drawn	JPC	AERIAL EXHIBIT
	date	04/24/17	
	scale (size B)	1"= 400'	ORMOND BEACH AIRPORT RUNWAY 08-26 EXTENSION
BIOLOGICAL CONSULTING SERVICES, INC.	job no.	17-03019	

☐ Original
☐ Update (give site#)

FLORIDA MASTER SITE FILE

Version 2.2 3/97

Consult *Guide to Archaeological Site Form* for detailed instructions.

Recorder Site# ______
Field Date ___/___/___
Form Date ___/___/___

08-26 Extension

Site Name(s) ORMOND Beach Municipal Airport Runway *Multiple Listing [DHR only]* ______
Project Name RUNWAY 08-26 EXTENSION *FMSF Survey #* ______
Ownership: ☐private-profit ☐private-nonprofit ☐private-individual ☐private-unspecifd. ☑city ☐county ☐state ☐federal ☐foreign ☐Native American ☐unknown
USGS 7.5 Map Name & Date ORMOND BEACH County Volusia
Township 14S Range 31E Section 12 and 38 ☐ Check if Irregular Section; **Qtr.** Section (check all that apply): ☐NE ☐NW ☐SE ☐SW
Landgrant 14 Tax Parcel # (s) ______
City / Town (if within 3 mi.) ORMOND BEACH In Current City Limits? ☐yes ☑no ☐unknown
UTM: Zone ☐16 ☐17 Easting _ _ _ _ _ 0 Northing _ _ _ _ _ _ 0
Address / Vicinity of / Route to ______

Name of Public Tract (e.g., park) ______

TYPE OF SITE (Check all choices that apply; if needed write others in at bottom)

SETTING *
- ☑ Land - *terrestrial*
- ☐ Cave/Sink - *subterranean*
  - ☐ terrestrial
  - ☐ aquatic
  - ☐ intermittently flooded
- ☐ Wetland - *palustrine*
  - ☐ usually flooded
  - ☐ sometimes flooded
  - ☑ usually dry
- ☐ Lake/Pond - *lacustrine*
- ☐ River/Stream/Creek - *riverine*
- ☐ Tidal - *estuarine*
- ☐ Saltwater - *marine*
  - ☐ marine unspecified
  - ☐ "high energy" marine
  - ☐ "low energy" marine
- ☐ Other ______

STRUCTURES - OR - FEATURES *
- ☐ aboriginal boat
- ☐ agric/farm building
- ☐ burial mound
- ☐ building remains
- ☐ cemetery/grave
- ☐ dump/refuse
- ☐ earthworks
- ☐ fort
- ☐ midden
- ☐ mill unspecified
- ☐ mission
- ☐ mound unspecified
- ☐ plantation
- ☐ platform mound
- ☐ road segment
- ☐ shell midden
- ☐ shell mound
- ☐ shipwreck
- ☐ subsurface features
- ☐ surface scatter
- ☐ well

FUNCTION *
- ☐ none specified
- ☐ campsite
- ☐ extractive site
- ☐ habitation (prehistoric)
- ☐ homestead (historic)
- ☐ farmstead
- ☐ village (prehistoric)
- ☐ town (historic)
- ☐ quarry

HISTORIC CONTEXTS (Check all that apply; use most specific subphases: e.g., if *Glades Ia* only, don't also use *Glades I*)

Aboriginal *					Nonaboriginal *
☐ Alachua	☐ Englewood	☐ Glades unspecif.	☐ St. Augustine	☐ Seminole: 2d War To 3d	☐ First Spanish 1513-99
☐ Archaic, Early	☐ Fort Walton	☐ Hickory Pond	☐ St. Johns Ia	☐ Seminole: 3d War On	☐ First Spanish 1600-99
☐ Archaic, Middle	☐ Glades Ia	☐ Leon-Jefferson	☐ St. Johns Ib	☐ Seminole unspecified	☐ First Spanish 1700-1763
☐ Archaic, Late	☐ Glades Ib	☐ Malabar I	☐ St. Johns I unspecified	☐ Swift Creek, Early	☐ First Spanish unspecified
☐ Archaic unspecified	☐ Glades I unspecif.	☐ Malabar II	☐ St. Johns IIa	☐ Swift Creek, Late	☐ British 1763-1783
☐ Belle Glade I	☐ Glades IIa	☐ Manasota	☐ St. Johns IIb	☐ Swift Creek, unspecified	☐ Second Spanish 1783-1821
☐ Belle Glade II	☐ Glades IIb	☐ Mount Taylor	☐ St. Johns IIc	☐ Transitional	☐ American Territorial 1821-45
☐ Belle Glade III	☐ Glades IIc	☐ Norwood	☐ St. Johns II unspecified	☐ Weeden Island I	☐ American Civil War 1861-65
☐ Belle Glade IV	☐ Glades II unspecif.	☐ Orange	☐ St. Johns unspecified	☐ Weeden Island II	☐ American 19th Century
☐ Belle Glade unspecif.	☐ Glades IIIa	☐ Paleoindian	☐ Santa Rosa	☐ Weeden Island unspecif.	☐ American 20th Century
☐ Cades Pond	☐ Glades IIIb	☐ Pensacola	☐ Santa Rosa-Swift Creek	☐ Prehistoric nonceramic	☐ American unspecified
☐ Deptford	☐ Glades IIIc	☐ Perico Island	☐ Seminole: Colonization	☐ Prehistoric ceramic	☐ African-American
	☐ Glades III unspecif.	☐ Safety Harbor	☐ Seminole: 1st War To 2d	☐ Prehistoric unspecified	

☐ Other (Less common phases are not check-listed. For historic sites, also give specific dates if known.) ______

* Consult *Guide to Archaeological Site Form* for preferred descriptions not listed above (data are "coded fields" at the Site File).

SURVEYOR'S EVALUATION OF SITE

Potentially eligible for a local register? ☐yes: name register at right ☑no ☐insufficient info Name of local register if eligible: ______
Individually eligible for National Register? ☐yes ☑no ☐insufficient info
Potential contributor to NR district? ☐yes ☑no ☐insufficient info
Explanation of Evaluation (Required if evaluated; limit to 3 lines; attach full justification) ______

Recommendations for Owner or SHPO Action NO ACTION NECESSARY And monitor during CON-STRUCTION and clearing for Cultural Resources

DHR USE ONLY OFFICIAL EVALUATIONS DHR USE ONLY

NR DATE __/__/___ *KEEPER-NR ELIGIBILITY:* ☐*yes* ☐*no* Date __/__/___
SHPO-NR ELIGIBILITY: ☐*yes* ☐*no* ☐*potentially elig.* ☐*insufficient info.* Date __/__/___
DELIST DATE __/__/___ *LOCAL DESIGNATION:* ______ *Date* __/__/___
Local office ______
National Register Criteria for Evaluation ☐*a* ☐*b* ☐*c* ☐*d* (See *National Register Bulletin 15*, p. 2)

FIELD METHODS (Check one or more methods for detection and for boundaries)

SITE DETECTION*

- ☐ no field check
- ☑ literature search
- ☑ informant report
- ☐ remote sensing
- ☑ exposed ground
- ☐ posthole digger
- ☐ auger--size:___
- ☐ unscreened shovel
- ☐ screened shovel

SITE BOUNDARIES*

- ☐ bounds unknown
- ☐ none by recorder
- ☐ literature search
- ☐ informant report
- ☐ remote sensing
- ☐ insp exposed ground
- ☐ posthole tests
- ☐ auger--size:______
- ☐ unscreened shovel
- ☐ screened shovel
- ☐ block excavations
- ☐ estimate or guess

Other methods; number, size, depth, pattern of units; screen size (attach site plan) ______

SITE DESCRIPTION

Extent Size (m^2) 59.9 Depth/stratigraphy of cultural deposit ______

Temporal Interpretation* - Components (check one): ☐ single ☐ prob single ☐ prob multiple ☐ multiple ☐ uncertain ☐ unknown

Describe each occupation in plan (refer to attached large scale map) and stratigraphically. Discuss temporal and functional interpretations: NO CULTURAL RESOURSES - NO CULTURAL COMPONENTS

Integrity Overall disturbance*: ☐ none seen ☐ minor ☐ substantial ☐ major ☐ redeposited ☐ destroyed-**document!** ☐ unknown

Disturbances/threats/protective measures ORland BEACH MUNICIPAL airport and approach

Surface: area collected 59.9 m^2 # collection units ______ ; Excavation: # noncontiguous blocks ______

ARTIFACTS

Total Artifacts # 0 ____(C)ount or (E)stimate? Surface #______(C) or (E) Subsurface # ______(C) or (E)

COLLECTION SELECTIVITY*

- ☐ unknown
- ☐ unselective (all artifacts)
- ☐ selective (some artifacts)
- ☐ mixed selectivity

SPATIAL CONTROL*

- ☐ uncollected
- ☐ general (not by subarea)
- ☐ unknown
- ☐ controlled (by subarea)
- ☐ variable spatial control
- ☐ Other EXISTING RUNWAY And Approach.

ARTIFACT CATEGORIES* and DISPOSITIONS* (*example*: A bone-human)

Pick exactly one *code* from Disposition List ⇨ ⇨ ⇨

____ bone-animal	____ exotic-nonlocal
____ bone-human	____ glass
____ bone-unspecified	____ lithics-aboriginal
____ bone-worked	____ metal-nonprecious
____ brick/building debris	____ metal-precious/coin
____ ceramic-aboriginal	____ shell-unworked
____ ceramic-nonaboriginal	____ shell-worked
____ daub	____ Others: NONE

A - category always collected
S - some items in category collected
O - observed first hand, but not collected
R - collected and subsequently left at site
I - informant reported category present
U - unknown

Artifact Comments NONE

DIAGNOSTICS (Type or mode, and frequency: e.g., *Suwanee ppk, heat-treated chert, Deptford Check-stamped, ironstone/whiteware*)

1. NONE	N=___	5.	N=___	9.	N=___
2.	N=___	6.	N=___	10.	N=___
3.	N=___	7.	N=___	11.	N=___
4.	N=___	8.	N=___	12.	N=___

ENVIRONMENT

Nearest fresh water type* & name (incl. relict source) ______ Distance (m)/bearing ______

Natural community (FNAI category* or leave blank) ______

Local vegetation ______

Topography* ______ Min Elevation____meters Max Elevation____meters

Present land use ______

SCS soil series ______ Soil association ______

FURTHER INFORMATION

Informant(s): Name/Address/Phone/Email Storm L. Richards PhD RPA

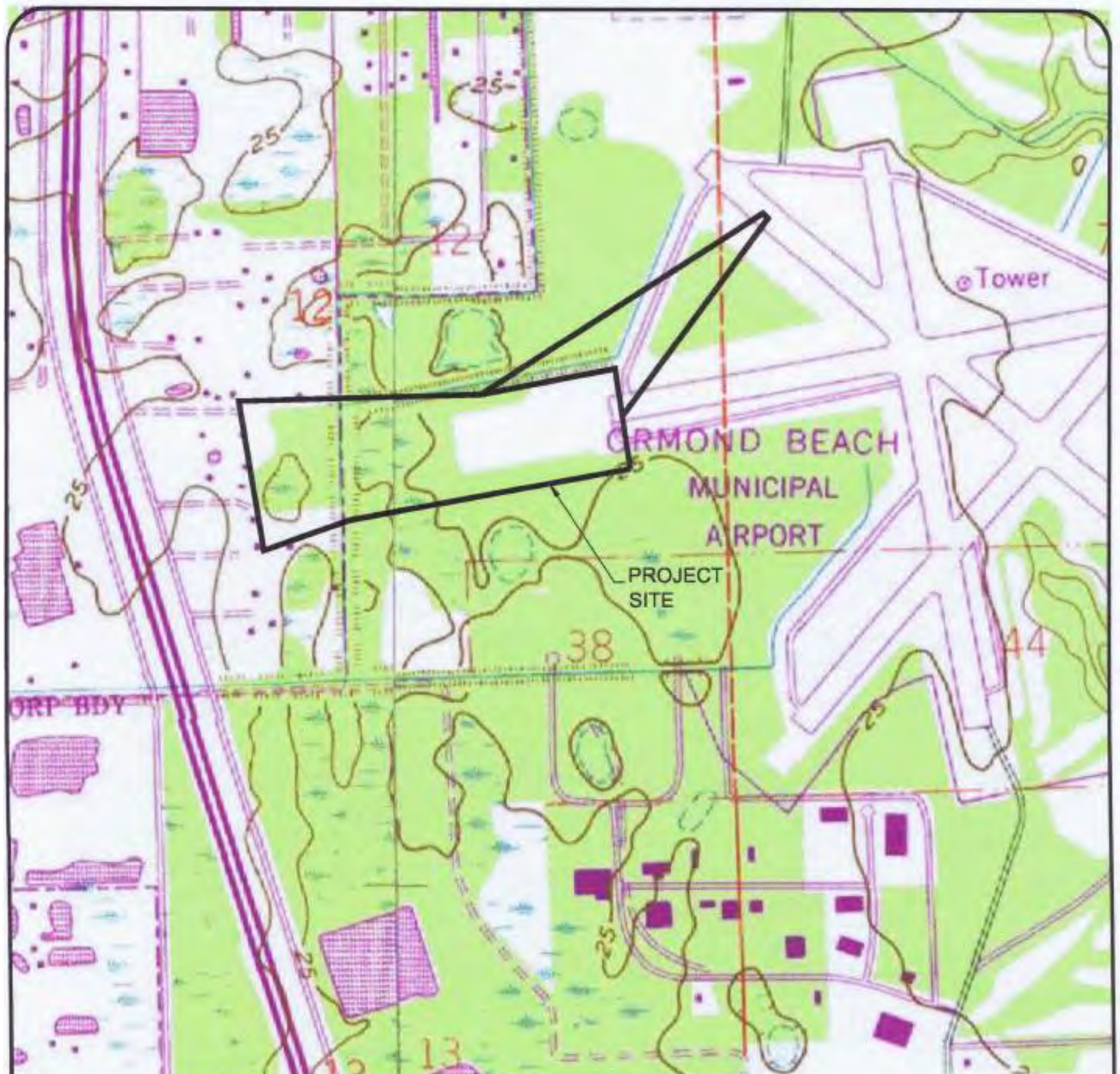
Describe field & analysis notes, artifacts, photos. For each, give type*(e.g., notes), curating organization*, accession #s, and short description.

Manuscripts or Publications on the site (Use continuation sheet, give FMSF# if relevant) ______

Recorder(s): Name/Addr./Phone/Email Storm L. Richards, principal 407 492 4706

Affiliation* or FAS Chapter ______

✱ Consult *Guide to Archaeological Site Form* for preferred descriptions not listed above (data are "coded fields" at the Site File). **SITE PLAN & USGS REQUIRED** At 1"=300' (1:3600) or larger scale, show: site boundaries, scale, north arrow, datum, test/collection units, landmarks, mappers, date.



N

SCALE: 1" = 1000'

0 250' 500' 1000'
GRAPHIC SCALE

MAP ADAPTED FROM
DIGITAL QUAD MAP

ORMOND BEACH, FL
1956
REVISED 1993

SCALE MAY
VARY SLIGHTLY

PROJECT LOCATED IN
SEC. 12 & 38 TWP. 14 S. RNG 31 E.

APPROXIMATE CENTER OF SITE
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SITE AREA = 59.936 ±ACRES

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BIOLOGICAL CONSULTING SERVICES, INC.

drawn	JPC
date	04/24/17
scale (size A)	1"= 1000'
job no.	17-03019

QUADRANGLE MAP

ORMOND BEACH AIRPORT
RUNWAY 08-26 EXTENSION

Ent D (FMSF only)__/__/__

Survey Log Sheet

Florida Master Site File
Version 2.0 9/97

Survey # (FMSF only) 10467

Consult *Guide to the Survey Log Sheet* for detailed instructions.

Identification and Bibliographic Information

Survey Project (Name and project phase): Section 106 reconnaissance survey & assessment: American Electronics Company telecom tower site (Verizon Wireless), Volusia County, Florida (subsurface testing / survey of area of potential visual/atmospheric effects.)

Report Title (exactly as on title page): ASSESSMENT OF POTENTIAL EFFECTS UPON HISTORIC PROPERTIES: PROPOSED 160-FOOT *AMERICAN ELECTRONICS COMPANY* WIRELESS TELECOMMUNICATIONS TOWER (VERIZON WIRELESS 082559-4), VOLUSIA COUNTY, FLORIDA.

Report Author(s) (as on title page— individual or corporate; last names first) Florida Archaeological Consulting, Inc.

Publication Date (year) 2004 Total Number of Pages in Report (Count text, figures, tables, not site forms): 22

Publication Information (If relevant, series and no. in series, publisher, and city. For article or chapter, cite page numbers. Use the style of *American Antiquity*: see *Guide to the Survey Log Sheet*.) __________

Supervisor(s) of Fieldwork (whether or not the same as author[s]; last name first): Parker, Brian T.

Affiliation of Fieldworkers (organization, city): Florida Archaeological Consulting, Inc., Daytona Beach, Florida

Key Words/Phrases (Don't use the county, or common words like *archaeology*, *structure*, *survey*, *architecture*. Put the most important first. Limit each word or phrase to 25 characters: Wireless Telecommunications Towers, Cell Tower, Dynamic Environmental Associates, Verizon Wireless.

Survey Sponsors (corporation, government unit, or person who is directly paying for fieldwork)

Name: Dynamic Environmental Associates,Inc.

Address/Phone: 3850 Lake St., Suite C, Macon, GA 31204 / Phone 478-745-7740

Recorder of *Log Sheet*: Parker, Brian T. Date *Log Sheet* Completed 7 /1/ 04

Is this survey or project a continuation of a previous project? [x] No ☐ Yes: Previous survey #(s) [FMSF only] __________

Mapping

Counties (List each one in which field survey was done - do not abbreviate; use supplement sheet if necessary): VOLUSIA

USGS 1:24,000 Map(s) : Map Name/Date of Latest Revision (use supplement sheet if necessary): ORMOND BEACH (1993)

Description of Survey Area

Dates for Fieldwork: Start 6 / 30 / 04 End 6 /30 / 04 Total Area Surveyed (fill in one) <1 acre (subsurface testing)

Number of Distinct Tracts or Areas Surveyed: one mile Area of Potential Effects (standing structures)

If Corridor (fill in one for each): Width _____ meters _____ feet Length ________ kilometers ________ miles

Survey Log Sheet of the Florida Master Site File

Research and Field Methods

Types of Survey (check all that apply): * archaeological * architectural historical/archival ❑ underwater ❑ other: ______

Preliminary Methods (✔Check as many as apply to the project as a whole. If needed write others at bottom).

❑ Florida Archives (Gray Building) ❑ library research- *local public* * local property or tax records * windshield
❑ Florida Photo Archives (Gray Building) ❑ library-special collection - *nonlocal* ❑ newspaper files * aerial photography
* FMSF site property search ❑ Public Lands Survey (maps at DEP) * literature search
* FMSF survey search * local informant(s) ❑ Sanborn Insurance maps
❑ other (describe) ______

Archaeological Methods (Describe the proportion of properties at which method was used by **writing in** the corresponding letter. Blanks are interpreted as "None.")

F(-ew: 0-20%), **S**(-ome: 20-50%); **M**(-ost: 50-90%); or **A**(-ll, Nearly all: 90-100%). If needed write others at bottom.

Check here if **NO** archaeological methods were used.

___ surface collection, controlled
___ surface collection, **un**controlled
_A shovel test-1/4"screen
___ shovel test-1/8" screen
___ shovel test 1/16"screen
___ shovel test-unscreened
___ other screen shovel test (size: ___)
___ water screen (finest size: ___)
___ posthole tests
___ auger (size:___)
___ coring
___ test excavation (at least 1x2 M)
___ block excavation (at least 2x2 M)
___ soil resistivity
___ magnetometer
___ side scan sonar
___ unknown
___ other (describe): surface inspection______

Historical/Architectural Methods (Describe the proportion of properties at which method was used by **writing in** the corresponding letter. Blanks are interpreted as "None.")

F(-ew: 0-20%), **S**(-ome: 20-50%); **M**(-ost: 50-90%); or **A**(-ll, Nearly all: 90-100%). If needed write others at bottom.

❑ Check here if **NO** historical/architectural methods were used.

___ building permits
___ commercial permits
___ interior documentation
___ demolition permits
_A exposed ground inspected
_A_ local property records
_A_ neighbor interview
_A_ occupant interview
___ occupation permits
___ subdivision maps
___ tax records
___ unknown
___ other (describe): ______

Scope/Intensity/Procedures: Surface inspection of tower footprint; two screened (1/4") subsurface tests excavated within the 600sqm tower footprint; windshield reconnaissance survey for visual effects upon historic properties (standing structures) within a radius of one mile of the telecommunications tower site.______

Survey Results (cultural resources recorded)

Site Significance Evaluated? ❑Yes ❑No If *Yes*, circle NR-eligible/significant site numbers below.

Site Counts: Previously Recorded Sites ___none______ Newly Recorded Sites ______none______

Previously Recorded Site #'s with Site File Update Forms (List site #'s without "8." Attach supplementary pages if necessary) ______

Newly Recorded Site #'s (Are you sure all are originals and not updates? Identify methods used to check for updates, ie, researched the FMSF records. List site #'s without "8." Attach supplementary pages if necessary.) ___N/A______

Site Form Used: ❑ SmartForm ❑ FMSF Paper Form ❑ Approved Custom Form: Attach copies of written approval from FMSF Supervisor.

DO NOT USE SITE FILE USE ONLY DO NOT USE

BAR Related
❑ 872 ❑ 1A32
❑ CARL ❑ UW

BHP Related
❑ State Historic Preservation Grant
❑ Compliance Review: CRAT #______

ATTACH PLOT OF SURVEY AREA ON PHOTOCOPIES OF USGS 1:24,000 MAP(S)

Figure 1. Location of the proposed 160-foot *American Electronics Company* wireless telecommunications tower (Verizon Wireless 082559-4), with the one mile Area of Potential Effects outlined on the USGS *Ormond Beach, Fla.* 7.5 series quadrangle (photo-revised 1993).

P

SURVEY NO.* 1943

SURVEY LOG SHEET
FLORIDA MASTER SITE FILE

Version 1.1: 8/89

Plottable?* Y✓ N_

TITLE Cultural Resource Assessment Survey of the Proposed Riverbend Golf Course Development Site, Volusia County, Florida

AUTHOR(S) Austin, Robert J., Ballo, Janice R.

ARCHAEOLOGIST/HISTORIAN Same

AFFILIATION Piper Archaeological Research, Inc

PUB. DATE March 1989 TOTAL NUMBER OF PAGES IN REPORT 41

PUBLICATION INFO Piper Archaeological Research, Inc.

KEY WORDS/PHRASES DESCRIBING SURVEY* (max of 30 columns each)

Riverbend Golf Course

REQUESTING GOVERNMENT UNIT, CORPORATION, OR PERSON

NAME Charles E. Burkett + Associates, Inc.

ADDRESS Daytona Beach, Florida

DESCRIPTION OF SURVEY: NUMBER OF DISTINCT AREAS SURVEYED 1

MONTH/YEAR DATES FOR FIELD WORK: START 2 / 89 THRU 2 / 89

TOTAL AREA +-575 ac/ha IF CORRIDOR: WIDTH __ ft/m LENGTH __ mi/km

TYPE OF SURVEY (Use as many as apply): ✓archaeological
__architectural __historical __underwater

OTHER TYPE(S): ______

METHODS EMPLOYED (Use as many as apply): _unknown _archival
_pedestrian ✓shovel test _test excav. _posthole
_extensive excav. _auger survey _coring
_remote sensing _windshield ✓surf.exposures

OTHER METHOD(S) ______

SITES Significance discussed? Y✓ N_ Circle NR-elig/signif site nos:

OLD SITE NUMBERS : COUNT 0 LIST ~~VO25~~

NEW SITE NUMBERS : COUNT 2 LIST VO2567, 2568

COUNTIES: VOLUSIA

USGS MAP(S) Ormond Beach

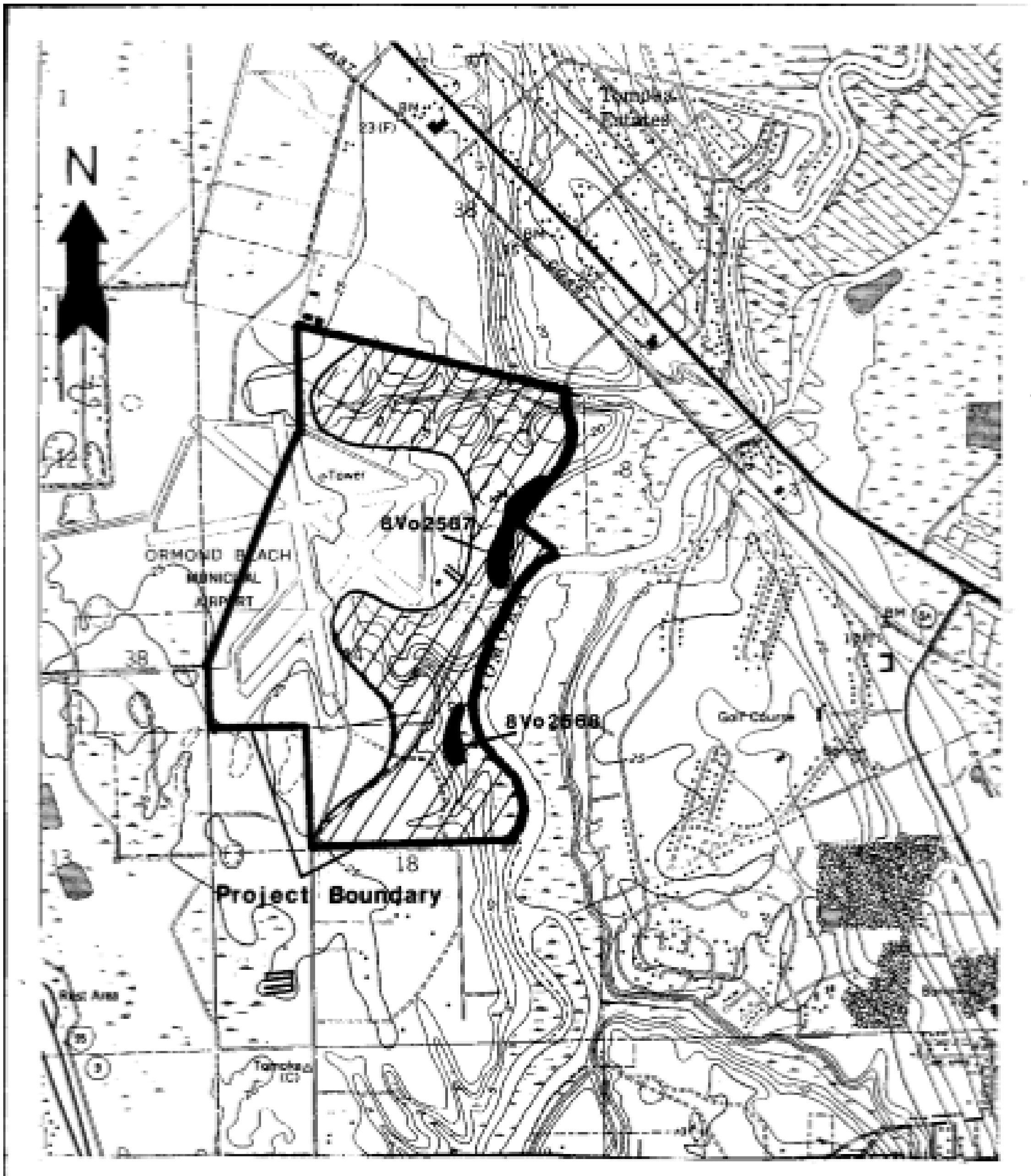
TOWNSHIP/RANGE (list all township/range combinations eg, 04S/29E)

14S/32E

REMARKS (Use reverse if needed): ______

SURVEY AREA MUST BE OUTLINED OR HIGHLIGHTED ON FDOT COUNTY HWY. MAP!
ATTACH OR PHOTOCOPY ONTO BACK OF FORM.

* For use of Fla. Master Site File only/Div. of Historical Resources/R. A. Gray Bldg/500 S. Bronough St/Tallahassee, FL 32399-0250



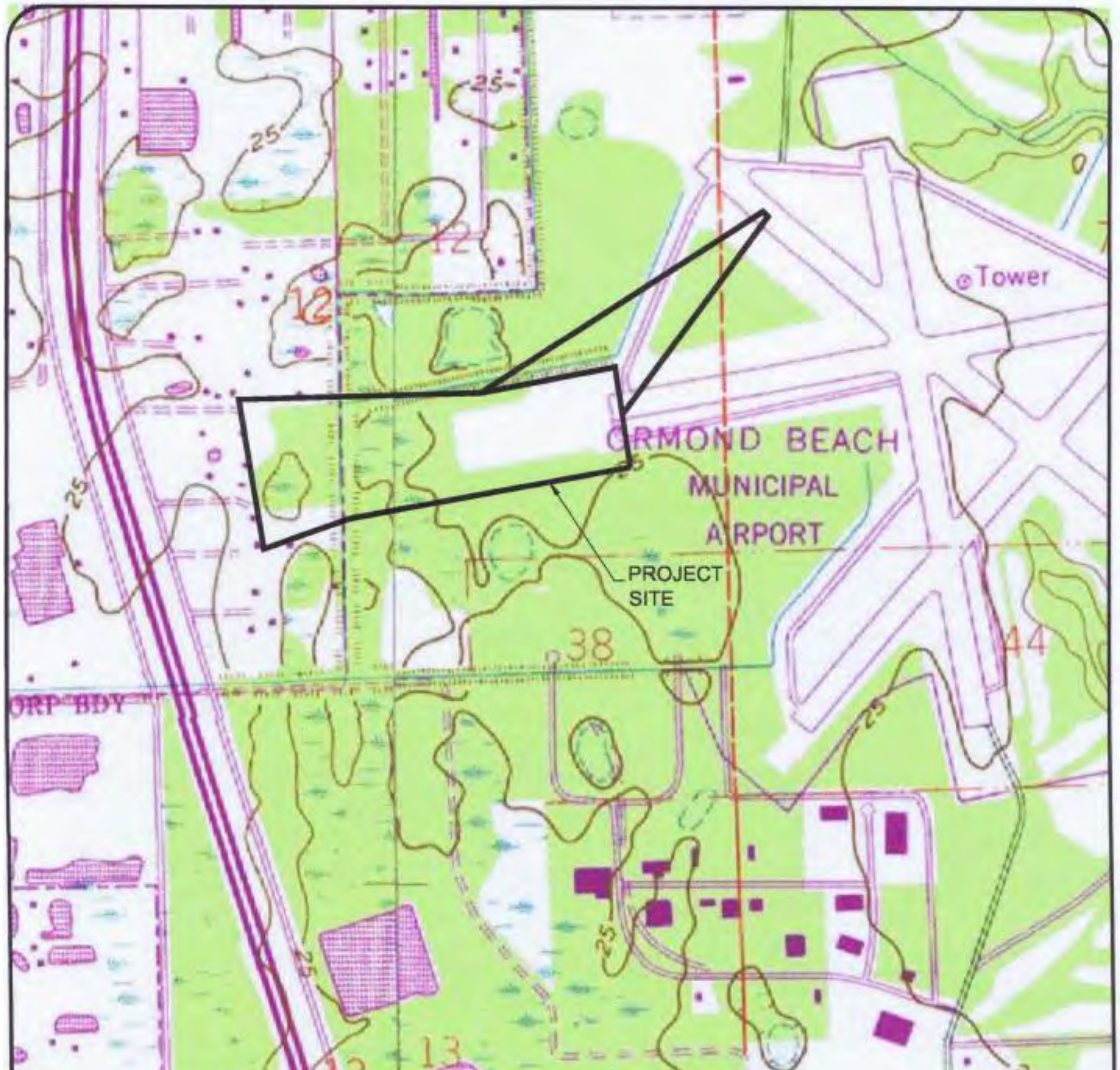
Map showing Riverbend Golf Course project area and archaeological sites discovered during the survey. Cross-hatching indicates DHR designated areas of high site potential.

PIPER ARCHAEOLOGY

St. Petersburg, FL

APPENDIX B

Maps of Site



N

SCALE: 1" = 1000'

0 250' 500' 1000'
GRAPHIC SCALE

MAP ADAPTED FROM
DIGITAL QUAD MAP

ORMOND BEACH, FL
1956
REVISED 1993

SCALE MAY
VARY SLIGHTLY

PROJECT LOCATED IN
SEC. 12 & 38 TWP. 14 S. RNG 31 E.

APPROXIMATE CENTER OF SITE
LAT. 29° 18' 1.50" N.,
LONG. 81° 7' 18.82" W.

SITE AREA = 59.936 ±ACRES

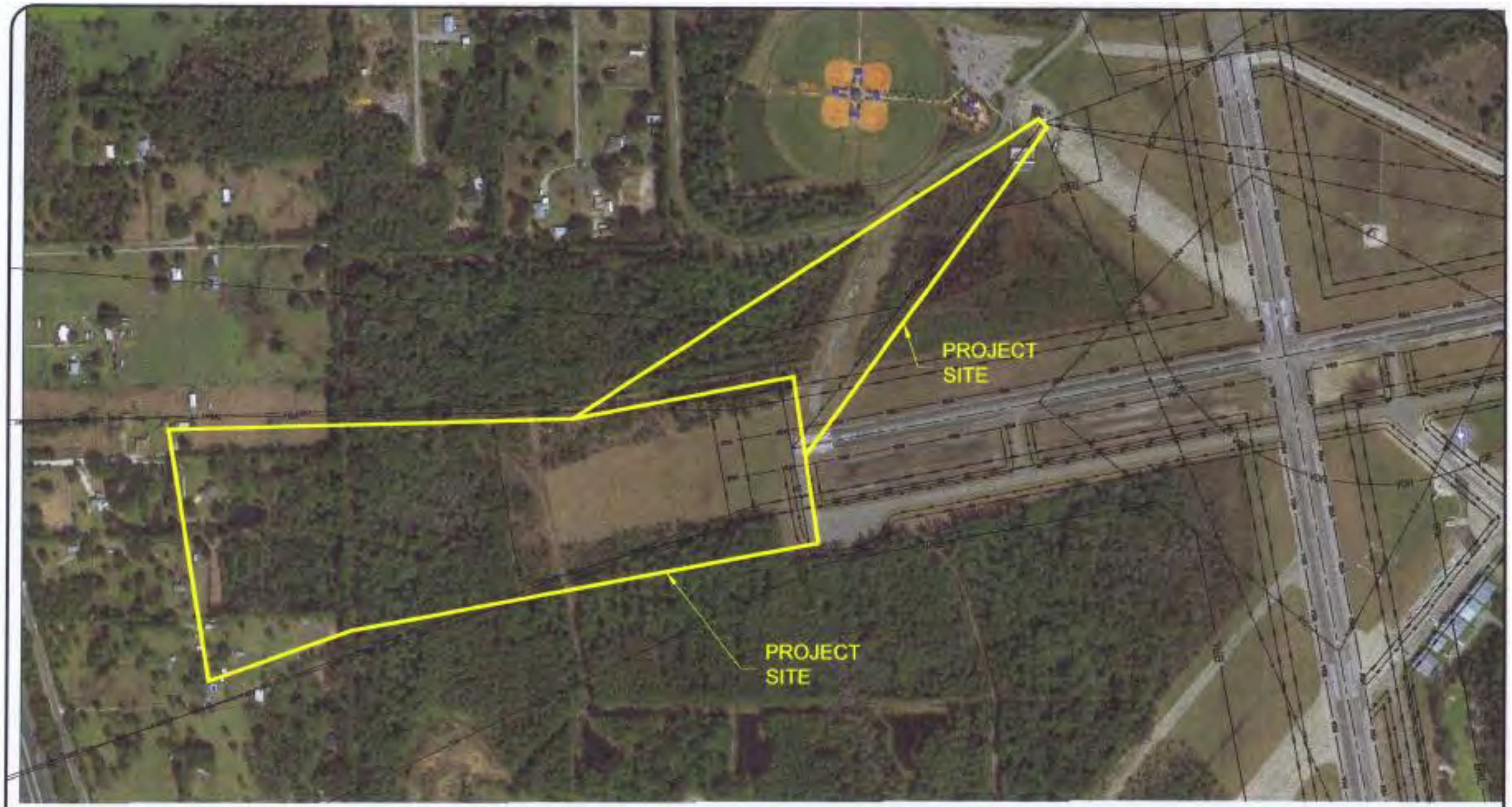
Joe H. Young III
Estuarine Field Biologist
208 Rush Street
New Smyrna Beach, FL 32168
386-423-3402
biocon@bellsouth.net

BIOLOGICAL CONSULTING SERVICES, INC.

drawn	JPC
date	04/24/17
scale (size A)	1"= 1000'
job no.	17-03019

QUADRANGLE MAP

ORMOND BEACH AIRPORT
RUNWAY 08-26 EXTENSION



N

SCALE: 1" = 400'

GRAPHIC SCALE

NOTES:
1 - BOUNDARY INFORMATION ADAPTED FROM AUTOCAD FILES PROVIDED BY HOYLE, TANNER & ASSOCIATES, INC.
2 - AERIAL IMAGERY ADAPTED FROM GOOGLE EARTH, INC. (DATED 2015) SCALE IS APPROXIMATE.

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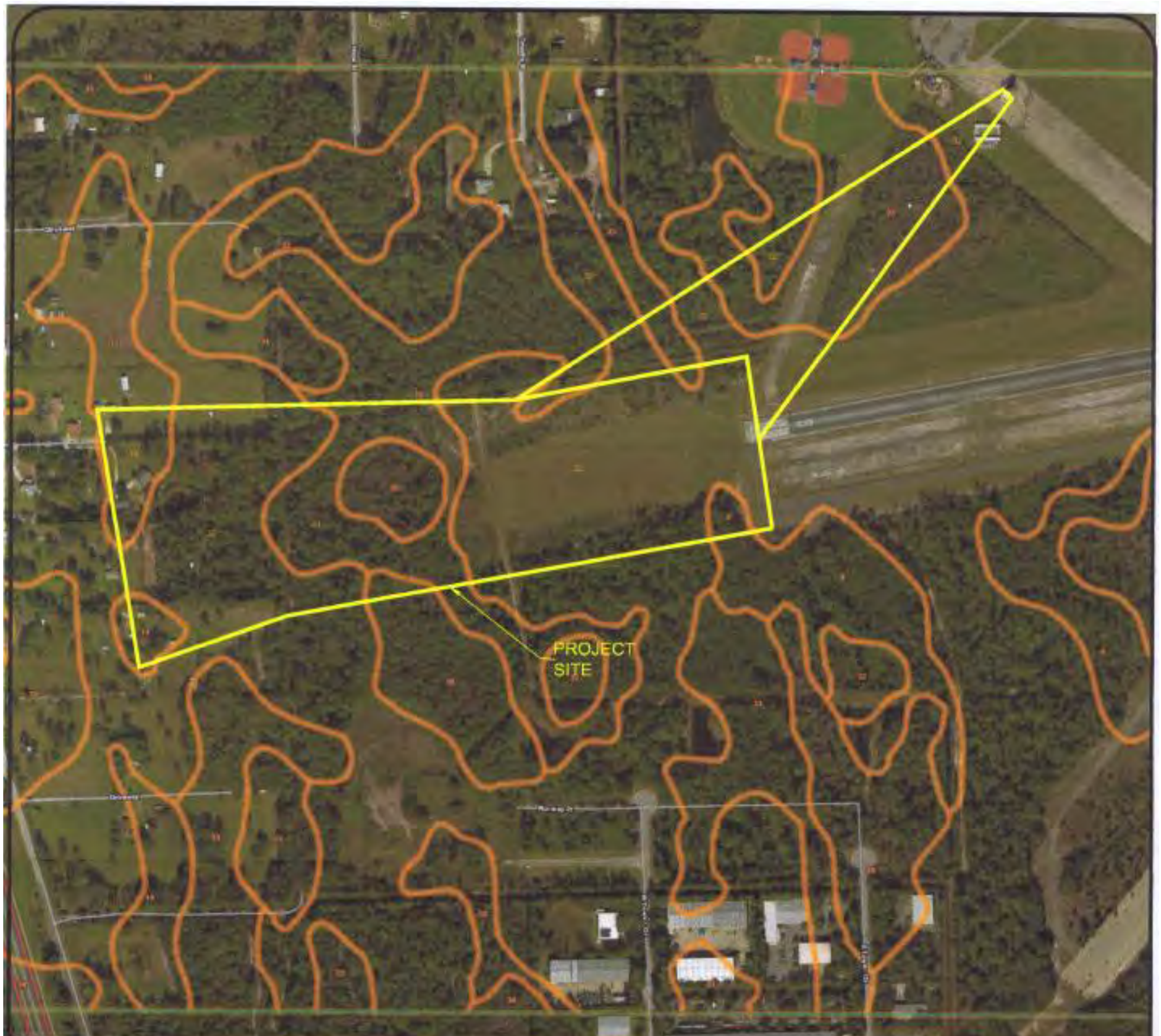
job no.	17-03019

AERIAL EXHIBIT

ORMOND BEACH AIRPORT
RUNWAY 08-26 EXTENSION



SOIL MAP - VOLUSIA COUNTY

SOIL TYPE ON SITE:

8 BASINGER FINE SAND, DEPRESSIONAL-hydric
13 CASSIA FINE SAND-non-hydric
30 IMMOKALEE SAND, DEPRESSIONAL-hydric
32 MYAKKA FINE SAND-non-hydric
33 MYAKKA FINE SAND, DEPRESSIONAL-hydric

N

SCALE: 1" = 600'

0 150' 300' 600'
GRAPHIC SCALE

NOTES:
1 - SOILS MAPPING ADAPTED FROM INFORMATION FOUND ON THE NATURAL RESOURCES CONSERVATION SERVICE WEB SOIL SURVEY. (websoilsurvey.nrcs.usda.gov)

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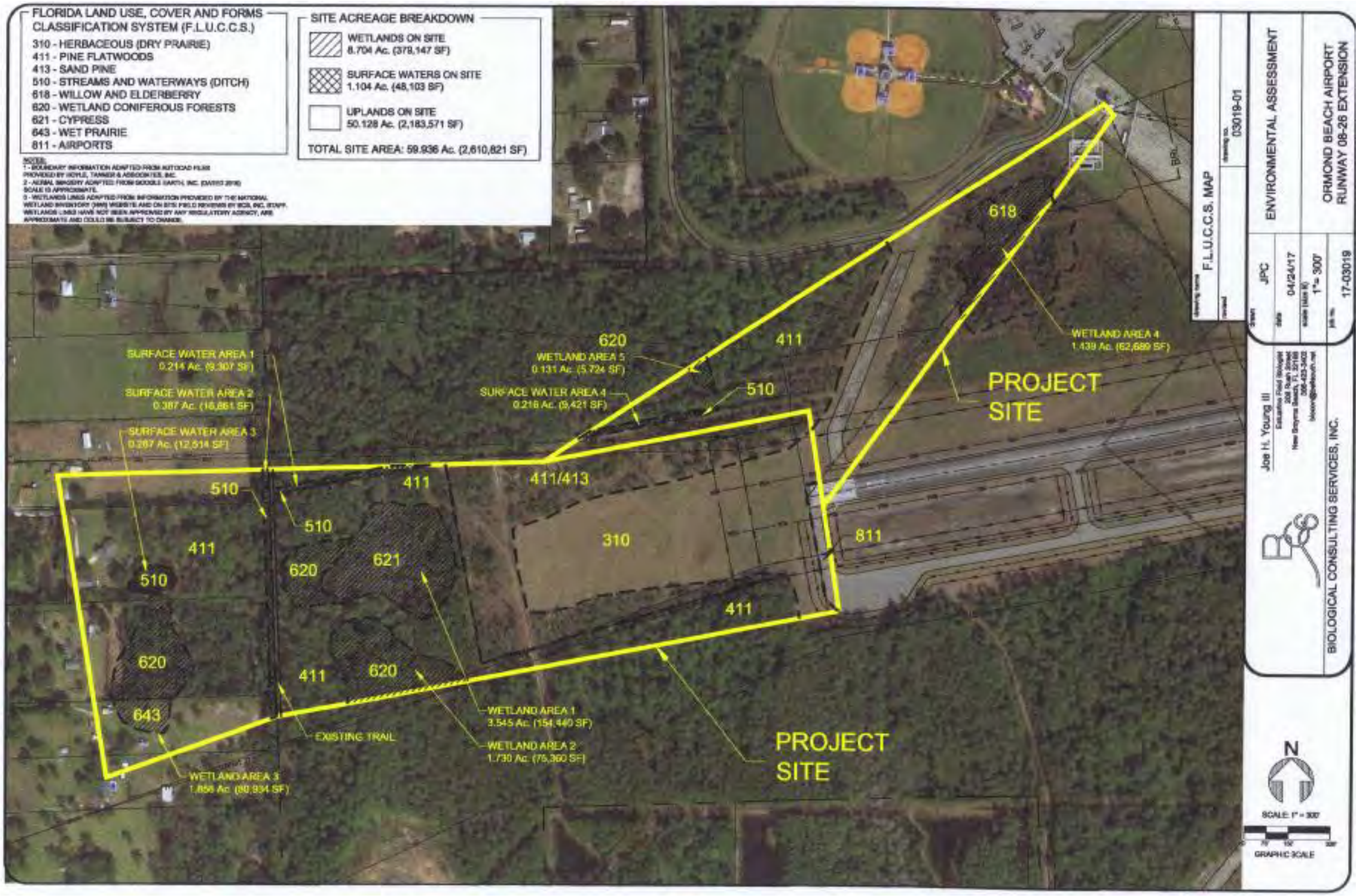
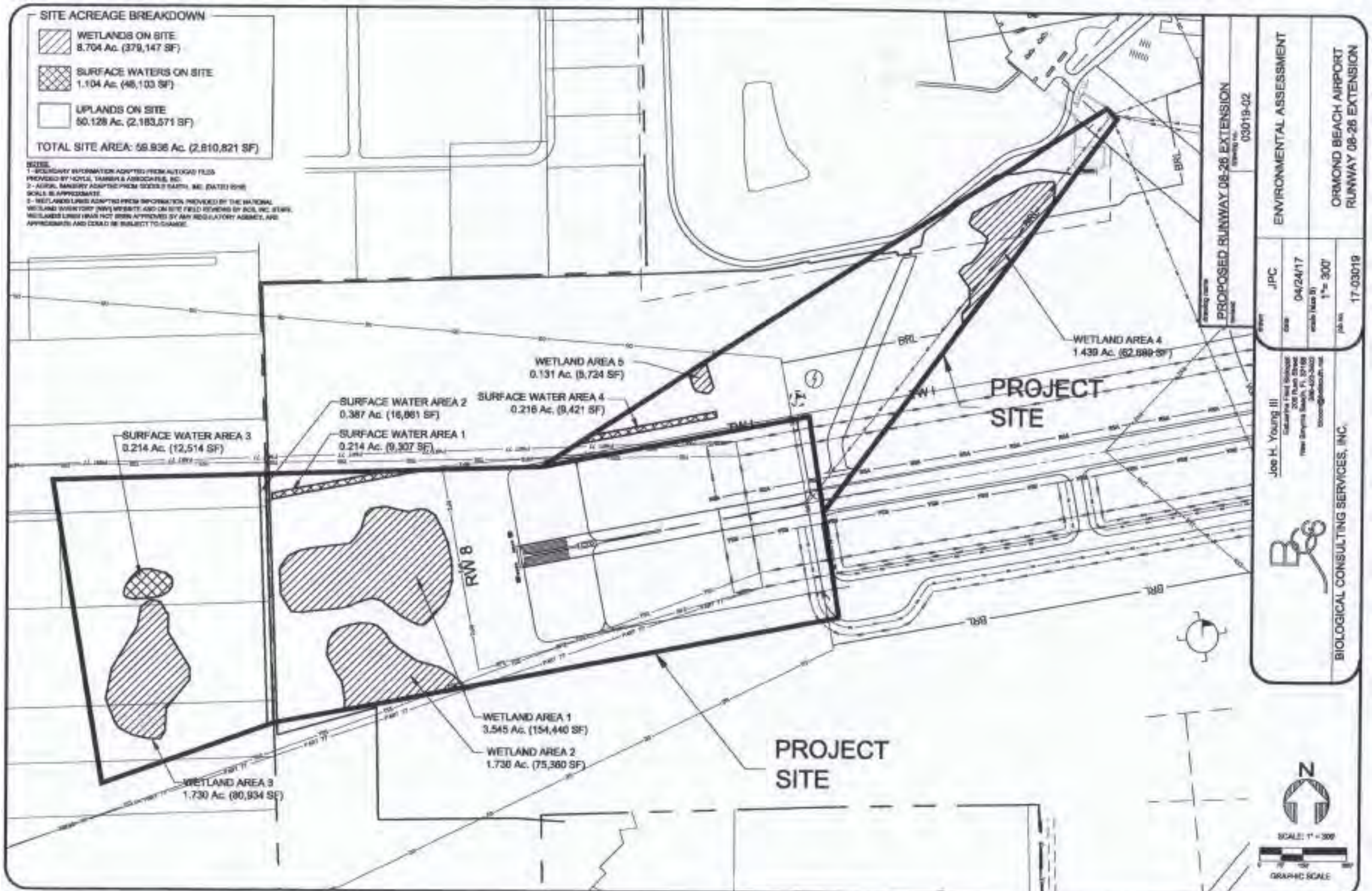
SOILS MAP

ORMOND BEACH AIRPORT
RUNWAY 08-26 EXTENSION



FLORIDA LAND USE, COVER AND FORMS CLASSIFICATION SYSTEM (F.L.U.C.C.S.)
310 - HERBACEOUS (DRY PRAIRIE)
411 - PINE FLATWOODS
413 - SAND PINE
510 - STREAMS AND WATERWAYS (DITCH)
618 - WILLOW AND ELDERBERRY
620 - WETLAND CONIFEROUS FORESTS
621 - CYPRESS
643 - WET PRAIRIE
811 - AIRPORTS
SITE ACREAGE BREAKDOWN
WETLANDS ON SITE 8.704 Ac. (379,147 SF)
SURFACE WATERS ON SITE 1.104 Ac. (48,103 SF)
UPLANDS ON SITE 50.128 Ac. (2,183,571 SF)
TOTAL SITE AREA: 59.936 Ac. (2,610,821 SF)
NOTES:
1 - BOUNDARY INFORMATION ADAPTED FROM AUTOCAD FILES PROVIDED BY HOYLE, TANNER & ASSOCIATES, INC.
2 - AERIAL IMAGERY ADAPTED FROM GOOGLE EARTH, INC. (DATED 2016) SCALE IS APPROXIMATE.
3 - WETLANDS LINES ADAPTED FROM INFORMATION PROVIDED BY THE NATIONAL WETLAND INVENTORY (NWI) WEBSITE AND ON SITE FIELD REVIEWS BY BCS, INC. STAFF. WETLANDS LINES HAVE NOT BEEN APPROVED BY ANY REGULATORY AGENCY, ARE APPROXIMATE AND COULD BE SUBJECT TO CHANGE.
SURFACE WATER AREA 1 0.214 Ac. (9,307 SF)
SURFACE WATER AREA 2 0.387 Ac. (16,861 SF)
SURFACE WATER AREA 3 0.287 Ac. (12,514 SF)
SURFACE WATER AREA 4 0.216 Ac. (9,421 SF)
WETLAND AREA 5 0.131 Ac. (5,724 SF)
WETLAND AREA 4 1.439 Ac. (62,689 SF)
WETLAND AREA 1 3.545 Ac. (154,440 SF)
WETLAND AREA 2 1.730 Ac. (75,360 SF)
WETLAND AREA 3 1.858 Ac. (80,934 SF)
EXISTING TRAIL
PROJECT SITE
PROJECT SITE
620
411
510
618
411/413
310
811
621
643
BRL
F.L.U.C.C.S. MAP
03019-01
ENVIRONMENTAL ASSESSMENT
JPC
04/24/17
1"= 300'
17-03019
ORMOND BEACH AIRPORT RUNWAY 08-26 EXTENSION
Joe H. Young III
BIOLOGICAL CONSULTING SERVICES, INC.
N
SCALE: 1" = 300'
GRAPHIC SCALE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SURFACE WATER AREA 4 0.216 Ac. (9,421 SF)
SURFACE WATER AREA 1 0.214 Ac. (9,307 SF)
SURFACE WATER AREA 3 0.214 Ac. (12,514 SF)
WETLAND AREA 4 1.439 Ac. (62,689 SF)
PROJECT SITE
RW 8
BRL
WETLAND AREA 1 3.545 Ac. (154,440 SF)
WETLAND AREA 2 1.730 Ac. (75,380 SF)
WETLAND AREA 3 1.730 Ac. (80,934 SF)
PROJECT SITE
PROPOSED RUNWAY 08-26 EXTENSION
03019-02
ENVIRONMENTAL ASSESSMENT
ORMOND BEACH AIRPORT RUNWAY 08-26 EXTENSION
JPC
04/24/17
1"= 300'
17-03019
Joe H. Young III
BIOLOGICAL CONSULTING SERVICES, INC.
N
SCALE: 1" = 300'
GRAPHIC SCALE

APPENDIX C

Seminole Tribe of Oklahoma Request for Additional Documentation

Project graphics are provided in Appendix B:

USGS quad map, aerial, soil, land cover types, and project plan

The Seminole Tribe of Oklahoma has requested a detailed analysis of the vegetation onsite of the Ormond Beach Municipal Airport Runway 08-26 Extension Site. This analysis can best be accomplished by current analysis of the environmental site and description of the subject site including location, USGS quadrangle information aerials, soils maps, vegetative community, wetlands and uplands. Potential threatened and endangered species found and likelihood of existing flora that could be identified as historic remnants of earlier indigenous vegetation on the subject site.

The Ormond Beach Municipal Airport Runway 0826 Extension project site is located within the secure and unsecure part of the Ormond Beach Municipal Airport in Sections 12 & 38, Township 14 South, and Range 31 East in Ormond Beach, Volusia County, Florida. The only runway construction will occur in the secure part of the Airport which is currently cleared and maintained and has no shrub or forested vegetation. The following information is from the Environmental Assessment Report, Ormond Beach Municipal Airport Runway 08-26 Extension, prepared by Hoyle Tanner & Associates, Inc., May 2017.

The project is the extension and improvement of the existing Runway 08-26, specifically the west end of Runway 08. The improvements include the 1000 ± feet extension of the current runway on the west end of Runway 08 and the clearing and grading of an associated Runway Safety Area at the west end of the new runway extension terminus. The proposed project area consists of approximately 59.9 acres. The runway construction area is only a small portion of the total area.
The Runway 08-26 Extension is a partially cleared area with natural vegetation. The site topography is generally represented in the Ormond Beach USGS map (attached) and the elevation ranges from 30.0 contour in the uplands to the east and down gradient to the west at 22.0 feet above mean sea level in the isolated wetland area (See USGS Ormond Beach Map).

