Item 5: Proposed Project Antidegradation Analysis

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Section 1: Antidegradation Analysis

1.1 Project Description

The Cuyahoga County Airport (CGF) currently has a single runway, designated Runway 6/24, that is 5,102 feet long and 100 feet wide. The taxiway system includes a full parallel taxiway and several access taxiways that connect the T-hangars, corporate hangars and apron areas, and the fixed base operator (FBO) area with the runway. The airport, owned by Cuyahoga County, is located approximately 11 miles east of downtown Cleveland, Ohio, within the city of Richmond Heights. It serves the aviation needs of eastern Cuyahoga County, western Lake and Geauga Counties in northeastern Ohio. The land area of the airport consists of approximately 660 acres.

In 2010 an Airport Master Plan was completed to identify improvements at CGF needed to comply with Federal Aviation Administration (FAA) design standards. A total of 40 planning alternatives were considered. Based on public opinion, solutions with fewer impacts were targeted. An Ultimate Layout Plan was approved that reflected the long term needs of the airport however the minimal-impact Alternative was preferred (Alternative #23) and carried forward to specifically address the immediate concerns of Runway Safety Area (RSA) deficiencies and pavement disrepair due to age. RSAs are defined by the FAA as "the surface surrounding the runway that is prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or other excursion from the runway". RSAs must be cleared and graded with no potentially hazardous humps, ruts, depressions, adequately drained to prevent water accumulation, capable of supporting snow removal equipment, rescue and firefighting equipment, and occasional aircraft passage without causing structural damage to the aircraft or injury to their occupants, and free of objects. RSA compliance is "triggered" by a runway construction or rehabilitation project, such as the pavement rehabilitation for CGF.

Table 1. Runway Safety Area Existing and FAA Standard Conditions

Design Element	FAA Standard	Existing Condition
Runway Width	100 ft	100 ft
RSA Width	500 ft	310 ft
RSA Length beyond Runway 6 End	1,000 ft	43 ft
RSA Length beyond Runway 24 End	1,000 ft	57 ft

Subsequently, an Environmental Assessment (EA) was conducted, as required by NEPA, to evaluate the effects of the Preferred Alternative on the surrounding environment. Input from other agencies was sought to guide the FAA to a decision, and the project was issued a FONSI on May 20, 2015. This process was required in order to receive federal funding (Federal Airport Improvement Program funds). A copy of the EA and FONSI are available on the enclosed CD. Additional information about the airport, including the Master Plan, is available online at http://publicworks.cuyahogacounty.us/en-US/County-Airport.aspx.

The purpose of the proposed project, Preferred Alternative #23, is to provide 5,500 feet of usable runway length, establish compliant runway safety areas per FAA requirements, and rehabilitate runway pavement.

The project is proposed to start on January 15, 2016 and end in December 2018. Wetland mitigation credits will be purchased at a bank and stream mitigation will be conducted on-site concurrently with the project.

The Preferred Alternative

The Preferred Alternative was chosen because it meets the project's purpose and need and has the least environmental impacts. This should not be confused with the Ultimate Layout Plan which recommends 6,000 feet of runway based on forecasts of certain aircraft and business needs. Under the preferred alternative, Runway 6 would be extended 550 feet to the west and Engineered Material Arresting System (EMAS) would be installed. EMAS uses crushable concrete placed at the end of a runway to stop an aircraft that overruns the runway. The tires of the aircraft sink into the lightweight concrete and the aircraft is decelerated as it rolls through the material. The threshold for Runway 6 would be displaced 317 feet to provide 600 feet of RSA prior to the landing threshold. The end of Runway 24 would be shortened by 110 feet to allow EMAS to be installed and the landing threshold for Runway 24 would also be displaced 502 feet to provide 600-foot undershoot protection (Figure 2.6 Preferred Alternative 23 – EMAS at Both Runway Ends). Additional associated work will also occur, including grading, taxiways, lighting, and drainage. Also the runway and taxiway pavement would be replaced as it has significantly exceeded its average lifespan.

This alternative provides 5,502 feet of pavement for takeoff operations in both directions with compliant safety areas. Alternative 23 provides less landing distance due to the use of displaced thresholds. The landing distance available is 5,252 feet for Runway 6 and 5,052 feet for Runway 24.

When compared to all of the other build alternatives, Alternative 23 has the least anticipated impacts to floodplains, streams and farmland. It does not impact parkland or recreational resources, has no road relocations and has the least amount of proposed ground disturbance for construction. The construction elements of this alternative can be accomplished entirely on airport property. This alternative has the least amount of community impacts and is supported by both the general public and elected officials in all three local communities.

