Section 6 – Selection of the Inaugural Airport Airfield Concept

This section describes the development and analysis of airfield concept alternatives that would accommodate the projected aviation activity and facility requirements identified in the Draft *Projections of Aeronautical Activity*[1] and the Draft *Demand/Capacity Analysis & Facility Requirements*[2] for the Inaugural Airport Program (IAP) at SSA. The IAP has been defined as the first five years of operation of SSA from Date of Beneficial Occupancy (DBO) to DBO+5. The facility requirements for the IAP specify that a 9,000 to 9,500-foot primary runway would need to be constructed to serve the projected aeronautical activity expected during the IAP.[3,4]

One of the Local Advisory Group meetings conducted by IDOT during 2004 was devoted to discussing the Inaugural Airport plan. Participants were divided into groups and asked to focus discussion on the following subjects: (1) Transportation, (2) Location of airport facilities, and, (3) Key concerns about the airport. The inaugural airfield alternatives discussed in the following include concepts presented by the Local Advisory Group in that meeting as well as concepts submitted to FAA during scoping. The Abraham Lincoln National Airport Commission (ALNAC), a potential future airport sponsor, has prepared a separate plan for the Inaugural Airport, which is also evaluated in this report. Another potential airport sponsor, Will County, Illinois, has submitted facility requirements to IDOT, but indicated that they would accept the Master Plan that IDOT prepares as their own plan for the Inaugural Airport. In addition, the Villages of Beecher and Crete submitted separate concepts for the ultimate airfield configuration, but did not specifically identify an Inaugural Airport concept. IDOT analyzed these ultimate configurations, as submitted by the Villages of Beecher and Crete, and identified a logical inaugural runway that corresponds to a runway in the respective ultimate airfield concept and included them for evaluation.

Based on the projected forecasts and conclusions of previous studies, it was determined that an airfield with one primary runway in an east-west orientation (09-27) would adequately accommodate the commercial passenger and cargo aviation demand projected for DBO+5 and beyond. A single runway with this orientation would provide sufficient wind coverage for All Weather, Visual and Instrument Flight Rules (IFR) conditions for the projected commercial passenger and cargo activity, as long as the recommended navigational aids detailed in the facility requirements report are also installed. To accommodate general aviation (GA) aircraft, a crosswind runway in a northeast-southwest orientation (05-23) will be required. While GA aircraft will be able to utilize the primary runway approximately 91 percent of the year, under certain wind and weather conditions a crosswind runway will be required for Aircraft Design Group (ADG) B-II aircraft to land at SSA. Thus, this section has been divided into two discussions, one focusing on alternatives for the inaugural primary runway (09-27) and one focusing on the inaugural crosswind runway (05-23).

[1] Draft *Projections of Aeronautical Activity for the Inaugural Airport Program, South Suburban Airport,* prepared for the Illinois Department of Transportation, May 2004.
[2] Draft *Demand/Capacity Analysis & Facility Requirements for the Inaugural Airport Program, South Suburban Airport,* prepared for the Illinois Department of Transportation, March 2005.
[3] Ibid.
[4] Draft *Projections of Aeronautical Activity for the Inaugural Airport Program, South Suburban Airport,* prepared for the Illinois Department of Transportation, May 2004.

6.1 Inaugural Airfield Primary Runway (09-27) Alternatives

The preliminary ultimate concept (see Section 5) located the position of the east-west runways in order to meet the Sponsor's stated objectives of preserving the option to accommodate four parallel runways capable of handling simultaneous precision instrument approaches. Thus, in order to preserve the Sponsor's stated objectives, it is important that the inaugural primary runway, or first runway to be constructed on the site, be compatible with the preferred ultimate airfield concept. At the least it should not conflict with the preferred ultimate airfield concept in a way that prevents the ultimate plan from being implemented in the future. Because the ultimate terminal area location has been identified on the preferred ultimate concept, it is logical to assume that the inaugural runway would be located in an area close to the ultimate terminal location so that investments in access roads, utility infrastructure, and airport infrastructure could be utilized in subsequent phases of development, if SSA expands beyond the IAP.

Thus, all of the inaugural alternative runways examined focus on the runways that would be located either to the north or south of the proposed terminal area. However, the inaugural airfield analysis was not limited to the runway locations depicted on the preferred ultimate concept, but also included multiple locations in the general area of the preferred ultimate terminal location. This was done to ensure that the selected inaugural primary runway location was the one that best met the evaluation criteria and was not predetermined by the preferred ultimate airfield concept. Because the preferred ultimate airfield concept for SSA indicates that the runways on either side of the proposed terminal location could be up to 12,000 feet in length, each proposed inaugural runway location was analyzed based on a 9,500-foot runway, as prescribed by the draft *Demand/Capacity Analysis & Facility Requirements for the Inaugural Airport Program.* Since the primary runway could be constructed from the west or the east end, assuming that the runway may ultimately be extended another 2,500 feet in the future, each runway location alternative also has a west and east alternate. The ALNAC alternative, discussed below, defined a single 10,000-foot primary runway beginning from the west only. The runway and taxiways would be designed and located to meet at least Aircraft Design Group (ADG) IV standards. Following is a brief description of the alternatives considered for the primary runway for the inaugural airfield.

- ***Alternative A–West*** – A one-runway airfield (9,500 feet) in an 09-27 orientation. The proposed runway would be located south of the ultimate terminal complex area. The associated taxiway system would be provided as appropriate for the runway length and expected operating patterns (see **Exhibit 6-1**).

- ***Alternative A–East*** – This is the same as Alternative A – West except that the inaugural runway has been shifted 2,500 feet east (see **Exhibit 6-2**).

- ***Alternative B–West*** – This alternative places the inaugural runway 7,400 feet north and parallel of the runway location shown in Alternative A - West (see **Exhibit 6-3**). This alternative proposes constructing the north inner runway of the preferred ultimate concept as the inaugural runway.

- ***Alternative B–East*** – This alternative is the same as Alternative B – West except that the inaugural runway has been shifted 2,500 feet east (see **Exhibit 6-4**).

- ***Alternative C–West*** – This alternative was proposed by the Village of Beecher. It depicts the location of the inaugural runway 2,500 feet north of Eagle Lake Road and west of Kedzie Avenue (see **Exhibit 6-5**).

- ***Alternative C–East*** –This alternative is the same as Alternative C – West except that the inaugural runway has been shifted 2,500 feet east (see **Exhibit 6-6**).

- ***Alternative D-West*** – This alternative was proposed by the Village of Crete and places the inaugural runway approximately ¼-mile north of Eagle Lake Road, ending just west of Kedzie Avenue (see **Exhibit 6-7**).

- ***Alternative D–East*** – This alternative is the same as Alternative D – West except that the inaugural runway has been shifted 2,500 feet east (see **Exhibit 6-8**).

- ***Alternative E–West*** – This alternative shifts the inaugural runway approximately ½-mile north of North Peotone Road (see **Exhibit 6-9**).

- ***Alternative E–East*** – This alternative is the same as Alternative E – West except that the inaugural runway has been shifted 2,500 feet east (see **Exhibit 6-10**).

- ***Alternative F*** – This alternative was proposed by ALNAC. It illustrates a 10,000-foot runway located south of the terminal complex area (see **Exhibit 6-11**). The west end of the primary runway corresponds to the location of the inaugural runway depicted in Alternative A - West. A partial parallel taxiway is proposed at DBO. The taxiway would be extended to full-length by DBO+5. ALNAC believes it is essential to build a 10,000-foot runway in its inaugural airport concept, extending to 12,000 feet when business volume permits. The phasing of runway extensions and, indeed, the full parallel taxiway, reflects ALNAC's commercial development scheme of building to support expected business levels.

6.2 Evaluation of Inaugural Airfield Primary Runway (09-27) Alternatives

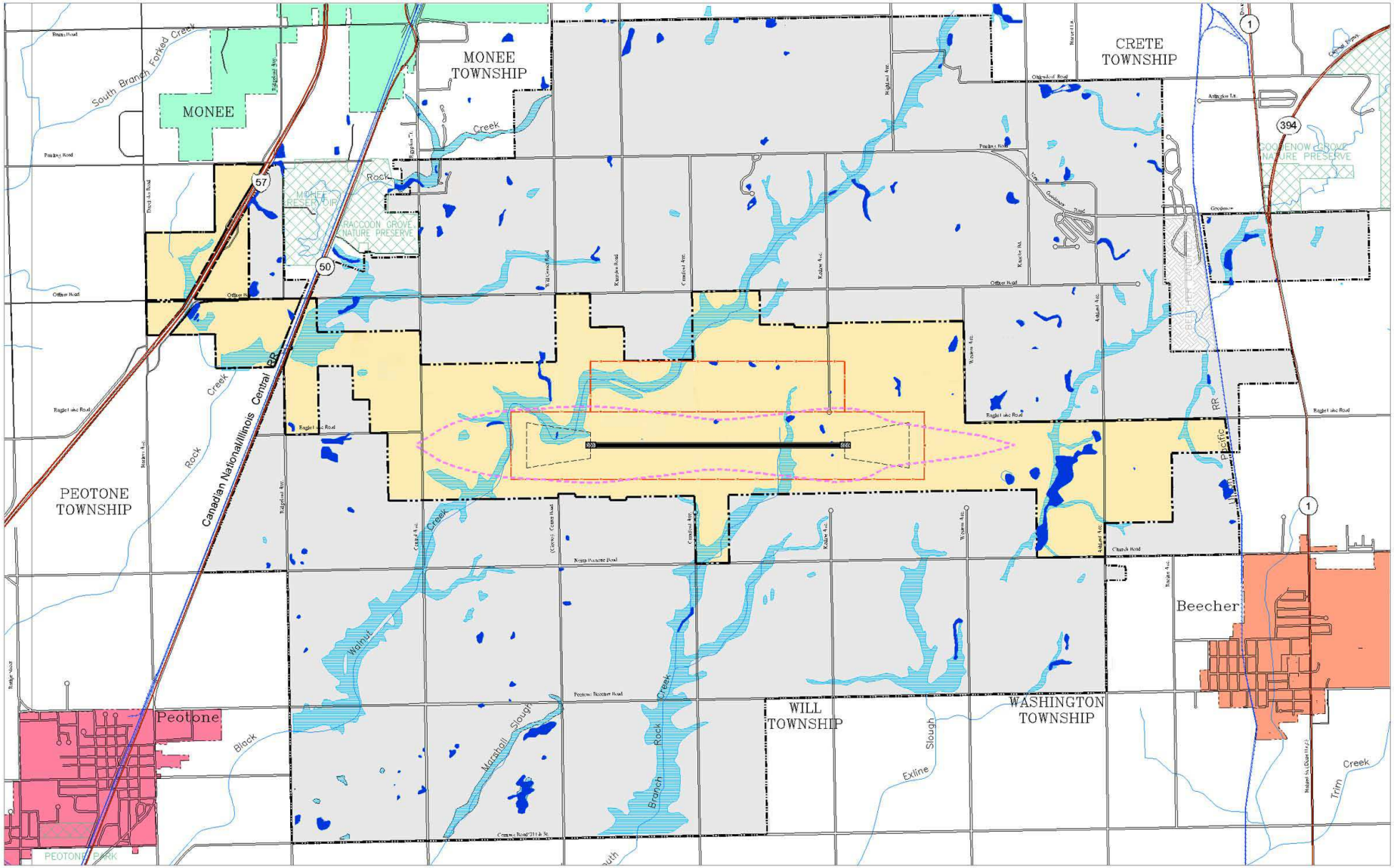
6.2.1 Inaugural Airfield Primary Runway (09-27) Alternatives Evaluation Criteria

The inaugural airfield alternatives were examined and evaluated based on a number of criteria that are listed and defined in **Table 6-1**. A short description of how each evaluation criteria was used to evaluate the alternatives is provided below.

Criteria 1 – Ability to Meet Forecasted Aviation Demand – Under the High Case Forecast Scenario for the IAP, a total of approximately 85,000 annual operations is expected at SSA by the end of DBO+5.[5] Each inaugural airfield alternative must be capable of accommodating at least this level of operations in order for it to be considered viable. Thus, as long as the alternative airfield could accommodate at least 85,000 annual operations, it received the highest rating. If the alternative could not accommodate this level of annual operations, it received the lowest rating.

Criteria 2 – Compatibility with Preferred Ultimate Concept – This criterion examines whether an alternative is compatible with the selected preferred ultimate airfield concept. If it was compatible, it received the highest rating; if the alternative was not compatible, it received the lowest rating.

[5] Draft *Projections of Aeronautical Activity for the Inaugural Airport Program, South Suburban Airport,* prepared for the Illinois Department of Transportation, May 2004.