Soil Survey

The Natural Resources Conservation Service Web Soil Survey indicates that the following soil types are found in this area. Normally vegetation within these soil types indicates hydric (wetland) or non-hydric (non-wetland) characteristics.

8	Basinger Fine Sand, Depressional (hydric)
13	Cassia Fine Sand (non-hydric)
30	Immokalee Sand, Depressional (hydric)
32	Myakka Fine Sand (non-hydric)
33	Myakka Fine Sand, Depressional (hydric)

The soil survey is fairly accurate in the typing of soils; however, boundaries of the soils are sometimes poorly indicative of site conditions. Please review the Soils Map for soil type boundaries and the chart below for soil type/vegetation correlation for this site.

UPLAND SOILS	WETLAND SOILS
13 – Cassia Fine Sand	8 – Basinger Fine Sand
32 – Myakka Fine Sand	30 – Immokalee Sand, Depressional
	33 – Myakka Fine Sand, Depressional

Basinger Fine Sand soil (8) is defined as a poorly drained, nearly level sandy soil typically found in depressions and in a few poorly defined drainage ways in the Flatwoods. The water table is within 30 inches of the surface during dry periods and above the surface for several months. Permeability is very rapid throughout. **Category: Hydric**

Cassia Fine Sand (13) is characterized as a somewhat poorly drained sandy soil typically found in elevated areas within flatwoods or in lower areas within sandhill communities. Generally, the water table is between depths of 15 and 40 inches for approximately 6 months during most years. During dry seasons the water table may recede to below 40 inches. Permeability is moderately rapid in the subsoil but very rapid in the other horizons. **Category: Non-hydric**

Immokalee Sand, Depressional (30) soil is a poorly drained, nearly level sandy soil which occurs in shallow intermittent ponds and sloughs in the flatwoods. The water table is within 10 inches of the surface for about 6 months in most years. Water stands above the surface for long periods after heavy rain. Permeability is moderate or moderately rapid in the subsoil and rapid in the other layers. **Category: Hydric**

Myakka Fine Sand (32) is characterized as a nearly level, poorly drained soil, typically found in flatwoods. The water table is within 12 inches of the surface from June to November and typically within 40 inches of the surface the rest of the year. Permeability is rapid in the surface layer and moderate in the subsoil layers. **Category: Non-hydric**

Myakka Fine Sand, Depressional (33) soils are characterized as a nearly level, poorly drained soil typically found in flatwoods, freshwater marshes and ponds. The water table is within 10 inches of the surface from May to November and typically within 24 inches of the surface the rest of the year. Permeability is rapid in the surface layer and moderate in the subsoil layers. **Category: Hydric**

The hydric soils listed for this site are the Basinger fine sand, depressional (8), Immokalee sand, depressional (30) and Myakka fine sand, depressional (33) soils types. The other soils types showed upland characteristics and upland vegetation was the dominant cover, indicating non-hydric conditions.

The depth to water table attribute of these soils was analyzed using the Natural Resource Conservation Service Web Soil Survey for this site (www.websoilsurvey.usda.nrcs.gov). The depth to water table is defined as the distance below grade that the saturated zone of the soil can be found within a specific soil type. Below is a chart that lists the existing soils onsite and the corresponding depth to water table.

SOILS ONSITE	DEPTH TO WATER TABLE
8 – Basinger Fine Sand	0 cm (0 feet)
13 – Cassia Fine Sand	46 cm (1.51 feet)
30 – Immokalee Sand, Depressional	0 cm (0 feet)
32 – Myakka Fine Sand	31 cm (1.02 feet)
33 – Myakka Fine Sand, Depressional	0 cm (0 feet)

The Florida Land Use, Cover & Classification System delineates the land use for the subject site. The HTA Environmental Assessment outlines this information.

Florida Land Use, Cover & Forms Classification System

The vegetative communities and land uses on the project site were field verified, and the site was mapped utilizing the Florida Land Use, Cover and Forms Classification System (FLUCCS, FDOT, 1999). Nine (9) land use and cover types were identified in and around the project site.

310	Herbaceous (Dry Prairie)
411	Pine Flatwood
413	Sand Pine
510	Streams and Waterways (Ditch)
618	Willow and Elderberry
620	Wetland Coniferous Forest
621	Cypress
643	Wet Prairie
811	Airports

The following section from the HTA Report presents a brief description of the land use and cover classes mapped for the project area.

Vegetative Communities

The vegetative communities encountered on the site with the dominant vegetative cover are listed below:

#310 – Herbaceous (Dry Prairie): This category includes upland prairie grasses, sedges and rushes which occur on non-hydric soils and are located within the open areas west of the existing Runway 08. These grasslands are generally treeless with a variety of vegetation types dominated by **Bahia Grass** (*Paspalum notatum*).

#411 – Pine Flatwoods: This community is found over a portion of the uplands onsite, and is dominated by **Slash Pine** (*Pinus elliottii*) in the canopy. The subcanopy consists of a mix of **Wax myrtl**e (*Myrica cerifera*), **Cabbage palm** (*Sabal palmetto*), and juvenile canopy species. The groundcover is dominated by **Saw Palmetto** (*Serenoa repens*), with other components of **Gallberry** (*Ilex glabra*), **Bracken fern** (*Pteridium aquilinium*), and juvenile canopy of species.

#413 – Sand Pine: This community is found in combination with the Pine flatwoods community described above on the north side of the site and is dominated by **Sand pine** (*Pinus clausa*) and **Slash pine** (*Pinus elliottii*) in the canopy. The subcanopy consists of **Sand Live oak** (*Quercus geminata*), **Myrtle oak** (*Quercus myrtifolia*), **Live oak** (*Quercus virginiana*), **Staggerbush** (*Lyonia ferruginea*), **Wax myrtle**, and juvenile **Sand pine**. The groundcover consists of **Broomsedge** (*Androppogon virginicus*), **Saw palmetto**, **Yaupon holly** (*Ilex vomitoria*), and juvenile subcanopy species.

#510 – Streams and Waterways (Ditch): This category is found within the existing ditch areas located within the project area. These areas are manmade water conveyance features with the primary function of storm water conveyance.

#618 – Willow and Elderberry: This community is found over a small portion of the wetland areas onsite and is primarily dominated by **Carolina Willow** (*Salix caroliniana*) with a minor component of **Cabbage palm** (*Sabal palmetto*), **Wax myrtle** (*Myrica cerifera*) and **Broomsedge** (*Andropogon virginicus*).

#620 – Wetland Coniferous Forests: This community is found within a portion of the wetland areas onsite. The canopy is dominated by **Slash pine** with minor amounts of young **Cypress**, and the subcanopy is dominated by young **Slash pine** mixed with **Wax myrtle**. The groundcover mainly consists of **St. Johns wort** (*Hypericum fasciculatum*), **Blue maidencane** (*Amphicarpum mhlenbergianum*), **Red root** (*Lachnanthes caroliniana*), **Bog buttons** (*Eriocaulon spp.*), and **Yellow-eyed grass** (*Xyris spp.*).

#621 – Cypress: This community occurs in the deeper parts of the wetlands, and is dominated by Cypress in the canopy, with juvenile **Cypress**, **Tupelo** (*Nyssa sylvatica*), **Dahoon holly** (*Ilex cassine*), and **Wax myrtle** in the subcanopy. Then groundcover is dominated by a mix of various wetland plants including several species of **Rushes** (*Juncus spp.*), **Sedges** (*Carex spp.*), **Panic grasses** (*Panicum spp.*), **Beakrushes** (*Rhynchospora spp.*), **St. Johns wort** (*Hypericum spp.*), and other supporting wetland species.

#643 – Wet Prairie: This community is found over a small portion of the wetland areas onsite and currently being used as pasture lands. This area is primarily dominated by **Bahia Grass** (*Paspaulum notatum*) with a minor component of **Soft Rush** (*Juncus effuses*), **Spikerush** (*Eleocharis baldwinii*) and **Broomsedge** (*Andropogon virginicus*).

#811 – Airports: This classification is for the active runway, non-active runway and taxiway areas.

The wetlands on the subject site are delineated in the HTA report and FLUCCS map showing wetlands within the construction area and in the Object-Free Area, scheduled to be cleared and not altered by changing of grade.

<u>Wetlands and Surface Water Description</u> (from the HTA Report)

The wetlands onsite can be found in five (5) systems. **Wetland Area 1** (3.545 acres; 154,440 sq. ft.) is centrally located within the project site, approximately 1,200 feet from west end of Runway 08. This wetland area is considered isolated within the landscape. **Wetland Area 2** (1.730 acres; 75,360 sq. ft.) is located along the southern project boundary and continues offsite to the south. **Wetland Area 3** (1.858 acres; 8,0934 sq. ft.) is located on the far west side of the project site, approximately 2200 feet from the west end of Runway 08. This wetland area is considered isolated within the landscape. **Wetland Area 4** (1.439 acres; 62,689 sq. ft.) is located within the "Tower Line of Sight" on the northeast side of the project site and continues offsite to the south. This wetland area is isolated within the landscape. **Wetland Area 5** (0.131 acres; 5,724 sq. ft.) is located within the “Tower Line of Sight” on the north side of the project site and continues offsite to the north. This wetland area is isolated within the landscape.

The total wetland area onsite is 8.704 acres (379,147 sq. ft.).

There are a totally of four (4) surface water areas onsite. Three (3) areas can be defined as manmade conveyances (ditches) and one (1) area is a small existing farm pond. Surface Water Area 1 (0.214 acres; 9,307 sq. ft.), Surface Water Area 2 (0.387 acres; 16,861 sq. ft.) and Surface Water Area 4 (0.216 acres; 9,421 sq. ft.) make up the manmade conveyances that are found within the project site. Surface Water Area 3 (0.287 acres; 12,514 sq. ft.) is located on the west of the project site and is an existing farm pond. The total surface water area onsite is 1.104 acres (48,103 sq. ft.).

The Potential Threatened and Endangered Species distribution evaluation by HTA includes Volusia County Protected Species Distribution Chart with the species of plants located in Volusia County.

COMMON NAME	SCIENTIFIC NAME	STATUS	POTENTIAL OF OCCURRENCE
MAMMALS			
Southeastern Beach Mouse	*Peromyscus polionatus nivelventris*	FT	Habitat does not occur onsite
West Indian Manatee	*Trichechus manatus*	FE	Habitat does not occur onsite
BIRDS			
Everglade Small Kite	*Rostrhamus sociabillis plumbeus*	FE	Habitat does not occur onsite
Florida Scrub Jay	*Aphelocoma coerulescens*	FT	Habitat does not occur onsite
Piping Plover	*Charadrius melodus*	FT	Habitat does not occur onsite
Red Knot	*Calidris canutus rufa*	FT	Habitat does not occur onsite
Red-cockaded Woodpecker	*Picoides borealis*	FE	Minor habitat available; not observed onsite
Wood Stork	*Mycteria Americana*	FT	Minor habitat available; not observed onsite
Florida Sandhill Crane	*Grus Canadensis pratensis*	ST	Minor habitat available; not observed onsite
Little Blue Heron	*Egretta coerulea*	ST	Minor habitat available; not observed onsite
Peregrine Falcon	*Falco peregrinus tundrius*	Delisted	Minor habitat available; not observed onsite
Roseate Spoonbill	*Ajaia ajaja*	ST	Minor habitat available; not observed onsite
Southeastern American Kestrel	*Falco spartverlius Paulus*	ST	Minor habitat available; not observed onsite
Tricolored Heron	*Egretta tricolor*	ST	Minor habitat available; not observed onsite
AMPHIBIANS & REPTILES			
Eastern Indigo Snake	*Drymarchon corais couperi*	FT	Minor habitat available; not observed onsite
Atlantic Salt Marsh Snake	*Nerodia clarkia toeniata*	FT	Habitat does not occur onsite

Hawksbill Sea Turtle	*Eretmochelys imbricate*	FE	Habitat does not occur onsite
Leatherback Sea Turtle	*Dermochelys cariacea*	FE	Habitat does not occur onsite
Florida Pine Snake	*Pituophis melanoleucus mugitus*	ST	Minor habitat available; observed onsite
Gopher Tortoise	*Gophersu Polyphemus*	ST	Minor habitat available; observed onsite
PLANTS			
Ashe's savory	*Calamintha ashei*	T	Minor habitat available; not observed onsite
Auricled spleenwort	*Asplenium erosum*	E	Minor habitat available; not observed onsite
Bird's nest spleenwort	*Asplenium serratum*	E	Minor habitat available; not observed onsite
Blue flowered Butterwort	*Pinguicula caerulea*	T	Minor habitat available; not observed onsite
Brittons Beargrass	*Nolia brittoniana*	E (FE)	Minor habitat available; not observed onsite
Catesby lily	*Lillum catesbaei*	T	Minor habitat available; not observed onsite
Celestial lily	*Nemastylis floridana*	E	Minor habitat available; not observed onsite
Chapman's sedge	*Carex chapmanii*	T	Minor habitat available; not observed onsite
Cinnamon Fern	*Osmunda cinnamomea*	CE	Minor habitat available; not observed onsite
Common wild pine	*Tillandsia fasciculate*	E	Minor habitat available; not observed onsite
Coontie (all native species)	*Zamia spp.*	CE	Minor habitat available; observed onsite
Curtiss' milkweed	*Asclepias curtissii*	E	Minor habitat available; not observed onsite
Easter-lily	*Zephranthes treatiae*	T	Minor habitat available; not observed onsite
Erect prickly pear	*Opuntia stricta*	T	Minor habitat available; observed onsite
Flatwoods sunflower	*Helianthus carnosus*	E	Minor habitat available; not observed onsite
Florida beargrass	*Nolina atopocarpa*	T	Minor habitat available; observed onsite
Florida butterfly orchid	*Encyclio tampensis*	CE	Minor habitat available; not observed onsite
Florida jointtail grass	*Coelorachis tuberculosa (Manisuris tuberculosa)*	T	Minor habitat available; not observed onsite
Florida lantana	*Lantan depresso*	E	Minor habitat available; not observed onsite
Florida mountain-mint	*Pycnanthemum floridanum*	T	Minor habitat available; not observed onsite
Garberia	*Garberia heterophylla*	T	Minor habitat available; not observed onsite

Giant orchid	*Pteroglossaspis ecristata (Eulophia ecristata)*	E	Minor habitat available; not observed onsite
Godfrey's sandwort	*Minuartia godfreyi*	E	Minor habitat available; not observed onsite
Great wild pine	*Tillandsia utriculata*	E	Minor habitat available; not observed onsite
Green-fly orchid	*Epidendurm conopseum*	CE	Minor habitat available; not observed onsite
Hand Fern	*Ophioglossum palmatum*	E	Minor habitat available; not observed onsite
Hartwrightia	*Hartwrightia floridana*	T	Minor habitat available; not observed onsite
Hooded pitcherplant	*Sarracenia minor*	T	Minor habitat available; not observed onsite
Indian plantain	*Arnoglossum diversifolium*	T	Minor habitat available; not observed onsite
Okeechobee gourd	*Cucurbita okeechobeensis ssp. Okeechobeensis*	E (FE)	Minor habitat available; not observed onsite
Lace-lip ladies' tresses	*Spiranthes laciniata*	T	Minor habitat available; not observed onsite
Large flowered rosemary	*Conradina grandiflora*	T	Minor habitat available; not observed onsite
Leafless beaked orchid	*Stenorrhynchos lanceolatus (Spiranthese lanceolate)*	T	Minor habitat available; not observed onsite
Low pepperomia	*Pepromia humillis*	E	Minor habitat available; not observed onsite
Nodding club-moss	*Lycopodum cernuum (Lycopodiella cernua)*	CE	Minor habitat available; not observed onsite
Pine pinweed	*Lechea divaricate*	E	Minor habitat available; not observed onsite
Pineland butterfly pea	*Centrosema arenicola*	E	Minor habitat available; not observed onsite
Plume polypody	*Polypodium plumula*	E	Minor habitat available; not observed onsite
Rainlily	*Zephyranthes atamasca*	T	Minor habitat available; not observed onsite
Rose pogonia	*Pogonia ophioglossoides*	T	Minor habitat available; not observed onsite
Royal fern	*Osmundoa regalis*	CE	Minor habitat available; not observed onsite
Sand dune spurge	*Chamaesyce cumuliocolo*	E	Minor habitat available; not observed onsite
Scrub pinweed	*Lechea cernua*	T	Minor habitat available; not observed onsite
Simpson zephyr lily	*Zephranthese simpsonii*	T	Minor habitat available; not observed onsite
Small ladies' tresses	*Spiranthes brevilabris*	E	Minor habitat available; not observed onsite

Snowy orchid	*Platanthera nivea (Habenaria nivea)*	T	Minor habitat available; not observed onsite
Southern tubercled orchid	*Platanthera flava*	T	Minor habitat available; not observed onsite
Swamp plume polypody	*Polypodum ptilodon*	E	Minor habitat available; not observed onsite
Tampa vervain	*Verbena tampensis (Glandularia tampensis)*	E	Minor habitat available; not observed onsite
Water sundrew	*DRosera intermedia*	T	Minor habitat available; not observed onsite
Widespread polypody	*Polypodoum dispersa*	E	Minor habitat available; not observed onsite
Yellow flowered butterwort	*Pinguicula lutea*	T	Minor habitat available; not observed onsite
Yellow fringed orchid	*Platanthera ciliaris*	T	Minor habitat available; not observed onsite
Rugel's pawpaw	*Deeringothamnus rugelii*	E (FE)	Minor habitat available; not observed onsite
Yellow star anise	*Illcium parviflorum*	E	Minor habitat available; not observed onsite

LEGAL STATUS LEGEND

State and Federal Status (FAUNA ONLY)

CODE	DEFINITION
FE	Federally-designated Endangered
FT	Federally-designated Threatened
FXN	Federally-designated Threatened Nonessential Experimental Population
FT(S/A)	Federally-designated Threatened species due to similarity of appearance
ST	State-designated Threatened
SSC	State-designated Species of Special Concern

FDACS STATUS (FLORA ONLY)

CODE	DEFINITION
E	Endangered
T	Threatened
CE	Commercially Exploited

The HTA Report lists the following:

<u>Threatened and Endangered Species for FFWCC</u>

Mammals

The endangered **Florida Panther** (*Felix concolor coryi*) is found in a wide variety of habitat types, but requires a large range and substantial food source to survive. This site does not offer a substantial food source or range for the panther.

Amphibians and Reptiles

The threatened **Gopher Tortoise** (*Gopherus polyphemus*) was a species of concern because some of the site could potentially provide habitat for this species. During the review, Gopher Tortoises and Gopher Tortoise burrows were observed within the project site. A number of commensal species are known to inhabit Gopher Tortoise burrows such as the threatened **Eastern Indigo Snake** (*Drymarchon corais couperi*) and the threatened **Florida Pine Snake** (*Pituophis melanoleucus mugitus*).

No protected amphibians or reptiles or signs of their utilization were noted on the site during the review, other than the Gopher Tortoise and the Gopher Tortoise Burrows.

Invertebrates

Very few invertebrates are listed by the State of Florida as Endangered or Threatened, and of the species listed, none occur within the habitat found on this project site.

Fish

No protected fish species were observed on the site in the area of proposed impact due to the lack of their specific habitat type.

Birds

There are a moderate number of birds that could potentially utilize the habitat available on the site. The herbaceous and Pine Flatwoods communities could provide foraging and nesting habitat for the threatened **Audubon's Crested Caracara** (*Polyborus plancus audobonii*), the threatened **Florida Sandhill Crane** (*Grus Canadensis pratensis*), the threatened **Southeastern American Kestrel** (*Falco sparverious paulus*), the endangered **Red-cockaded Woodpecker** (*Picoides borealis*) and the **Bald Eagle** (*Haliaeetus leucocephalus*). A search of the FFWCC Bald Eagle Nest Locator for documented bald eagle nesting territories revealed no documented nests are located within 660 feet of the project site. Additionally, no eagle nest was observed during the reviews of the site.

The wetland communities onsite could provide foraging and nesting habitat for the threatened **Little Blue Heron** (*Egretta caerulea*), the threatened **Roseate Spoonbill** (*Ajaia ajaja*), the threatened **Tricolored Heron** (*Egretta tricolor*) and the threatened **Wood Stork** (*Mycteria Americana*). A review of the U.S. Fish and Wildlife Service "Wood Stork Core Foraging Areas" mapping determined that the proposed Runway 08 Extension does not fall within a mapped foraging area for the Wood stork.

The listing of plants indicates three listed species that are potentially occurring on the subject Ormond Beach Municipal Airport Runway 08-26 Extension site (HTA Report, May 2017). See also the Florida Natural Areas Inventory (May 2017) documentation. These species include the following:

Erect Prickly Pear (*Opuntia stricta*), **Florida Beargrass** (*Nolina atopocarpa*), and **Coontie** (*Zamia spp.*). According to Section 581.185 (8), *Florida Statutes*, certain exemptions apply to the clearing and removal of protected plant species on lands that will be utilized for silvicultural or agricultural uses, fire control measures, or required mining assessment work. The clearing or removal of regulated plants form canals, ditches, survey lines, building sites or roads or other right-of-ways by the landowner or his or her agent is also exempt on privately-owned lands. On utility areas, the clearing of land by a public agency or a publicly or privately-owned utility when acting in the performance of its obligation to provide a service to the public is also exempt. Listed plant species found on this site fall under one of the exemptions listed above and may be removed if needed (HTA Report, May 2017).

Plant species with U.S. Fish and Wildlife Service Consultation include: **Okeechobee gourd** (*Curcurbita okeechobeensis spp. Okeechobeensis*): minor habitat available; not observed onsite and **Rugel's pawpaw** (*Deeringothamnus rugelii*); Endangered; minor habitat available; not observed onsite. (HTA Report, May 2017, p. 21).

In conclusion, the proposed Runway Extension will not impact shrub species because the cleared area is routinely maintained and no shrub vegetation or forested vegetation is present.

The area west of the fence, the proposed approach, is predominantly a planted and volunteer pine forest with limited shrub vegetation and no documentation of significant native vegetation (See Florida Natural Areas Inventory and HTA Environmental Assessment).

1018 Thomasville Road
Suite 200-C
Tallahassee, FL 32303
850-224-8207
850-681-9364 fax
www.fnai.org

Florida Natural Areas Inventory
Biodiversity Matrix Query Results
UNOFFICIAL REPORT
Created 5/7/2017
(Contact FNAI Data Services Coordinator
for an official **Standard Data Report**)

NOTE: The Biodiversity Matrix includes only rare species and natural communities tracked by FNAI.

Report for 1 Matrix Unit: 51834

Descriptions

DOCUMENTED - There is a documented occurrence in the FNAI database of the species or community within this Matrix Unit.

DOCUMENTED-HISTORIC - There is a documented occurrence in the FNAI database of the species or community within this Matrix Unit; however the occurrence has not been observed/reported within the last twenty years.

LIKELY - The species or community is *known* to occur in this vicinity, and is considered likely within this Matrix Unit because:

1. documented occurrence overlaps this and adjacent Matrix Units, but the documentation isn't precise enough to indicate which of those Units the species or community is actually located in; *or*
2. there is a documented occurrence in the vicinity and there is suitable habitat for that species or community within this Matrix Unit.

POTENTIAL - This Matrix Unit lies within the known or predicted range of the species or community based on expert knowledge and environmental variables such as climate, soils, topography, and landcover.

Matrix Unit ID: 51834
0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

3 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mesic flatwoods	G4	S4	N	N
Mycteria americana	G4	S2	LT	FT

Wood Stork				
Ursus americanus floridanus Florida Black Bear	G5T2	S2	N	N

Matrix Unit ID: 51834

21 **Potential** Elements for Matrix Unit 51834

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Alligator mississippiensis American Alligator	G5	S4	SAT	FT(S/A)
Calopogon multiflorus Many-flowered Grass-pink	G2G3	S2S3	N	T
Carex chapmanii Chapman's Sedge	G3	S3	N	T
Centrosema arenicola Sand Butterfly Pea	G2Q	S2	N	E
Conradina grandiflora Large-flowered Rosemary	G3	S3	N	T
Deeringothamnus rugelii Rugel's Pawpaw	G1	S1	LE	E
Gopherus polyphemus Gopher Tortoise	G3	S3	C	ST
Grus canadensis pratensis Florida Sandhill Crane	G5T2T3	S2S3	N	ST
Gymnopogon chapmanianus Chapman's Skeletongrass	G3	S3	N	N
Heterodon simus Southern Hognose Snake	G2	S2	N	N
Illicium parviflorum Star Anise	G2	S2	N	E
Lechea cernua Nodding Pinweed	G3	S3	N	T
Matelea floridana Florida Spiny-pod	G2	S2	N	E
Nemastylis floridana Celestial Lily	G2	S2	N	E
Neofiber alleni Round-tailed Muskrat	G3	S3	N	N
Nolina atopocarpa Florida Beargrass	G3	S3	N	T
Pituophis melanoleucus mugitus Florida Pine Snake	G4T3	S3	N	SSC
Platanthera integra Yellow Fringeless Orchid	G3G4	S3	N	E
Pteroglossaspis ecristata Giant Orchid	G2G3	S2	N	T

Pycnanthemum floridanum Florida Mountain-mint	G3	S3	N	T
Salix floridana Florida Willow	G2	S2	N	E

Disclaimer

The data maintained by the Florida Natural Areas Inventory represent the single most comprehensive source of information available on the locations of rare species and other significant ecological resources statewide. However, the data are not always based on comprehensive or site-specific field surveys. Therefore, this information should not be regarded as a final statement on the biological resources of the site being considered, nor should it be substituted for on-site surveys. FNAI shall not be held liable for the accuracy and completeness of these data, or opinions or conclusions drawn from these data. FNAI is not inviting reliance on these data. Inventory data are designed for the purposes of conservation planning and scientific research and are not intended for use as the primary criteria for regulatory decisions.

Unofficial Report

These results are considered unofficial. FNAI offers a Standard Data Request option for those needing certifiable data.

1018 Thomasville Road
Suite 200-C
Tallahassee, FL 32303
850-224-8207
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Florida Natural Areas Inventory
Biodiversity Matrix Query Results
UNOFFICIAL REPORT
Created 5/7/2017
(Contact FNAI Data Services Coordinator
for an official **Standard Data Report**)

NOTE: The Biodiversity Matrix includes only rare species and natural communities tracked by FNAI.

Report for 1 Matrix Unit: 52168

Descriptions

DOCUMENTED - There is a documented occurrence in the FNAI database of the species or community within this Matrix Unit.

DOCUMENTED-HISTORIC - There is a documented occurrence in the FNAI database of the species or community within this Matrix Unit; however the occurrence has not been observed/reported within the last twenty years.

LIKELY - The species or community is *known* to occur in this vicinity, and is considered likely within this Matrix Unit because:

1. documented occurrence overlaps this and adjacent Matrix Units, but the documentation isn't precise enough to indicate which of those Units the species or community is actually located in; *or*
2. there is a documented occurrence in the vicinity and there is suitable habitat for that species or community within this Matrix Unit.

POTENTIAL - This Matrix Unit lies within the known or predicted range of the species or community based on expert knowledge and environmental variables such as climate, soils, topography, and landcover.

Matrix Unit ID: 52168
0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

4 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mesic flatwoods	G4	S4	N	N
Mycteria americana	G4	S2	LT	FT

Wood Stork				
Scrub	G2	S2	N	N
Trichechus manatus West Indian Manatee	G2	S2	LE	FE

Matrix Unit ID: 52168
21 **Potential** Elements for Matrix Unit 52168

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Alligator mississippiensis American Alligator	G5	S4	SAT	FT(S/A)
Calopogon multiflorus Many-flowered Grass-pink	G2G3	S2S3	N	T
Centrosema arenicola Sand Butterfly Pea	G2Q	S2	N	E
Conradina grandiflora Large-flowered Rosemary	G3	S3	N	T
Deeringothamnus rugelii Rugel's Pawpaw	G1	S1	LE	E
Gopherus polyphemus Gopher Tortoise	G3	S3	C	ST
Grus canadensis pratensis Florida Sandhill Crane	G5T2T3	S2S3	N	ST
Gymnopogon chapmanianus Chapman's Skeletongrass	G3	S3	N	N
Heterodon simus Southern Hognose Snake	G2	S2	N	N
Illicium parviflorum Star Anise	G2	S2	N	E
Lechea cernua Nodding Pinweed	G3	S3	N	T
Matelea floridana Florida Spiny-pod	G2	S2	N	E
Nemastylis floridana Celestial Lily	G2	S2	N	E
Neofiber alleni Round-tailed Muskrat	G3	S3	N	N
Nolina atopocarpa Florida Beargrass	G3	S3	N	T
Pituophis melanoleucus mugitus Florida Pine Snake	G4T3	S3	N	SSC
Platanthera integra Yellow Fringeless Orchid	G3G4	S3	N	E
Pteroglossaspis ecristata Giant Orchid	G2G3	S2	N	T
Pycnanthemum floridanum	G3	S3	N	T

Florida Mountain-mint				
Salix floridana Florida Willow	G2	S2	N	E
Ursus americanus floridanus Florida Black Bear	G5T2	S2	N	N

Disclaimer

The data maintained by the Florida Natural Areas Inventory represent the single most comprehensive source of information available on the locations of rare species and other significant ecological resources statewide. However, the data are not always based on comprehensive or site-specific field surveys. Therefore, this information should not be regarded as a final statement on the biological resources of the site being considered, nor should it be substituted for on-site surveys. FNAI shall not be held liable for the accuracy and completeness of these data, or opinions or conclusions drawn from these data. FNAI is not inviting reliance on these data. Inventory data are designed for the purposes of conservation planning and scientific research and are not intended for use as the primary criteria for regulatory decisions.

Unofficial Report

These results are considered unofficial. FNAI offers a Standard Data Request option for those needing certifiable data.

SLRA

STORM L. RICHARDS & ASSOCIATES, INC.
ENVIRONMENTAL ASSESSMENTS, FEASIBILITY STUDIES, & PERMITTING
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DR. JEANNE FILLMAN-RICHARDS, President
DR. STORM L. RICHARDS, Principal

May 12, 2017

Mr. Theodore Isham
Historic Preservation Officer
Seminole Nation of Oklahoma
P.O. Box 1498
Wewoka, Oklahoma 74884

RE: Ormond Beach Municipal Airport Runway Extension Project

Dear Mr. Isham:

Thank you for discussing with me the Ormond Beach Municipal Airport Runway Extension Project. A Cultural Resource Assessment Pedestrian Survey for the site has been completed and the final copy will be transmitted to your office as we discussed. The construction aspect of the project is in the existing clear zone with no forested or shrub vegetation. The wetlands identified in this area are isolated and not permanently wet features (See Current Photography). The proposed cleared area west of the Ormond Beach fence line will be cleared with no current construction activity proposed. There will be no impacts to Seminole Tribe vegetation, artifacts or cultural resources.

Dr. Storm L. Richards, R.P.A. and Dr. Jeanne Fillman-Richards, R.P.A. will be on call for the entire project and available for consultation at any time and will coordinate directly with you and the Department of Historical Resources.

If you have any questions, please do not hesitate to contact me or Mr. Doug Norman, Project Manager, HTA, Orlando, Florida.

The full Cultural Resources Assessment will be transmitted to you at the earliest date.

If you have any questions, please do not hesitate to contact me at 407-492-4706 or email StormLRA@gmail.com at any time.

Respectfully submitted,

Storm L. Richards, Ph.D., R.P.A., C.E.P., C.E.C., C.E.I.
Registered Professional Archaeologist
Certified Environmental Professional
Certified Environmental Consultant
Certified Environmental Inspector
Florida Association of Environmental Professionals, Member

cc: Mr. Doug Norman
Project Manager, HTA

APPENDIX D

Unanticipated Discoveries and Florida Law

UNANTICIPATED DISCOVERIES AND FLORIDA LAW

Due to the local nature of land use decisions, historic preservation laws are predominantly enforced by state and local governments. The Florida legislature has enacted laws pertaining to unmarked human burials, intending that "all human burials and human skeletal remains be accorded equal treatment and respect based upon common human dignity without reference to ethnic origin, cultural background, or religious affiliation."[1] This section discusses some of the laws which may apply in the event that certain unanticipated discoveries are encountered.

Applicable Florida Law

The mandates of Florida Statutes (Chapter 872, *Offenses Concerning Dead Bodies And Graves*) apply when human skeletal remains, human burial, or associated burial artifacts have been or are discovered "upon or within any public or private land in the state, including submerged lands."[2] An "unmarked human burial"[3] is statutorily defined as:

- "any human skeletal remains or associated burial artifacts", or
- "any location, including any burial mound or earthen or shell monument, where human skeletal remains or associated burial artifacts are discovered or believed to exist on the bases of archaeological or historical evidence, excluding any burial marked or previously marked by a tomb, monument, gravestone, or other structure or thing placed or designed as a memorial of the dead."

Duty to Immediately Cease Activity

Upon discovery of an unmarked human burial, other than during an archaeological excavation authorized by the State or an educational institution, "all activity that may disturb the unmarked human burial shall cease immediately, and the district medical examiner shall be notified. Such activity shall not resume unless specifically authorized by the district medical examiner or the State Archaeologist."[4] Thus, when an unmarked human burial is encountered, the contractor must notify the district medical examiner and cease all work in the vicinity, and should protect the area from further spoliation. Storm L. Richards & Associates, Inc. recommends covering the find with plastic sheeting or tarps, marking the location, and preventing further disturbances to the immediate area. Such discoveries should be immediately reported to Storm L. Richards & Associates, Inc. at (407) 323-9021. Storm L. Richards & Associates, Inc. will respond to such calls and initiate the necessary actions to comply with Chapter 872.

---

[1] FLA STAT. § 872.05 (1) (Unmarked Human Burials; Legislative Intent) 2002.

[2] *Id.* (stating "This section applies to all human burials, human skeletal remains, and associated burial artifacts not otherwise protected under chapter 497 or other state law").

[3] *Id.* § 2(f).

[4] *Id.* § 2(b) (providing the "District medical examiner is a person appointed under F.S. § 406.06, § 406.15, or § 406.17"; and § 2(3), stating "State Archaeologist" means the person employed the Division of Historical Resources of the Florida Department of State pursuant to § 267.031(6)).

Duty to Notify Authorities

Florida law imposes a mandatory duty to notify local law enforcement authorities of site disturbance. "Any person who knows or has reason to know that an unmarked human burial is being unlawfully disturbed, destroyed, defaced, mutilated, removed, excavated, or exposed shall immediately notify the local law enforcement agency with jurisdiction in the area where the unmarked human burial is located."[5] Upon inspection, "any law enforcement agency that finds evidence that an unmarked human burial has been unlawfully disturbed shall notify the district medical examiner."[6]

Procedures Following the Discovery of an Unmarked Human Burial

Jurisdiction and duties of the district medical examiner (DME) are described at §872.05 (4)(a). Note: This section does not apply to an archaeological excavation authorized by the State or an educational institution.[7] Initially, the DME shall assume jurisdiction over, and responsibility for, such unmarked human burial if he or she

- Determines that the unmarked human burial may be involved in a legal investigation, or
- Represents the burial of an individual who has been dead less than 75 years

After receiving notification of the unmarked human burial, the DME has 30 days to determine if he or she shall maintain jurisdiction or refer the matter to the State Archaeologist. If the unmarked human burial is determined not to be involved in a legal investigation and represents the burial of an individual who has been dead 75 years or more, the DME will notify the State Archaeologist.

Duties of the State Archaeologist

Upon receiving notice from the DME, the Division of Historical Resources of the Department of State
("Division") may assume jurisdiction over and responsibility for the unmarked human burial pursuant to §872.05(6).[8] This process is typically to initiate efforts to properly protect the burial, human skeletal remains, and associated burial artifacts. If the Division assumes jurisdiction, "the State Archaeologist shall consult a human skeletal analyst who shall report within 15 days as to the cultural and biological characteristics of the human skeletal remains and where such burial or remains should be held prior to a final disposition."[9]

The State Archaeologist must make "reasonable efforts to identify and locate persons who can establish direct kinship, tribal, community, or ethnic relations with the individual or individuals

---

[5] *Id.* (3)(a).
[6] *Id.* (3)(b).
[7] See §872.05 (5) Discovery of an Unmarked Human Burial During an Archaeological Excavation).
[8] *Id.* (6).
[9] *Id.* (4)(©).

whose remains constitute the unmarked human burial."[10] If possible, he or she "shall consult with the closest related family member or recognized community leaders, if a community or ethnic relationship is established, in determining the proper disposition of the remains found in the unmarked human burial."[11]

Ownership of A Historical, Archaeological, or Significant Unmarked Human Burial

The State Archaeologist is required to determine whether the unmarked human burial is historically, archaeologically, or scientifically significant. If the burial is deemed significant, re-interment may not occur until the remains have been examined by a human skeletal analyst designated thereby. Frequently, no links to family or the community can be identified. Under Florida law, this occurs when the State Archaeologist "is unable to establish a kinship, tribal, community, or ethnic relationship with the unmarked human burial, determine the proper disposition of the burial and consult with persons with relevant experience, including:

(1) A human skeletal analyst,
(2) Two Native American members of current state tribes recommended by the Governor's Council on Indian Affairs, Inc., if the remains are those of a Native American,
(3) Two representatives of related community or ethnic groups if the remains are not those of a Native American, or
(4) An individual who has special knowledge or experience regarding the particular type of the unmarked human burial."[12]

If the State Archaeologist finds that an unmarked human burial is historically, archaeologically, or scientifically significant <u>and</u> if the parties (listed above) with whom he or she is required under §872.05(6)(©) to consult agree, the human skeletal remains, and the associated burial artifacts, shall belong to the State of Florida. The title thereto will be vested in the Division.

Storm L. Richards & Associates, Inc. Scope of Work

Storm L. Richards & Associates, Inc. will provide coordination with State and local agencies, including the Division. We will work with property owners and contractors to alleviate construction delays or alterations resulting from such discoveries. Typically, construction is temporarily shifted to areas away from the find while an assessment is conducted. Depending upon results of the assessment however, project redesign, and/or provisions for reburial, may be required.

Should the remains be classified as archaeologically or scientifically significant, Storm L. Richards & Associates, Inc. will negotiate a Scope of Work or a Management Plan with the State Archaeologist. A Management Plan may include disinterment, or preservation in place. If disinterment is selected, Storm L. Richards & Associates, Inc. will work with a physical anthropologist to carefully remove the remains for forensic examination. Following completion

[10] *Id.* (6)(b).
[11] *Id.*
[12] *Id.* (6)(©).

of the forensic investigation, a Management Report will be provided to facilitate decisions regarding whether site development activities may proceed in the vicinity of the discovery. The Management Report will also include all relevant correspondence between Storm L. Richards & Associates, Inc., the District Medical Examiner, the State Archaeologist, and other agencies involved in the project.

When forensic and management analyses are completed, Storm L. Richards & Associates, Inc. will prepare a draft report to the client for review and approval. Florida Master Site File forms will be completed and updated as needed. In compliance with Florida law, Storm L. Richards & Associates, Inc. will submit a Final Report to the State Archaeologist.[13]

[13] *Id.* (7) (providing "The archaeologist and human skeletal analyst involved in the archaeological excavation and scientific analysis of an unmarked human burial shall submit a written report of archaeological and scientific findings as well as a summary of such findings, in terms that may be understood by laypersons, to the State Archaeologist within 2 years after completion of an excavation. The Division shall publish the summary within 1 year after its receipt and shall make such report available upon request").

Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Attachment I

From:	Peace, Kimberly R.
To:	Peace, Kimberly R.
Subject:	FW: Ormond beach Airport EA comments
Date:	Wednesday, March 21, 2018 11:14:33 AM

file

Kimberly R. Peace
Senior Environmental Coordinator
Hoyle, Tanner & Associates, Inc.
(603) 669-5555, ext 151 | Cell: (603) 716-3343

From: Corain Lowe [mailto:CLowe@mcn-nsn.gov]
Sent: Wednesday, March 21, 2018 10:57 AM
To: Peace, Kimberly R. <kpeace@hoyletanner.com>
Subject: RE: Ormond beach Airport EA comments

Ms. Peace,

Thank you for contacting the Muscogee (Creek) Nation Cultural Preservation Office concerning the Ormond Beach Airport Runway 8-26 Extension located in Ormond Beach, Volusia County, Florida.

After reviewing the material provided, it has been determined that the Muscogee (Creek) Nation has no objections/comments to the proposed extension project and related activities. Please consider this letter as our concurrence. Also, if there are any additional updates on this, we request to be notified.

Should further information or comment be needed, please do not hesitate to contact me at (918) 732-7835.

Ms. Corain Lowe-Zepeda
Historic and Cultural Preservation Department, THPO
Muscogee (Creek) Nation
P. O. Box 580
Okmulgee, OK 74447
T 918.732.7835
clowe@mcn-nsn.gov

From:	Peace, Kimberly R.
To:	Theodore Isham
Cc:	Virginia.Lane@faa.gov; Bart.Vernace@FAA.GOV; Norman, Doug; McDougal, Evan R.
Subject:	RE: Ormond Beach Airport Cultural Resources Assessment Survey
Date:	Tuesday, November 07, 2017 3:21:49 PM

Hello Theodore, thank you for your response. We will include this email as documentation in the Draft EA that coordination is complete with the Seminole Nation of Oklahoma.

Kimberly R. Peace

From: Theodore Isham [mailto:isham.t@sno-nsn.gov]
Sent: Tuesday, November 07, 2017 12:35 PM
To: Peace, Kimberly R. <kpeace@hoyletanner.com>
Subject: RE: Ormond Beach Airport Cultural Resources Assessment Survey

This ***Opinion*** is being provided by Seminole Nation of Oklahoma's Cultural Advisor, pursuant to authority vested by the Seminole Nation of Oklahoma General Council. The Seminole Nation of Oklahoma is an independently Federally-Recognized Indian Nation headquartered in Wewoka, OK.
In keeping with the National Environmental Policy Act (NEPA)d, and Section 106 of the National Historic Preservation Act (NHPA), 36 CFR Part 800, this letter is to acknowledge that the Seminole Nation of Oklahoma has received notice of the proposed project at the above mentioned location.

The Seminole Nation of Oklahoma concurs with the recommendation of 'no adverse effect'. Therefore, we have no other comment on the project as proposed.
We do request that if cultural or archeological resource materials are encountered that all activity cease and the Seminole Nation of Oklahoma and other appropriate agencies be contacted immediately.

Furthermore, due to the historic presence of our people in the project area, inadvertent discoveries of human remains and related NAGPRA items may occur, even in areas of existing or prior development. Should this occur we request all work cease and the Seminole Nation of Oklahoma and other appropriate agencies be immediately notified.

From: Peace, Kimberly R. [mailto:kpeace@hoyletanner.com]
Sent: Tuesday, June 27, 2017 8:38 AM
To: Theodore Isham
Cc: Virginia.Lane@faa.gov; Norman, Doug
Subject: Ormond Beach Airport Cultural Resources Assessment Survey

Hello-

The City of Ormond Beach has completed a Phase 1 Cultural Resources Assessment Survey with shovel testing for the Ormond Beach Municipal Airport Runway Extension Project. Please respond to Virginia Lane, FAA Environmental Specialist, with any comments or questions; her contact information is included in the attached letter.

Thank you-

Kimberly R. Peace
Senior Environmental Coordinator
Hoyle, Tanner & Associates, Inc.

Responsive. Consistent. Competent.™

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(603) 669-5555, ext 151 | Fax: (603) 669-4168
kpeace@hoyletanner.com
www.hoyletanner.com

Our vision is to provide innovative, collaborative and sustainable engineering and planning solutions to the challenges our clients face, while enhancing the communities in which we work and live. We strive to uphold the highest ethical standards while maintaining integrity and respect within our professional relationships. We continue to build a corporate culture that honors and values the individuality and strengths of our team members and our clients.

U.S. Department
of Transportation
**Federal Aviation
Administration**

Airports District Office
5950 Hazeltine National Drive, Suite 400
Orlando, Florida 32822
407-812-6331

August 17, 2017

Theodore Isham
Seminole Nation of Oklahoma
Historic Preservation Officer
PO Box 1498
Wewoka, OK 74884
Phone: 405-234-5218
e-mail: isham.t@sno-nsn.gov

Ormond Beach Airport Runway 8-26 Extension, AIP 3-12-0059-019-2016, Ormond Beach, Florida, Government-to-Government Consultation

The Federal Aviation Administration (FAA) in cooperation with the City of Ormond Beach, owner and operator of the Ormond Beach Municipal Airport is preparing an Environmental Assessment for proposed changes as depicted on the federally-approved airport layout plan (ALP). The changes include an extension of Runway 8-26 and its parallel taxiway along with tree clearing of FAA safety and approach surfaces required by the extension. The airport is located at 770 Airport Road, Ormond Beach, Volusia County. The Federal Aviation Administration (FAA) is acting as the lead federal agency for the U.S. Department of Transportation for this project.

Per the requirements of Section 106 of the National Historic Preservation Act (NHPA) as defined in 36 CFR Part 800- Protection of Historic Properties, in conjunction with Federal Executive Order 13175 “Consultation and Coordination with Indian Tribal Governments” and FAA’s Order 1210.20 “American Indian and Alaska Native Tribal Consultation Policy and Procedures” the Seminole Nation of Oklahoma, a Federally-recognized Tribe, was given the opportunity to provide meaningful and timely input regarding the proposed FAA action that could uniquely or significantly affect Tribes.

The FAA received your emailed comments on the project dated July 6, 2017 and notes your concurrence with the FAA determination that the proposed undertaking will have no effect on historic, cultural or archaeologic resources. The Florida Division of Historical Resources (FDHR), the State Historic Preservation Officer (SHPO) for Florida also concurred with the no effect determination.

Because the project is not located on Tribal Lands, per 36 CFR 800.2(c)(1)(ii) the Seminole Nation of Oklahoma is a consulting party to the project but does not function as SHPO for this project. The concerns regarding impacts on plant communities has been documented and considered as part of the review of potential effects but does not change this determination. Vegetation that is significant to native tribes (e.g., *Salix humulis*, *S. carolinia, Arundius gigantica, Ilex vomitoria)* will be used to replant any disrupted or disturbed riparian or wetland areas should the US Army Corps of Engineers or the St. Johns River Water Management District require replanting as mitigation for such impacts during the permit process.

In accordance with FAA regulations and guidance, if historic, cultural or archaeologic resources are discovered during construction, project construction will be immediately stopped in the vicinity of the discovered resources. The FAA will determine what actions can be taken to resolve any adverse effects. Within 48 hours of discovery, the FAA will notify the Seminole Nation, SHPO/THPO and any tribal organization or other relevant organizations in the area that might attach religious and cultural significance to the affected property, and the Advisory Council on Historic Preservation (ACHP). The notification will describe the actions proposed by the FAA to resolve the adverse effects. The relevant entity(s) and the ACHP shall respond within 48 hours of notification and the FAA will take into account their recommendations and carry out appropriate actions. The FAA will provide a report of the actions when completed.

Sincerely,

Virginia Lane

Virginia Lane
Environmental Specialist
FAA Orlando Airports District Office

From:	Theodore Isham
To:	Peace, Kimberly R.
Subject:	RE: Ormond Beach Municipal Airport Runway 08-26 Cultural Resources Survey
Date:	Thursday, July 06, 2017 10:19:53 AM

This ***Opinion*** is being provided by Seminole Nation of Oklahoma's Cultural Advisor, pursuant to authority vested by the Seminole Nation of Oklahoma General Council. The Seminole Nation of Oklahoma is an independently Federally-Recognized Indian Nation headquartered in Wewoka, OK.

In keeping with the National Environmental Policy Act (NEPA)d, and Section 106 of the National Historic Preservation Act (NHPA), 36 CFR Part 800, this letter is to acknowledge that the Seminole Nation of Oklahoma has received notice of the proposed project at the above mentioned location.

Based on the information provided showing the topographic setting, the undeveloped nature of the property, and the potential for buried cultural resources, the proposed project has a potential of affecting archaeological resources, some of which may be eligible for listing in the National Register of Historic Places (NRHP).

We request more detailed information on the areas #618 and #413 as it pertains to the plant community, pictures of the vegetation, population counts etc. Also in areas #620 and #261 and the aforementioned areas, SNO requests that vegetation that is significant to native tribes be used to replant any disrupted or disturbed riparian or wetland areas.

SNO suggests using where applicable in the replanting of these disturbed areas, salix humulis, salix carolinia, arundius gigantica, ilex vomitoria and others as requested.

Finally, we also request that if cultural or archeological resource materials are encountered at all activity cease and the Seminole Nation of Oklahoma and other appropriate agencies be contacted immediately.

Furthermore, due to the historic presence of our people in the project area, inadvertent discoveries of human remains and related NAGPRA items may occur, even in areas of existing or prior development. Should this occur we request all work cease and the Seminole Nation of Oklahoma and other appropriate agencies be immediately notified.

Therefore, we recommend a finding of "No Adverse Effect" for the proposed undertaking.

If you have any questions, please feel free to contact me at (405) 234-5218 or by e-mail at isham.t@sno-nsn.gov. Thank you for your time and cooperation in this matter.

Sincerely,

Theodore Isham

Seminole Nation of Oklahoma
Historic Preservation Officer
PO Box 1498
Wewoka, Ok 74884
Phone: 405-234-5218
e-mail: isham.t@sno-nsn.gov

From: Peace, Kimberly R. [mailto:kpeace@hoyletanner.com]
Sent: Monday, May 22, 2017 2:50 PM

To: Theodore Isham <isham.t@sno-nsn.gov>
Cc: Virginia.Lane@faa.gov; Norman, Doug <dnorman@hoyletanner.com>; McDougal, Evan R. <emcdougal@hoyletanner.com>; StormLRA@gmail.com
Subject: Ormond Beach Municipal Airport Runway 08-26 Cultural Resources Survey

On behalf of Virginia Lane, FAA Environmental Specialist, please accept the attached Cultural Resources Survey as response to your email dated April 24, 2017.

I understand that you received a copy of this report this morning from the historic subconsultant, Storm L. Richards, and discussed with him the vegetation within the project area on May 12, 2017, as noted in Appendix C of the attached Survey.

Please provide either myself or Virginia Lane, Virginia.Lane@faa.gov. with comments or requests regarding this project by email before June 9, 2017.

Kimberly R. Peace
Senior Environmental Coordinator
Hoyle, Tanner & Associates, Inc.

Responsive. Consistent. Competent.™

150 Dow Street | Manchester, NH 03101
(603) 669-5555, ext 151 | Fax: (603) 669-4168
kpeace@hoyletanner.com
www.hoyletanner.com

Our vision is to provide innovative, collaborative and sustainable engineering and planning solutions to the challenges our clients face, while enhancing the communities in which we work and live. We strive to uphold the highest ethical standards while maintaining integrity and respect within our professional relationships. We continue to build a corporate culture that honors and values the individuality and strengths of our team members and our clients.

From:	Virginia.Lane@faa.gov
To:	Section106@mcn-nsn.gov
Cc:	Peace, Kimberly R.; Norman, Doug
Subject:	RE: Ormand Beach Airport Runway 8-26 Extension, AIP 3-12-0059-01902016, Ormond Beach FL
Date:	Wednesday, July 05, 2017 3:30:09 PM

Ms. Lowe-Zepeda,

The FAA appreciates the Muscogee (Creek) Nation's timely response to our correspondence. We will ensure that the construction plans reflect your request. Thank you.

Virginia Lane

From: Section106 [mailto:Section106@mcn-nsn.gov]
Sent: Wednesday, June 28, 2017 3:05 PM
To: Lane, Virginia (FAA)
Subject: RE: Ormand Beach Airport Runway 8-26 Extension, AIP 3-12-0059-01902016, Ormond Beach FL

Virginia Lane
Federal Aviation Administration
Orlando Airports District Office

Ms. Lane,

Thank you for the correspondence regarding the proposed Ormond Beach Airport Runway 8-26 Extension. The project area located in Ormond Beach, Volusia County, Florida is within our historic area of interest. The Muscogee Creek) Nation is **unaware of any Muscogee cultural or sacred sites located within the immediate project area**. We concur that there should be **no effects to any known historic/cultural properties** and that work should proceed as planned. However, as the project is located in an area that is of general historic interest to the Tribe, we request that work be stopped and our office contacted immediately if any Native American cultural materials are encountered. This stipulation should be placed on the construction plans to insure contractors are aware of it. Please feel free to contact me with any further questions or concerns.

Ms. Corain Lowe-Zepeda
Historic and Cultural Preservation Department, THPO
Muscogee (Creek) Nation
P. O. Box 580
Okmulgee, OK 74447
T 918.732.7835
clowe@mcn-nsn.gov

From: Virginia.Lane@faa.gov [mailto:Virginia.Lane@faa.gov]
Sent: Monday, May 22, 2017 2:17 PM
To: Section106
Cc: kpeace@hoyletanner.com
Subject: Ormand Beach Airport Runway 8-26 Extension, AIP 3-12-0059-01902016, Ormond Beach FL

The FAA has attached a copy of the Cultural Resources Assessment Study for the Ormond Beach

Airport Runway 8-26 Extension project for your review. Review was requested by Corraine Low on May 18, 2017. Please provide us with any comments or requests by email before June 9, 2017. Thank you.

Sincerely,

Virginia Lane, EPS
Federal Aviation Administration
Orlando Airports District Office

From:	Virginia.Lane@faa.gov
To:	VictoriaMenchaca@semtribe.com
Cc:	Peace, Kimberly R.; Norman, Doug; Rebecca.Henry@faa.gov; Allan.Nagy@faa.gov
Subject:	RE: FAA Cultural Resource Assessment Survey for the Ormond Beach Municipal Airport Runway 08-26 Extension, Volusia County FL
Date:	Wednesday, July 05, 2017 1:18:28 PM
Attachments:	image001.png

Thank you very much for your quick response. We appreciate it.