Minimal Degradation Alternatives

Out of the 40 alternatives reviewed, the following alternatives directly address runway safety area deficiencies and provide 5,500 feet of runway:

- Alternative 15 – Runway Reorientation (relocate Bishop & Richmond Road)
- Alternative 16 – Runway 6 extension to west (Relocate Richmond Road)
- Alternative 17 – Runway 24 extension to east (Relocate Bishop Road)
- Alternative 18 – Runway 24 extension to the east (tunnel Bishop Road)
- Alternative 23 – EMAS at both Runway Ends (Preferred Alternative)
- Alternative 24 – Combination of Runway 24 shift to west and Runway 6 EMAS

Two alternatives, #15 and #24, have fewer wetland impacts compared to the preferred alternative. However, both other alternatives have greater impacts to the 100- year floodplain, streams, ditches, and prime farmland. Therefore the preferred alternative #23 has the least total disturbance and least environmental impact.

The summary of impacts for various alternatives considered to meet the project's needs is shown in the table below:

Table 1. Summary of Environmental Impacts Evaluated in EA

Criterion	Alt. 15	Alt. 16	Alt. 17	Alt. 18	Alt. 19	Alt. 23 (Preferred)	Alt. 24
Wetlands (acres)	1.62	12.37	3.92	3.92	2.72	3.91	2.61

Criterion	Alt. 15	Alt. 16	Alt. 17	Alt. 18	Alt. 19	Alt. 23 (Preferred)	Alt. 24
100-year Floodplain	8.16	20.22	7.43	4.23	6.55	2.30	5.51
Streams (linear feet)	9,040.33	6,824.76	8,319.31	6,354.12	8,182.08	5,249.42	7,617.43
Ditches (linear feet)	1,398.86	2,818.31	1,618.48	2,068.65	2,303.99	2,068.65	1,373.60
Prime Farmland if Drained	304.74	280.55	252.09	251.67	267.33	209.28	220.53
Total Ground Disturbance (acres)	344.00	318.77	298.71	293.49	312.28	239.86	260.86
Probable Project Costs (2006)	$73.8 M	$19.0 M	$19.2 M	$32.0 M	$19.1 M	$20.8 M	$21.0 M

*Green highlights the least impact and red highlights the most impact

Non-Degradation Alternatives

There are three potential non-degradation alternatives including the No-Build Alternative, building a new airport at a new location, or using another nearby airport. The No-Build Alternative, while considered as part of the EA, will not be discussed as the project is not water-dependent. Though it is important to note in the No-Build scenario that the Runway Safety Area must be brought up to FAA standards or the airport will lose the potential to receive any federal funding toward improvements, including routine maintenance items, therefore the airport would have to seek all local or private funding or close.

Development of a new site to replace the functions of CGF would likely involve considerable land acquisition, cause significant residential and commercial relocations, could take years to construct, and would result in a substantial cost. Although constructing a new airport would accomplish the project's purpose and need of FAA compliant safety areas, even a new site of the size required could have unacceptable environmental impacts.

Three other airports within a 30 mile radius of CGF were considered as alternatives. One airport, Lost Nation Municipal Airport, does not have a runway of sufficient length to meet the project needs. The second airport, Burke Lakefront Airport, has existing infrastructure constraints and physical limitations to expand, it is unlikely that it would be able to absorb the tenants and aircraft operations from CGF. The third airport, Cleveland Hopkins International Airport, has the infrastructure to meet the project needs, but is focused on serving commercial airlines and may not have the capacity to accept a significant number of general aviation operations. In addition, relocating airport operations to another facility and abandoning the existing infrastructure is not a practicable or feasible alternative since there is a demonstrated need to provide an airport in the local community. These options would cause the FAA and the County to lose their public investment in the facility and would cause businesses to lose their private investment.

1.2 Avoidance

There are no prudent, feasible, or reasonable alternatives to avoid all impacts to the wetlands, however impacts were minimized to the extent possible. The preferred alternative avoided impacts to higher quality wetlands located southwest and northeast of the airport by utilizing the EMAS system and declared distances to reduce the impact footprint. Tables 2, 3, and 4 list all water resources avoided.

