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Chapter One
Purpose and Need

This Environmental Assessment (EA) has been prepared by the City of Manhattan to fulfill Federal requirements for environmental review of airport development projects that are eligible for Federal funding, as outlined in the Federal Aviation Administration's (FAA) Order 5050.4B, "Airport Environmental Handbook," and FAA Order 1050.1E, "Environmental Impacts: Policies and Procedures."

All Federal actions, undertaken by the FAA, that have the potential for environmental impact must comply with the National Environmental Policy Act of 1969 (NEPA), the Airport and Airway Improvement Act of 1982, as amended, and other pertinent laws. Guidance for considering environmental impacts is found within FAA Order 5050.4B, FAA Order 1050.1E, and the Council on Environmental Quality's (CEQ) "Regulations for Implementing NEPA."

This EA describes the purpose and need for the Proposed Action, evaluates the reasonable alternatives to the Proposed Action, and provides full disclosure of the potential environmental impacts associated with implementation of the Proposed Action at the Manhattan Regional Airport (MHK).

This chapter includes:

- Background information
- Activity forecast overview
- Purpose and Need
- Proposed Action description
- Time frame for implementation
- Requested Federal Action

1.1 BACKGROUND INFORMATION

MHK is owned and operated by the City of Manhattan (Sponsor). The Airport is located three miles west of Manhattan on Highway K-18 (See **Figure 1-1**). MHK provides a variety of services related to commercial, general, and military aviation. Scheduled passenger service is available from Manhattan to Kansas City. General aviation services such as pilot training, aircraft maintenance, fueling, and tie-downs are provided at MHK. As Fort Riley's neighbor, MHK also supports military deployments and training.

The current airfield facilities include two runways: 3/21 and 13/31 (**See Figure 1-2**). Runway 3/21 is 7,000 feet long and 150 feet wide and has high intensity runway edge lights (HIRLs). Both runway ends are equipped with Visual Approach Slope Indicators (VASIs) which provide visual guidance to pilots. In addition, MHK is equipped with a terminal very high frequency omnirange (TVOR) and a Category I instrument landing system (ILS), which allows for instrument approaches to Runway 3. A TVOR is an electronic navigation aid that provides horizontal guidance to a pilot. An ILS provides electronic vertical and horizontal guidance to a pilot. By using these navigational aids, a pilot may land an aircraft in reduced visibility conditions. Runway 3 also has a medium intensity approach lighting system with runway alignment indicator lights

(MALSR). The Airport Reference Code (ARC) designation for Runway 3/21 is C-II. The ARC is used by the FAA to relate airport design criteria to aircraft characteristics including wing span and approach speed. The C-II ARC includes aircraft with an approach speed of between 121 and 141 knots and a wingspan of between 49 and 79 feet. A typical C-II type of aircraft is the Gulfstream III.

Runway 13/31 is 3,801 feet long and 100 feet wide, and has medium intensity runway lights (MIRLs). Both ends are equipped with VASIs. Runway 13/31 is designated as a B-I runway. The B-I ARC includes aircraft with an approach speed of between 91 and 121 knots and a wingspan of up to 49 feet. This runway primarily serves single and twin engine aircraft.

The landside facilities include a passenger terminal, fueling facilities, fire station, airport traffic control tower, two fixed base operators, and several hangars.

1.2 ACTIVITY FORECASTS

A forecast was developed for this EA to estimate the total operations in calendar year 2004, and to forecast operations for 2005, 2008, and 2013. Sources of data used in the forecast effort included:

- FAA Air Traffic Control Tower Counts,
- Airport Landing Reports,
- Official Airline Guide,
- U.S. Department of Transportation T-100 Data,
- Radar Data,
- FAA Terminal Area Forecast,
- FAA Aerospace Forecasts for FY 2005-2016,
- General Aviation Statistical Datebook, and
- Interviews with Airport management, Midwest ATC, the Fort Riley Transportation Officer, the U.S. Air Fore liaison at Fort Riley, and the Airport's primary fixed base operator (FBO), Kansas Air Center.

A summary of the Airport activity forecast is shown in **Table 1.1**. See *Appendix A* for additional information regarding the forecast.

1.3 PURPOSE AND NEED

FAA Order 1050.1E requires that EA address the purpose of a proposed action and why the action is needed. The identification of the purpose and need is the primary foundation for the identification of reasonable alternatives and the evaluation of environmental consequences.

There are several problems the Sponsor is proposing to address:

- The runway safety area (RSA) and runway object free area (ROFA) for Runway 21 do not meet FAA criteria.
- The crosswind runway, Runway 13/31, is not long enough to serve the commercial aircraft operating at MHK.
- There is not a full length parallel taxiway for Runway 13/31.
- The Sponsor does not own the land required to control the presence of objects in the area surrounding the TVOR.

Table 1.1

Historic and Forecast Aircraft Operations by Group

Aircraft Group	Estimated 2004		Forecast 2005		Forecast 2008		Forecast 2013	
	Ann. Ops.	Percent	Ann. Ops.	Percent	Ann. Ops.	Percent	Ann. Ops.	Percent
GA/Military Single Engine Piston	19,978	56.0%	20,048	55.8%	20,099	43.8%	20,009(1)	41.8%
GA/Military Small Multi-engine Piston &Turboprops	8,280	23.2%	8,341	23.2%	8,434	18.4%	8,553	17.9%
Commercial/Military Large Turboprops	3,768	10.6%	3,766	10.5%	3,967	8.7%	3,992	8.3%
GA/Military Small Jets	2,796	7.8%	2,929	8.2%	3,637	7.9%	4,931	10.3%
Commercial/Military Large Jets	210	0.6%	213	0.6%	437	1.0%	510	1.1%
GA/Military Helicopters	622	1.7%	632	1.8%	9,284	20.2%	9,906	20.7%
Total	35,655	100.0%	35,929	100.0%	45,858	100.0%	47,900	100.0%

(1) Airport management and airport users agree that more complex aircraft (particularly business jets) will comprise an increasing share of GA activity at MHK, reflecting the overall trend shown in FAA's national forecast for hours flown by these types of aircraft. In addition, based on FAA's national growth rates for single engine aircraft, the share of single engine operations at MHK will decrease from an estimated 66 percent in 2004 to 63 percent in 2013. See *Appendix A* for more information regarding the forecast.

Source: HNTB analysis.

1.3.1 RSA and ROFA

The RSA must be free of above ground objects and must not have significant surface variations. The ROFA must also be free of above ground objects. RSA and ROFA dimensions are determined based on the ARC. The ARC for Runway 3/21 is C-II. The corresponding required RSA is 500 feet wide and extends 1,000 feet beyond the end of the runway and the corresponding ROFA is 800 feet wide and extends 1,000 feet beyond the end of the runway. See **Figure 1-3**. The existing RSA and ROFA do not meet the grading or clearance requirements within the 1,000 feet beyond the end of Runway 21 because of the location of the localizer and the Eureka Valley Tributary. The localizer is part of the ILS and is located approximately 660 feet from the end of Runway 21. The Eureka Valley Tributary is a ditch contained by approximately ten foot berms and provides drainage for a large area including areas off Airport property. The Eureka Valley Tributary crosses the RSA approximately 850 feet from the end of Runway 21. See Figure 1-3. Therefore, the area extending beyond Runway 21 does not meet the FAA criteria for RSAs or ROFAs.

1.3.2 Crosswind Runway

The FAA encouraged the City to consider extending Runway 13/31 in order that commercial aircraft, including the Saab 340, could access the Airport in all weather conditions, or if the primary runway was closed for maintenance or construction. In

their letter dated September 29, 1999, the FAA recommended the Runway be extended to a length of at least 5,000 feet to accommodate the Saab 340 aircraft. The FAA selected the Saab 340 because they believed there was potential for future use of this aircraft at MHK. As requested in the letter, the performance curves for Saab 340 were reviewed. According to performance curves, the Saab 340B could take-off of a 5,000 foot long runway at MHK with 99 percent of its maximum take off weight of 28,500 pounds (See *Appendix B*). Given the short stage length of these commercial flights (MHK to Kansas City International Airport), and that the Saab 340B could take-off with 99 percent of its MTOW, a 5,000 foot long crosswind runway would be of a sufficient length to address FAA concerns.

1.3.3 Parallel Taxiway

Without a full length parallel taxiway for Runway 13/31, aircraft must taxi on the runway to reach the terminal area after landing. Safety could be enhanced by constructing a parallel taxiway which would allow aircraft to access the terminal area without taxiing on Runway 13/31.

1.3.4 Very High Frequency Omnirange (TVOR)

The land surrounding the TVOR is not under the control of the City. This is a problem because a structure could potentially be erected that would cause distortion of the TVOR signal. All structures must be at least 1,000 feet from the antenna. In addition, metal structures located beyond 1,000 feet from the TVOR antenna must not penetrate a 1.2 degree angle measured from the antenna base.

Therefore, the purpose of the Proposed Action is to correct non-standard conditions, provide a crosswind runway capable of serving the commercial fleet, avoid extensive taxiing on Runway 13/31, and protect an existing navigational aid.

1.4 SPONSOR'S PROPOSED ACTION

The Sponsor's Proposed Action is illustrated in **Figure 1-4** and described in the following paragraphs:

- Construct a standard RSA/ROFA for the Runway 21 end by shifting Runway 3/21to the southwest by 400 feet. The 400 foot shift includes the construction of 400 feet of runway and taxiway, and relocation of the MALSR and the VASI. No land acquisition is required.

- Extend Runway 13 by 1,199 feet to the northwest. The extension of Runway 13 includes acquisition of approximately 74 acres of land, installation of runway end identifier lights (REILs), and relocation of the existing VASI.

- Construct a full length parallel taxiway for Runway 13/31 by extending Taxiway E and

- Acquire approximately 53 acres of land to protect the TVOR signal, .

1.5 TIME FRAME FOR IMPLEMENTATION

Construction of the Sponsor's Proposed Action would begin upon FAA approval of the Airport Layout Plan (ALP) and issuance of an environmental finding. Construction of the Proposed Action is expected to take approximately two years to complete.

1.6 REQUESTED FEDERAL ACTION

The requested Federal actions are FAA approval of the Proposed Action as depicted on the Airport Layout Plan and potential

funding in the form of Airport Improvement Program (AIP) grants.

FAA action is necessary in connection with the Proposed Action because, pursuant to 49 USC Section 47107(a)(16), the FAA Administrator (under authority delegated from the Secretary of Transportation) must approve any revision or modification to an Airport Layout Plan before the revision or modification takes effect. The purpose of the FAA action is to ensure that the proposed alterations to the Airport do not adversely affect the safety, utility, or efficiency of the Airport.

Related FAA actions include the following:

- Determination that the Sponsor's Proposed Action would be operated in accordance with accepted practice for safe and efficient use of navigable airspace.

- Adjust existing flight procedures, including visual, instrument, and missed approach procedures to accommodate the Proposed Action.

Chapter Two Alternatives

The evaluation of reasonable alternatives to the Sponsor's Proposed Action is considered the heart of the NEPA process according to the CEQ. This chapter describes the alternatives considered for MHK including the Proposed Action. A range of alternatives are examined to determine if they meet the purpose and need for the Proposed Action while potentially impacting fewer environmental resources. This chapter documents the narrowing process used in consideration of the potential alternatives including:

- Identification of potential alternatives;
- Elimination of alternatives that do not meet the purpose and need;
- Additional screening of alternatives; and
- Evaluation of reasonable alternatives.

2.1 IDENTIFICATION AND EVALUATION OF POTENTIAL ALTERNATIVES

This section includes the identification and initial evaluation of the potential alternatives to the Proposed Action. The potential alternatives are evaluated as to whether they are feasible and whether they meet the purpose and need. Remaining alternatives will be further screened in Section 2.2.

When identifying alternatives, it is customary to consider both off-site and on-site alternatives. Off-site alternatives include the use of other modes of transportation or other airports. Off-site alternatives would not correct non-standard conditions, provide a crosswind runway capable of serving the commercial fleet, enhance safety, nor protect an existing navigational aid at MHK. Therefore, off-site alternatives do not meet the purpose and need and are eliminated from further consideration.

Several on-site alternatives were considered. Potential on-site alternatives are numerous because the Proposed Action includes the following improvements to the airfield:

- Construct a standard runway safety area beyond the Runway 21 end (1,000 feet by 500 feet),
- Extend Runway 13/31 from 3,801 to 5,000 feet long,
- Protect the TVOR signal and,
- Construct Taxiway E extension to provide a full length parallel taxiway for Runway 13/31.

Alternatives for each of these improvements including the No Action Alternative are discussed in the following paragraphs. The No Action Alternative must be evaluated in order to comply with CEQ Regulations.[1]

2.1.1 Construct a Standard Runway Safety Area for Runway 21

In 2003, the Sponsor completed a study entitled "Runway 3-21 Safety Area

[1] Regulations for Implementing The Procedural Provisions of the National Environmental Policy Act, Council on Environmental Quality, 1978, Section 1502.14 (d).

Engineering Considerations"[2] (Study). The Study was completed to examine alternatives to meet FAA RSA criteria. The primary problem with the RSA was that it encompassed a portion of the Eureka Valley Tributary (EVT). The EVT flows through the RSA and drains over two square miles of land both on and off the Airport. Therefore, extensive hydrologic analysis was completed for alternatives to move or enclose the EVT. Several alternatives were considered including: enclosure of the EVT with box culverts combined with storage of floodwaters in detention basins, and relocating the EVT various distances outside of the RSA. The final list of alternatives included:

- Enclose EVT with use of the Fort Riley Detention Basin,
- Enclose EVT with Detention near the Airport,
- Relocate EVT 500 feet Outside the RSA, and
- Displace Runway Threshold and Use Declared Distances.

The alternatives considered in this EA include the Study alternatives. Alternatives outside the scope of the Study are also evaluated. Additional alternatives are considered provided they maintain the current usable runway length of 7,000 feet.

Alternatives were limited to those providing 7,000 feet of usable runway because the recommended runway length for Runway 3-21 is 7,000 feet.

FAA Advisory Circular (AC) 150/5325-4B, *Runway Length Requirements for Airport Design*, was used to determine the recommended runway length. The first step was to review the fleet mix to determine the critical design aircraft that operate at MHK on a regular basis (500 annual operations). Charter, military, scheduled commuter, and general aviation aircraft were considered. Charter aircraft operations individually and in total do not exceed 500 in 2013; therefore, charter aircraft are not used to determine the recommended runway length. Military aircraft operating at MHK on a regular basis are either helicopters or multi-engine turboprops. None of the military jets operate at MHK on a regular basis. Scheduled commuter and general aviation aircraft operating at MHK on a regular basis include jets, multi-engine turboprop and single engine prop aircraft. The next step is to identify the maximum takeoff weight (MTOW) of the aircraft that regularly operate at MHK. All of these jets, multi-engine turboprop and single engine prop aircraft have a MTOW less than 60,000 pounds. Therefore, the runway length design approach used was the family groupings of large airplanes (Chapter 3 of AC 150/5325-4B). By using the design guidelines in Chapter 3 of AC 150/5325-4B it was determined that the recommended runway length for Runway 3-21 is 7,000 feet See *Appendix B* for details of runway length calculation. *Appendix B* also includes correspondence from Kansas State University, the Department of the Army, and Northwest Airlines Performance Engineering in support of the need for a 7,000 foot long runway.

Only two additional alternatives that provided for a usable runway length of 7,000 feet were identified: shift Runway 3/21 to the southwest and install engineered material arresting system (EMAS) in the existing Runway 21 RSA. Descriptions of

[2] Final Runway 3-21 Safety Area Engineering Considerations, March 18, 2003, Crawford, Murphy & Tilly, Inc. Consulting Engineers.

these two alternatives and the Study alternatives are provided in the following paragraphs.

2.1.1.1 Enclose EVT with use of the Fort Riley Detention Basin

This alternative is to enclose the EVT in a 500 foot long box culvert beneath the RSA and mitigate floodwaters with a new dam located on Fort Riley (See **Figure 2-1**). Initially this was the Sponsor's preferred alternative. However, coordination with Fort Riley personnel after the publication of the Study indicated that the construction of a dam on their property is unlikely. Therefore, this alternative is no longer feasible.