From: Victoria Menchaca [mailto:VictoriaMenchaca@semtribe.com]
Sent: Friday, June 30, 2017 1:39 PM
To: Lane, Virginia (FAA)
Subject: FAA Cultural Resource Assessment Survey for the Ormond Beach Municipal Airport Runway 08-26 Extension, Volusia County FL

SEMINOLE TRIBE OF FLORIDA
TRIBAL HISTORIC PRESERVATION OFFICE
AH-TAH-THI-KI MUSEUM

TRIBAL HISTORIC PRESERVATION OFFICE

SEMINOLE TRIBE OF FLORIDA
AH-TAH-THI-KI MUSEUM

30290 JOSIE BILLIE HIGHWAY
PMB 1004
CLEWISTON, FL 33440

THPO PHONE: (863) 983-6549
MUSEUM PHONE: (863) 902-1113
FAX: (863) 902-1117

THPO WEBSITE: WWW.STOFTHPO.COM
MUSEUM WEBSITE: WWW.AHTAHTHIKI.COM

TRIBAL OFFICERS

MARCELLUS W. OSCEOLA JR.
CHAIRMAN

MITCHELL CYPRESS
VICE CHAIRMAN

LAVONNE ROSE
SECRETARY

PETER A. HAHN
TREASURER

June 30, 2017

Ms. Virginia Lane, Environmental Specialist
Federal Aviation Administration
5950 Hazeltine National Drive, Suite 400
Orlando, FL 32822
Phone: 407-812-6331 ext.129
Email: virginia.lane@faa.gov

Subject: FAA Cultural Resource Assessment Survey for the Ormond Beach Municipal Airport Runway 08-26 Extension, Volusia County FL.
THPO #: 0029751

Dear Ms. Lane

Thank you for contacting the Seminole Tribe of Florida – Tribal Historic Preservation Office (STOF-THPO) regarding the FAA Cultural Resource Assessment Survey for the Ormond Beach Municipal Airport Runway 08-26 Extension, Volusia County FL. We have reviewed the documents that FAA provided and completed our assessment pursuant to Section 106 of the National Historic Preservation Act and its implementing authority, 36 CFR 800. We have no objections to the project at this time. However, please notify us if any archaeological, historical, or burial resources are inadvertently discovered.

Thank you and feel free to contact us with any questions.

Respectfully,

Victoria Menchaca

Victoria L. Menchaca, MA, Compliance Review Specialist
STOF-THPO, Compliance Review Section
30290 Josie Billie Hwy, PMB 1004
Clewiston, FL 33440
Office: 863-983-6549 ext 12216
Email: victoriamenchaca@semtribe.com
Web: www.stofthpo.com

Ms. Virginia Lane
Federal Aviation Administriation
5950 Hazeltine National Drive, Suite 400
Orlando, Florida 32822

May 16, 2017

RE: DHR Project File No.: 2017-2028, Received by DHR: April 18, 2017
Project: *Ormond Beach Municipal Airport Runway 8-26 Extension*
County: Volusia

To Whom It May Concern:

The Florida State Historic Preservation Officer reviewed the referenced project for possible effects on historic properties listed, or eligible for listing, on the *National Register of Historic Places.* The review was conducted in accordance with Section 106 of the *National Historic Preservation Act of 1966*, as amended, and its implementing regulations in *36 CFR Part 800: Protection of Historic Properties.*

A review of the Florida Master Site File (FMSF) indicates that the Ormond Beach Municipal Airport has been designated as 8VO9252. The airport's designation is due to the fact that the airport was built in 1943 as a naval aviation training field. It is the opinion of this office that the proposed project is unlikely to affect historic properties. However, the permit, if issued, should include the following special condition regarding unexpected discoveries:

- If prehistoric or historic artifacts, such as pottery or ceramics, projectile points, dugout canoes, metal implements, historic building materials, or any other physical remains that could be associated with Native American, early European, or American settlement are encountered at any time within the project site area, the permitted project shall cease all activities involving subsurface disturbance in the vicinity of the discovery. The applicant shall contact the Florida Department of State, Division of Historical Resources, Compliance Review Section at (850)-245-6333. Project activities shall not resume without verbal and/or written authorization. In the event that unmarked human remains are encountered during permitted activities, all work shall stop immediately and the proper authorities notified in accordance with Section 872.05, *Florida Statutes*.

At this time, we have insufficient information to determine whether the airport is eligible for listing on the *National Register*. The airport is over 50 years of age. We request that the Ormond Beach Municipal Airport be documented using a FMSF Resource Group Form. The form is available online at http://dos.myflorida.com/historical/preservation/master-site-file/documents-forms/. If there are any questions regarding the completion of the form, please contact the FMSF office at 850.245.6440. We appreciate your help in adding this important resource to our records.

If you have any questions, please contact Mercedes Harrold, Historic Sites Specialist, by email at *Mercedes.Harrold@dos.myflorida.com*, or by telephone at 850.245.6333 or 800.847.7278.

Sincerely,

Jason Aldridge
For

Timothy A Parsons, Ph.D., RPA
Director, Division of Historical Resources
& State Historic Preservation Officer

From:	Virginia.Lane@faa.gov
To:	Peace, Kimberly R.; Douglas.Norman@faa.gov
Cc:	Allan.Nagy@faa.gov
Subject:	Response from Miccusukee Tribe
Date:	Tuesday, May 09, 2017 7:49:47 AM

Kimberly,

Fred Dayhoff, Section 106 and NAGPRA Coordinator of the Miccusukee Tribe of Indians of Florida, contacted me by telephone regarding the runway extension project at Ormond Beach Airport. The Tribe does not have any concerns associated with the proposed project.

Virginia Lane, Environmental Protection Specialist
FAA ORL/ADO

From:	Virginia.Lane@faa.gov
To:	Peace, Kimberly R.; Douglas.Norman@faa.gov
Cc:	Allan.Nagy@faa.gov
Subject:	FW: FAA Ormond Beach Airport Runway 8-26 Extension, AIP 3-12-0059-019-2016 Ormond Beach, Volusia County, FL
Date:	Tuesday, May 09, 2017 7:41:22 AM

Please see from Semininole Tribe of Florida.

From: Victoria Menchaca [mailto:VictoriaMenchaca@semtribe.com]
Sent: Thursday, May 04, 2017 4:46 PM
To: Lane, Virginia (FAA)
Subject: FAA Ormond Beach Airport Runway 8-26 Extension, AIP 3-12-0059-019-2016 Ormond Beach, Volusia County, FL

May 04, 2017

Ms. Virginia Lane, Environmental Specialist
Federal Aviation Administration
5950 Hazeltine National Drive, Suite 400
Orlando, FL 32822
Phone: 407-812-6331 ext. 129
Email: virginia.lane@faa.gov

Subject: FAA Ormond Beach Airport Runway 8-26 Extension, AIP 3-12-0059-019-2016 Ormond Beach, Volusia County, FL
THPO #: 0029751

Dear Ms. Lane,

Thank you for contacting the Seminole Tribe of Florida – Tribal Historic Preservation Office (STOF-THPO) regarding the FAA Ormond Beach Airport Runway 8-26 Extension, AIP 3-12-0059-019-2016 Ormond Beach, Volusia County, FL. Due to the undeveloped nature of the land on which the runway extension is proposed, we would like to respectfully request that a Phase I Cultural Resource Survey be conducted prior to any construction. Thank you, please continue to send updates and feel free to contact us with any further questions.

Respectfully,

Victoria L. Menchaca, MA, Compliance Review Specialist
STOF-THPO, Compliance Review Section
30290 Josie Billie Hwy, PMB 1004

Clewiston, FL 33440
Office: 863-983-6549 ext 12216
Email: victoriamenchaca@semtribe.com
Web: www.stofthpo.com

From:	Virginia.Lane@faa.gov
To:	Peace, Kimberly R.; Douglas.Norman@faa.gov
Cc:	Allan.Nagy@faa.gov
Subject:	FW: SNO Response to FAA Ormond Beach Airport Runway Extension project
Date:	Monday, April 24, 2017 1:09:37 PM

See email below just received. The airport sponsor is going to need to conduct a Phase 1 survey of the affected area by a qualified archaeologist. You might also request a list of Tribally significant plants.

From: Theodore Isham [mailto:isham.t@sno-nsn.gov]
Sent: Monday, April 24, 2017 12:30 PM
To: Lane, Virginia (FAA)
Subject: SNO Response to FAA Ormond Beach Airport Runway Extension project

This ***Opinion*** is being provided by Seminole Nation of Oklahoma's Cultural Advisor, pursuant to authority vested by the Seminole Nation of Oklahoma General Council. The Seminole Nation of Oklahoma is an independently Federally-Recognized Indian Nation headquartered in Wewoka, OK.

In keeping with the National Environmental Policy Act (NEPA)d, and Section 106 of the National Historic Preservation Act (NHPA), 36 CFR Part 800, this letter is to acknowledge that the Seminole Nation of Oklahoma has received notice of the proposed project at the above mentioned location.

Based on the information provided and because the potential for buried cultural resources, the proposed project has an extreme probability of affecting archaeological resources, some of which may be eligible for listing in the National Register of Historic Places (NRHP).

We recommend that an intensive literature/phaseI survey of the nearby archaeological sites from the states master site files be completed and other CRS surveys. Also, we request that a listing of the flora in the affected area be provided. Also that if any wetlands/riparian areas are affected by said project that consideration for replanting of Tribally significant plants be utilized where possible.

We do request that if cultural or archeological resource materials are encountered at all activity cease and the Seminole Nation of Oklahoma and other appropriate agencies be contacted immediately.

Furthermore, due to the historic presence of our people in the project area, inadvertent discoveries of human remains and related NAGPRA items may occur, even in areas of existing or prior development. Should this occur we request all work cease and the Seminole Nation of Oklahoma and other appropriate agencies be immediately notified.

Theodore Isham
Seminole Nation of Oklahoma
Historic Preservation Officer
PO Box 1498
Wewoka, Ok 74884
Phone: 405-234-5218

e-mail: isham.t@sno-nsn.gov

U.S. Department
of Transportation
**Federal Aviation
Administration**

Airports District Office
5950 Hazeltine National Drive, Suite 400
Orlando, Florida 32822
407-812-6331

April 11, 2017

Historic and Cultural Preservation Department (email)
Muscogee (Creek) Nation Cultural Preservation
PO Box 580
Okmulgee, OK 74447
section106@MCN-NSN.gov

Ormond Beach Airport Runway 8-26 Extension, AIP 3-12-0059-019-2016, Ormond Beach, Florida, Government-to-Government Consultation Initiation

The Federal Aviation Administration (FAA) in cooperation with the City of Ormond Beach, owner and operator of the Ormond Beach Municipal Airport is preparing an Environmental Assessment for proposed changes as depicted on the federally-approved airport layout plan (ALP). The changes include an extension of Runway 8-26 and its parallel taxiway along with tree clearing of FAA safety and approach surfaces required by the extension. The airport is located at 770 Airport Road, Ormond Beach, Volusia County. The Federal Aviation Administration (FAA) is acting as the lead federal agency for the U.S. Department of Transportation for this project.

A location map and preliminary plan have been provided showing the Areas of Potential Effect (APE) to assist with the understanding of the scope of work. A majority of the area within the APE has been identified for aviation use by the airport since its initial development in 1943 as a naval aviation training field. The airport was deeded to the City in 1959 by the Federal Government.

Purpose of Government-to-Government Consultation
The primary purpose of government-to-government consultation as described in Federal Executive Order 13175 “Consultation and Coordination with Indian Tribal Governments” and FAA’s Order 1210.20 “American Indian and Alaska Native Tribal Consultation Policy and Procedures” is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect Tribes.

Confidentiality
I understand that you may have concerns regarding the confidentiality of information on areas or resources of religious, traditional and cultural importance to the Tribe. I would be happy to discuss these concerns and develop procedures to ensure the maintenance of confidentiality

Project Consultation Options Form
Your timely response will assist us in incorporating your concerns into project planning. For that reason, I respectfully request that you contact me within thirty (30) days of your receipt of this correspondence as to your interest in Government-to-Government Consultation regarding the project. I can be reached via email at Virginia.Lane@faa.gov or via phone at 407-812-6331 ext. 129.

Sincerely,

Virginia Lane

Virginia Lane
Environmental Specialist

Enclosures

U.S. Department
of Transportation
**Federal Aviation
Administration**

Airports District Office
5950 Hazeltine National Drive, Suite 400
Orlando, Florida 32822
407-812-6331

April 11, 2017

Mr. James Floyd
Principal Chief
Muscogee (Creek) Nation
Office of the Administration
PO Box 580
Okmulgee, OK 74447

Ormond Beach Airport Runway 8-26 Extension, AIP 3-12-0059-019-2016, Ormond Beach, Florida, Government-to-Government Consultation Initiation

The Federal Aviation Administration (FAA) in cooperation with the City of Ormond Beach, owner and operator of the Ormond Beach Municipal Airport is preparing an Environmental Assessment for proposed changes as depicted on the federally-approved airport layout plan (ALP). The changes include an extension of Runway 8-26 and its parallel taxiway along with tree clearing of FAA safety and approach surfaces required by the extension. The airport is located at 770 Airport Road, Ormond Beach, Volusia County. The Federal Aviation Administration (FAA) is acting as the lead federal agency for the U.S. Department of Transportation for this project.

A location map and preliminary plan have been provided showing the Areas of Potential Effect (APE) to assist with the understanding of the scope of work. A majority of the area within the APE has been identified for aviation use by the airport since its initial development in 1943 as a naval aviation training field. The airport was deeded to the City in 1959 by the Federal Government.

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Sincerely,

Virginia Lane

Virginia Lane
Environmental Specialist

Enclosures

U.S. Department
of Transportation
Federal Aviation Administration

Airports District Office
5950 Hazeltine National Drive, Suite 400
Orlando, Florida 32822
407-812-6331

April 11, 2017

Stephanie A. Bryan
Tribal Chair
Poarch Band of Creek Indians
5811 Jack Springs Road
Atmore, AL 36502

Ormond Beach Airport Runway 8-26 Extension, AIP 3-12-0059-019-2016, Ormond Beach, Florida, Government-to-Government Consultation Initiation

The Federal Aviation Administration (FAA) in cooperation with the City of Ormond Beach, owner and operator of the Ormond Beach Municipal Airport is preparing an Environmental Assessment for proposed changes as depicted on the federally-approved airport layout plan (ALP). The changes include an extension of Runway 8-26 and its parallel taxiway along with tree clearing of FAA safety and approach surfaces required by the extension. The airport is located at 770 Airport Road, Ormond Beach, Volusia County. The Federal Aviation Administration (FAA) is acting as the lead federal agency for the U.S. Department of Transportation for this project.

A location map and preliminary plan have been provided showing the Areas of Potential Effect (APE) to assist with the understanding of the scope of work. A majority of the area within the APE has been identified for aviation use by the airport since its initial development in 1943 as a naval aviation training field. The airport was deeded to the City in 1959 by the Federal Government.

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Project Consultation Options Form
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Sincerely,

Virginia Lane

Virginia Lane
Environmental Specialist

Enclosures

U.S. Department
of Transportation
**Federal Aviation
Administration**

Airports District Office
5950 Hazeltine National Drive, Suite 400
Orlando, Florida 32822
407-812-6331

May 10, 2017

Annie Dziergowski
U. S. Fish & Wildlife Service
North Florida Ecological Services Office
7915 Baymeadows Way, Suite 200
Jacksonville, FL 32256-7517

RE: Section 7 Consultation for Activities Associated with Lengthening Runway 08/26 by 1000 feet, Acquiring Easements and Completing Off Airport Obstruction Removal at Ormond Beach Municipal Airport (OMN), Ormond Beach, FL
IPAC Consultation Code: 04EF1000-2017-SLI-0049

Dear Ms. Dziergowski:

The Federal Aviation Administration (FAA) in cooperation with the City of Ormond Beach, owner and operator of the Ormond Beach Municipal Airport, is preparing an Environmental Assessment (EA) per the requirements of the National Environmental Policy Act (NEPA) and FAA implementing regulations for proposed changes as depicted on the federally-approved airport layout plan (ALP). FAA is acting as the lead federal agency for the U.S. Department of Transportation for this project. Federal actions associated with the proposed project comprise FAA's approval of the EA and unconditional approval of updates to the ALP to reflect the proposed project.

The purpose of this letter is to describe the proposed project and to fulfill FAA's consultation obligations with the U.S. Fish and Wildlife Service (i.e., the Service) pursuant to Section 7 of the Endangered Species Act of 1973 (ESA). The airport location and project action areas are depicted on the graphics in the attached Environmental Assessment Report prepared by Biological Consulting Services, Inc.

Description of the Proposed Project

The proposed project for the EA includes the following actions located at OMN:

- Extending Runway 8-26 from existing 4,004 feet to 5,005 feet;
- Extending the existing parallel taxiway and installing a bypass taxiway;
- Relocating runway end identifier light (REILs), Precision Approach Path Indicators (PAPI's) and remarking pavement;
- Acquiring necessary avigation easements or purchasing properties to control the Runway Protection Zone (RPZ) per FAA requirements; and
- Removing trees that are identified as obstructions to navigable airspace located within the new approach surfaces and the air traffic control tower line of sight.

Effects Determination

The USFWS Information for Planning and Conservation (IPaC) online tool was used to develop a list of federally-protected threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may be affected by the proposed project, consultation code 04EF1000-2017-SLI-0049, attached.

To address the recommendations of the Service in regards to this list, and pursuant to FAA's Section 7 consultation obligations under the ESA, the enclosed attached Environmental Assessment Report was prepared by Biological Consulting Services, Inc. for the Service's review. As detailed in this report, there will be no effect on federally-listed species. In regard to the species with minor habitat within the project area, the following is presented in support of the "No Effect" determination:

Red-cockaded Woodpecker (*Picoides borealis*): Endangered; minor habitat available within the project boundary; no individuals or indicators observed. Typically, Red-cockaded woodpecker colonies are found in old growth pines, usually Long Leaf Pine, with open understory. Most colonies are found in live pine trees which are 60 years or older in age. This type of habitat is not present in the project area.

Wood Stork (*Mycteria Americana*): Threatened; a review of the US Fish and Wildlife Service "Wood Stork Core Foraging Areas" mapping determined that the proposed Runway 08 extension does not fall within a mapped foraging area for the Wood stork.

Eastern Indigo Snake (*Drymarchon corais couperi*): Threatened; minor habitat available on site; not observed on site. Fewer than 25 gopher tortoise burrows are expected within the project area and using of the USFWS Eastern Indigo Snake Progammatic Effect Key, if best management practices are used during construction and the Standard Indigo Snake Protection Measures are followed, a "no effect" determination would typically be granted by the USFWS. Implementation of the Standard Protection Measures for the Eastern Indigo Snake (updated August 2013) will occur during all construction phases of the project.

Okeechobee gourd (*Cucurbita okeechobeensis ssp.okeechobeensis*) and **Rugel's pawpaw** (*Deeringothamnus rugelii*) were not observed within the project areas.

The City will coordinate with the Service and the Florida Fish and Wildlife Conservation Commission (FFWCC) as the project develops to minimize the impacts to gopher tortoises and gopher tortoise commensurate species and obtain the necessary relocation permits.

Requested Action

The FAA requests the Service's concurrence with the effects determination summarized in this letter and detailed within the enclosed report. We will also accept and consider any comments you have on the provided materials in preparing the EA.

Please respond to me at the address provided on this letter, via email at Virginia.Lane@faa.gov or via phone at (407) 812-6331 Ext. 129 with your comments/concurrence decision, and feel free to contact me if you have any questions or concerns.

Sincerely,

Virginia Lane

Virginia Lane
Environmental Specialist

Enclosures

U.S. Department
of Transportation
**Federal Aviation
Administration**

Airports District Office
5950 Hazeltine National Drive, Suite 400
Orlando, Florida 32822
407-812-6331

April 11, 2017

Mr. Robert Thrower
Acting Tribal Historic Preservation Officer
Poarch Band of Creek Indians
5811 Jack Springs Road
Atmore, AL 36502

Ormond Beach Airport Runway 8-26 Extension, AIP 3-12-0059-019-2016, Ormond Beach, Florida, Government-to-Government Consultation Initiation

The Federal Aviation Administration (FAA) in cooperation with the City of Ormond Beach, owner and operator of the Ormond Beach Municipal Airport is preparing an Environmental Assessment for proposed changes as depicted on the federally-approved airport layout plan (ALP). The changes include an extension of Runway 8-26 and its parallel taxiway along with tree clearing of FAA safety and approach surfaces required by the extension. The airport is located at 770 Airport Road, Ormond Beach, Volusia County. The Federal Aviation Administration (FAA) is acting as the lead federal agency for the U.S. Department of Transportation for this project.

A location map and preliminary plan have been provided showing the Areas of Potential Effect (APE) to assist with the understanding of the scope of work. A majority of the area within the APE has been identified for aviation use by the airport since its initial development in 1943 as a naval aviation training field. The airport was deeded to the City in 1959 by the Federal Government.

Purpose of Government-to-Government Consultation
The primary purpose of government-to-government consultation as described in Federal Executive Order 13175 “Consultation and Coordination with Indian Tribal Governments” and FAA’s Order 1210.20 “American Indian and Alaska Native Tribal Consultation Policy and Procedures” is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect Tribes.

Confidentiality
I understand that you may have concerns regarding the confidentiality of information on areas or resources of religious, traditional and cultural importance to the Tribe. I would be happy to discuss these concerns and develop procedures to ensure the maintenance of confidentiality

Project Consultation Options Form
Your timely response will assist us in incorporating your concerns into project planning. For that reason, I respectfully request that you contact me within thirty (30) days of your receipt of this correspondence as to your interest in Government-to-Government Consultation regarding the project. I can be reached via email at Virginia.Lane@faa.gov or via phone at 407-812-6331 ext. 129.

Sincerely,

Virginia Lane

Virginia Lane
Environmental Specialist

Enclosures

Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Attachment J

Cultural Resource Assessment Survey for the Ormond Beach Municipal Airport Runway 08-26 Extension Volusia County, Florida

SEARCH Project No. 3950-17094V

Prepared for

Hoyle, Tanner & Associates, Inc.

Prepared By

SEARCH

June 2017

CULTURAL RESOURCE ASSESSMENT SURVEY FOR THE ORMOND BEACH MUNICIPAL AIRPORT RUNWAY 08-26 EXTENSION VOLUSIA COUNTY, FLORIDA

SEARCH PROJECT NO. 3950-17094V

PREPARED FOR

HOYLE, TANNER & ASSOCIATES, INC.

PREPARED BY

SEARCH

William J Werner

WILLIAM WERNER, MA
PRINCIPAL INVESTIGATOR

WWW.SEARCHINC.COM

JUNE 2017

EXECUTIVE SUMMARY

From June 14 to June 16, 2017, SEARCH conducted a Phase I cultural resource assessment survey in support of the proposed extension of Runway 08-26 at the Ormond Beach Municipal Airport in Volusia County, Florida. SEARCH conducted the CRAS on behalf of Hoyle, Tanner & Associates, Inc. for the City of Ormond Beach. The Area of Potential Effects (APE) for the proposed undertaking is defined as the construction and ground-disturbing footprint along with a 300-foot buffer, encompassing a total area of approximately 34 acres. The purpose of the survey was to identify archaeological resources or historic structures within the APE and assess their potential for listing in the National Register of Historic Places (NRHP).

A total of 46 shovel tests were excavated within the APE, none of which contained evidence of archaeological sites. Likewise, no historic structures were observed within the APE. The APE is encompassed within the previously recorded boundary of the Ormond Municipal Airport District (8VO9252), which has not been evaluated for eligibility for listing in the NRHP. Based on prior consultation between the Federal Aviation Administration and the State Historic Preservation Officer, considerations of effects to 8VO09252 as a result of the proposed undertaking are not required at this time. Thus, it is the opinion of SEARCH that the proposed undertaking will have no effect on cultural resources listed or eligible for listing on the NRHP, and no further survey is recommended.

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INTRODUCTION

This report presents the findings of a Phase I cultural resource assessment survey (CRAS) conducted in support of the proposed extension of Runway 08-26 at the Ormond Beach Municipal Airport in Volusia County, Florida (**Figure 1**). The proposed undertaking will implement Federal Aviation Administration (FAA) standards for overall runway length, Runway Safety Area (RSA), and Runway Object-Free Area (ROFA) with the addition of 1,000 feet to the existing runway and the associated RSA cleared of vegetation and graded. SEARCH conducted the CRAS on behalf of Hoyle, Tanner & Associates, Inc. (Client) for the City of Ormond Beach.

The Area of Potential Effects (APE) for the proposed undertaking is defined as the construction and ground-disturbing footprint along with a 300-foot buffer, encompassing a total area of approximately 34 acres (**Figure 2**). The Client has notified SEARCH that the auditory effects of the proposed undertaking have been analyzed elsewhere and thus are excluded from consideration in the current APE. The Client has furthermore notified SEARCH that the State Historic Preservation Officer (SHPO) and the FAA have consulted and agreed that effects to the Ormond Municipal Airport District (8VO09252), a previously recorded resource group which encompasses the APE, do not require consideration at this time. Consequently, updated documentation of 8VO9252 was excluded from the scope of work for the current survey and is not included in this report.

The purpose of the survey was to identify archaeological resources or historic structures within the APE and assess their potential for listing in the National Register of Historic Places (NRHP). This study was conducted to comply with Chapter 267 of the Florida Statutes and also complies with Public Law 113-287 (Title 54 U.S.C.), which incorporates the provisions of the National Historic Preservation Act (NHPA) of 1966 and its implementing regulations (36 CFR Part 800), as well as the Archeological and Historic Preservation Act of 1979, as amended.

The survey was conducted from June 14 to June 16, 2017 by archaeologists Blue Nelson, MA, RPA and Jeremiah Hull, BA. William Werner, MA, served as the Principal Investigator and primary report author. Mr. Nelson and Mr. Werner meet the Secretary of the Interior's *Standards and Guidelines for Archeology and Historic Preservation* (48 FR 44716-42). The fieldwork was conducted in accordance with the guidelines established in the FDHR *Module Three: Guidelines for Use by Historic Preservation Professionals*, particularly Chapter 2 as it relates to Phase I surveys. This report summarizes the results of the background research and field investigation and complies with the requirements set forth in Rule Chapter 1A-46, Florida Administrative Code. An FDHR survey log is provided in **Appendix A**.

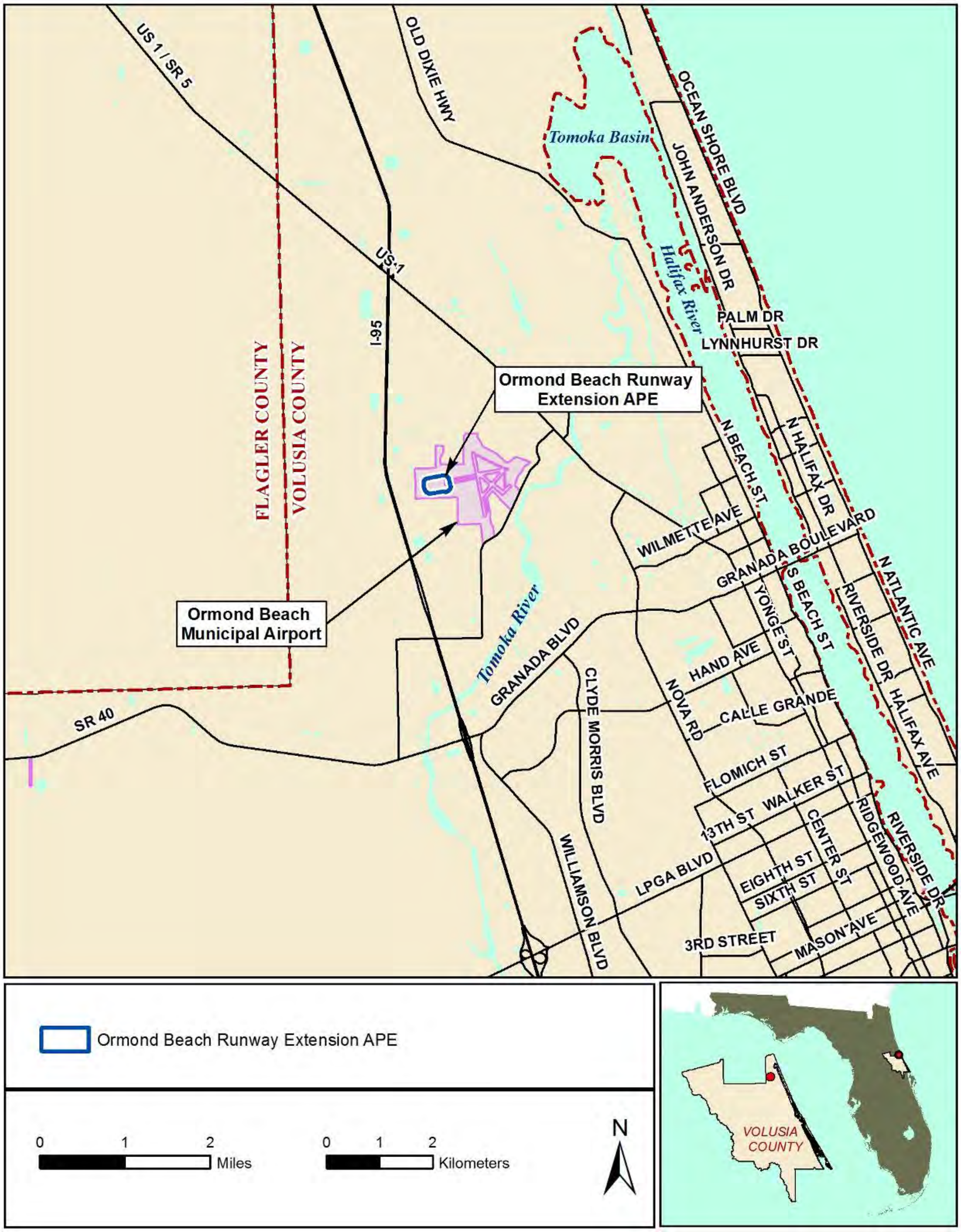

Figure 1. Location of the Ormond Beach Municipal Airport Runway Extension APE.

Figure 2. Aerial photograph of the APE.

PROJECT LOCATION AND ENVIRONMENT

LOCATION AND MODERN CONDITIONS

The 34-acre APE is located at the western end of Runway 08-26 at the Ormond Municipal Airport, in Volusia County, Florida within Section 12 of Township 14 South, Range 31 East, approximately one mile west of the Tomoka River. As shown on the topographic map in **Figure 3**, the APE is situated on nearly level terrain at approximately 25 feet above mean sea level (amsl). The APE is located along the eastern margin of the Volusia Ridge Sets physiographic province within the Eastern Flatwoods District; this portion of the province is characterized by flatwoods plains formed from beach ridges and is also known as the Pamlico Terrace (Brooks 1981).

Soils within the APE are predominantly classified as Myakka fine sand, Basinger fine sand, and Immokalee sand, with approximately 80% of the APE characterized as poorly drained and the remaining 20% characterized as very poorly drained (US Department of Agriculture [USDA] 2017) (**Table 1; Figure 4**). Typical natural vegetation on these soils consists of longleaf and slash pine forest with a varied understory featuring saw palmetto, wax myrtle, and pineland threeawn. Much of the APE consists of a maintained lawn around the extant runway (see **Figure 2**).

Table 1. Soil Types within the APE.

Soil Name	Drainage Capacity	Acreage	Percentage
Myakka Fine Sand	Poorly Drained	27.1	79.5%
Basinger Fine Sand, Depressional	Very Poorly Drained	3.3	9.8%
Myakka Fine Sand, Depressional	Very Poorly Drained	3.1	9.0%
Immokalee Sand, Depressional	Very Poorly Drained	0.6	1.7%
Total		34.1	100.0%

PALEOENVIRONMENT

Between 18,000 to 12,000 years before present (BP), Florida was a much cooler and drier place than it is today. Melting of the continental ice sheets led to a major global rise in sea level (summarized for long time scales by Rohling et al. 1998) that started from a low stand of -120-meters at 18,000 BP. The rise was slow while glacial conditions prevailed at high latitudes but became very rapid in the latest Pleistocene and earliest Holocene. It became warmer and wetter rather rapidly during the next three millennia. By about 9000 BP, a warmer and drier climate began to prevail. These changes were more drastic in northern Florida and southern Georgia than in southern Florida, where the “peninsular effect” and a more tropically influenced climate tempered the effects of the continental glaciers that were melting far to the north (Watts 1969, 1971, 1975, 1980). Sea levels, though higher, were still much lower than at present; surface water was limited, and extensive grasslands probably existed, which may have attracted mammoth, bison, and other large grazing mammals. By 6000–5000 BP, the climate

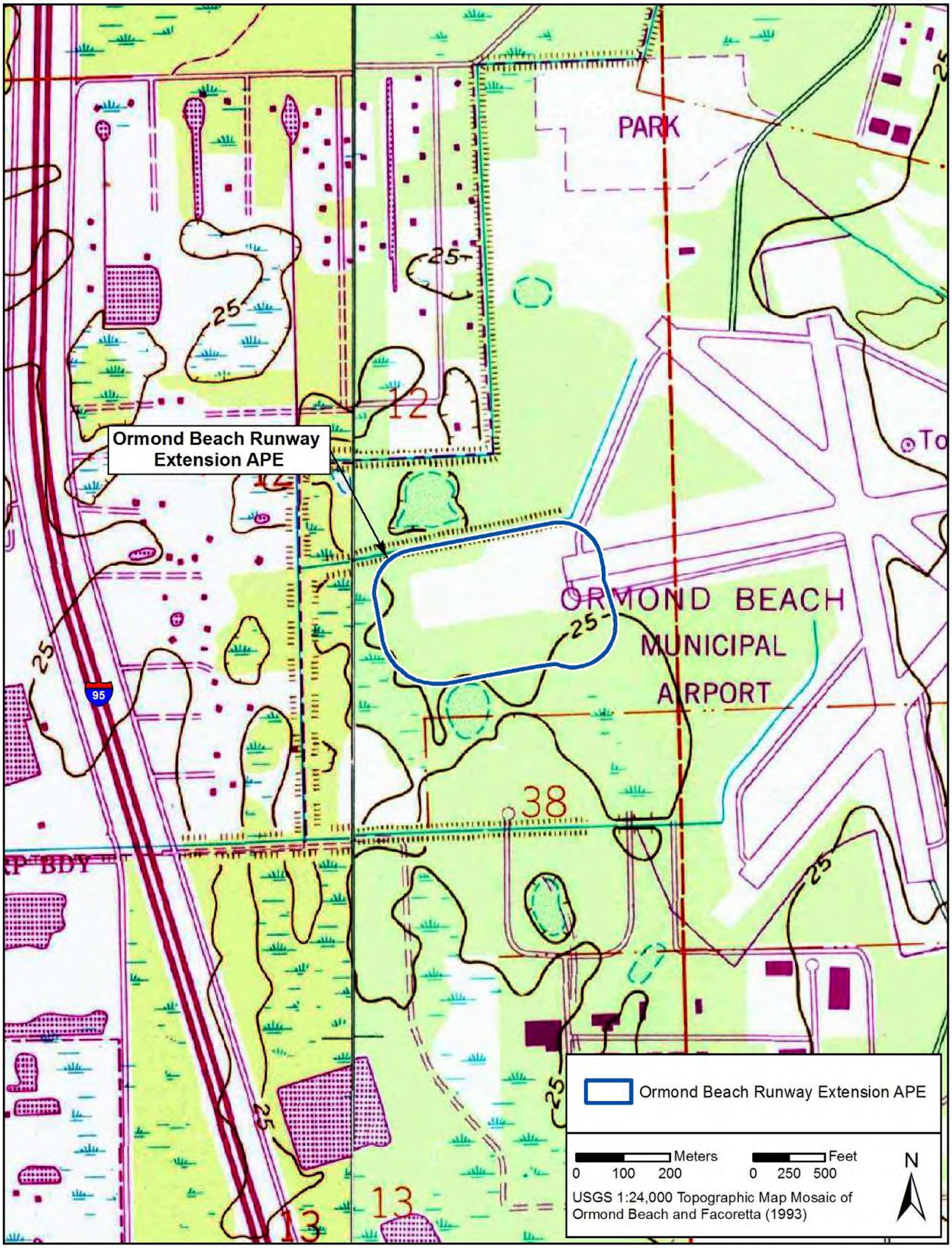

Figure 3. 1993 topographic map of the APE.

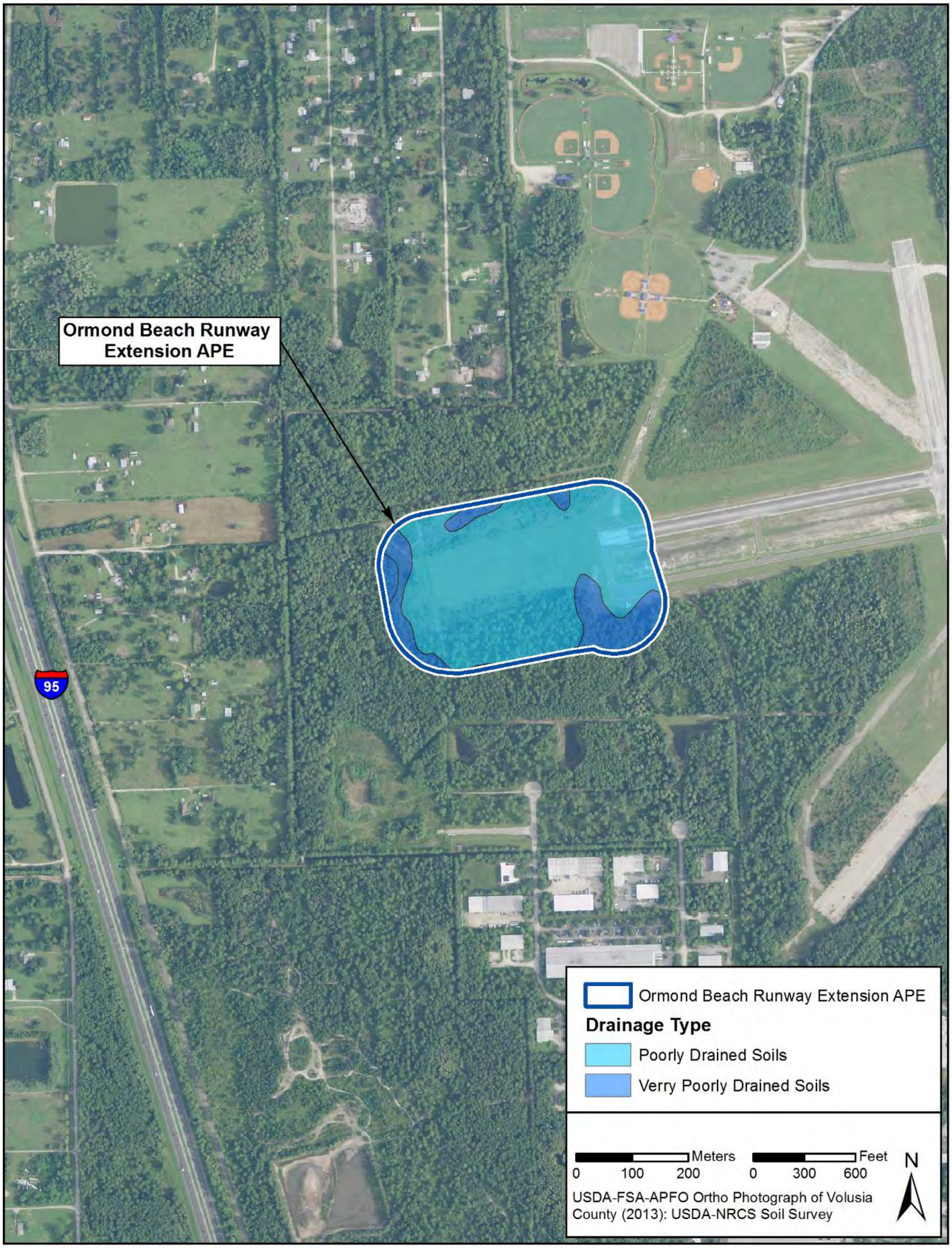

Figure 4. Soil drainage within the APE.

had changed to one of increased precipitation and surface water flow. By the late Holocene, ca. 4000 BP, the climate, water levels, and plant communities of Florida attained essentially modern conditions. These have been relatively stable with only minor fluctuations over the past 4,000 years.

CULTURAL CONTEXT

NATIVE AMERICAN CULTURE HISTORY

Paleoindian Period

Current evidence indicates that the first inhabitants of Florida entered the area approximately 15,000 years ago. Sea level was much lower than today, and the Florida peninsula was wider and drier. Most of the known Paleoindian sites are located in north and west-central Florida, where karst springs and chert were available. Florida's earliest Native Americans were probably nomadic hunter-gatherers who relied on now-extinct mammals (i.e., mammoth, mastodon, horse, dire wolf) and wild plant foods for their subsistence (Milanich 1994). By the late Paleoindian period, however, it appears that people were spending part of each year in large habitation sites located near freshwater springs and lithic raw material sources (Daniel and Wisenbaker 1987). Purdy (1981) has suggested that the Paleoindian populations followed rivers through north and central Florida, exploiting the resources of the Florida Highlands and the Gulf Coast. The Paleoindian tool assemblage contains lanceolate-shaped projectile points, blades, end scrapers, thumbnail scrapers, gouges, and Edgefield scrapers, reflecting a reliance on hunting and butchering of animals as well as the use of well-made scraping tools for woodworking, hide scraping, and other tasks. Lanceolate Suwannee and Simpson projectile points are commonly found on sites in the karst regions of north and central Florida, although they are sometimes found in south Florida as well. The Paleoindian Database of the Americas (PIDBA) reports three Paleoindian points from Volusia County, including Clovis, Redstone, and Suwannee types (Anderson et al. 2010; PIDBA 2011). In addition, the Florida Master Site File (FMSF) database identifies three sites from which Paleoindian points have been reported in Volusia County: the Dean Sligh site (8VO00451), located on the shore of Lake Monroe in southern Volusia County, and the Samuel Butts site (8VO05266) in the City of Daytona, west of the Indian River.

Archaic Period

Around 8000 BC, the environment and physiology of Florida underwent pronounced changes. These changes were interconnected and included a gradual warming trend, a rise in sea levels, a reduction in the width of peninsular Florida, and the spread of oak-dominated forests and hammocks throughout much of the state (Milanich 1994; Smith 1986).

Concomitant with these environmental changes were alterations in native subsistence strategies, which became more diverse due to the emergence of new plant, animal, and aquatic species. Also occurring at this time was a significant increase in population numbers and density, with native groups developing regional habitat-specific adaptations and material assemblages (Milanich 1994; Smith 1986:10). Along the coasts, settled communities began to develop, while in the interior, a more mobile lifestyle appears to have been practiced. A variety of site types reflect these different regional adaptations: residential base camps, short-term settlements, specialized procurement camps, quarries, and cemeteries (Milanich 1994:75-85).

The Early Archaic period (8000–5000 BC) was arid and warm and characterized by the spread of oak hardwood forests (Watts and Hansen 1988). Early Archaic campsites and habitation sites tend to be located in the same places that earlier Paleoindian sites are located, primarily around springs and spring-fed rivers. The FMSF database reports only two Early Archaic sites recorded in Volusia County: the JD site (8VO00627) and the Fort Florida Midden site (8VO00048). Both sites are located in close proximity to high-volume waterways. The JD site is located near the coast on the north side of Strickland Bay, which is between present-day Daytona Beach and New Smyrna Beach. The Fort Florida Midden site is located in southwestern Volusia County near the confluence of the St. Johns River and the Wekiva River.

The Middle Archaic period (5000–3000 BC) coincided with the climatic episode known as the Hypsithermal, a period in which temperatures peaked and rainfall diminished, while the Late Archaic saw an increase in precipitation and the intrusion of mixed pine and oak into the hardwood forests. As conditions became wetter, riparian and lacustrine adaptations became increasingly common, particularly along the coasts where relatively sedentary habitations occur (Russo 1991; Ste. Claire 1990). By contrast, the interior Archaic hunter-gatherers remained fairly mobile (Austin 1996; Chance 1983). By the Late Archaic period (3000–1000 BC), there was a trend toward more sedentary occupations and more circumscribed territories as conditions became increasingly similar to the modern environment.

Around 2000 BC, a major technological innovation of the Late Archaic was the development of fired-clay pottery. Referred to as Orange pottery by archaeologists, this early ceramic ware was tempered with vegetal fibers, either thin strands of palmetto or Spanish moss (Bullen 1972; Griffin 1945). Bullen (1972) divided this period into four subperiods (Orange 1-4) that dated from 2000 BC to about 500 BC. However, research conducted by Sassaman (2003) in the middle St. Johns River region has resulted in the refinement of the Orange period, with radiometric analysis illustrating that the phase spanned a much shorter interval from about 2000 to 1500 BC. With regard to vessel form, early pots were hand-molded and tended to be thick-walled, whereas some of the later vessels were thinner and formed by coiling. Horticulture preceded the early fiber-tempered pottery, which appeared simultaneously in three areas of the southeastern United States (Sassaman 1993).

The Middle and Late Archaic periods saw an increase in human activity within Volusia County. This increased activity was particularly intensive around the St. Johns River, although Middle and Late Archaic sites also are common in the eastern portion of the county, along rivers and creeks that empty into the Intracoastal Waterway. Along the lower portion of the Tomoka River, just east of the Ormond Beach Municipal Airport, are two sites that date to the latter portion of the Archaic period: the Tomoka River site (8VO02568) and Alissa's Site (8VO07495). Both sites consist of moderately dense artifact scatters, with Orange series pottery present at both. Late Archaic fiber-tempered sites have been documented in New Smyrna Beach, mostly along the modern Indian River.

Some Archaic-period peoples in central and south Florida practiced a unique mortuary custom of interring their dead in wetland cemeteries. One of the most famous is located at the Windover site in Titusville (Doran 2002). Other wetland cemeteries have been documented in Hardee, Sarasota, and Collier Counties. Evidence of Middle Archaic burials in east Florida includes the Harris Creek site (8VO00024) at Tick Island, where burials were interred in specially prepared terrestrial locations, including a low sand mound (Aten 1999).

Woodland and Mississippian Periods

Following the Archaic period there began a gradual development of more complex forms of political, social, and religious community life throughout much of Florida, including Volusia County. This was accompanied by the establishment of more formal, settled communities and increased regional diversity. This regional diversity, due primarily to local adaptation to varied ecological conditions within the state, has traditionally been described in terms of cultural periods based on variations in ceramic types.

The post-Archaic culture on Florida's northeast coast is referred to as St. Johns. This native culture began around 500 BC or earlier (cf. Sassaman 2003) and lasted until after historic settlement occurred in St. Augustine in AD 1565 (Milanich 1994:246-248). The St. Johns culture arose out of the preceding Late Archaic, Orange-period cultures of the region. Clear continuities in incised design motifs exist between the Orange fiber-tempered ceramics and the chalky and incised wares of the early St. Johns periods (Bullen 1972; Rouse 1951). Many early St. Johns culture sites occupy the same locations as the preceding Orange-period cultures, further supporting this developmental relationship (Milanich 1994:254-255). The common ceramic type on the northeast Atlantic Coast was a soft paste ware containing sponge spicules and referred to as St. Johns. This pottery was sometimes decorated with incised lines, and after AD 750, paddle stamping became a common decoration. Pre-AD 750 assemblages are commonly assigned to the St. Johns I period, and those post-dating AD 750 are assigned to the St. Johns II period. The period of time after AD 1565 is referred to as the Spanish Mission period. The main archeological indicator of the Spanish Mission period is the presence of artifacts of European manufacture and the introduction of Old World domesticated plants and animals.

St. Johns I sites in Volusia County are concentrated along the St. Johns River and the eastern coastal boundary. However, during the St. Johns II period, native populations began to increasingly move deeper into the interior of the county. For example, sites such as the Campbell Oaks site (8VO01973) and the Muck Lake site (8VO03463), both located east of the present city of DeLand, suggest an increasing trend of St. Johns II groups moving farther away from the high-subsistence-resource riverine and coastal zones. This movement away from these environments may represent an alteration in subsistence strategies, with a greater reliance on horticulture and agriculture.

The St. Johns I period is divided into three subperiods (I, Ia, and Ib) on the basis of observable changes in material culture, most notably ceramics (Goggin 1952:40; Milanich 1994:247).

People of the St. Johns I culture (500 BC–AD 100) were foragers who relied primarily on hunting, fishing, and wild-plant collecting. During this time, the resources found near freshwater wetlands, swamps, and the coastal zones were typically the most heavily exploited. St. Johns I sites are typically shell middens in coastal zones that contain St. Johns Plain and St. Johns Incised pottery.

At St. Johns Ia sites (AD 100–500), St. Johns Plain and Incised pottery continued to be produced, and a red-painted St. Johns variant called Dunns Creek Red also was made. Exotic Hopewellian artifacts also occur in burial mounds. Weeden Island pottery (a primarily Gulf Coast ware) has been recovered from late St. Johns Ia sites, and was apparently acquired through trade. The St. Johns Ib period (AD 500–750) is similar to the Ia period, with the carryover of St. Johns Plain and Incised wares and Dunns Creek Red, but Weeden Island pottery becomes more common, particularly in burial mounds. However, the majority of everyday ceramics are plain. As the St. Johns culture progressed, sand mounds continued to be constructed and became larger through time.

The St. Johns II period is divided into three subperiods (IIa, IIb, and IIc). As populations grew, the number and size of mounds and villages increased. The emergence of check stamping marks the beginning of the St. Johns II period around AD 750 and, along with plain pottery, dominates the assemblages throughout the period. During St. Johns IIa (AD 750–1050), incised and punctated wares, possibly a reflection of Gulf Coast influences, occur with some frequency in mounds and middens. Late Weeden Island pottery continued to be traded into the St. Johns region and is recovered in sand burial mounds.

The St. Johns II culture reached its apex in terms of social, political, and ceremonial complexity during the St. Johns IIb period (AD 1050–1513). Classic Mississippian traits such as the construction of large truncated mounds and the presence of Southern Cult burial paraphernalia in association with perceived elite burials are evident (Milanich 1994; Smith 1986), indicating influence from northwest Florida. Some sand burial mounds were quite large and ceremonially complex, including truncated pyramidal mounds with ramps or causeways leading up to their summits (Milanich 1994:269-270). The rise in the number of St. Johns village and mound sites implies greater cultural complexity compared to that of the earlier St. Johns I period (Milanich 1994:267-274; Miller 1998). Shell and bone ornaments, worked copper, and other exotic materials and artifacts occur with some frequency in burial mounds (Goggin 1952; Milanich 1994).

In addition to the exploitation of aquatic resources for subsistence, it has been suggested that there was an increased dependence on horticulture during St. Johns II times (Goggin 1952; Milanich 1994:263-264). However, no direct evidence of corn agriculture in prehistoric St. Johns-period sites has been recovered, although indirect evidence is provided by corncob impressions on ceramic pots and clay effigies of corncobs, squash, and gourds (Milanich 1994:264-265). Corncobs and kernels have been recovered at Hontoon Island (Newsom 1987:74-75) and at the Riverbend site (8VO02567) on the Tomoka River in Volusia County

(Russo et al. 1989), but in archaeological deposits that date to the historic Spanish Mission period.

POST-CONTACT HISTORY

Early Spanish Exploration and Colonization, 1513–1763

The earliest attempts to colonize Florida by Europeans occurred during the early sixteenth century with the entradas of Ponce de Leon (1513, 1521), Panfilo de Narvaez (1528), and Hernando de Soto (1539–1540). These early efforts were largely unsuccessful and were followed by a similarly unsuccessful attempt in Pensacola by Tristan de Luna (1559–1561). These failures to colonize Florida caused King Phillip II to abandon the effort. He changed his mind, however, when he learned that the French were building settlements and military fortifications on Florida's east coast (Lyon 1983).

One of these, Fort Caroline, was established near the mouth of the St. Johns River near present-day Jacksonville in 1564. The French settlement not only undermined Spanish claims to Florida, it threatened Spanish fleets loaded with gold that sailed through the Straits of Florida. Consequently, King Phillip sent Pedro Menendez de Aviles to Florida with orders to expel the French. Menendez arrived in Florida in 1565, quickly dispatched the French, and established St. Augustine. Chosen for its strategic location, St. Augustine existed as a military outpost and as a base for missionaries, who were sent to convert the native peoples to Catholicism (Deagan 1983).

Although the French occupation of Florida lasted only 15 months, they had many opportunities to interact with native groups in the region. After the fall of Fort Caroline and the establishment of St. Augustine, the Saturiwa and their allies, who were hostile to the Spanish, mounted a series of raids on the Spanish garrisons in the area. Governor Menendez, upset by these constant attacks, decided that it was time to deal with the Indian problem. Menendez's plan was to immobilize Saturiwa by traveling south and forging an alliance with Saturiwa's allies and enemies. At the end of August 1566, he proceeded in three small vessels with 100 men up the St. Johns River (Lyon 1983:168). He was ambushed by the Mayaca at a narrows in the river south of Lake George and had to retreat.

Tensions between the Spanish and the Indians continued to escalate. In the summer of 1567, the Mayaca joined forces with Saturiwa, the Nocoroco (whose village was on the Tomoka River), and the Potano (located within modern Alachua County) to wage war on the Utina (Lyon 1983:198). In 1568, the Saturiwa allied themselves with the French in attacking and burning several Spanish forts including the fort at San Mateo at the mouth of the St. Johns River (Lyon 1983:199-201). San Mateo was eventually abandoned for good in 1569 (Milanich 1995:162), heralding the end of Spanish interest in peninsular Florida until the seventeenth century. Instead, the Spanish shifted their focus towards the area of the Atlantic coast north of St. Augustine.

British Period 1763–1784

In 1763, Spain ceded Florida to Great Britain. Florida was then divided at the Apalachicola River into East and West Florida. The area of modern-day Volusia County was part of East Florida, and St. Augustine served as the capitol of East Florida (Fabel 1996). The British extended huge grants of land to investors who promised to develop the interior of the territory. Richard Oswald, a Scotsman of renown in British governmental circles, received two tracts of 20,000 acres each. One was located along the Halifax and Tomoka Rivers at present-day Tomoka State Park and was known as Mount Oswald. An absentee landowner, Oswald relied on local representatives to run his operation which cultivated rice and indigo on several plantations. Without the labor of dozens of slaves, these efforts likely would not have been successful. Another grant recipient, John Moultrie of South Carolina, also chose land on the Tomoka River. He called his plantation Rosetta (Strickland 1980).

One of the largest English efforts to establish a colony in Florida was at Smyrnea in modern-day New Smyrna Beach. In 1768, a Scottish physician, Dr. Andrew Turnbull, established a plantation on his 20,000-acre land grant and raised indigo, rice, and other crops. Turnbull brought over 1,200 indentured servants, primarily Minorcans, from Europe to work his land and established a settlement for his workers along the Indian River (Griffin 2000).

Several years of drought eventually brought Turnbull's effort to ruin, and by 1777, the colony was completely abandoned after the colonists revolted and relocated to St. Augustine. The impact of the New Smyrna plantation, however, would last much longer than the colony itself. By the time of their departure from the settlement, Turnbull's workers had cleared more than 3,000 acres of land, covered the county with an intricate and extensive canal system, and the remains of building foundations from the plantation are present (Griffin 2000:63). Additionally, its importance to British settlement efforts is made apparent by the British government financing the construction of King's Road, the southern portion of which went from St. Augustine to Turnbull's settlement.