TAMS an Earth Tech Company

N

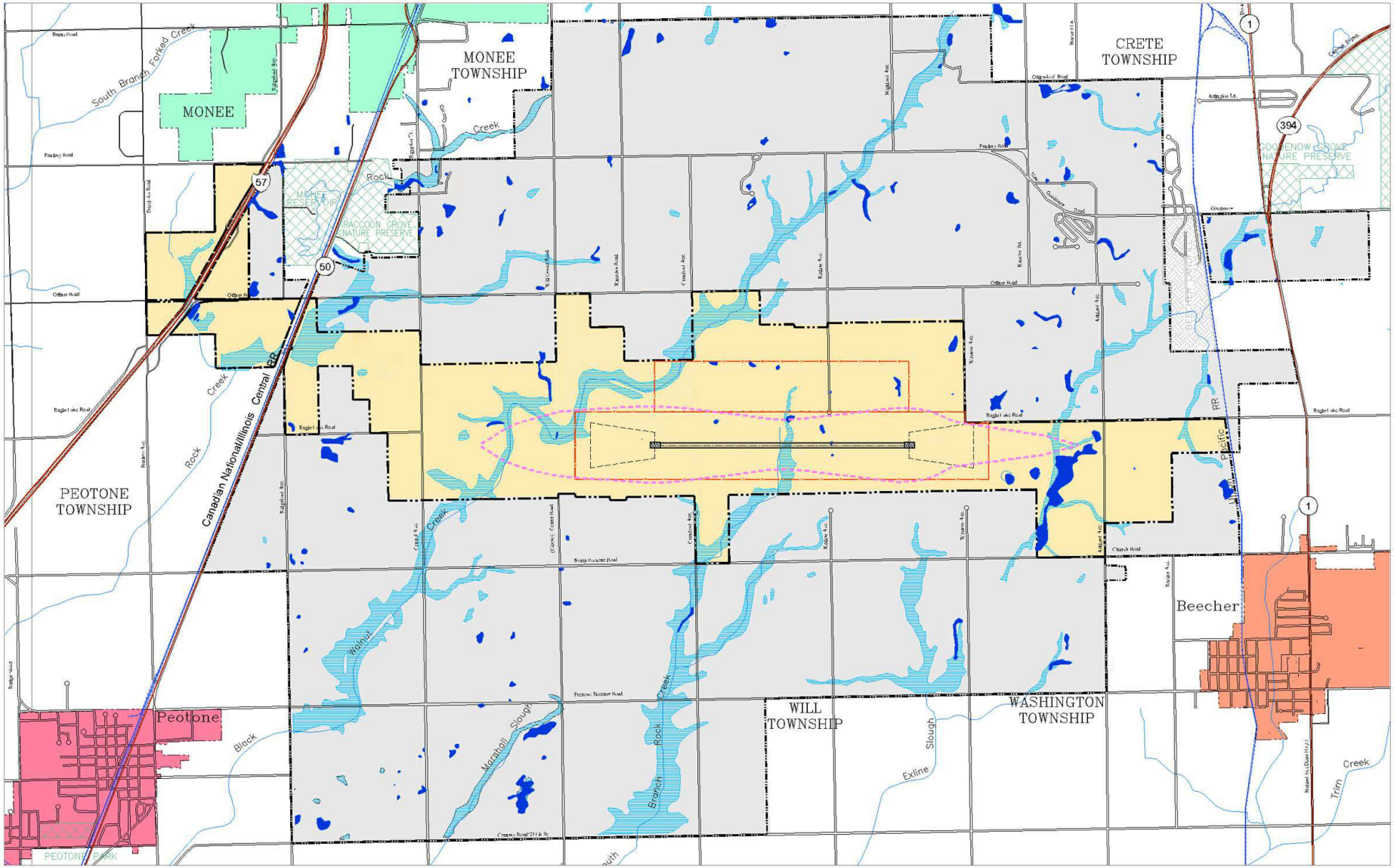
0 3000 6000 ft

Legend

- AIRPORT RUNWAY
- AIR OPERATION AREA (AOA)
- TERMINAL & CARGO DEVELOPMENT AREA
- 65 DNL NOISE CONTOUR
- INAUGURAL AIRPORT BOUNDARY
- ULTIMATE AIRPORT BOUNDARY
- WETLAND AREA
- 100-YEAR FLOODPLAIN
- PARK LAND
- LANDFILL (CLOSED)

Inaugural Airport Airfield Alternatives
Primary Runway 9-27
Alternative A - West

Exhibit 6-1



TAMS an Earth Tech Company

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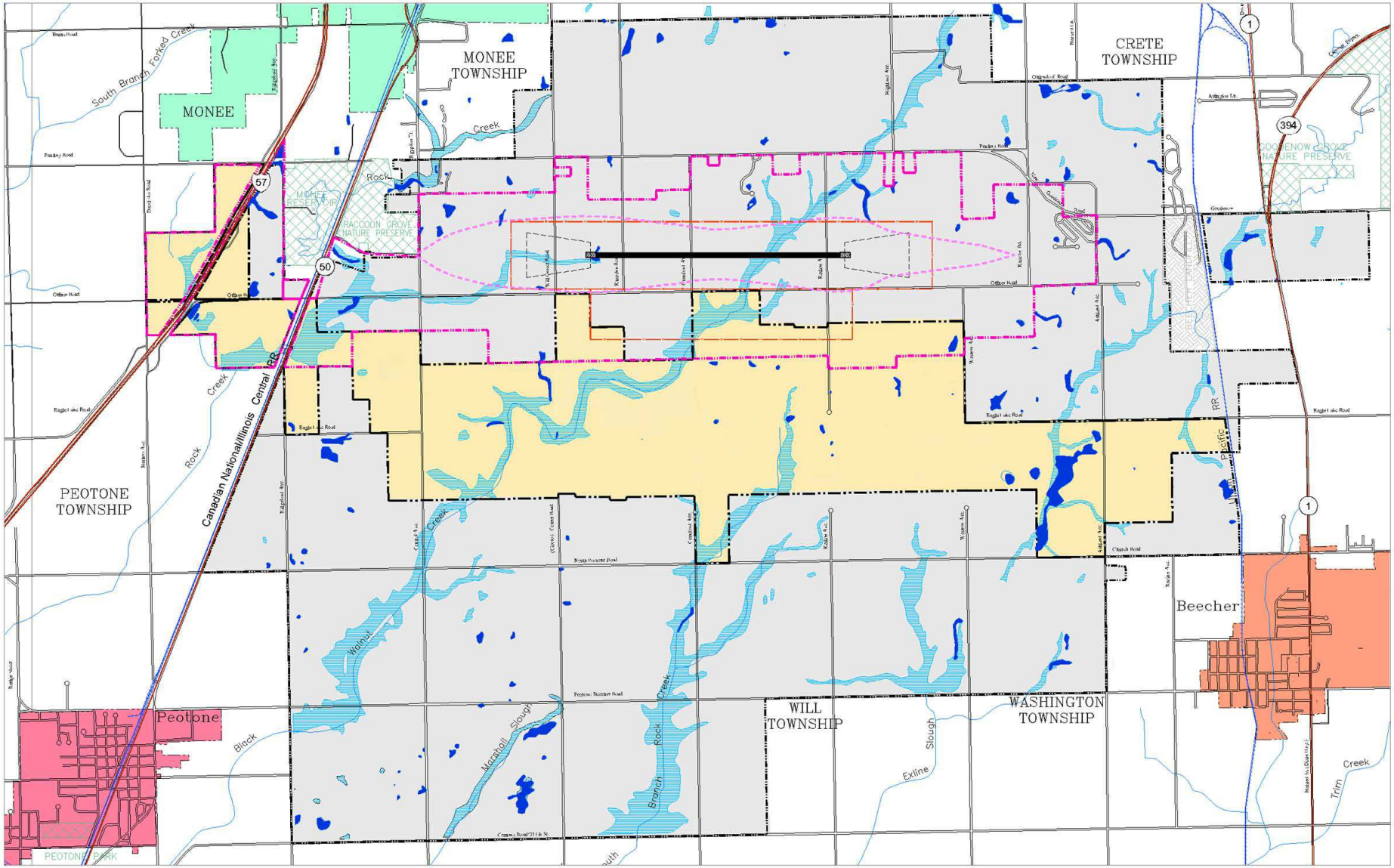
- AIRPORT RUNWAY
- AIR OPERATION AREA (AOA)
- TERMINAL & CARGO DEVELOPMENT AREA
- 65 DNL NOISE CONTOUR
- INAUGURAL AIRPORT BOUNDARY
- ULTIMATE AIRPORT BOUNDARY
- WETLAND AREA
- 100-YEAR FLOODPLAIN
- PARK LAND
- LANDFILL (CLOSED)

Inaugural Airport Airfield Alternatives
Primary Runway 9-27
Alternative A - East

Exhibit 6-2



TAMS an Earth Tech Company

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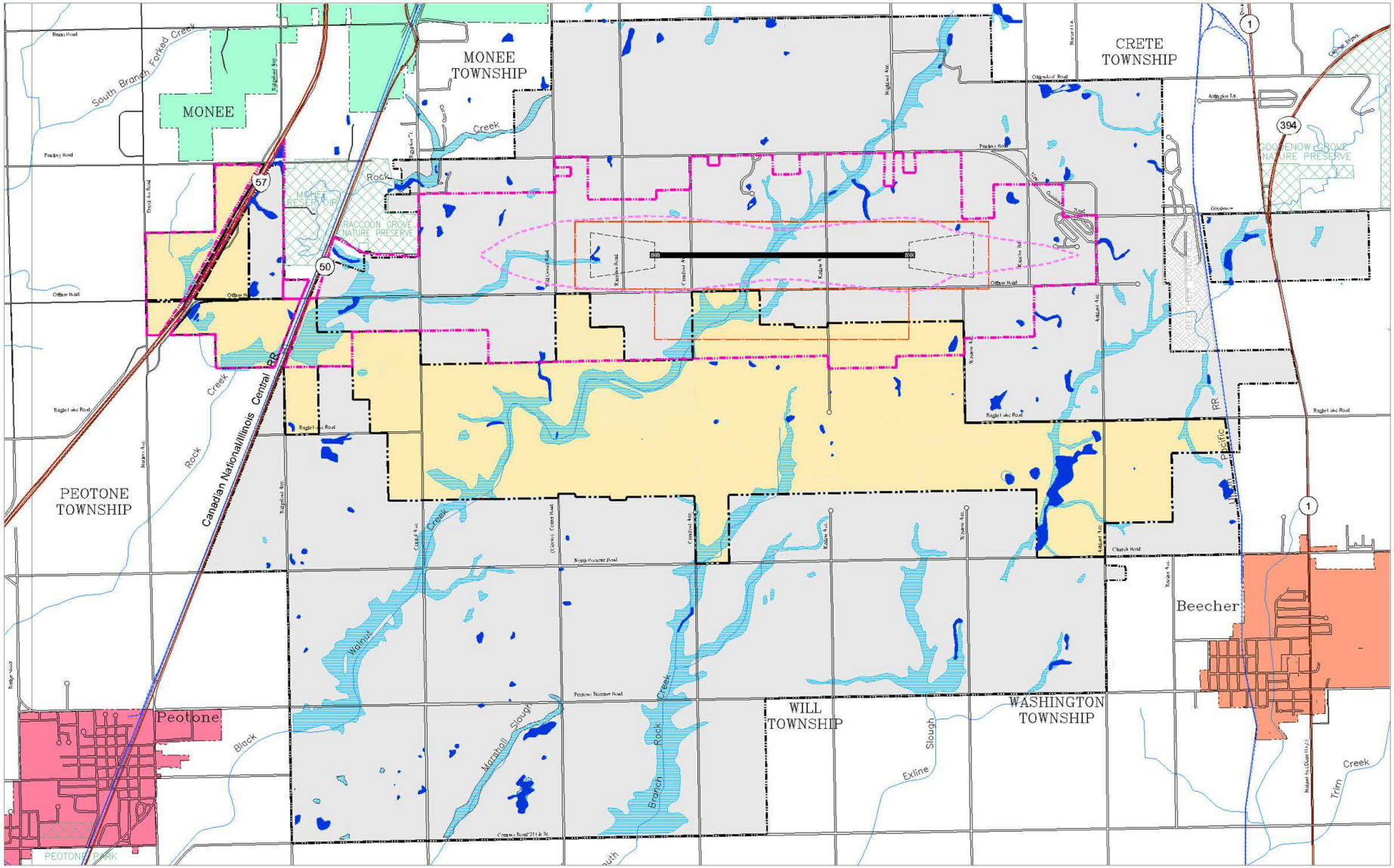
- AIRPORT RUNWAY
- AIR OPERATION AREA (AOA)
- TERMINAL & CARGO DEVELOPMENT AREA
- 65 DNL NOISE CONTOUR
- INAUGURAL AIRPORT BOUNDARY
- ULTIMATE AIRPORT BOUNDARY
- WET LAND AREA
- 100-YEAR FLOODPLAIN
- PARK LAND
- LANDFILL (CLOSED)

Inaugural Airport Airfield Alternatives
Primary Runway 9-27
Alternative B - West

Exhibit 6-3



TAMS an Earth Tech Company

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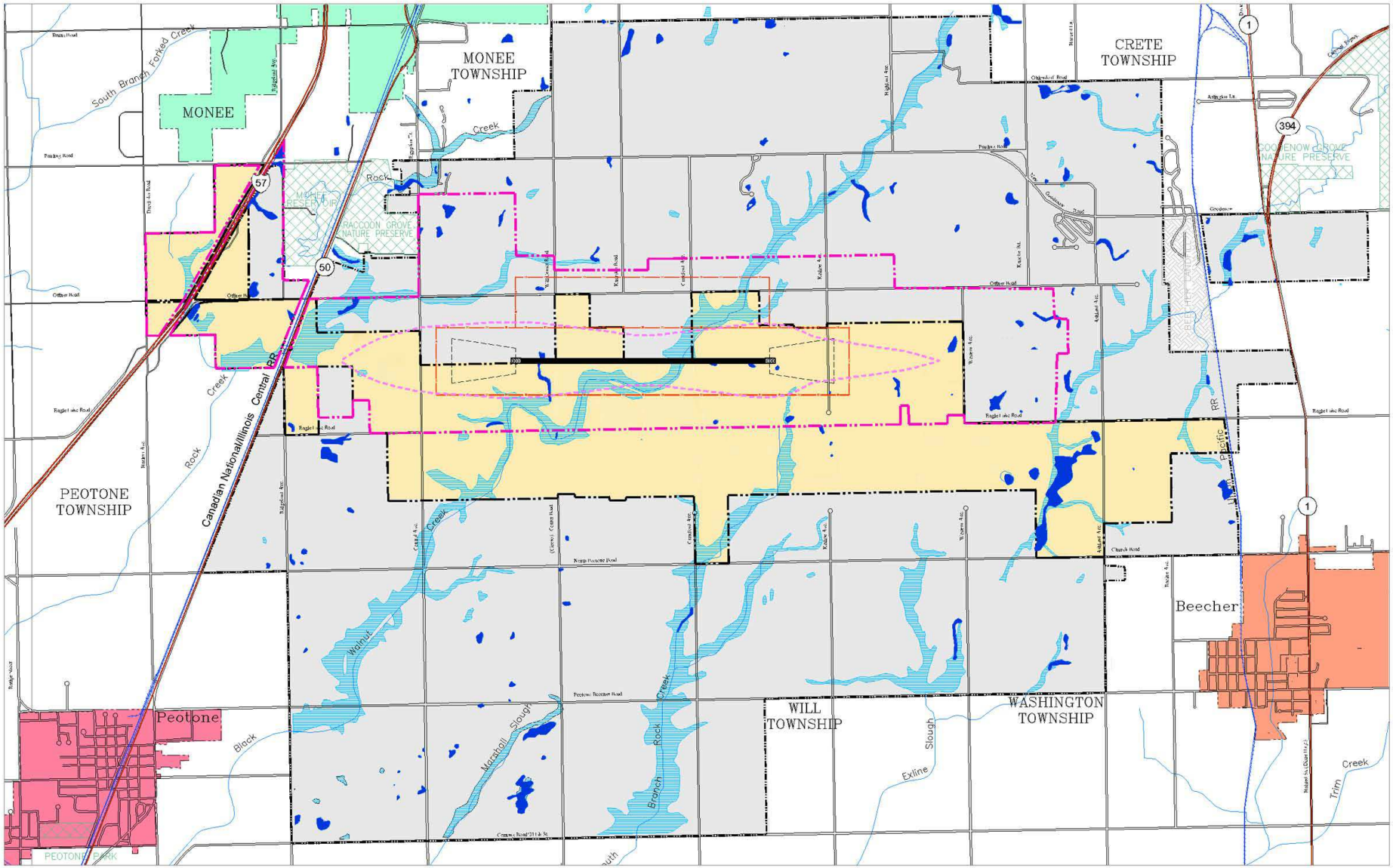
Legend