2.1.1.2 Enclose EVT with Detention near the Airport

Originally in the Study, this alternative was to enclose the EVT with a 650 foot long box culvert beneath the RSA and OFA. This alternative was modified slightly for this EA to use a 500 foot long box culvert. Floodwaters would be mitigated in detention basins on each side of the EVT upstream of the culvert on future Airport property (See **Figure 2-2).** The localizer would also be relocated outside of the RSA. This alternative is feasible and would provide the full RSA and ROFA beyond Runway 21. This alternative would meet the purpose and need for the Proposed Action and is therefore retained for further consideration.

2.1.1.3 Relocate EVT 500 feet Outside of the RSA

This alternative is to relocate the EVT 500 feet outside of the RSA and reconstruct 1,000 feet of existing channel upstream of the RSA. (See **Figure 2-3**) Relocating the EVT outside of the RSA is feasible and would provide the full RSA and ROFA beyond Runway 21. This alternative would meet the purpose and need for the Proposed Action and is therefore retained for further consideration.

It is noted that distances other than 500 feet were also considered in the Study. Alternatives to relocate the EVT either 100 feet or 1,500 feet outside the RSA were eliminated from further consideration because these alternatives either restricted airport planning flexibility or were too costly.

2.1.1.4 Displace Runway Threshold and Use Declared Distances – No Action Alternative

The alternative to use declared distances was identified by both the Sponsor and the FAA as a temporary solution. Declared distances are the length of runway available for aircraft operations based on their performance characteristics. Ideally the entire runway is available for landing and departing aircraft. However, when an airport is constrained and it is not viable to provide RSAs or ROFAs that meet FAA criteria, declared distances may be used. The declared distances published by the FAA tell a pilot how much of the runway is available for a particular operation. For instance one of the declared distances identified is the Landing Distance Available (LDA). The landing starts at the runway threshold and includes the completion of the approach, touchdown and deceleration to a stop, plus safety factors. The LDA is the length of runway available for landing. The full runway length is only available for landing if the full RSA and ROFA are provided beyond each end of the runway. In the case of MHK, the full RSA and ROFA are only available beyond the end of Runway 3. The localizer on the Runway 21 end limits the RSA and ROFA to 660 feet (340 feet less than the required 1,000 feet

for aircraft landing on Runway 3). Therefore, LDA for an aircraft landing on Runway 3 is 7,000 feet minus 340 feet or 6,660 feet.

By implementing declared distances the FAA criteria for RSAs and ROFAs may be met. However, the runway available for aircraft landing on Runway 3 will be less than 7,000 feet. Since the runway length needed is 7,000 feet, declared distances are considered only a temporary solution. In this case declared distances may be implemented by simply publishing them in the Airport Facilities Directory. Therefore, the use of the declared distances will be considered the No Action Alternative (See **Figure 2-4**).

2.1.1.5 Shift Runway 3/21 to the Southwest

Another alternative to provide a full RSA is to shift the entire runway to the southwest. There are two options to shift the runway and provide the full RSA; shift the runway 400 feet, or move the localizer and shift the runway 200 feet.

The closest object to the Runway 21 threshold, the localizer, is 660 feet from the Runway 21 threshold. Therefore Runway 3/21 would be shifted at least 340 feet to the southwest to result in a standard runway safety area. If the Runway were shifted 400 feet it would be less costly because the existing runway edge lighting would not need to be relocated. (Per FAA requirements runway edge lights are spaced at 200 feet starting at the runway threshold.) This option would include the construction of 400 feet of runway and the relocation of some of the lights that make up the MALSR (See **Figure 2-5**).

If the closest object to the Runway 21 threshold, the localizer, is moved the next closest object would be the EVT. The EVT is approximately 850 feet from the Runway 21 end. Therefore Runway 3/21 would be shifted at least 150 feet to the southwest to result in a standard runway safety area. If the Runway were shifted 200 feet it would allow the localizer to be relocated between the end of the RSA and the EVT. This option would include the construction of 200 feet of runway and the relocation of some of the lights that make up the MALSR (See **Figure 2-6**).

The alternative to shift Runway 3/21 to the southwest (both options) is feasible and meets the purpose and need by resulting in a standard RSA. Therefore, this alternative is retained for further consideration.

2.1.1.6 Install EMAS

EMAS is a bed of crushable, lightweight concrete blocks installed in a non-standard RSA. When an aircraft travels across the EMAS, it crushes the concrete blocks and thus decelerates. FAA Order 5200.8, *Runway Safety Area Program*, states that EMAS shall be considered when determining the feasible alternatives to develop a standard RSA.[3] According to FAA Order 5200.9, *Financial Feasibility and Equivalency of Runway Safety Area Improvements and Engineered Material Arresting Systems*, "A standard EMAS installation provides a level of safety that is generally equivalent to a full RSA constructed to the standards of AC 150/5300-13 for overruns. It also provides an acceptable level of safety for undershoots."[4] Therefore, this alternative is

[3] US DOT FAA Order 5200.8, October 1999, Appendix 2, pages 1 and 2.

[4] US DOT FAA Order 5200.9, Financial Feasibility and Equivalency of Runway Safety Area Improvements and Engineered Material Arresting Systems, March 2004, page 3, paragraph 6.

feasible and meets the purpose and need for the Proposed Action by providing an RSA that would satisfy FAA requirements. See **Figure 2-7** for an illustration of this alternative. The installation of EMAS alternative is retained for further consideration.

2.1.2 Extend Runway 13/31

A 5,000 foot long crosswind runway is needed to provide redundant service for commercial aircraft operations at MHK. Runway 13/31 is currently 3,801 feet long. Therefore, an extension of 1,199 feet is needed. There are three alternatives to extend Runway 13/31: extend Runway 13 by 1,199 feet to the northwest, extend Runway 31 by 1,199 feet to the southeast, or extend both ends for a total of 1,199 feet.

Extending Runway 31 is problematic because the distance between the RSA, which extends 300 feet beyond the end of the Runway, and the service road is approximately 200 feet. Therefore, Runway 31 could not be extended more than 200 feet unless the service road is relocated. Due to the proximity of K-18 and the Union Pacific Railroad the service road could not be markedly relocated. The remaining alternatives are therefore limited to either extending Runway 13 by 1,199 feet to the northwest, or extending Runway 13 by 999 feet to the northwest and Runway 31 by 200 feet to the southeast. Considering constructability and cost, it is beneficial to limit the construction to one end of the runway. By extending only Runway 13, airport operations would be less impacted during construction, and NAVAID relocation would be only necessary for Runway 13. Therefore, the alternatives to be considered for further analysis are limited to the No Action Alternative and the extension of Runway 13 by 1,199 feet to the northwest. See **Figure 2-8**.

2.1.3 Protect TVOR Signal

The Critical Area for the TVOR is not under the control of the City. This is a problem because a structure could potentially be erected that would cause distortion of the TVOR signal. To protect the TVOR signal, the City could either acquire the land surrounding the TVOR or move the TVOR to another location on the Airport.

The first alternative would be to acquire the necessary land such that the City would own all of the property within the TVOR Critical Area (See **Figure 2-9**). This alternative meets the purpose and need and is feasible.

The second alternative, which is to move the TVOR to another location on the Airport, is not feasible. The Airport could not accommodate the entire TVOR Critical Area anywhere on existing property. Therefore, only the No Action and the Land Acquisition Alternatives will be considered for further analysis.

2.1.4 Construct a Full Length Parallel Taxiway for Runway 13/31

Runway 13/31 does not have a full length parallel taxiway. Without a full length parallel taxiway for Runway 13/31, aircraft must back taxi on the runway to reach the terminal area after landing. While back taxiing is allowed, it is not preferable from an airport operations standpoint. Thus operating conditions would be enhanced by providing a full length parallel taxiway.

The Airport layout would allow for a taxiway on either the east side or west side of Runway 13/31. However, since the existing partial parallel taxiway is constructed on the east side of Runway 13/31, it is preferable to construct the new taxiway on this side as well. If the parallel taxiway were constructed on the west side of

Runway 13/31, an additional taxiway would be required between Runway 3/21 and Taxiway A, and general aviation (GA) traffic would have to cross Runway 13/31 to access the GA facilities. The necessity to cross a runway to access facilities is typically avoided for safety and operational reasons. Therefore, the alternatives to be considered for further analysis are limited to the no action and the construction of the parallel taxiway on the east side of Runway 13/31 (See Figure 2-8).

2.1.5 Summary

Potential alternatives have been identified and evaluated. All alternatives that were not feasible and/or did not meet the purpose and need for the Proposed Action were eliminated from further consideration. The remaining alternatives to extend Runway 13/31, protect the TVOR, and construct a parallel taxiway consisted of the Sponsor's Preferred Alternatives and the No Action Alternative (for each of these improvements). The No Action Alternatives must be evaluated in order to comply with CEQ Regulations.[5] Therefore the following alternatives will be carried forward for detailed environmental analysis:

- Extend Runway 13/31 by 1,200 feet to Runway 13 end for a total length of 5,000 feet.
- Acquire land to protect the TVOR.
- Construct Taxiway E extension to provide a full length parallel taxiway on the east side of Runway 13/31.
- No Action Alternative.

The remaining alternatives to provide the full RSA and ROFA for Runway 3/21 are:

- Enclose EVT with detention near the Airport.
- Relocate EVT 500 feet outside the RSA.
- Shift Runway 3/21 to the southwest.
- Install EMAS.
- No Action - Displace Runway Threshold and Use Declared Distances.

All of these alternatives are feasible and meet the purpose and need. These alternatives will be further screened to both identify a preferred alternative and, if appropriate, eliminate alternatives from further consideration.

2.2 SCREENING OF REMAINING ALTERNATIVES

In this section, the remaining alternatives to develop a standard RSA and ROFA for Runway 3/21 will be screened. The screening criteria will include operational impacts, financial feasibility, and environmental considerations.

2.2.1 Operational Impacts

Although all of the remaining alternatives are feasible, they may have negative operational impacts on the Airport. Negative operational impacts are associated with an alternative that would limit how the Airport operates. An example of such would be an alternative that limits the amount of runway usable for landing.

As described in Section 2.1.1.4, the No Action Alternative would have negative operational impacts. The No Action

[5] Regulations for Implementing The Procedural Provisions of the National Environmental Policy Act, Council on Environmental Quality, 1978, Section 1502.14 (d).

Alternative includes implementing declared distances and thus would limit the runway available for aircraft landing on Runway 3 to 6,600 feet.

The alternatives to Enclose EVT with Detention near the Airport, Relocate EVT 500 feet outside the RSA, and Install EMAS do not have negative operational impacts. None of these alternatives include moving a runway threshold or changing an approach. These alternatives would allow for use of the full runway length for all operations and the current approaches to Runway 3/21 would not be impacted.

To understand the operational impacts of shifting the runway, the aircraft approach to Runway 3 is examined for potential obstructions to air navigation. The standards used to determine if an object is considered an obstruction are related to the type of approach; visual, non- precision, or precision. The approach to Runway 3 is a precision instrument approach because it is equipped with an ILS and appropriate approach lighting. The ILS provides vertical and horizontal guidance to a pilot and allows aircraft to land in reduced visibility conditions. The categories (CAT) of ILS approaches are associated with specific visibility conditions. The ILS at MHK is a CAT I ILS. A Category I ILS may be used to land an aircraft if the Decision Height is not less than 200 feet (i.e., the height from the ground to the lowest layer of clouds that obscure over half of the sky) and the horizontal visibility on the ground is not less than 1,800 feet.

The standards to determine whether an object is an obstruction to air navigation are established in Title 14 of the Code of Federal Regulations (14 CFR) Part 77, Objects Affecting Navigable Airspace (Part 77). Objects penetrating the approach surface for a particular runway would be considered obstructions. For a precision runway the approach surface starts 200 feet from the runway threshold and extends out and up. This surface widens from 1,000 feet to 16,000 feet, extends for 50,000 feet, and is at a slope of 50:1 for the first 10,000 feet (40:1 for the remaining 40,000 feet). See **Figure 2-10** for an illustration of the portion of this surface near the Runway 3 end. This figure also shows that several objects would penetrate the Runway 3 approach slope and therefore would be considered obstructions to air navigation.

Further analysis is required to determine the appropriate disposition of these obstructions. Depending on their location and height some obstructions may remain in place if they are appropriately lighted. Other obstructions must be removed to allow aircraft operations to continue in the existing manner. To determine the disposition of these obstructions, analysis is completed using FAA Order 8260.3B Change 19, United States Standard for Terminal Instrument Procedures (TERPS). Criteria in two sections of TERPS were reviewed: Volume 1 Paragraph 251 and Volume 3 Paragraph 3.

TERPS Volume 1 Paragraph 251 (Paragraph 251), Visual Portion of the Final Approach Segment, includes criteria to determine an obstacle identification surface. If this surface is penetrated, the obstacle must either be removed or the minimum visibility must be limited to ¾ mile. Limiting the minimum visibility to ¾ mile would impact operations at MHK because currently the published minimum for Runway 3 is ½ mile. Therefore, under weather conditions when visibility is between ½ and ¾ mile, pilots would no longer be able to land their aircraft at MHK.

The Paragraph 251 obstacle identification surface is shown in plan and elevation on Figure 2-10. (Details regarding the location,

dimensions and slope of this surface are included in *Appendix C*.) Objects 5, 6, and 11 all penetrate the obstacle identification surface. These are trees which are located off of existing airport property. Potentially these trees may be removed/topped to clear the Paragraph 251 obstacle identification surface. It is assumed that the City will be able to obtain permission to remove/top these trees and therefore no changes to the existing minimums would be necessary.

TERPS Volume 3 Paragraph 3 (Paragraph 3), Precision Final and Missed Approach Segments, specifies obstacle clearance surfaces (OCS) for precision approaches. The primary areas of the OCS are the W and X surfaces. If either of these surfaces is penetrated by an obstruction one of the following actions must be taken:

- eliminate the penetration,
- displace the runway threshold,
- increase the glide slope angle, or
- raise the decision height.

The options that include displacing the runway threshold, increasing the glide slope angle, or raising the decision height would all impact airport operations. Displacing a runway threshold would decrease the length of runway available for an aircraft landing on Runway 3. Increasing the glide slope angle would result in a non-standard condition for pilots landing aircraft on Runway 3. Raising the decision height from the existing 200 feet increases the minimum visibility conditions under which aircraft may land on Runway 3.

The Paragraph 3 Precision W and X surfaces are shown in plan and elevation on Figure 2-10. (Details regarding the location, dimensions and slope of this surface are included in *Appendix C*.) Object 6 penetrates the X surface. This is a tree which is located off of existing airport property. Potentially this tree may be topped to clear the X surface assuming that the City will be able to obtain permission to top these trees and therefore no changes to the existing airport operations would be necessary.

Since penetrations to both the Paragraph 251 obstacle identification surface and the Paragraph 3 Precision X surface are trees which presumably may be topped, no operational impacts would be expected to result from shifting the runway

In summary, assuming the obstructing trees may be topped, none of the alternatives, except the No Action, would be expected to impact aircraft operations at MHK.

2.2.2 Financial Feasibility

FAA Order 5200.9 provides guidance on determining whether alternatives for RSA improvements are financially feasible. The basis for whether an alternative is financially feasible is the cost of the EMAS alternative. Using this Order the maximum feasible cost for improving the RSA may be determined. Also, the life cycle cost of an EMAS alternative is compared to the other RSA alternatives. If the costs of the other alternatives are less than 90 percent of the EMAS alternative, then the EMAS alternative is not considered the best alternative in regard to financial feasibility. Conversely, if the cost of the EMAS alternative is less than 90 percent of the cost of the other alternatives, then EMAS is considered the best alternate in regard to financial feasibility.

To determine the financial feasibility of the RSA alternatives at MHK, maximum feasible cost and the lifecycle cost of each

alternative is determined. These costs are determined and evaluated using the five step process described in Order 5200.9.

The first step is to determine the EMAS design aircraft. The EMAS design aircraft for MHK was determined to be the Lear 45 because it is the heaviest aircraft that operates at MHK on a regular basis (over 500 annual operations).

The second step is to estimate the length of EMAS bed required. For planning purposes the length of the EMAS bed may be determined using Figure 3 of Order 5200.9 (See *Appendix D*). Using this figure, it is concluded that an EMAS length of 175 feet is appropriate for evaluation of the financial feasibility of the alternatives.

Determining the maximum feasible cost is the third step. Using Figure 4 of Order 5200.9 (See *Appendix D*) for a 175 foot long EMAS bed it is determined that the maximum feasible RSA improvement cost is approximately eight million dollars. If any of the alternatives cost more than eight million dollars, they are not considered financially feasible.