Completed in 1775 during the British period of Florida history, the King's Road stretched from New Smyrna in Volusia County to the St. Marys River in Nassau County. The road connected St. Augustine with points northward and southward, providing a land alternative to sea travel. From both a commercial and military standpoint, the 150-mile road was vital. When the Spanish returned to Florida in 1784, they maintained the road which continued to serve as a major corridor in the region into the early American period when it became known alternatively as the "Road to Jacksonville" or the "Road to St. Augustine". The King's Road dwindled in importance as the nineteenth century drew to a close (Adams et al. 1997; Coomes 1975).

Second Spanish Period 1784–1821

In 1783, the Treaty of Paris returned Florida to the Spanish. However, English-speaking settlers continued to reside in the countryside. The combination of former British subjects, Spanish soldiers and returning families, their slaves, white and black immigrants from the United States and Caribbean, and Seminole Indians made East Florida, including present-day Volusia County, a culturally and racially heterogeneous area (Coker and Parker 1996:158-159).

Foreign, particularly American, settlement of East Florida was encouraged by a royal order issued by the King of Spain to Governor Quesada of Florida on October 20, 1790. The order authorized Quesada to grant lands to foreigners under certain conditions. Under the order, 100 acres could be allotted to each head of a family and 50 acres to other members. Quesada added his own terms to the royal order, requiring 10 years continued residence before full title was granted or an oath of allegiance to the Spanish King. Enrique White, Quesada's successor, revised the terms for issuing grants on October 12, 1803, reducing the amount of land that could be granted to 50 acres for the head of a family, 25 acres for each child or servant older than 16, and 15 acres for each child or servant between the ages of eight and 15 (Hoffman 2002).

The revised terms also required that cultivation of the granted lands must begin within one month or forfeiture would occur. Some modification to White's terms was made by Governor Kindelan in 1815, whereby land titles were delivered upon proof that the grantees had cleared the land and made certain improvements. Kindelan's terms continued until 1817, when four years residence upon the land was required to establish ownership (Gold 1927:34). One of the most notable of these land grants was a 3,000-acre plot along the Halifax River given to Samuel Williams in 1804. The Williams plot makes up the bulk of what is now Daytona Beach (Cardwell and Cardwell 2004:7).

Title to much of the land in present-day Volusia County rests upon these old Spanish land grant concessions. The eighth article of the treaty ceding Florida to the United States by Spain in 1821 provided "that all grants of land made before the 24th of January 1818, by Spain, shall be ratified and confirmed to the same extent that the same grants would be valid if the territories had remained under the dominion of Spain" (Gold 1927:34, 35).

Spanish control over Florida during the period from 1784 to 1821 remained tenuous. The influx of foreign nationals into northern Florida, combined with the growing sentiment that the United States should control the territory, eventually led to the deterioration of Spanish dominance in the area. Spanish authority in Florida slowly waned until 1819, when the United States purchased the territory for $5 million. The United States officially took over Florida in 1821, with Andrew Jackson serving as the first Territorial Governor (Coker and Parker 1996).

Early American Settlement and the Seminole Wars, 1821–1861

With the establishment of Florida as a territory of the United States, two large counties divided along the Suwannee River were created—Escambia County to the west of the river and St. Johns County to the east. On December 29, 1824, St. Johns County itself was divided, with a portion of it becoming Alachua, Nassau, Monroe and Mosquito Counties. Mosquito County encompassed an area south of St. Johns County that was 190 miles long and 60 miles wide.

New Smyrna eventually emerged as the county seat of Mosquito County on January 29, 1835 (Morris 1998).

Disputes between the Seminole Indians and white settlers led to three successive wars, the first taking place between 1817 and 1818, predominantly in the northern part of Florida. In 1823, the Treaty of Moultrie Creek formed an Indian Reservation in the interior of Florida (Mahon 1985). The treaty restricted the Seminoles to just 4 million acres of land and isolated them from the coast of Florida (Mahon 1985:50). This treaty, as well as subsequent treaties (the Treaty of Payne's Landing [1832] and the Treaty of Fort Gibson [1833]) were unpopular with the Seminole. This dissatisfaction led to years of conflict with white settlers and the US military culminating in the Second Seminole War (1835–1842). A major source of tension between whites and Seminoles was slavery. For decades, runaway slaves had sought and found refuge among the Seminoles, who incorporated them as members of their frontier communities. This comradeship between blacks and Seminoles served as a beacon to slaves living on plantations in Florida and neighboring states. Therefore, pro-slavery forces were adamant about the removal of the Seminole from Florida (Landers 1996; Mahon 1985).

At the start of the Second Seminole War, several large and prosperous plantations that had been developed in previous decades in present-day Volusia County were destroyed. In response to requests from settlers, the United States established a chain of forts as a protective measure, including one in New Smyrna in 1837. After pursuing the Seminoles to the Everglades, the US government ended the war in 1842, and reservation boundaries were established further south (Mahon 1985).

Following the war, the US government attempted to encourage settlement into Florida by passing the Armed Occupation Act in 1842. The act made available for homesteading 80,972 hectares (200,000 acres) south of Gainesville to the Peace River. Homesteads of 65 hectares (160 acres) were given to any head of a family or single man, 18 years of age or older, who would agree to cultivate at least 2 hectares (5 acres), build a dwelling, and live on the land for five years (Tebeau 1971:149). The Homestead Acts of 1866 and 1876 provided further incentives to settlers (Tebeau 1971:266, 294).

As the war with the Seminole drew to a close, Enterprise emerged as the focus of new settlement in what would later become Volusia County. Settlement of the locale began in 1841, when Major Cornelius Taylor, along with a group of other settlers, established homesteads in the vicinity of Green Spring. Settlement increased as traffic along the St. Johns River expanded and people from coastal areas moved inland to relocate along the shores of Lake Monroe. Among these new settlers was James Brock, who, in 1852, built a hotel on a shell bluff above Lake Monroe, about a mile from the old site of Enterprise. The hotel served as a catalyst for the new town site of Enterprise (Nance 1962: 224). Volusia County was established from a portion of Mosquito County in 1854 and named for a landing called "Volusia" near Lake George on the St. Johns River (Morris 1974:147). The origin of the name is unknown, but may be from a Frenchman or Belgian named "Veluche."

By the 1850s, remaining Seminoles led by Billy Bowlegs saw the ever-expanding reach of white civilization as a threat. Conflict continued, eventually resulting in the Third Seminole War or Billy Bowlegs War (1855–1858). Unlike the previous war, much of the action of this war was set in south Florida. Three years later, the war ended, and Billy Bowlegs and his followers were sent to lands in the west (Covington 1982). An estimated 200 Seminole were left behind, whose descendants live in south Florida today (Tebeau 1966:50).

The Civil War and the Late Nineteenth Century, 1861–1900

On January 10, 1861, Florida seceded from the United States as a slave state, becoming the third state to join the Confederacy. Volusia County's delegate to the Secession Convention was the Reverend James H. Chandler, who at the time was the county judge. During the war, Union soldiers raided the western part of the county three times in search of cattle and horses, while destroying the town of DeLeon Springs and plantations in the area. In eastern Volusia County, federal gunboats bombarded New Smyrna and burned stockpiles of oak timber abandoned by loggers at the beginning of the war. The gunboats were also after blockade runners at Mosquito Inlet, which was an important shipping point in the area (Hebel 1955:4).

Farmers with cattle did particularly well during the war. The war, in fact, was a major turning point in the establishment of the cattle industry in Volusia County. During the Civil War, cattlemen were exempt from military service due to the large demand for beef from the Confederate Army. Cattlemen in Volusia County contributed to the war effort by sending tons of beef to Confederate troops (Hebel 1955:26). Beef became such a valuable commodity during the war that the Confederacy organized a "Cow Cavalry" to protect herds of cattle from Union raiders (Schene 1976).

With the end of the Civil War in 1865, an influx of new settlers came to Florida. Some were Southerners looking for new homes. Others were former slaves in search of a new beginning, and still others were Northerners looking for new economic opportunities. Among these economic opportunists were cattlemen in search of a milder climate, longer pasture-growing season, and an extensive territory of grassland for their herds. Many of these cattlemen settled in Volusia County, where they established large cattle ranches (Hebel 1955:26).

Prior to the establishment of railroads through the area, Volusia County cattlemen drove their herds to market along established cattle trails. Ranchers separated the animals intended for market from the common herd and generally began the cattle drive in September. The closest cattle market was at Jacksonville, but prior to the railroad ranchers would also drive their cattle as far north as Savannah, Georgia, or Charleston, South Carolina. For these longer cattle drives, cattlemen crossed the St. Johns River at Cowford (present-day Jacksonville) or Palatka. The trip to Savannah generally took four to five weeks, with cattlemen moving the herds slowly to prevent loss of weight (Hebel 1955:27).

A physician and a veteran of the Union Army, J. M. Hawks purchased several hundred acres of land in Volusia County in 1865 with the intention of starting a colony. Five years later, he settled the land and began attracting other settlers to his new community, which he called Hawks Park. In later years, it would become Edgewater (Sikes 1993). Mathias Day, Jr., an entrepreneur from Ohio, moved to eastern Volusia County in 1870 to establish a settlement. Day purchased 2,144.5 acres of the Samuel Williams' grant from Williams' daughter, Christina Reft, and laid out the town of Daytona. By 1873, there were 20 homes, a mercantile business, and a post office in Day's settlement, in addition to the Palmetto House and a sawmill. In July 1876, the settlement was incorporated and named Daytona in honor of Day (Cardwell and Cardwell 2004). Also during this period, the Bostrom family also settled in what would become Ormond Beach.

The rebuilding and expansion of rail lines through Volusia County greatly reduced the time required to transport livestock to market, while spurring further growth of the cattle industry in the vicinity around Osteen. Cattle shipping centers such as Osteen and Haw Creek subsequently emerged to facilitate the transport of cattle to northern markets (Hebel 1955:26). In Volusia County, the Florida East Coast Railway (FEC) and one of its predecessor lines, the Jacksonville, Tampa, and Key West Railroad (JT&KW), provided the catalyst for much of the development in the area. The completion of the JT&KW branch line in December 1885 encouraged growth in the community of Osteen and provided cattle ranchers in the area with a new means of transportation. It also spurred the establishment of new trackside communities, such as Kalamazoo. Located 3 miles east of Osteen, Kalamazoo was a small rural cattle community along the JT&KW corridor with about 100 people living in the area by 1905. Many of the residents worked at nearby stock yards or assisted local ranchers in bringing their cattle to the Kalamazoo depot (Schene 1976:121).

During the 1880s, citrus groves were an important source of income for Volusia County residents (Webb 1885:109). The Town of New Smyrna was incorporated in 1887 with a population of 150. Development continued with the extension of Henry Flagler's East Coast Railway along the eastern coast of the county in the 1890s. The arrival of the railroad brought further changes to the community. The railroad hastened development in the area by encouraging tourism and opening up new markets for citrus growers and commercial fisherman (Fitzgerald, 1993[1939]). Hurt by the Great Freeze of the mid-1890s, agriculture nevertheless recovered as the twentieth century began (Strickland 1980).

Twentieth Century to Recent Times, 1900–present

Shortly after the turn of the century, automobiles came to Volusia County, and it was not long before it was realized that the hard compacted sand of the Daytona beaches was an ideal surface for a racecourse. Beginning in 1903, men from around the world brought their cars to Daytona to break the world's speed records. Publicity for these events earned Daytona the nicknames "World's Most Famous Beach" and the "Birthplace of Speed" (Atwell and Clarida 1998:8). Races continued on the beach until 1959, when with the Daytona International Speedway opened.

In the 1930s, Volusia County boosters marketed their land as "the most productive in Florida" and invited outsiders, particularly Northerners, to tourist centers of Daytona Beach, DeLand, and New Smyrna. The diversity of soil types to be found won the county the nickname of "Versatile Volusia." Many varieties of fruits and vegetables were produced. Approximately 1.5 million boxes of citrus were produced in the county annually. At least three orange varieties were born here—the Enterprise, the Hamlin, and the Lue Gim Gong. Cattle raising remained important, as did commercial fishing. On the St. Johns, Indian, and Halifax Rivers, freight steamers could still be seen. Daytona Beach offered year-round entertainment alongside "the world's finest beach" (Florida Chamber of Commerce 1935:278). DeLand, the county seat, was home to Stetson University. New Smyrna attracted historical interest as one of the oldest settlements in Florida. The lure was unmistakable: by 1935, the population had grown to 50,591 as compared to 42,725 in 1930 (Florida Chamber of Commerce 1935).

The federal government's efforts to relieve the Great Depression could be seen across Volusia County in the 1930s and particularly at Daytona. The Works Progress Administration (WPA) provided hundreds of the area's men with jobs. Some of Daytona's most interesting architectural resources are the result of projects completed by the WPA, including the band shell, the boardwalk, and the armory (Atwell and Clarida 1998). By 1939, the economy was back on the upswing in Daytona. The United States' entry into World War II provided a boost to the economy through military contracts awarded to the Daytona Beach Works for the construction of boats for the Navy (Atwell and Clarida 1998:8). In addition to these contracts, Daytona Beach also saw the addition of a US Navy Air Base and was host to a Women's Army Corps (WAC) Training Center and a US Convalescent Hospital (Atwell and Clarida 1998). Indeed, World War II (1941–1945) was evident in Volusia County as numerous service men and women trained here, and the coast was active with German submarine patrols (Strickland 1980).

World War II precipitated another cattle boom in Volusia County. Thousands of acres were cleared for permanent pastures. In 1952, land suitable for pasture sold for $27 per acre. Inquiries for pasture land became so great that the Agricultural Extension Service began providing information on available properties to interested buyers. The Soil Conservation Service was another valuable resource for ranchers buying land, since it furnished seed and planting materials for new pastures (Hebel 1955:29). By the mid-1950s, there were nearly 12,000 acres of improved pasture in grasses and clovers in the county, while the number of cattle increased from approximately 10,000 in 1940 to approximately 25,000 in 1954 (Hebel 1955:29).

In the late 1950s, the Miami-based Mackle Brothers purchased 12,000 acres in the Enterprise area of southwestern Volusia County for the development of a new city called Deltona. Patterned on other Mackle developments in Florida, such as Port Charlotte and Port St. Lucie, the community was notable at the time because it was to be a self-contained community with its own utilities, water, sewer, churches, schools, recreation, shopping center, and industrial area. Model houses were built at the site in 1962, and a nationwide advertising campaign was begun (*Daytona Beach Morning Journal* 1962).

Long known for its beaches and racetrack, Daytona Beach was losing attention to the newly-developed Disney World at the start of the 1970s. An advertising campaign successfully reversed the situation, luring college students away from Fort Lauderdale to Daytona's 27 miles of beaches and generating millions in new revenue for the city (Mormino 2005).

Presently, tourism is vital to Volusia County's economy, but the picture is fairly diversified. Major employers in recent years are the Volusia County School Board (8,998 employees), Halifax Staffing (6,330 employees), and Publix Supermarkets (2,798 employees). DeLand is the county seat. Deltona is the largest city followed by Daytona Beach and Port Orange. There are three airports in the county. The opportunities for post-secondary education in Volusia County have expanded in the twentieth century. Embry-Riddle Aeronautical, Stetson University, Bethune Cookman College, University of Central Florida (Daytona campus) as well as several junior colleges and vocational/technical schools are well established (Enterprise Florida 2010).

BACKGROUND RESEARCH

FLORIDA MASTER SITE FILE REVIEW

The FMSF database last updated in April 2017 was queried to identify previous cultural resource surveys and recorded resources within one mile of the APE (**Figure 5**). The query identified six previous cultural resource surveys (**Table 2**), including three systematic Phase I surveys surveys, one Phase II excavation report, one cell tower survey, and one reconnaissance survey. The Phase II report (Survey No. 2043) and cell tower survey (Survey No. 10467) are not shown on **Figure 5**. Three previously recorded resources were identified in the FMSF database query, including two archaeological sites and one resource group (**Table 3**).

Table 2. Previous Cultural Resource Surveys Conducted within One Mile of the APE.

FMSF Survey No.	Title	Date	Company
1943	*Cultural Resource Assessment Survey of the Proposed Riverbend Golf Course Development Site, Volusia County, Florida*	1989	Burkett and Associates, Inc.
2043	*Phase II Archaeological Investigations at the Riverbend Site, Volusia County, Florida*	1986	Piper Archaeological Research, Inc.
4646	*A Cultural Resources Survey of Interstate 95 from a Point 0.32 KM North of U.S. 92 in Volusia County to a Point 0.64 KM North of the St. Johns County Line in Flagler County, Florida*	1995	Bowyer-Singleton & Assoc.
10467	*Assessment of Potential Effects Upon Historic Properties: Proposed 160-foot American Electronics Company Wireless Telecommunications Tower, Volusia County, Florida*	2004	Dynamic Environmental Associates, Inc.
11571	*Cultural Resource Assessment Survey of the Ormond Crossings Development, Flagler and Volusia Counties, Florida*	2005	Tomoka Holdings, LLC
13500	*A Cultural Resource Reconnaissance Survey of the Pineland Tract Volusia County, Florida*	2006	Funcoast Developers, LLC

Previous Cultural Resource Surveys

The four systematic cultural resource surveys include the survey of the proposed Riverbend Golf Course development, which encompassed approximately 480 acres along the Tomoka River including the east half of the Ormond Beach Municipal Airport. This survey led to the identification of the only two archaeological sites within a one-mile radius of the current APE, 8VO02567 and 8VO02568, the latter of which was determined to be eligible for listing in the NRHP upon Phase II testing (Survey No. 2043). These sites are discussed in more detail below.

The remaining surveys did not identify any archaeological sites within one mile of the current APE. Survey No. 4646 was conducted along the I-95 corridor, which is less than a half-mile west of the current APE. Three archaeological sites consisting of non-diagnostic lithic scatters were identified during the survey, none of which are within one mile of the current APE. Survey No. 11571 consisted of a 5,700-acre tract that was systematically surveyed at 100-meter intervals. Four archaeological sites (three sites dating to the late nineteenth through mid-twentieth

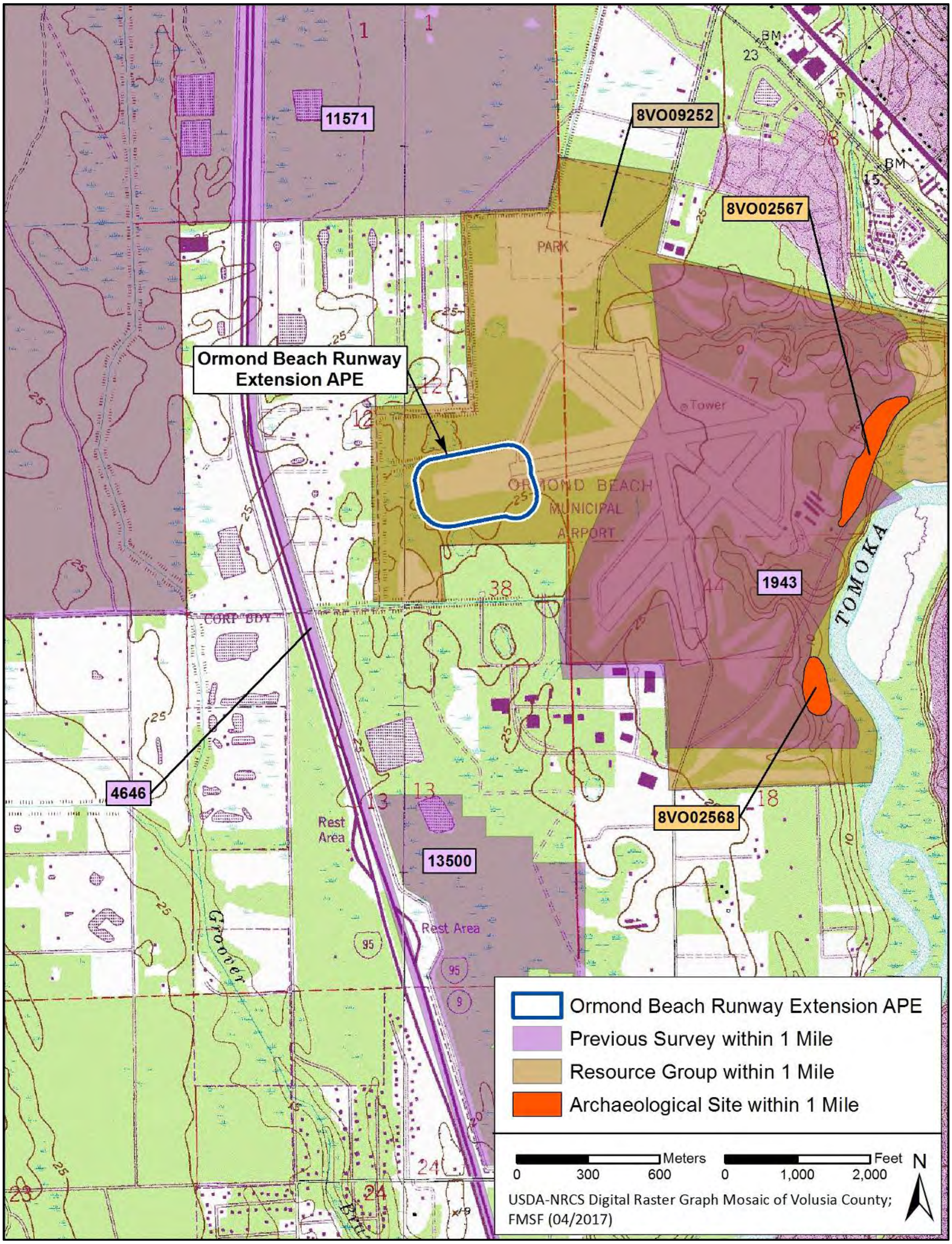

Figure 5. Previous cultural resource surveys and recorded cultural resources within one mile of the APE.

centuries, and one isolated projectile point) were identified, none of which are within one mile of the current APE. Survey No. 13500 was a reconnaissance survey of a 165-acre tract deemed to have low probability for the presence of archaeological sites and was subjected to pedestrian survey and the excavation of six shovel tests; no cultural resources were identified.

Table 3. Previously Recorded Archaeological Sites Within One Mile of APE.

Archaeological Sites				
FMSF No.	**Name**	**Time Period**	**Surveyor Evaluation**	**SHPO Evaluation**
8VO02567	Riverbend	St. Johns I, First Spanish Period 151-1763	Eligible for NRHP	NRHP Eligible
8VO02568	Tomoka River	Late Archaic, St. Johns II, AD 800-1500	Not Evaluated	Not Evaluated
Resource Groups				
8VO09252	Ormond Beach Municipal Airport	1943 - present	Insufficient Information	Insufficient Information

Previously Recorded Resources

As noted above FMSF review revealed that two archaeological sites within one mile of the APE (see **Table 3**). Both of these sites, Riverbend (8VO02567) and Tomoka River (8VO02568) were recovered during Burkett and Associates' survey of a proposed golf course in 1989 (Survey No. 1943). The Riverbend Site consists of a prehistoric St. Johns I-period midden alongside a First Spanish period (1513-1763) aboriginal habitation site situated among moderately well- to excessively drained soils on the west bank of the Tomoka River. Phase II testing was conducted at this site by Piper Archaeological Research, Inc. (Survey No. 2043), during which 20 1-x-1-meter test units were excavated resulting in the identification of five cultural features consisting of middens and refuse pits. The site is currently evaluated as eligible for listing in the NRHP. The Tomoka River Site consists of a low-density artifact scatter featuring ceramics diagnostic of the Late Archaic (Orange) period and the Late Woodland/Missippian (St. Johns II) periods. This site has not been evaluated for NRHP eligibility.

In addition to the archaeological sites discussed above, the Ormond Beach Municipal Airport itself was recorded as a Designed Historic Landscape (8VO09252) in 2010 by the City of Ormond Beach. The airport originated as a naval aviation training field established in 1943 to support wartime training operations conducted in coordination Naval Air Station DeLand, Naval Air Station Daytona Beach, and Naval Air Station Sanford. The airfield was deeded to the City by the United States Government in 1959 for use as a civilian airport, and first airport building was constructed in 1968. This resource has not been evaluated for NRHP eligibility.

HISTORIC MAP AND AERIAL PHOTOGRAPH REVIEW

A selection of historic maps and aerial photographs were reviewed in order to understand the historic setting of the APE. After the 1821 acquisition of Florida, the federal government began to formally survey the new territory into separate townships. The Bureau of Land Management General Land Office (BLM GLO) survey maps created between 1837 and 1853 depict parcel boundaries but no evidence of structures or significant land use within the APE (**Figure 6**) (GLO 1837, 1845, 1850, 1853).

Historic USGS topographic maps are available from 1937 and 1944. The 1937 map depicts the setting of the APE prior to the construction of the naval airfield (**Figure 7**). A system of unimproved roads likely related to naval stores or timber extraction had been constructed throughout the vicinity by this time, including one that passed east-west through the south half of the APE (USGS 1937). This road does not appear on the 1944 topographic map, which shows overall less detail for the vicinity and does not reflect the construction of the naval airfield (USGS 1943). Drainage ditches also are depicted throughout the vicinity on these maps, but none are within the APE.

Aerial photographs are available in the 1940s and 1950s. The 1943 aerial photograph shows the APE to be vacant and sparsely vegetated (**Figure 8**). One of the drainage ditches depicted on the historic topographic maps discussed above is visible on the aerial photograph to the west and north of the APE. Faint trails are discernible within the APE and may correspond to the unimproved road depicted on the 1937 topographic map. Ground scarring east of the APE may be related to preparations for the construction of the naval airfield. Aerial photographs from 1950 and 1958 (**Figure 9**) depict a runway and associated taxiway within the APE in the same configuration as they appear on modern aerial photographs see **Figure 2**). Additional drainage ditches appear to have been constructed along with the airfield including one parallel to the north APE boundary. No buildings are evident within or around the APE (USDA 1950, 1958).

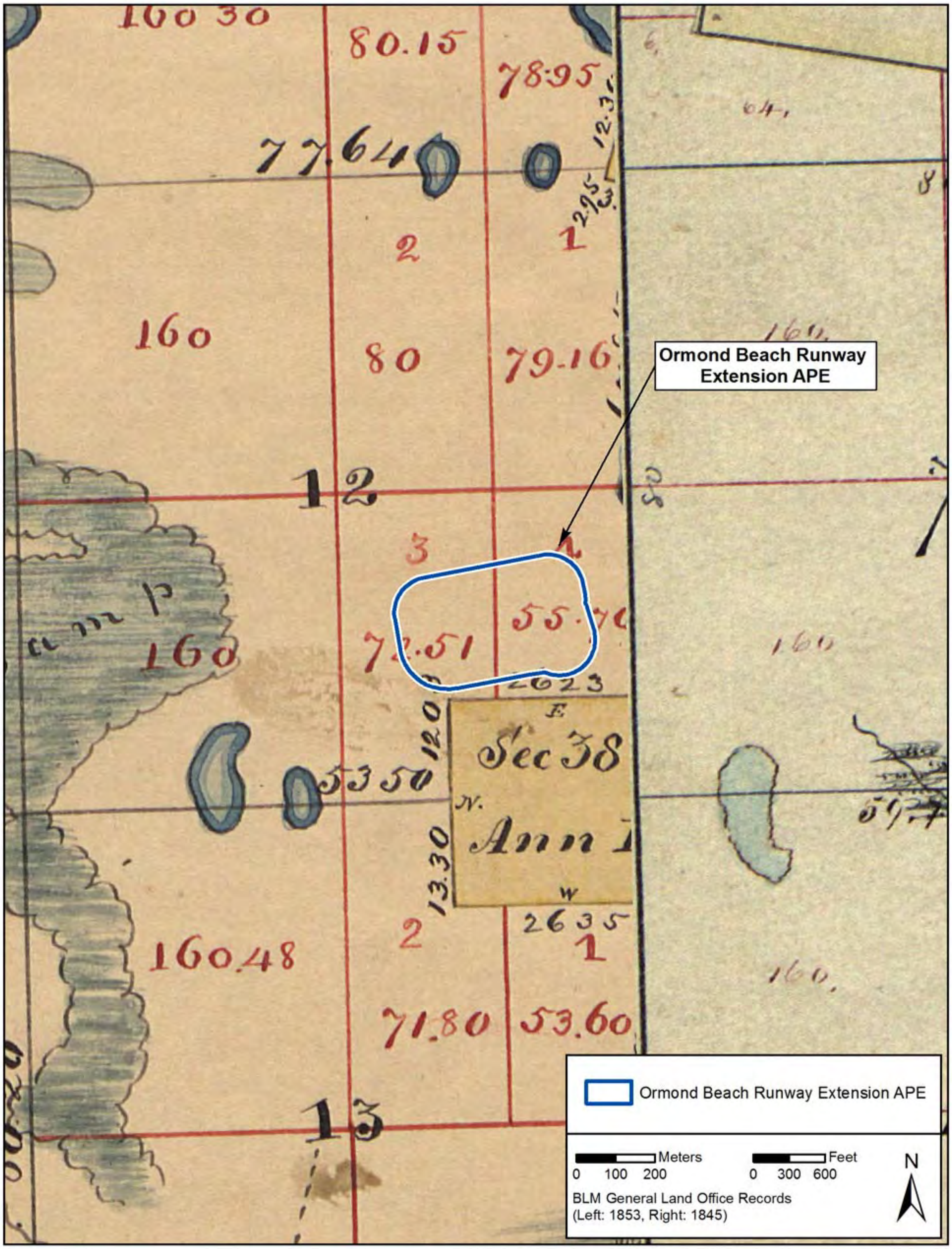

Figure 6. GLO survey plats showing the APE.

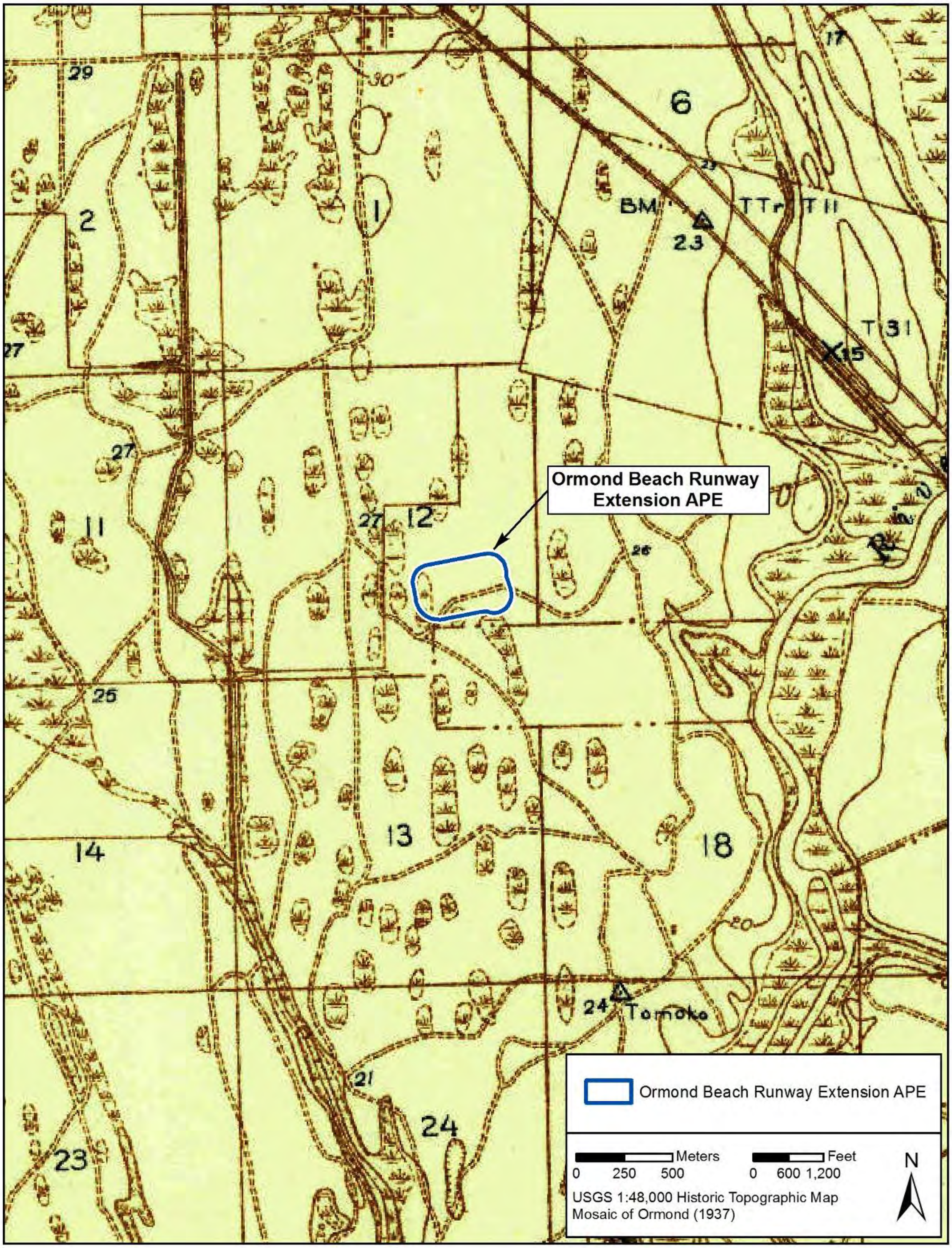

Figure 7. 1937 topographic map of the APE.

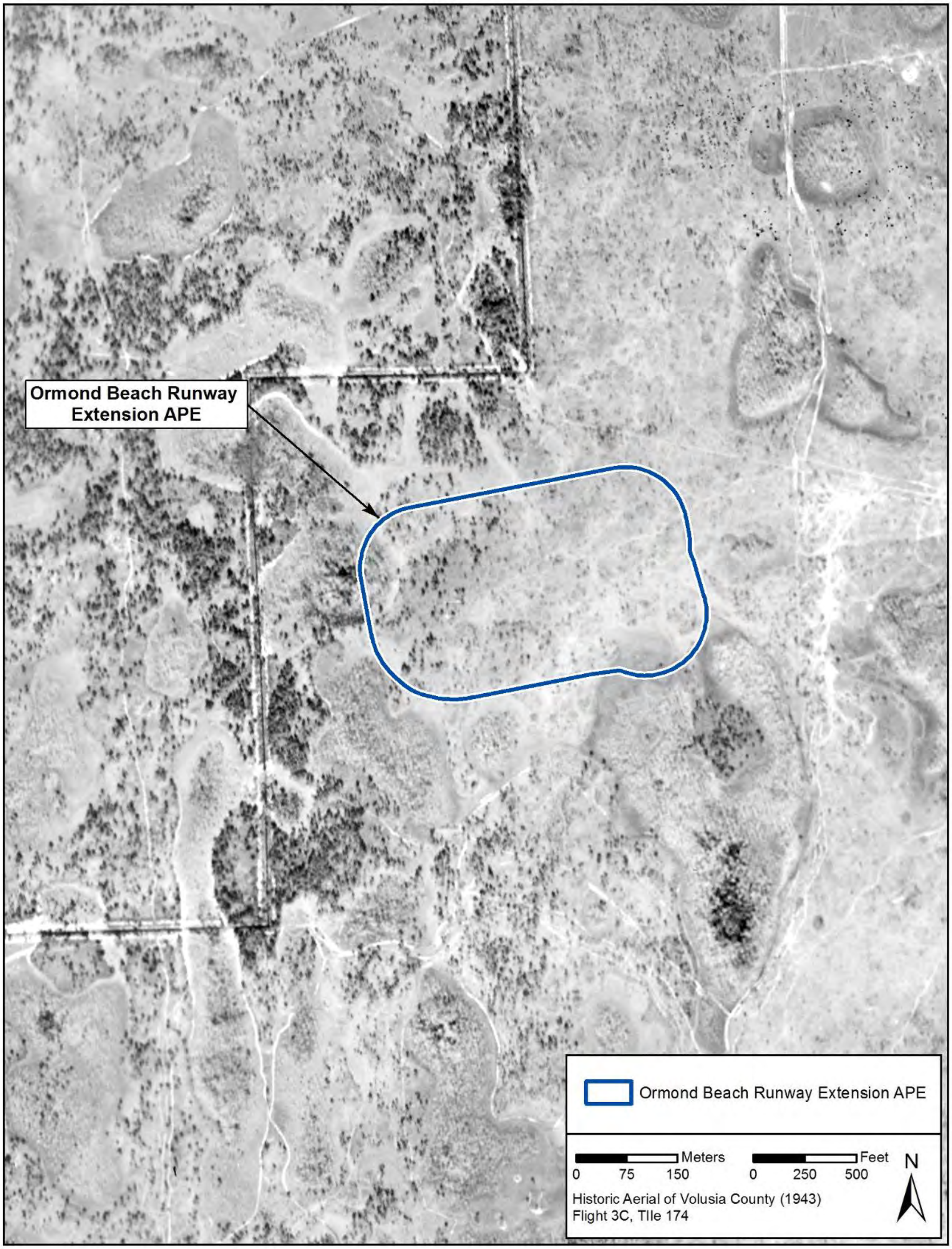

Figure 8. 1943 aerial photograph of the APE.

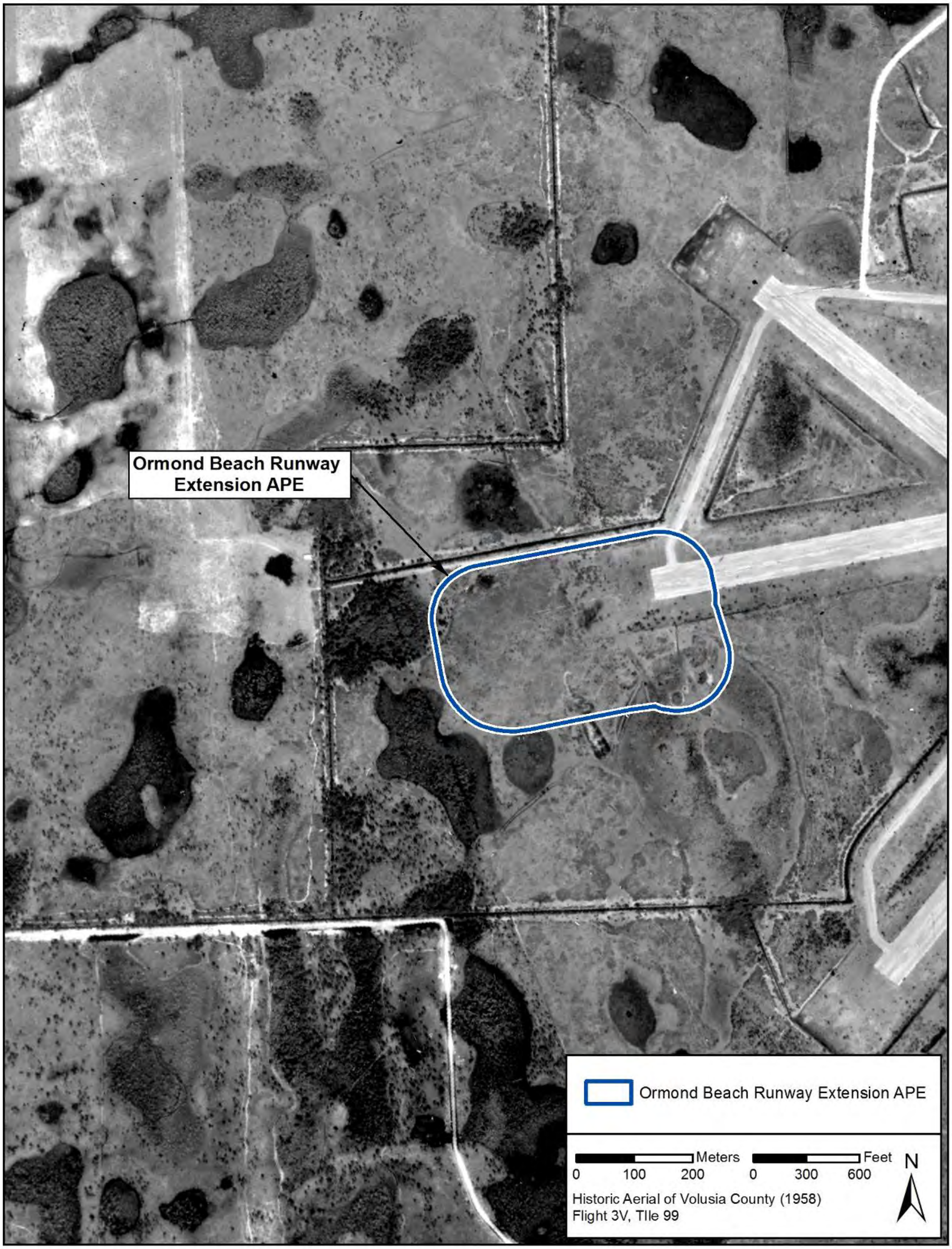

Figure 9. 1958 aerial photograph of the APE.

RESEARCH DESIGN AND METHODS

The goal of this CRAS is to identify the presence of cultural resources (archaeological sites or historic structures) within the APE and assess their eligibility for listing in the NRHP. The research design included a background investigation, historical document search, and a field survey. The background investigation involved reviewing the environmental, historical, and archaeological context for the APE; querying the FMSF database for the results of previous investigations in the vicinity of the APE; and examining historic maps and aerial photographs to identify the history of land use and potential resource locations within the APE. These data were used in combination to develop expectations regarding the types of cultural resources likely to be present in the vicinity and to determine the level of effort required to confirm their presence or absence within the APE.

The historical document search involved a review of primary and secondary historic sources as well as a review of the FMSF for any previously recorded historic structures. The original township plat maps, early aerial photographs, and other relevant sources were checked for information pertaining to the existence of historic structures, sites of historic events, and historically occupied or noted aboriginal settlements within the project limits.

CULTURAL RESOURCE POTENTIAL

Based on the environmental, archaeological, and historical contexts reviewed in the previous sections, the APE was determined to have moderate potential for containing previously unidentified cultural resources. Paleoenvironmental data and the distribution of previously recorded Paleoindian and Early/Middle Archaic sites in Volusia County suggest that sites dating to these early cultural periods are most likely to occur along ancient coastlines, river channels, and freshwater springs, none of which are present in the vicinity of the APE. Environmental conditions beginning during the Late Archaic period are consistent with those of today. Soil drainage within the APE is exclusively poor or very poor, indicating that the APE has been poorly suited to permanent habitation from the Late Archaic through the present. Large-scale surveys of tracts exhibiting similar environments within a one-mile radius of the APE failed to identify any archaeological sites except for locations characterized by well-drained soils along the Tomoka River, approximately one mile east of the APE. Nonetheless, the proximity of these sites to the APE suggests that subsurface testing was warranted. Furthermore, the use of the APE as an airfield beginning in 1943, and the presence of an unimproved road within the APE on the 1937 topographic map, indicate the potential presence of cultural remains dating to the World War II era or early twentieth century.

SURVEY METHODS

Archaeological Field Methods

The Phase I field survey consisted of systematic subsurface shovel testing according to the potential for buried archaeological sites within the APE. As the project area was determined to have moderate archaeological potential, shovel tests were excavated at 50-meter intervals throughout the APE. Shovel tests measured approximately 50 centimeters in diameter and were excavated to a depth of 100 centimeters below surface (cmbs) or until subsoil or the water table was reached. Excavated sediment was screened through 1/4-inch mesh hardware cloth. The location of each shovel test was marked on aerial photographs and recorded on handheld GPS units that used the Wide Area Augmentation System (WAAS). The cultural content, soil strata, and environmental setting of each shovel test were recorded in field notebooks.

Laboratory Methods

No artifacts were recovered as a result of this survey, and therefore, no laboratory analysis was required.

Curation

The field records (notes, maps, photographs, and GIS data) generated by this project will be curated at the SEARCH laboratory facility in Newberry, Florida and turned over to the Client upon request.

PROCEDURES TO ADDRESS UNEXPECTED DISCOVERIES

The results of the background research and field survey indicate there that is no reasonable expectation of encountering significant cultural remains within the APE. Nonetheless, there is always a possibility that unanticipated discoveries may yet occur within the project limits. Should evidence of unrecorded cultural resources be discovered during construction activities, reasonable efforts should be made to avoid the discovery until it can be assessed by a professional archaeologist. Evidence of cultural resources includes aboriginal or historic pottery, prehistoric stone tools, bone or shell tools, historic trash pits, and historic building foundations. If human remains are encountered during site development, the stipulations of *Florida Statutes* Chapter 872.05 (Offenses Concerning Dead Bodies and Graves) shall apply.

RESULTS

The CRAS of the APE consisted of pedestrian survey and the excavation of 46 shovel tests placed at 50-meter intervals. No cultural material was observed as a result of these efforts. The environment encountered throughout the APE was consistent with expectations, consisting of open, maintained lawn around the extant runway as well as pine forest around the margins of the APE (**Figure 10**). An aerial photograph of the APE depicting the placement of shovel tests is provided in **Figure 11**.

Shovel test profiles indicated that approximately 90 percent of the APE is characterized by undisturbed Myakka series soils. Five of the 46 shovel tests indicated subsurface disturbance, likely related to ground preparations during the original construction of the airfield. The disturbed soil profiles were located along the north margin of the clearing within the APE, adjacent to a drainage ditch visible on both modern and historic aerial photographs. These soil profiles consisted of mottled brown (10YR 4/3), dark brown (10YR 3/3), very dark brown (10YR 2/2), and light gray (10YR 7/2) sand to depths of at least 100 cmbs. No cultural material was observed in any of the shovel tests.

The remainder of the shovel tests revealed intact soil profiles. **Figure 12** depicts the typical soil profile of these undisturbed areas, consisting of four strata corresponding to typical Myakka soil horizons:

Figure 10. Mixed pine forest in the northern portion of APE, facing north (left); and clearing west of the runway within the APE, facing north (right).

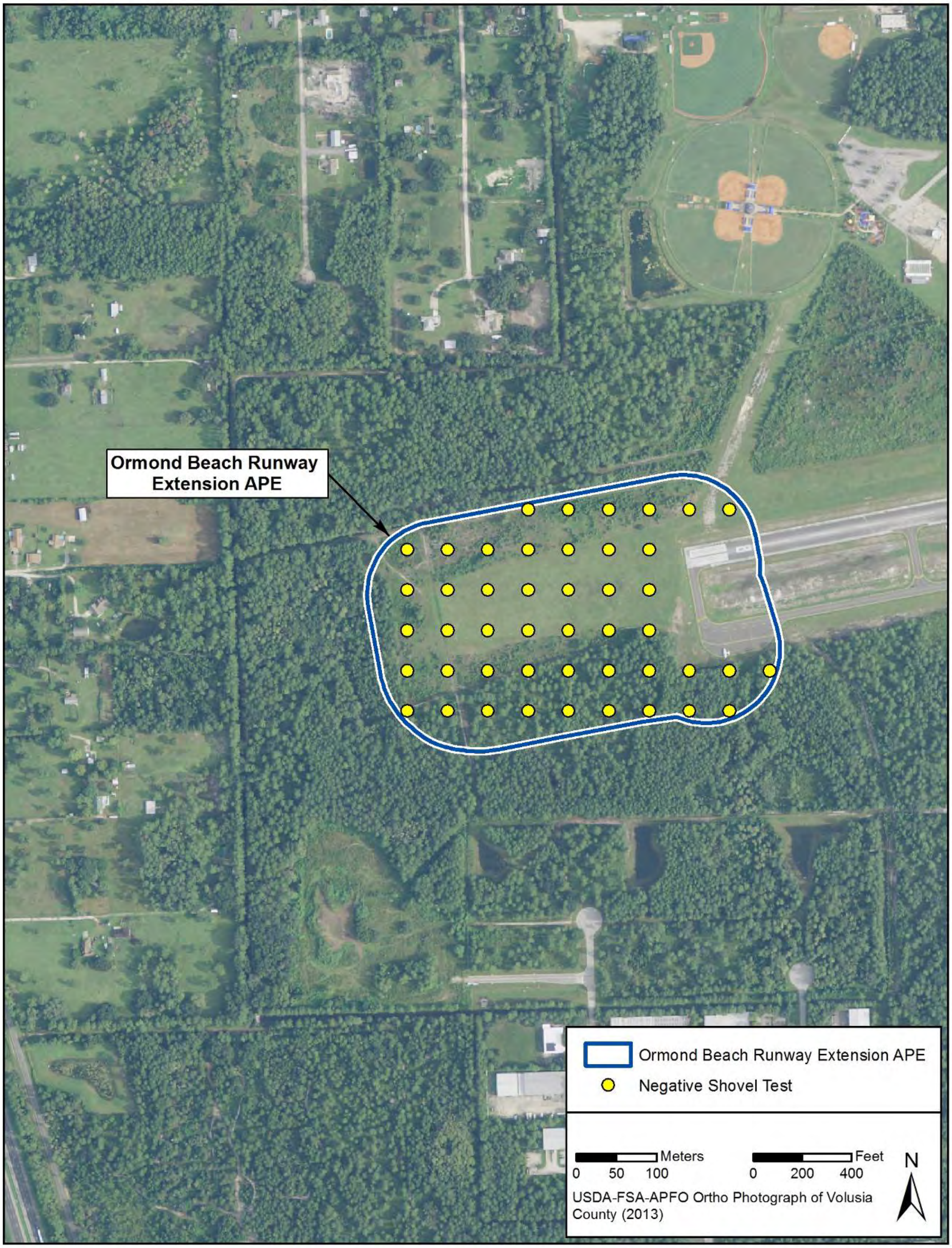

Figure 11. Shovel testing results within the APE.

- Stratum I (A horizon, 0-15 cmbs): dark gray (10YR 4/1) mottled with light gray (10YR 7/2) sand;
- Stratum II (E horizon, 15-34 cmbs): light gray (10YR7/1) medium sand;
- Stratum III (Bh horizon, 34-50 cmbs): very dark brown (10YR2/2) compact loamy sand;
- Stratum IV (C horizon, 50-100 cmbs): light yellowish brown (10YR 6/4) fine sand.

Figure 12. Typical soil profile within the APE.

Pedestrian survey of the APE did not identify any unrecorded buildings or structures. A portion of a taxiway that appears to no longer be in use is present within the northeast corner of the APE (**Figure 13**). It is outside of the construction footprint but within the 300-foot buffer included within the APE. The taxiway appears on historical aerial photographs from the 1950s and may be considered an element of the previously recorded Ormond Municipal Airport District (8VO9252). As noted above, prior consultation between the FAA and SHPO regarding the effects of the present undertaking determined that further documentation of 8VO09252 is not required at this time.

Figure 13. Former taxiway present in the northeast corner of the APE.

CONCLUSION AND RECOMMENDATIONS

This report presents the findings of a Phase I CRAS conducted in support of the proposed extension of Runway 08-26 at the Ormond Beach Municipal Airport in Volusia County, Florida. SEARCH conducted the CRAS on behalf of Hoyle, Tanner & Associates, Inc. for the City of Ormond Beach. The Area of Potential Effects (APE) for the proposed undertaking is defined as the construction and ground-disturbing footprint along with a 300-foot buffer, encompassing a total area of approximately 34 acres. The purpose of the survey was to identify archaeological resources or historic structures within the APE and assess their potential for listing in the National Register of Historic Places (NRHP).

A total of 46 shovel tests were excavated within the APE, none of which contained cultural material. Likewise, no historic buildings or structures were observed within the APE. The APE is encompassed within the previously recorded boundary of the Ormond Municipal Airport District (8VO9252), which has not been evaluated for eligibility for listing in the NRHP. Based on prior consultation between the FAA and SHPO, considerations of effects to 8VO09252 as a result of the proposed undertaking are not required at this time. Thus, it is the opinion of SEARCH that the proposed undertaking will have no effect on cultural resources listed or eligible for listing on the NRHP, and no further survey is recommended.

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APPENDIX A.

FDHR SURVEY LOG SHEET

Ent D (FMSF only)

Survey Log Sheet

Florida Master Site File
Version 4.1 1/07

Survey # (FMSF only)

Consult *Guide to the Survey Log Sheet* for detailed instructions.

Identification and Bibliographic Information

Survey Project (name and project phase) Cultural Resource Assessment Survey for the Ormond Beach Municipal Airport Runway 08-26 Extension, Volusia County, Florida

Report Title (exactly as on title page) Cultural Resource Assessment Survey for the Ormond Beach Municipal Airport Runway 08-26 Extension, Volusia County, Florida

Report Authors (as on title page, last names first) 1. Werner, William 2. 3. 4.

Publication Date (year) 2017 **Total Number of Pages in Report** (count text, figures, tables, not site forms) 39

Publication Information (Give series, number in series, publisher and city. For article or chapter, cite page numbers. Use the style of *American Antiquity*.)
SEARCH,Inc., Jacksonville, Florida

Supervisors of Fieldwork (even if same as author) Names Nelson, Blue

Affiliation of Fieldworkers: Organization Southeastern Archaeological Research City Jacksonville, Florida

Key Words/Phrases (Don't use county name, or common words like *archaeology*, *structure*, *survey*, *architecture, etc.*)
1. Ormond Beach Municipal Ai 2. 3. 4. 5. 6. 7. 8.

Survey Sponsors (corporation, government unit, organization or person directly funding fieldwork)
Name Hoyle, Tanner & Associates, Inc. Organization
Address/Phone/E-mail

Recorder of Log Sheet William Werner **Date Log Sheet Completed** 6-23-2017

Is this survey or project a continuation of a previous project? ☒ No ☐ Yes: Previous survey #s (FMSF only)

Mapping

Counties (List each one in which field survey was done; attach additional sheet if necessary)
1. Volusia 2. 3. 4. 5. 6.

USGS 1:24,000 Map Names/Year of Latest Revision (attach additional sheet if necessary)

1. Name	ORMOND BEACH	Year 1993	4. Name		Year
2. Name		Year	5. Name		Year
3. Name		Year	6. Name		Year

Description of Survey Area

Dates for Fieldwork: Start 6-14-2017 End 6-16-2017 **Total Area Surveyed** (fill in one) ____ hectares 34 acres

Number of Distinct Tracts or Areas Surveyed 1

If Corridor (fill in one for each) **Width:** ____ meters ____ feet **Length:** ____ kilometers ____ miles

Survey Log Sheet

Survey #__________

Research and Field Methods

Types of Survey (check all that apply): ☒ archaeological ☒ architectural ☐ historical/archival ☐ underwater ☐ damage assessment ☐ monitoring report ☐ other(describe): ____________

Scope/Intensity/Procedures 46 shovel tests were placed at 50-meter intervals throughout the entire survey area.

Preliminary Methods (check as many as apply to the project as a whole)

☐ Florida Archives (Gray Building) ☐ library research- *local public* ☒ local property or tax records ☒ other historic maps
☐ Florida Photo Archives (Gray Building) ☐ library-special collection - *nonlocal* ☐ newspaper files ☒ soils maps or data
☒ Site File property search ☒ Public Lands Survey (maps at DEP) ☒ literature search ☐ windshield survey
☒ Site File survey search ☐ local informant(s) ☐ Sanborn Insurance maps ☒ aerial photography
☐ other (describe): ____________

Archaeological Methods (check as many as apply to the project as a whole)

☐ Check here if **NO** archaeological methods were used.