- AIRPORT RUNWAY
- AIR OPERATION AREA (AOA)
- TERMINAL & CARGO DEVELOPMENT AREA
- 65 DNL NOISE CONTOUR
- INAUGURAL AIRPORT BOUNDARY
- ULTIMATE AIRPORT BOUNDARY
- WET LAND AREA
- 100-YEAR FLOODPLAIN
- PARK LAND
- LANDFILL (CLOSED)

Inaugural Airport Airfield Alternatives
Primary Runway 9-27
Alternative B - East

Exhibit 6-4



TAMS an Earth Tech Company

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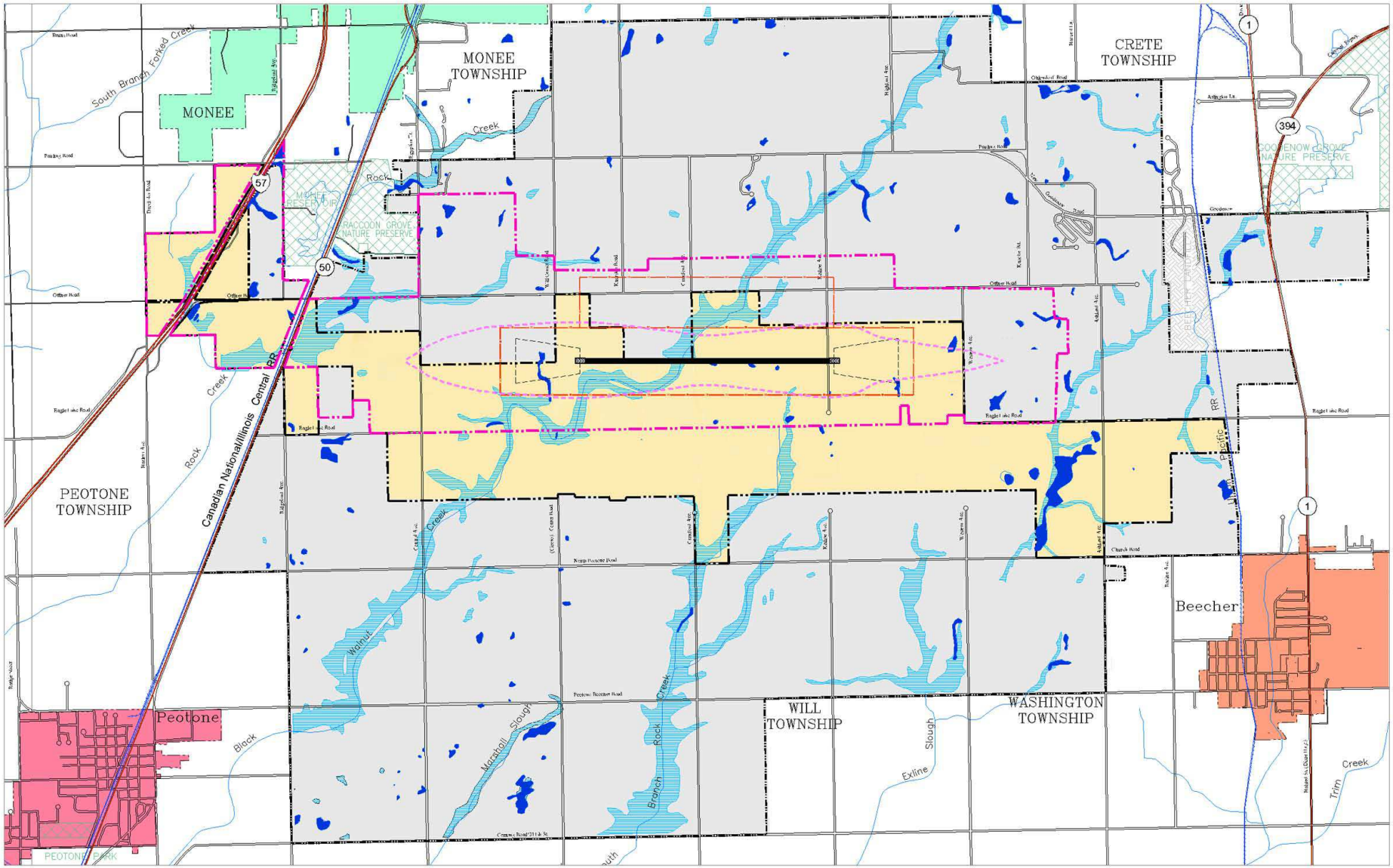
Legend

- AIRPORT RUNWAY
- AIR OPERATION AREA (AOA)
- TERMINAL & CARGO DEVELOPMENT AREA
- 65 DNL NOISE CONTOUR
- INAUGURAL AIRPORT BOUNDARY
- ULTIMATE AIRPORT BOUNDARY
- WETLAND AREA
- 100-YEAR FLOODPLAIN
- PARK LAND
- LANDFILL (CLOSED)

Inaugural Airport Airfield Alternatives
Primary Runway 9-27
Alternative C - West
(Derived from Village of Beecher Proposal)

Exhibit 6-5



TAMS an Earth Tech Company

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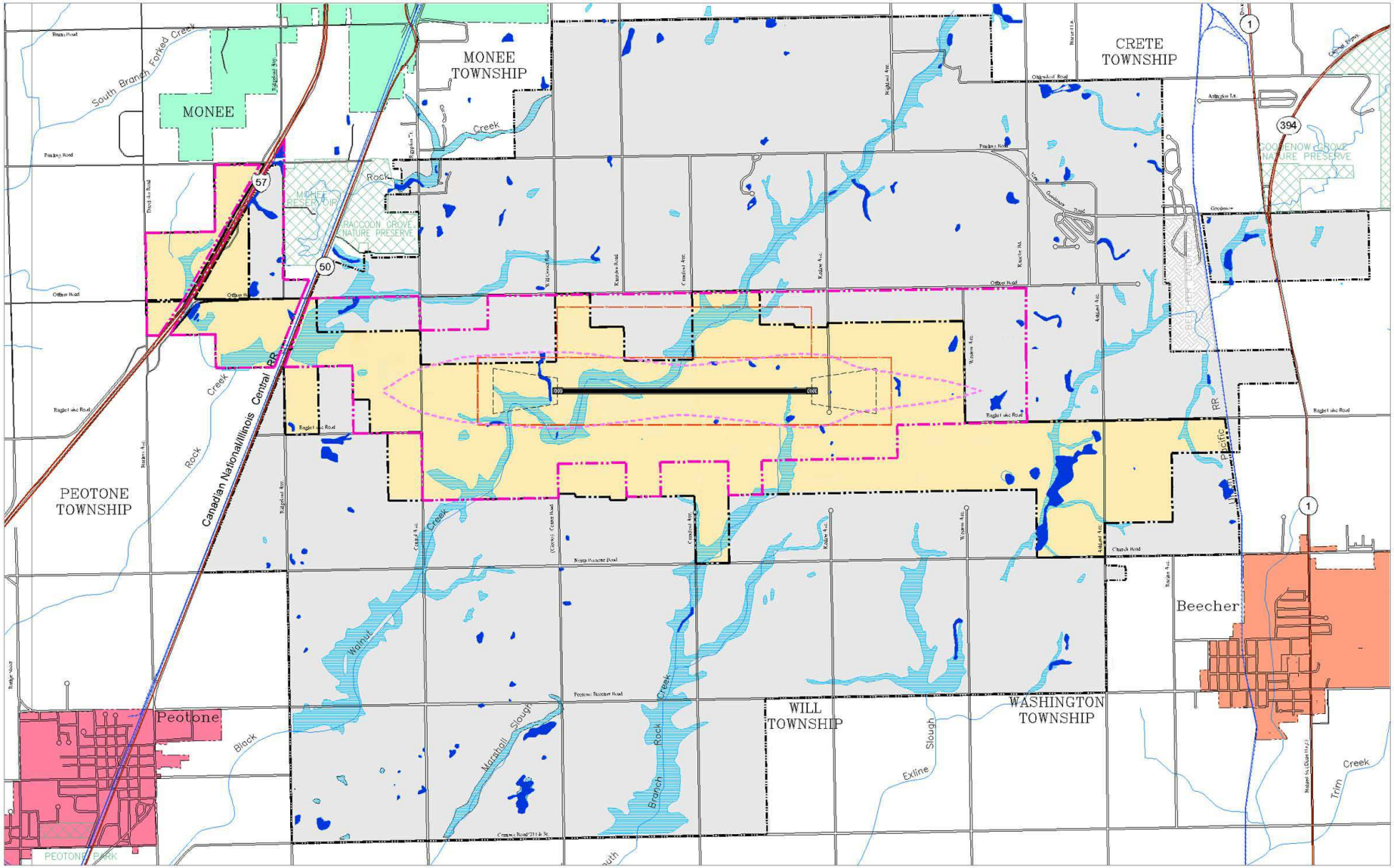
Legend

- AIRPORT RUNWAY
- AIR OPERATION AREA (AOA)
- TERMINAL & CARGO DEVELOPMENT AREA
- 65 DNL NOISE CONTOUR
- INAUGURAL AIRPORT BOUNDARY
- ULTIMATE AIRPORT BOUNDARY
- WETLAND AREA
- 100-YEAR FLOODPLAIN
- PARK LAND
- LANDFILL (CLOSED)

Inaugural Airport Airfield Alternatives
Primary Runway 9-27
Alternative C - East
(Derived from Village of Beecher Proposal)

Exhibit 6-6



TAMS an Earth Tech Company

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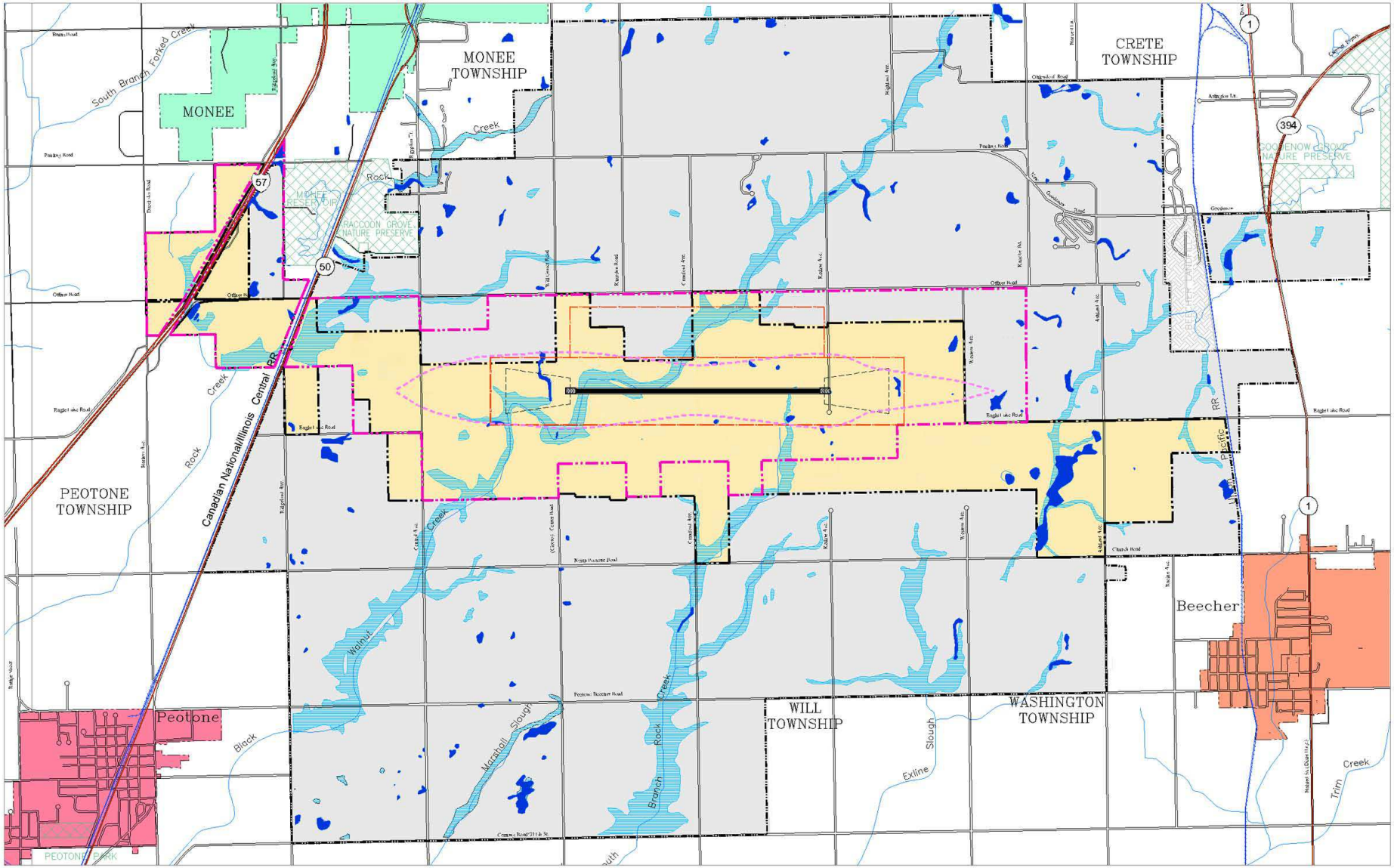
Legend

- AIRPORT RUNWAY
- AIR OPERATION AREA (AOA)
- TERMINAL & CARGO DEVELOPMENT AREA
- 65 DNL NOISE CONTOUR
- INAUGURAL AIRPORT BOUNDARY
- ULTIMATE AIRPORT BOUNDARY
- WETLAND AREA
- 100-YEAR FLOODPLAIN
- PARK LAND
- LANDFILL (CLOSED)

Inaugural Airport Airfield Alternatives
Primary Runway 9-27
Alternative D - West
(Derived from Village of Crete Proposal)