Step four is to calculate the life cycle costs of all of the alternatives. The life cycle costs include the present value of construction and maintenance costs for a 20 year period. See *Appendix D* for details and assumptions regarding the development of the costs for each alternative.

Step five, the final step, is to determine the best financially feasible alternative for improving the RSA. If the costs of any of the alternatives are greater than the maximum feasible cost developed in step three, then these alternatives are not considered financially feasible. **Table 2.1** provides the estimated costs of the alternatives. None of the life cycle costs for the RSA alternatives exceed the maximum feasible cost.

Furthermore, if the costs of the alternatives other than EMAS are less than ninety percent of the EMAS alternative, then these alternatives are the best financially feasible alternatives. The life cycle cost of the alternatives to enclose EVT with detention near the Airport and relocate EVT 500 feet outside the RSA, are less than 90 percent of

Table 2.1

Estimated Costs of the Alternatives

Alternative		Initial Cost	Life Cycle Cost*
Enclose EVT with detention near the Airport.		$4.0 million	$4.0 million
Relocate EVT 500 feet outside the RSA.		$1.8 million	$1.8 million
Shift Runway 3/21 to the southwest.	400 feet	$5.3 million	$5.3 million
	200 feet	$5.3 million	$5.3 million
Install EMAS.		$3.4 million	$4.9 million
No Action - Displace Runway Threshold and Use Declared Distances.		$0	$0

* Each of the alternatives has minimal maintenance costs over a twenty year life cycle with the exception of the EMAS Alternative. EMAS has specific maintenance, inspection and replacement requirements in a twenty year period.

Source: HNTB Analysis

the Install EMAS Alternative. Therefore, EMAS is not the best financially feasible alternative.

Since the EMAS alternative is not the best financially feasible alternative, and climate conditions and sponsor support are not conducive to installing EMAS, the EMAS alternative is eliminated from further consideration. Order 5200.9 states that factors other than cost, including climate conditions and sponsor support, are important in considering whether installing EMAS is a reasonable alternative. Climate conditions at MHK are not ideal for EMAS. Very cold temperatures and flooding conditions (EMAS would be placed in the 100 year flood plain) at MHK may limit the durability and effectiveness of the EMAS. Additionally, the sponsor does not support the installation of EMAS because of the associated maintenance costs. Therefore, despite the fact that the EMAS alternative is financially feasible, this alternative is dropped from further analysis.

It is noted that the lifecycle cost of the Shift Runway 3/21 alternative (both options) is 8 percent higher than the lifecycle cost of the install EMAS alternative. Clearly the Shift Runway 3/21 Alternative is not the best financially feasible alternative. However, the cost of the Shift Runway 3/21 Alternative is less than the maximum feasible cost of eight million dollars and therefore will not be eliminated from further consideration.

2.2.3 Environmental Considerations

Potential environmental impacts are normally considered when screening alternatives. The selection of environmental impact categories to screen is based on the types of impacts anticipated for each of the alternatives. One alternative, Shift Runway 3/21, involves relocating the Runway 3/21 thresholds which may result in noise or land use compatibility impacts. Other alternatives include moving or enclosing the EVT which may result in floodplain impacts. Therefore, the alternatives are compared relative to their potential to impact noise, land use compatibility, and floodplains

A difference in noise exposure between the No Action Alternative and the Shift Runway 3/21 Alternative is expected because the locations of the runway thresholds will change. Since the runway shift is toward the southwest, the noise exposure would decrease for those residents adjacent to the northeast corner of the Airport. A difference in noise exposure between the No Action Alternative and the Install EMAS, Enclose EVT, or Relocate EVT Alternatives is not expected because the locations of the Runway 3/21 thresholds will not change.

Compatible land use near airports is particularly important in the runway protection zones (RPZs). The RPZ is a trapezoidal area located just off of each runway end which is intended to protect people and property on the ground. FAA AC 150/5300-13, Airport Design, states that residential land use is prohibited in the RPZ[6]. Currently there are residences located within the Runway 21 RPZ. With the shifting of Runway 21, the RPZ would necessarily shift as a result of the alternative to shift Runway 3/21. As can be seen in Figures 2-5 and 2-6, the residences would no longer be within the RPZ. Since the Runway 3/21 thresholds do not move as a result of the No Action, Install EMAS, Enclose EVT, or Relocate EVT Alternatives, incompatible land use in the Runway 21 RPZ would continue.

[6] AC 150/5300-13, Airport Design, page 13 paragraph 212 (b)(2)(b).

The Enclose EVT, Relocate EVT, and Shift Runway 3/21 (200 foot option) alternatives would likely result in greater impacts to the 100 year floodplain than the No Action, Install EMAS, and Shift Runway 3/21 (400 foot option) Alternatives. Preliminary engineering indicates that the Enclose EVT, Relocate EVT, and Shift Runway 3/21 (200 foot option) Alternatives require the placement of fill in the floodplain/floodway to accommodate the required construction.

2.2.4 Summary

In this section, the remaining alternatives to develop a standard RSA and ROFA for Runway 3/21 were screened. The screening criteria included operational impacts, financial feasibility, and environmental considerations. **Table 2.2** shows a comparison of these alternatives in terms of the evaluation criteria. Only the Install EMAS Alternative was eliminated from further analysis because conditions at MHK are not well-suited for EMAS. The remaining alternatives to provide the full RSA and ROFA will be carried forward for further analysis. The remaining alternatives are:

- Enclose EVT with detention near the Airport.
- Relocate EVT 500 feet outside the RSA.
- Shift Runway 3/21 to the southwest.
- No Action – Displace runway threshold and use declared distances.

2.3 ALTERNATIVES RETAINED FOR FURTHER CONSIDERATION

This section presents a summary of the alternatives that will be retained for environmental analysis. In accordance with Order 1050.1E the potential permitting requirements are identified. **Table 2.3** lists the alternatives retained and potential permitting requirements for each proposed airfield improvement.

Table 2.2

Comparison of RSA Alternatives

Alternative		Operational Impacts	Life Cycle Cost	Environmental Considerations*		
				Noise	Land Use Compatibility	Floodplain
Enclose EVT with detention near the Airport.		No	$4.3 million	0	0	-
Relocate EVT 500 feet outside the RSA.		No	$2.0 million	0	0	-
Shift Runway 3/21 to the southwest.	400 feet	No	$5.7 million	+	+	0
	200 feet	No	$5.8 million	+	+	-
Install EMAS.		No	$4.9 million	0	0	0
No Action - Displace Runway Threshold and Use Declared Distances.		Yes	$0	0	0	0

* 0 indicates no/minor impact anticipated, + indicates anticipated positive impact, - indicates anticipated negative impact

Source: HNTB Analysis

Table 2.3

Alternatives Retained for Further Analysis

Proposed Airfield Improvement	Alternatives Retained		Potential Permitting Requirements
Construct a standard runway safety area for the Runway 21 end (1,000 feet by 500 feet)	Enclose EVT with Detention near the Airport		Section 401 and 404
	Relocate EVT 500 feet outside the RSA		Section 401 and 404
	Shift Runway 3/21 to the southwest	400 feet	None
		200 feet	Section 401 and 404
	No Action - Displace Runway Threshold and Use Declared Distances		None
Extend Runway 13/31 by 1,200 feet	Extend Runway 13 by 1,199 feet to the Northwest		Section 401 and 404
	No Action		None
Protect the TVOR Signal	Acquire Land		None
	No Action		None
Construct Taxiway E extension to provide a full length parallel taxiway for Runway 13/31	Construct the Parallel Taxiway on the East Side of Runway 13/31		None
	No Action		None

Source: HNTB Analysis

2.4 SPONSOR'S PREFERRED ALTERNATIVE

The Sponsor's Preferred Alternative is the Sponsor's Proposed Action and consists of specific airfield improvements to meet each element of the purpose and need. The Sponsor's Preferred Alternative includes:

- extending Runway 13 by 1,199 feet to the northwest to provide a crosswind runway capable of serving the commercial fleet,
- constructing a parallel taxiway on the east side of Runway 13/31 to reduce the need to taxi on the Runway,
- acquiring land to protect the TVOR, and
- shifting Runway 3/21 400 feet to the southwest to provide a standard RSA/ ROFA for the Runway 21 end.

The first three airfield improvements are included in the Sponsor's Preferred Alternative because all other alternative airfield improvements were eliminated from further consideration as they were either not feasible or they did not meet the purpose and need for the Proposed Action.

The last airfield improvement, shift Runway 3/21 by to the southwest, was included in the Sponsor's Preferred Alternative because shifting the Runway is the only alternative (other than the No Action Alternative) that would not result in potential conflicts with the recommendations from the Eureka Valley Tributary Feasibility Study. The USACE and the Sponsor have entered into a Feasibility Cost Share Agreement to complete a Feasibility Study of alternatives to reduce the exposure of residential and commercial property to the flood threat from the Eureka Valley Tributary. Although funded, the Feasibility Study has not started

as of the writing of this document. It is anticipated that the study will take at least two years to complete. Upon completion of the Feasibility Study, detailed design of the recommended development would occur. Coordination with the USACE indicated that the recommendations of the Feasibility Study may not be compatible with the alternatives to enclose or relocate the EVT in the vicinity of the Airport. Therefore, although the alternative to shift Runway 3/21 to the southwest is the most costly of the alternatives to provide a standard RSA/ROFA, it was identified as the Sponsor's Preferred Alternative in order to avoid potential conflicts with the Feasibility Study solutions to reduce flooding of the EVT.

The Sponsor's Preferred Alternative to provide a standard RSA/ROFA was further refined by evaluating two options to shift Runway 3/21; shift 200 feet or shift 400 feet. The option to shift the runway 400 feet was selected as the Sponsor's Preferred Alternative to provide a standard RSA/ ROFA. While both options were estimated to cost approximately the same, the 400 foot shift would move the 65 DNL contour further away from the residential area adjacent to the northeast corner of the Airport.

Chapter Three
Affected Environment

This chapter describes the existing conditions in the Study Area for environmental resources potentially affected by the Proposed Action. The following categories of environmental resources would be potentially impacted by the Proposed Action:

- Land Use
- Noise
- Air Quality
- Department of Transportation Act: Section 4(f)
- Fish, Wildlife, and Plants
- Hazardous Materials
- Historical, Architectural, Archeological, and Cultural Resources
- Water Quality
- Wetlands
- Floodplains and Floodways
- Farmlands

3.1 STUDY AREA

The Study Area is the geographic area where the potential impacts of the alternatives retained for further study are analyzed. As stated in Chapter Two, the alternatives retained for further analysis are:

No Action Alternative: This alternative includes only the implementation of the declared distances and does not include construction of any airport improvements

Build Alternatives: (The Build Alternatives are named according to the concept used to provide the full RSA and ROFA for Runway 3/21. All of these alternatives include the extension of Runway 13/31 and the associated parallel taxiway by 1,199 feet, as well as the acquisition of land for the runway and taxiway extensions, and to protect the TVOR.)

- **Enclose EVT:** This alternative consists of the construction of a 500 foot long box culvert and detention basins on each side of the EVT upstream of the culvert including land acquisition to accommodate the detention basins.
- **Relocate EVT:** This alternative consists of reconstruction of the EVT at a location 500 feet outside of the RSA and the associated land acquisition to accommodate the relocation.
- **Shift Runway 3/21:** This alternative has two options;
    - **Option 1- Shift Runway 3/21 by 400 feet to the Southwest (Sponsor's Preferred Alternative)**: The 400 foot shift includes the construction of 400 feet of runway and taxiway, and relocation of the MALSR. No land acquisition is required.
    - **Option 2: Shift Runway 3/21 by 200 feet to the Southwest**. The 200 foot shift includes construction of

200 feet of runway and taxiway, relocation of the MALSR and relocation of the localizer. Land acquisition is not required.

The Study Area shown in **Figure 3-1** was developed based on the Build Alternatives and includes all current Airport property and the property to be acquired. Figure 3-1 also shows the limits of construction based on preliminary engineering. The limits of construction are shown because the analysis of potential impacts to certain environmental impact categories, such as wetlands are related to the limits of construction.

The Study Area for the Proposed Action is located in the Eureka Valley along the Kansas River southwest of Manhattan, Kansas and east of Fort Riley Military Reservation. The Airport is located within the Kansas River Floodplain, and the City of Manhattan and Fort Riley are located on the surrounding high terraces and uplands. With the Airport at the lower end of the watershed, a large amount of offsite drainage crosses the Airport property. The Eureka Valley Tributary (EVT) drains over two square miles including a portion of Fort Riley and the lowlands of the valley north of the Airport from Wildcat Creek Road to Highway K-18 between Eureka Drive and the end of Runway 21.

3.2 LAND USE

The Manhattan Regional Airport is located within Riley County, Kansas, and falls under the jurisdiction of the City of Manhattan. This section describes existing and planned land uses in the vicinity of MHK.

3.2.1 Existing Land Use

According to the Riley County Community GIS website the land surrounding MHK is comprised of a combination of land uses.[7] **Figure 3-2** illustrates existing land use around the Airport. To the north and south of the Airport, land is mainly used for agricultural purposes. Small low- to medium- density residential areas are interspersed to the northeast and east of MHK. It is noted that the residential land use within the Runway 21 RPZ is considered incompatible with the purpose of the RPZ; protection of people and property on the ground. A larger pocket of residential land use exists southwest of the Airport. In addition, approximately one mile from the southwest corner of the Airport lays the town of Ogden, which consists mainly of residential land use (both low- to medium-density and high density). Along the west side of the Airport, there is another small residential area, along with offices and vacant land. Fort Riley, a military installation, is also located adjacent to the west side of the Airport. Commercial and industrial land use dominates to the east of MHK.

3.2.2 Proposed Land Use

Future land use cannot be definitively determined based on demand and population changes that cannot be foreseen. However, the Manhattan Urban Area Comprehensive Plan[8] outlines several broad guidelines for future development and land use.

Based on the Manhattan Urban Area Comprehensive Plan land use around the Airport is expected to change in the following manner. The land use on the west

[7] City of Manhattan and Riley County, "Manhattan Urban Area Comprehensive Plan," April 2003.

[8] City of Manhattan and Riley County, Manhattan Urban Area Comprehensive Plan, April 2003. Available online at http://www.ci.manhattan.ks.us/index.asp?NID=493.

side of MHK and east of Fort Riley would be changed from office, residential, and vacant to office-research park. On the east side of the Airport, existing land use would be converted to community commercial and industrial uses. The northeast residential section would be converted to industrial and agricultural land. The residential community located southwest of the Airport would remain. **Figure 3-3** illustrates proposed land use in the vicinity of the Airport.

According to the Manhattan Urban Area Comprehensive Plan, service industrial, office and research park, and limited heavy industrial uses will be encouraged in the vicinity of MHK. Some commercial uses will also be encouraged in the area around the Airport.

3.3 NOISE

The FAA has developed specific guidance and requirements for the assessment of aircraft noise in order to comply with NEPA requirements. This guidance, specified in FAA Order 1050.1E, "Environmental Impacts: Policies and Procedures," requires that aircraft noise be analyzed in terms of the yearly Day-Night Average Sound Level (DNL) metric (See *Appendix E* for additional information on noise metrics.) In practice, this requirement means that DNL noise levels are computed for the Average Annual Day (AAD) of operations for the year of interest. DNL noise levels are calculated by using FAA's authorized noise model; the Integrated Noise Model (INM). Noise model development, methodology, and operational data are described in *Appendix F*.

Federal guidelines in 14 CFR Part 150 establish the 65 DNL as the threshold of non-compatibility for noise sensitive land uses (e.g., homes, schools, places of worship, etc.) Therefore, the Study Area for noise considerations is the area within the 65 DNL.

Figure 3-4 shows the Year 2005 noise exposure contour based on current operations and runway configuration. The 65 DNL contour is entirely within airport boundaries. Additionally, no noise sensitive locations were identified within the 65 DNL noise contour.

3.4 AIR QUALITY

The U.S. Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) for ambient (outdoor) concentrations of the following criteria pollutants: Carbon Monoxide (CO), Nitrogen Dioxide (NO_2), Ozone (ground-level O_3), Sulfur Dioxide (SO_2), Lead (Pb), and particulate matter with a diameter of 10 microns or less (PM-10 and PM-2.5). Primary standards set limits to protect public health, including health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

States must identify geographic areas that do not meet the national ambient air quality standards for each criteria pollutant. These areas are then identified as non-attainment areas for the applicable criteria pollutant(s). States must develop a State Implementation Plan (SIP) for non-attainment areas that includes a variety of emission control measures that the state deems necessary to produce attainment of the applicable standards in the future. If the SIP already exists, it must be revised if an area is determined to be in non-attainment for a criteria pollutant, or if the severity of non-attainment changes.