☐ surface collection, controlled ☐ shovel test-other screen size ☐ block excavation (at least 2x2 m)
☐ surface collection, **un**controlled ☐ water screen ☐ soil resistivity
☒ shovel test-1/4"screen ☐ posthole tests ☐ magnetometer
☐ shovel test-1/8" screen ☐ auger tests ☐ side scan sonar
☐ shovel test 1/16"screen ☐ coring ☒ pedestrian survey
☐ shovel test-unscreened ☐ test excavation (at least 1x2 m) ☐ unknown
☐ other (describe): ____________

Historical/Architectural Methods (check as many as apply to the project as a whole)

☐ Check here if **NO** historical/architectural methods were used.

☐ building permits ☐ demolition permits ☐ neighbor interview ☐ subdivision maps
☐ commercial permits ☒ exposed ground inspected ☐ occupant interview ☐ tax records
☐ interior documentation ☒ local property records ☐ occupation permits ☐ unknown
☐ other (describe): ____________

Survey Results (cultural resources recorded)

Site Significance Evaluated? ☐ Yes ☒ No

Count of Previously Recorded Sites 0 **Count of Newly Recorded Sites** 0

Previously Recorded Site #'s with Site File Update Forms (List site #'s without "8". Attach additional pages if necessary.) ____________

Newly Recorded Site #'s (Are all originals and not updates? List site #'s without "8". Attach additional pages if necessary.) ____________

Site Forms Used: ☐ Site File Paper Form ☒ Site File Electronic Recording Form

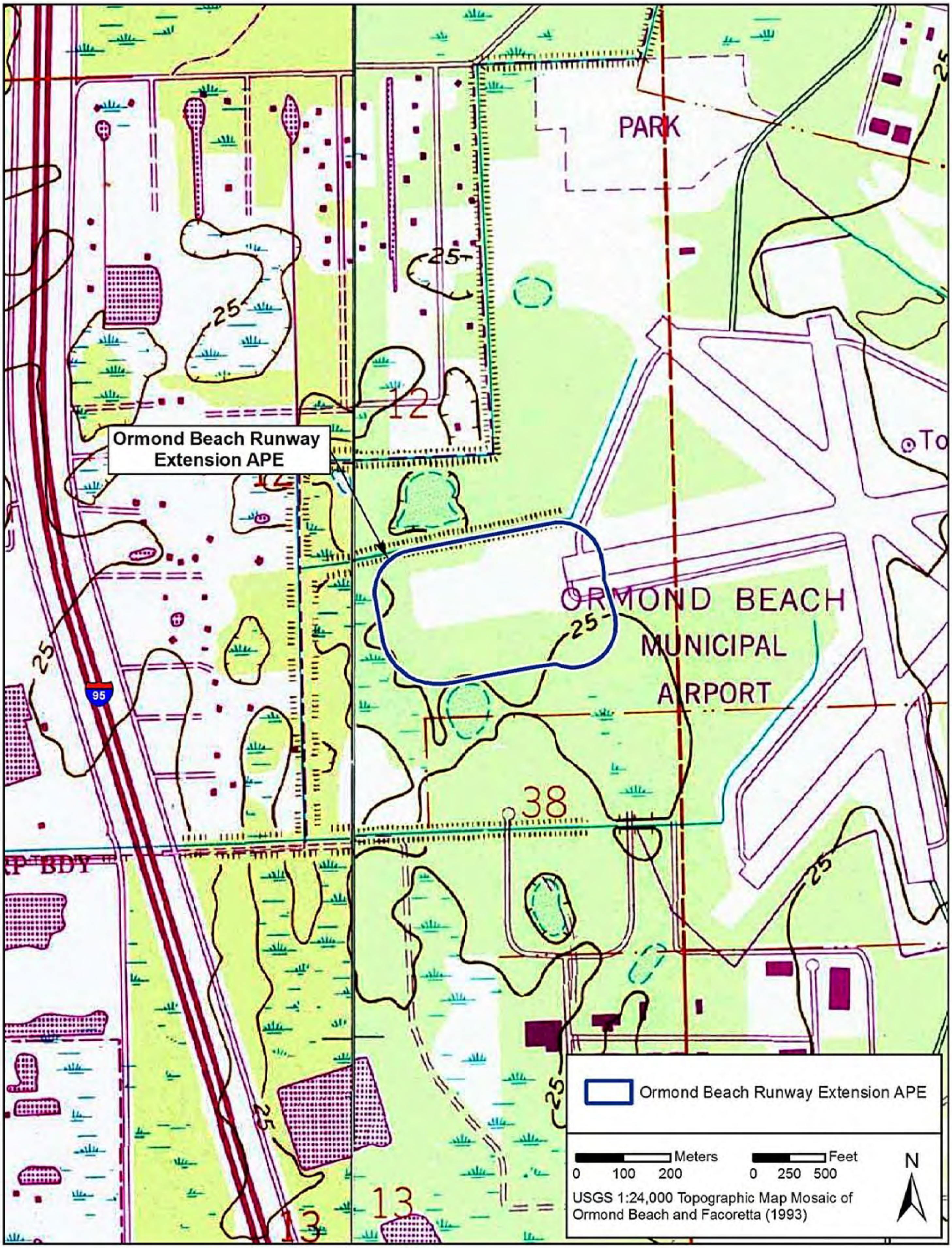
*****REQUIRED: ATTACH PLOT OF SURVEY AREA ON PHOTOCOPY OF USGS 1:24,000 MAP(S)*****

SHPO USE ONLY SHPO USE ONLY SHPO USE ONLY

Origin of Report: ☐ 872 ☐ CARL ☐ UW ☐ 1A32 # ____________ ☐ Academic ☐ Contract ☐ Avocational
☐ Grant Project # ____________ ☐ Compliance Review: CRAT # ____________

Type of Document: ☐ Archaeological Survey ☐ Historical/Architectural Survey ☐ Marine Survey ☐ Cell Tower CRAS ☐ Monitoring Report
☐ Overview ☐ Excavation Report ☐ Multi-Site Excavation Report ☐ Structure Detailed Report ☐ Library, Hist. or Archival Doc
☐ MPS ☐ MRA ☐ TG ☐ Other: ____________

Document Destination: ____________ **Plotability:** ____________


Ormond Beach Runway Extension APE
PARK
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MUNICIPAL
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95
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Ormond Beach Runway Extension APE
Meters
0 100 200
Feet
0 250 500
N
USGS 1:24,000 Topographic Map Mosaic of Ormond Beach and Facoretta (1993)

Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Attachment K

ENVIRONMENTAL ASSESSMENT
ORMOND BEACH MUNICIPAL AIRPORT

Environmental Consequences Sections:

I. **Air Quality**
II. **Climate**
III. **Noise**

FINAL

Prepared by:

KB Environmental Sciences, Inc.

Prepared for:

Hoyle, Tanner and Associates

May 2017

Revision 2 (May 16, 2017)

This document provides the environmental consequences sections for air quality, climate, and noise for the Environmental Assessment (EA) at Ormond Beach Municipal Airport (OMN). The proposed project involves the extension of Runway 8-26 by 1,000 feet to the west, as documented in the Airport's recent Master Plan. Related to the runway extension is a 1,000-foot extension of connecting Taxiway A. In addition, the runway extension would induce additional business jet operations by improving safety and capacity issues for the existing fleet mix at OMN. The additional business jet operations are included in the Build scenario analyses for air quality, climate, and noise.

I. AIR QUALITY

As discussed in the affected environment section of the EA, the National Environmental Policy Act (NEPA) and Clean Air Act (CAA) are the two primary regulations that apply to assessment of air quality impacts attributable to the proposed project. The NEPA requires the disclosure of the proposed project's impacts on the human environment; and the CAA requires that the proposed project does not cause, or contribute to, a violation of the National Ambient Air Quality Standards (NAAQS).

With respect to the NAAQS "attainment" and "non-attainment" designations OMN is located in Volusia County which is currently designated as "attainment" of all NAAQS established by the U.S. Environmental Policy Agency (EPA). Thus, General Conformity requirements outlined under the federal CAA do not apply to the proposed project and accordingly a General Conformity Applicability Analysis is not warranted. However, for disclosure purposes under the NEPA, both short-term construction and operational-related emissions due to the proposed improvements at OMN were analyzed.

a. Construction Emissions

Construction activities are temporary and variable depending on project location, duration and level of activity. Emissions occur predominantly in the engine exhaust from the operation of construction equipment and vehicles (e.g., scrapers, dozers, delivery trucks, etc.) at the site, the transportation of construction workers to and from the site, as well as attributed to fugitive dust produced from construction materials staging, soil handling, un-stabilized land, and wind erosion.

Construction equipment typically utilized in airport development projects comprises both of on-road (i.e., on-road-licensed) and off-road equipment. The former category of vehicles is used for the transport and delivery of supplies, material and equipment to and from the site, and also include construction worker vehicles. The latter category of equipment is operated on-site for activities such as paving, site clearing and fill.

The short-term construction emissions associated with the proposed improvements at OMN were computed using the Airport Construction Emissions Inventory Tool (ACEIT)[1]. Project-specific details were used in the ACEIT to estimate construction activities and equipment/vehicles activity data (e.g., equipment mixes/times). Because the default emission factors used by ACEIT are outdated and do not reflect the latest EPA's Motor Vehicle Emission Simulator (i.e., MOVES/NONROAD)[2] model, only activity data was extracted from ACEIT. Up-to-date emission factors were then developed using the MOVES, which

[1] TRB, ACRP Report 102, *Guidance for Estimating Airport Construction Emissions*, http://www.trb.org/ACRP/Blurbs/170234.aspx.
[2] MOVES2014a is the latest version of MOVES/NONROAD. Additional information on MOVES2014a is available at https://www.epa.gov/moves/moves2014a-latest-version-motor-vehicle-emission-simulator-moves.

includes both on-road vehicles and off-road construction equipment. Consistent with the planning and development timeframes for the proposed project, **Table 1** presents the year(s) and the construction activities associated with the proposed improvement projects.

Table 1: Construction Schedule and Activities	
Year	**Construction Activities**
2018-2019	• 1000’ Runway 8-26 Extension • 1000’ Taxiway A Extension and bypass Taxiway Installation • Tree Removal
Source: Hoyle, Tanner and Associates, 2017.	

Additionally, fugitive emissions were calculated using emission factors within EPA’s Compilation of Air Pollutant Emission Factors (AP-42)[3]. Fugitive emissions result from site preparation, land clearing, material handling, equipment movement on unpaved areas; and evaporative fugitive emissions from application of asphalt paving.

Construction emissions of on- and off-road vehicles/equipment are presented in **Table 2** by construction year. *De minimis* thresholds were not included because Volusia County is designated as “attainment” of all the NAAQS established by the EPA; therefore, the General Conformity Rule does not apply. Again, for disclosure purposes, construction emissions of CO, NO_x, SO_2, PM_{10}, $PM_{2.5}$ and VOC are reported.

Table 2: Construction Emissions (tons per year)							
Year	**Source**	**CO**	**NO_x**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**VOC**
2018	On-Road Motor Vehicles	2.5	0.3	<0.1	<0.1	<0.1	0.2
	Off-Road Equipment	9.7	22.8	<0.1	1.6	1.6	2.6
	Fugitive Emissions	-	-	-	0.8	0.1	0.1
	Total	**12.1**	**23.1**	**<0.1**	**2.5**	**1.7**	**2.9**
2019	On-Road Motor Vehicles	4.6	0.6	<0.1	0.1	<0.1	0.3
	Off-Road Equipment	12.7	30.7	<0.1	1.9	1.9	3.8
	Fugitive Emissions	-	-	-	1.6	0.2	0.1
	Total	**17.3**	**31.4**	**<0.1**	**3.6**	**2.1**	**4.3**

Source: KB Environmental Sciences Inc., 2017.
Notes: CO - carbon monoxide, NO_x - nitrogen oxides, SO_2 - sulfur dioxide, $PM_{10/2.5}$ - particulate matter, and VOC - volatile organic compounds.
Totals may be subject to rounding.

b. Operational Emissions

The aircraft operational-related emissions associated with the No-Build and Build scenarios at OMN were computed using the latest version of FAA’s Aviation Environmental Design Tool (AEDT).[4] Airport operational emissions sources other than aircraft (e.g., auxiliary power units, ground service equipment, and motor vehicles) were not considered in the analysis as these source emissions would not change as a result of the proposed improvements.

Aircraft fleet mix and annual operations remained the same between the future no build and build years for each year analyzed (2019 and 2024), with the exception of additional of business jet operations induced by the runway extension for each year. **Table 3** and **Table 4** summarize the aircraft fleet mix and

[3] EPA, Emissions Factors & AP-42, *Compilation of Air Pollutant Emission Factors*, http://www.epa.gov/ttn/chief/ap42/index.html#toc.
[4] AEDT 2c Service Pack 2 is the current release version of AEDT. Additional information on AEDT is available at https://aedt.faa.gov/.

level of operations for the additional aircraft modeled in AEDT for 2019 and 2024, respectively. In addition, for the Build scenario taxi times were increased to reflect the extended taxiway distance of 1,000 feet.

Table 3: 2019 Annual Aircraft Fleet Mix and Operations Modelled in AEDT		
Aircraft Type	**Aircraft Engine**	**Operations**
Bombardier Challenger 350	HTF7000 (AS907-1-1A)	29
Bombardier Challenger 600	CF34-3B	29
Cessna 550 Citation II	PW530	110
Cessna 560 Citation XLS	BIZMEDIUMJET_F	228
Cessna 680 Citation Sovereign	PW308C	29
Cessna 750 Citation X	AE3007C1	29
Dassault Falcon 2000-EX	PW308C	5
Embraer 505	BIZLIGHTJET_F	29
Westwind II	TFE731-3	134
	Total	**622**

Source: KB Environmental Sciences Inc., 2017.
Note: Totals may be subject to rounding.

Table 4: 2024 Annual Aircraft Fleet Mix and Operations Modelled in AEDT		
Aircraft Type	**Aircraft Engine**	**Operations**
Bombardier Challenger 350	HTF7000 (AS907-1-1A)	29
Bombardier Challenger 600	CF34-3B	29
Bombardier Challenger 650	CF34-3B	6
Cessna 550 Citation II	PW530	110
Cessna 560 Citation XLS	BIZMEDIUMJET_F	228
Cessna 680 Citation Sovereign	PW308C	29
Cessna 750 Citation X	AE3007C1	35
Dassault Falcon 2000-EX	PW308C	11
Embraer 505	BIZLIGHTJET_F	29
Hawker 800XP	TFE731-2-2A	7
Hawker 900XP	TFE731-2/2A	7
Westwind II	TFE731-3	134
	Total	**654**

Source: KB Environmental Sciences Inc., 2017.
Note: Totals may be subject to rounding.

Table 5 presents the aircraft operational emission results for the No-Build and Build scenarios for future years 2019 and 2024. *De minimis* thresholds were not included because the area is designated as "attainment". For disclosure purposes under NEPA, operational emissions of CO, NO_x, SO_2, PM_{10}, $PM_{2.5}$ and VOC are reported.

Table 5: Aircraft Operation Emissions (tons per year)							
Year	**Scenario**	**CO**	**VOC**	**NO_x**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
2019	No-Build	1,137	18	2.5	1.3	0.7	0.7
	Build	1,138	18.4	2.8	1.4	0.8	0.8
	Difference (Project-related)	**1**	**0.4**	**0.3**	**<0.1**	**<0.1**	**<0.1**
2024	No-Build	1,194	18.7	2.6	1.4	0.8	0.8
	Build	1,195	19.2	3	1.4	0.8	0.8
	Difference (Project-related)	**1**	**0.5**	**0.4**	**<0.1**	**<0.1**	**<0.1**

Source: KB Environmental Sciences Inc., 2017.
Notes: CO - carbon monoxide, NO_x - nitrogen oxides, SO_2 - sulfur dioxide, $PM_{10/2.5}$ - particulate matter, and VOC - volatile organic compounds.
Table reflects the ***change*** in emissions due to the proposed project only.

c. Conclusion

The air quality analysis evaluated the potential for air pollutant emissions associated with the proposed project. The results indicated that a temporary increase in emissions would occur to construct the facilities; however, this increase would not exceed the *de minimis* thresholds for any of the NAAQS. During operation, a small increase in aircraft emissions would occur compared to the No Action Alternative due to the projected increase in operations.

Based on the results of the analysis, operational and construction-related emissions from the proposed action would not create a significant air quality impact.

II. CLIMATE

Although there are no federal standards for aviation-related GHG emissions or NEPA requirements for their assessment, a GHG inventory was prepared for the proposed project for disclosure purposes.

For this analysis, GHG emissions associated with construction activities as well as the aircraft operations due to the proposed improvements at OMN were computed. The emissions are presented in metric tons of CO_2 equivalent (CO_{2e}). The estimated project-related annual CO_{2e} construction and operational emissions are presented in **Tables 6 and 7**, respectively.

Table 6: Construction CO_{2e} Emissions (metric tons)	
Construction Year	**CO_{2e}**
2018	5,584
2019	11,127

Source: KB Environmental Sciences Inc., 2017.
Note: Emissions modelled using ACEIT and MOVES2014a modeling tools, 2017.

Table 7: Operational CO_{2e} Emissions (metric tons)	
Project-related Emissions	**CO_{2e}**
2019	147
2024	161

Source: KB Environmental Sciences Inc. 2017.
Note: Emissions modelled using AEDT 2c, 2017.
Table reflects the ***change*** in emissions due to the proposed project only.

As shown, construction emissions are expected to range from 5,584 to 11,127 tons during the construction duration. Operational emissions are estimated to increase by 147 and 161 tons with the implementation of the Proposed Project in 2019 and 2024, respectively.

III. NOISE

This section presents the noise exposure for the future years 2019 (the projected year of opening) and 2024, for the No Build and Build alternatives.

a. Significance Criteria

Per FAA Order 1050.1F, "a significant noise impact would occur if the action would increase noise by DNL 1.5 dB or more for a noise sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65 dB level due to a DNL 1.5 dB or greater increase, when compared to the no action alternative for the same timeframe." Noise sensitive areas primarily include residential neighborhoods; educational, health, and religious facilities; outdoor recreational areas; and, cultural and historic sites.

b. Methodology

The methodology for assessing noise exposure included preparing DNL contours for the No Build and Build alternatives for the years 2019 and 2024. The contours were developed to assess if a significant noise impact would occur as a result of the proposed project, by comparing the noise exposure levels of the future No Build and future Build conditions.

c. 2019 No Build Alternative

According to the 2016 OMN Airport Master Plan Update, aircraft operations are forecast to increase to 130,947 annual operations in 2019 (an average of approximately 359 operations per day). The 2019 No Build aircraft operations by category is provided in **Table 8.**

Table 8: 2019 No Build Alternative Annual Aircraft Operations

Year	Single Engine	Multi-Engine Piston	Turboprop	Jet	Helicopter	Military	Total
2019	99,944	19,935	3,353	1,164	6,547	4	130,947

Source: Airport Master Plan Update, January 2016, HTA, Inc; KB Environmental Sciences, Inc.

The 2019 aircraft fleet mix was determined by multiplying the percentages by aircraft type that occurred in 2016 by the total operations forecasted to occur at the airport in 2019. The 2019 No Build annual average day aircraft fleet for itinerant and local operations are provided in **Tables 9 and 10,** respectively. For noise modeling purposes, OMN Air Traffic Control Tower (ATCT) staff estimated that approximately five percent operations at the airport occur during the nighttime hours (10:00pm to 6:59am).

Table 9: 2019 No Build Alternative Average-Day Itinerant Operations

Aircraft Category	Aircraft Types	Daytime Operations	Nighttime Operations	Total Operations
Single Engine Piston	Cessna 172/182	80.589	4.242	84.830
	Cessna 150	11.106	0.585	11.690
	Piper PA-28	10.609	0.558	11.167
	Cirrus SR20	7.384	0.389	7.773
	Piper PA-32 Cherokee Six	4.776	0.251	5.027
	Cirrus SR22	3.227	0.170	3.397
	Mooney M20	2.668	0.140	2.808
	Cessna 206/210	0.869	0.046	0.915
	Piper PA-24/46 Malibu	0.869	0.046	0.915
Multi-Engine Piston	Piper PA-23 / 31	20.072	1.056	21.129
	Piper PA-44 Seminole	7.256	0.382	7.638
	Beech Baron 55/58/60	3.287	0.173	3.460
	Cessna 310/340	2.978	0.157	3.134
	Cessna 414/421	1.590	0.084	1.674
	Piper PA-34 Seneca	1.364	0.072	1.436
Turboprop	Super King Air 200/300	8.009	0.422	8.430
	Cessna 425 Conquest I	0.310	0.016	0.326
	King Air 90/100	0.206	0.011	0.216
	Pilatus PC-12	0.203	0.011	0.214
Jet	Cessna 550 Citation Bravo	2.002	0.105	2.107
	Cessna 500 Citation I	0.513	0.027	0.540
	Cessna 510 Citation Mustang	0.206	0.011	0.216
	Cessna 525/525B CitationJet	0.206	0.011	0.216
	Cessna 560 Excel/XLS	0.104	0.005	0.110
Helicopter	Schweizer 300	17.040	0.897	17.937
Military	C-130	0.010	0.001	0.011
Total Average-Day Itinerant Operations:		187.452	9.866	197.318

Notes: (1) Totals may be subject to rounding.
Source: KB Environmental Sciences, Inc., 2017.

Table 10: 2019 No Build Alternative Average-Day GA Local Operations				
Aircraft Category	**Aircraft Types**	**Daytime Operations**	**Nighttime Operations**	**Total Operations**
Single-Engine Piston	Cessna 172/182	89.011	4.685	93.696
	Cessna 150	12.277	0.646	12.923
	Piper PA-28	11.728	0.617	12.345
	Cirrus SR20	8.160	0.429	8.589
	Piper PA-32 Cherokee Six	6.163	0.324	6.488
	Cirrus SR22	3.568	0.188	3.756
	Mooney M20	3.870	0.204	4.074
	Cessna 206/210	3.253	0.171	3.425
Multi-Engine Piston	Piper PA-23 / 31	8.454	0.445	8.899
	Piper PA-44 Seminole	3.623	0.191	3.814
	Beech Baron 55/58/60	1.692	0.089	1.781
	Cessna 310/340/414/421	1.569	0.083	1.652
Total Average-Day Local Operations:		153.369	8.072	161.441

Notes: (1) Totals may be subject to rounding.
Source: KB Environmental Sciences, Inc., 2017.

d. Flight Tracks

The flight tracks and flight track use percentages modeled for the 2019 No Build alternative were the same as the 2016 existing condition.

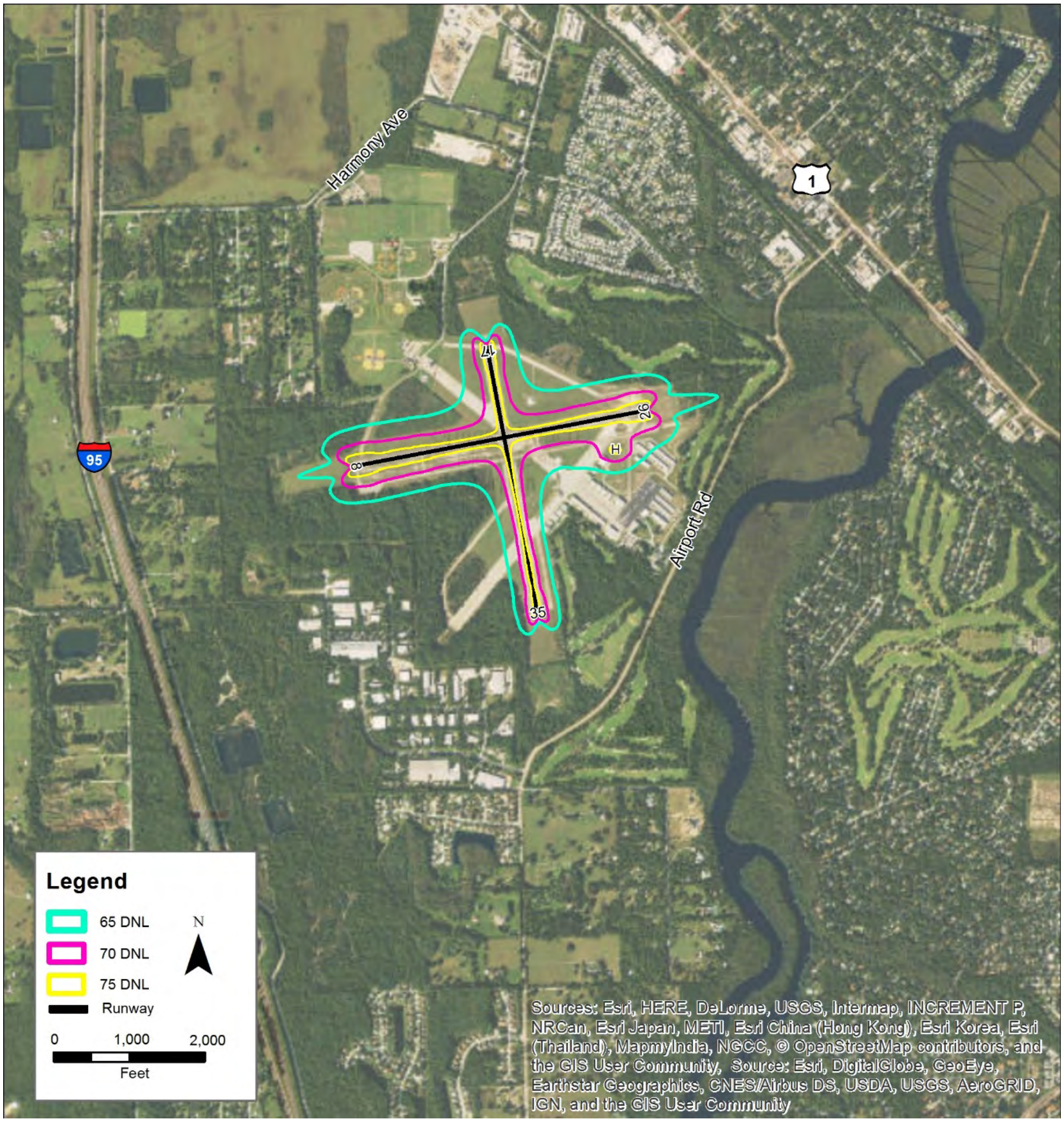
e. 2019 No Build Noise Contours

The 2019 No Build DNL contours are provided on **Figure 2**. **Table 11** identifies the areas within the DNL contour ranges. As shown in the table, the total area within the DNL 65 dB and greater contour is approximately 165 acres. Notably, there are no residences or other noise sensitive land uses within the 2019 No Build DNL 65 dB contour.

Table 11: 2019 No Build Alternative DNL Contour Areas	
DNL (dB)	**Area (Acres)**
65 to <70	90
70 to <75	50
75 and greater	25
Total	165

Source: KB Environmental Sciences, Inc., 2017.

Figure 2: 2019 No Build Alternative DNL Contours



Source: KB Environmental Sciences, Inc., 2017.

f. 2019 Build Alternative

The Build alternative includes a 1,000-foot extension to the west end of Runway 8/26. With the increased runway length, it is projected that an additional 622 annual jet operations would occur at the airport in 2019. These operations would increase the 2019 forecast annual operations to 131,569. **Table 12** includes the additional average-day jet aircraft operations forecast to occur as a result of the runway extension. These operations were added to the 2019 No Build operations to model the 2019 Build alternative. The modeled Runway 8 flight tracks for the 2019 Build alternative were reflective of the Runway 8 end being moved 1,000 feet to the west. All other flight tracks remained the same as the No Build alternative.

Table 12: 2019 Build Alternative Average-Day Additional Forecast Jet Operations				
Aircraft Category	**Aircraft Types**	**Daytime Operations**	**Nighttime Operations**	**Total Operations**
Jet	Cessna 560 Citation XLS	0.593	0.031	0.625
	Cessna 680 Citation Sovereign	0.075	0.004	0.079
	Cessna 750 Citation X	0.075	0.004	0.079
	Bombardier Challenger 350	0.075	0.004	0.079
	Bombardier Challenger 600	0.075	0.004	0.079
	Embraer 505	0.075	0.004	0.079
	Dassault Falcon 2000-EX	0.013	0.001	0.014
	Cessna 550 Citation II	0.286	0.015	0.301
	Westwind II	0.349	0.018	0.367
Total Average-Day Additional Jet Operations:		1.619	0.085	1.704

Source: HTA, Inc.; KB Environmental Sciences, Inc., 2017.

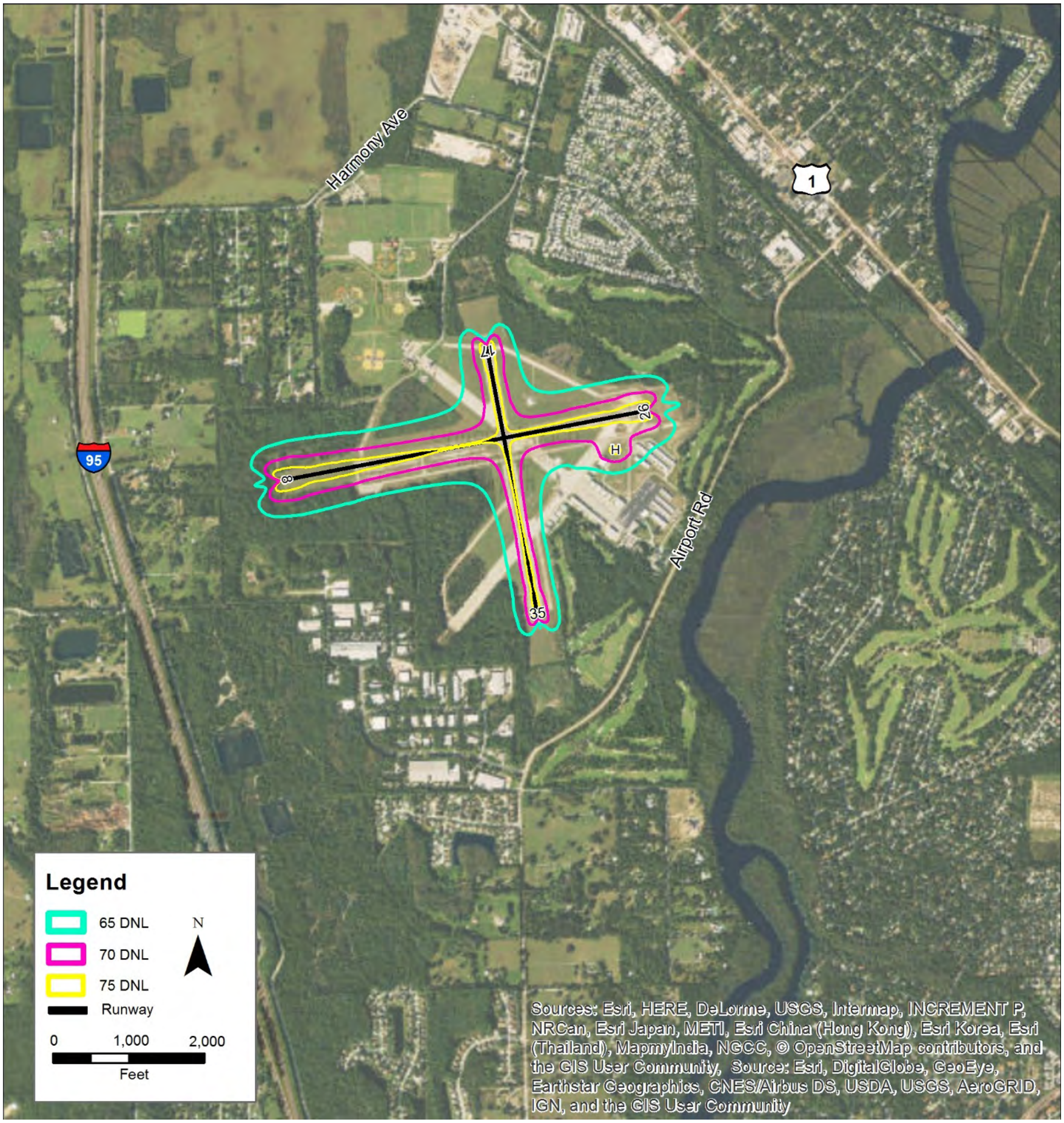
g. 2019 Build Alternative Noise Contours

The 2019 Build alternative DNL contours are provided on **Figure 3**. The contours expand to the west, reflective of the runway extension when compared to the No Build alternative. **Table 13** identifies the areas within the DNL contour ranges. As shown in the table, the total area within the DNL 65 dB and greater contour is approximately 178 acres, an increase of 13 acres over the No Build alternative. This increase is primarily a result of the additional runway length. There are no residences or other noise sensitive land uses within the 2019 Build alternative DNL 65 dB contour.

Table 13: 2019 Build Alternative DNL Contour Areas	
DNL (dB)	**Area (Acres)**
65 to <70	97
70 to <75	56
75 and greater	25
Total	178

Source: KB Environmental Sciences, Inc., 2017.

Figure 3: 2019 Build Alternative DNL Contours



Source: KB Environmental Sciences, Inc., 2017.

h. 2024 No Build Alternative

According to the 2016 OMN Airport Master Plan Update, aircraft operations are forecast to increase to 137,653 annual operations in 2024 (an average of approximately 377 operations per day). The 2024 No Build aircraft operations by category is provided in **Table 14.**

Table 14: 2024 No Build Alternative Annual Aircraft Operations

Year	Single Engine	Multi-Engine Piston	Turboprop	Jet	Helicopter	Military	Total
2024	105,063	20,957	3,524	1,222	6,883	4	137,653

Source: Airport Master Plan Update, January 2016, HTA, Inc; KB Environmental Sciences, Inc., 2017.

The 2024 aircraft fleet mix was determined by multiplying the percentages by aircraft type that occurred in 2016 by the total operations forecasted to occur at the airport in 2024. The 2024 No Build annual average day aircraft fleet for itinerant and local operations are provided in **Tables 15 and 16,** respectively. For noise modeling purposes, OMN Air Traffic Control Tower (ATCT) staff estimated that approximately five percent operations at the airport occur during the nighttime (10:00 PM TO 6:59 AM) hours.

Table 15: 2024 No Build Alternative Average-Day Itinerant Operations				
Aircraft Category	**Aircraft Types**	**Daytime Operations**	**Nighttime Operations**	**Total Operations**
Single Engine Piston	Cessna 172/182	84.717	4.459	89.175
	Cessna 150	11.676	0.615	12.290
	Piper PA-28	11.153	0.587	11.740
	Cirrus SR20	7.761	0.408	8.170
	Piper PA-32 Cherokee Six	5.021	0.264	5.285
	Cirrus SR22	3.394	0.179	3.573
	Mooney M20	2.803	0.148	2.951
	Cessna 206/210	0.914	0.048	0.962
	Piper PA-24/46 Malibu	0.914	0.048	0.962
Multi-Engine Piston	Piper PA-23 / 31	21.100	1.111	22.211
	Piper PA-44 Seminole	7.629	0.402	8.030
	Beech Baron 55/58/60	3.456	0.182	3.638
	Cessna 310/340	3.131	0.165	3.296
	Cessna 414/421	1.671	0.088	1.759
	Piper PA-34 Seneca	1.434	0.075	1.510
Turboprop	Super King Air 200/300	8.420	0.443	8.863
	Cessna 425 Conquest I	0.325	0.017	0.342
	King Air 90/100	0.213	0.011	0.225
	Pilatus PC-12	0.213	0.011	0.225
Jet	Cessna 550 Citation Bravo	2.103	0.111	2.214
	Cessna 500 Citation I	0.539	0.028	0.567
	Cessna 510 Citation Mustang	0.216	0.011	0.227
	Cessna 525/525B CitationJet	0.216	0.011	0.227
	Cessna 560 Excel/XLS	0.107	0.006	0.112
Helicopter	Schweizer 300	17.915	0.943	18.858
Military	C-130	0.010	0.001	0.011
Total Average-Day Itinerant Operations:		197.051	10.371	207.422

Source: KB Environmental Sciences, Inc., 2017.
Notes: (1) Totals may be subject to rounding.

Table 16: 2024 No Build Alternative Average-Day GA Local Operations				
Aircraft Category	**Aircraft Types**	**Daytime Operations**	**Nighttime Operations**	**Total Operations**
Single-Engine Piston	Cessna 172/182	93.568	4.925	98.493
	Cessna 150	12.907	0.679	13.586
	Piper PA-28	12.329	0.649	12.978
	Cirrus SR20	8.579	0.452	9.030
	Piper PA-32 Cherokee Six	6.478	0.341	6.819
	Cirrus SR22	3.751	0.197	3.948
	Mooney M20	4.068	0.214	4.282
	Cessna 206/210	3.420	0.180	3.600
Multi-Engine Piston	Piper PA-23 / 31	8.888	0.468	9.356
	Piper PA-44 Seminole	3.808	0.200	4.008
	Beech Baron 55/58/60	1.778	0.094	1.871
	Cessna 310/340/414/421	1.650	0.087	1.737
Total Average-Day Local Operations:		161.224	8.485	169.710

Source: KB Environmental Sciences, Inc., 2017.
Notes: (1) Totals may be subject to rounding.

i. Flight Tracks

The flight tracks and flight track use percentages modeled for the 2024 No Build alternative were the same as the 2016 existing condition.

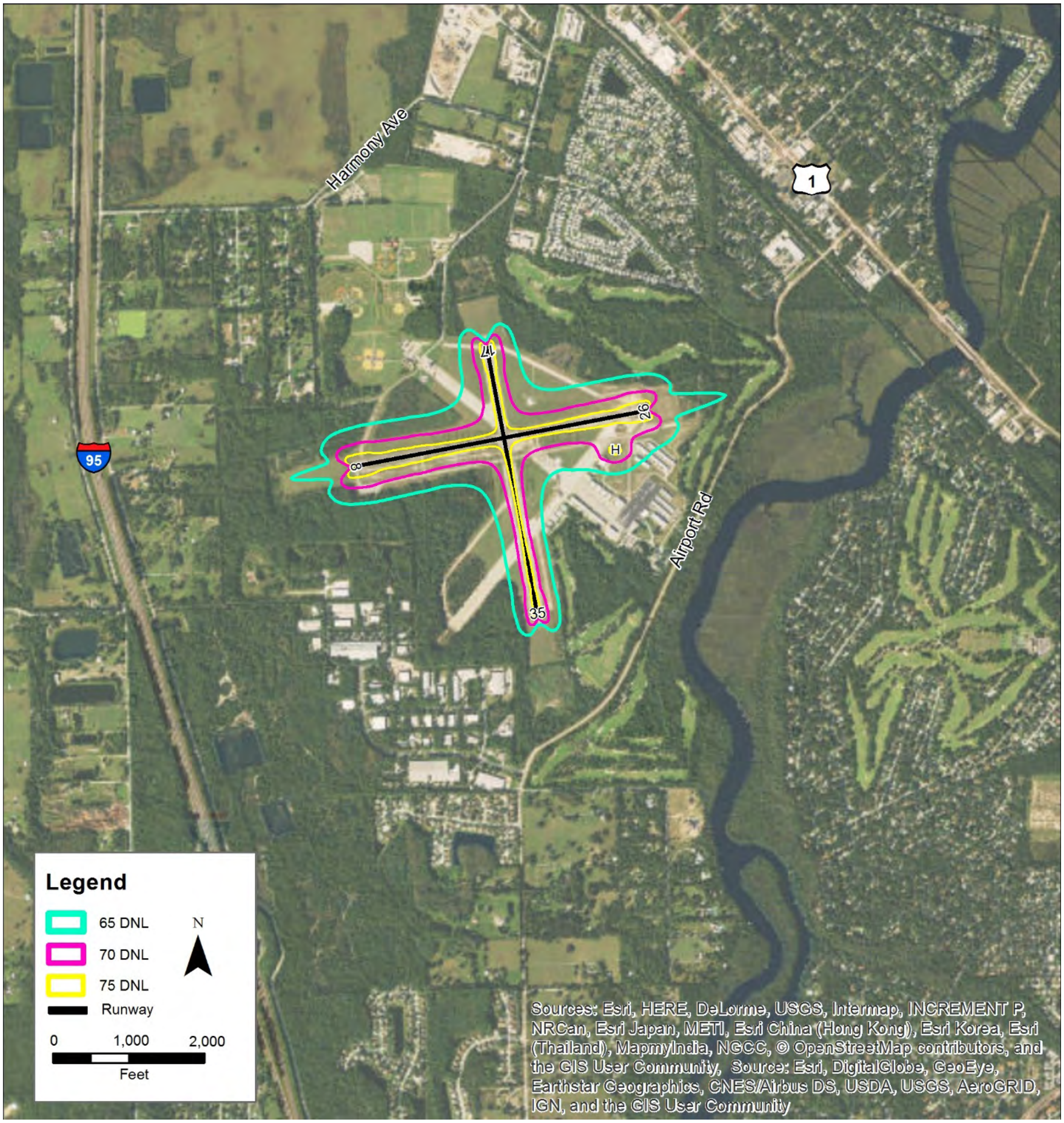
j. 2024 No Build Noise Contours

The 2024 No Build DNL contours are provided on **Figure 4**. **Table 17** identifies the areas within the DNL contour ranges. As shown in the table, the total area within the DNL 65 dB and greater contour is approximately 170 acres. Notably, there are no residences or other noise sensitive land uses within the 2024 No Build DNL 65 dB contour.

Table 17: 2024 No Build Alternative DNL Contour Areas	
DNL (dB)	**Area (Acres)**
65 to <70	93
70 to <75	51
75 and greater	26
Total	170

Source: KB Environmental Sciences, Inc., 2017.

Figure 4: 2024 No Build Alternative DNL Contours



Source: KB Environmental Sciences, Inc., 2017.

k. 2024 Build Alternative Noise Contours

The 2024 Build alternative includes a 1,000-foot extension to the west end of Runway 8/26. With the increased runway length, it is projected that an additional 654 annual jet operations would occur at the airport in 2024. These operations would increase the 2024 forecast annual operations to 138,307. **Table 18** includes the additional average-day jet aircraft operations forecast to occur as a result of the runway extension. These operations were added to the 2024 No Build alternative operations to model the 2024 Build alternative. The modeled Runway 8 flight tracks for the 2024 Build alternative were reflective of the Runway 8 end being moved 1,000 feet to the west. All other flight tracks remained the same as the No Build alternative.

Table 18: 2024 Build Alternative Average-Day Additional Forecast Jet Operations

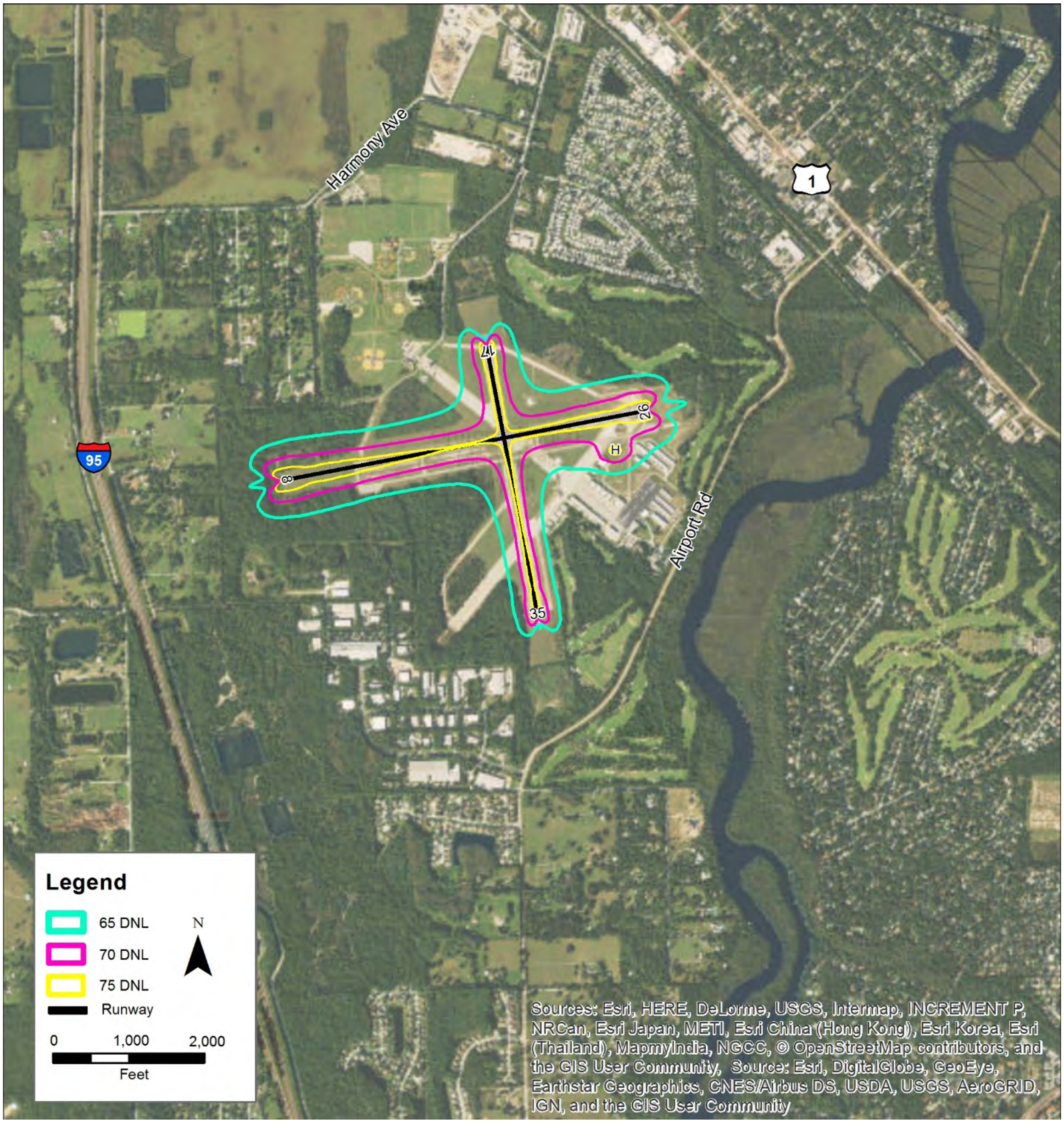
Aircraft Category	Aircraft Types	Daytime Operations	Nighttime Operations	Total Operations
Jet	Cessna 560 Citation XLS	0.593	0.031	0.625
	Cessna 680 Citation Sovereign	0.075	0.004	0.079
	Cessna 750 Citation X	0.091	0.005	0.096
	Bombardier Challenger 350	0.075	0.004	0.079
	Bombardier Challenger 600	0.075	0.004	0.079
	Embraer 505	0.075	0.004	0.079
	Dassault Falcon 2000-EX	0.029	0.002	0.030
	Cessna 550 Citation II	0.286	0.015	0.301
	Westwind II	0.349	0.018	0.367
	Bombardier Challenger 650	0.016	0.001	0.016
	Hawker 800XP	0.018	0.001	0.019
	Hawker 900XP	0.018	0.001	0.019
Total Average-Day Additional Jet Operations:		1.702	0.090	1.792

Source: HTA, Inc.; KB Environmental Sciences, Inc., 2017.

l. 2024 Build Alternative Noise Contours

The 2024 Build alternative DNL contours are provided on **Figure 5**. The contours expand to the west, reflective of the runway extension when compared to the No Build alternative. **Table 19** identifies the areas within the DNL contour ranges. The total area within the DNL 65 dB and greater contour is approximately 184 acres, an increase of 14 acres over the No Build alternative. This increase is primarily a result of the additional runway length. There are no residences or other noise sensitive land uses within the 2024 Build alternative DNL 65 dB contour.

Figure 5: 2024 Build Alternative DNL Contours



Source: KB Environmental Sciences, Inc.

Table 19: 2024 No Build Alternative DNL Contour Areas	
DNL (dB)	**Area (Acres)**
65 to <70	100
70 to <75	58
75 and greater	26
Total	184

Source: KB Environmental Sciences, Inc., 2017.

m. Mitigation

Because no noise sensitive land uses would experience a DNL 1.5 dB increase at or above DNL 65 dB in 2019 or 2024 as a result of the proposed action, no mitigation is required for noise.

Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Attachment L

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Volusia County, Florida

Ormond Beach Municipal Airport

March 22, 2017

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map

Map Scale: 1:18,300 if printed on A landscape (11" x 8.5") sheet.