Table 2. Avoided Wetlands

Wetland ID	Existing Size (acre)	Cowardin Type	Quality (ORAM)	Designated Use (rule 26, page 11*)	Category
E	0.48	PEM	26	LRW, AWS, IWS, SCR	1
O	0.81	PFO	41	LRW, AWS, IWS, SCR	Modified 2
P	0.18	PFO/PSS	38	LRW, AWS, IWS, SCR	Modified 2
Q	0.03	PFO	34	LRW, AWS, IWS, SCR	1 or 2
R	0.89	PFO	41	LRW, AWS, IWS, SCR	Modified 2
U	0.05	PEM	16	LRW, AWS, IWS, SCR	1
1	0.26	PEM	14.5	LRW, AWS, IWS, SCR	1
2	0.05	PEM	13.5	LRW, AWS, IWS, SCR	1
3	0.04	PEM	13.5	LRW, AWS, IWS, SCR	1
4	0.02	PEM	28.5	LRW, AWS, IWS, SCR	1
Total	**2.81**				

*East Branch Euclid creek - unnamed tributary (RM 1.55)

Table 3. Avoided Streams

Stream ID	Existing Length (ft)	Type	Drainage Area (sqmi)	Quality	Habitat	OHWM (ft)	Depth (ft)
1	191	intermittent	0.06	32 HHEI	Modified Class II PHWH	8	1.5
2	1208	intermittent	0.06	60 HHEI	Modified Class II PHWH	8	2.5
3	499	intermittent	0.01	52 HHEI	Modified Class II PHWH	4	0.3
9	872	intermittent	0.04	57 HHEI	Modified Class II PHWH	8	0.5
5	848	perennial	3.25	63.5 QHEI	WWH	10	3
6	203	perennial	0.72	74 HHEI	WWH	10	0.8
7	498	perennial	3.22	47 QHEI	WWH	10	1.5
8	43	perennial	0.34	50 HHEI	Modified Class II PHWH	10	0.3
Total	**4,362**						

Table 4. Avoided Ditches

Ditch ID	Existing Length (ft)	Type	Drainage Area (sqmi)	Quality	Habitat	OHWM (ft)	Depth (ft)
5	462	ephemeral	<0.1	n/a	negligible	4	0.5
8	117	ephemeral	<0.1	n/a	negligible	2	0.1
Total	**1,177**						

1.3 Minimization

Stream and wetland impacts were minimized to the extent possible by limiting fill to only that required to meet the FAA RSA design criteria. Excavated soil material will be placed only in upland locations and hauled off-site even though it could be utilized to maximize future developable land adjacent to the airport and significantly reduce costs associated with hauling excess soil off-site.

Grading will impact a total of eight emergent wetlands for an area of 2.19 acres, one ephemeral stream for a length of 459 feet, and three jurisdictional ephemeral ditches for a length of 820 feet. This is a reduction from the potential impacts assessed in Alternative 23 during the EA (Table 1). Relocation of Stream 4 will minimize the direct impacts on Euclid Creek watershed by maintaining existing stream functions on-site. Relocation of Ditches 3 and 4 was considered, however to the west are FAA Comm/electrical lines making this direction prohibitive and to the east the elevation change is too significant.

Minimization efforts are somewhat restricted in that ditches may be enclosed within the airfield instead of allowing open standing water which could become a wildlife attractant. Impacts were limited to only the existing degraded streams, ditches, and wetlands within the existing airfield and no impacts were made to higher quality streams and wetlands adjacent to the airfield.

1.4 Describe the magnitude of the proposed lowering of water quality.

The Preferred Alternative

To evaluate potential water quality impacts, a wetland delineation was conducted by a qualified biologist in the study area of the Airport (see enclosed Item 3, Waters of the United States Delineation.....Report and additional information). The survey was intended to determine the locations and limits of water resources, appraise their types and functions, assess their regulatory status and evaluate potential impacts from the proposed project. The wetland delineation was reviewed by the USACE during a field inspection on April 29, 2015, several revisions made as an addendum, and approved as a Preliminary Jurisdictional Determination No. 2013-00443. All proposed construction activities of Preferred Alternative 23 will take place on existing Airport property, which will minimize impacts to surface water resources that occur adjacent to the airport.

Construction of the proposed project will result in approximately 820 total linear feet of impact to three ditches on Airport property. One stream will be impacted, resulting in a loss of 459 feet. All streams and ditches to be impacted are ephemeral, channelized, located within the existing airfield, and receive routine maintenance such as mowing. This restricts most habitat value and limits potential water quality functions. No changes in potential pollution levels downstream are expected since storm water will still be managed on-site. No effects on economic value of the water bodies are expected. Stream 4 will be relocated with equal or improved function and value using natural vegetation for bank stabilization in accordance with guidance and consultation with the regulatory agencies.