An area previously designated non-attainment pursuant to the Clean Air act (CAA) amendments of 1990 and subsequently re-designated as attainment, is termed a maintenance area. A maintenance area must have a maintenance plan in a revision to the SIP to ensure attainment of the air quality standards is maintained. In summary,

- An attainment area is any area that meets the national primary or secondary ambient air quality standard for a given pollutant,
- A non-attainment area is any area that does not meet the national primary or secondary ambient air quality standard for a given pollutant,
- A maintenance area is any geographic area previously designated non-attainment pursuant the CAA Amendments of 1990 and subsequently re-designated as attainment.

The City of Manhattan and Riley County, including the entire Study Area, are in attainment for all criteria pollutants.

3.5 DEPARTMENT OF TRANSPORTATION ACT: SECTION 4(f)

Forty-nine U.S.C. Section 303(C), commonly referred to as Section 4(f) of the DOT Act, states that it is federal policy that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites. Under Section 4(f), FAA may approve a program or project requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance, or land of a historic site of national, State, or local significance only if: (1) there is no prudent and feasible alternative to using that land; and (2) the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from use.

The Study Area was reviewed to identify any 4(f) properties that were located within its boundaries. No parks, recreation areas, or wildlife refuges were found in the Study Area. Historic sites also qualify as 4(f) and they are discussed in Section 3.8, *Historic, Architectural, Archeological, and Cultural Resources.*

3.6 FISH, WILDLIFE AND PLANTS

This section discusses biotic communities, and threatened and endangered species in regard to the Study Area.

3.6.1 Biotic Communities

The Airport is located within the historic flood plain of the Kansas River, which commences just west of the project site when the Smoky Hill and Republican Rivers join together. This area is part of the Flint Hills physiographic region of Kansas. It is an area composed of woodlands and prairie with riparian corridors providing habitat for a wide range of plant and animal communities. The Airport itself is located within the Tall Grass Prairie and adjacent to the Floodplain Forest and Savanna biotic communities. Most of the original plant communities have been converted during settlement of the area to croplands and improved pasture lands. There are woodlands to the west of the airport as the topography becomes hilly and less suitable for agricultural activities.

3.6.2 Threatened and Endangered Species

Section 7 of the Endangered Species Act of 1973 provides protection to any wildlife, which includes endangered plants or animals. In compliance with this law, as amended, federal agencies are required to ensure developments/improvements will not jeopardize the continued existence of threatened or endangered species, or result in the destruction or adverse modification of the critical habitat of such species. Endangered species are defined as those in danger of extinction throughout all or a significant portion of its range. Threatened species are defined as any species that are likely to become an endangered species, within the foreseeable future, throughout all or a significant portion of its range.

Fourteen species are currently listed as threatened or endangered in Riley County by the State of Kansas. Eighteen species are currently listed as threatened or endangered by the U.S. Fish and Wildlife Service for the State of Kansas. A list of state and federally recognized, threatened, and endangered wildlife species that have designated critical habitat or may be migratory near MHK are shown in **Table 3.1**. The two federally-listed plant species shown are limited to high quality native prairies and are included as the plants are present at other locations nearby such as the Konza Prairie on K-177, south of Manhattan.

Based on field investigations, it was determined that there are no areas of suitable habitat within or immediately adjacent to the area that would potentially be disturbed for construction related to the Proposed Action for either of the threatened plant species in the Study Area, Meade's milkweed and western prairie fringed orchid.

3.7 HAZARDOUS MATERIALS

Four primary laws have been passed governing the handling and disposal of hazardous materials, chemicals, substances, and wastes. The two statutes most applicable to airports are the Resource Conservation and Recovery Act (RCRA, as amended by the Federal Facilities Compliance Act of 1992) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended. RCRA governs the generation, treatment, storage, and disposal of hazardous wastes. CERCLA provides remedies for uncontrolled and abandoned hazardous waste sites.

A NEPA document should include documentation of an appropriate level of review regarding the hazardous nature of any materials or wastes to be used, generated, or disturbed by the Proposed Action. Since the Proposed Action necessitates soil disturbance and acquisition of property, a review of EPA's EnviroMapper Website and the Kansas Department of Health records was conducted.

The US Environmental Protection Agency's EnviroMapper Website was reviewed for hazardous materials, CERCLA, and RCRA sites. The Kansas Department Health and Environment (KDHE) records were reviewed for Underground Storage Tanks (USTs). There are no CERCLA sites, one RCRA site, and four UST's on the MHK site. The RCRA site is a Conditionally Exempt Small Generator, Ray's Petroleum Equipment Company located at 5500 Murray Road.

Table 3.1

Threatened and Endangered Species

Common Name	Scientific Name	State Status[(1)]	Federal Status[(2)]	Habitat
Bald Eagle	*Haliaeetus Ieucocephalus*	Threatened	Threatened	Designated critical habitat – present along Kansas River
Least Tern	*Sterna antillarum*	Endangered	Endangered	Designated critical habitat sandbars in Kansas River
Meade's Milkweed	*Asclepias meadii*	Not Listed	Threatened	No designated critical habitat, found in prairies
Peregrine Falcon	*Falco peregrinus*	Endangered	Delisted 1999	No designated critical habitat
Piping Plover	*Charadrius melodus*	Threatened	Threatened	Designated critical habitat along Kansas River
Silver Chub	*Macrhybopsis storeriana*	Endangered	Not Listed	Designated critical habitat – Kansas River
Snowy Plover	*Charadrius alexandrinus*	Threatened	Not Listed	No designated critical habitat
Sturgeon Chub	*Macrhybopsis gelida*	Threatened	Candidate	Designated critical habitat – Kansas River
Topeka Shiner	*Notropis Topeka*	Threatened	Endangered	Designated critical habitat – Kansas River & tributary creeks
Western Prairie Fringed Orchid	*Platanthera praeclara*	Not Listed	Threatened	No designated critical habitat, found in prairies
Whooping Crane	*Grus Americana*	Endangered	Endangered	No designated critical habitat

Notes: (1) State listed species are provided only for Riley County. Designated critical habitat for Riley County
(2) Federally listed species may be present or have designated critical habitat in Riley County.

Sources: Kansas Department of Wildlife and Parks, June 2005.
U.S. Fish and Wildlife Service Threatened and Endangered Species System, Listings by State and Territory as of 12/12/05.

The four USTs located on the MHK property are as follows:

- UST U5-081-11991 Kansas Air Center
- UST U5-081-00527 Kansas National Guard OMS 11
- UST U5-081-00428 Stein Leasing and Rental
- UST U5-081-00427 Manhattan Municipal Airport

These four USTs are depicted in **Figure 3-5**. One additional UST was listed in the Kansas Department of Health and Environment database that may be located on Airport property, U5-081-00777 Nrg Lubricants. No specific address was listed for this UST. All five of these UST sites are listed as "closed". Underground storage tanks have been removed at four of the five sites, and a tank is scheduled to be removed at the National Guard, Oms 11 site.

Figure 3-5 also shows the location of two additional potential hazardous materials sites: the Paralax International Corporation – Rex Mobil-5, located on Airport property, and the Florence Corporation, which is located west of the Airport. These two sites on the Airport property were identified as potentially having uncontrolled emissions of less than 100 tons per year.

The sites are well documented and located; however, given the long history of airport usage, there may be unknown sites on the airport property. Given the present level of agricultural activities, this possibility does appear to be remote.

3.8 HISTORICAL, ARCHITECTURAL, ARCHEOLOGICAL, AND CULTURAL RESOURCES

To comply with the National Historic Preservation Act of 1966, and the Archaeological and Historic Preservation Act of 1974, cultural resources which have the potential to be affected by the Proposed Action must be identified. A historic property is defined as one that is listed, or eligible for listing, on the National Register of Historic Places (NRHP), the official list of the nation's cultural resources. The acts are defined as follows:

- The National Historic Preservation Act of 1966 (as amended) – This act establishes the National Historic Preservation Program which includes elements for identification, assistance, and protection of historic properties. The Act establishes the Advisory Council on Historic Preservation to advise the President and Congress on historic preservation matters, to recommend measures to coordinate Federal preservation activities, and to comment on Federal actions affecting properties included in or eligible for inclusion in the NRHP.
- The Archaeological and Historic Preservation Act of 1974 – This act provides for the survey, recovery, and preservation of significant scientific, prehistoric, historic, or archaeological data that may be destroyed or irreparably lost due to a Federally funded or Federal licensed project.

The NRHP has established standards by which individual resources (both archaeological and architectural) are evaluated to determine their eligibility for listing. Resources may include buildings,

sites, objects, and structures and are placed on the National Register according to the following summarized criteria:

a) Association with events that have made a significant contribution to the broad patterns of American history; or

b) Association with the lives of persons significant in our past; or

c) Significance for architecture; or

d) Significance for archaeology.[9]

To determine the presence of cultural properties, an Area of Potential Effect (APE) must be determined. The APE must include the area that may be directly or indirectly environmentally impacted by the Proposed Action.

The APE for the Proposed Action is the existing Manhattan Municipal Airport construction disturbance area with a 1,000 foot buffer, as per Kansas State Historical Society (KSHS) guidelines. See **Figure 3-6**. The architectural survey of the APE resulted in the identification of two cemeteries, one bridge, and 56 properties. Of those 56 properties, nine had buildings that pre-dated 1955. The bridge and four of the nine historic properties (Properties 1, 3, 5, and 7) are within the construction disturbance area. See **Figure 3-7** for locations of the nine historic properties. All of the properties with buildings pre-dating 1955 and the bridge were assessed for historical significance and recorded on KSHS Historic Resources Inventory Reconnaissance Forms.

The Cultural Resources Surveys for the Study Area's APE consisted of three surveys: an architectural survey, a historic archeological survey, and an archeological survey. See *Appendix G*. Since much of area is presently cultivated, the archeological survey was undertaken after the crops present were harvested.

For the MHK Airport APE, the Cultural Resources Report recommended three properties as eligible for inclusion on the NRHP. There were no archeological sites recommended for further testing or recommended eligible for the NRHP. The recommended eligible properties include the Wood/Elsea Property (Property 2; barn only), the Eureka Valley School Property (Property 4; school, privy, and cemetery) and the Manhattan Airport Work Progress Administration (WPA) Airport Hanger (Property 8). All three properties were determined to be eligible for the NRHP.

The Wood/Elsea Property at 5861 Eureka Drive is located just east of the Wildcat Creek Road and Eureka Drive intersection. Although the residence is in good condition, it has extensive alterations and replacements and therefore is not recommended as eligible for the National Register. Four outbuildings are associated with the residence. Of the four, the barn is eligible for listing on the NRHP under Criteria C. The barn has a limestone block first story, and the barn has undergone little alteration since it was first constructed, likely before 1900.

The Eureka Valley School is a front gabled, one-room prairie school house constructed with local limestone. Built in 1865 on land donated by James Wood, the building held classes for the children of Eureka Valley until 1947. Also on the property is a limestone privy similar in construction to the school house. The Eureka Valley Cemetery is part of the same tract of land as the school and was apparently established prior to the school's construction; the earliest headstone is from 1857. Both limestone buildings and

[9] 36 Code of Federal Regulations [CFR] 60.4.

the cemetery are in good condition. The school is an excellent example of an early one-room schoolhouse and privy constructed from local limestone. The Eureka Valley School property is considered is eligible for listing on the NRHP under criteria A and C for the NRHP.

On the Manhattan Airport Property itself, only two of the buildings present were constructed prior to 1955, the 1939 Manhattan Regional Airport hangar and a small brick maintenance building. The hanger was constructed using limestone blocks by the Works Progress Administration (WPA) with little or no alterations having occurred since its construction. The WPA constructed hanger has retained its integrity and is eligible for listing on the NRHP under criteria C for architecture. The maintenance building has lost some of its architectural integrity, and is not recommended for the NRHP.

The Cultural Resources Report and the results of the architectural and archeological field surveys were submitted to the State Historic Preservation Office (SHPO) at the Kansas State Historical Society on January 6, 2006. On January 26, 2006, the State Historic Preservation Office concurred with the findings and recommendations of the Cultural Resources Report.

3.9 WATER QUALITY

The Federal Water Pollution Control Act, as amended by the Clean Water Act (CWA) of 1977, establishes water quality standards for restoring and maintaining the integrity of the nation's waters. Section 402 of the CWA established the National Pollutant Discharge Elimination System (NPDES) to limit pollutant discharges into streams, rivers and bays and is the key regulatory element in the enforcement of the CWA.

The EVT, located north of Runways 21 and 13, is an intermittent steam, containing flowing water only when rainfall occurs, but can and does maintain pools. The EVT is characteristically a drainage ditch, and the potentially disturbed portion is approximately five feet in width, at the ordinary high water mark (OHWM), and 7,625 feet in length (resulting in a surface area of approximately 0.87 acres of jurisdictional waters of the U.S.). This is the only jurisdictional water resource that would potentially be impacted by the Proposed Action.

A review of the Kansas Department of Health and Environment Water Quality listing did not indicate that there were water quality issues in the Eureka Valley Tributary. Documentation is provided in *Appendix H, Water Quality*. The MHK has standard operating procedures and protocols for dealing with deicing wash down, and the disposal of oils, greases, solvents and similar products that are generally found and used in airport operations. There is a hazardous materials response plan in effect for the MHK airport to prevent and treat surface and groundwater contamination from accidental spills.

3.10 WETLANDS

Executive Order 11990 requires Federal agencies to minimize the destruction, loss, or degradation of wetlands resulting from their actions. Section 404 of the Clean Water Act, as amended, requires regulation of discharges or fill matter into Waters of the United States. The U.S. Army corps of Engineers (USACE) has primary responsibility for implementing, permitting, and enforcing the provisions of Section 404.

Wetlands are defined as those areas that are inundated or saturated by surface or groundwater at a frequency and duration

sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar special aquatic habitats (33 CFR 328.3(c), 1996).

Initial wetlands identification commenced with a review of the National Wetlands Inventory (NWI) mapping of the area. **Figure 3-8** shows the NWI wetlands in the vicinity of MHK. It is noted that not all NWI wetlands are jurisdictional, i.e. fall within the jurisdiction of US Army Corps of Engineers (USACE) Section 404 Permit process. A previous wetland previous delineation investigation for the area was also reviewed.

Both the NWI mapping and the previous investigation were used as a basis for a field visit to identify wetlands potentially impacted by the Proposed Action. The field visit, water resource survey, was conducted on August 31, 2005. The following paragraphs summarize the findings of the water resource survey.

There was one emergent wetland area (approximately one acre in size) located at the west corner of Runway 3, that was identified during the water resource survey but not shown on the National Wetland Inventory (NWI) maps. This is a low area that receives water from overland sheet flow. Although this area meets all three parameters (hydrophytic vegetation, hydrology, hydric soils) to be considered a wetland, it is not considered a "jurisdictional" wetland, but rather an "isolated" wetland because it is not connected to a jurisdictional water (it is not in the 100-year floodplain and there is no stream with an OHWM flowing in or out of the wetland area).

There was also an emergent wetland area identified in a previous investigation.[10] This wetland area was located along the northwest side of Runway 21, and was described as a grassed drainage swale, with wetland characteristics, that conveys storm water runoff from a portion of the runway and the cultivated land west of the runway. In the report done for the previous investigation, it was concluded that this drainage swale was a "storm water management facility", and as such, was exempt from Section 404 requirements for maintenance activities, which would include re-grading activities for runway expansion.

There is only one other NWI designation that is potentially impacted by construction, however, it is in reference to an upland pond which is designated as PFOAh (palustrine, forested, temporarily flooded, diked/impounded). It is located northwest of the curve on Wildcat Creek Road. Although it is surrounded by trees, there are no wetland characteristics associated with this pond, and it is considered "isolated" (non-jurisdictional) because there is no discernible channel flowing out of the pond and therefore no connection to a jurisdictional stream (water of the U.S.).

Within the project limits of construction, the only jurisdictional stream (regulated Water of the U.S. as defined by Section 404 of the Clean Water Act) is the Eureka Valley Tributary. It is located north of Runways 21 and 13, and flows from west to east into the Kansas River. It is shown as an intermittent stream on the USGS map, and is also shown on the NWI maps as PSSAx (palustrine, scrub-shrub, temporarily flooded,

[10] Jurisdictional Waters of the U.S. Delineation, Manhattan Regional Airport, State Route 18, Riley County, Kansas; D.G. Purdy & Associates, Inc., July 29, 2002

excavated) and PEMAx (palustrine, emergent, temporarily flooded, excavated).