Meters: 0, 250, 500, 1000, 1500

Feet: 0, 500, 1000, 2000, 3000

N

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Volusia County, Florida
Survey Area Data: Version 15, Sep 20, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 12, 2011—Dec 13, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Volusia County, Florida (FL127)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
4	Astatula fine sand, 0 to 8 percent slopes	85.4	6.9%
5	Astatula fine sand, 8 to 17 percent slopes	0.7	0.1%
8	Basinger fine sand, depressional, 0 to 1 percent slopes	19.2	1.5%
17	Daytona sand, 0 to 5 percent slopes	21.5	1.7%
29	Immokalee sand	13.3	1.1%
30	Immokalee sand, depressional	11.3	0.9%
32	Myakka-Myakka, wet, fine sands, 0 to 2 percent slopes	493.4	39.7%
33	Myakka fine sand, frequently ponded, 0 to 1 percent slopes	123.0	9.9%
34	Myakka-St. Johns complex	19.1	1.5%
37	Orsino fine sand, 0 to 5 percent slopes	94.0	7.6%
42	Paola fine sand, 0 to 8 percent slopes	8.7	0.7%
43	Paola fine sand, 8 to 17 percent slopes	5.5	0.4%
48	Placid fine sand, frequently ponded, 0 to 1 percent slopes	15.6	1.3%
49	Pomona fine sand	3.1	0.3%
63	Tavares fine sand, 0 to 5 percent slopes	147.6	11.9%
65	Terra Ceia muck, frequently ponded, 0 to 1 percent slopes	96.3	7.7%
67	Turnbull muck	63.6	5.1%
99	Water	22.4	1.8%
Totals for Area of Interest		**1,243.6**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Volusia County, Florida

4—Astatula fine sand, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 1ntt1
Elevation: 10 to 150 feet
Mean annual precipitation: 53 to 61 inches
Mean annual air temperature: 66 to 73 degrees F
Frost-free period: 285 to 315 days
Farmland classification: Not prime farmland

Map Unit Composition

Astatula and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Astatula

Setting

Landform: Ridges on marine terraces, hills on marine terraces
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Eolian or sandy marine deposits

Typical profile

A - 0 to 2 inches: fine sand
C - 2 to 95 inches: fine sand

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 to 50.02 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Other vegetative classification: Sand Pine Scrub (R155XY001FL), Sandy soils on ridges and dunes of xeric uplands (G155XB111FL)
Hydric soil rating: No

Minor Components

Deland

Percent of map unit: 3 percent
Landform: Ridges on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G155XB111FL)
Hydric soil rating: No

Orsino

Percent of map unit: 3 percent
Landform: Ridges on marine terraces, hills on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G155XB121FL)
Hydric soil rating: No

Apopka

Percent of map unit: 3 percent
Landform: Ridges on marine terraces, hills on marine terraces
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G155XB111FL)
Hydric soil rating: No

St. lucie

Percent of map unit: 2 percent
Landform: Dunes on marine terraces, ridges on marine terraces
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G155XB111FL)
Hydric soil rating: No

Paola

Percent of map unit: 2 percent
Landform: Knolls on marine terraces, hills on marine terraces
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G155XB111FL)
Hydric soil rating: No

Tavares

Percent of map unit: 2 percent
Landform: Ridges on marine terraces, flats on marine terraces
Landform position (three-dimensional): Interfluve

Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G155XB121FL)
Hydric soil rating: No

5—Astatula fine sand, 8 to 17 percent slopes

Map Unit Setting

National map unit symbol: 1nttd
Elevation: 30 to 150 feet
Mean annual precipitation: 53 to 61 inches
Mean annual air temperature: 66 to 73 degrees F
Frost-free period: 285 to 315 days
Farmland classification: Not prime farmland

Map Unit Composition

Astatula and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Astatula

Setting

Landform: Ridges on marine terraces, hills on marine terraces
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Eolian or sandy marine deposits

Typical profile

A - 0 to 3 inches: fine sand
C - 3 to 80 inches: fine sand

Properties and qualities

Slope: 8 to 17 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 to 50.02 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Other vegetative classification: Sand Pine Scrub (R155XY001FL), Sandy soils on strongly sloping to steep side slopes of xeric uplands (G155XB113FL)
Hydric soil rating: No

Minor Components

Paola

Percent of map unit: 10 percent
Landform: Ridges on marine terraces, valley sides on marine terraces
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on strongly sloping to steep side slopes of xeric uplands (G155XB113FL)
Hydric soil rating: No

Apopka

Percent of map unit: 5 percent
Landform: Ridges on marine terraces, hills on marine terraces
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on strongly sloping to steep side slopes of xeric uplands (G155XB113FL)
Hydric soil rating: No

8—Basinger fine sand, depressional, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2v16v
Elevation: 0 to 160 feet
Mean annual precipitation: 38 to 62 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 300 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Basinger, depressional, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Basinger, Depressional

Setting

Landform: Depressions on marine terraces, drainageways on marine terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave

Across-slope shape: Concave
Parent material: Sandy marine deposits

Typical profile

A - 0 to 5 inches: fine sand
E - 5 to 14 inches: fine sand
Bh/E - 14 to 36 inches: fine sand
Cg - 36 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum in profile: 1 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A/D
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL), Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Minor Components

Smyrna, hydric

Percent of map unit: 5 percent
Landform: — error in exists on —
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Samsula, muck

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL), Organic soils in depressions and on flood plains (G155XB645FL)
Hydric soil rating: Yes

Floridana, hydric

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Cypress Woodlands (MCV026CA), Sandy over loamy soils on stream terraces, flood plains, or in depressions (G155XB245FL)
Hydric soil rating: Yes

17—Daytona sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 1nts7
Elevation: 10 to 200 feet
Mean annual precipitation: 53 to 61 inches
Mean annual air temperature: 66 to 73 degrees F
Frost-free period: 285 to 315 days
Farmland classification: Not prime farmland

Map Unit Composition

Daytona and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Daytona

Setting

Landform: Knolls on marine terraces, rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Eolian or sandy marine deposits

Typical profile

A - 0 to 5 inches: sand
E - 5 to 36 inches: sand
Bh - 36 to 47 inches: sand
C - 47 to 80 inches: sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 42 to 60 inches

Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Other vegetative classification: Sand Pine Scrub (R155XY001FL), Sandy soils on rises, knolls, and ridges of mesic uplands (G155XB121FL)
Hydric soil rating: No

Minor Components

Electra

Percent of map unit: 3 percent
Landform: Flats on marine terraces, rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G155XB131FL)
Hydric soil rating: No

Immokalee, non-hydric

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Cassia

Percent of map unit: 3 percent
Landform: Flats on marine terraces, rises on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G155XB131FL)
Hydric soil rating: No

St. lucie

Percent of map unit: 2 percent
Landform: Dunes on marine terraces, ridges on marine terraces
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G155XB111FL)
Hydric soil rating: No

Orsino

Percent of map unit: 2 percent
Landform: Ridges on marine terraces, hills on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G155XB121FL)
Hydric soil rating: No

Satellite

Percent of map unit: 2 percent
Landform: Flats on marine terraces, rises on marine terraces
Landform position (three-dimensional): Talf, rise
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G155XB131FL)
Hydric soil rating: No

29—Immokalee sand

Map Unit Setting

National map unit symbol: 1ntsn
Elevation: 10 to 150 feet
Mean annual precipitation: 53 to 61 inches
Mean annual air temperature: 66 to 73 degrees F
Frost-free period: 285 to 315 days
Farmland classification: Not prime farmland

Map Unit Composition

Immokalee, non-hydric, and similar soils: 65 percent
Immokalee, hydric, and similar soils: 10 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Immokalee, Non-hydric

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 10 inches: sand
E - 10 to 34 inches: sand
Bh - 34 to 43 inches: sand
C - 43 to 85 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B/D
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Description of Immokalee, Hydric

Setting

Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 10 inches: sand
E - 10 to 34 inches: sand
Bh - 34 to 43 inches: sand
C - 43 to 85 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: B/D
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Minor Components

Placid
Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Myakka, non-hydric
Percent of map unit: 4 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Daytona
Percent of map unit: 4 percent
Landform: Knolls on marine terraces, rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G155XB121FL)
Hydric soil rating: No

Basinger, depressional
Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

St. johns, hydric
Percent of map unit: 3 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Smyrna, non-hydric

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Satellite

Percent of map unit: 3 percent
Landform: Flats on marine terraces, rises on marine terraces
Landform position (three-dimensional): Talf, rise
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G155XB131FL)
Hydric soil rating: No

30—Immokalee sand, depressional

Map Unit Setting

National map unit symbol: 1ntsq
Elevation: 30 to 150 feet
Mean annual precipitation: 53 to 61 inches
Mean annual air temperature: 66 to 73 degrees F
Frost-free period: 285 to 315 days
Farmland classification: Not prime farmland

Map Unit Composition

Immokalee, depressional, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Immokalee, Depressional

Setting

Landform: Depressions on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 8 inches: sand
E - 8 to 36 inches: sand
Bh - 36 to 50 inches: sand
C - 50 to 80 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: B/D
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL), Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Minor Components

Basinger, depressional

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Myakka, depressional

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Pompano, depressional

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Placid

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

St. johns, hydric

Percent of map unit: 4 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

32—Myakka-Myakka, wet, fine sands, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2twt7
Elevation: 10 to 130 feet
Mean annual precipitation: 50 to 60 inches
Mean annual air temperature: 70 to 73 degrees F
Frost-free period: 310 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Myakka and similar soils: 75 percent
Myakka, wet, and similar soils: 15 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Myakka

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 6 inches: fine sand
E - 6 to 20 inches: fine sand
Bh - 20 to 36 inches: fine sand
C - 36 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Description of Myakka, Wet

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 6 inches: fine sand
E - 6 to 20 inches: fine sand
Bh - 20 to 36 inches: fine sand
C - 36 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: A/D
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Minor Components

Basinger

Percent of map unit: 5 percent
Landform: Drainageways on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Convex, linear
Across-slope shape: Linear, concave
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Eaugallie, non-hydric

Percent of map unit: 4 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Placid, depressional

Percent of map unit: 1 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave, convex
Across-slope shape: Concave, linear
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

33—Myakka fine sand, frequently ponded, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2sm5d
Elevation: 0 to 140 feet
Mean annual precipitation: 38 to 62 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 320 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Myakka and similar soils: 85 percent

Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Myakka

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 5 inches: fine sand
E - 5 to 25 inches: fine sand
Bh - 25 to 39 inches: fine sand
C - 39 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A/D
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL), Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Minor Components

Basinger

Percent of map unit: 5 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Placid

Percent of map unit: 4 percent
Landform: Depressions on marine terraces, drainageways on marine terraces

Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL), Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Anclote

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL), Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Floridana

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL), Sandy over loamy soils on stream terraces, flood plains, or in depressions (G155XB245FL)
Hydric soil rating: Yes

Samsula

Percent of map unit: 1 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL), Organic soils in depressions and on flood plains (G155XB645FL)
Hydric soil rating: Yes

34—Myakka-St. Johns complex

Map Unit Setting

National map unit symbol: 1ntsv
Mean annual precipitation: 53 to 61 inches
Mean annual air temperature: 66 to 73 degrees F
Frost-free period: 285 to 315 days
Farmland classification: Not prime farmland

Map Unit Composition

Myakka, depressional, and similar soils: 60 percent
St. johns, depressional, and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Myakka, Depressional

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Sandy marine deposits

Typical profile

A - 0 to 5 inches: fine sand
E - 5 to 27 inches: fine sand
Bh - 27 to 43 inches: fine sand
C - 43 to 78 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A/D
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Description of St. Johns, Depressional

Setting

Landform: Depressions on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Sandy marine deposits

Typical profile

A - 0 to 10 inches: fine sand
E - 10 to 26 inches: fine sand

Bh - 26 to 43 inches: fine sand
B/C - 43 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: B/D
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Minor Components

Basinger, depressional

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Pompano, depressional

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Placid

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Valkaria

Percent of map unit: 2 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Pomona, depressional

Percent of map unit: 2 percent
Landform: Depressions on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Samsula

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Organic soils in depressions and on flood plains (G155XB645FL)
Hydric soil rating: Yes

37—Orsino fine sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 1ntsy
Elevation: 10 to 140 feet
Mean annual precipitation: 53 to 61 inches
Mean annual air temperature: 66 to 73 degrees F
Frost-free period: 285 to 315 days
Farmland classification: Not prime farmland

Map Unit Composition

Orsino and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Orsino

Setting

Landform: Ridges on marine terraces, hills on marine terraces

Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Eolian or sandy marine deposits

Typical profile

A - 0 to 6 inches: fine sand
E - 6 to 30 inches: fine sand
B/C - 30 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 to 50.02 in/hr)
Depth to water table: About 42 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Other vegetative classification: Sand Pine Scrub (R155XY001FL), Sandy soils on rises, knolls, and ridges of mesic uplands (G155XB121FL)
Hydric soil rating: No

Minor Components

Cassia

Percent of map unit: 5 percent
Landform: Flats on marine terraces, rises on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G155XB131FL)
Hydric soil rating: No

Daytona

Percent of map unit: 5 percent
Landform: Knolls on marine terraces, rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G155XB121FL)
Hydric soil rating: No

Paola

Percent of map unit: 5 percent

Landform: Knolls on marine terraces, hills on marine terraces
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G155XB111FL)
Hydric soil rating: No

Tavares

Percent of map unit: 5 percent
Landform: Ridges on marine terraces, flats on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G155XB121FL)
Hydric soil rating: No

42—Paola fine sand, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2tzwh
Elevation: 0 to 100 feet
Mean annual precipitation: 44 to 68 inches
Mean annual air temperature: 66 to 77 degrees F
Frost-free period: 285 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Paola and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paola

Setting

Landform: Knolls on marine terraces, ridges on marine terraces, flats on marine terraces, hills on marine terraces
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve, side slope, riser, rise, talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 6 inches: fine sand
E - 6 to 26 inches: fine sand
B/E - 26 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 8 percent

Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very high (20.00 to 50.02 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Other vegetative classification: Sand Pine Scrub (R155XY001FL), Sandy soils on ridges and dunes of xeric uplands (G155XB111FL)
Hydric soil rating: No

Minor Components

Astatula

Percent of map unit: 5 percent
Landform: Knolls on marine terraces, ridges on marine terraces, hills on marine terraces
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve, side slope, riser, rise
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G155XB111FL)
Hydric soil rating: No

Candler

Percent of map unit: 5 percent
Landform: Knolls on marine terraces, ridges on marine terraces, hills on marine terraces
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve, side slope, riser, rise
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Longleaf Pine-Turkey Oak Hills (R154XY002FL), Sandy soils on ridges and dunes of xeric uplands (G155XB111FL)
Hydric soil rating: No

Cassia

Percent of map unit: 5 percent
Landform: Knolls on marine terraces, ridges on marine terraces, hills on marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, tread, rise
Down-slope shape: Convex, linear
Across-slope shape: Linear

Other vegetative classification: Sand Pine Scrub (R154XY001FL), Sandy soils on rises and knolls of mesic uplands (G155XB131FL)
Hydric soil rating: No

43—Paola fine sand, 8 to 17 percent slopes

Map Unit Setting

National map unit symbol: 1ntt5
Elevation: 10 to 150 feet
Mean annual precipitation: 53 to 61 inches
Mean annual air temperature: 66 to 73 degrees F
Frost-free period: 285 to 315 days
Farmland classification: Not prime farmland

Map Unit Composition

Paola and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paola

Setting

Landform: Ridges on marine terraces, valley sides on marine terraces
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 5 inches: fine sand
E - 5 to 25 inches: fine sand
B/C - 25 to 80 inches: fine sand

Properties and qualities

Slope: 8 to 17 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 to 50.02 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: A
Other vegetative classification: Sand Pine Scrub (R155XY001FL), Sandy soils on strongly sloping to steep side slopes of xeric uplands (G155XB113FL)
Hydric soil rating: No

Minor Components

Daytona

Percent of map unit: 4 percent
Landform: Knolls on marine terraces, rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G155XB121FL)
Hydric soil rating: No

Orsino

Percent of map unit: 4 percent
Landform: Ridges on marine terraces, hills on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G155XB121FL)
Hydric soil rating: No

Astatula

Percent of map unit: 4 percent
Landform: Ridges on marine terraces, hills on marine terraces
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Other vegetative classification: Sandy soils on strongly sloping to steep side slopes of xeric uplands (G155XB113FL)
Hydric soil rating: No

Tavares

Percent of map unit: 3 percent
Landform: Ridges on marine terraces, flats on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G155XB121FL)
Hydric soil rating: No

48—Placid fine sand, frequently ponded, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2tzx9

Elevation: 0 to 250 feet
Mean annual precipitation: 44 to 61 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 335 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Placid and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Placid

Setting

Landform: Depressions on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Sandy marine deposits

Typical profile

A - 0 to 24 inches: fine sand
Cg - 24 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A/D
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL), Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Minor Components

Basinger

Percent of map unit: 7 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Myakka

Percent of map unit: 5 percent
Landform: Drainageways on flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Linear, concave
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Gentry

Percent of map unit: 3 percent
Landform: Depressions on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G155XB245FL)
Hydric soil rating: Yes

Samsula

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL), Organic soils in depressions and on flood plains (G155XB645FL)
Hydric soil rating: Yes

Felda

Percent of map unit: 2 percent
Landform: Drainageways on marine terraces, flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: Slough (R155XY011FL)
Other vegetative classification: Slough (R155XY011FL), Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
Hydric soil rating: Yes

49—Pomona fine sand

Map Unit Setting

National map unit symbol: 1nttc
Elevation: 20 to 120 feet
Mean annual precipitation: 53 to 61 inches

Mean annual air temperature: 66 to 73 degrees F
Frost-free period: 285 to 315 days
Farmland classification: Not prime farmland

Map Unit Composition

Pomona, non-hydric, and similar soils: 70 percent
Pomona, hydric, and similar soils: 10 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pomona, Non-hydric

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 5 inches: fine sand
E - 5 to 18 inches: fine sand
Bh - 18 to 45 inches: fine sand
E' - 45 to 50 inches: fine sand
Btg - 50 to 60 inches: fine sandy loam
C - 60 to 70 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Description of Pomona, Hydric

Setting

Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear

Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 5 inches: fine sand
E - 5 to 18 inches: fine sand
Bh - 18 to 45 inches: fine sand
E' - 45 to 50 inches: fine sand
Btg - 50 to 60 inches: fine sandy loam
C - 60 to 70 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Minor Components

Basinger, depressional

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Eaugallie, non-hydric

Percent of map unit: 4 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Wauchula, non-hydric

Percent of map unit: 3 percent

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
Hydric soil rating: No

Farmton, non-hydric
Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Immokalee, non-hydric
Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Myakka, non-hydric
Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

63—Tavares fine sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2sw00
Elevation: 0 to 130 feet
Mean annual precipitation: 38 to 62 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 300 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Tavares and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tavares

Setting

Landform: Knolls on marine terraces, ridges on marine terraces, flats on marine terraces, hills on marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, side slope, tread, rise
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Parent material: Eolian or sandy marine deposits

Typical profile

A - 0 to 6 inches: fine sand
C - 6 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: About 42 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Other vegetative classification: Sand Pine Scrub (R155XY001FL), Longleaf Pine-Turkey Oak Hills (R155XY002FL), Sandy soils on rises, knolls, and ridges of mesic uplands (G155XB121FL)
Hydric soil rating: No

Minor Components

Candler

Percent of map unit: 4 percent
Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G154XB111FL)
Hydric soil rating: No

Adamsville

Percent of map unit: 3 percent
Landform: Flats on marine terraces, rises on marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Upland Hardwood Hammock (R155XY008FL), Sandy soils on rises and knolls of mesic uplands (G155XB131FL)
Hydric soil rating: No

Cassia

Percent of map unit: 2 percent
Landform: Knolls on marine terraces, rises on marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sand Pine Scrub (R155XY001FL), Sandy soils on rises and knolls of mesic uplands (G155XB131FL)
Hydric soil rating: No

Zolfo

Percent of map unit: 1 percent
Landform: Rises on marine terraces, flatwoods on marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, rise
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on rises and knolls of mesic uplands (G155XB131FL)
Hydric soil rating: No

65—Terra Ceia muck, frequently ponded, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2svzl
Elevation: 0 to 130 feet
Mean annual precipitation: 37 to 62 inches
Mean annual air temperature: 68 to 79 degrees F
Frost-free period: 300 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Terra ceia and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Terra Ceia

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, convex
Across-slope shape: Concave, linear
Parent material: Herbaceous organic material

Typical profile

Oa1 - 0 to 15 inches: muck
Oa2 - 15 to 44 inches: muck
Oa3 - 44 to 80 inches: muck

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very high (about 26.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A/D
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL), Organic soils in depressions and on flood plains (G155XB645FL)
Hydric soil rating: Yes

Minor Components

Okeelanta

Percent of map unit: 6 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, convex
Across-slope shape: Concave, linear
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL), Organic soils in depressions and on flood plains (G155XB645FL)
Hydric soil rating: Yes

Gator

Percent of map unit: 5 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, convex
Across-slope shape: Concave, linear
Hydric soil rating: Yes

Tomoka

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, convex
Across-slope shape: Concave, linear
Other vegetative classification: Organic soils in depressions and on flood plains (G155XB645FL)
Hydric soil rating: Yes

Okeechobee

Percent of map unit: 2 percent
Landform: Marshes on depressions on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear, convex
Across-slope shape: Linear
Hydric soil rating: Yes

Placid

Percent of map unit: 1 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, convex
Across-slope shape: Concave, linear
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Anclote, depressional

Percent of map unit: 1 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, convex
Across-slope shape: Concave, linear
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL), Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Chobee

Percent of map unit: 1 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave, linear
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL), Organic soils in depressions and on flood plains (G155XB645FL)
Hydric soil rating: Yes

Pompano

Percent of map unit: 1 percent
Landform: Drainageways on depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear

Other vegetative classification: Slough (R155XY011FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

67—Turnbull muck

Map Unit Setting

National map unit symbol: 1ntv0
Mean annual precipitation: 53 to 61 inches
Mean annual air temperature: 66 to 73 degrees F
Frost-free period: 285 to 315 days
Farmland classification: Not prime farmland

Map Unit Composition

Turnbull, tidal, and similar soils: 70 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Turnbull, Tidal

Setting

Landform: Tidal marshes on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material over sandy and clayey estuarine deposits

Typical profile

Oa - 0 to 14 inches: muck
Cg1 - 14 to 49 inches: clay
2Cg2 - 49 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Strongly saline (16.0 to 32.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 70.0
Available water storage in profile: High (about 11.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8

Hydrologic Soil Group: D
Other vegetative classification: Salt Marsh (R155XY009FL), Forage suitability group not assigned (G155XB999FL)
Hydric soil rating: Yes

Minor Components

Hydraquents, tidal

Percent of map unit: 30 percent
Landform: Tidal marshes on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G155XB999FL)
Hydric soil rating: Yes

99—Water

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Interpretive groups

Land capability classification (irrigated): None specified
Other vegetative classification: Forage suitability group not assigned (G155XB999FL)
Hydric soil rating: Unranked

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Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Attachment M

CONTAMINATION LOCATOR MAP

Florida DEP

Search Criteria: Sites in Ormond Beach. Cleanup types: ▲ Brownfields ▲ Petroleum ▲ Superfund ▲ Other Waste Cleanup

For further information, please call the Waste Cleanup Hotline at (866)282-0787. **If you wish to search again, please click here**

Print Clear Reload

DEP Cleanup Sites: 27 found.

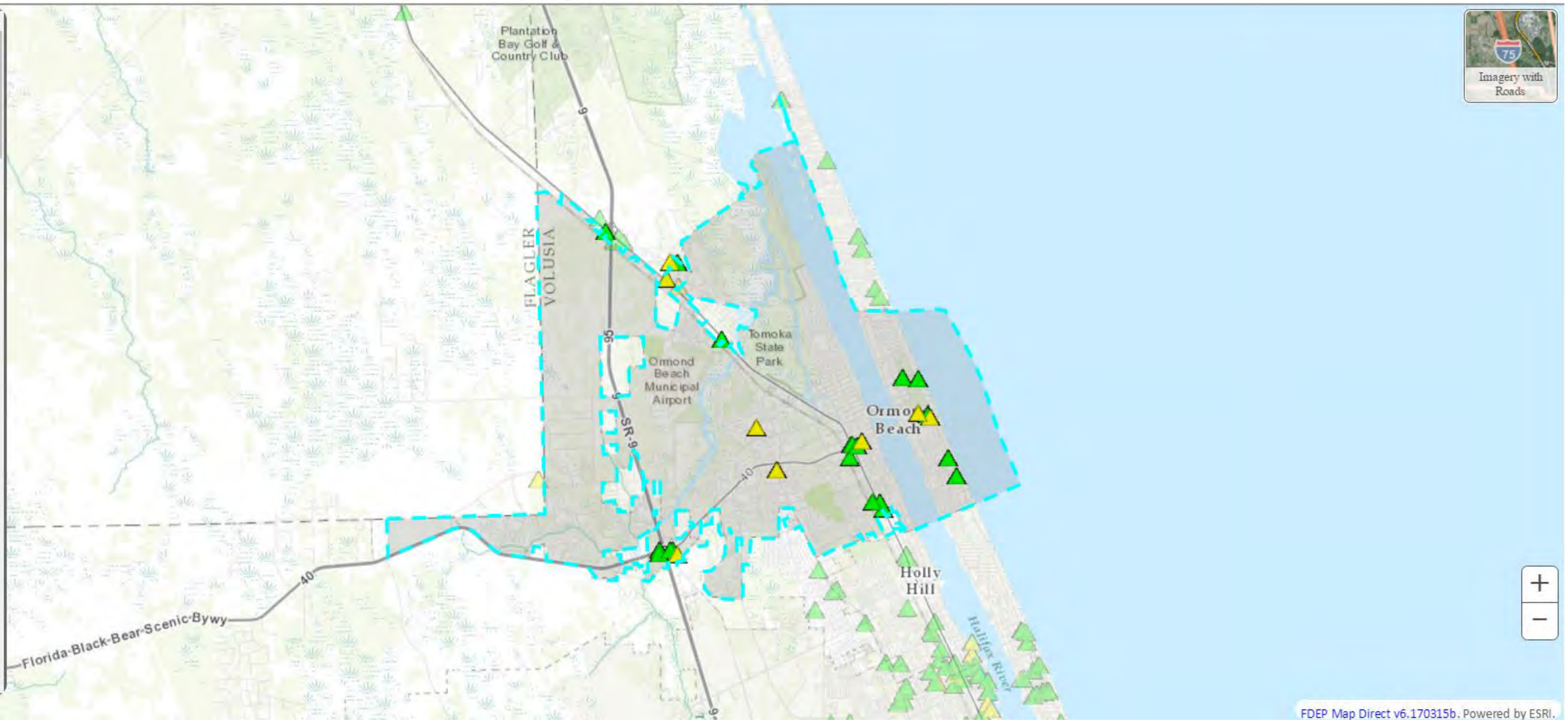
SUNSHINE FOOD MART #230
1622 N US HWY 1 I-95
ORMOND BEACH, FL 32074
Facility Id: 8517563
ACTIVE Petroleum Cleanup
Watch This Site
Documents

Hudson Tool & Die Company Inc
1327 N US Hwy 1
Ormond Beach, FL 32174
Facility Id: FLD054880216
ACTIVE Other Cleanup
Watch This Site
Documents

HOMAC MANUFACTURING CO
12 SOUTHLAND RD
ORMOND BEACH, FL 32174
Facility Id: COM_205198
ACTIVE Other Cleanup
Watch This Site
Documents

VOLUSIA CNTY-HALIFAX FIRE STATION #13
15 SOUTHLAND RD
ORMOND BEACH, FL 32174
Facility Id: 8622677
ACTIVE Petroleum Cleanup
Watch This Site
Documents

SUNSHINE FOOD MART #204
1628 GRANADA BLVD
ORMOND BEACH, FL 32074
Facility Id: 8517258
ACTIVE Petroleum Cleanup
Watch This Site



DEP Cleanup Sites: 27 found.

SUNSHINE FOOD MART #230
1622 N US HWY 1 I-95
ORMOND BEACH, FL 32074
Facility Id: 8517563
ACTIVE Petroleum Cleanup
Watch This Site
Documents

Hudson Tool & Die Company Inc
1327 N US Hwy 1
Ormond Beach, FL 32174
Facility Id: FLD054880216
ACTIVE Other Cleanup
Watch This Site
Documents

HOMAC MANUFACTURING CO
12 SOUTHLAND RD
ORMOND BEACH, FL 32174
Facility Id: COM_205198
ACTIVE Other Cleanup
Watch This Site
Documents

VOLUSIA CNTY-HALIFAX FIRE STATION #13
15 SOUTHLAND RD
ORMOND BEACH, FL 32174
Facility Id: 8622677
ACTIVE Petroleum Cleanup
Watch This Site
Documents

SUNSHINE FOOD MART #204
1628 GRANADA BLVD
ORMOND BEACH, FL 32074
Facility Id: 8517258
ACTIVE Petroleum Cleanup
Watch This Site
Documents

SUNRISE FOOD MART #57
1629 W GRANADA BLVD
ORMOND BEACH, FL 32174
Facility Id: 8517543
ACTIVE Petroleum Cleanup
Watch This Site
Documents

SUNOCO #0041-8012
1546 W GRANADA BLVD
ORMOND BEACH, FL 32174
Facility Id: 8517248
ACTIVE Petroleum Cleanup
Watch This Site
Documents

CIRCLE K #2722574
1520 HWY 40 & WILLIAMSON BLVD
ORMOND BEACH, FL 32174

Facility Id: 8517430
ACTIVE Petroleum Cleanup
Watch This Site
Documents
Ormond Beach Cleaners Inc
1482 W Granada Blvd Ste 610
Ormond Beach, FL
Facility Id: 000649500356
PENDING Other Cleanup
Watch This Site
Documents
CIRCLE K #2722104
1058 N US 1
ORMOND BEACH, FL 32176
Facility Id: 9600128
PENDING Petroleum Cleanup
Watch This Site
Documents
NOVA ROAD LANDFILL
520 NORTH NOVA ROAD
ORMAND BEACH, FL 32174
Facility Id: COM_299893
ACTIVE Other Cleanup
Watch This Site
Documents
Touch of Class Cleaners
160 S Nova Rd
Ormond Beach, FL
Facility Id: 000649501392
ACTIVE Other Cleanup
Watch This Site
Documents
ORMOND BEACH CITY - PUBLIC WORKS
298 TOMOKA AVE
ORMOND BEACH, FL 32174
Facility Id: 8622686
PENDING Petroleum Cleanup
Watch This Site
Documents
SHELL-FIRST COAST ENERGY #1090
201 W GRANADA BLVD
ORMOND BEACH, FL 32174
Facility Id: 8517403
ACTIVE Petroleum Cleanup
Watch This Site
Documents
SUNOCO #0405-2205
3 N YONGE ST
ORMOND BEACH, FL 32174
Facility Id: 8622767
ACTIVE Petroleum Cleanup
Watch This Site
Documents

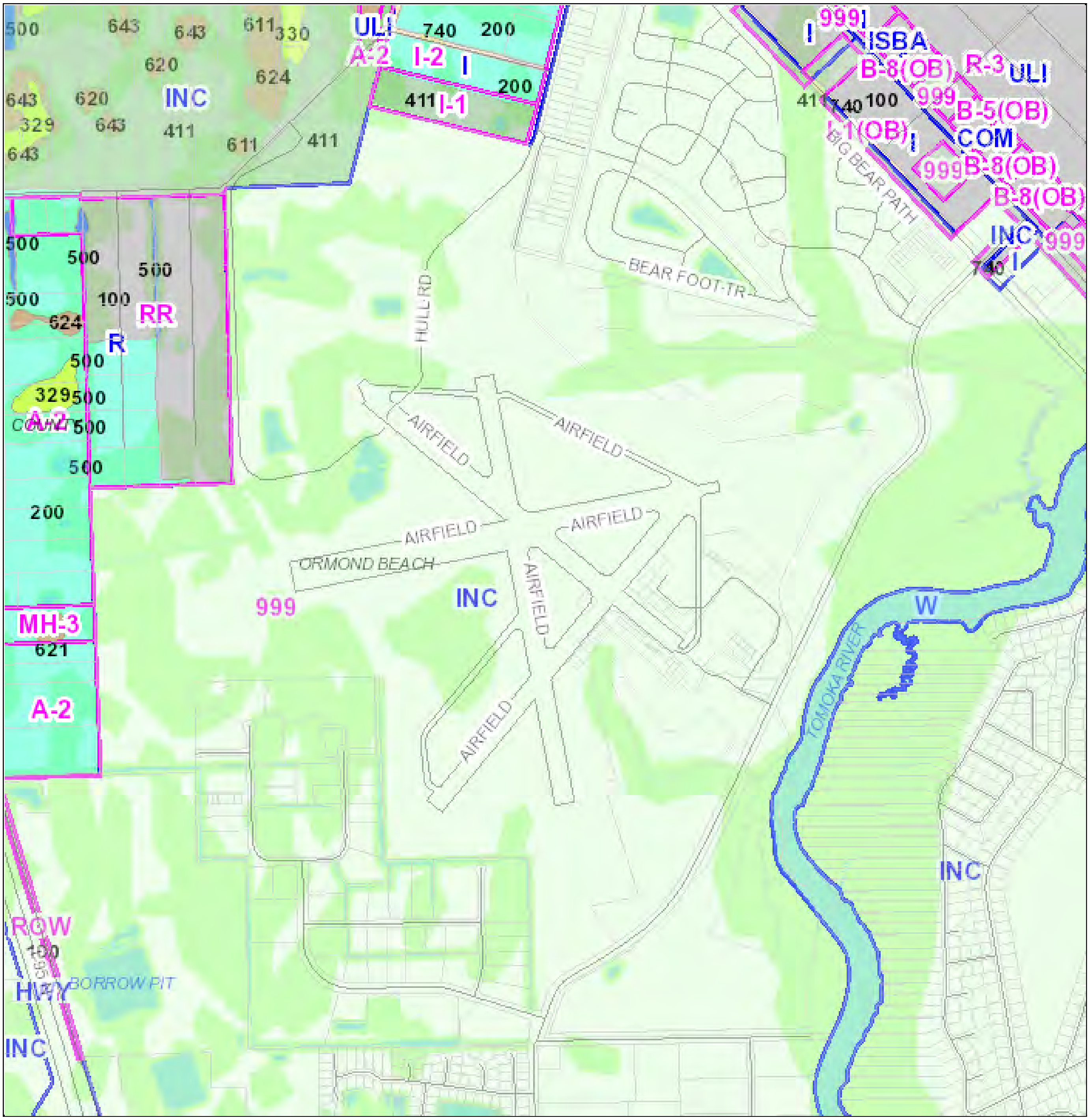
ORMOND BEACH CITY - PUBLIC SAFTEY
170 W GRANADA BLVD
ORMOND BEACH, FL 32174
Facility Id: 8622774
PENDING Petroleum Cleanup
Watch This Site
Documents
Sunshine Cleaners
124 W Granada Blvd
Ormond Beach, FL
Facility Id: 000649501022
ACTIVE Other Cleanup
Watch This Site
Documents
GREGS ROOFING INC
545 PARQUE DR
ORMOND BEACH, FL 32174
Facility Id: 8631447
ACTIVE Petroleum Cleanup
Watch This Site
Documents
ORLANDO & SONS REPAIR CENTER INC
569 S YONGE ST
ORMOND BEACH, FL 32174
Facility Id: 8517580
ACTIVE Petroleum Cleanup
Watch This Site
Documents
SUGAR CREEK #5
625 S YONGE ST
ORMOND BEACH, FL 32174
Facility Id: 8517582
ACTIVE Petroleum Cleanup
Watch This Site
Documents
MOBIL-ATLANTIC ENTERPRISES INC
650 S ATLANTIC AVE
ORMOND BEACH, FL 32176
Facility Id: 8735190
ACTIVE Petroleum Cleanup
Watch This Site
Documents
SUNOCO #0696-4746
460 S ATLANTIC AVE
ORMOND BEACH, FL 32176
Facility Id: 8517583
ACTIVE Petroleum Cleanup
Watch This Site
Documents
Granda Dry Cleaners
52 Bovard Ave
Ormond Beach, FL
Facility Id: 000649500452
PENDING Other Cleanup

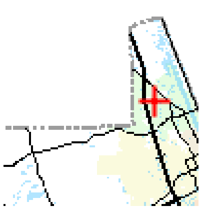
Watch This Site
Documents
SHELL-FIRST COAST ENERGY #3084
30 S ATLANTIC AVE
ORMOND BEACH, FL 32176
Facility Id: 8517595
ACTIVE Petroleum Cleanup
Watch This Site
Documents
Quick Clean Coin Laundry
125 E Granada Blvd
Ormond Beach, FL
Facility Id: 000649501192
PENDING Other Cleanup
Watch This Site
Documents
EMBRY RIDDLE AERONAUTICAL UNIVERSITY
317 OCEAN SHORE BLVD
ORMOND BEACH, FL 32176
Facility Id: 9101759
PENDING Petroleum Cleanup
Watch This Site
Documents
143 NEPTUNE
143 NEPTUNE AVE
ORMOND BEACH, FL 32176
Facility Id: 9806832
PENDING Petroleum Cleanup
Watch This Site
Documents

Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Attachment N

VOLUSIA COUNTY LAND USE MAP





Scale 1:16,401 - 1 in = 1,367 ft
Date Created:
22-Mar-17 10:45 AM

Legend

County Zoning

County Future Land Use

Environmental Review Required

SOURCE: PARCEL DATA, VOLUSIA COUNTY PROPERTY APPRAISER

Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Attachment O

Ormond Beach Municipal Airport

P.O. Box 277 Ormond Beach, FL 32175 Office: (386) 615-7019 Fax: (386) 676-3330

May 22, 2017

Virginia Lane
Environmental Specialist
FAA Airports District Office
5950 Hazeltine National Drive, Suite 400
Orlando, Florida 32822

RE: Land Use Assurances for Ormond Beach Municipal Airport
Runway 8-26 Extension, Easement Acquisition and Obstruction Removal

Dear Ms. Lane:

The City of Ormond Beach, Florida, as the grant sponsor of the Ormond Beach Municipal Airport Runway 8-26 Extension Project makes the following statement of compatible land use assurance pursuant to Section 511 (a)(5) of the Airport and Airway Improvement Act of 1982, as amended:

The City of Ormond Beach provides assurance that appropriate action and enforcement of zoning laws, has been or will be taken, to the extent reasonable, to restrict the use of land adjacent to or near Ormond Beach Municipal Airport to activities and purposes compatible with normal airport operation, including landing and takeoff of aircraft per 49 USC Section 47107(a)(10).

Sincerely,

Steven R. Lichliter
Airport Manager

Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Attachment P

U.S. Department
of Transportation

Federal Aviation
Administration

Advisory Circular

Subject: SPECIFICATION FOR DISCHARGE-TYPE FLASHING LIGHT EQUIPMENT	**Date:** 09/08/10 **Initiated by:** AAS-100	**AC No.:** 150/5345-51B **Change:**

1. PURPOSE. This advisory circular (AC) contains the specifications for discharge-type flashing light equipment to be used for runway end identification lights (REIL) and for an omni-directional approach lighting system (ODALS).

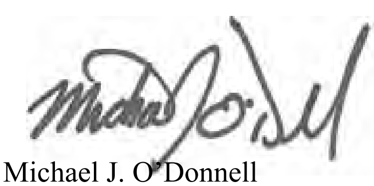
2. EFFECTIVE DATES. Effective six months after the issue date of this advisory circular, only equipment certified per the specifications herein will be listed per AC 150/5345-53, Airport Lighting Equipment Certification Program.

3. CANCELLATION. This AC cancels AC 150/5345-51A, Specification for Discharge-Type Flashing Light Equipment, dated 09/15/05.

4. APPLICATION. The Federal Aviation Administration (FAA) recommends the specifications contained in this AC in all applications involving development of this nature. In general, use of this AC is not mandatory. However, use of the AC is mandatory for all projects funded with federal grant monies through the Airport Improvement Program (AIP) and with revenue from the Passenger Facility Charges (PFC) Program. See Grant Assurance No. 34, “Policies, Standards, and Specifications,” and PRC Assurance No. 9, “Standards and Specifications.”

5. PRINCIPAL CHANGES. This AC adds FAA Engineering Brief #67 as a reference to provide requirements for light sources other than incandescent and xenon.

6. METRICS. To promote an orderly transition to metric units, this AC contains both English and metric dimensions. The metric conversions may not be exact metric equivalents, and, until there is an official changeover to the metric system, the English dimensions will govern.



Michael J. O’Donnell
Director of Airport Safety and Standards

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LIST OF TABLES

1. SCOPE AND CLASSIFICATION.

1.1 Scope.

The flashing light equipment in this specification is used for runway end identification lights (REIL) and for an omni-directional approach lighting system (ODALS).

1.2 Classification.

Four types and six styles of flashing light equipment are in this specification.

1.2.1 Types.

L-849V – REIL powered by airport voltage power source

L-849I – REIL powered by constant current 6.6 A power supply

L-859V – ODALS powered by airport voltage power source

L-859I – ODALS powered by constant current 6.6 A power supply

1.2.2 Styles.

A - Unidirectional, high intensity, one brightness step.

B - Omni-directional, high intensity, one brightness step.

C - Unidirectional, low intensity, one brightness step.

D - Omni-directional, low intensity, one brightness step.

E - Unidirectional, three brightness steps.

F - Omni-directional, three brightness steps.

All styles apply to Type L-849, only Style F applies to Type L-859.

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2. REFERENCED DOCUMENTS.

2.1 General.

The following is a listing of documents referenced in this document. All references are to the current versions found on www.faa.gov.

2.1.1 Federal Aviation Administration (FAA) Publications.

2.1.1.1 FAA Advisory Circulars.

AC 150/5345-10	Specification for Constant Current Regulators Regulator Monitors
AC 150/5345-43	Specification for Obstruction Lighting Equipment
AC 150-5345-47	Specification for Series to Series Isolation Transformers for Airport Lighting Systems
AC 150/5345-53	Airport Lighting Equipment Certification Program

2.1.1.2 FAA Drawing.

C-6046	Frangible Coupling, Type 1 and 1A, Details

2.1.1.3 FAA Specifications.

FAA-G-2100	Electronic Equipment, General Requirements
FAA-E-1100	Photometric Test Procedures for Condenser Discharge Lamps

2.1.1.4 FAA Engineering Briefs

Engineering Brief #67	Light Sources Other Than Incandescent and Xenon for Airport and Obstruction Lighting Fixtures

2.1.2 Military and Federal Publications.

2.1.2.1 Military Specification and Standard.

MIL-C-7989	General Specification for Light-transmitting Cover for Aeronautical Lights
MIL-STD-810	Environmental Engineering Considerations and Laboratory Tests

2.1.2.2 Federal Standard.

FED-STD-595	Colors Used in Government Procurement

2.1.2.3 Code of Federal Regulations (CFR).

Code of Federal Regulations (CFR)	Title 47, Telecommunications, Part 15, Radio Frequency Devices

2.1.3 Institute of Electrical and Electronics Engineers IEEE)/American National Standards Institute (ANSI) Publications.

IEEE C37.90	Relays and Relay System Associated with Electric Power Apparatus
IEEE C62.41	IEEE Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits
IEEE C62.45	IEEE Recommended Practice on Surge Testing for Equipment

Connected to Low-Voltage (1000 V and Less) AC Power Circuits

2.1.4 National Electrical Manufacturers Association (NEMA) Publication.

NEMA 250	Enclosures for Electrical Equipment (1,000 Volts Maximum)

2.1.5 Powder Coating Institute (PCI) Publication.

PCI	Powder Coating - The Complete Finisher's Handbook, 3rd edition.

2.1.6 Illuminating Engineering Society of North America (IESNA) Publication.

IESNA	IESNA Handbook (Document no. IESNA HB-9-2000)

2.1.7 International Standardization Organization (ISO) Publication.

ISO-10012	Measurement Management Systems – Requirements for Measurement Processes

Copies of FAA advisory circulars may be obtained from:

U.S. Department of Transportation
Subsequent Distribution
Office Ardmore East Business Center
3341 Q 75th Ave.
Landover, MD 20785

Tel: (301) 322-4961
FAX: (301) 386-5394
Website: www.faa.gov/airports/resources/advisory_circulars/

Copies of military standards and specifications publications may be obtained from:

DAPS/DODSSP
Building 4, Section D
700 Robbins Avenue
Philadelphia, PA 19111-5094

Tel: (215)697-2179
FAX: (215)697-1460
Website: dodssp.daps.dla.mil

Copies of Federal specifications and standards may be obtained from:

Federal Supply Services
Specification Section
470 L'Enfant Plaza East
SW Suite 8100
Washington, DC 20407

Tel: (202) 619-8925
FAX: (202) 619-8985
Website: www.dsp.dla.mil

Copies of Code of Federal Regulations (CFRs) may be obtained free of charge from:

Website: www.gpoaccess.gov

Copies of International Electrical and Electronics Engineers standards may be obtained from:

IEEE Customer Service Center
445 Hoes Lane
P.O. Box 1331
Piscataway, NJ 08855-1331

Tel: (800) 678-4333
FAX: (732) 981-0060 *(Worldwide)*
FAX: (732) 981-9667
E-mail: storehelp@ieee.org
Website: shop.ieee.org/ieeestore

Information about obtaining National Electrical Manufacturers Association (NEMA) publications can be obtained from:

NEMA
1300 North 17th Street
Suite 1847
Rosslyn, VA 22209

Tel: (703) 841-3286
FAX: (703) 841 3386
Website: www.nema.org

Copies of Powder Coating Institute documents may be obtained from:

PCI Publications
2121 Eisenhower Avenue
Suite 401
Alexandria, VA 22314

Tel: (800) 988-COAT
FAX: (703) 684-1711
Website: www.powdercoating.org

Copies of Illuminating Engineering Society of North America documents may be obtained from:

IESNA
120 Wall Street, Floor 17
New York, NY 10005

Phone: (212) 248-5000
FAX: (212) 248-5017/18
Website: www.iesna.org

Copies of the International Standardization Organization document is available online from:

Website: www.iso.ch

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3. EQUIPMENT REQUIREMENTS.

3.1 Equipment to be Supplied by the Manufacturer.

Each system must include the following items:

a. Control Unit - one per system.

b. Optical Assembly:

(1) Two optical heads for Type L-849I/V systems.

(2) Seven optical heads for Type L-859I/V systems.

c. Power supply (as required for each system).

d. Instruction manual - one per system.

3.1.1 Connecting Cables.

Cables for connecting between the control unit and optical assemblies or between the optical head and power supply when installed remotely (paragraph 3.5.2) are not included in this specification. However, the instruction manual must provide sufficient information to guide the installer in selecting the proper cables.

3.2 System Description.

The REIL system is used to identify the threshold (approach end) of a visual or instrument non-precision runway and provides guidance to pilots during approach for landing. The REIL consists of two uni-directional or omni-directional simultaneous discharge-type flashing lights. A light is located at each side of the runway threshold.

The ODALS system uses seven omni-directional discharge-type flashing lights, five of which are installed on an extended runway centerline. The lights flash in sequence and appear as a ball of light traveling toward the runway threshold. This aids the pilot in determining which runway is in use. In addition to the five centerline lights, two lights are installed in a REIL configuration. The two REIL system lights flash simultaneously after the last flash of the centerline lights.

3.3 Environmental Requirements.

The equipment must be designed for outdoor operation in the following environmental conditions:

a. Temperature: The equipment must operate at temperatures from (–40 to +131 degrees Fahrenheit (F) (–40 to +55 degrees Celsius (C)).

b. Altitude: The equipment must operate at altitudes from sea level to 10,000 feet (3,000 meters).

c. Temperature Shock: The equipment must operate and not be damaged by the sudden application of cold water to the light emitting surface of an optical assembly at its normal operating temperature.

d. Humidity: The equipment must operate at a relative humidity of up to 100 percent, including conditions of dew or frost.

e. Salt spray: The equipment must operate when exposed to a salt laden atmosphere.

f. Rain: The equipment must operate when exposed to windblown rain.

g. Wind: The equipment must not be damaged when exposed to wind velocities of 150 knots (278 kilometers per hour).

h. Solar Radiation (Sunshine): If any non-metallic exterior components or plastic/thermoplastic lenses are used, they must be resistant to solar radiation.

3.4 Photometric Requirements.

3.4.1 Effective Intensity.

The optical assemblies must meet the effective intensity requirements listed in Table 1 with a tolerance of plus or minus 50 percent for the following beam patterns:

a. Styles A, C, and E: 10 degrees vertical by 30 degrees horizontal.

b. Styles B, D, and F: from 2 to 10 degrees vertical by 360 degrees horizontal.

The effective intensity must be maintained when the equipment is operated within plus or minus 10 percent of the design input voltage or when operated at the design input voltage and subjected to the temperature range per paragraph 3.3a. Light output below the vertical cutoff points must be minimized.

Table 1. Effective Intensity Requirements

Type	Style	Effective Intensity (candelas (cd)) Brightness Step		
		High	Medium	Low
L-849	A	15,000	--	--
L-849	B	5,000	--	--
L-849	C	--	--	700
L-849	D	--	--	700
L-849	E	15,000	1,500	300
L-849	F	5,000	1,500	300
L-859	F	5,000	1,500	300

NOTE: *For styles A, C, and E, corners may be rounded on a 5-degree radius to determine compliance.*

c. The effective intensity for flashing lights must be determined with the following formula by the methods described in the IESNA Handbook.

$$I_e = \left(\int_{t_1}^{t_2} I dt \right) / \left(0.2 + \left(t_2 - t_1\right)\right)$$

Where:

I_e	=	Effective intensity (Candela)
I	=	Instantaneous intensity (Candela)
t_1, t_2	=	Times in seconds of the beginning and end of that part of the flash when the value of I exceeds I_e. This choice of the times maximizes the value of I_e.

d. If multiple pulses are used to form what is apparent to an observer as a single flash, see AC 150/5345-43, paragraph 3.4.1.1, for additional descriptions and effective intensity measurement methods.

3.4.2 Flash Rate, Type L-849.

a. For L-849V/I Style B, D, and F: the flash rate must be 60 flashes per minute (fpm) plus or minus 10 percent.

b. For L-849V/I Style A, C, and E: the flash rate must be 120 flashes per minute plus or minus 10 percent.

c. Both optical assemblies must flash simultaneously with no more than 20 milliseconds of difference between them.

3.4.3 Flash Rate, Type L-859.

a. The optical heads must flash at a rate of 60 fpm, 10 percent tolerance.

b. The flash sequence must start with optical assembly located farthest from the runway threshold. The remaining assemblies must flash in sequence toward the runway threshold.

(1) The interval between flashes of the projected runway centerline units must be 1/15 second.

(2) The interval between the flash of the last runway centerline optical assembly and the simultaneous flashes of the REIL configuration must be 4/15 second.

c. The interval between the REIL configuration flash and the start of a new cycle must be 7/15 second.

d. All flash intervals must be within 10 percent of the specified time.

3.4.4 Color of Light.

The color of light emitted by the optical head assemblies must be equivalent to that produced by an unfiltered xenon gas discharge lamp (approximately 4,000-8,000 degrees Kelvin).

3.5 Equipment Design Requirements.

3.5.1 General Operating Requirements.

a. The discharge-type flashing light systems must be capable of for continuous operation.

b. Style E and F equipment must have three intensity settings: high, medium, and low.

c. All systems must have provisions for remote control per paragraph 3.5.4.2

d. Lamp intensity changes must be completed within 1.50 seconds after initiating the command.

e. The power input to the optical assembly may be interrupted during intensity step changes.

f. The system design must prohibit the occurrence of flashes other than per paragraphs 3.4.2 and 3.4.3.

3.5.2 Optical Assembly.

a. The optical assembly consists of an optical head and a power supply.

b. The Type L-849 optical head must be attached to the power supply enclosure.

c. Type L-859 optical heads must be capable of being attached to the power supply enclosure or installed remotely up to 150 feet (45 m) from the power supply.

d. Brackets must be provided for mounting the optical head directly to the power supply enclosure or onto a single vertical 2-inch Electrical Metallic Tubing (EMT) conduit for remote locations.

e. The Type L-859 optical head must weigh no more than 12 pounds (5.5 kg).

f. When installed, the overall height of the Type L-849 optical assembly must not exceed 34 inches (0.85 m) above grade.

g. Frangible mounting hardware per FAA Drawing C-6046 (or equivalent) must be provided for Type L-849 optical assemblies and for Type L-859 optical heads mounted on 2-inch EMT conduit.

3.5.2.1 Flash Tube.

The flash tube must operate without failure or adjustment for a minimum of 1,000 hours while meeting the flash rates and high intensity requirements per paragraph 3.4.1. The effective intensity must not decrease more than 30 percent during this time period and flash skipping (misfiring) must be less than one percent with no skips occurring consecutively.

3.5.2.2 Power Supply.

The power supply provides power and triggering pulses to the optical head.

a. A power supply may power more than one optical head assembly.

b. The power supply must be designed to operate safely and reliably with the voltages and amperages required and with safety features consistent with those required for the control unit.

c. The power supply must be housed in a National Electrical Manufacturers Association (NEMA) type 4 (or equal) enclosure with a hinged access door and provision for padlocking.

d. Frangible points per FAA Drawing C-6046 (or equivalent) and associated hardware must be provided to mount the power supply enclosure on its foundation

3.5.2.3 Aiming and Leveling.

a. Style A, C, and E optical heads must be designed so the light beam may be aimed in a vertical and horizontal plane.

b. A positive locking device must be provided to prevent accidental movement of the optical head after aiming.

c. The optical head must be adjustable vertically from 0 to 15 degrees and horizontally 15 degrees each side of a zero reference point.

d. Aiming reference scales must be graduated in a maximum of one degree increments.

e. Style B, D, and F optical heads must have provisions to permit adjustment, after installation, of up to 6 degrees for leveling.

3.5.3 Control Unit.

The control unit powers and controls the individual optical assemblies.

NOTE: *At the manufacturer's option, the control unit may be integrated into a power supply enclosure; however, the following requirements must still be met with regard to any power supply/control unit.*

a. The control unit must be designed to operate from a 120/240 volt AC source or optionally from other standard commercial voltages.

b. The control unit must be housed in a NEMA type 4 enclosure (or equal) with a hinged door and have provisions for padlocking.

c. Terminal blocks with a suitable voltage rating must be located near the side or bottom of the enclosure for termination of external power and control wires feeding into the control unit. The terminal blocks must accommodate No. 8 through No. 20 American Wire Gauge (AWG) wires with an insulation rating up to 600V.

d. Mounting lugs or bolts must be provided on the back of the enclosure to allow vertical mounting.

e. If the control unit is not integrated with the power supply, frangible points per FAA Drawing C-6046 (or equivalent) and associated hardware must be provided to mount the control enclosure on its foundation.

f. A service entrance power disconnect switch must be furnished when utilizing either a voltage or constant current power source.

g. If the disconnect switch is mounted external to the control unit enclosure, it must be weatherproof and have provisions for locking.

h. A ground terminal must be provided on the outside of the control unit enclosure.

3.5.3.1 Elapsed Time Meter.

The manufacturer may optionally offer elapsed time meters in either L-849 or L-859 power supply assemblies.

a. The meter elapsed time must be in hours up to 999.

b. The meter must be a recycling type.

3.5.3.2 Series Circuit Adapter

An optional adapter may be provided to allow the discharge-type lighting system to be powered by an airport series lighting circuit (that may or may not have other types of lighting on the same circuit) which is energized by a constant current regulator as described in AC 150/5345-10, Specification for Constant Current Regulators Regulator Monitor. When the runway edge lights are on, the discharge-type lighting equipment must be on.

a. The circuit adapter must be compatible with series to series isolation transformer per AC 150/5345-47, Specification for Series to Series Isolation Transformers for Airport Lighting Systems. The input to the isolation transformer will be either from a 6.6 or 20 ampere series lighting circuit. The output of the transformer must be 6.6A to the series lighting circuit adapter. The manufacturer does not supply the isolation transformer or any associated cabling.

b. The discharge-type lighting system must operate and be compatible with all approved constant current regulators. A series circuit adapter must provide ON/OFF control of Type L-849I, Styles A,B,C, and D single intensity equipment depending on the current level in the runway lighting circuit. For Type L-849I Styles E and F and Type-L859 Style F three intensity level equipments, see Table 2 to correlate regulator current steps with discharge-type lighting equipment brightness levels.

c. The series circuit adapter circuitry may be incorporated into the control unit or housed in a separate enclosure. Any separate enclosure must pass all the environmental tests in this specification.

d. Approved regulator manufacturers (listed in AC 150/5345-53, Airport Lighting Equipment Certification Program) will make available oscilloscope photographs or digital images (e.g., JPG, TIF, BMP) of the output waveforms of their regulators; the manufacturer of the flashing light equipment is responsible for any lack of compatibility.

Table 2. Constant Current Regulator (CCR) Settings and Discharge Lighting Equipment Intensity Levels

Runway Lighting Circuits	CCR Current	Discharge Lighting Equipment Intensity Level
Medium Intensity Runway Lighting	3 Step Regulator (6.6 Amps (A))	
	6.6 (A)	High Intensity
	5.5 A	Medium Intensity
	4.8 A	Low Intensity
High Intensity Runway Lighting (6.6A)	5 Step Regulator (6.6 A)	
	6.6 A	High Intensity
	5.2 A	High Intensity
	4.1 A	Medium Intensity
	3.4 A	Low Intensity
	2.8 A	Low Intensity
High Intensity Runway Lighting (20 A)	5 Step Regulator (20 A)	
	20.0 A	High Intensity
	15.8 A	High Intensity
	12.8 A	Medium Intensity
	10.3 A	Low Intensity
	8.5 A	Low Intensity

3.5.4 System Control.

3.5.4.1 Local Control.

All discharge-type lighting systems must have a local control capability located in the control unit for maintenance purposes. For equipment Styles A, B, C, and D, a three position switch must be per Table 3.

Table 3. Single Intensity Switch Functions

Switch position	Switch Function
REMOTE	System controlled by remote control (ON/OFF/Intensity)
ON	System ON
OFF	System OFF

For equipment Styles E and F, the switch must be a five position rotary switch with mechanical detents, labeled as follows to perform the indicated functions per Table 4.

Table 4. Three Intensity Switch Functions

Switch position	Switch Function
REMOTE	System controlled by remote control (ON/OFF/Intensity)
OFF	Power and control circuits de-energized
LOW	System operating at LOW intensity flash
MEDIUM	System operating at MEDIUM intensity flash
HIGH	System operating at HIGH intensity flash

3.5.4.2 Remote Control.

a. The Control Unit for Types L-849V and L-859V must have provisions for remote control by a switch or by a radio receiver/decoder unit. The operating voltage for the remote control system must not exceed 120 volts AC or plus 48 volts DC and is applied only when the local control is in the REMOTE position.

b. For single intensity discharge-type lighting systems (Styles A, B, C, and D), ON/OFF control is provided via 3 terminals (120 volts AC or plus 48 volts DC, ON, and Neutral).

c. For three intensity discharge-type lighting systems (Styles E and F), five terminals must be provided for control, as follows:

(1) Low Intensity

(2) Medium Intensity

(3) High Intensity

(4) 120 volts AC or plus 48 volts DC

(5) Neutral

3.5.4.2.1 Intensity-Step Switching.

a. A 120-volt AC or plus 48 volts DC source terminal fused for a 150-watt load shall be provided to activate the remote-control switching network.

b. For single-step style systems, the remote switch will close a circuit between the 120-volt or plus 48 volt DC source and an "on" terminal; the system will turn on when this terminal receives the 120-volt AC or plus 48 volt DC potential.

c. For multiple-step systems, the 120-volt AC or plus 48 volts DC potential (terminal (4)) is provided only when the local control switch is in the "remote" position.

d. The remote switching network will return the 120-volt AC or plus 48 volts DC potential to terminal (1), (2), or (3), and the system will turn on to the selected intensity.

e. If more than one intensity terminal is energized, the system shall operate at the highest intensity selected.

3.5.5 Circuit Design.

The circuit design and construction must be in accordance with highest standards, with emphasis on reliability and long life. The brightness control circuit must be designed such that it will revert to the lowest brightness setting in the event of failure.

3.5.6 Electrical Protection.

The system must be protected against electrical transients found in the airport environment as described below.

3.5.6.1 Transient Suppression.

To protect against input power line surges, the system must withstand without operational interruption or damage a 50-millisecond pulse with a peak value of 500 volts superimposed on the input power lines.

3.5.6.2 Dielectric Protection.

When installed in an operational environment per the manufacturer's instructions, the system must withstand repeated applications of a 5,000 volt potential between the equipment case (electrical ground) and any control or power conductor for 10 milliseconds.