Table 5. Proposed Stream Impacts

Stream ID	Existing Length (ft)	Impact Length (ft)	Type	Drainage Area (sqmi)	Quality	Habitat	OHWM (ft)	Depth (ft)
4	707	459	ephemeral	0.06	38 HHEI	Modified Class II PHWH	4	0.3
Total	**707**	**459**						

Table 6. Proposed Ditch Impacts

Ditch ID	Existing Length (ft)	Impact Length (ft)	Type	Drainage Area (sqmi)	Quality	Habitat	OHWM (ft)	Depth (ft)
2	537	381	ephemeral	<0.1	n/a	negligible	1	0.1
3	511	144	ephemeral	<0.1	n/a	negligible	1	0.1
4	370	295	ephemeral	0.21	57 HHEI	Modified Class II PHWH	1	0.3
Total	**1,177**	**820**						

Nineteen wetland complexes were delineated within the boundaries of the Airport property; however only eight wetlands are expected to be impacted by Preferred Alternative 23. As these wetlands are located in the same general area and exhibit identical characteristics, they were evaluated as one wetland complex in terms of quality and function (see Waters Report). A total of 2.19 acres of Category 1 wetland will be eliminated due to grading activities and the installation of new drainage systems. All wetlands that will be impacted provide limited habitat value because they are within the airfield and mowed and maintained by the airport personnel. The wetlands to be impacted are not unique or rare. Water quality functions such as groundwater recharge and pollutant filtering will be eliminated. No effects on economic value of the water bodies are expected.

Table 7. Proposed Wetland Impacts

Wetland ID	Existing Size (acre)	Impact Area (Acre)	Cowardin Type	Quality (ORAM)	Designated Use (rule 26, page 11*)	Category
F	0.21	0.21	PEM	19	LRW, AWS, IWS, SCR	1
G	1.76	0.57	PEM	26	LRW, AWS, IWS, SCR	1
H	0.03	0.03	PEM	19	LRW, AWS, IWS, SCR	1
I	0.08	0.01	PEM	19	LRW, AWS, IWS, SCR	1
J	0.03	0.02	PEM	19	LRW, AWS, IWS, SCR	1
K	0.61	0.35	PEM	19	LRW, AWS, IWS, SCR	1
S	0.09	0.09	PEM	16	LRW, AWS, IWS, SCR	1
T	0.91	0.91	PEM	16	LRW, AWS, IWS, SCR	1
Total	**3.72**	**2.19**				

*East Branch Euclid creek - unnamed tributary (RM 1.55)

Preferred Alternative 23 is not expected to have any adverse water quality impacts that cannot be easily mitigated.

1.5 Technical Feasibility and Cost Effectiveness

The Preferred Alternative

The preferred alternative was chosen based upon the ability to fully comply with RSA criteria while minimizing natural resource impacts and being economically feasible. The total cost (current) for the preferred alternatives 23 is $42,058,925 assuming the project is completed over three years. Costs are estimated to escalate to $43,668,181 if the project is accelerated to be constructed in one construction season. The use of EMAS in lieu of further runway extension has been determined to be technically feasible in this application.

Minimal Degradation Alternative

There are no minimal degradation alternatives as the project sponsor already chose the least damaging, practicable alternative as the preferred. Costs for several of the other alternatives are provided in Table 1. These costs are in 2006 dollars, obtained from the Master Plan Update, and should be considered relative.

Non-Degradation Alternative

The airport relocation would be technically feasible however the cost is prohibitive and unrealistic. As mentioned in Section 1.1, all money invested in the Cuyahoga County airport would be wasted and development of a new airport would cost hundreds of millions of dollars due to land purchase, environmental studies, design, infrastructure, utilities, and construction.

If the airport does not comply with the FAA regulations for the runway safety area, the airport will not receive any future funding.

1.6 Economic Considerations

A report titled "Economic Impact of Cuyahoga County Airport" was prepared as part of the EA. This report is available in its entirety on the CD previously noted. The study identified 1,280,122 people living in Cuyahoga County and 230,041 in Lake County with a median household income of $44,088 and $55,968 respectively. More than 980,000 jobs are located in the 2 counties. In summary, the analysis encompassed three classes of aviation-related activities: on-airport aviation activities, off-airport visitor spending activities, and other off-airport aviation dependent activities. In total, the airport contributes more than $200 million and supports almost 1,000 jobs annually in Cuyahoga and Lake Counties from direct or spin-off effects.