Based on field investigations, this tributary is characteristically a drainage ditch with an Ordinary High Water Mark (OHWM), and appears to contain water only when rainfall occurs (the channel contained no water at the time of the field investigation). The average width of the channel at the OHWM is approximately 5 feet, and the length of the channel running through the Construction Disturbance Area is approximately 7625 linear feet (equating to approximately 0.87 acres of surface area of jurisdictional waters of the U.S.).

The tributary is within a narrow, 50 to 70-foot wide riparian corridor which is lined with mostly small to medium size deciduous trees. These tree species include red mulberry (*Morus rubra*), box elder (*Acer negundo*), and hackberry (*Celtis occidentalis*). At scattered locations there are larger eastern cottonwood (*Populus deltoides*) trees present. The tributary is bordered on each side by cultivated crops of soy beans and sorghum. (The previous investigation also identified the tributary as a "ditched" water of the U.S., and therefore jurisdictional.)

Although the USACE Kansas City District will make the final determination concerning jurisdictionality of the water resources, it appears that the only jurisdictional water located within the Construction Disturbance Area is the Eureka Valley Tributary.

3.11 FLOODPLAINS AND FLOODWAYS

Executive Order 11988 was enacted in order to avoid, to the extent possible, the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practical alternative. The order was issued in furtherance of NEPA, the National Flood Insurance Act of 1968, and the Flood Disaster Act of 1973.

Floodplains are defined as lowland and flat areas adjoining waters that are subject to a one percent or greater chance of a flood in any given year, i.e. a 100 year flood event. A "Regulatory Floodway", as defined by the Federal Emergency Management Agency (FEMA), means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height (surcharge). The base flood is generally defined as the 100-year event, and the designated maximum surcharge height is generally one foot or less. Communities must regulate development in these floodways to ensure that there are no increases (0.00 feet) in upstream flood elevations ("no-rise" regulations). Development, land disturbances, and/or embankment fills within the floodplain and outside of the regulatory floodway are generally acceptable, unless there are upstream structures in the floodplain that are already susceptible to flooding. Any construction or disturbance within the regulatory floodway is subject to "no-rise" regulations.

The FEMA Flood Insurance Rate Map (FIRM) for Riley County, depicted in **Figure 3-9**, indicates that the areas adjacent to the Airport to the north and northeast are subject to inundation by the one-percent annual chance flood on the Eureka Valley Tributary. The area to the north of the intersection of the Airport's two runways and an area just east of the intersection are also part of the Eureka Valley Tributary

100-year floodplain. In addition, the Eureka Valley Tributary has a regulatory floodway, which impacts the EVT, and which must be kept free of encroachment or else supplemented with compensatory conveyance, so that no increase (0.00 feet) in flood levels result from any construction. It should be noted that there is also floodplain associated with an overflow area from the Eureka Valley Tributary floodplain to the Eureka Creek floodplain, located to the northeast. This overflow area is identified on the Flood Insurance Rate Map (FIRM) as "Breakout area 1% chance flow conveyance must be maintained".

The existing Eureka Valley Tributary is continuously flanked with levees immediately adjacent to both sides of the channel. The levees are heavily overgrown with vegetation, and are likely very vulnerable to rapid erosion/failure during significant events. These levees were probably not engineered, and are obviously not maintained regularly. It appears that FEMA has completely ignored their existence for their floodplain mapping.

3.12 FARMLAND

The Farmland Protection Policy Acts (FPPA) of 1980 and 1995 require identification of proposed projects that would affect and soils classified as prime and unique. Prime farmland soil is soil that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is also available for other uses. Unique farmland is land other than prime farmland that is used for the production of specific high value food and fiber crops.

Projects can be considered exempt under the FPPA if they require no additional property, or require property that is developed, urbanized, or zoned for urban use. The property that is anticipated to be acquired is under Riley County Jurisdiction. The Riley County land use map shows the property that is being farmed is designated predominantly as agricultural (See Figure 3-2). Therefore the FPPA does apply.

The National Resources Conservation Service (NRCS) Soil Survey website was used to identify prime and important farmland soils in the vicinity of MHK. See **Figure 3-10**. The mapped soils classified as Prime Farmland or of Statewide Importance are identified in **Table 3.2**.

Based on Figure 3-10 it may be concluded that the majority of soils potentially affected by the Proposed Action are either prime farmland or farmland of statewide importance.

Table 3.2

Prime and Statewide Important Farmland Soils

Map Unit Symbol	Map Unit Name	Farmland Classification
3775	Muir silt loam, rarely flooded	Prime
3843	Geary silt loam, 1 to 3 percent slopes	Prime
3844	Geary silt loam, 3 to 7 percent slopes	Prime
3884	Kenesaw silt loam, 2 to 5 percent slopes	Prime
3886	Kenesaw silt loam, 5 to 12 percent slopes	Statewide Importance
3919	Smolan silt loam, 1 to 3 percent slopes	Prime
3920	Smolan silt loam, 3 to 7 percent slopes	Statewide Importance
3923	Smolan silty clay loam, 3 to 7 percent slopes, eroded	Statewide Importance
4018	Chase silty clay loam, very rarely flooded	Prime
4050	Ivan and Kennebec silt loams, occasionally flooded	Prime
4052	Ivan silt loam, occasionally flooded	Prime
7106	Eudora-Bismarckgrove silt loams, rarely flooded	Prime
7107	Bismarckgrove-Kimo complex, rarely flooded	Prime
7123	Eudora silt loam, rarely flooded	Prime
7170	Reading silt loam, rarely flooded	Prime
7171	Reading silt loam, moderately wet, rarely flooded	Prime
7174	Reading silt loam, 1 to 3 percent slopes	Prime
7176	Rossville silt loam, very rarely flooded	Prime
7680	Wymore silty clay loam, 0 to 1 percent slopes	Prime

Source: USDA Natural Resources Conservation Service

Chapter Four
Environmental Consequences

This chapter describes the potential environmental consequences associated with the No Action Alternative and Build Alternatives in accordance with FAA Orders 1050.1E and 5050.4B. A total of 19 impact categories are addressed. Potential impacts are evaluated by comparing the projected future conditions of the affected environment due to each Alternative with the corresponding future conditions due to the No Action Alternative.

4.1 NOISE

Aircraft noise is often the most noticeable environmental effect associated with aviation projects. As described in *Appendix E*, noise that is sufficiently loud or frequent in occurrence may interfere with various human activities and/or be considered non-compatible with noise sensitive land uses. This section describes the potential aircraft-induced noise impacts that the No Action and Build Alternatives would have on the surrounding community. The years analyzed are 2008, the first year after implementation, and 2013, the future condition. Additional information on the noise modeling analysis is available in *Appendix F*.

4.1.1 DNL Noise Impacts

The Federal Interagency Committee on Noise (FICON) has established guidelines to address the compatibility of various land uses within an aircraft operation's induced noise environment. These guidelines provide a means to describe the potential effect of the Proposed Action on land areas within the vicinity of the Airport. The FAA has informally adopted the FICON guidelines regarding land use compatibility with various levels of aircraft noise. The FAA has defined a DNL of 65 dB as the threshold of noise compatibility with residential and other noise-sensitive land uses. FAA Orders 1050.1E and 5050.4B establish that a change of 1.5 DNL or more at or above 65+ DNL at noise sensitive land uses, due to the Build Alternatives as compared to the No Action Alternative, is considered a significant impact. Examination of noise levels below 65 DNL is necessary if there is a significant noise impact within the 65 DNL contour.[11]

4.1.2 No Action Alternative

The future noise exposure levels for the No Action Alternative are shown on **Figures 4-1 through 4-6**. As shown in Figures 4-1 through 4-3, the No Action Alternative 65 DNL contour does not extend beyond the Airport property boundary in 2008. In 2013, the No Action Alternative 65 DNL contour would extend just beyond the Airport property boundary to the northeast, crossing into a residential area. However, it would not encompass any structures. In addition, as shown on Figure 3-3, this area is expected to be agricultural in the future.

[11] U.S. Department of Transportation, Federal Aviation Administration, Office of Environment and Energy, March 2006, "Environmental Impacts: Policies and Procedures," FAA Order 1050.1E, Change 1, and U.S. Department of Transportation, Federal Aviation Administration, Office of Airport Planning and Programming, April 2006, "National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions," FAA Order 5050.4B.

4.1.3 Build Alternatives

Figures 4-1 and 4-4 show the 2008 and 2013 noise exposure levels, respectively, for the option to enclose or relocate the EVT. As stated in Chapter 3, this option includes the extension of Runway 13. As shown in Figures 4-1 and 4-4, the 2008 and 2013 65 DNL contours for this option would extend beyond the existing Airport property boundary to the northeast. However, in order for Runway 13 to be extended, property off of the existing end of this runway and to the north of the Airport would be acquired. The 65 DNL contour would be encompassed by the future Airport property boundary. In 2013, the 65 DNL contour for this option would extend beyond both the existing and future Airport property boundaries to the northeast, into a residential area. However, as with the 2013 No Action Alternative, the 65 DNL contour would not encompass any structures and the residential area is expected to become agricultural in the future.

Figures 4-2 and 4-5 show the 2008 and 2013 noise exposure levels for the option to shift Runway 3/21 200 feet. As shown, the 65 DNL contour would be within the future Airport property boundaries in both years analyzed.

Figures 4-3 and 4-6 show the 2008 and 2013 noise exposure levels for the option to shift Runway 3/21 400 feet, respectively. As shown, the 65 DNL contour would be within the future Airport property boundaries in both years analyzed.

4.1.4 Summary of Noise Impacts

Based upon the analysis presented in the preceding sections, there would be no increase in noise exposure levels in excess of the applicable thresholds of significance due to the Build Alternatives or the No Action Alternative. Accordingly, no further evaluation of noise is required.

4.2 COMPATIBLE LAND USE

The compatibility of existing and planned land uses with aircraft operations is usually determined based on the extent of noise impacts around an airport. As described in Section 4.1, there would be no increase in noise exposure levels in excess of the applicable thresholds of significance due to the Build Alternatives or the No Action Alternative.

Although compatible land use is usually related to the extent of noise impacts other factors may be considered in the analysis. In this case the existing residential land use within the Runway 21 RPZ is incompatible with the function of the RPZ. Any alternative that would result in the relocation of the Runway 21 RPZ such that the residences are no longer within the RPZ boundaries, would have a beneficial compatible land use impact. The only alternative that would result in the required relocation of the RPZ is the shift Runway 3/21 alternative (both options). Therefore, the shift Runway 3/21 alternative would have a beneficial land use compatibility impact.

In addition, future land use around the Airport is expected to become increasingly compatible with airport activities. For example, the residential areas to the northeast and east of MHK would be converted to agricultural and industrial lands, and commercial and industrial uses, respectively.

Therefore, no new non-compatible land use would result from the Build Alternatives or the No Action Alternative.

4.3 AIR QUALITY

For assessment of potential air quality impacts resulting from airport development two primary laws apply; NEPA and the CAA. To satisfy NEPA, the impacts of the Alternatives on the NAAQS are considered. According to the *Air Quality Handbook* a comparison of the NAAQS to the air quality resulting from the implementation of an alternative should be considered if the resulting pollutant level would be expected to exceed the NAAQS.[12] To determine whether the resulting pollutant level would be expected to exceed the NAAQS, the level of subject airport's operations and passenger enplanements may be compared with a screening threshold. The screening threshold equation provided in the *Air Quality Handbook* is:

1.346 x million annual passengers[13] + 0.0194 x General Aviation & Air Taxi operations[14]

If the resulting number is less than 3.5, a NAAQS assessment need not be considered. For MHK in 2013 the annual enplanements are forecasted to be 12,303 passengers.[15] This equates to .025 million annual passenger (MAP). There are 44,333 forecasted general aviation and air taxi operations for 2013 (See *Appendix A*). Using the preceding equation with the MHK 2013 MAP and operations, a value of 0.9 was calculated. Since 0.9 is less than 3.5 and given that MHK is in an attainment area for all NAAQS pollutants, a NAAQS assessment is not required.

The requirements of the CAA General Conformity Rule must also be considered for airport improvement projects. The final rule for Determining Conformity of General Federal Actions to State and Federal Implementation Plans, (40 CFR Parts 6, 51, and 93), was published in the Federal Register in 1993. The EPA promulgated rules that outline the criteria and procedures for determining a project's conformity with the CAA and the SIP for all general (non-highway) Federal projects. A conformity (with the SIP) determination is required for each criteria pollutant if the emissions in a non-attainment or maintenance area for that pollutant caused by a Federal action would equal or exceed a specified annual emission rate when compared to the No Action Alternative. As described in Section 3.4, the MHK Study Area is in attainment for all NAAQS criteria pollutants.

Therefore, it is concluded that neither the Build Alternatives nor the No Action Alternative would result in air quality and no further air quality analysis is required.

4.4 DEPARTMENT OF TRANSPORTATION 4(f)

As discussed in Chapter Three, *Affected Environment*, there were no 4(f) resources in the form of parks, recreation areas, or wildlife refuges in the Study Area. However, there were three properties eligible to be listed on the NRHP (historic sites) identified within the APE. The potential for the Alternatives to either directly or indirectly impact these historic sits was considered. None of the Alternatives would directly impact the three properties because none of the Alternatives would require the alteration, acquisition, or

[12] Air Quality Procedures For Civilian Airports and Air Force Bases, FAA Office of Environment and Energy, April 1997, p. 19.

[13] Million annual passenger is equal to enplanements plus deplanements.

[14] Operations in thousands. For MHK, there are 44.3 thousand general aviation and air taxi operations forecast for 2013.

[15] FAA Terminal Area Forecast, February 2006.

demolition of the three sites. Furthermore, none of the Alternatives would indirectly impact the three sites because all of these properties are well outside the 65 DNL contour for each Alternative. Therefore, no properties listed on or eligible to be listed on the NRHP would be affected by any of the Alternatives.

Accordingly, neither the Build Alternatives nor the No Action Alternative would impact Section 4(f) properties.

4.5 SOCIOECONOMIC IMPACTS AND ENVIRONMENTAL JUSTICE

The Build Alternatives and the No Action Alternative were evaluated for the potential to result in the relocation of residences and businesses as well as the potential to alter surface transportation patterns, divide established communities, disrupt orderly planned development, or to create an appreciable change in employment.

The No Action Alternative does not include any property acquisition or construction and therefore does not result in the relocation of residences or businesses, alteration of traffic patterns, division of communities, disruption of planned development, or appreciable changes in employment.

The Build Alternatives do include acquisition of two farms and one residence, and the relocation of one renter. Although the City would acquire the farms, farming could continue on these properties in a manner similar to the agricultural activities on the MHK property at this time. Therefore, the acquisition of these farms would not be expected to cause appreciable economic hardship on the community. Additionally, since the number of residential relocations required is small, there would be sufficient relocation housing available. The Build Alternatives would not result in disruption of local traffic patterns that substantially reduce the level of service of nearby roads nor loss in community tax base.

In terms of Environmental Justice, Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*, regulates against Federal action that would result in high and adverse human health or environmental impacts that disproportionately impact minority and low income population. The FAA is also directed to identify and assess disproportionate impacts to children's health pursuant to Executive Order 13045.

Since neither the No Action Alternative nor the Build Alternatives would result in impacts exceeding the thresholds of significance for any of the impact categories it may be concluded that there would not be high and adverse human health or environmental impacts. Therefore, neither the Build Alternatives nor the No Action Alternative would disproportionately impact minority and/or low-income households, or children's health.

4.6 FISH, WILDLIFE, AND PLANTS

Potential impacts to fish, wildlife, and plants were evaluated in accordance with FAA Order 1050.1E. A significant impact would occur if the Proposed Action would jeopardize the continued existence of federally listed threatened or endangered species or result in the destruction or adverse modification of critical habitat for any species. Impacts were also considered in accordance with Executive Order 13112, "Invasive Species." by studying the Alternatives' potential to introduce or spread invasive species.

4.6.1 Biotic Communities

There would be minimal impact on the biotic diversity of the Study Area due to the MHK improvements. The property has been developed since the 1940's in airport associated uses. The property to be acquired is presently in agricultural uses, primarily row crops, including soybeans.