3.5.6.3 Lightning Protection.

a. Lightning arresters must be installed on all ungrounded conductors as near as possible to their cabinet entry point.

b. The arrester's spark-over voltage must be less than the unit's dielectric withstand rating (paragraph 3.5.6.2). Telephone or gap-type arresters must not be used.

3.5.6.4 Radiated and Conducted Emissions.

a. The discharge light system must cause minimal conducted emissions (power lines/interface cables) and radiated RF emissions that may cause harmful interference to FAA or other airport equipment located on or near the airport (see paragraph 4.2.7 for measurements).

b. Discharge lighting equipment is classified as an incidental radiator (47 CFR § 15.13). This applies to equipment that does not intentionally generate any radio frequency energy, but may create such energy as an incidental part of its intended operations.

c. A discharge lighting system must employ sound engineering practices to minimize the risk of harmful interference. Since the equipment is operated in an environment where radiated RF and conducted emissions are a concern, both the conducted and radiated limits must be tested.

3.5.6.5 Electromagnetic Interference (EMI).

EMI sensitive components, such as timers or controllers, must be adequately shielded or otherwise protected.

3.5.6.6 Interlock Switches.

a. Interlock switches must be used in the control unit and power supplies so that opening the enclosure will:

(1) Disconnect the input power.

(2) Safely discharge all voltages over 150 volts to 50 volts within 30 seconds. This discharge must occur, even if components that normally draw current from the high voltage power supply are removed.

(3) Means must be provided to defeat the interlock with the door open for maintenance purposes.

b. The system design must include bleeder resistors to discharge the high voltage (>150V) power supply to 50 volts within 5 minutes after input power is disconnected. This feature must serve as a back-up to the interlock activated bleeder circuit.

c. If an interlock is not provided on an optical assembly, a warning label must be attached advising the maintainer not to open the optical assembly until the system power has been disconnected and the high voltage power supply is safely discharged.

3.6 Material and Parts.

a. All materials and parts used in the discharge lighting system must be suitable for the intended purpose and adequately protected against corrosion.

b. All assembly hardware, including screws, bolts, nuts, washers, and latches must be 18-8 stainless steel.

c. All wiring and components must have adequate capacity and must not be operated in excess of the manufacturer's ratings.

3.6.1 Light Covers.

a. Light transmitting covers for the optical head assembly must be per MIL-C-7989B (8 March 1971), paragraph 1.2, Class A for glass and Class D for plastic. The light transmitted by the covers must not be noticeably different in chromaticity from the illuminant.

b. If plastic or thermoplastic light transmitting covers are used, they must withstand prolonged exposure to ozone and ultraviolet radiation with no degradation.

3.6.2 Gaskets.

a. Gasket material used must withstand temperatures from –40 to +131 degrees F (–40 to +55 degrees C).

b. Gasket materials used in the optical head assembly must withstand prolonged exposure to ultraviolet radiation and ozone with no degradation.

3.6.3 Special Component Requirements.

a. All materials and components (including the insulation on wiring) which are located in or near the optical head assembly must be resistant to ultraviolet radiation and ozone.

b. Flash capacitors must be suitable for the application and have a service life greater than 1 year in continuous operation at the working voltage.

3.7 Finish.

a. The exterior of all units must be painted with 3 coats of aviation orange paint, matching color No. 12197, FED-STD-595.

b. Interior surfaces must be painted white.

c. Painting must be done per FAA-STD-012.

d. Nonferrous enclosures will not require painting if the exterior material color matches aviation orange; otherwise the exterior surfaces must receive the 3 coats of paint.

e. Powder coatings with equivalent color, appearance, and corrosion protection properties may be substituted for paint. See Powder Coating Institute publication: *Powder Coating - The Complete Finisher's Handbook*, 3rd edition, for guidance about the selection, application, and corrosion resistance.

3.8 Assembly and Marking.

a. All components must be properly assembled and marked.

b. Each electrical component or part thereof must be identified by a reference designation marked adjacent to the physical location of the part of the equipment and readily visible to maintenance personnel.

c. Identification markings must be identical to reference designations used in instruction books for the equipment.

d. All wiring must, where possible, be grouped, color coded, laced into cables, neatly clamped, and properly marked.

e. Wire marking must be per FAA-G-2100g, paragraph 3.3.1.3.10.2

3.9 System Nameplates.

Identification data must be permanently affixed to each equipment unit (optical head, power supply, control unit, etc.) and must contain at least the following information:

a. Name of unit (optical head, power supply, etc.).

b. Type and style.

c. Manufacturer's name and address.

d. Manufacturer's part Number.

3.10 Instruction Manual.

An instruction manual must be supplied as part of each system and must contain the following information:

a. Safety precautions used while maintaining the equipment.

b. Theory of circuit and system operation.

c. Complete schematics and interconnecting wiring diagrams.

d. Complete parts list with each circuit component keyed to the designation assigned on schematics or wiring diagrams. Complete information shall be given for each part to permit ordering for replacement purposes. This information shall include the component's rating, name of the manufacturer, and the manufacturer's part number.

e. Recommended preventive maintenance.

f. Troubleshooting procedures.

g. Physical characteristics (weight, size, mounting dimensions).

h. Installation instructions.

i. Operating instructions.

4. EQUIPMENT QUALIFICATION REQUIREMENTS.

4.1 Qualification Requirements.

4.1.1 Qualification Request.

Procedures for qualifying equipment to be furnished under the Federal grant assistance program for airports are contained in AC 150/5345-53, Airport Lighting Equipment Certification Program, Appendix 2.

4.2 Test Procedures.

The environmental tests specified in the following paragraphs must be conducted on a system (a control unit and at least one optical assembly). Operational tests required during or after environmental tests per the particular test methods must consist of a least one operational cycle per paragraph 4.2.14 with all test components connected together.

Where tests are conducted on an abbreviated system (a system without a complete complement of optical assemblies), the load imposed by the missing components and their interconnecting cables must be simulated by equivalent circuits.

A photometric test as described in this section must be performed before conducting any environmental tests. The same units must be used throughout the tests.

4.2.1 Altitude Test.

The equipment must be tested for low pressure (altitude) per MIL-STD-810F (1 January 2000), Method 500.4, Procedure II, Operation/Air Carriage.

a. The maximum altitude must be 10,000 feet (2,000 meters).

b. The maximum chamber ambient air temperature must be 131 degrees F (55 degrees C).

c. Allow the equipment to temperature stabilize.

d. Perform an operational test of the equipment after one hour of altitude and high temperature soak. Failure of the equipment to operate properly will be cause for rejection.

e. After the test chamber has depressurized and cooled, examine the equipment components for evidence of discoloration, cracking, or swelling. Any deterioration of materials will be cause for rejection.

4.2.2 Thermal Shock Test

The equipment must be installed as in normal use and operated at maximum intensity until the temperatures have stabilized. At a temperature between 32-41 degrees F (0-5 degrees C), water must be applied in droplets, having a diameter range between 0.5 and 4.5 millimeters, to the light face. There must be no cracking of glass, metal, or plastic as a result of this test.

4.2.3 Humidity.

The equipment must be tested for humidity tolerance per MIL-STD-810F (1 January 2000), Method 507.4, Humidity.

a. The chamber maximum temperature must be 131 degrees F (55 degrees C) maximum for this test.

b. Subject the equipment to five cycles (48 hours per cycle) at 95% relative humidity at a maximum temperature per paragraph 4.2.1.4a. See MIL-STD-810F (1 January 2000), Figure 507.4-1 for a graph of humidity cycles. Perform an equipment operational test at hour 24 of the test cycle.

c. At the conclusion of testing, inspect the equipment and components. Any evidence of water (condensation), corrosion, discoloration, swelling, or cracking will be cause for rejection.

4.2.4 Rain Test.

a. The rain test must be conducted per Method 506.4, Procedure I, paragraph 4.4.2 of MIL-STD-810F (1 January 2000).

(1) A simulated rainfall rate of 4 inches per hour or 1.7 millimeters per minute must be used.

(2) Wind velocity must be 40 miles per hour or 18 meters per second.

(3) The EUT must be at ambient temperature for this test.

b. Perform an operability test of the equipment under test (EUT) prior to the rain test.

CAUTION: *Perform a preliminary inspection before energizing the equipment to remove any accumulated water and prevent a potential shock hazard to test personnel.*

c. At the conclusion of rain testing and after a preliminary inspection for water intrusion, perform an operational test of the equipment.

d. If the EUT fails to operate or water has penetrated the equipment, it is a cause for rejection.

NOTE: *If the housing is ventilated, small amounts of water may penetrate the equipment during this test but must not be cause for rejection. Water penetration must not prevent proper operation of the equipment, and a path of egress for the water must be provided.*

4.2.5 Wind.

An optical head mounted to a power supply enclosure and one mounted to a 2-inch EMT conduit must be subjected to a 150-knot wind applied perpendicular to the optical head face. Distress or damage to any part of the assembly must be cause for rejection.

4.2.6 Salt Fog Test.

a. A salt fog test must be conducted to determine the discharge lighting equipment resistance to a salt laden atmosphere. Tests must be conducted per MIL-STD-810F (1 January 2000), Method 509.4, Salt Fog, Paragraph 4.5.2, Procedure I.

b. At the conclusion of salt fog testing, inspect the EUT for evidence of corrosion, flaking paint/powder coating, gasket failure, and in enclosed volumes for water damage where condensation may have occurred. Any evidence of the preceding will be cause for rejection.

c. Inspect circuit boards and components for evidence of corrosion, swelling, or discoloration. Any evidence of the preceding will be cause for rejection.

CAUTION: *Energize the EUT only after it has been determined there will be no shock hazard.*

d. Energize the EUT and perform an operational test. Failure of the equipment to operate properly will be cause for rejection.

4.2.7 Radiated and Conducted Emissions Tests.

a. The discharge lighting equipment must be in its normal operating configuration for the following tests.

b. The equipment tested must not exceed the conducted power line emissions per 47 CFR § 15.107b:

Table 5. Conducted Emission Limits

Frequency of Emission (MHz)	Quasi-peak Emissions Decibels per microvolt dB/µV	Average Emissions dB/µV
0.15 - 0.5	79	66
0.5 -30.0	73	60

c. The equipment tested must not exceed the radiated emission limits per 47 CFR § 15.109b for the following limits at 33 feet (10 meters):

Table 6. Radiated Emission Limits

Frequency of Emission (MHz)	Field Strength (microvolts per meter)
30-88	90
88-216	150
216-960	210
Above 960	300

d. If the equipment is not per the limits in paragraph 4.2.7b and c, the manufacturer must be advised that there is a potential for harmful interference with the operation of FAA or other airport equipment.

4.2.8 Transient Suppression Test.

The control unit and one optical assembly shall be tested for conformance to the requirements specified in 3.5.6.1. The test method shall be developed using IEEE C37.90 as a guide.

4.2.9 Solar Radiation (Sunshine) Test.

The equipment must be in its normal operational configuration for this test.

a. A sunshine test must be conducted in accordance with MIL-STD-810F (1 January 2000), Method 505.4, paragraph 4.4.3, Procedure II for all discharge lighting equipment with nonmetallic exterior parts or plastic/thermoplastic light covers.

b. The discharge lighting equipment must be subjected to a minimum of 56 cycles.

c. Perform an operational test of the equipment after 56 cycles.

d. Any evidence of deterioration of plastic parts: chalking, bleaching, cracking, hazing, or color changes (yellowing) to the thermoplastic lenses of the test unit must be causes for rejection.

e. For plastic/thermoplastic optical lenses or covers, the photometric performance must be measured after this test.

4.2.10 Visual Inspection.

The equipment must be visually inspected for workmanship, fabrication, finish, painting, and adequacy of selected parts.

4.2.11 Photometric Tests.

Photometric tests must be conducted on equipment to determine compliance with 3.4. Photometric tests must be conducted per FAA-E-1100, *Photometric Test Procedures for Condenser Discharge Lights.* Test results must include a graph showing the isocandela curve of effective intensity for each brightness setting and oscilloscope photographs or digital image files (e.g., TIF, JPG, BMP) of the discharge pulse shape.

4.2.12 Dielectric Tests.

a. A dielectric test must be made on power and control wiring of the system.

b. The test must be made by applying both positive and negative 5kV pulses, 10 milliseconds minimum, between input power and control wires and ground (equipment case).

c. The test must continue until 10 pulses have been applied during a 10-second interval or until a 5kV DC voltage has been applied for 10 seconds.

d. The equipment must be capable of normal operation after this test.

e. After completion of the dielectric test, a 1,000-volt DC insulation tester must be used to check the same points.

f. The resistance to ground, as observed with the insulation tester, must not be less than 300 megohms.

g. Components not designed for the high voltage of the insulation tester such as capacitors, rectifiers, printed circuit boards, transient suppressors, etc., may be disconnected for this test.

h. Production units need only be checked with the insulation tester.

4.2.13 Lightning Protection Test.

NOTE: *The equipment might be damaged by the following tests, perform them only after all other testing is complete.*

a. Subject the equipment power line and control line inputs to 3 pulses at 15 second intervals to a standard 1.2/50 microsecond - 8/20 microsecond combination wave of 4,000 volts at 3,000 amps.

b. See IEEE C62.41-1991 Section 9.3 for test condition and test generator information.

c. See IEEE C62.41-1991 Section 9.4 for a detailed combination and ring wave generation and parameters discussion.

d. See also IEEE C62.45, IEEE Recommended Practice on Surge Testing for Equipment Connected to Low-Voltage (1000 V and less) AC Power Circuits*,* for guidance about equipment test methods.

4.2.14 Operational Test.

a. All components that will be part of a particular system must be connected together when undergoing operational tests.

b. For qualification testing, the components must be interconnected with the maximum length of interconnecting cable specified (paragraph 3.5.2c).

c. Proper operation of the interlock switches must be verified.

d. All operating requirements of the equipment must be checked over the full range of input voltage variations at the control unit power input terminal.

e. The brightness switching operation of the components must be verified through the remote control inputs provided in the control unit.

4.2.15 Eighty-hour Test.

An 80-hour continuous operation test must be performed on the system. All intensities must be checked using the remote control to cycle the system as described below, with a 10 percent tolerance on the time intervals specified.

a. Low Intensity - 5 minutes.

b. Off - 2 seconds.

c. Medium Intensity - 5 minutes.

d. Off - 2 seconds.

e. High Intensity - 5 minutes.

f. Off - 60 seconds.

g. Repeat Cycle, starting with a.

The local control switch must be manually cycled through the off, low, medium, and high intensity step positions a minimum of 20 times at the completion of the 80-hour test. Flashtubes used in the 80-hour test must not be shipped as part of the equipment but must be replaced with new flashtubes.

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5. PRODUCTION TESTS.

Production units must be subjected to the following tests:

5.1 Visual Inspection.

Per paragraph 4.2.10.

5.2 Photometric Tests.

a. Style A, C, and E production units shall be checked at the beam center, ± 15 degrees horizontally from the beam axis, and ± 5 degrees vertically from the beam axis.

b. Style B, D, and F production units shall be checked at 2, 6, and 10 degrees vertically for maximum and minimum points to determine compliance with 3.4.1.

5.3 Dielectric Test.

Per paragraph 4.2.12.

5.4 Operational Test.

Per paragraph 4.2.14.

5.5 Five-And-One-Half-Hour Test.

All production units must have a 5½-hour continuous operational test performed on them using the remote control inputs as follows:

a. High Intensity - 5 hours, minimum.

b. Per paragraph 4.2.15, cycle the equipment through steps a through g - one-half hour, minimum.

c. The local control switch must be manually cycled through the off, low, medium, and high intensity positions a minimum of 20 times at the completion of the 5½-hour test.

5.6 Failures.

Units failing any part of the production test must be repaired and undergo a complete retest per paragraphs 5.1 through 5.5.

5.7 Production Test Equipment.

All measuring and test equipment used in the production of discharge lighting equipment classified under paragraph 1.2 must have their accuracy and precision maintained by a calibration program with traceability to ISO-10012 *Measurement Management Systems – Requirements for Measurement Processes* or current industry accreditation criteria. The manufacturer must show that all production photometric testing equipment correlates to the certifying laboratory's equipment to within plus or minus 5 percent. Photometric testing must be performed in a properly designed photometric range using a calibrated photometer. All photometric measurements must be based on a minimum five flash average.

5.8 Production Test Records.

The manufacturer shall maintain records showing actual test results of all tests required by paragraphs 5.2 through 5.5 for a period of three years. These records shall be traceable to the units tested by serial number.

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Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Attachment Q

U.S. Department
of Transportation
Federal Aviation
Administration

Advisory Circular

Subject: PRECISION APPROACH PATH INDICATOR (PAPI) SYSTEMS

Date: 9-29-2011
Initiated by: AAS-100

AC No.: 150/5345-28G
Change:

1. **PURPOSE.** This Advisory Circular (AC) contains the Federal Aviation Administration (FAA) standards for the Precision Approach Path Indicator (PAPI) systems, which provides pilots with visual glideslope guidance during approach for landing.

2. **EFFECTIVE DATE**. Effective six months after the issue date of this AC, only that equipment qualified in accordance with the specifications herein will be listed in accordance with AC 150/5345-53, *Airport Lighting Equipment Certification Program*.

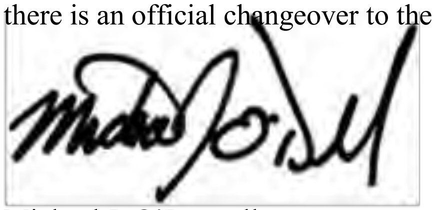
3. **CANCELLATION.** AC 150/5345-28F, *Precision Approach Path Indicator (PAPI) Systems*, dated April 12, 2005, is cancelled.

4. **APPLICATION.** The Federal Aviation Administration (FAA) recommends the guidance and specifications in this Advisory Circular for Design and Installation Details for the Precision Approach Path Indicator System. In general, use of this AC is not mandatory. However, use of this AC is mandatory for all projects funded with federal grant monies through the Airport Improvement Program (AIP) and with revenue from the Passenger Facility Charges (PFC) Program. See Grant Assurance No. 34, "Policies, Standards, and Specifications," and PFC Assurance No. 9, "Standards and Specifications." The lighting configurations contained in this standard are a means acceptable to the Administrator to meet the lighting requirements of Title 14 CFR Part 139, Certification of Airports, Section 139.311, Marking, Signs and Lighting. See exception in paragraph 2.1.2b (2), Location and Spacing.

5. **PRINCIPAL CHANGES.**

a. Incorporated Engineering Brief #67, Light Sources Other Than Incandescent and Xenon For Airport and Obstruction Lighting Fixtures, when using alternative lighting devices.
b. Paragraph 3.14.1 – Surge protection category is changed from category C1 to C2.
c. Paragraph 5a – FAA Approval is changed to 3rd party certification body approval for production tests.

6. **METRIC UNITS.** To promote an orderly transition to metric units, this specification includes both "English" and "Metric" dimensions. The metric conversions may not be exact equivalents and until there is an official changeover to the metric system the English dimensions will govern.



Michael J. O'Donnell
Director of Airport Safety and Standards

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1. SCOPE

This AC contains the equipment requirements for PAPI systems.

NOTE: *Chapter 2, Section 16, Siting and Installation Standards have been removed from this document and relocated to AC 150/5340-30, Installation Details for Airport Visual Aids.*

1.1 PAPI Equipment Classifications

a. Type.

(1) L-880 - System consisting of 4 light units.

(2) L-881- System consisting of 2 light units.

b. Style.

(1) Style A - Voltage powered systems.

(2) Style B - Current powered (series lighting circuit) systems.

c. Class.

(1) Class I - Systems that operate from -31 degrees Fahrenheit (F) (-35 degrees Centigrade [C]) to 131 degrees F (55 degrees C).

(2) Class II - Systems that operate from -67 degrees F (-55 degrees C) to 131 degrees F (55 degrees C).

d. Options.

(1) Lamp socket bypass device in paragraph 3.11.2.

(2) An isolation transformer consolidating harness for Style B systems in paragraph 3.9.6.3.1.

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2. APPLICABLE DOCUMENTS

The following documents are referenced in this AC.

a. FAA ACs:

AC 150/5345-53	Airport Lighting Equipment Certification Program
AC 150/5345-26	Specification for L-823 Plug and Receptacle, Cable Connectors
AC 150/5345-47	Isolation Transformers for Airport Lighting Systems
AC 150/5345-49	Specification L-854, Radio Control Equipment

Electronic copies of FAA ACs may be obtained from:

Internet: www.faa.gov/airports/resources/advisory_circulars/

Or by standard mail at:

Department of Transportation
General Services Paragraph M443.2
Washington, DC 20590

b. FAA Standards and Drawings:

FAA-STD-019	*Lightning and Surge Protection, Grounding, Bonding and Shielding Requirements for Facilities and Electronic Equipment*
FAA Drawing C-6046	*Frangible Coupling, Type 1 and 1A, Details*

Electronic copies of FAA Standards may be obtained from:

Internet: www.faa.gov/air_traffic/nas/system_standards/standards/

FAA drawings may be obtained from:

FAA William J. Hughes Technical Center
NAS Documentation Facility, ACK-1
Atlantic City International Airport
New Jersey, 08405

c. FAA Engineering Brief:

Engineering Brief #67*, Light Sources Other Than Incandescent and Xenon For Airport and Obstruction Lighting Fixtures*

Electronic copies of FAA Engineering Briefs may be obtained from:

Internet: www.faa.gov/airports/engineering/engineering_briefs/

d. Military Specifications and Standards.

MIL-C-7989 *Covers, Light Transmitting, for Aeronautical Lights, General Specification for*

NOTE: MIL-C-7989 is withdrawn – AAS-100 maintains a copy on website with this Advisory Circular.

MIL-STD-810F *1 January 2000, Environmental Test Methods and Engineering Guidelines*

e. Federal Standards

FED-STD-595 *Colors Used in Government Procurement*

Copies of Military Standards may be obtained from:

Internet: dodssp.daps.dla.mil/

Site use requires registration and user information.

or compact discs (CDs) on website order form by standard mail from:

DAPS / DODSSP
Building 4 / Section D
700 Robbins Avenue
Philadelphia PA 19111-5094

Copies of Federal Standards may be obtained from:

Internet: global.ihs.com
or telephone: 800-854-7179

f. Illuminating Engineering Society (IES) Transaction.

LM-35-02 *IES Approved Method for Photometric Testing of Floodlights Using High Intensity Discharge or Incandescent Filament Lamps*

Copies of IES standards may be obtained from:

Internet: www.iesna.org/ (fees for documents)

or by standard mail from:

Illuminating Engineering Society
120 Wall Street
17th Floor
New York, New York 10002

g. Society of Automotive Engineers (SAE)

AS-25050	*Colors, Aeronautical Lights and Lighting Equipment, General Requirements for*

Copies of SAE Standards are available from:

Internet: www.sae.org

or by standard mail at:

SAE World Headquarters
400 Commonwealth Drive
Warrendale, PA 15096-0001 USA

h. Institute of Electrical and Electronics Engineers (IEEE)

C62.41-1991	*IEEE Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.*

Copies of IEEE Standards are available from:

Internet: http://www.ieee.org

or by standard mail at:

IEEE Customer Service
445 Hoes Lane
PO Box 1331
Piscataway, NJ 08855-1331

FAX: +1 732 981.9667
Email: onlineproducts@ieee.org

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3. REQUIREMENTS

A PAPI system consists of:

a. Four identical light units, Type L-880, or two identical light units, Type L-881.

b. A power and control unit (PCU) (for style A systems only).

c. Aiming and calibration equipment (may be part of the light units).

3.1 Environmental

The PAPI equipment must be designed for outdoor installation and continuous operation in the following environmental conditions:

3.2 Temperature

The PAPI equipment must operate in the following ambient temperatures:

a. Class I systems - from -31 degrees F (-35 degrees C) to 131 degrees F (55 degrees C).

b. Class II systems - from -67 degrees F (-55 degrees C) to 131 degrees F (55 degrees C).

3.3 Humidity

The PAPI equipment must operate in any relative humidity up to 100 percent.

3.4 Sand and Dust

The PAPI equipment must operate when exposed to windborne sand and dust particles.

3.5 Wind-blown Rain

The PAPI equipment must operate when exposed to wind-blown rain from any direction.

3.6 Wind

The PAPI equipment must operate when exposed to wind speeds up to 100 miles per hour (mph) (161 kilometers per hour [km/hr]) from any direction.

3.7 Salt Spray

The PAPI equipment must operate when exposed to a salt laden atmosphere with relative humidity up to 100 percent.

3.8 Sunshine

The PAPI equipment must operate when exposed to solar radiation with ambient temperatures stated in paragraph 3.2, Temperature.

3.9 Light Units

3.9.1 Photometric Requirements

a. Each light unit must have at least two light sources.

b. The light units must produce a beam of light split horizontally, with aviation white light in the top sector and aviation red light in the bottom.

c. When the PAPI is viewed at 1000 feet (300 meters), the transition from red light to white light must be within 3 minutes of arc at the beam center and within 5 minutes of arc at the beam edges.

d. A line drawn through center of the transition band at +10 degrees, 0 degrees, and -10 degrees must be straight within 3 minutes of arc.

e. The transition band must be flat within 3 minutes of arc.

f. The light distribution and intensity for each light unit must be per Figure 1.

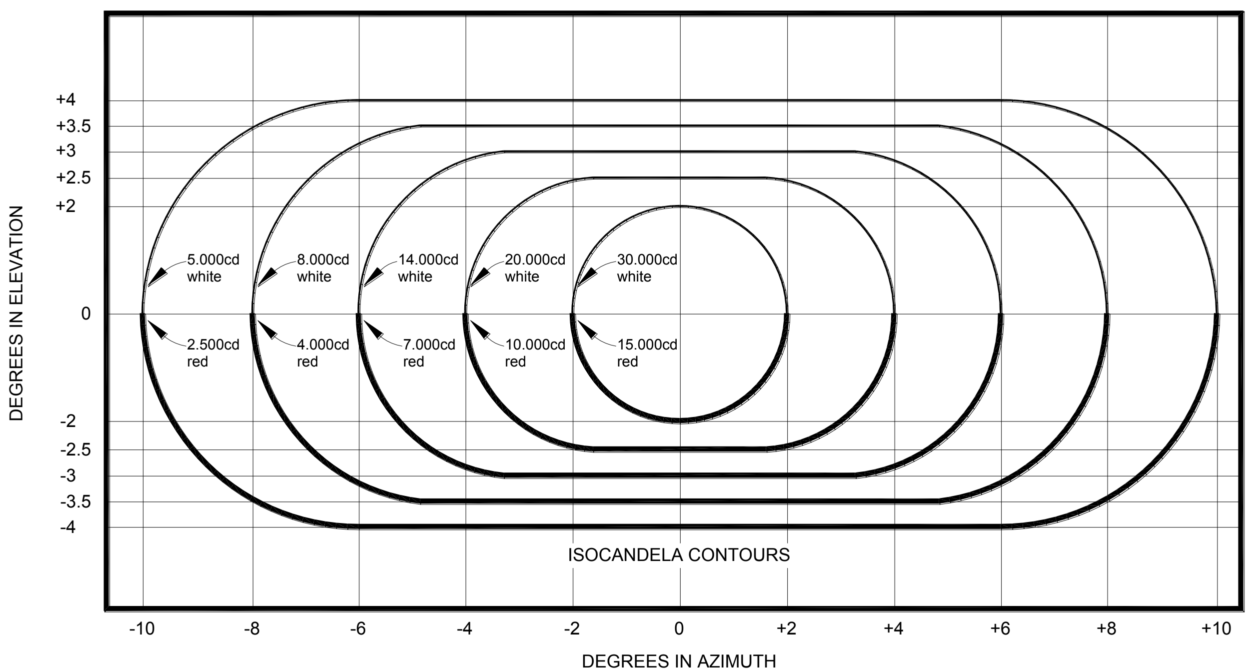

Figure 1. PAPI Light Distribution Requirements

g. The PAPI light colors must be aviation white and red and meet the requirements of SAE AS25050, Colors, Aeronautical Lights and Lighting Equipment, General Requirements for, paragraph 3.1, Aviation Colors.

(1) For PAPI systems that use alternative lighting devices (light emitting diodes (LED)), see Engineering Brief #67, Light Sources Other Than Incandescent and Xenon For Airport and Obstruction Lighting Fixtures*,* for additional information and requirements.

(2) LED wavelength for aviation red must be per Engineering Brief #67.

(3) White LEDs must be per the aviation white chromaticity limits specified in Engineering Brief #67.

h. Light transmitting covers must conform to the requirements of MIL-C-7989, Covers, Light Transmitting, for Aeronautical Lights, General Specification for, Paragraph 1.2, Classification, Class B.

i. Heat resistant glass per MIL-C-7989 is not required for PAPI systems that use alternative lighting devices.

j. If incandescent lamps are used, they must have a minimum rated life of 1000 hours.

k. Incandescent lamps (if used) must be at 100% intensity within 5 seconds after a "cold start."

3.9.2 Light Unit Construction

a. Light unit dynamic loading from wind, or static loading from snow or ice accumulation, must not cause the light pattern to shift.

b. The weight of each light unit must not exceed 100 pounds (45 kilograms).

NOTE: *If the PCU is part of the light unit, the combined unit weight must not exceed 150 pounds (68 kilograms).*

c. A light unit may not be higher than 40 inches (1 meter) at its maximum height when installed at its minimum mounting height. See AC 150/5340-30, Design and Installation Details for Airport Visual Aids, for complete PAPI installation requirements.

d. The light unit must use a protective overhang or other method to prevent rain or snow from accumulating on its lens surfaces.

3.9.3 Light Unit Mounting Provisions

3.9.3.1 Mounting Legs

a. A minimum of three adjustable mounting legs must be used for leveling the light unit when one side of the unit is installed up to 1 inch (25 millimeters) higher or lower than the opposite side.

NOTE: The manufacturer may use 2 mounting legs if equivalent rigidity and leveling capability to a 3 leg mounting system can be demonstrated.

b. At a minimum, the mounting legs must include:

(1) a light housing mounting and level adjusting hardware;

(2) frangible couplings per FAA Drawing C6046 (or an equivalent performing part that will pass the frangibility test in paragraph 4.7.) The FAA Drawing may be obtained from:

http://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/techops/navservices/lsg/vgleap/specifications/index.cfm

(3) and flanges for mounting the light unit on a concrete pad.

NOTE: *2 inch electrical metallic tubing (EMT) must be furnished by the installer*.

3.9.3.2 Adjusting Hardware

Any adjusting hardware must be vibration resistant and prevent movement of the optical system.

3.9.4 Light Unit Adjustments

3.9.4.1 Vertical Adjustment

All light units must use built-in adjustments for accurate vertical positioning of the light beam center at any elevation between 2 and 8 degrees.

NOTE: *The center of the light beam is the transition band between red and white light.*

Light Beam Aiming

An aiming tool must be furnished with the PAPI system. The tool must measure the vertical angle of the light beam center from 2 to 8 degrees in graduated increments of 10 minutes of arc. The aiming tool must have a repeatable accuracy of ± 3 minutes of arc.

3.9.4.2.1 Alternate Light Beam Aiming

Light units may be factory calibrated to a fixed vertical angle specified by the purchaser. The manufacturer must provide a procedure to check the calibration of the aiming system in the field with an accuracy of ± 3 minutes of arc.

3.9.5 Excessive Light Unit Tilt

The unit design must ensure all lamps in the system are de-energized when one light unit is lowered more than ¼ degree or raised greater than ½ degree.

a. The unit design must ensure all lamps in the system are de-energized when the optical pattern of one light unit is inadvertently lowered between ¼ and ½ degree or raised between ½ degree and 1 degree with respect to the preset aiming angle.

b. A delay between 10-30 seconds before de-energizing the light units must be used to prevent intermittent activation caused by vibration or other movement.

c. The light unit tilt sensing must be fail-safe so any malfunction, including loss of input power, de-energizes the PAPI light units.

3.9.6 Light Unit Electrical Wiring

Factory molded plugs must be on the exterior end of the wiring that penetrates the PAPI enclosure.

3.9.6.1 Lead Length

Power leads must be sufficiently long to extend from the light unit, through a flexible conduit, and to a breakaway connector at ground level.

3.9.6.2 Strain Relief

Strain relief must be used on any light unit power leads.

3.9.6.3 Plugs

a. Style B systems must use Class A, Style 1 or 6 plugs per AC 150/5345-26, *Specification for L-823, Plug and Receptacle, Cable Connectors*, to mate with the output lead of the isolation transformer.

b. Style A systems may use any plug with a capacity and electrical performance equivalent to an L-823 plug.

3.9.6.3.1 Style B Alternate Plug System

The manufacturer may furnish an alternate harness that accepts the output of several transformers and combines them into a single receptacle for use in the transformer housing. The receptacle must be located just below the light unit's frangible coupling and mate with a compatible plug from the light unit.

3.10 Power and Control

3.10.1 Style A Systems

The PAPI power supply and control functions may be enclosed in a separate power and control unit (PCU) or inside a light box.

3.10.2 PCU Cabinet

a. The PCU cabinet must be an enclosure that meets the National Electrical Manufacturers Association (NEMA) Type 4 rating.

b. The PCU cabinet must contain all the power and control functions for a PAPI system.

c. The cabinet door must open to 110 degrees minimum and equipped with a locking device to ensure it remains open during field maintenance.

d. The cabinet must be furnished with a padlock hasp to secure the cabinet door when necessary.

3.10.3 Power

a. The PAPI Style A system must operate from any standard utility single-phase alternating-current service voltage less than 600 volts.

b. A trip-free circuit breaker must be furnished to allow de-energizing the PAPI system power.

3.10.4 Style A Voltage Regulation

If an incandescent lamp is used, the lamp socket voltage must be adjustable and regulated within 3 percent of its design value on the brightest step under the following conditions:

a. the input line voltage deviates up to 10 percent above or below its nominal value;

b. the individual light units are spaced between 20 feet (6 meters) and 30 feet (10 meters) apart;

c. the Power Control Unit is located from 0 to 100 feet (30 meters) from the nearest light unit.

3.10.5 Style A Lamp Failure

When one or more lamps fail, it may not cause damage to either the power supply or the remaining lamps.

3.10.6 Photoelectric Intensity Control

The PAPI must be equipped with a photoelectric type control that automatically switches the lamps between two operating modes:

a. Day mode – full intensity complying with Figure 1.

b. When the system is first energized, and daylight is detected, the night mode must be selected between 2 to 3 seconds before switching to the day mode.

c. The photoelectric intensity control must have a delay between 45 to 75 seconds before switching lamp intensity to prevent unintentional switching caused by transient light, shadows, or transient voltages.

3.10.7 PAPI Remote Control

The PAPI must be provided by the manufacturer with the capability to be turned on and off from a remote location. The remote control may be by a hardwired cable or a radio frequency controller (specified in AC 150/5345-49, *Specification L854, Radio Control Equipment*).

3.10.8 Style A Night Mode Illumination Intensity

There must be two selectable night mode intensity settings, approximately 5 and 20 percent of the day mode intensities shown in Figure 1, to adapt the PAPI to airport ambient light levels.

3.11 Style B Systems

a. Style B systems must operate from a series lighting circuit with a current range of 2.8 to 6.6 amperes.

NOTE: *PAPI remote control may be accomplished by sensing the current in the associated runway circuit during night operations.*

b. The lamps in Style B systems must be compatible with an isolation transformer size per AC 150/5345-47, *Specification for Series to Series Isolation Transformers for Airport Lighting Systems.*

NOTE: *Components of the series lighting circuit (for example: L-828 regulator, isolation transformer) will not be supplied with the PAPI system.*

3.11.1 Failure of Style B Lamp

Lamp failures must not cause damage to either the power supply or the remaining lamps.

3.11.2 Style B Lamp Shorting Device

A lamp bypass device to short circuit the socket of a burned out lamp must be available upon request by the customer.

3.12 PAPI Lamp Monitor

The manufacturer may offer an optional go/no go type PAPI lamp monitoring output.

3.13 PAPI System Control

3.13.1 Day Mode Illumination Intensity

a. PAPI day mode must be selected when the illumination on a vertical surface facing north rises to 50 to 60 foot-candles.

b. The PAPI must remain in the day mode until the illumination decreases to 25 to 35 foot-candles.

3.13.2 Night Mode Illumination Intensity

a. The night mode must be selected when the illumination on a vertical surface facing north decreases to 25 to 35 foot-candles.

b. When the PAPI has switched to night mode, it must remain in the night mode until the illumination rises to 50 to 60 foot-candles.

3.13.3 Photoelectric Intensity Control Failure

The PAPI must automatically switch to night mode if the photoelectric control fails.

3.14 Transient Suppression

3.14.1 Style A Surge and Transient Protection

The PAPI equipment susceptibility to power line surges must be per the defined waveforms detailed in Table 4, Location Category C2, in ANSI/IEEE C62.41-1991, Recommended Practices on Surge Voltages in Low Voltage AC Power Circuits. Surge protection must be provided against a minimum of 3 applications at 15 second intervals of a 5 kilo amp 8/20 microsecond (µS) short circuit current pulse and 10 kilo volt 1.2/50 µS open circuit pulse.

NOTE: *Series lighting circuits for Style B PAPI systems already have integral lightning protection on the regulator output. However, if any solid state components are used, paragraph 3.14.1 must apply.*

3.15 Equipment Grounding

Conductive materials enclosing electrical conductors, equipment, or housings within the equipment must be connected to a common lug that allows connection to the system ground conductor.

3.16 Equipment Finish

The exterior of all PAPI units must be painted International Orange, Federal Color Number 12197, per FED-STD-595.

3.17 PAPI Parts and Materials

a. All PAPI system parts and materials must meet the environmental requirements in this AC.

b. All parts and materials must be protected against corrosion.

   (1) All fasteners and other hardware must be compatible with the material joined and may not cause galvanic corrosion.

c. PAPI system components may not be operated in excess of the component manufacturers recommended rating.

d. Plastic components exposed to sunlight must be oxidation and ultraviolet resistant.

3.18 PAPI Maintenance

a. The PAPI system must be designed for ease of maintenance so field repairs and routine maintenance can be accomplished without special tools.

b. If lamp defocusing occurs after lamp replacement, the manufacturer must furnish any special tools and procedures required for refocusing.

c. If any special tools are required for other than routine maintenance and field repairs, the manufacturer must furnish them.

3.19 Workmanship

The equipment must be fabricated under the highest quality commercial standards of workmanship.

3.20 PAPI Instruction Book

An instruction book containing the following information must be furnished with each system:

a. System schematic and wiring diagrams showing all components cross-indexed to the parts list;

b. Parts list with:

   (1) part name,

(2) part rating,

(3) physical characteristics of the part,

(4) component manufacturer's name and part number.

c. Installation instructions, including procedures for aiming, calibration of the aiming system, focusing, and adjustment of the excessive tilt mechanism;

d. Maintenance instructions, including re-lamping procedure, theory of operation and trouble-shooting charts.

e. Operating instructions.

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4. PAPI QUALIFICATION REQUIREMENTS

a. Procedures for qualification approval are in AC 150/5345-53, *Airport Lighting Equipment Certification Program.*

b. The following tests are required to demonstrate compliance with this AC. All tests may be performed on the PAPI power supply and a single light unit; any other units may be simulated by a resistive load.

c. For PAPI equipment that uses alternative lighting devices, the requirements in EB #67, Light Sources Other Than Incandescent and Xenon For Airport and Obstruction Lighting Fixtures, must apply.

4.1 Visual Examination

The equipment must be examined for compliance with the requirements in this AC for size, weight, materials, finish, and quality of workmanship.

4.2 High Temperature Test

a. A high temperature test must be conducted per MIL-STD-810F, method 501.4, Procedure II.

b. The equipment must be exposed to 131 degrees F (+55 degrees C) for 4 hours after temperature stabilization.

c. The equipment must be operated during the temperature test.

d. Any deterioration in materials or system performance must be considered a test failure.

4.3 Low Temperature Test

a. A low temperature test per MIL-STD-810F, Method 502.4, Procedure II must be conducted.

   (1) For Class I systems, the equipment must be exposed to -31 degrees F (-35 degrees C) for 24 hours.

   (2) For Class II systems, the equipment must be exposed to -67 degrees F (-55 degrees C) for 24 hours.

b. The equipment must be operated after temperature stabilization at the beginning and prior to the end of the test.

c. No accumulation of dew or frost must be evident on any portion of the PAPI front lens surfaces.

d. Any deterioration in materials or performance must be considered a test failure.

4.4 Rain Test

a. A wind-blown rain test must be conducted per MIL-STD-810F, Method 506.4, Procedure I.

b. The rain must be at a rate of 5.2 inches/hour (130 millimeters/hour) with an exposure time of 30 minutes per side.

c. The equipment must be operated during the test.

d. Any deterioration of system performance or excessive accumulation of water in equipment cabinets must be considered a test failure.

4.5 Salt-Fog Test

a. A salt-fog test must be conducted per MIL-STD-810F, Method 509.4, Procedure 1.

b. The test duration must be 48 hours exposure and 48 hours drying.

c. Any evidence of damage, rust, pitting, or corrosion (sacrificial coatings are excepted) must be considered a test failure.

4.6 Wind Loading

Using either wind tunnel tests or static loading, it must be demonstrated the system can withstand a 100 mph (161 km/hr.) wind load from any azimuth direction without displacing the optical pattern more than allowed in the rigidity test in paragraph 4.11.

4.7 Frangibility Test

The frangibility of the PAPI mounting legs must be demonstrated to be the same as the 2-inch frangible coupling depicted in FAA drawing C-6046 per AC 150/5220-23, Frangible Connections.

4.8 Transient Suppression Test

The test waveforms applied to the equipment must be per paragraph 3.14.1.

4.9 Photometric Tests

a. A photometric test for the color, intensity, and beam pattern requirements of paragraph 5 in this AC must be conducted.

b. All lamps used for photometric testing must be randomly selected from a production lot.

c. The photometric requirements in paragraph 3.9.1 must be tested for one set of lamps.

d. To demonstrate repeatability, the intensity along the horizontal and vertical axes for two additional sets of lamps must be checked.

e. If any refocusing is required after lamp replacement, it must be accomplished using the manufacturer's FAA approved procedure to demonstrate that the required photometrics are reproduced.

f. Any test equipment must be calibrated before testing.

g. All measurements must be taken at a distance that allows full focusing of the beam.

4.9.1 Chromaticity Tests

The PAPI must be tested at 100% intensity with the light sources, filters (if used), and optical system used to ensure that it meets chromaticity requirements.

a. Spectral transmittance measurements of the filter (if present) must be performed at the specified operating temperatures of the lamps.

b. The PAPI must meet the chromaticity requirements of SAE AS 25050 when tested at 100% intensity at the center of the main beam and the extremes of the horizontal and vertical beam distribution. Chromaticity outside of distribution boundaries may be verified visually.

c. For PAPI that use light emitting diodes (LED), see Engineering Brief #67 for additional information about chromaticity requirements aviation red. See also aviation white chromaticity limits for 1931 CIE color space.

4.10 Lens Certification

A certificate of compliance must be furnished from the lens manufacturer stating that the light unit lenses meet:

a. The requirements in MIL-C-7989 for incandescent lamps (LED light sources are excepted).

b. The color requirements in SAE AS-25050 for incandescent lamps. See Engineering Brief #67 for aviation red and white chromaticity limits.

4.11 Light Unit Rigidity Test

This test applies a static load equivalent to the maximum light unit design wind loading and determines if there is any movement of the light pattern.

a. Before applying the static load, the light unit must be set up and the light pattern displayed on a vertical surface 20 feet (6 meters) in front of the light unit.

b. The top, bottom, and the sides of the light unit beam pattern must be marked on the vertical surface in paragraph 4.11a.

c. A uniformly distributed sand load or other suitable material of 15 pounds per square foot (73 kilograms per square meter) must be applied over the entire top surface of the light unit.

NOTE: *A framework or other method may be used to ensure the sand used to load the light unit does not spill over its sides.*

d. The load must be applied by allowing the sand to pour down on the center top surface of the light unit.

e. The sand load must be left in place for 5 hours.

f. After 5 hours has elapsed, the light housing beam pattern must be checked for any movement from the original marks drawn in paragraph 4.11b. The light unit beam pattern must be within +1/4 inch (6 millimeters) of the original markings.

g. Remove the sand load.

h. The beam pattern must be checked against the markings in paragraph 14.11b, and mark any movement. The light unit beam pattern must be within +1/4 inch (6 millimeters) of the original markings.

4.12 Aiming Device Test

a. The PAPI aiming device must be checked, using the manufacturer's procedure (approved prior to testing by the FAA), to demonstrate that when the light unit is moved by the adjustment mechanism, the measuring device indicates the change with an accuracy of ± 3 minutes of arc.

b. The measuring device must be checked at one degree intervals from 2 to 8 degrees.

4.13 Operational Test

a. A PAPI system operational test, using the manufacturer's test procedure (approved prior to testing by the FAA), must be conducted to demonstrate compliance with all operating requirements.

b. The manufacturer's procedure must test:

(1) the excessive tilt mechanism;

(2) the power supply performance (current, voltage while at 100% intensity);

(3) the photoelectric controller;

(4) operation with one light source out per light unit and verify proper voltage is still applied to the sockets of the operational lamps (if incandescent lamps are used);

(5) if the failure of a light source produces transients or over-voltage conditions that damage the remaining light sources.

5. PRODUCTION TESTS

a. A test procedure that verifies the light output and aiming device accuracy for each production unit must be submitted to the third party certification body for approval.

b. After approval, the test procedure must be used for all production units.

c. The visual examination in paragraph 4.1 and the operational test in paragraph 4.13 must be performed for each production system.

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Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Attachment R

Ormond Beach Municipal Airport

P.O. Box 277 Ormond Beach, FL 32175 Office: (386) 615-7019 Fax: (386) 676-3330

May 22, 2017

Virginia Lane
Environmental Specialist
FAA Airports District Office
5950 Hazeltine National Drive, Suite 400
Orlando, Florida 32822

RE: Commitment to Wetland Mitigation Requirements for Ormond Beach Municipal Airport Runway 8-26 Extension, Easement Acquisition and Obstruction Removal

Dear Ms. Lane:

The City of Ormond Beach, Florida, as the grant sponsor of the Ormond Beach Municipal Airport Runway 8-26 Extension Project makes the following statement:

The City of Ormond Beach hereby commits to implementing a mitigation plan developed to the satisfaction of the US Army Corps of Engineers (USACE) in consultation with state and local agencies having an interest in the affected wetlands.

Sincerely,

Steven R. Lichliter
Airport Manager

Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Attachment S

**Notice of Availability of Draft Environmental Assessment (EA)
Proposed Runway Extension, Taxiway A Extension, Easement
Acquisition and On- and Off-Airport Obstruction Removal
at Ormond Beach Municipal Airport**

The Federal Aviation Administration (FAA) has directed the City of Ormond Beach to prepare a Draft Environmental Assessment (EA) for the proposed Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal at Ormond Beach Municipal Airport. The Draft EA is prepared in accordance with the National Environmental Policy Act (NEPA). The proposed runway and taxiway extension will impact wetlands, floodplains, and residential land use. The FAA encourages all interested parties to provide comments concerning the scope and content of the Draft EA.

The Draft EA will be available for public review and comment for 30 days during normal business hours at the following location: Ormond Beach City Hall, 22 South Beach Street, Ormond Beach, FL 32174, 386-615-7019 or can be viewed or downloaded from the Ormond Beach Airport website: https://www.ormondbeach.org/77/Airport.

To receive a paper copy of the Draft EA, contact either Bart Vernace, Manager of Southern Region - Orlando, Florida Airports District Office or Kimberly Peace, Senior Environmental Coordinator, Hoyle, Tanner & Associates, Inc.; their contact information is provided below.

Comments should be provided to either the FAA, the City of Ormond Beach or their Contractor, Hoyle, Tanner & Associates, Inc., and should focus on the economic, social and environmental effects of the proposed project. Comments should be as specific as possible and address the analysis of potential environmental impacts and the adequacy of the proposed project or merits of alternatives and the mitigation being considered. This commenting procedure is intended to ensure that substantive comments and concerns are made available to the FAA in a timely manner so that the FAA has an opportunity to address them.

Commentors must include their address, phone number, email address or other personal identifying information. Be advised that comments – including personal identifying information – may be made publicly available at any time. While you can ask the FAA to withhold your personal identifying information from public review, the FAA cannot guarantee we will be able to do so. The FAA has also directed the City of Ormond Beach to provide the opportunity for a public hearing for the proposed runway extension project. A request for a public hearing must be received within 15 days of this notice. The FAA will consider whether a public hearing is warranted.

Comments on this Draft EA will be accepted until the close of business on Monday, January 22, 2018.

Comments should be sent to either address below:

Bart Vernace
FAA Orlando Airport District Office
South Park Building
8427 South Park Circle, 5th Floor
Orlando, FL 32819
407.812.6331 ext. 127
Bart.Vernace@FAA.gov

Kimberly Peace
Senior Environmental Coordinator
Hoyle, Tanner & Associates, Inc.
150 Dow Street
Manchester NH 03101
603.669.5555 ext 151
kpeace@hoyletanner.com

Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension, Taxiway A Extension, Easement Acquisition and On- and Off-Airport Obstruction Removal

Attachment T

Ormond Beach Municipal Airport

Runway 08-26 Extension

RPZ Alternatives Analysis Report

Prepared for:

City of Ormond Beach

Prepared by:

Hoyle, Tanner & Associates, Inc.

95 E. Mitchell Hammock Rd., Suite 200

Oviedo, FL 32765

October 2017

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LIST OF FIGURES

1.1 Introduction

This report presents an analysis of the Runway Protection Zones (RPZ) for Runway 08-26 in terms of proposed development actions and potential solutions for compliance with the FAA's Interim Guidance for Land Use Compatibility, as detailed in a memorandum dated September 27, 2012. The City has identified a need to extend RW 8-26 at OMN to enhance capacity of general aviation operations. The existing length of RW 8-26 currently does not provide for the efficient use of the airport for certain types of aircraft. Airport tenants, transient business and charter operators take a payload or weight penalty when operating from the relatively short runway; users must reduce either the fuel or passenger load to remain within the takeoff and landing limits defined in the individual aircraft operating manuals, limiting their range and/or utility and existing business tenants have had to refuse work due to the existing length of RW 08-26 not being able to accommodate aircraft. The runway is too short for some of the critical airport reference code B-II business and charter aircraft to efficiently operate and as such creates a condition of limited use and growth for OMN.

The following report analyzes several alternatives for extending Runway 08-26 and their associated RPZs and cost estimates.

1.2 Existing Land Uses in the RPZs

The City of Ormond Beach has complete ownership control over the existing RPZs. This land is currently zoned as I-1 (Light Industrial). Current land use is consistent with current zoning.

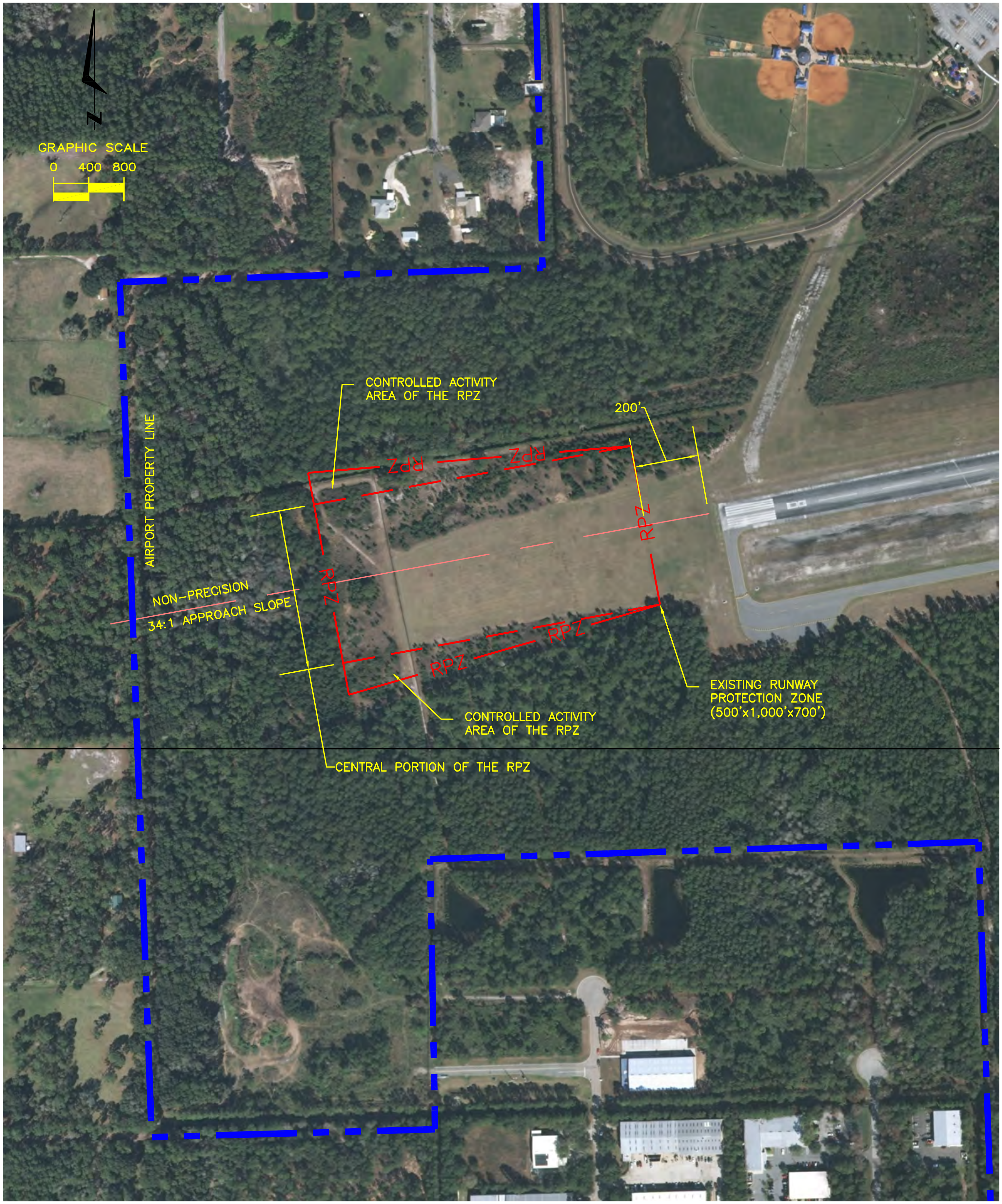
Figure 1 and **Figure 2** depict the existing RPZs on the west and east ends of Runway 08-26, respectively.

The existing RPZ associated with the Runway 08 end lies entirely on airport property and consists mainly of open space and some wooded area.