Exhibit 6-7



TAMS an Earth Tech Company

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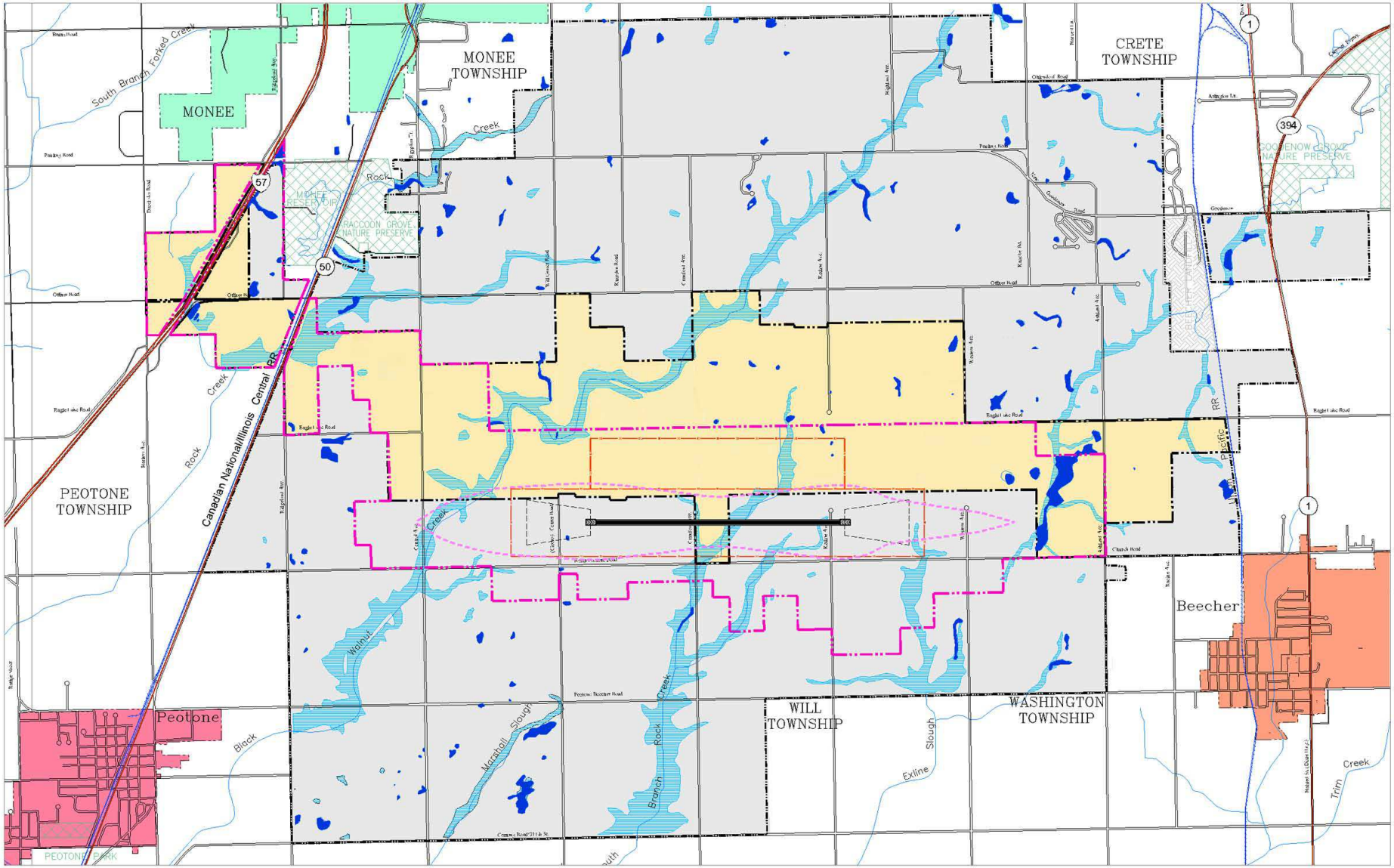
Legend

- AIRPORT RUNWAY
- AIR OPERATION AREA (AOA)
- TERMINAL & CARGO DEVELOPMENT AREA
- 65 DNL NOISE CONTOUR
- INAUGURAL AIRPORT BOUNDARY
- ULTIMATE AIRPORT BOUNDARY
- WETLAND AREA
- 100-YEAR FLOODPLAIN
- PARK LAND
- LANDFILL (CLOSED)

Inaugural Airport Airfield Alternatives
Primary Runway 9-27
Alternative D - East
(Derived from Village of Crete Proposal)

Exhibit 6-8



TAMS an Earth Tech Company

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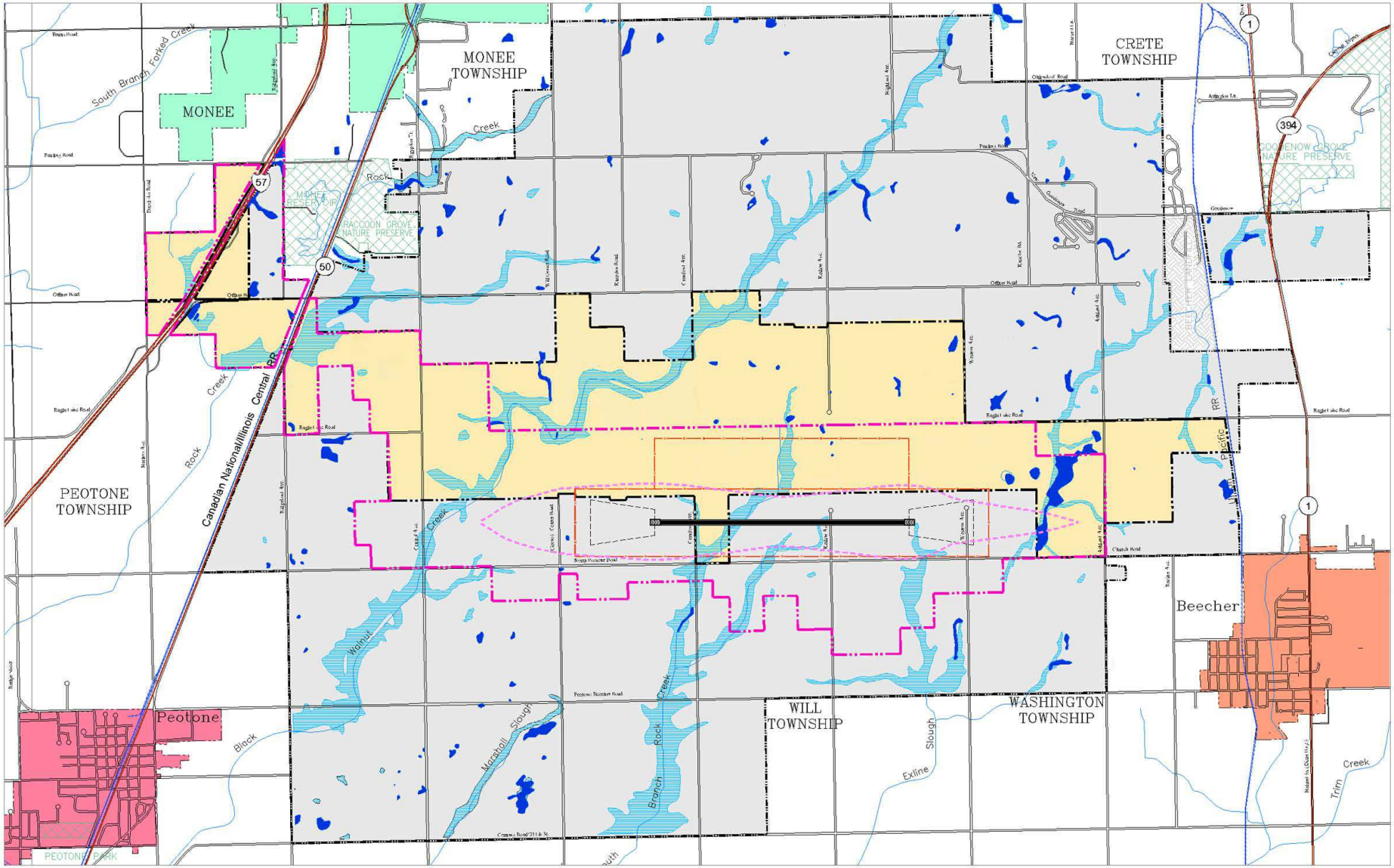
0 3000 6000 ft

Legend

- AIRPORT RUNWAY
- AIR OPERATION AREA (AOA)
- TERMINAL & CARGO DEVELOPMENT AREA
- 65 DNL NOISE CONTOUR
- INAUGURAL AIRPORT BOUNDARY
- ULTIMATE AIRPORT BOUNDARY
- WETLAND AREA
- 100-YEAR FLOODPLAIN
- PARK LAND
- LANDFILL (CLOSED)

Inaugural Airport Airfield Alternatives
Primary Runway 9-27
Alternative E - West

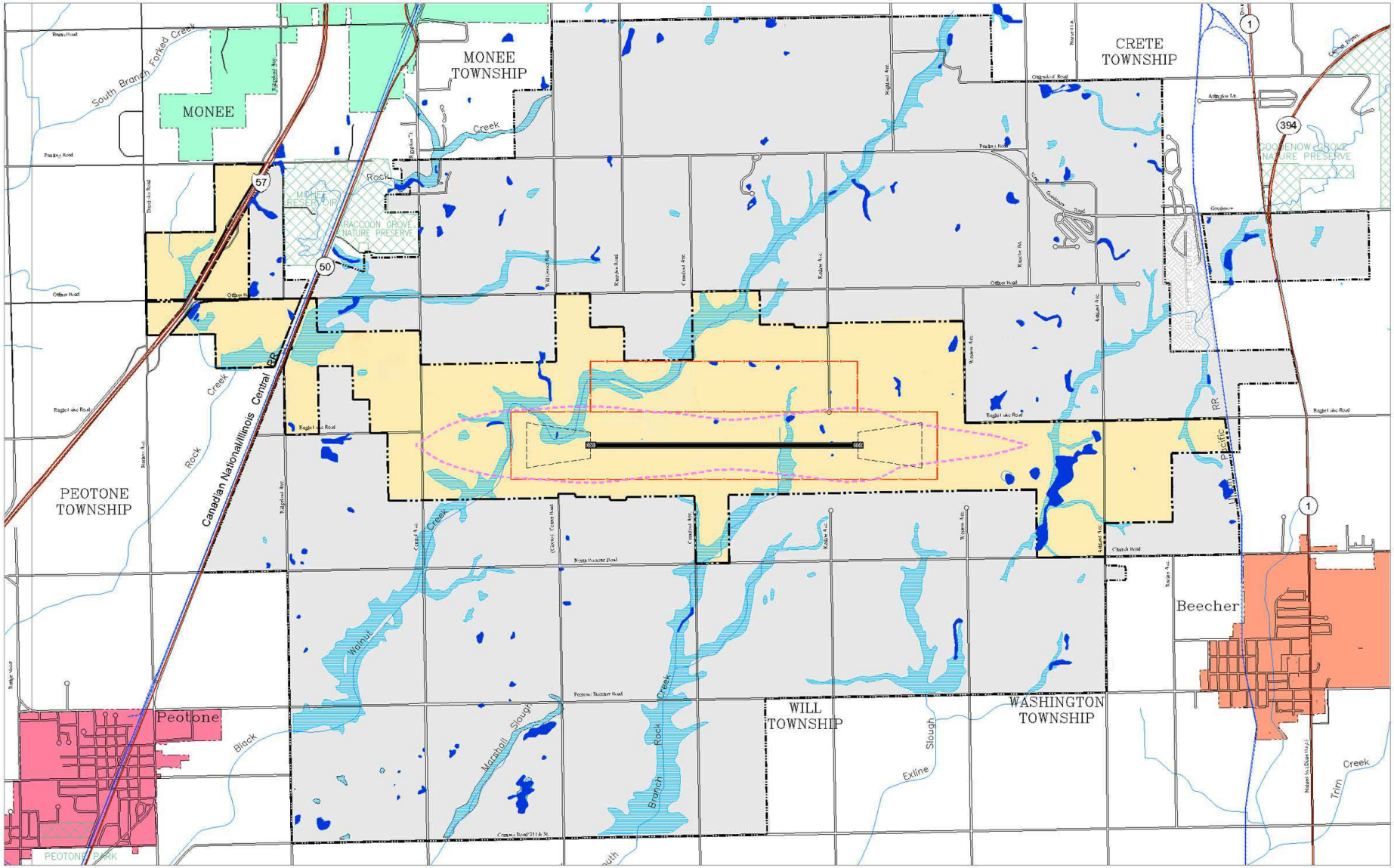
Exhibit 6-9



TAMS an Earth Tech Company

Inaugural Airport Airfield Alternatives
Primary Runway 9-27
Alternative E - East

Exhibit 6-10



TAMS an Earth Tech Company

N

0 3000 6000 ft

Legend

- AIRPORT RUNWAY
- AIR OPERATION AREA (AOA)
- TERMINAL & CARGO DEVELOPMENT AREA
- 65 DNL NOISE CONTOUR
- INAUGURAL AIRPORT BOUNDARY
- ULTIMATE AIRPORT BOUNDARY
- WETLAND AREA
- 100-YEAR FLOODPLAIN
- PARK LAND
- LANDFILL (CLOSED)

Inaugural Airport Airfield Alternatives
Primary Runway 9-27
Alternative F (ALNAC Proposal)

Exhibit 6-11

Table 6-1
Inaugural Airport
Airfield Concept Alternatives Evaluation Criteria

No.	Criteria	Definition
1	Ability to meet aviation forecast demand and accommodate the projected fleet mix (DBO+5)	• The inaugural runway should provide adequate capacity to handle the forecasted aeronautical activity and projected fleet mix through DBO+5.
2	Compatibility with ultimate airfield concept	• The inaugural runway should be compatible with the preferred ultimate airfield concept.
3	Ability to meet security criteria	• The inaugural airfield should be able to meet perimeter security criteria (which are currently being developed by TSA).
4	Ability to avoid and/or minimize adverse land use impacts and community disruption	• Develop an inaugural airfield concept that would minimize conflicts with the land use plans of the neighboring communities. • Contain all significant aircraft-generated noise, as defined by FAA, on airport property or compatible land uses. • Define the Inaugural Airport boundary to encompass the optimal land area needed for airport-related uses, but no more land than is necessary and minimizes impacts to surrounding land uses. • Population displacement. • Local traffic disruption and permanent closure of existing local roads. • Impacts to emergency vehicle and school bus routes.
5	Ability to avoid and/or minimize impacts on natural resources	• Impacts to wetlands. • Impacts to floodplains. • Impacts to Section 303(c) Lands (parklands). • Impacts to water resources. • Impacts to prime farmland.
6	Relative cost comparison	• Compare relative costs of each inaugural airfield concept.

Source: TAMS, an Earth Tech Company, 2004.

Criteria 3 – Airport Security Criteria – This criterion examined the perimeter of the Air Operations Area (AOA) to determine whether an alternative would have more or less area to secure. Those alternatives that were more compact were considered to be superior to those alternatives that required larger AOAs.

Criteria 4 – Ability to Avoid and/or Minimize Land Use Impacts and Community Disruption – This criterion was divided into five sub-criteria to rate different impacts that are of concern to the landowners and communities surrounding the site. Each sub-criterion was rated separately and then averaged with ratings from the other sub-criteria for each alternative.

Sub-Criteria 4a – *Conflicts with Local Land Use Plans* – Each alternative was evaluated against the *Land Use Plan for the Eastern Will County Area* (August 1997) to determine if the alternative would conflict with the plan. Conflicts were defined as airport facilities being located outside of the previously defined airport boundary (shown on the land use map), on land planned for other uses by the communities within the airport boundary, or if the inaugural runway would be located directly east or west of planned residential land uses.