There is presently only a minimal amount of wildlife habitat on the airport property but it is likely that wildlife would use the Eureka Valley Tributary as a travel corridor and the adjacent cropland as a food source. The woodlands of Fort Riley are located just east of the airport property and provide suitable habitat for a variety of wildlife. A wildlife management plan is in place for Fort Riley.

Two of the Build Alternatives, the Enclose EVT and Relocate EVT Alternatives, require a small area of the narrow band of trees along the EVT to be removed for drainage improvements and/or on site stormwater detention requirements. The following paragraphs describe the impacts to the trees along the EVT.

The Enclose EVT Alternative would provide for up to 75 acres of offline detention ponds along the EVT between Runways 13 and 21. The construction of the detention areas would remove all the existing trees along the EVT. Replacement trees could be planted adjacent and within some areas of the detention basins, however, based on the age class of many of the trees, it would take a number of years until the forested corridor would be back to its present level of diversity.

The Relocate EVT Alternative would require the removal of the vegetation along the existing EVT for approximately 1,260 feet. The relocated channel would be approximately 2,660 feet long, about one third of which would be within the Runway Protection Zone (RPZ) 20:1 Visual Approach Surface. It is not anticipated that this 910 feet (length within the RPZ) would be replanted with trees. It appears that a net increase in riparian corridor habitat of nearly 500 feet in length would be achieved with this alternative.

There is presently only a minimal amount of wildlife habitat on the airport property but it is likely that wildlife would use the Eureka Valley Tributary as a travel corridor and the adjacent cropland as a food source. The woodlands of Fort Riley are located just east of the airport property and provide suitable habitat for a variety of wildlife. A wildlife management plan is in place for Fort Riley.

4.6.2 Threatened and Endangered Species

Based on correspondence with U.S. Department of Interior, Fish and Wildlife Service and the Kansas Department of Wildlife and Parks (KDWP) as well as a field visit, it is concluded that no threatened or endangered species or designated critical habitat are present within the Study Area. It is noted that the nearby Kansas River riparian corridor[16] is designated critical habitat for the bald eagle, least tern, piping plover, silver chub, sturgeon chub, and the Topeka shiner. However, none of the Alternatives include any construction activities within or adjacent to the Kansas River. Therefore, neither the Build Alternatives nor the No Action Alternative will likely jeopardize a species' continued existence or destroy or adversely affect a species' critical habitat.

[16]The riparian corridor includes the river, the sandbars and adjacent woodlands within 300 feet of the ordinary highwater mark of the river.

4.6.3 Invasive Species

Executive Order 13112 directs Federal agencies to prevent the introduction of invasive species. Invasive species are defined as alien species whose introduction does or is likely to cause economic or environmental harm to human health. Re-vegetation for the Build Alternatives will be limited to the use of plant species indigenous to Kansas and the Manhattan area and therefore will not introduce invasive species. Standard specifications for seed mix will be utilized to minimize potential for the introduction of invasive species.

4.7 HAZARDOUS MATERIALS, POLLUTION PREVENTION, AND SOLID WASTE

This section includes information regarding the potential to generate, disturb or dispose of hazardous materials, and the potential to generate or dispose of additional solid waste.

4.7.1 Hazardous Materials

The potential to disturb or dispose of hazardous materials as a result of the implementation of the Build and No Action Alternatives was assessed.

None of the hazardous waste sites identified in Chapter 3 are within the areas to be disturbed by construction. Therefore, none of the Alternatives would impact any know hazardous materials.

4.7.2 Solid Waste

The No Action Alternative would not generate additional solid waste. None of the Build Alternatives would be expected to affect solid waste collection, control or disposal, other than that associated with the construction itself. Solid waste would be collected and disposed of at approved solid waste landfills by a contracted solid waste disposal firm. Construction activities will employ a similar firm for disposal of the construction debris. Therefore, none of the Build Alternatives is expected to result in solid waste impacts

4.8 HISTORICAL, ARCHITECTURAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

Archaeological and historic architectural resources that will be affected by Federally funded and licensed undertakings come under the protection of the National Historic Preservation Act.[17] Section 106 of this Act requires Federal agencies to consider the effects of such undertakings on properties listed, or eligible for listing, on the National Register of Historic Places (NRHP). An adverse effect is considered to be one that directly or indirectly diminishes the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.[18]

Three properties within the APE were identified as eligible for listing in the NRHP. The potential for the Alternatives to either directly or indirectly impact these properties was considered. None of the Alternatives would directly impact the three properties because none of the Alternatives would require the alteration, acquisition, or demolition of the three properties. Furthermore, none of the Alternatives would indirectly impact the three properties because all of these properties are well outside the 65 DNL contour for each Alternative. Therefore, no properties listed

[17] 16 USC 470.

[18] 36 CFR Part 800.

on or eligible to be listed on the NRHP would be affected by any of the Alternatives.

4.9 WATER QUALITY

Section 402 of the CWA established the National Pollutant Discharge Elimination System (NPDES) to limit pollutant discharges into streams, rivers, and bays. In Kansas, the Kansas Department Health and Environment administers the NPDES program. MHK operates under the City of Manhattan's Kansas Water Pollution Control General MS4 Permit, Permit No. M-KS38-SN01. The Manhattan Stormwater Management Program is the basis for the permit. It is noted that the permit does not identify the need for specific Total Maximum Daily Load (TMDL) best management practices for discharges into the EVT.

Stormwater runoff would increase as a result of the Build Alternatives. The impervious surface will increase by approximately 7.1 acres for the Enclose EVT and Relocate EVT Alternatives, 10.3 acres for the Shift Runway 3/21 400 feet Alternative, and 9.4 acres for the Shift Runway 3/21 200 feet Alternative. Drainage design for these Alternatives would be in accordance with the Manhattan Stormwater Management Program and FAA Advisory Circular 150/5320-5, Airport Drainage, to minimize the amount of runoff and significantly eliminate the erosion and turbidity increases in the vicinity of MHK.

Stormwater runoff from construction activities is also regulated. Projects which disturb more than one acre of land must be authorized under the construction stormwater general permit S-MCST-0110-1. Therefore, for construction of any of the Build Alternatives, a Notice of Intent (NOI) must be submitted to the KDHE.

Because there is also the potential to place fill in the EVT, which is a waters of the US, a Section 404 permit may be required. The Section 404 permit would be required for the Relocate the EVT and the Enclose the EVT Alternatives. The fill at or below the OHWM would be associated with filling in the abandoned portions of the EVT, after the new alignment is constructed as well as the alternative that would enclose the EVT in a culvert. This would be approximately 920 feet of the EVT for the Relocate the EVT Alternative and 1200 feet of the EVT for the with the Enclose the EVT Alternative.

4.9.1 No Action Alternative

There would be no impacts to water quality as a result of the No Action Alternative.

4.9.2 Build Alternatives

All of the Build Alternatives would increase the amount of stormwater runoff. Two of the Build Alternatives, Enclose the EVT and Relocate the EVT, would require placing fill in the EVT. Provided stormwater design is consistent with the Manhattan Stormwater Management Program, a 404 permit is obtained, and a NOI is filed, none of the Build Alternatives would be expected to impact water quality.

4.10 WETLANDS

Wetlands include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, river overflows, mud flats, and natural ponds. Executive Order 11990, "Protection of Wetlands," compels federal agencies to avoid, to the extent possible, adverse impacts associated with the destruction or modification of wetlands, and to avoid direct or indirect new construction on wetlands.

As discussed in Chapter 3, no jurisdictional wetlands were identified within the limits of construction areas for any of the Alternatives. Therefore, none of the Alternatives would affect wetlands.

4.11 FLOODPLAINS AND FLOODWAYS

In evaluation of potential impacts to floodplains in the Study Area, consideration is given to four issues: (1) increased flooding risks; (2) impacts on existing natural and beneficial floodplain values; (3) support of probable floodplain development; and (4) possible measures to minimize impacts and restore the existing floodplain values.

- *Increased Flooding Risks* – The proposed Runway 13 extension in the Build Alternatives would be above the elevation of the 100-year frequency event, based on studies prepared by FEMA. Flow in the floodplain is shallow, with low velocities. Consequently, the risk of flooding to users of the runway extension and the potential for property loss and hazard to life are minimal.

- *Impacts on Natural and Beneficial Floodplain Values* – The proposed Runway 13 extension and associated grading in the Build Alternatives would encroach into the floodplain, resulting in the loss of some benefits, mainly a minor portion of the floodplain's ability to store floodwater. The footprint of the Build Alternatives embankment is minimal when compared to the total floodplain surface area. The Shift Runway 3/21 Alternative (200 foot option only) requires some grading and fill within the limits of the floodplain. Similar to the Runway 13 extension, there is a minor impact that would occur through loss of a minimal portion of floodplain storage; this would have an insignificant and immeasurable impact upon peak flow discharges. There would also be some impact to the ability of the floodplain to convey flows. Because of the existence of a FEMA floodway and the proximity of flood prone structures, this impact would need to be mitigated to a "no-rise" through the addition of compensatory flow area, which most likely would be accomplished through excavation of the floodplain overbank area between the channel and the edge of the new fill area. This additional flow area would be constructed above the elevation of the ordinary high water in the channel, and would only convey water when the channel's capacity is exceeded. For the Enclose EVT Alternative, upstream detention storage will be provided, which would more than compensate for loss of floodplain storage at the runway crossing location. For the Relocate EVT Alternative, the relocated channel will include significant flow area in excavated overflow areas adjacent to a main channel sized to match the existing channel, and actual loss of floodplain storage will be minimal. The Relocate EVT Alternative would avoid the reconstruction of the levees adjacent to the existing channel; if replaced at all, these levees would be located outside of the overflow areas and would result in a more desirable connection between the stream and the adjacent floodplain. Consequently, the adverse impacts on existing natural and beneficial floodplain values would not be notable.

- *Support of Probable Incompatible Floodplain Development* – Incompatible floodplain development is not anticipated as resulting from the Proposed Action. The floodplain and regulatory floodway for the EVT would

continue to cover a large area and would remain unchanged for the Build Alternatives. The existing City of Manhattan floodplain ordinance will help safeguard the area from floodplain development.

- *Measures to Minimize Floodplain Impacts and Measures to Restore and Preserve the Natural and Beneficial Floodplain Values* – Floodplain impacts would be minimized by following standard design criteria. Runway, embankment and drainage structure design would be consistent with local, state and federal water resources and floodplain management programs. All practical measures to minimize harm to the floodplains would be incorporated into the design of the Build Alternatives. Although construction would be required in some floodplain areas, impacts to base flood elevations would be in compliance with National Flood Insurance Program (NFIP) regulations.

4.11.1 No Action Alternative

The No Action Alternative has no impact upon the floodplain or regulatory floodway of the EVT, nor on the breakout area for flow from the EVT to Eureka Creek. No construction in the floodplain is involved in this alternative.

4.11.2 Build Alternatives

The Build Alternatives physically impact the EVT floodplain because all of the Build Alternatives include the extension of Runway 13. The extension of Runway 13 involves placing fill in the 100-year and 500-year floodplains, but would not result in any fill being placed within the regulatory floodway, and therefore would not require a no-rise permit.

The Shift Runway 3/21 Alternative (200 foot option only), Enclose EVT Alternative, and the Relocate EVT Alternative involve placing additional fill in the floodplain/floodway. The Enclose EVT Alternative also includes enclosing a reach of the channel in a multiple cell reinforced concrete box culvert (RCB). However, these Build Alternatives for the main runway would be designed in accordance with FEMA and local regulations concerning impacts to floodplains and existing structures, and would, prior to construction, require no-rise certification to the local authorities (City of Manhattan, and Riley County) with floodplain ordinances.

The Enclose EVT Alternative and the Relocate EVT Alternative provide opportunities to incorporate measures to restore existing floodplain values, the former through its use of offline storage areas, and the latter by means of a new, longer channel that will have the direct connection with its adjacent floodplain that is presently denied because of the presence of the continuous levees along both sides of the channel.

4.11.3 Summary

All of the Build Alternatives incorporate placing fill within the floodplain and/or floodway of the EVT. However, the alternatives would be designed in accordance with FEMA and local regulations. They involve only minimal increases in flooding risks, and would not result in notable adverse impacts to natural and beneficial floodplain values. The Build Alternatives are not anticipated to support probable incompatible floodplain development, and would be designed with the appropriate measures to minimize floodplain impacts.

4.12 FARMLANDS

There are agricultural activities on the MHK that provide income for the Airport from what would ordinarily be unused or undeveloped property. This multiple use activity would likely continue after the construction of the proposed improvements has been completed.

Land beyond the Airport boundary is to be acquired as part of the alternatives. Much of that property is presently being farmed. It should be noted, however, that the amount of property acquired, and farmland converted is miniscule in comparison to the amount of land farmed in Riley County, Kansas. In 2002, there were just over 222,000 acres of farmland in Riley County, 48 percent being used as cropland and 45 percent being used as pasture.

Farmland would be converted to non-agricultural use as a result of all of the Build Alternatives. The amount of farmland converted would vary by the Build Alternative; approximately 155 acres for the Enclose EVT Alternative, 130 acres for the Relocate EVT Alternative, and 174 and 146 acres for the Shift Runway 3/21 Alternative by 400 feet and 200 feet respectively. All of the farmland that would be converted to non-agricultural use is considered prime or important farmland. Therefore, a Farmland Conversion Impact Rating form was submitted to the NRCS for their completion (See *Appendix I*). Preliminary consultation indicates that the total score will be lower than 160 for all of the Build Alternatives. Therefore, no additional analysis of farmland impacts is required.

4.13 LIGHT EMISSIONS AND VISUAL IMPACTS

This impact category considers potential impacts due to light emissions and visual impacts associated the Build Alternatives and the No Action Alternative per FAA Order 1050.1E.

4.13.1 Light Emissions

Potential light emission impacts to residences and 4(f) properties should be considered in a NEPA document. However, according to FAA Order 1050.1E, adverse impacts on residential or other sensitive land uses are unlikely due to the relatively low levels of intensity compared to background levels of existing airport lighting.

All of the Build Alternatives would include changes to the current Airport lighting. Additional runway and taxiway lighting would be installed to light the extension to Runway 13 and the associated parallel taxiway. In addition the existing Visual Approach Slope Indicator (VASI) would be relocated and new Runway End Identifier Lights (REILs) would be installed on the Runway 13 end. The potential for these lighting changes to create annoyance to interfere with normal activities would be minimal because there are very few residences in the vicinity of Runway 13 and all the residences to remain are on the other side of Eureka Drive. Additionally, the type and location of the lighting for this runway reduces the potential for annoyance. The Runway 13/31 runway lights are of medium intensity and the VASI lights are aimed above the residences. The REILs are high intensity strobe type flashing white lights that can be baffled and adjusted to prevent annoyance.

Both Shift Runway 3/21 Alternatives would also change the current lighting by adding runway/taxiway lighting, relocating the VASI, and shifting the MALSR. Although this would result in the lighting being closer to a residential community to the southwest of the Airport, the residences would be

shielded by the terrain between the Airport and the residences. Therefore, none of the Alternative would be expected to result in annoyance to residents which would interfere with their normal activities.

Visual Impacts

Airport improvement activities involving potential disruption of the natural environment or aesthetic integrity of the area or any activities that may affect sensitive locations such as parks, historic sites, or other public use areas are relevant visually. There would be minimal potential for the Build Alternatives to result in objectionable visual contrast with the existing environment because the development is consistent with the future land use as shown in the Manhattan Urban Area Comprehensive Plan.

4.14 NATURAL RESOURCES AND ENERGY SUPPLY

Environmental assessment documentation should consider the Proposed Action's potential to change demands on stationary facilities and on the use of natural resources other than for fuel. For most airport actions, changes in energy or other natural resource consumption will not result in significant impacts.

Aircraft operational activity is expected to experience normal growth with or without the changes suggested by the Build Alternatives. Extended runways and taxiways will mean more lighting, which will increase the energy being used by the airport. The power required to operate these facilities is negligible relative to the amount of power available to the City of Manhattan and Fort Riley.

No unusual materials or those in short supply are to be used as a result of the construction of the Build Alternatives; therefore, no further analysis of natural resources and energy supply is necessary.

4.15 CONSTRUCTION IMPACTS

Construction of the Build Alternatives may create some unavoidable temporary impacts to surrounding communities such as noise, fugitive dust, and degraded water quality. Most of these impacts can be mitigated using proper construction techniques, many of which are regulated. The Build Alternatives would be constructed in accordance with the applicable state and local ordinances and regulations, and FAA advisory Circular 150/5370-10B, Standards for Specifying Construction of Airports, Item P-156, Temporary Air and Water Pollution, Soil Erosion, and Siltation Control.