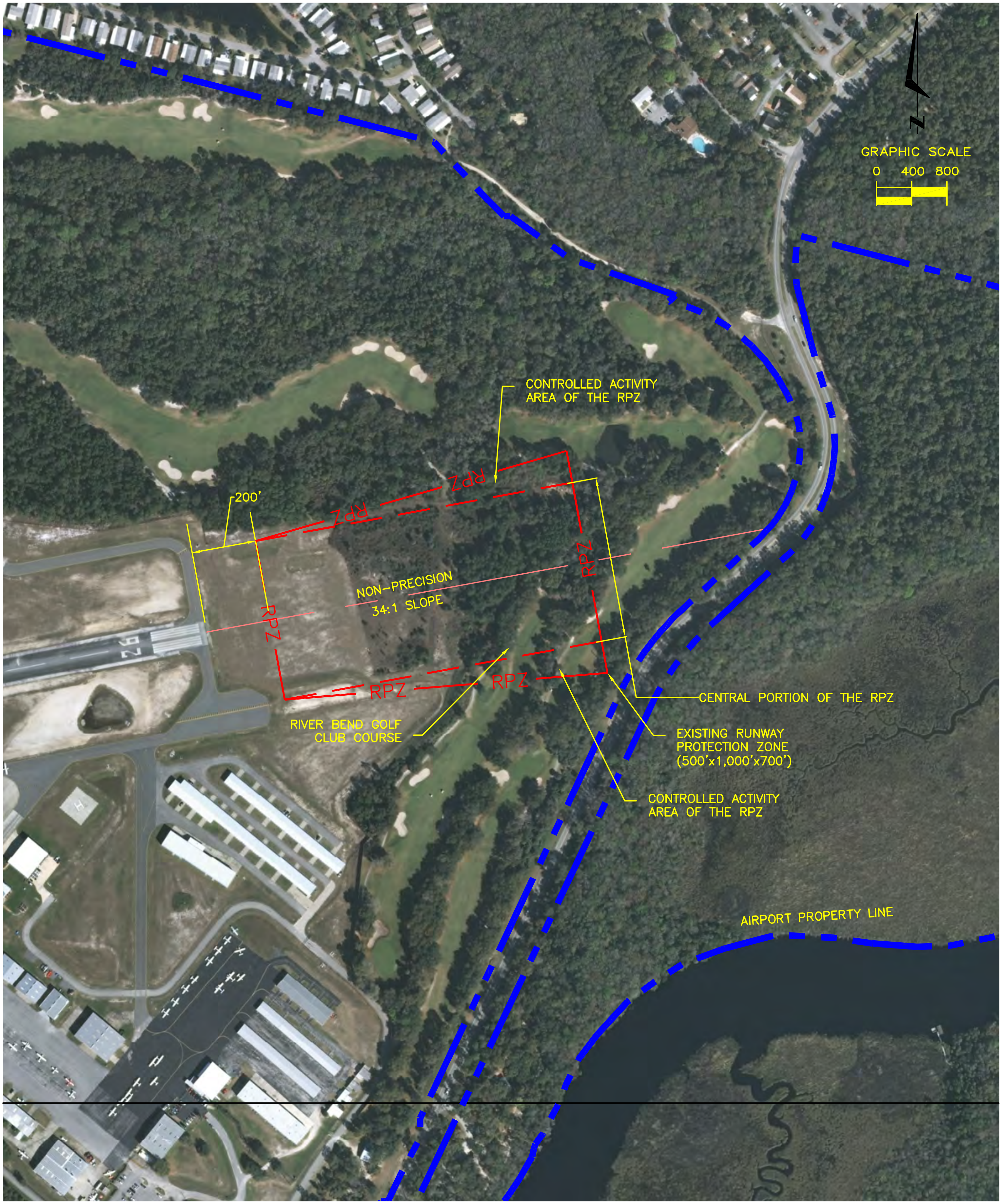
The existing RPZ associated with the Runway 26 end also lies entirely on airport property. A small portion of the RPZ (approximately 2.1 acres) falls on the River Bend Golf Club course, which is located on airport property. The remaining portions of this RPZ consist of open space and some trees/vegetation.

1.3 Proposed Land Use Changes in the RPZs

The Airport Sponsor's preferred proposed action would be to extend Runway 08-26 1,000 feet on the west side (See section 1.6.3 Alternative 2). This proposed action will push the future RPZ off airport property and over three adjacent homeowner parcels. The impact to these parcels is summarized in the following table and depicted in **Figure 3**. No existing structures lie in the proposed RPZ.



PROJECT NO. 88750	Hoyle, Tanner & Associates, Inc. 95 E. Mitchell Hammock Rd., Suite 200, Oviedo, FL 32765 (407) 380–1919					ORMOND BEACH MUNICIPAL AIRPORT	Figure 1
CADD NO. 088750–RPZ	CHKD. BY WJM	DR. BY PRN	DES. BY WJM	DATE: JULY 2017	SCALE: GRAPHIC	EXISTING LAND USE IN RUNWAY 08 RPZ	SHEET 1 OF 1



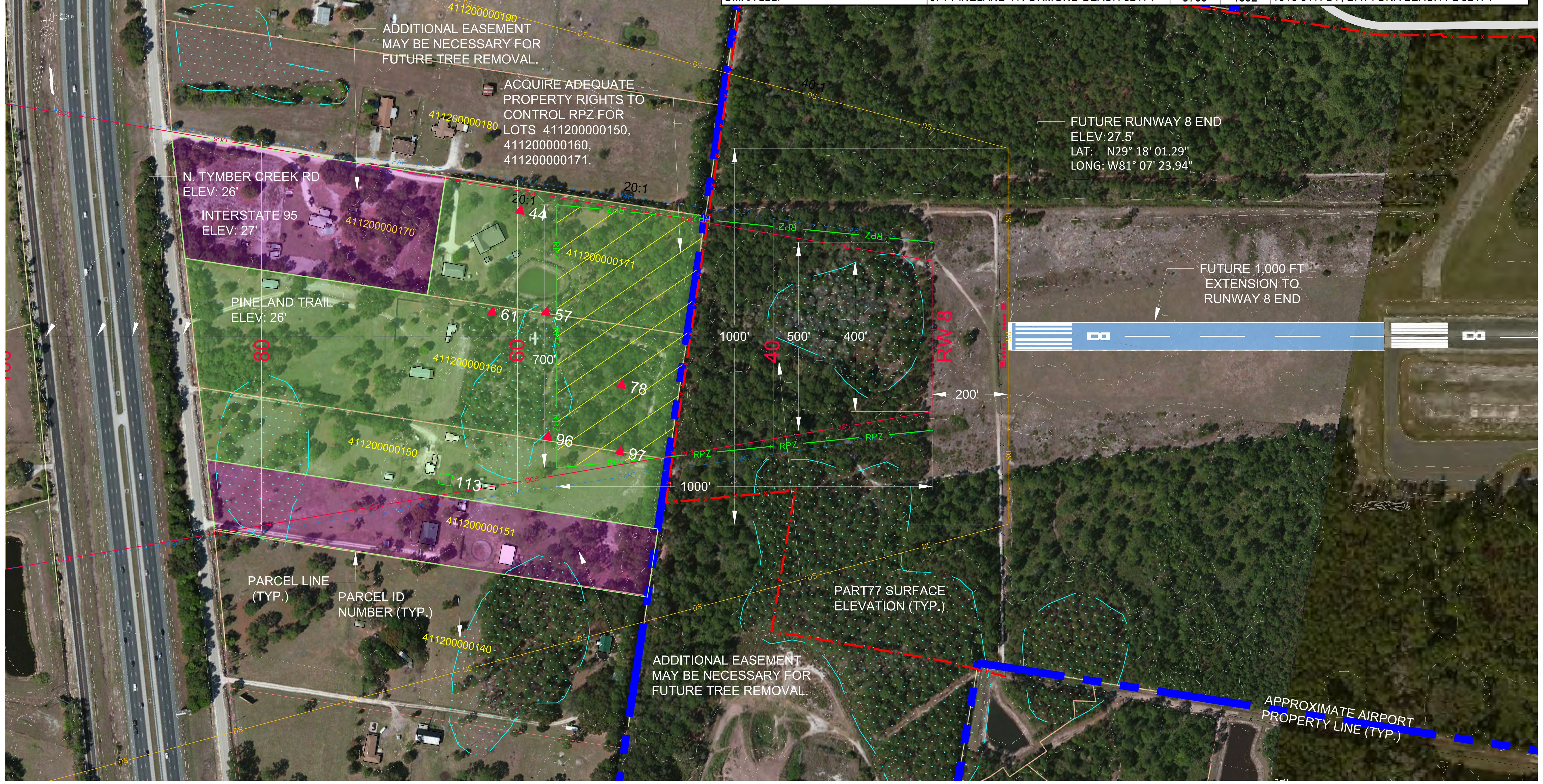
PROJECT NO. 88750	Hoyle, Tanner & Associates, Inc. 95 E. Mitchell Hammock Rd., Suite 200, Oviedo, FL 32765 (407) 380-1919				ORMOND BEACH MUNICIPAL AIRPORT
CADD NO. 088750-RPZ	CHKD. BY WJM	DR. BY PRN	DES. BY WJM	DATE: JULY 2017	SCALE: GRAPHIC

EXISTING LAND USE IN RUNWAY 26 RPZ

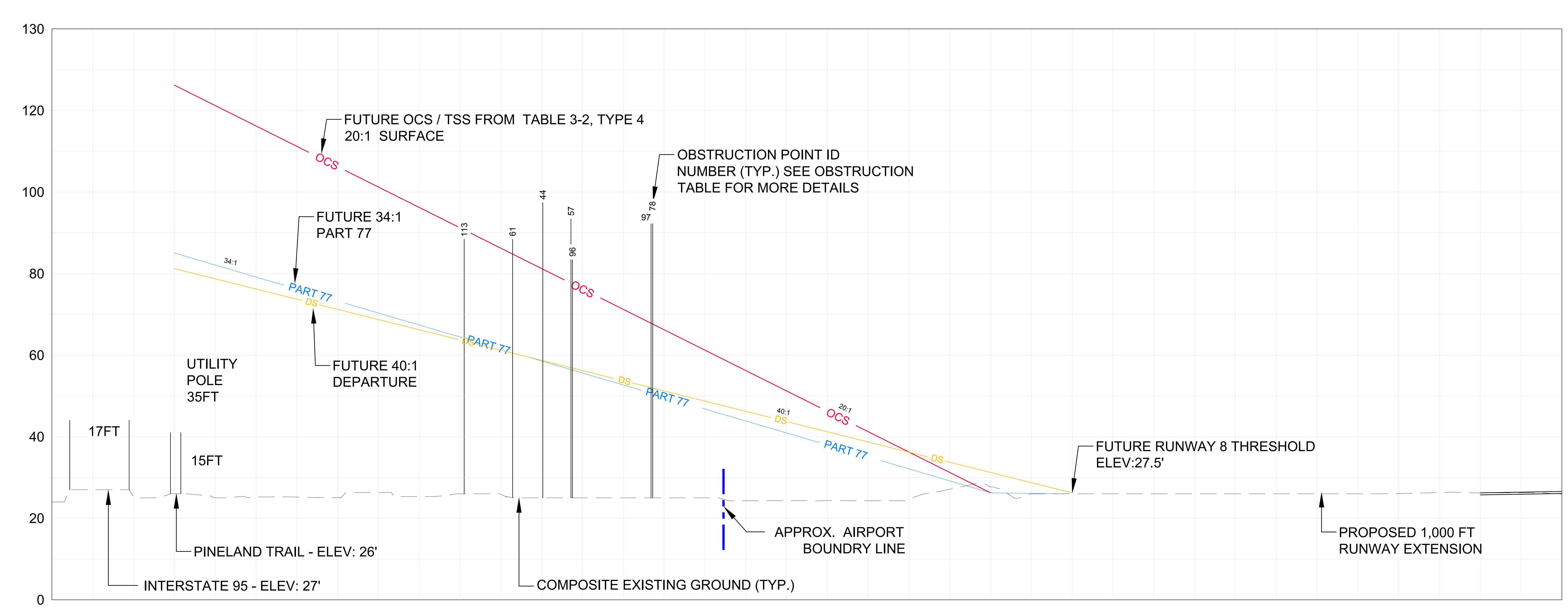
Figure 2

SHEET 1 OF 1

Owner	Parcel Address	Book	Page	Owner Mailing Address
DAY FAMILY TRUST	641 PINELAND TR ORMOND BEACH 32174	6747	4610	24605 ALLIGATOR RD, ASTOR, FL 32102
AUGAT KARIN D & CHESTER C JR	655 PINELAND TR ORMOND BEACH 32174	6343	708	782 N. BEACH ST, ORMOND BEACH, FL 32174
ROGERS MICHAEL A	667 PINELAND TR ORMOND BEACH 32174	3764	4137	SAME AS PARCEL
RAYMOND PHILIP & SUSANNA	663 PINELAND TR ORMOND BEACH 32174	7134	1392	SAME AS PARCEL
OMAA LLLP	671 PINELAND TR ORMOND BEACH 32174	5709	4582	1016 6TH ST, DAYTONA BEACH FL 32174



RUNWAY 8 END PROFILE



OBSTRUCTION TABLE

OBSTRUCTIONS ARE TO THE FAA AC 150/5300 TABLE 3-2 TYPE 4
20:1 APPROACH SURFACE

Pt No	DESCRIPTION	OBJECT TOP ELEV. (MSL)	OCS SURF. 20:1 ELEV (MSL)	OCS SURF. 20:1 PENET. (FT)	PROPOSED MITIGATION
44	Tree	99	82.36	16.64	REMOVE
57	Tree	95	78.9	16.1	REMOVE
61	Tree	90	86.06	3.94	REMOVE
78	Tree	96	68.9	27.1	REMOVE
96	Tree	85	78.73	6.27	REMOVE
97	Tree	94	69.1	24.9	REMOVE
113	Tree	90	91.99	-1.99	REMOVE

SEE FAA AC 150/5300 Table 3-2, Type 4

NOTES:
1. OBSTRUCTION DATA SOURCED FROM FAA DATABASES BASED ON A SURVEY PERFORMED ON FEBRUARY 24, 2011
2. BEGINNING OF SURFACES AREA BASED ON THE ASSUMED FUTURE EXTENDED RUNWAY END ELEVATION AND ARE FOR PLANNING PURPOSES ONLY
3. HORIZONTAL DATUM IS BASED ON THE FLORIDA STATE PLANE NAD 83 US FOOT. VERTICAL DATUM IS BASED ON NAVD 88.
4. TRAVERSE ELEVATIONS ARE ACTUAL GROUND ELEVATIONS AND REQUIRE ADJUSTMENTS: 23' FOR RAILWAYS, 17' FOR INTERSTATE, 15' FOR OTHER PUBLIC ROADS, AND 10' FOR PRIVATE ROADS.
5. UTILITY POLES ARE ASSUMED HEIGHT OF 35 FT ABOVE GROUND ELEVATION, ACTUAL HEIGHT AND ELEVATION UNVERIFIED.

LEGEND

101 — CURRENT PENETRATION TO OCS/TSS 20:1 SURFACE/SINGLE TREE CLEARING WITH POINT NUMBER TO CORRESPONDING OBSTRUCTIONS TABLE FOR THE OCS/TSS 20:1 APPROACH SURFACE

OBJECT WITHIN 10 FT OF OCS/TSS 20:1 SURFACE

1"= 200' HORIZONTAL
0 200 500 1000 FEET
0 4 8 10 20
1"= 20' VERTICAL

ENGINEER'S SEAL

PROJECT DESIGNER
Hoyle, Tanner & Associates, Inc.
150 Dow Street
Manchester, NH 03101-1227
Tel 603-669-5555
Fax 603-669-4168
web page: www.hoyletanner.com

DESIGNED BY ERM
DRAWN BY JLC
CHECKED BY ERM

CITY OF ORMOND BEACH ORMOND BEACH MUNICIPAL AIRPORT ORMOND BEACH, FLORIDA

EASEMENT EXHIBIT-A

DATE: JUNE 2017
SCALE: AS SHOWN

REVISIONS

REV. NO.	DATE	DESCRIPTION	BY
1	9/19/17	HATCH ACQUIRE ADEQUATE PROPERTY RIGHTS IN RPZ	MCR

HTA PROJ. No.: 307103
FILE NAME: EASEMENT-EXHIBIT-A
AIP No.: 3-33-0011-XX-2017

Figure 3
SHEET 1 OF 1

Drawing name: H:\307103 Ormond Beach\Dwgs\Easements\Ormond Easement Exhibit-A\EASEMENT-EXHIBIT-A-FIGURE-3.dwg Oct 05, 2017 - 2:45pm

TABLE 1 – PARCELS IMPACTED BY THE PREFERRED ALTERNATIVE

Volusia County Parcel Number	Address	Zoning	Future Land Use	Area Impacted
411200000171	667 Pineland Tr	A-2(Rural Ag)	Rural[1]	2.6 Acres
411200000160	655 Pineland Tr	MH-3(Rural MH)	Rural[1]	2.5 Acres
411200000150	641 Pineland Tr	A-2(Rural Ag)	Rural[1]	0.2 Acres

The Runway Protection Zone (RPZ) is a trapezoidal, two dimensional area located at ground level beyond the runway end to enhance the safety and protection of people and property on the ground.

For each separate parcel where the RPZ extends beyond the existing airport boundary, avigation easements or a fee simple purchase of the property will be needed to gain control of the RPZ. Control should include Airport Access to conduct the clearing/trimming of trees, restrictions on incompatible land use including buildings and structures, recreational land use, or other places of public assembly, and the future construction of structures within the RPZ.

1.4 Sponsor Control of RPZ Land

The airport sponsor (City of Ormond Beach) has ownership and control over approximately 7.18 acres (57%) of the proposed RPZ. Avigation Easements or land acquisition will be necessary over the balance of the RPZ (5.3 acres). Figure 6 shows the proposed action and the impact to the adjacent three parcels.

The City of Ormond Beach is given the legislative authority to establish, amend, and enforce land development regulations by Florida Statute 163.3202, and the City's zoning classifications [1]implement the land use policies and objectives in the City's comprehensive Plan. The zoning districts are utilized to promote land use compatibility as a means of protecting the health, safety, and general welfare of the City and its citizens.

Additionally, as a result of recent changes to Florida Statues Ch.333 "Airport Hazard and Incompatible Land Use Zoning", the City of Ormond Beach has been able to enter into an interlocal agreement with Volusia County to cooperate in the application of the County's regulations as needed in order to protect Ormond Beach Municipal Airport's airspace. This has been established to ensure proper notification and runway approach protection on airport-related zoning and/or permitting for future development around the airport.

1.5 Federal, State, and Local Transportation Agencies

Agencies with involvement and/or interest in the RPZ alternatives include the Federal Aviation Administration (FAA), Florida Department of Transportation (FDOT), Volusia County, and the City of Ormond Beach.

[1] This designation consists of areas which are a mixture of agriculture and low-density residential (1 unit per 5 acres.)

1.6 Identification of RPZ Alternatives

Four runway development alternatives were selected for further analysis: No Build Alternative, Alternative 1, Alternative 2, and Alternative 3. The following sections describe each alternative in detail and explain their ability to meet the need of the airport and users. Rehabilitation and reconstruction efforts are not considered in the development alternatives as this infrastructure already exists and the impacts of maintaining use are insignificant.

1.6.1 No Build Alternative

The “No Build” does not propose any new changes to the existing runway configuration. Runway 8/26 would remain at 4,005 feet in length and 75 feet wide, and Runway 17/35 would remain at 3,704 feet in length and 100 feet wide. There are no biotic resources impacted by this alternative, however it will have an effect on the future economic development of the airport and the surrounding community by limiting the efficient use of aircraft that can utilize the facility.

During and after the recent Airport Master Planning process the City of Ormond Beach and its airport consultants analyzed data from the FAA Enhanced Traffic Management System Counts (ETMSC) to review the existing fleet mix at OMN. The ETMSC provides information on traffic counts by airport for flights that operate under IFR and are captured by the FAA’s enroute computers. Most VFR traffic is excluded from this system. In addition, a customized report was purchased from FlightAware™ which provides similar information to the ETMSC data. Based on the review of this data, the aircraft family with the most demanding aircraft characteristics (the critical aircraft) currently operating at OMN are the Cessna Citation C525, C550, and C560. These are all ARC B-II aircraft with approach speeds between 91 and 120 knots and wingspans between 49 and 78 feet. The faster the approach speed the longer the runway needs to be to support safe takeoffs and landings at the most efficient aircraft weights. The most cost effective, efficient takeoff weight for the aircraft operator is usually the manufacturer’s maximum gross takeoff weight which allows the operator to balance the aircraft usable payload of people and cargo against the fuel load to maximize the capacity and range of the planned flight operation. Payloads and fuel loads (and therefore efficiency and range) suffer whenever preflight planning requires reductions due to shorter or contaminated runways.

The City of Ormond Beach worked with local businesses and other airport users to better quantify their needs and preferred aircraft usage if an extension was constructed. A summary of the user needs, aircraft types used and operations annually expected are shown in the accompanying **Table 2**. A no-build scenario means these aircraft will **not** use the field or will use it less due to the runway length operational restriction and the airport and existing airport businesses would not get the revenue flow from the fuel and services that these additional aircraft operations require. With typical fuel capacities exceeding 800 gallons each and jet fuel burn between 140 and 225 gallons per flight hour the loss of future fuel sales revenue alone is significant. Just one hour flown by each of the 622 expected aircraft will require almost 100,000 gallons of jet fuel. Any of these aircraft that are based at OMN will also require additional services including hangars, maintenance, and other specialized services that support existing providers and create new job opportunities for others.

The aircraft models being used for the 622 expected operations after the runway is extended are consistent with the ARC B-II critical aircraft determination.

TABLE 2 – RUNWAY NEEDS BASED ON USERS INPUT

Airport User	Aircraft Owner	Aircraft Model(s) Used	Destinations	Approximate Current or Projected Annual OMN Operations	Comments
Lewis Heaster Properties	NetJets	C560, C680, C750, CL35, CL60, EMB 505, FT2H	TEB, MEI, CKB	30	Aircraft type and size varies with customer needs.
Gary Yoemans	Blue Skies Aviation of Daytona	C550	East Coast	110	Plans to acquire a larger aircraft when RWY 8 is extended. The company owns several aircraft currently based at DAB, but would move to OMN when the primary runway has been extended.
NETJETS	NetJets	C560, C680, C750, CL35, CL60, EMB 505, FT2H	LAX, MDLR	6	NetJets supports the proposed extension of RWY 8 and has customer demand at OMN. Annual operations would increase by NetJets when the primary runway has been extended.
Entech Controls	NetJets	C560, C680, C750, CL35, CL60, EMB 505	MKC, APA, BUR	70	Aircraft type and size varies with customer needs.

Command Medical Products	Command Medical	Citation V	MNMG	200	Annual operations expected to double with business expansion.
World Color International	World Color International	Westwind II		134	Currently based at FIN due to runway length, but business is in the OMN business park.
Sunrise Aviation	Sunrise Aviation	Cessna Citation	Charter/Flight Training	unspecified	Sunrise plans to expand their FBO operations to include turbine transition training and charter service using the Cessna Citation family of aircraft, pending extension of the primary runway at OMN.
Stonewood Holdings LLC	NetJets	C560, C680, C750, CL35, CL60, EMB 505,	PVD	72	Aircraft type and size varies with customer needs.
Wayne Luginbuhl	Corporate/Charter Pilot	CE500, CJII	East Coast, Europe, Russia	unspecified	Pilot also flies a CJ I with an Eagle modification to carry extra fuel. Pilot states that this aircraft, so equipped, faces operational restrictions at OMN.
Ormond Aircraft Brokers	Various	Various	N/A	unspecified	Tenant runs a paint shop; has had to turn away business due to lack of runway length.

Hangar Seven Aviation	Various	Various	N/A	unspecified	Tenant operates rental hangars; longer runway would support additional tenants and development.
	Total Proposed Operations			**622**	

This alternative may limit the airport to minor growth or may result in a decline as businesses and users grow and expand they will relocate to facilities that meet their needs.

This alternative does not meet the needs of the Airport or many aircraft owners, however, it does provide the least expensive option when considering capital improvement costs and not the potential economic impacts. This alternative allows the public to decide whether or not it is worth investing in this airport. The “No Build” alternative is depicted graphically in **Figure 4.**

ORMOND BEACH MUNICIPAL AIRPORT
RUNWAY 8-26 EXTENSION
NO BUILD ALTERNATIVES

Figure 4

Drawing name: H:\307101\dwg\Exhibit\Exhibit-Future NO-BUILD.dwg Aug 04, 2015 - 2:03pm

1.6.2 Alternative 1

Alternative 1 extends Runway 8/26 by 400 feet to the east and 600 feet to the west. The width of Runway 8/26 would remain the same at 75 feet. This would increase the runway length from 4,005 feet to 5,005 feet. Runway 17/35 would remain at 3,704 feet in length and 100 feet wide. This alternative expands the runway within the existing airport property limits. Alternative 1 is depicted graphically in **Figure 5.**

Vegetative clearing would be required for the new instrument approaches, which may require off-airport tree removal or obstruction lighting. This alternative will increase the development constraints caused by the ATCT line of sight and the Runway Visibility Zone (RVZ).

The RPZ for Runway 26 for this alternative envelops River Bend Golf Course and Airport Road which are classified by the FAA as incompatible land uses. The impacts for each of these are discussed below:

> In order to make this alternative compliant, the golf course would need to realign three holes. During the relocation construction, there would be an impact to the revenues generated by the golf course. All efforts to maintain the existing holes while the new holes are re-aligned would be made but the community should expect minor impacts over a probable 12-month period. The existing lease between the airport and the golf course would need to be amended to include the new footprint of the golf course. This realignment is depicted in **Figure 5.**
>
> Airport Road would need to be realigned around the RPZ which would have significant impacts to the 100-year flood plain and biotic resources associated with the Tomoka River. Existing wetlands would need to be mitigated based on the new footprint of the realigned roadway. Also, it is expected based on the available soils data that a significant de-mucking would need to be accomplished under the new roadway to ensure a stable sub-base. These costs are included in the overall realignment costs.

The new Runway 8 RPZ established by the extension would remain on airport property. The new Runway 26 RPZ established by the extension would remain on airport property as the airport property boundary extends beyond Airport Road and up to the Tomoka River's edge.

The estimated probable costs of Alternative 1 are approximately $7.34 million. A breakdown of costs is shown in **Table 3**.

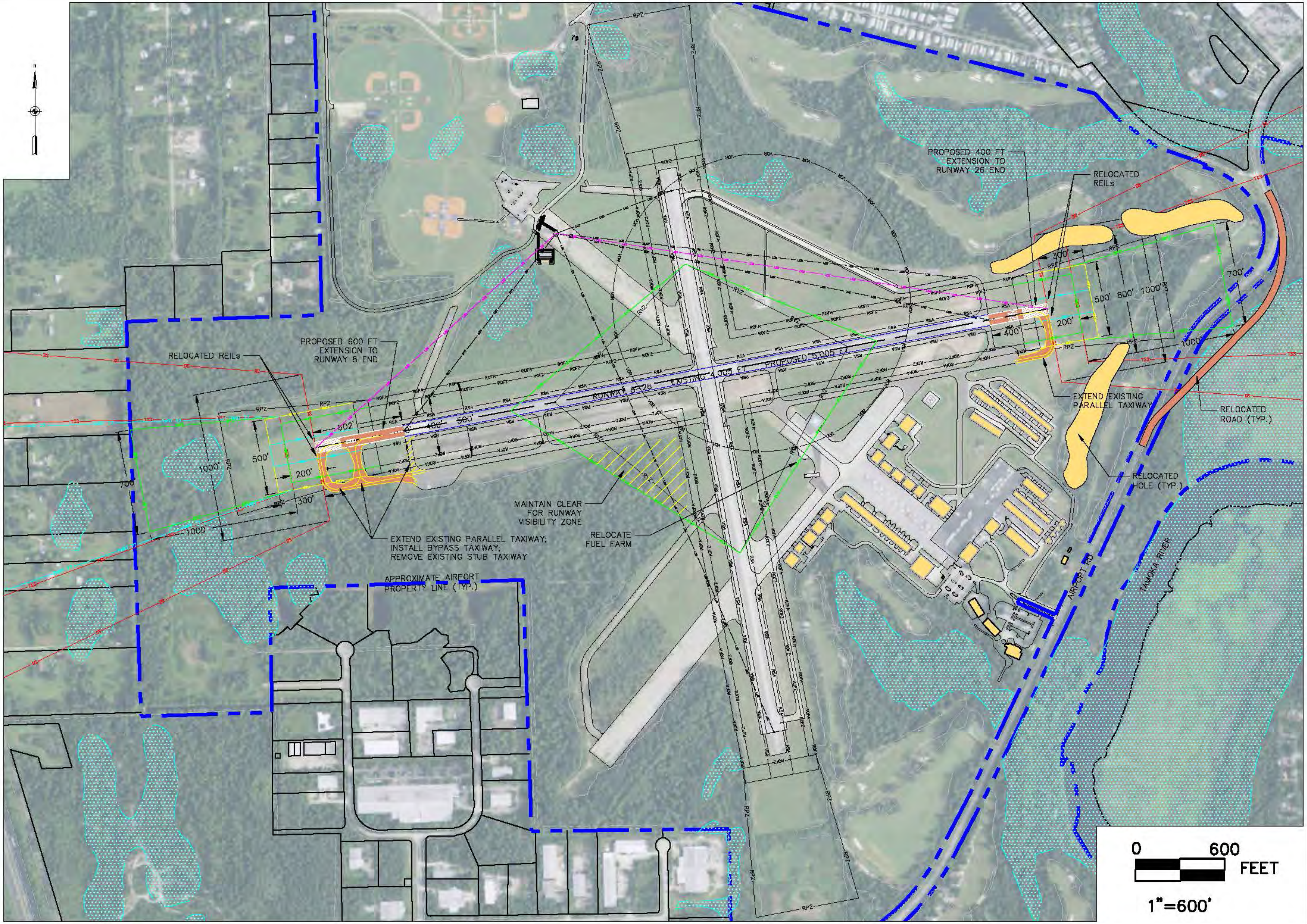
TABLE 3 – ESTIMATED PROBABLE COST FOR ALTERNATIVE 1

Element	Approximate Cost
Extend Runway 8 (600' west)	$950,000.00
Extend Runway 26 (400' east)	$650,000.00
Extend Taxiway Alpha (600' west)	$1,020,000.00
Extend Taxiway Alpha (400' east)	$680,000.00
Obstruction Removal	$274,000.00
Realign Airport Road (2,100' in length)	$2,466,000.00
Wetland Mitigation (approx. 3.85 acres)	$500,000
Relocate 3 Golf Holes	$800,000
Total	**$7,340,000.00**

The relocation of the golf holes is conceptual in nature with respect to location and costs. Exact location, associated costs and construction feasibility would need to be determined after further evaluation.

This estimate accounts for the proposed development and does not include any resolutions to existing non-conformities or rehabilitation to existing infrastructure. Additional associated projects may include:

- Relocate AWOS within 1,000 feet of the Runway 8 approach threshold (Final location TBD based on obstruction analysis)
- Relocation of golf course holes



ORMOND BEACH MUNICIPAL AIRPORT
RUNWAY 8-26 EXTENSION
ALTERNATIVE #1

Figure 5

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1.6.3 Alternative 2

Alternative 2 extends Runway 8/26 by 1,000 feet to the west. The width of runway 8/26 would remain the same at 75 feet. This would increase the runway length from 4,005 feet to 5,005 feet. This alternative satisfies the findings of the Runway Length Analysis included in the Master Plan. Runway 17/35 would remain at 3,704 feet in length and 100 feet wide. This alternative expands the runway without impacting the golf course or Airport Road. Alternative 2 is depicted graphically in **Figure 6.**

Vegetative clearing would be required for any new approach, which may require off-airport tree removal or obstruction lighting. This alternative will increase the development constraints caused by the ATCT line of sight and the Runway Visibility Zone (RVZ). The proposed action would extend the RPZ off airport property and over 3 privately-owned parcels.

Because the RPZ associated with Runway 8 extends beyond airport property, the airport must acquire sufficient property rights to control the land use beneath the RPZ. This requirement could be met by purchasing the property in fee, or purchasing an avigation easement from the property owners. Currently, the land use directly under the proposed RPZ would be compatible pursuant to FAA's *Interim Guidance* dated September 27, 2012. This alternative requires negotiation with private property owners to acquire rights to approximately 5.3 acres of privately-owned property in order to maintain control of the RPZ. The Airport has met with the affected homeowners and they are amenable to avigation easement negotiations. The cost of an easement is significantly less expensive than acquiring the ownership of the property under the RPZ in fee. The estimated cost of acquiring an avigation easement is $315,000; as opposed to an estimated cost of $945,000 if the properties are purchased in fee. These estimated costs were derived from the assessed value of the property and historical data from similar easements associated with similar general aviation airports. A fair market value appraisal would be required in negotiations. All Avigation Easement documents will be approved by the FAA – ADO prior to execution of the agreements with the land owners.

Additional easements on adjacent privately-owned parcels may be necessary to remove trees that penetrate approach surfaces. This includes one additional parcel (411200000170) as depicted in **Figure 6**.

The estimated probable costs of Alternative 2 is approximately $3.8 million for an avigation easement and $4.4 million for fee simple purchase. A breakdown of costs is shown in **Table 4 and 5**.

TABLE 4 – ESTIMATED PROBABLE COST FOR ALTERNATIVE 2 WITH AVIGATION EASEMENT

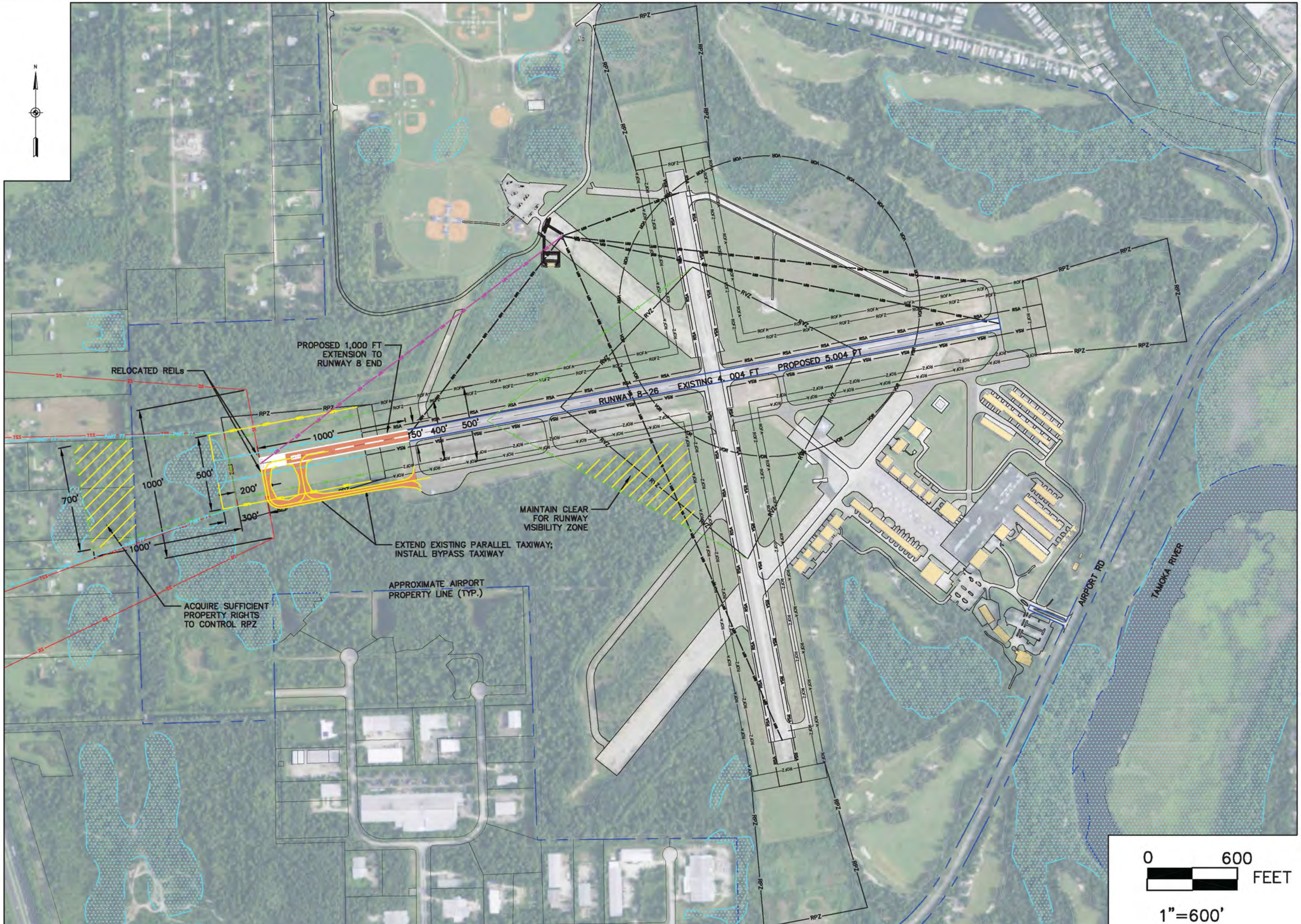
Element	Approximate Cost
Extend Runway 8 (1000' west)	$1,553,000.00
Extend Taxiway Alpha (1000' west)	$1,535,000.00
Obstruction Removal	$376,000.00
Property Rights	$315,000.00
Total	**$3,779,000.00**

TABLE 5 – ESTIMATED PROBABLE COST FOR ALTERNATIVE 2 WITH FEE SIMPLE PURCHASE

Element	Approximate Cost
Extend Runway 8 (1000' west)	$1,553,000.00
Extend Taxiway Alpha (1000' west)	$1,535,000.00
Obstruction Removal	$376,000.00
Property Rights	$945,000.00
Total	**$4,409,000.00**

This estimate accounts for the proposed development and does not include any resolutions to existing non-conformities or rehabilitation to existing infrastructure. Additional associated projects may include:

- Relocate AWOS within 1,000 feet of the Runway 8 approach threshold (Final location TBD based on obstruction analysis)
- Purchase of entire properties affected by the extension. This is an option in lieu of obtaining avigation easements. Please see **Figure 3** for affected parcels.
- Purchase additional avigation easements for obstruction removal. Please see **Figure 3** for affected parcels.



CITY OF ORMOND BEACH FLORIDA

ORMOND BEACH MUNICIPAL AIRPORT
RUNWAY 8-26 EXTENSION
ALTERNATIVE #2

Figure 6

1.6.4 Alternative 3

Alternative 3 extends runway 8/26 by 600 feet to the west. The width of runway 8/26 would remain the same at 75 feet. This would increase the runway length from 4,005 feet to 4,605 feet. This alternative does not satisfy the findings of the Runway Length Analysis included in the Master Plan. Runway 17/35 would remain at 3,704 feet in length and 100 feet wide. This alternative extends runway 8 and the associated RPZ to the west but remains within the existing airport property limits. Alternative 3 is depicted graphically in **Figure 7.**

This alternative would have the same impacts as depicted in Alternative 1, less the impacts to the east caused by existing Runway 26 towards the golf course.

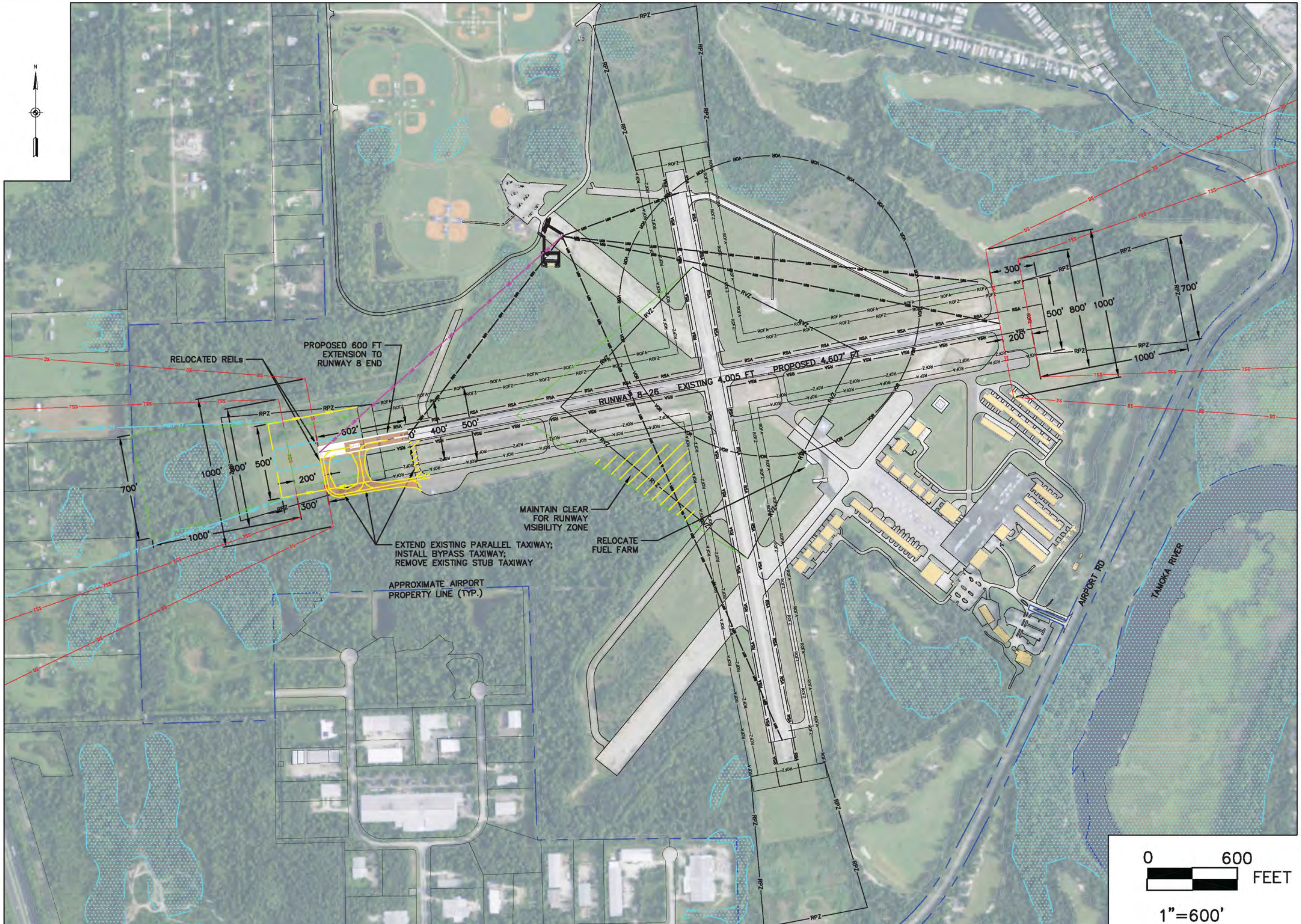
The estimated probable costs of Alternative 3 is approximately $2.5 million. A breakdown of costs is shown in **Table 5**.

TABLE 6 – ESTIMATED PROBABLE COST FOR ALTERNATIVE 3

Element	Approximate Cost
Extend Runway 8 (600' west)	$934,000.00
Extend Taxiway Alpha (600' west)	$1,221,000.00
Obstruction Removal	$295,000.00
Total	**$2,450,000.00**

This estimate accounts for the proposed development and does not include any resolutions to existing non-conformities or rehabilitation to existing infrastructure. Additional associated projects may include:

- Relocate AWOS within 1,000 feet of the Runway 8 approach threshold (Final location TBD based on obstruction analysis)



ORMOND BEACH MUNICIPAL AIRPORT
RUNWAY 8-26 EXTENSION
ALTERNATIVE #3

Figure 7

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1.7 Cost Estimates

Cost estimates were prepared for the aforementioned alternatives and were based upon current market knowledge of bid prices for similar airport projects in Florida. The cost estimates include construction costs and program costs. Construction costs include all materials and labor. A construction contingency of 25% is provided in the estimate for unknown items at this conceptual level of planning. Program costs include engineering design fees, construction management services, topographic survey, geotechnical investigations, utility location services, and quality assurance and materials testing.

Cost estimates are presented in 4th Quarter, 2017 dollars. Escalation needs to be applied to carry these costs into future periods. **Table 7** presents a summary of the cost estimates.

Table 7 Alternative Cost Estimates

Alternative	Description	Estimated Cost
No Build	No new changes to the existing runway configuration	$0
1	Extend Runway 08-26, Extend Taxiway A, Obstruction Removal, Realign Airport Road, Relocate 3 golf holes	$7,340,000
2	Extend Runway 08, Extend Taxiway A, Obstruction Removal, **Property Rights**	$3,779,000
2	Extend Runway 08, Extend Taxiway A, Obstruction Removal, **Fee Purchase**	$4,409,000
3	Extend Runway 08, Extend Taxiway A, Obstruction Removal	$2,450,000

The “No Build” alternative is the least costly, because it does not include runway construction. Alternative 1 is the most expensive due to the need to realign Airport Road and the impact to the golf course. Alternatives 2 and 3 vary due to the difference in runway length.

1.8 Practicability Assessment

The FAA’s memorandum entitled *Interim Guidance on Land Use within Runway Protection Zones* requires a practicability assessment based on cost, constructability, and other factors. For the purpose of this assessment the following factors were considered:

- Operational Impacts
- Compliance with FAA Land Use Guidance
- Cost
- Constructability
- Other Factors

1.8.1 Operational Impacts

One of the most important items when evaluating the practicability of RPZ alternatives is the impact that they would have on the existing and proposed aircraft operations. As part of the airport's Master Plan, a runway length analysis was performed. In order for Runway 8-26 to satisfy the runway length as determined by the analysis, the runway would have to be extended from 4,005 feet to 5,005 feet. Alternative 1 and Alternative 2 satisfy this requirement. Alternative 3 brings the final runway length to 4,605 feet, which does not completely satisfy the requirement as outlined in the airport's Master Plan.

1.8.2 Compliance with FAA Land Use Guidance

The presented alternatives have different impacts affecting compliance with the FAA Land Use Guidance. Alternative 1 would be considered incompliant as the extension would cause Airport Road to be partially within the RPZ for Runway 26. In addition, the RPZ would include a recreational land use. Airport Road would have to be realigned, and the affected portion of the golf course relocated. Alternative 2 would also be considered noncompliant because the extension will cause the RPZ to be partially off airport property and over parcels zoned for residential land use. Alternative 3 is considered in compliance with the FAA Land Use Guidance.

1.8.3 Cost Implications

As noted in the preceding section, the "No Build" alternative is the least costly, because it does not include runway construction. Alternatives 2 and 3 are costlier due to their runway extensions of 1000-feet and 600-feet, respectively. Alternative 1 is the most expensive alternative at an estimated cost of $6,491,000.

1.8.4 Constructability

Factors affecting constructability include the following:

- Capacity
- Capability
- Efficiency
- Environmental Factors
- Property or Easement Acquisition

The following paragraphs address each of the items.

1.8.4.1 Capacity

The forecast presented in Chapter 5 of the approved Airport Master Plan determined that there is little likelihood of exceeding the current runway capacity limitations at OMN over the planning period. Therefore, capacity is not a factor when evaluating development alternatives.

1.8.4.2 Capability

The capability of the airport to meet the needs and desires of the flying public is at the core of the operational performance evaluations of the proposed development alternatives. The public involvement program has revealed a common theme whereby members of the flying and non-flying community believe the airport could and should have greater capability to provide better amenities and play a larger role in servicing the regional aviation community.

1.8.4.3 Efficiency

Operational performance is measured for an aircraft in a fashion similar to that of a business. Efficiency revolves around the question of whether an aircraft owner or operator can plan a flight to OMN, land, easily find parking near an FBO or terminal that provides physical and business amenities including bathrooms, fuel, flight planning, rental cars, etc. and then just as easily file a flight plan, taxi, and depart from the field at or near maximum gross takeoff weight to maximize range and payload. Efficiency is measured against other airports from which the aircraft pilot has been able to successfully operate. If OMN does not measure up to the standards of capability and efficiency at competing airports, the aircraft owner or operator may go elsewhere and possibly not utilize OMN again, and thus business opportunities and revenue will be lost. This concept stimulates the need for an alternative which would extend runway 08-26. Alternatives 1 and 2 bring runway 08-26 to the preferred length of 5,005 feet while Alternative 3 only extends the runway to 4,605 feet.

1.8.4.4 Environmental Factors

Environmental constraints play a significant role in determining alternative development feasibility from a stewardship, aesthetic, and financial perspective. OMN has significant forests and wetlands that are buffers and important filters for stormwater. Additional environmental factors include development related impacts that may affect humans including noise, socioeconomics, public areas, disproportionate impacts, and how a specific project contributes to the cumulative total of impacts over time. All proposed developments must be closely examined during the planning phase to ensure Federal and State NEPA requirements are met and that impacts to any of the fourteen (14) environmental categories are avoided, minimized, or plans are made to mitigate. Specific projects will require different levels of NEPA review effort, provided extraordinary circumstances are absent, with the least impactful projects eligible to receive a Categorical Exclusion (CATEX) determination and more significant projects with more potential human environmental impacts requiring an Environmental Assessment (EA) or if warranted, an Environmental Impact Statement (EIS). **Table 8** below identifies the potential environmental, Cultural Resource and Economic impacts for each alternative.

TABLE 8 – POTENTIAL ENVIRONMENTAL, CULTURAL and ECONOMIC IMPACTS

Alternative	Environmental Impacts	Cultural Impacts	Economic Impacts
No Build	None	None	Negative – Limited growth and loss of current and future revenue
1	Wetland Impacts – 5.87 Acres Species - Possible	Likely – the project would impact wetlands located in close proximity to the Tomoka River which may contain Tribal artifacts	Positive – Runway length of 5,005' would meet the runway length analysis requirement
2	Wetland Impacts – 2.42 Acres Species - Possible	None – Based on recent cultural resource surveys completed	Positive – Runway length of 5,005' would meet the runway length analysis requirement
3	Wetland Impacts – None Species - Possible	None – Based on recent cultural resource surveys completed	Positive – Runway length of 4,605' would not meet the runway length analysis requirement or the Airport's goals

1.8.4.5 Property or Easement Acquisition

Alternatives 1 and 3 would not require any property or easement acquisition. Alternative 2 would require negotiation with private property owners to acquire rights to approximately 5.3 acres of land in order to maintain control of the RPZ. Currently no buildings or structures exist within the proposed RPZ for Alternative 2. Easements obtained over the affected landowners would prohibit incompatible land uses or any activity not compatible with the guidance dated September 27, 2012.The cost of an easement is significantly less expensive than acquiring the ownership of the property under the RPZ in fee. The estimated probable cost of acquiring an avigation easement is approximately $315,000; as opposed to an estimated of $945,000 if the properties are purchased in fee. These estimated costs were derived from the assessed value of the property. A fair market value appraisal would be required in negotiations.

1.8.5 Other Factors

Additional factors to be considered when choosing an alternative for the Runway 08-26 extension include the consideration of the Runway Length Analysis as included in the Master Plan. Specifically, this affects Alternative 3 which does not satisfy the needs of the airport as outlined in the analysis.

Another factor is the consideration of the on-property River Bend Golf Course. Alternative 1 would cause the course to have to abandon 3 holes. In addition, Alternative 1 would cause a realignment of Airport Road.

Considering all other factors involved, Alternative 2 is the Airport Sponsor's preferred option. The airport has experienced minimal growth over the past several years. This slow growth can be closely attributed to the lack of a runway that meets the needs for the business jet aircraft that either currently utilize the airport or are expected to use the airport in the near future. During the recent Master Plan, several options were discussed to increase the runway length and the only option that provided the least impact to the users and the surrounding community was to extend Runway 8-26. This analysis shows the viability of a 1,000' extension to Runway 8. A complete summary of the practicability assessment for each alternative is provided in **Table 9**.

Table 9
Summary of Practicability Assessment

Item	Alternative 1	Alternative 2	Alternative 3
Operational Impacts	Increases existing RW length from 4,005 ft. to 5,005 ft.	Increases existing RW length from 4,005 ft. to 5,005 ft.	Increases existing RW length from 4,005 ft. to 4,605 ft.
Compliance with FAA's RPZ Land Use Guidance	The eastern extension of RW 08-26 would require a relocation of Airport Road	This alternative would cause the RPZ to be partially off airport property, over residential property	This alternative is compliant with the RPZ Land Use Guidance
Cost	$6,540,000	$3,779,000 PR $4,409,000 Purch.	$2,450,000
Construction Complexity	Medium	Low	Low
Environmental Factors	Minimal impact to biotic resources, Vegetative clearing and off-airport tree removal may occur	Limited impact to biotic resources, Vegetative clearing and off-airport tree removal may occur	Minimal impact to biotic resources, Vegetative clearing and off-airport tree removal may occur
Property/Easement Acquisition	None Required	5.3 Acres Avigation Easement Required[2]	None Required
Other Factors	The golf course on airport property would have to relocate 3 holes with this extension and Airport Road would have to be realigned.	This is the preferred alternative for the airport	Does not satisfy the Runway Length Analysis included in the Master Plan and will negatively influence current and future revenue and airport goals

[2] Additional easements may be required for obstruction removal.

Ormond Beach Municipal Airport
Draft EA
Runway 8-26 Extension,
Taxiway A Extension,
Easement Acquisition and On- and Off-Airport Obstruction Removal

Attachment U

From: Stahl, Chris
To: Peace, Kimberly R.
Cc: State_Clearinghouse
Subject: State_Clearance_Letter_For_FL201712208218C_Draft Environmental Assessment for Ormond Beach Municipal Airport Improvement Projects, Ormond Beach, Volusia County
Date: Friday, January 26, 2018 2:19:59 PM

January 26, 2018

Kimberly Peace
Hpyle, Tanner and Associates. Inc.
150 Dow Street
Manchester , New Hampshire 03101

RE: Department of Transportation, Federal Aviation Administration, Airport Improvement Program - Draft Environmental Assessment for Ormond Beach Municipal Airport Improvement Projects, Ormond Beach, Volusia County, Florida
SAI # FL201712208218C

Dear Kimberly:

Florida State Clearinghouse staff has reviewed the proposal under the following authorities: Presidential Executive Order 12372; § 403.061(42), Florida Statutes; the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended; and the National Environmental Policy Act, 42 U.S.C. §§ 4321-4347, as amended.

Based on the information submitted and minimal project impacts, the state has no objections to the subject project and, therefore, it is consistent with the Florida Coastal Management Program (FCMP). The state's final concurrence of the project's consistency with the FCMP will be determined during any environmental permitting processes, in accordance with Section 373.428, Florida Statutes.

Thank you for the opportunity to review the proposed plan. If you have any questions or need further assistance, please don't hesitate to contact me at (850) 717-9076.

Sincerely,

Chris Stahl

Chris Stahl, Coordinator
Florida State Clearinghouse
Florida Department of Environmental Protection
2600 Blair Stone Road, M.S. 47

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