Sub-Criteria 4b – *Contain Aircraft Noise on Airport Property* – Those alternatives that contain all significant aircraft-generated noise (as defined by FAA) on airport property were rated higher than those that did not contain all significant aircraft-generated noise on airport property. Those that would result in 65 DNL noise contours over compatible land uses (as defined by FAA FAR Part 150) were rated second highest. Other alternatives that result in 65 DNL noise contours over land outside the airport boundary and on other land uses were rated lower.

Sub-Criteria 4c – *Optimal Land Area* – Alternatives that would result in less land required for airport purposes were rated higher than those that would require more land.

Sub-Criteria 4d – *Population Displacement* – Alternatives that minimize impacts to homes and residents were rated higher than those that had greater impacts.

Sub-Criteria 4e – *Local Traffic Disruption* – Alternatives that would result in less road closures would have fewer impacts on local traffic including emergency vehicle and school bus routes. Roadways that have higher existing traffic volumes were considered to have a greater impact than roads with lower existing traffic volumes. Those alternatives that had less impact on roads were rated higher than alternatives that had higher impact on local roads.

Criteria 5 – Ability to Avoid and/or Minimize Natural Resource Impacts – This criterion was divided into five sub-criteria to rate different impacts that are of concern to the Federal and state natural resource agencies, special interest groups and the general public. Each sub-criterion was rated separately and then averaged with ratings from the other sub-criteria for each alternative.

Sub-Criteria 5a – *Impacts on Wetlands* – Alternatives that would result in fewer impacts to wetlands rated higher than alternatives with greater impacts.

Sub-Criteria 5b – *Impacts on Floodplains* – Alternatives that would result in fewer impacts to floodplains rated higher than alternatives with greater impacts.

Sub-Criteria 5c – *Impacts on Section 303(c) Lands* – Alternatives that would result in fewer impacts to Section 303(c) Lands (parks, forest preserves, etc.) rated higher than alternatives with greater impacts.

Sub-Criteria 5d – *Impacts on Water Resources* – Alternatives that would result in fewer impacts to water resources (streams, lakes, etc.) rated higher than alternatives with greater impacts to water resources.

Sub-Criteria 5e – *Impacts on Prime Farmland* – Alternatives that would result in fewer impacts to prime farmland rated higher than alternatives with greater impacts to prime farmland.

Criteria 6 – Comparison of Relative Costs – Alternatives were compared against a Base Concept (Alternative A - West) to determine if they would be relatively more or less expensive than the Base Concept. Those alternatives that are relatively less expensive rated higher than those that are relatively more expensive.

6.2.2 Inaugural Airfield Primary Runway (09-27) Alternatives Evaluation Matrix

The same methodology employed in evaluating the ultimate airfield alternatives was used for evaluation of the inaugural airfield alternatives. Each concept was evaluated and ranked by each criteria identified in **Table 6-1**. A rating scale from 1

to 5 was assigned to each criterion to better distinguish differences between each of the alternatives. A score of 5 was considered the best score for a criterion, while a score of 1 was considered the worst.

The alternatives were compared against the six major criteria developed for this process. **Table 6-2** depicts the results of applying the criteria and rating scale to each of the airfield concepts. The evaluation worksheet with a more detailed explanation of the rating scale is shown in **Table 6-3**.

6.2.3 Preferred Inaugural Airfield Primary Runway (09-27) Alternative

The results in **Table 6-2** show that Alternative A - East (see **Exhibit 6-2**) rated the highest of all inaugural airfield alternatives examined. This alternative had the lowest relative cost, primarily due to avoiding impacts to Black Walnut Creek and its associated 100-year floodplain. It also rated well on all of the other criteria. Alternative A - West and Alternative F both ranked second. These alternatives rated lower than Alternative A - East due to greater impacts to wetlands, floodplains and streams and a greater cost associated with earthworks and environmental mitigation. All of the B and C Alternatives had higher natural resource impacts, and thus were rated lower. The D Alternatives rated well in all areas except for cost and compatibility with the preferred ultimate concept. These two alternatives would both require the greatest amount of earthworks for construction of the primary runway, resulting in higher costs. The E Alternatives rated lower due to greater land requirements, disruption to more local roads and impacts to prime farmland.

Based on these results, Alternative A - East was selected as the preferred inaugural airfield alternative for the primary runway and was used as the base for subsequent alternatives analysis on the remaining Inaugural Airport elements, discussed in the following sections.

Table 6-2
Inaugural Airport
Airfield Concept Alternatives Evaluation Matrix

No	Criteria	Alternative A (Base)		Alternative B (North Runway)		Alternative C (Proposed by Village of Beecher)		Alternative D (Proposed by Village of Crete)		Alternative E (Shift the proposed air-field to the South)		Alternative F (Proposed by ALNAC)
		West	East	West	East	West	East	West	East	West	East	
1	**Ability to meet aviation forecast demand and accommodate projected fleet mix (DBO+5)**	5	5	5	5	5	5	5	5	5	5	5
2	**Compatibility with preferred ultimate concept**	5	5	5	5	1	1	1	1	1	1	5
3	**Ability to meet airport security criteria**	5	5	5	5	5	5	5	5	5	5	5
4	**Ability to avoid and/or minimize land use impacts and community disruption**	4.0	4.0	3.8	3.8	5.0	5.0	4.0	4.0	3.2	3.4	4.0
a	*Conflicts with the comprehensive land use plans of neighboring communities.*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*
b	*Contain all significant aircraft-generated noise, as defined by FAA, on airport property or compatible land uses.*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*
c	*The Inaugural Airport boundary will encompass the optimal land area needed for airport-related uses*	*4*	*4*	*3*	*3*	*5*	*5*	*4*	*4*	*1*	*1*	*4*
d	*Population displacement*	*4*	*4*	*5*	*5*	*5*	*5*	*1*	*1*	*4*	*5*	*4*
e	*Local traffic disruption and permanent closure of existing local roads, emergency vehicles and school bus routes*	*2*	*2*	*1*	*1*	*5*	*5*	*5*	*5*	*1*	*1*	*2*
5	**Ability to avoid and/or minimize impacts on natural resources**	3.6	4.6	2.6	3.0	2.4	2.4	4.4	4.8	4.0	4.0	3.4
a	*Wetlands*	*3*	*4*	*3*	*1*	*1*	*1*	*5*	*5*	*5*	*5*	*3*
b	*Floodplains*	*3*	*5*	*2*	*2*	*1*	*1*	*4*	*5*	*4*	*4*	*3*
c	*Section 303(c) Lands*	*5*	*5*	*1*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*
d	*Water resources*	*3*	*5*	*2*	*2*	*1*	*1*	*3*	*5*	*5*	*5*	*3*
e	*Prime farmland*	*4*	*4*	*5*	*5*	*4*	*4*	*5*	*4*	*1*	*1*	*3*
6	**Relative cost comparison**	3.8	4.8	2.3	2.5	2.7	2.2	2.7	2.9	4.5	4.0	3.7
	Total	26.4	28.4	23.7	24.3	21.1	20.6	22.1	22.7	22.7	22.4	26.1
	Rating	4.4	4.7	4.0	4.1	3.5	3.4	3.7	3.8	3.8	3.7	4.4

Source: TAMS, an Earth Tech Company, 2004.

Table 6-3
Inaugural Airport
Airfield Concept Alternatives Evaluation Worksheet

Score	Rating	**Criteria 1** Ability to Meet Forecasted Aviation Demand	**Criteria 2** Compatibility with Preferred ultimate concept	**Criteria 3** Perimeter Security & Access Control	**Criteria 4a** Conflicts with Local Land Use Plans	**Criteria 4b** Contain Aircraft Noise on Airport Property	**Criteria 4c** Optimal Land Area	**Criteria 4d** Population Displacement	**Criteria 4e** Local Traffic Disruption	**Criteria 5a** Impact on Wetlands	**Criteria 5b** Impact on Floodplains	**Criteria 5c** Impact on Sec. 303(c) Lands	**Criteria 5d** Impact on Water Resources	**Criteria 5e** Impact on Prime Farmland	**Criteria 6** Comparison of Relative Costs
5	**Excellent**	Yes	Yes	Shortest perimeter	No conflicts	65 DNL on airport property	Lowest acreage	Lowest population impacted	Lowest impact on local roads	Lowest acreage impacted	Lowest acreage impacted	Lowest acreage impacted	Lowest stream length impacted	Lowest acreage impacted	Lowest relative cost (all things being equal)
4	**Good**	N/A	N/A	20 - 39% longer	One conflict	65 DNL on airport property or compatible land use	20 - 39% greater impact	20 - 39% greater impact	20 - 39% greater impact	20 - 39% greater impact	20 - 39% greater impact	20 - 39% greater impact	20 - 39% greater impact	20 - 39% greater impact	20 - 39% greater cost
3	**Average**	N/A	N/A	40 - 59% longer	Two conflicts	1-100 acres	40 - 59% greater impact	40 - 59% greater impact	40 - 59% greater impact	40 - 59% greater impact	40 - 59% greater impact	40 - 59% greater impact	40 - 59% greater impact	40 - 59% greater impact	40 - 59% greater cost
2	**Fair**	N/A	N/A	60 - 79% longer	Three conflicts	200-300 acres outside airport property	60 - 79% greater impact	60 - 79% greater impact	60 - 79% greater impact	60 - 79% greater impact	60 - 79% greater impact	60 - 79% greater impact	60 - 79% greater impact	60 - 79% greater impact	60 - 79% greater cost
1	**Poor**	No	No	Longest perimeter	Four or more conflicts	Over 300 acres outside airport property	Highest acreage	Highest population impacted	Highest impact on local roads	Highest acreage impacted	Highest acreage impacted	Highest acreage impacted	Highest stream length impacted	Highest acreage impacted	Highest relative cost

Source: TAMS, an Earth Tech Company, 2004.
N/A = Not Applicable

6.3 Inaugural Airfield Crosswind Runway (05-23) Alternatives

The results of the wind and weather analysis[1] conducted for SSA indicated that under certain wind and meteorological conditions, general aviation (GA) aircraft lighter than 12,500 pounds would not be able to land at SSA on a primary runway 09-27. To satisfy operational requirements of these GA aircraft it was concluded that a crosswind runway in an 05-23 orientation, combined with the primary runway, would increase the wind coverage for Aircraft Design Group (ADG) B-II aircraft under 13-knot crosswind conditions from 89.8 percent to 97.0 percent.[2]

Because activity by GA aircraft is projected to account for a sizable portion of aeronautical activity at SSA during the IAP, IDOT is including a small crosswind runway, 4,000 feet in length, for B-II aircraft as part of the IAP. A range of potential crosswind runway locations was examined to determine the optimal siting of the crosswind runway in conjunction with the preferred primary runway location. The proposed locations assumed direct unobstructed line-of-sight from a potential Airport Traffic Control Tower (ATCT) to the approach ends and taxiing areas. Siting of a potential ATCT is discussed in Section 9 of this document; for purposes of this analysis, it was assumed that the ATCT would be sited in a central location.

Alternatives for the inaugural crosswind runway are described below. The exhibits for each of the inaugural crosswind runway alternatives identify the potential land that would need to be acquired for implementation of that alternative. The additional land requirements identify whole parcels, which complies with IDOT's land acquisition policy for this project. It should also be noted that the exhibits depict geographic north, not magnetic north; thus, a discrepancy in the orientation between the existing Sanger Field crosswind, which is a 05-23 orientation using magnetic or true north, and the alternative crosswind runways, which are depicted in a 05-23 orientation using geographic north.

- ***Alternative 1*** – This alternative would overlay the existing 05-23 crosswind runway on Sanger Field, which is located approximately one mile north of the eastern end of the preferred inaugural primary runway (see **Exhibit 6-12**).

- ***Alternative 1a*** – This alternative was proposed by ALNAC and is similar to Alternative 1. However, ALNAC proposed that during the IAP, GA aircraft would utilize the existing runway facility at Sanger Field[3] (see **Exhibit 6-13**).

- ***Alternative 2*** – Under this alternative the crosswind runway would be located north of and close to the east end of runway 09-27 (see **Exhibit 6-14**), similar to Alternative 1. This option was developed based on the premise that inaugural GA facilities could be located on the east side of the airport and share a common apron area with a potential cargo facility.

- ***Alternative 2a*** – This alternative is a variation of Alternative 2, the main difference being that the crosswind runway was shifted approximately ½-mile west to provide greater flexibility for a potential east side airport development area (i.e., eastern access, GA facilities, cargo facilities, ancillary facilities) (see **Exhibit 6-15**).

[1] Draft *Demand/Capacity Analysis & Facility Requirements for the Inaugural Airport Program, South Suburban Airport,* prepared for the Illinois Department of Transportation, March 2005.
[2] Ibid.
[3] In ALNAC's study there is no indication of future extension or improvement of the existing 05-23 runway at Sanger Field or any future connecting taxiway between Sanger Field and the primary runway.

- ***Alternative 3*** – The crosswind runway in this alternative would be located on the west side of the airport, approximately 1½-miles west of Runway 09-27 (see **Exhibit 6-16**).

- ***Alternative 4*** – This alternative locates the inaugural crosswind runway south of the primary runway, close to the western end of runway 09-27. This location could be advantageous if the GA facilities develop independently and are located close to the west end of the primary runway (see **Exhibit 6-17**).

- ***Alternative 5*** – The location of the crosswind runway in this alternative would be directly south of the primary runway, close to the eastern end. This option allows for flexibility in locating GA facilities either south of the runway or sharing a common apron area and access on the northeast side of the primary runway (see **Exhibit 6-18**).

- ***Alternative 5a*** – This alternative is a variation of Alternative 5, shifting the crosswind runway approximately ½-mile east (see **Exhibit 6-19**).