The following presents a summary of the impacts that may be expected to result from typical activities associated with the construction of runways and taxiways:

- Increased noise from construction operations,
- Temporary increase in air pollutant emissions,
- Temporary increase in water turbidity; and
- Disposal and management of soil and hazardous wastes.

4.15.1 Noise

Grading and scraping operations are among the noisiest construction activities, with equipment generating noise levels as high as 70 to 95 dB within 50 feet of their operations. However, distance would rapidly attenuate noise levels so area

residences would experience only a slight increase in ambient background conditions.

4.15.2 Air Quality

Fugitive dust pollution from excavated areas and construction equipment emissions can result in temporary impacts to ambient air quality. In terms of fugitive dust, Best Management Practice (BMP) methods would minimize air quality impacts by treating excavated areas with water and covering graded areas with fast-growing grasses. No further analysis of fugitive dust is required. Because MHK is in an attainment area, construction equipment emissions do not need to be quantified.

4.15.3 Water Quality

The Build Alternatives would disturb one acre or more of soil, and therefore, the Airport is required to file a NOI with the KDHE. A Stormwater Pollution Prevention Plan (SW3P) for construction activities would be prepared in conjunction with the NOI. BMPs would be included in the SW3P to minimize the level of temporary water quality impacts from the construction of the Build Alternatives. Potential BMPs would include the use of siltation screens and hay bales to trap construction sediment.

4.15.4 Solid and Hazardous Waste

Solid and hazardous waste, including debris generated by construction activities, would be collected and disposed of at an approved facility as mandated by the county, state, and Federal requirements.

In the event that previously unknown contaminants are discovered during construction, or that a spill occurs during construction, work would necessarily stop in that area until the National Response Center is notified.

4.16 COASTAL RESOURCES

The Coastal Zone Management Act (CZMA) of 1972 insures effective management, beneficial use, protection and development of the coastal zone. Coastal Zone Management Programs, prepared by states according to guidelines issued by the National Oceanic and Atmospheric Administration (NOAA), are designed to address issues affecting coastal areas.

The Coastal Barriers Resources Act of 1982 prohibits federal financing for development within the Coastal Barrier Resources System, which consists of undeveloped coastal barriers along the Atlantic and Gulf Coast. The legislation was amended by the Coastal Barrier Improvement Act in 1990 to include undeveloped coastal barriers along the shores of the Great Lakes, including Lake Superior in St. Louis County.

Kansas, as a landlocked state, does not contain any coastal zones, and is not within any coastal barrier as defined by the federal government. Therefore no further analysis is required.

4.17 WILD AND SCENIC RIVERS

The Wild and Scenic Rivers Act[19] provides for the protection and preservation of rivers which are free-flowing and have "outstandingly remarkable scenic, recreational, geological, fish and wildlife, historic, cultural, and other similar values." Wild rivers are those that exist in a free-flowing state with excellent water quality and with adjacent lands that are largely undeveloped (i.e., adjacent lands still present an overall natural character, but in places that may have been developed for agricultural, residential, or other uses).

[19] PL 90-542, as amended.

Recreational rivers are those rivers that may have undergone some impoundment or diversion in the past and that may have adjacent lands which are considerably developed, but that are still capable of being managed so as to further the purposes of the Wild and Scenic Rivers Act.

There are no Wild and Scenic rivers in the Study Area. Therefore, there would be no impacts to these resources and no further analysis is required.

4.18 SECONDRY (INDUCED) IMPACTS

The Build Alternatives were evaluated for its potential to impose secondary effects on the surrounding communities as a result of airport development. This includes any shifts in patterns of population movement and growth, the demand for public services, and changes in business and economic activity that are influenced by airport development.

According to Order 1050.1E secondary impacts would not normally be significant except where there is also a significant impact to another category particularly noise, compatible land use, or social impact. Since none of the Build Alternatives would result in impacts exceeding the threshold of significance in any impact category, secondary impacts would not be expected.

4.19 CUMULATIVE IMPACTS

Cumulative impacts occurring as a result of any of the Build Alternatives were considered. This section defines cumulative impacts, identifies potential cumulative impact categories, and presents the analysis of these categories.

The concept of cumulative impacts addresses the potential for individually minor but collectively significant impacts to occur over time. CEQ Regulations, Section 1508.7, define Cumulative Impacts as the incremental impact of the action when added to the past, present, and reasonably foreseeable future actions regardless of the agency (federal or non-federal) undertaking such actions.

Cumulative impacts are evaluated by considering the projects recently completed, underway and foreseeable in and around MHK, including the proposed widening and realignment of K-18, and projects at Fort Riley resulting from Base Realignment and Closure (BRAC) process.

4.19.1 Recently Completed

Recent projects have been of the airfield lighting, and maintenance and rehabilitation type resulting in temporary construction impacts but no permanent environmental impact.

4.19.2 Underway

Projects that are currently approved and/or are underway at MHK are:

- Installation of Airfield fencing,
- Fort Riley BRAC projects, and
- Construction of Fort Riley Deployment Facility and Ramp Expansion.

The FAA's list of categorically excluded action includes minor development items such as fencing.20 According to FAA Order 1050.1E paragraph 303a, categorical exclusions represent actions that the FAA has found, based on past experience with similar actions, do not normally require an

[20] FAA Order 1050.1E, paragraph 310f

EA or EIS because they do not individually or cumulatively have a significant effect on the human environment, with the exception of extraordinary circumstances.

All current Fort Riley BRAC projects are being constructed within the military reservation and therefore would unlikely result in significant cumulative impacts.

The potential for the combined impacts of the Fort Riley Deployment Facility Construction and Ramp Expansion, and the Build Alternatives to result in a significant impact was considered.

The Fort Riley Deployment Facility and Ramp Expansion would include the expansion of the existing ramp for loading or unloading aircraft at MHK, and would create new facilities to support Fort Riley air deployments at the airport. New facilities could include a Command and Control building, a parking lot and staging area for buses and soldiers, an access road and a "guard shack" to control access to the proposed new facilities. Other new facilities could include an additional enlargement of the existing ramp, aviation fuel storage facilities, deicing facilities, road improvements to link Fort Riley directly to MHK, and a staging area for ordnance. According to the EA completed for the Fort Riley Deployment Facility Construction and Ramp Expansion the project would result in adverse impacts to the noise, soil and water, airspace, soil and water, fauna, air quality, and aspects of the health and safety environment All of the adverse impacts would be below the threshold of significance.

According to the analysis in this chapter, none of the Build Alternatives would impact the following environmental categories; coastal resources; compatible land use; Department of Transportation Act: Section 4(f) properties; fish, wildlife and plants; historical, architectural, archaeological, and cultural resources; hazardous materials and solid waste, light emissions and visual impacts; natural resources and energy supply; secondary impacts; socioeconomic impacts and environmental justice, wetlands; and wild and scenic rivers. Therefore, cumulative impacts associated with these impact categories are not anticipated. Each of the Alternatives may result in air, floodplain, farmland, noise, water quality, and temporary construction impacts. Impacts to floodplains and waters of the US due to the Alternatives would be mitigated.

It is not likely that the impacts from the Fort Riley Deployment Facility Construction and Ramp Expansion when combined with the impacts form any of the Build Alternatives would result in a significant impact because:

- The operational forecast developed for this EA includes the additional military operations associated with the Fort Riley Deployment Facility and Ramp.

- Construction of the projects would take place at different times; the Fort Riley project is anticipated to be constructed in 2007. The City of Manhattan Capital Improvement Program shows that construction of the Build Alternative improvements would not begin until 2008.

- The Fort Riley Deployment Facility and Ramp are not located in the floodplain nor do they impact the EVT.

- The amount of farmland to be converted to non-agricultural use as a result of the Fort Riley Deployment Facility and Ramp construction was included in the acreage to be converted for the Sponsor's Preferred Alternative.

- Drainage design for the Fort Riley Deployment Facility and Ramp would be in accordance with the Manhattan Stormwater Management Program and FAA Advisory Circular 150/5320-5, *Airport Drainage*, to minimize the amount of runoff and significantly eliminate the erosion and turbidity increases in the vicinity of MHK.

4.19.3 Foreseeable Future

Table 4.1 identifies Airport, Fort Riley and other relevant projects along with their potential for cumulative impact. All of these projects would require NEPA review including assessment of potential cumulative environmental impacts prior to implementation. Furthermore, proposed K-18 widening and realignment has not been sufficiently defined to determine its associated environmental impacts. Likewise, planning studies are still being completed for transportation and utility improvements for Fort Riley to accommodate the Base Realignment and Closure (BRAC).

4.20 OTHER CONSIDERATIONS

Other considerations include consistency of the alternatives with State and local plans, and the potential for the action to be controversial on environmental grounds.

All of the Build Alternatives are consistent with the local land use plans/development patterns identified in the Manhattan Urban Area Comprehensive Plan. However, the Enclose EVT Alternative and the Relocate the EVT Alternative may result in potential conflicts with the recommendations from the Eureka Valley Tributary Feasibility Study. Coordination with the USACE indicated that the recommendations of the Feasibility Study may not be compatible with the alternatives to enclose or relocate the EVT in the vicinity of the Airport. Therefore, the City has identified the shift Runway 3/21 by 400 feet to the southwest as its Preferred Alternative.

Interaction with the public indicates it is unlikely that the Sponsor's Preferred Alternative would be controversial on environmental grounds. A joint City commission working session and public/agency scoping meeting was held in the Manhattan City Hall on the evening of November 22, 2005. No members of the general public attended the meeting.

Table 4.1

Potential Cumulative Impacts for Programmed and Reasonably Foreseeable Projects

Description	Anticipated Environmental Issues that Could be Cumulative	Primary Impact Location
Airport Projects		
Land Acquisition for Runway 21 RPZ (2007)	6	Parcels Outside of Airport Property within the Runway 21 RPZ
Install Edge Drains for Taxiway A (2009)	2,4	Airport Property
Extend and Widen Taxiway A and Connecting Taxiway (2010)	1,2,4	Airport Property
Expand Terminal Parking Lot (2010)	1, 2, 4	Airport Property
Land Acquisition for Runway 3 Approach (2010)	6	Parcels Outside of Airport Property within the Runway 3 Approach
Construct Transient Aircraft Hangar (2011)	1, 2, 4	Airport Property
Construct Airport Perimeter Road (2012)	1,2,4	Airport Property
Fort Riley Projects		
Base Realignment and Closure (BRAC) Projects	1,2,3,4,5,6	Fort Riley
Other Projects		
Widening and realignment of K-18	1,2,3,4,5,6	Not defined because alignment of K-18 has not been determined.

Issues:

1 = Air	4 = Water (Wetland, Floodplain, etc.)
2 = Construction Impacts	5 = Noise
3 = Farmland	6 = Socioeconomic

Sources: City of Manhattan Capital Improvement Program, HNTB Analysis.

Chapter Five
Public and Agency Involvement

Public and agency involvement meetings are conducted to ensure that information is provided to the general public and public agencies. The following sections discuss the consultation with the public, interested parties, and public agencies completed to fulfill the requirements of the NEPA process.

5.1 PUBLIC AND AGENCY SCOPING

The following agencies were contacted as part of the scoping effort for this EA:

- Fort Riley, Environmental Division,
- Kansas Department of Health and Environment,
- Kansas Department of Transportation, Docking State Office Building,
- Kansas Department of Wildlife and Parks, Environmental Services – Pratt Operations Office,
- Kansas State Board of Agriculture, Division of Water Resources,
- Kansas State Historical Society, Cultural Resources Division,
- Riley County Planning and Development,
- United States Department of Agriculture, Kansas Natural Resources Conservation Service,
- United States Department of Interior, Fish and Wildlife Service, Kansas State Office,
- United States Environmental Protection Agency, Region 7,
- City of Manhattan, Public Works,
- Kansas Division of Emergency Management, Mitigation/Planning,
- United States Department of the Army, Kansas City District – Corps of Engineers, and
- Riley County Public Works Department.

Each of the aforementioned agencies was sent a scoping letter on November 1, 2005, which requested comments and their attendance at a public and agency scoping meeting, described the Proposed Project, and depicted the Study Area. Ten responses have been received from the agencies. A copy of the scoping letter sent to the agencies and responses from the agencies are provided in *Appendix I*.

In addition to scoping letters, a joint City commission working session and public/agency scoping meeting was held in the City Commission Room at City Hall on the evening of November 22, 2005. Notice of the meeting was given in the Manhattan Mercury on November 6, 2005. The meeting was attended by members of the City Commission, including Ed Klimek, Mayor, Bruce Snead, Mayor Pro Tem, Tom Phillips, City Commissioner, Mark Hatesohl, City Commissioner, and Jayme Morris-Hardeman, City Commissioner. The meeting began with a PowerPoint presentation which explained the NEPA process, identified the proposed projects,

listed potential alternatives, described the affected environment, and identified resource categories likely to be affected by the Proposed Action. The Airport Layout Plan Process was also described. The presentation was followed by a question and answer session and a request for comments.

Questions/concerns that were addressed at the meeting include:

- Flooding problems at the Airport and how they will be considered and addressed;
- The military ramp expansion project and associated land acquisition; and
- Noise impacts with the changing land use and the consideration of military noise impacts;

No comments were received from members of the City Commission.

5.2 OTHER AGENCY COORDINATION

Additional agency coordination was conducted with Fort Riley representatives and the USACE. Due to the proximity of Fort Riley and the number of military operations at MHK, a project coordination meeting was held with Fort Riley representatives. The meeting included a discussion of the Proposed Action for MHK and upcoming projects at Fort Riley. Notes and a list of attendees for this meeting are included in *Appendix I*.

Two project coordination meetings were held with the USACE because of the potential for the Proposed Action to impact the EVT and conflict with recommendations from the USACE Feasibility Study. The meetings were held on February 14th, 2005 and June 21st, 2006. Notes and a list of attendees for these meetings are included in *Appendix I*.

5.3 PUBLIC HEARING

A public hearing will be scheduled after the release of the Draft EA. The purpose of this hearing is to offer the public an opportunity to comment on the Draft EA concerning economic, social, and environmental effects of the proposed project. Transcripts of the public hearing and any comments received will be provided in *Appendix I*.

5.4 COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT

Copies of the Draft EA will be sent to the following agencies and interested parties for their review and comment:

- Fort Riley
- Kansas Department of Health and Environment
- Kansas Department of Transportation
- Kansas Department of Wildlife and Parks
- Kansas State Board of Agriculture
- Kansas State Historical Society
- Riley County Planning & Development
- United States Department of Agriculture
- United States Department of Interior
- United States Environmental Protection Agency
- Kansas Division of Emergency Management

- United States Army Corps of Engineers
- Riley County – Public Works Department

The Draft EA will also be made available for public review at the following location(s):

- Manhattan City Hall
- Manhattan Regional Airport
- Manhattan Public Library

All comments received on the Draft EA will be included and addressed in *Appendix J* of the Final EA.