An inventory of existing operations in 2012 identified 206 based aircraft including 88 single-engine aircraft, 19 multi-engine aircraft, 98 jet aircraft, and 1 helicopter. Total operations were 34,475. Projections through the next 20 years revealed a modest increase in operations. The preferred alternative is intended to provide better accommodations to area businesses by supplying safer means of travel and transport for people and goods. The airport provides services that will benefit by remaining compliant with FAA regulations. However, the main purpose of the project is to comply with current FAA design standards that are intended to increase safety.

No significant land development or other projects are known for the project area at this time. Therefore, no cumulative effects are anticipated to occur to natural, social, or cultural resources for any of the alternatives. However, the preferred alternative may have a minor positive effect on business activity in the area, should the runway safety and airport use factor into a business's decision to locate to the area.

1.7 Cumulative Impact

In order to build the existing runway, taxiway and other associated airport facilities, several streams were dredged, straightened, and encapsulated (approximately 1,800 feet), native vegetation cleared, and ditches constructed to drain surface water more efficiently. These kind of impacts typically increase peak discharges downstream and remove headwater type habitat. This project adds to the previous impact by impacting these streams further. If the airport was not constructed, this property would likely have been farmed for a period of time and then converted to residential or commercial uses as the city grew. This is inferred by the surrounding land uses today and typical progression of development (see Item 6, maps).

Although a minor amount of residential, commercial and industrial development could be expected to occur as a result of the project, most of the assumed development is expected to be infill by nature, consisting of redevelopment of existing built-up areas, including brownfields, rather than the

development and disturbance of outlying areas of limited woodlands, green space, parkland or other natural areas. Impacts on existing natural features and further habitat fragmentation are not expected to occur as a result of Preferred Alternative 23 project. Future Airport improvements as part of this project will primarily occur within the existing Airport footprint and will utilize and improve the existing access points. This type of development will minimize potential secondary development and minimize creation of new impervious surfaces and the associated adverse indirect environmental impacts on surface water quality. No significant contributions to cumulative impacts will result from the construction of Preferred Alternative 23. See Section 5 of EA for additional discussion.

1.8 Indirect Impacts

The project may indirectly impact stream flows offsite due to improved drainage as a result of the RSA grading work. Less water will remain standing in the airfield. This may result in increased peak flows during rain events and less infiltration. Temporary impacts due to construction are outlined in the erosion control plans, specifically on plan sheet 18. See Section 5 of EA for additional discussion on indirect impacts. A summary is provided below.

Indirect impacts are often related to changes in land use. While land use changes are the direct result of local planning decisions, there may be indirect impacts associated with projects that affect the rate and pattern of development. In general, projects in a new location or projects in which there is a dramatic change in travel patterns are more likely to contribute to indirect impacts than projects in areas which are already developed, or involve a smaller increase in development. The Airport is a well-established facility having been owned and operated by Cuyahoga County since 1946. The proposed improvements to the runway are unlikely to spur landside development as would a new airport at a new location. The intended purpose of the project is to enhance safety, not to promote economic development or increase operations, however, the proposed improvements may facilitate some natural growth at the Airport.

A facility requirements analysis in the 2010 Master Plan Update identified a need for up to 34,000 square feet of additional corporate hangar space. The Airport Master Plan Update proposes an area for new hangers extending further along the flight line to the northeast. It is expected that general aviation-related development may consist of new and improved availability of T-hangers and new corporate hanger space. In addition to aviation-related development, two areas on Airport property and bordering on Richmond Road are designated for specific uses. One is the site at the southeast corner of Richmond Road and Curtiss Wright Parkway that is reserved for development of a mutual aid fire/rescue facility. North of this site along Curtis Wright Parkway, is an area reserved for expansion of landside commercial development. For the foreseeable future, development is located on Airport property and has been planned for eventual Airport development since the original Airport Layout Plan (ALP) developed in the early 1970's.

1.9 Construction Storm Water Management Plans

Erosion and sediment control measures will be employed during construction of the project. This shall include the installation of compost filter socks around the perimeter of all disturbed areas, stabilized construction entrances, inlet protection, staging areas, riprap in concentrated flow areas, erosion control blankets, and temporary and permanent vegetative stabilization of all non-paved surfaces, etc. A detailed erosion and sediment control plan has been developed for this project (see plan sheets 14 through 21).

1.10 Post-Construction Storm Water Management Plans

The storm water runoff for the airport in the newly graded RSA will be directed toward grassed swales with catch basin inlets located periodically. These catch basins will be routed to discharge to existing ditches and streams in a similar manner as currently exists. No open water detention will be constructed. See plan sheets 73 through 85 for proposed drainage details.