6.4 Evaluation of Inaugural Airfield Crosswind Runway (05-23) Alternatives

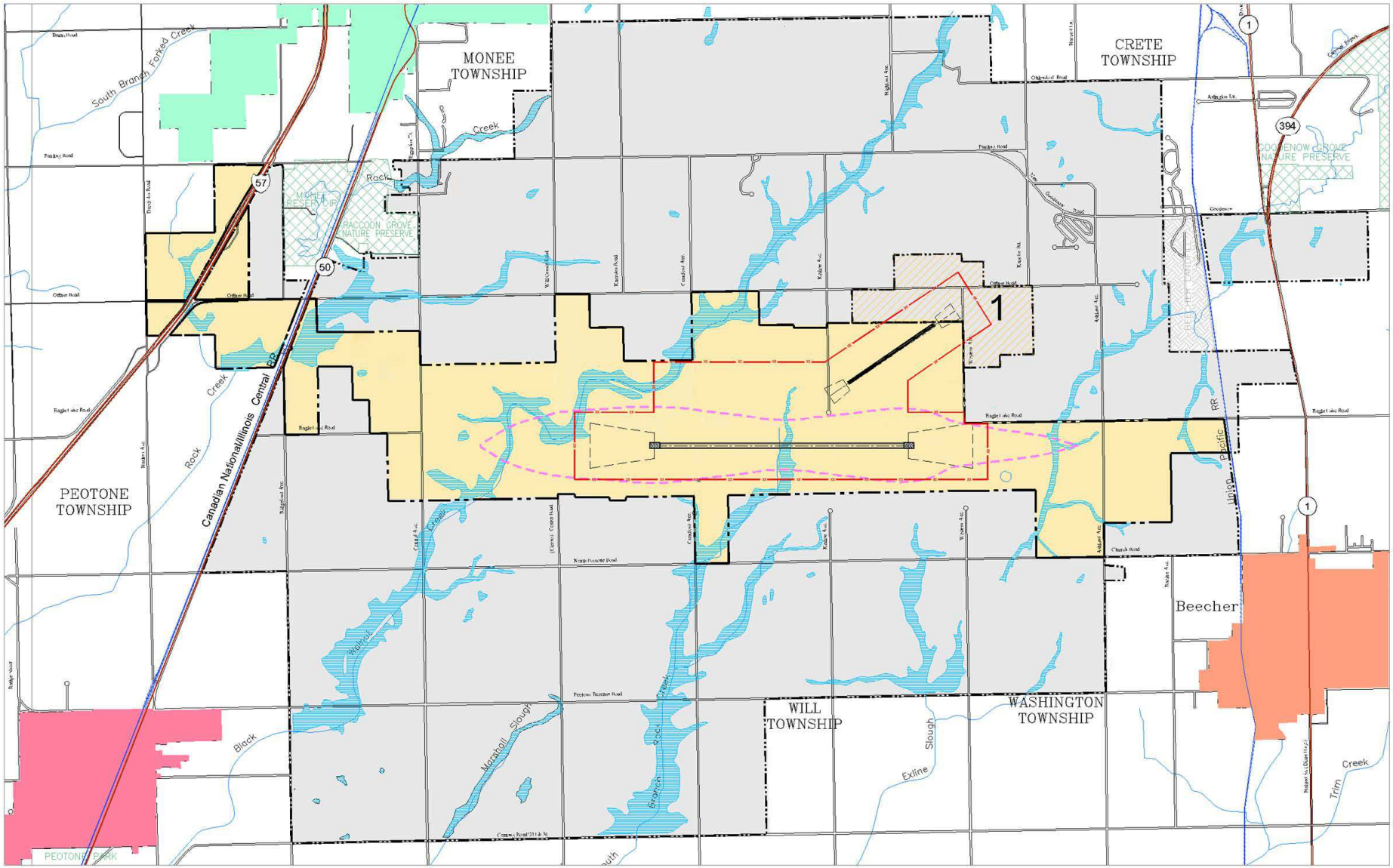
6.4.1 Inaugural Airfield Crosswind Runway (05-23) Alternatives Evaluation Criteria

The inaugural crosswind runway alternatives were examined and evaluated based on a number of criteria that are listed and defined in **Table 6-4**. A short description of how each evaluation criteria was used to evaluate the alternatives is also provided.

Table 6-4
Inaugural Airport
Crosswind Runway Siting Alternatives Evaluation Criteria

No.	Criteria	Definition
1	Operational Requirements	• Crosswind runway concept should meet the requirements of the design aircraft using it
2	Ability to provide maximum airfield capacity	• Crosswind runway concept should provide for maximum runway capacity in conjunction with the primary runway(s)
3	Compatibility with the preferred ultimate airfield concept	• Should minimize conflicts with future planned airfield facilities
4	Ability to avoid and/or minimize adverse land use impacts and community disruption	• Conflicts with the land use plans of the neighboring communities • Population displacement • Local traffic disruption and closure of existing local roads, emergency vehicle and school bus routes
5	Ability to avoid and/or minimize impacts on natural resources	• Impacts to wetlands • Impacts to floodplains • Impacts to water resources • Impacts to prime farmlands
6	Comparison of relative costs	• Compare relative construction costs of each runway concept

Source: TAMS, an Earth Tech Company, 2004.



TAMS an Earth Tech Company

N

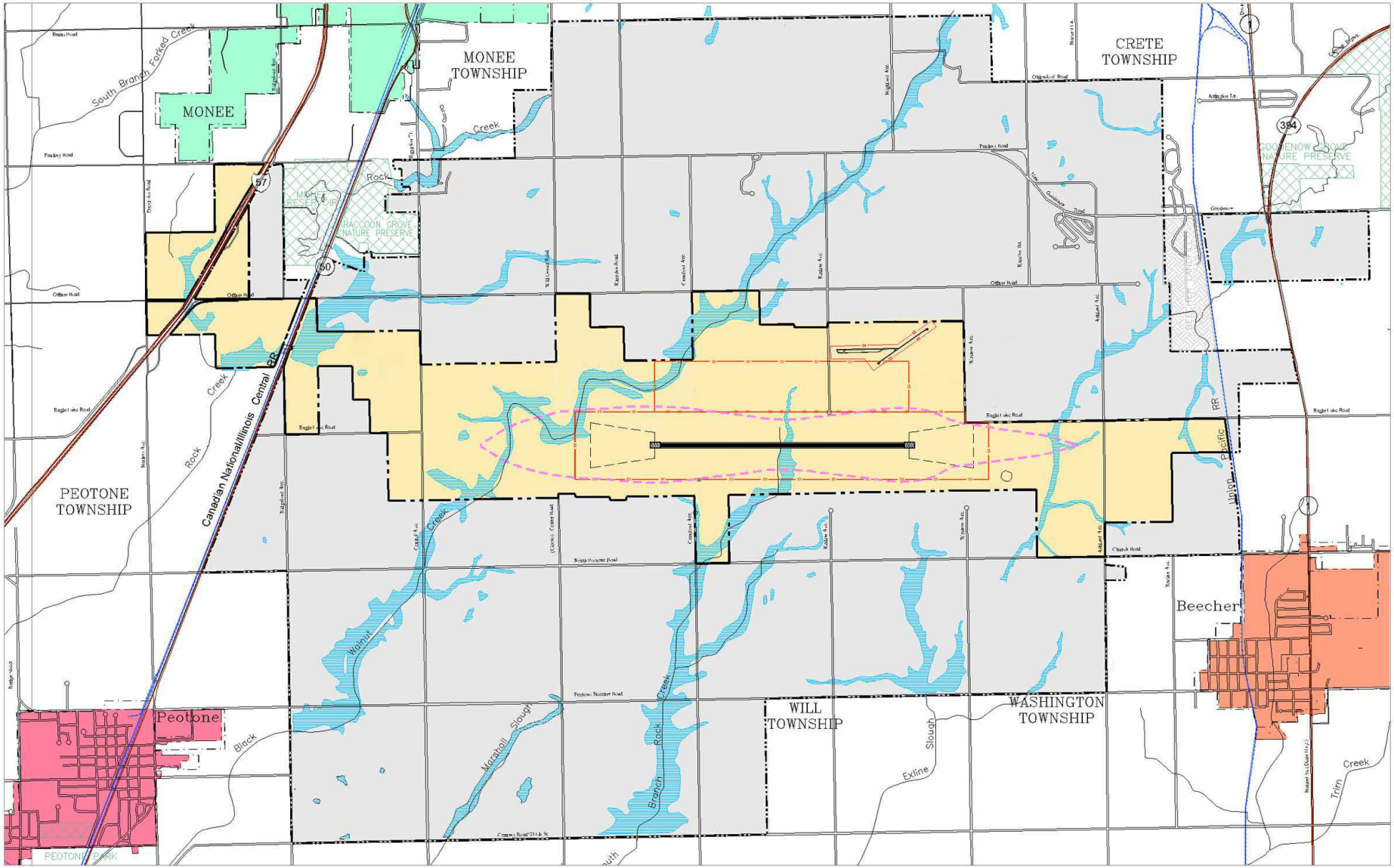
0 3000 6000 ft

Legend

- AIRPORT RUNWAY
- AIR OPERATION AREA (AOA)
- TERMINAL & CARGO DEVELOPMENT AREA
- 65 DNL NOISE CONTOUR
- INAUGURAL AIRPORT BOUNDARY
- ULTIMATE AIRPORT BOUNDARY
- ADDITIONAL PROPERTY REQUIRED FOR CROSSWIND RUNWAY
- PARK LAND
- LANDFILL (CLOSED)
- WETLAND AREA
- 100-YEAR FLOODPLAIN

Inaugural Airport Airfield Alternatives
Crosswind Runway 5-23
Alternative 1

Exhibit 6-12



TAMS an Earth Tech Company

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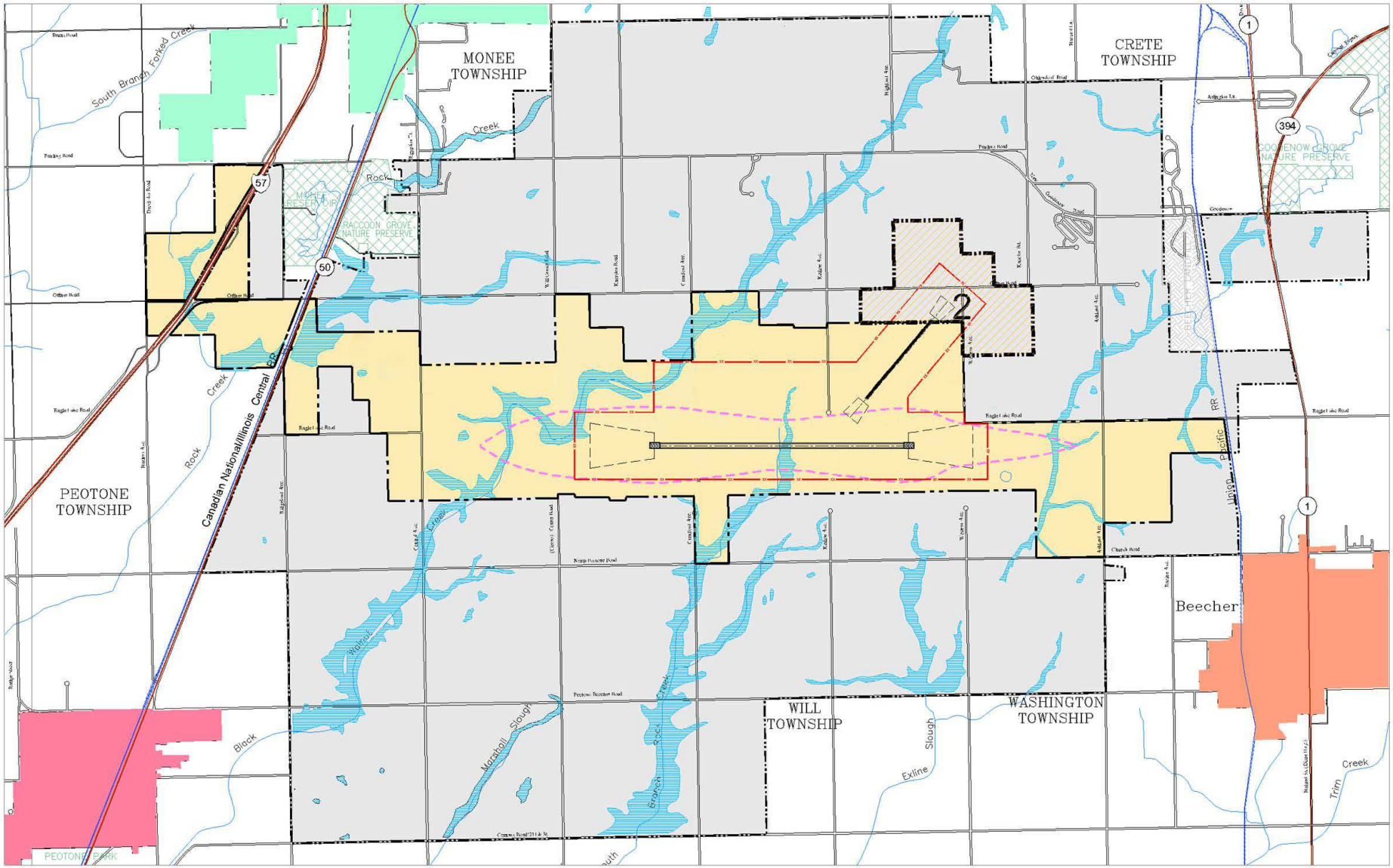
- AIR OPERATION AREA (AOA)
- TERMINAL & CARGO DEVELOPMENT AREA
- 65 DNL NOISE CONTOUR
- INAUGURAL AIRPORT BOUNDARY
- ULTIMATE AIRPORT BOUNDARY
- ADDITIONAL PROPERTY REQUIRED FOR CROSSWIND RUNWAY
- PARK LAND
- LANDFILL (CLOSED)
- WETLAND AREA
- 100-YEAR FLOODPLAIN

Inaugural Airport Airfield Alternatives
Crosswind Runway 5-23
Alternative 1a (ALNAC Proposal)