Chapter Six
List of Preparers

Table 6.1

List of Preparers

Name	Education	Experience (Years)	Responsibility
HNTB Corporation			
Brian Tompkins	B.S. Civil Engineering	8	Project Manager, Alternatives
Lynette Heinaur	B.S. Civil Engineering	2	Alternatives
Dan VanPetten	Master of Urban Planning B.S. Forestry	31	Threatened & Endangered Species, Wetlands, Hazardous Materials, Water Quality, Farmland
Pete Jarchow	B.S. Civil Engineering	27	Floodplain Impacts
Mark Williams	B.S. Civil Engineering	14	Quality Control
Tim Flagler	Master of Landscape Architecture M.A. Fine Arts B.A. Fine Arts	21	Farmland, Wetlands
Barbara Kulvelis	B.S. Civil/ Environmental Engineering	22	Document Development, Purpose and Need, and Alternatives
Bryan Bielinski	B.S. Geography	7	GIS Analysis
Ashley Eckles	B.S. Environmental Policy and Planning	2	Noise Analysis and Document Development
Archaeological Research Center of St. Louis, Inc.			
Valerie Altizer	M.A. Anthropology B.A. Anthropology, Geology Minor	12	Phase II Archaeological and Architectural Survey, Principal Investigator
Joe Harl	M.A. Anthropology B.A. Anthropology	26	Phase II Archaeological and Architectural Survey
Janet Kneller	B.A. Anthropology	10	Phase II Archaeological and Architectural Survey
Meredith McLaughlin	B.A. Anthropology	5	Phase II Archaeological and Architectural Survey

Chapter Seven
List of Abbreviations, Acronyms and Glossary

7.1 LIST OF ABBREVIATIONS AND ACRONYMS

AC	Advisory Circular
ACBM	Asbestos-containing building materials
ACM	Asbestos containing materials
APE	Area of Potential Effect
AST	Aboveground storage tank
ASTM	American Society for Testing and Materials
ATCT	Airport Traffic Control Tower
BMP	Best Management Practices
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cm^2	square centimeters
CMSA	Consolidated Metropolitan Statistical Area
CO	Carbon Monoxide
CWA	Clean Water Act
CZMA	Coastal Zone Management Act of 1972
CZMP	Coastal Zone Management Program
dB	Decibel
DNL	Day-Night Average Sound Level
DOT	Department of Transportation
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Environmental Site Assessment
EVT	Eureka Valley Tributary
FAA	Federal Aviation Administration
FBO	Fixed Base Operator
FEMA	Federal Emergency Management Agency
FICON	Federal Interagency Committee on Noise
FIRM	Flood Insurance Rate Map
FPPA	Farmland Protection Policy Acts of 1980 and 1995
HUD	Housing and Urban Development

IHW	Industrial hazardous waste
LBP	Lead-based paint
LPST	Leaking petroleum storage tank
mg	milligrams
MHK	Manhattan Regional Airport
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969
NESHAP	National Emission Standard for Hazardous Air Pollutants
NO_2	Nitrogen Dioxide
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRHP	National Register of Historic Places
O_3	Ozone
O&M	Operations and maintenance
Part 77	14 Code of Federal Regulations Part 77
Pb	Lead
$PM_{2.5}$	Particulate Matter with a diameter of 2.5 microns or less
PM_{10}	Particulate Matter with a diameter of 10 microns or less
PVAS	Preliminary Visual Asbestos Screening
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Conditions
RPZ	Runway Protection Zone
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SOC	Species of concern
SW3P	Storm Water Pollution Prevention Plan
TAF	Terminal Area Forecast
TSS	Threshold Siting Surface
USACE	U.S. Army Corp of Engineers
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
UST	Underground Storage Tank
USGS	United States Geological Survey
VOC	Volatile Organic Compound

7.2 GLOSSARY OF TERMS

100-year Floodplain – lowland and flat areas adjoining waters that are subject to inundation by a flood having a one-percent or greater probability of being equaled or exceeded during any given year.

Air Carrier – Aircraft operating under certificates of public convenience and necessity issued by the FAA authorizing the performance of scheduled air transportation over specified routes and a limited amount of non-scheduled air transportation over specified routes and a limited amount of non-scheduled operations.

Air Traffic Control (ATC) – Division of the FAA responsible for the safe, orderly, and expeditious flow of air traffic in their transit or airspace and on the ground at towered airports.

Aircraft Operations – The airborne movement (landing or taking off) of aircraft. There are two types of operations – local and itinerant.

1. Local operations are performed by aircraft that:
    a. Operate in the local traffic pattern or within sight of the airport.
    b. Are known to be departing for, or arriving from, flight in local practice areas within a 20-mile radius of the airport.
    c. Execute simulated instrument approaches or low passes at the airport.

2. Itinerant operations are all aircraft operations other than local operations.

Aircraft Types – An arbitrary classification system which identifies and groups aircraft having similar operational characteristics for the purpose of computing runway and terminal area capacity.

Area of Potential Effect (APE) – the area where the Proposed Action may cause changes in the character or use of a historic resource.

Airport – An area of land or water that is used or intended to be used for the landing and takeoff of aircraft, including its buildings and facilities (FAR Part 1).

Attainment Area – any area that meets the national primary or secondary ambient air quality standard for a given pollutant.

Best Management Practices (BMPs) – Methods employed during construction and included in the development for ensuring environmental management to the greatest possible extent.

Biotic Communities – Fish, wildlife and ecologically sensitive resources, including rare, threatened and endangered species.

Criteria Pollutants – Six principal pollutants for which the U.S. Environmental Protection Agency has established National Ambient Air Quality Standards. The six criteria pollutants are

carbon monoxide, nitrogen dioxide, ozone, sulfur dioxide, lead, and particulate matter with a diameter of 10 microns or less (PM-10 and PM-2.5).

Day-Night Equivalent Sound Level (DNL or Ldn) – The average sound level over a 24-hour period with noise events occurring between the hours of 2200 and 0700 subject to a penalty of 10 decibels.

Decibel (dB) – A unit of noise level representing a relative quantity. This reference value is a sound pressure of 20 micronewtons per square meter.

Decision Height – the height from the ground to the lowest layer of clouds that obscure over half of the sky.

Environmental Site Assessment (ESA) – an assessment to identify recognized environmental conditions that indicate the presence or likely presence of any contamination on or affecting the Study Areas. Phase I ESAs include a description of the site, a records review, an historical review, site reconnaissance and interviews, and a summary of findings and conclusions.

Federal Aviation Regulations (FAR) – The procedures, standards, and methodology governing the development, submission, and review of the airport noise exposure maps and airport noise compatibility programs, including the process for evaluating and approving or disapproving those programs, required by the FAA to be eligible for Federal funds.

Fleet Mix – The proportion of aircraft types or models expected to operate at an airport.

Flight Track – the path along the ground followed by an aircraft in flight.

Floodplain - lowland and flat areas adjoining waters that are subject to a one percent or greater chance of flooding in any given year.

General Aviation (GA) – All civil aviation except commercial carriers.

General Permit – A set of conditions that can be standardized for a number of facilities; use of general permits where possible eliminates individualized permits for similar situations and is cheaper and less burdensome administratively than individual permits.

Hazardous Material – Specific substances listed by the EPA, and any other substance that is corrosive, ignitable, reactive or toxic.

Integrated Noise Model (INM) – A computer model developed and maintained by the FAA to predict the noise impacts generated by aircraft operations.

Land Use Compatibility – The ability of land uses surrounding the airport to co-exist with airport-related activities with minimum conflict.

Maintenance Area – any geographic area previously designated non-attainment pursuant the Clean Air Act Amendments of 1990 and subsequently re-designated as attainment.

National Ambient Air Quality Standards (NAAQS) – Standards established by the U.S. Environmental Protection Agency used for protecting and improving air quality.

Noise Contour – An outline graphically displayed on a plan or map identifying the limits of an area exposed to a specific sound level (example: 65 DNL dB noise contour).

Non-attainment Area – any area that does not meet the national primary or secondary ambient air quality standard for a given pollutant.

Operation – A landing or take-off by an aircraft.

Runway Protection Zone (RPZ) – The trapezoidal area at the end of a runway that must be acquired to afford a safety zone for aircraft landings and take-offs. The FAA requires that RPZs be a part of airport property.

Runway Object Free Area (ROFA) – An area on the ground centered on a runway centerline provided to enhance the safety of aircraft operations by having the area free of objects, except for objects that need to be locating the object free area for air navigation or aircraft ground maneuvering purposes.

Runway Safety Area (RSA) – A defined surface surrounding the runway prepared or suitable for reducing risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway.

State Implementation Plan (SIP) – a plan that must be developed by states for non-attainment areas that includes a variety of emission control measures that the state deems necessary to produce attainment of the applicable standard(s) in the future.

Study Area – the geographic area where the potential impacts of the alternatives retained for further study are analyzed.

Wetlands – those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar special aquatic habitats (33 CFR 328.3(c), 1996).

U.S. Department
of Transportation

**Federal Aviation
Administration**

Central Region
Iowa, Kansas,
Missouri, Nebraska

901 Locust
Kansas City, Missouri 64106
(816) 329-2600

March 1, 2007

Mr. Peter Van Kuren
Airport Director
City of Manhattan
5500 Fort Riley Blvd.
Suite 120
Manhattan, KS 66502

Dear Mr. Van Kuren:

Manhattan Regional Airport
Final Environmental Assessment
Finding of No Significant Impact

Enclosed please find the Finding of No Significant Impact/Record of Decision for the related EA (Environmental Assessment) for improvements identified on the Airport Layout Plan for the Manhattan Regional Airport, Manhattan, Kansas. These documents should be made available to the public via a notice in the appropriate newspaper(s). A copy of a suggested format for the notice is enclosed. Please send an affidavit/proof of publication to this office. A signed EA cover sheet is being provided to HNTB to be used for reproducing the final EA.

If you have any questions, please call me at (816) 329-2645.

Sincerely,

Mark H. Schenkelberg

Mark H. Schenkelberg, P.E.
Environmental Specialist

Cc: Ms. Barb Kulvelis, HNTB Corporation, 2900 S. Quincy St., Ste. 200, Arlington, VA 22206 (w/encls)

NOTICE OF AVAILABILITY

FEDERAL FINDING OF NO SIGNIFICANT IMPACT

For Proposed Development

[Name of Airport]

[City, State]

The Federal Aviation Administration has approved a Finding of No Significant Impact (FONSI) for the improvements identified at the ***[Name of Airport, City, State]***. The FONSI is being made available to the public pursuant to Part 1506 of the Council On Environmental Quality Regulations concerning implementation of the National Environmental Policy Act. Copies of the FONSI are located at: ***[Include the locations in the community where the FONSI can be viewed plus the Federal Aviation Administration, Airports Division, 901 Locust, Kansas City, Missouri 64106]***.

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
CENTRAL REGION

MANHATTAN REGIONAL AIRPORT
MANHATTAN, KANSAS

FINDING OF NO SIGNIFICANT IMPACT/RECORD OF DECISION

PROPOSED FEDERAL ACTION: ENVIRONMENTAL APPROVAL OF THE FOLLOWING PROPOSED ACTIONS AS DEPICTED ON THE ALP (AIRPORT LAYOUT PLAN) AND DESCRIBED IN DETAIL IN THE ENVIRONMENTAL ASSESSMENT:

1. Construct a standard RSA (Runway Safety Area) and ROFA (Runway Object Free Area) for the Runway 21 end by shifting Runway 3/21 to the southwest by 400 feet. The shifting of the runway will require the relocation of the Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) and possible relocation of the Glide Slope.
2. Extend Runway 13/31 by 1,199 feet to the northwest for a total length of 5,000 feet. Extension includes the acquisition of approximately 74 acres of land, installation of REIL (Runway End Identifier Lights) and relocation of the existing VASI (Visual Approach Slope Indicator).
3. Construct a full length parallel taxiway to Runway 13/31 by extending Taxiway E.
4. Protect the TVOR (Terminal Very High Frequency Omnirange) by acquiring approximately 53 acres of land.

PURPOSE AND NEED FOR PROJECT:

The sponsor's proposed actions addresses the following deficiencies at the Manhattan Regional Airport:

1. The RSA and ROFA for Runway 21 do not meet FAA criteria. The existing RSA and ROFA do not meet grading or clearance requirements within 1000 feet beyond the end of Runway 21 because of the localizer and the EVT (Eureka Valley Tributary). The localizer is located approximately 666 feet of the end of the runway and the EVT crosses the RSA approximately 850 off the end of the runway.
2. The crosswind runway, Runway 13/31, is not long enough to serve the commercial aircraft operating at the Manhattan Municipal Airport. The crosswind runway is to be extended to 5000 feet to meet the requirements of the design aircraft, the Saab 340.
3. There is not a full length parallel taxiway for Runway 13/31. A full length taxiway enhances safety.

4. The sponsor does not own the land needed to control the presence of objects in the area surrounding the TVOR. Structures must be placed at least 1,000 feet from the TVOR. The airport needs to acquire approximately 74 acres of land to meet this requirement.

The purpose of the proposed actions is to correct the non-standard conditions, provide a crosswind runway capable of serving the commercial fleet, enhance safety by providing a parallel taxiway and protect an existing navigational aid.

Alternatives Considered: The following alternatives, discussed in detail in the EA, were considered for the Runway 21 RSA:

- Off-site alternatives.
- Enclose EVT (Eureka Valley Tributary) with use of the Fort Riley Detention Basin.
- Enclose EVT with detention near the airport.
- Relocate EVT 500 feet outside the RSA.
- Displace runway threshold and use declared distances. This is considered the no action alternative.
- Shift Runway 3/21 to the Southwest.
- Install EMAS (Engineered Material Arresting System).

Off site alternatives including the use of other modes of transportation and the use of other airports do not meet the purpose and need of providing a standard safety area and were eliminated from further consideration.

Enclosing EVT with use of a Fort Riley Detention Basin was not considered a feasible alternative as Fort Riley personnel indicated that construction of a dam on their property is unlikely.

Enclosing EVT with detention near the airport met the purpose and need but was eliminated from consideration as USACE (United States Army Corps of Engineers) indicated that this alternative may not be compatible with EVT Feasibility Study that is to reduce the exposure of residential and commercial property to the flood threat from the EVT.

Relocating EVT 500 feet outside the RSA met the purpose and need but was eliminated for the same reason as enclosing EVT with detention on the airport.

Displace runway threshold and use declared distances results in a Landing Distance Available and Accelerate-Stop Distance Available of 6600 feet for Runway 3. This action is considered the no-action alternative and was further evaluated. This alternative limits the landing and distance available and shortens the accelerate-stop distance.

Shifting Runway 3/21 to the Southwest of either 200 feet or 400 feet and associated navaid relocations was considered feasible and prudent, met the purpose and need, and shifting the runway by 400 feet is the sponsors' preferred alternative. This alternative is also the environmentally preferred alternative as it eliminates potential conflicts with the EVT Feasibility study to reduce flooding and also moves residences located in the RPZ out of the RPZ. This alternative also moves noise further away from residential areas.

Installing EMAS must be considered per FAA Order 5200.8. This alternative meets the purpose and need. Costs of alternatives other than EMAS are less than 90% of EMAS. EMAS is not the best financially feasible alternative and lack sponsor support so this alternative was eliminated from consideration.

- Runway 13/31 alternatives. Extending Runway 31 was not considered feasible due to the location of a service road, the proximity of K-18 and the Union Pacific Railroad. Extending Runway 13 was considered feasible and is the sponsors' preferred alternative.

- Protect TVOR signal. Moving the TVOR was not considered feasible, as there is no other airport location with the available land. Acquiring property needed to protect the existing location is feasible and is the sponsors' preferred alternative.

- Construct a full length parallel taxiway for Runway 13/31. Without construction of a full length parallel taxiway, aircraft are required to back taxi, which is not a preferred operation. Putting the taxiway on the east side of the runway is preferred to the west side as a portion of the taxiway is already constructed.

An EA (Environmental Assessment), which examined all potential environmental impact categories has been prepared by the sponsor under guidance from the FAA (Federal Aviation Administration). After careful review of the EA, the FAA has determined that the proposal will have no significant environmental impacts and no further study is necessary.

FEDERAL ENVIRONMENTAL APPROVAL:

After careful and thorough consideration of the facts contained herein, the undersigned finds that the proposed Federal action is consistent with existing national environmental policies and objectives as set forth in Section 101(a) of the National Environmental Policy Act of 1969 (NEPA), and that it will not significantly affect the quality of the human environment or otherwise include any condition requiring consultation pursuant to Section 102(2)(c) of NEPA.

CONDITIONS:

Social Impacts: The acquisition of residences and farmland and relocation of the renter is required to conform with the URARPAPA (*Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970*).

Water Quality: The construction of the proposed action requires stormwater general permit S-MCST-0110-1. A Notice of Intent must be filed with the Kansas Department of Health and Environment.

Historical, Archaeological, Cultural Resources: Should construction activities expose unanticipated buried archaeological material, work must stop in that area and the Kansas State Historical Society and the FAA Central Region Airports Division must be notified immediately.

Construction: The project must be constructed in accordance with the applicable state and local ordinances and regulations, and FAA *Advisory Circular 150/5371-10, Standards for Specifying Construction of Airports, Item P-156, Temporary Air and Water Pollution, Soil Erosion and Siltation Control.*

DECISION AND ORDER:

This decision constitutes the Federal approval for the actions identified above and any subsequent actions approving a grant of federal funds for the project. This action is taken pursuant to 49 U.S.C. Subtitle VII, Parts A and B, and constitutes a final order of the Administrator subject to review by the Courts of Appeals of the United States in accordance with the provisions of 49 U.S.C. 46110.

RIGHT OF APPEAL:

Any party to this proceeding having a substantial interest may appeal the order to the Courts of Appeals of the United States upon petition filed within 60 days after entry of this order.

APPROVED: _____ 3/1/07
Manager, Airports Division Date

DISAPPROVED: _____ _____
Manager, Airports Division Date