Exhibit 6-13



TAMS an Earth Tech Company

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Legend

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- AIR OPERATION AREA (AOA)
- TERMINAL & CARGO DEVELOPMENT AREA
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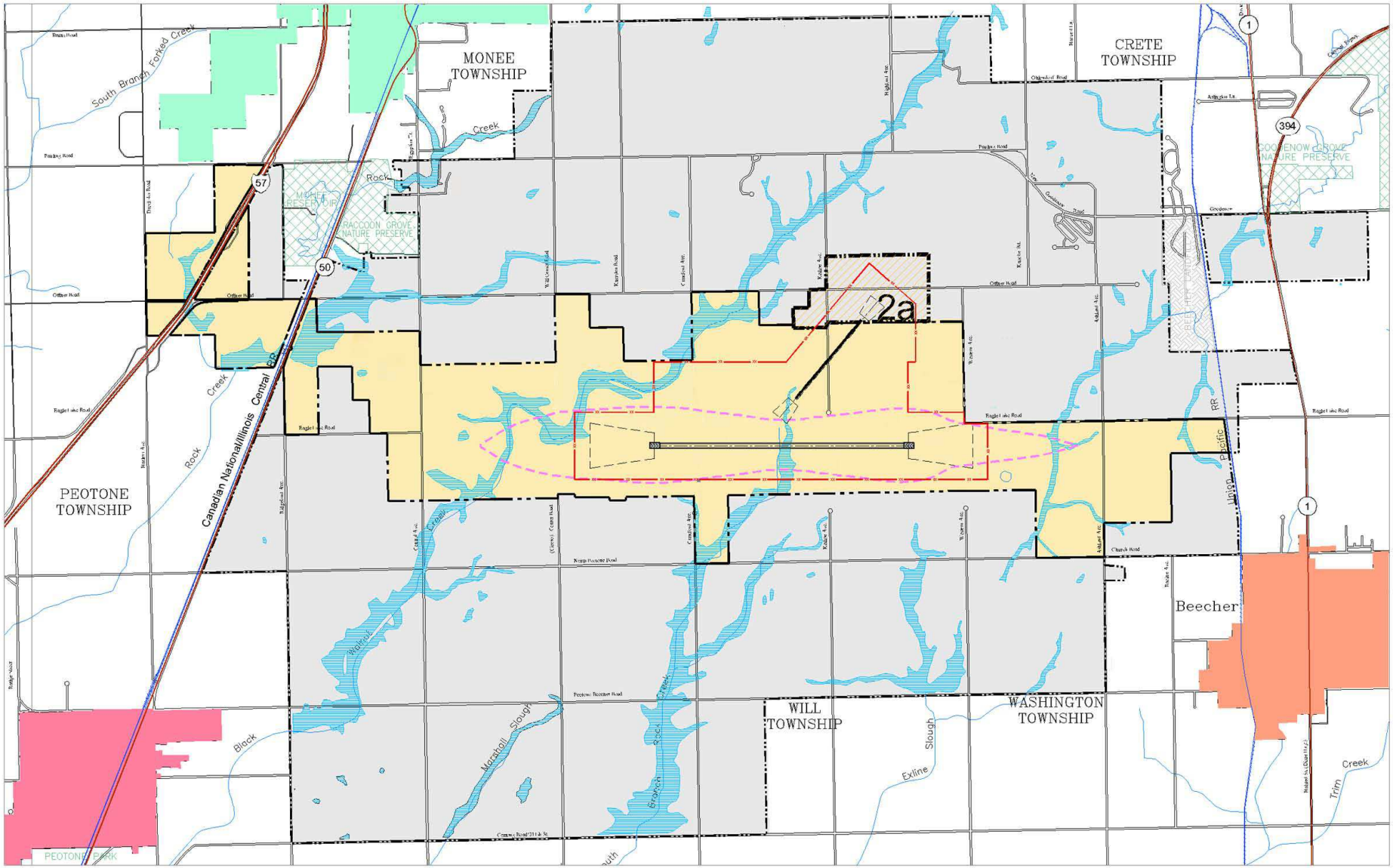
- ULTIMATE AIRPORT BOUNDARY
- ADDITIONAL PROPERTY REQUIRED FOR CROSSWIND RUNWAY
- PARK LAND
- LANDFILL (CLOSED)
- WETLAND AREA
- 100-YEAR FLOODPLAIN

Inaugural Airport Airfield Alternatives
Crosswind Runway 5-23
Alternative 2

Exhibit 6-14



TAMS an Earth Tech Company

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Legend

- AIRPORT RUNWAY
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- ULTIMATE AIRPORT BOUNDARY
- ADDITIONAL PROPERTY REQUIRED FOR CROSSWIND RUNWAY
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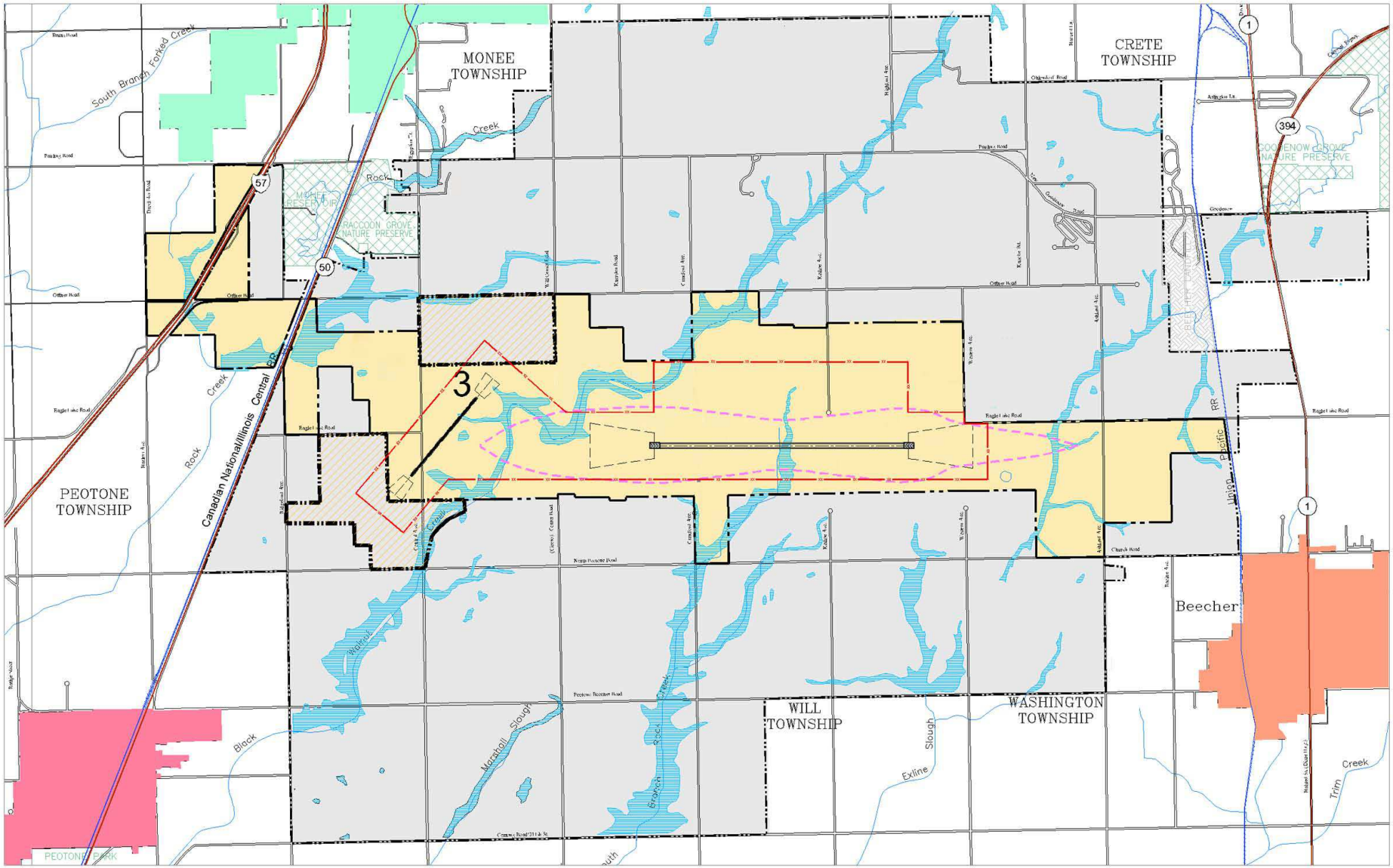
- LANDFILL (CLOSED)
- WETLAND AREA
- 100-YEAR FLOODPLAIN

Inaugural Airport Airfield Alternatives
Crosswind Runway 5-23
Alternative 2a

Exhibit 6-15



TAMS an Earth Tech Company

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Legend

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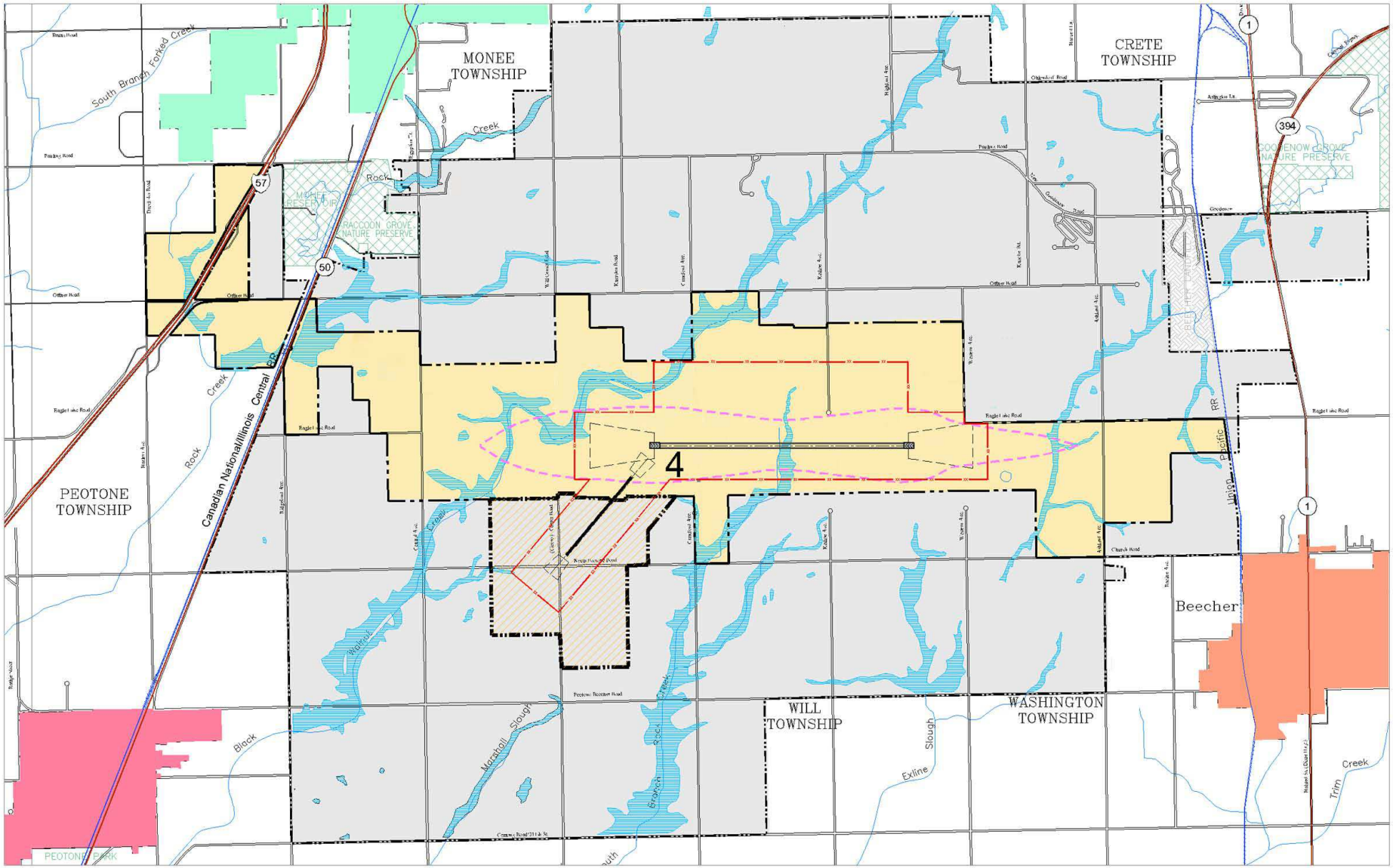
- 65 DNL NOISE CONTOUR
- INAUGURAL AIRPORT BOUNDARY
- ULTIMATE AIRPORT BOUNDARY
- ADDITIONAL PROPERTY REQUIRED FOR CROSSWIND RUNWAY
- PARK LAND
- LANDFILL (CLOSED)
- WETLAND AREA
- 100-YEAR FLOODPLAIN

Inaugural Airport Airfield Alternatives
Crosswind Runway 5-23
Alternative 3

Exhibit 6-16



TAMS an Earth Tech Company

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Legend

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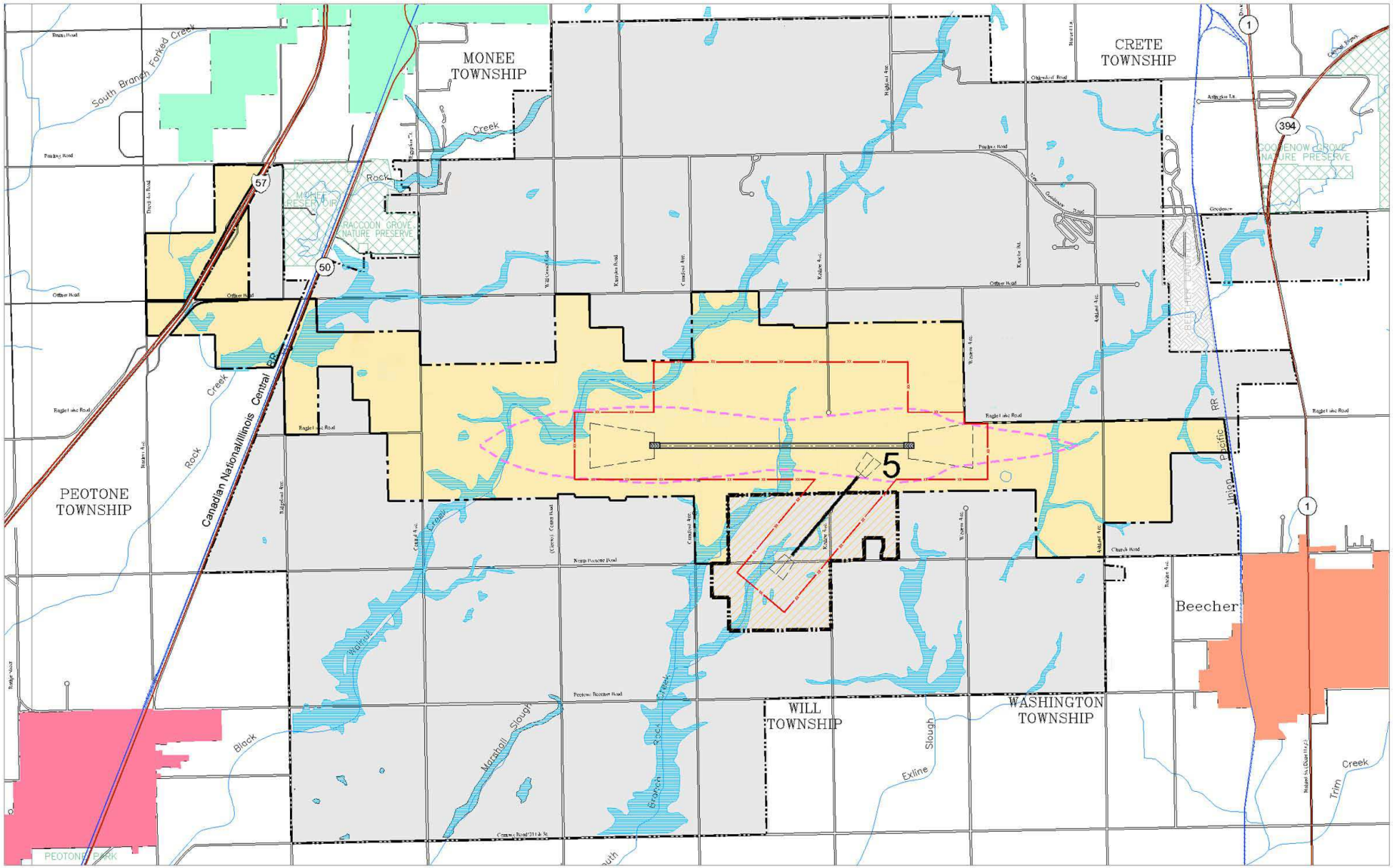
- TERMINAL & CARGO DEVELOPMENT AREA
- 65 DNL NOISE CONTOUR
- INAUGURAL AIRPORT BOUNDARY
- ULTIMATE AIRPORT BOUNDARY
- ADDITIONAL PROPERTY REQUIRED FOR CROSSWIND RUNWAY
- PARK LAND
- LANDFILL (CLOSED)
- WETLAND AREA
- 100-YEAR FLOODPLAIN

Inaugural Airport Airfield Alternatives
Crosswind Runway 5-23
Alternative 4

Exhibit 6-17



TAMS an Earth Tech Company

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Legend

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- ULTIMATE AIRPORT BOUNDARY
- ADDITIONAL PROPERTY REQUIRED FOR CROSSWIND RUNWAY
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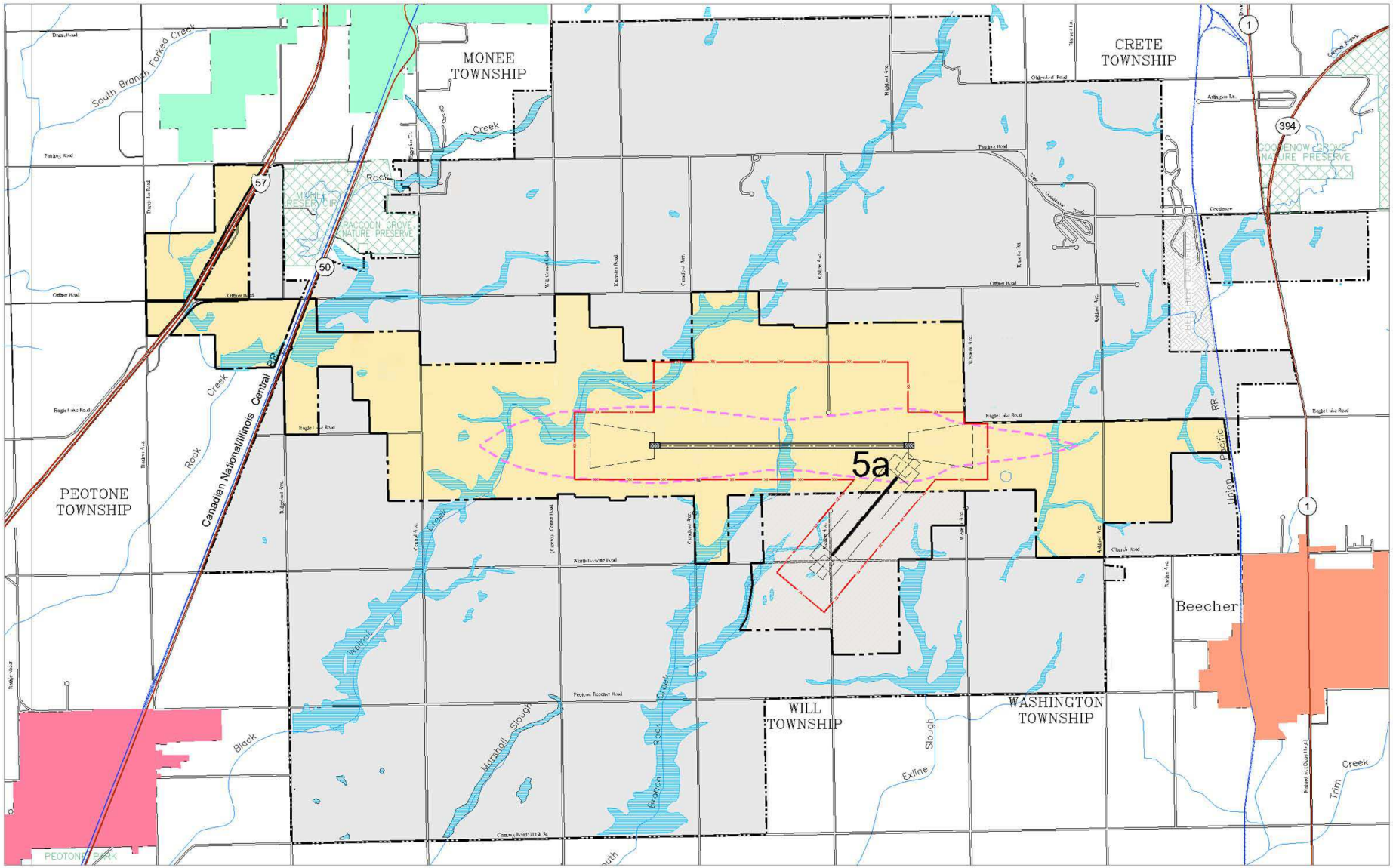
- LANDFILL (CLOSED)
- WETLAND AREA
- 100-YEAR FLOODPLAIN

Inaugural Airport Airfield Alternatives
Crosswind Runway 5-23
Alternative 5

Exhibit 6-18



TAMS an Earth Tech Company

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Legend

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- ADDITIONAL PROPERTY REQUIRED FOR CROSSWIND RUNWAY
- PARK LAND
- LANDFILL (CLOSED)
- WETLAND AREA
- 100-YEAR FLOODPLAIN

Inaugural Airport Airfield Alternatives
Crosswind Runway 5-23
Alternative 5a

Exhibit 6-19

Criteria 1 – Operational Requirements – This criterion examined whether an alternative would meet the requirements of Aircraft Design Group (ADG) B-II aircraft and was used as a screening criterion. If an alternative could not meet the minimal requirements for ADG B-II aircraft, it was eliminated from further consideration.

Criteria 2 – Configuration & Capacity – Each alternative's airfield capacity was evaluated based on the configuration of the crosswind runway with the preferred inaugural primary runway. An open "V" runway configuration provides higher airfield capacity than intersecting runways; thus, they were rated higher.

Criteria 3 – Compatibility with the Ultimate Airfield Concept – This criterion evaluated the potential of an alternative to fit into the preferred ultimate airfield concept. Those alternatives that conflicted with potential planned facilities rated lower than those that had fewer potential conflicts.

Criteria 4 – Ability to Avoid and/or Minimize Land Use Impacts and Community Disruption – This criterion was divided into three sub-criteria to rate different impacts that are of concern to the landowners and communities surrounding the site. Each sub-criterion was rated separately and then averaged with ratings from the other sub-criteria for each alternative.

Sub-Criteria 4a – *Conflicts with Local Land Use Plans* – Each alternative was evaluated against the *Land Use Plan for the Eastern Will County Area* (August 1997) to determine if the alternative would conflict with the plan. Conflicts were defined as airport facilities being located outside of the previously defined airport boundary (shown on the land use map), on land planned for other uses by the communities within the airport boundary, or if planned residential land uses would be located directly off the ends of the crosswind runway.

Sub-Criteria 4b – *Population Displacement* – Alternatives that minimize impacts to homes and residents were rated higher than those that had greater impacts.

Sub-Criteria 4c – *Local Traffic Disruption* – Alternatives that would result in less road closures would have fewer impacts on local traffic including emergency vehicle and school bus routes. Roadways that have higher existing traffic volumes were considered to have a greater impact than roads with lower existing traffic volumes. Those alternatives that had less impact on roads were rated higher than alternatives that had higher impact on local roads.

Criteria 5 – Ability to Avoid and/or Minimize Natural Resource Impacts – This criterion was divided into four sub-criteria to rate different impacts that are of concern to the Federal and state natural resource agencies, special interest groups and the general public. Each sub-criterion was rated separately and then averaged with ratings from the other sub-criteria for each alternative.

Sub-Criteria 5a – *Impacts on Wetlands* – Alternatives that would result in fewer impacts to wetlands rated higher than alternatives with greater impacts.

Sub-Criteria 5b – *Impacts on Floodplains* – Alternatives that would result in fewer impacts to floodplains rated higher than alternatives with greater impacts.

Sub-Criteria 5c – *Impacts on Water Resources* – Alternatives that would result in fewer impacts to water resources (streams, lakes, etc.) rated higher than alternatives with greater impacts to water resources.

Sub-Criteria 5d – *Impacts on Prime Farmland* – Alternatives that would result in fewer impacts to prime farmland rated higher than alternatives with greater impacts to prime farmland.

Criteria 6 – Comparison of Relative Costs – Alternatives were compared against each other to determine if they would be relatively more or less expensive to implement. Those alternatives that are relatively less expensive rated higher than those that are relatively more expensive.

6.4.2 Inaugural Airfield Crosswind Runway (05-23) Alternatives Evaluation Matrix

The same methodology employed in evaluating the inaugural airfield alternatives was used for evaluation of the inaugural crosswind runway alternatives. Each concept was evaluated and ranked by each criteria identified in **Table 6-4**. A rating scale from 1 to 5 was assigned to each criterion to better distinguish differences between each of the alternatives. A score of 5 was considered the best score for a criterion, while a score of 1 was considered the worst.

The alternatives were compared against the six major criteria developed for this process. **Table 6-5** depicts the results of applying the criteria and rating scale to each of the airfield concepts. The evaluation worksheet and a more detailed explanation of the rating scale are shown in **Table 6-6**.

6.4.3 Preferred Inaugural Airfield Crosswind Runway (05-23) Alternative

The results in **Table 6-5** show that Alternative 5a (see **Exhibit 6-19**) rated the highest of all inaugural crosswind runway alternatives examined. This alternative had the lowest relative cost, best configuration and airfield capacity and also rated well on the other criteria. Alternatives 1, 2, 2a and 3 all posed problems with the intermediate expansion of the airport, and were thus rated lower. Alternative 1a would not meet the requirements of ADG B-II aircraft and, as a result, was eliminated from consideration. Alternative 4 would have greater social impacts while Alternative 5 would have greater impacts to natural resources. Based on the results contained in Table 6-5, Alternative 5a was selected as the preferred inaugural crosswind runway alternative.

The crosswind runway would be a 4,000-foot long, visual runway. This analysis concluded that the proposed crosswind runway would require the acquisition of an additional 850 acres of land beyond the previously established inaugural airport boundary[4] (see **Exhibit 6-19**). However, all of the operationally feasible alternatives required additional land and the land required for the inaugural crosswind runway is contained within the previously established ultimate airport boundary, as shown on the exhibit. In addition, the crosswind runway would impact approximately one mile of North Peotone Road. Local traffic coming from the east would be re-routed south on Kedzie Avenue, then east on Peotone – Beecher Road and then back north on Center Road to North Peotone Road. Traffic originating from the west would travel in a reverse sequence of the described route.

[4] The inaugural and ultimate airport boundaries were established by IDOT in 2000 and were evaluated in the FAA's Tier 1 EIS, *Final Environmental Impact Statement, Tier 1: FAA Site Approval and Land Acquisition by the State of Illinois, Proposed South Suburban Airport,* April 2002.

Table 6-5
Inaugural Airport
Crosswind Runway Alternatives Evaluation Matrix

No.	Criteria	Alternative 1	Alternative 1a	Alternative 2	Alternative 2a	Alternative 3	Alternative 4	Alternative 5	Alternative 5a
1	**Ability to meet operational requirements**	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
2	**Ability to provide maximum airfield capacity**	**4**		**4**	**4**	**2**	**4**	**4**	**4**
3	**Compatibility with the preferred ultimate airfield concept**	**1**		**1**	**1**	**1**	**4**	**4**	**4**
4	**Ability to avoid and/or minimize adverse land use impacts and community disruption**	**4.7**		**4.7**	**4.0**	**4.3**	**3.0**	**4.0**	**4.3**
a	*Conflicts with the land use plans of the neighboring communities*	5		5	5	5	5	5	5
b	*Population displacement*	4		4	2	4	1	4	5
c	*Local traffic disruption and permanent closure of existing local roads, emergency vehicle & schools bus routes*	5		5	5	4	3	3	3
5	**Avoid and/or Minimize impacts on natural resources**	**4.8**		**4.8**	**4.5**	**2.0**	**4.3**	**2.0**	**4.0**
a	*Wetlands*	*4*		*4*	*3*	*1*	*5*	*5*	*5*
b	*Floodplains*	*5*		*5*	*5*	*1*	*5*	*1*	*4*
c	*Water resources*	*5*		*5*	*5*	*5*	*5*	*1*	*5*
d	*Prime farmland*	*5*		*5*	*5*	*1*	*2*	*1*	*2*
6	**Relative Cost Comparison**	**5**		**5**	**5**	**1**	**3**	**5**	**5**
	Total	**19.5**		**19.5**	**18.5**	**10.3**	**18.3**	**19.0**	**21.3**
	Rating	**3.9**		**3.9**	**3.7**	**2.1**	**3.7**	**3.8**	**4.3**

Source: TAMS, an Earth Tech Company, 2004.

Table 6-6
Inaugural Airport
Crosswind Runway Alternatives Evaluation Worksheet

Score	Rating	**Criterion 1** Meet Operational Requirements of ADG B-II	**Criterion 2** Capacity & Configuration	**Criterion 3** Compatibility with Preferred DBO+20 Plan	**Criterion 4a** Land Use Conflicts	**Criterion 4b** Population Displacement	**Criterion 4c** Traffic Disruption on Local Roads	**Criterion 5a** Wetland Impacts	**Criterion 5b** Floodplain Impacts	**Criterion 5c** Water Resource Impacts	**Criterion 5d** Prime Farmland Impacts	**Criterion 6** Relative costs
5	**Excel-lent**	Yes	N/A	No conflict with DBO+20 planned facilities	No conflict	Lowest population impacted	No road closures	Lowest acreage impacted	Lowest acreage impacted	Lowest stream length impacted	Lowest acreage impacted	Lowest relative cost
4	**Good**	N/A	Open "V" Configuration	1 conflict with future planned facilities	1 conflict	20 - 39% greater population impact	Shortest road closure	20 - 39% greater impact	20 - 39% greater impact	20 - 39% greater impact	20 - 39% greater impact	20 - 39% greater cost
3	**Aver-age**	N/A	Intersecting runways	2 conflicts with future planned facilities	2 conflicts	40 - 59% greater population impact	Road closure, providing detour options	40 - 59% greater impact	40 - 59% greater impact	40 - 59% greater impact	40 - 59% greater impact	40 - 59% greater cost
2	**Fair**	N/A	Impairs activity on primary runway	3 conflicts with future planned facilities	3 conflicts	60 - 79% greater population impact	Road closure providing no alternative detour	60 - 79% greater impact	60 - 79% greater impact	60 - 79% greater impact	60 - 79% greater impact	60 - 79% greater cost
1	**Poor**	No	N/A	4 or m ore conflicts with planned facilities	4 conflicts	Highest population impacted	Permanent road closure	Highest acreage impacted	Highest acreage impacted	Highest stream length impacted	Highest acreage impacted	Highest relative cost

Source: TAMS, an Earth Tech Company, 2004.
N/A = Not Applicable