Flagstaff County
Flagstaff Regional Airport
Fuel System Conditional Assessment

Phase I Condition Assessment Report

2025-03-03

CA0048111.3572

FLAGSTAFF REGIONAL AIRPORT

FUEL SYSTEM CONDITION ASSESSMENT (FINAL)

FLAGSTAFF COUNTY

FINAL

CLICK HERE TO ENTER TEXT.

PROJECT NO.: CA0048111.3572
DATE: FEBRUARY 2025

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February 28, 2025

Johnathan Dahl
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Flagstaff, AB

Dear Johnathan:

Subject: **FLASGTAFF REGIONAL AIRPORT**
Fuel System Condition Assessment (FINAL)

Please find attached the FINAL Technical Investigation Report for your use.

If you have any questions, please feel free to contact the undersigned.

Yours sincerely,
WSP Canada Inc.

Maria-Jose Garces
Senior Project Manager, Aviation

: MJG/djc
Cliquez ici pour taper du texte.
WSP ref.: CA0048111.3572

SIGNATURES

PREPARED BY

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TABLE OF CONTENTS

IMAGES

1 INTRODUCTION AND BACKGROUND INFORMATION

1.1 PROJECT GOALS

WSP Canada Inc was engaged by Flagstaff County to investigate the existing Flagstaff Regional Airport Aircraft Fueling Station.

The Flagstaff Regional Airport is situated between Killam and Sedgewick in Alberta, Canada. It is owned by Flagstaff County and operated with the assistance of the Iron Creek Flying Club. Here are some key details regarding the Aerodrome:

- **Location**: 44271 Rge Rd 131, Flagstaff County, Alberta.
- **Coordinates**: 52°47′44″N 111°45′38″W.
- **Elevation**: 2,182 feet above sea level.
- **Runway**: The airport has a single asphalt runway (12/30) that is 2,952 feet long and 75 feet wide.
- **Facilities**: The airport offers a 24-hour cardlock fuel system and has a small terminal building with a pilot lounge and washrooms.
- **Communications**: It features an Aircraft Radio Control of Aerodrome Lighting (ARCAL) system, activated by five clicks on 123.2 MHz.
- **Additional Services**: The airport also provides leased land for aircraft hangars.

It has come to the County's attention that the cardlock fueling system is not in compliance with the **CSA B836-14 – Storage, Handlings, and Dispensing of Aviation Fuels** standard and as result, the County has ceased fuel sales at the Aerodrome.

The County is looking for a report on the condition of their fuel system which highlights any code compliance issues and identifies the scope of work that is required to reinstate fuel sales at the airport.

In completing this investigation, the initial Phase was split into several Tasks. These include:

PHASE 1: Visual condition assessment and code compliance review

This phase will aim to evaluate the current condition of the system and identify potential areas of concern and provide recommendations for the scope of work to ensure compliance with industry standards.

For **PHASE 1**, WSP will provide the following services to Flagstaff County:

Task 1: Conduct a visual condition assessment of the fueling system of the following:

- Tank
- Piping and associated components
- Valves and connections
- Pumps and dispensing systems
- Monitoring and control equipment
- Slab
- Drainage

The assessment will focus on identifying any signs of corrosion, leaks, wear or other defects or issues that may impact the integrity, operation or compliance of the system. Photographs will be provided for reference.

Task 2: Evaluation of existing conditions

- WSP will conduct a desktop review with industry standards and regulations including evaluating compliance with safety regulations and potential risks that could affect operational safety or lead to failure.

Task 3: Recommendations and Scope of Work

- Based on findings from the visual condition assessment and compliance review, WSP will develop a recommendation for upgrades and prioritization if required.
- WSP will prepare a Class D estimate of the recommended scope of work.

1.2 REFERENCE CODES AND STANDARDS

The codes and standards utilized during this investigation included:

- **Canadian Aviation Regulations (CARs)**: These regulations, particularly Part III (Aerodromes, Airports, and Heliports) and Part VI (General Operating and Flight Rules), provide comprehensive guidelines for the operation and management of aerodromes, including aircraft refuelling procedures.
- **Transport Canada Advisory Circular AC 300-012**: This advisory circular provides additional guidance on the application of the CSA B836-14 standard.
- **Canadian Standards Association (CSA) B836-14 – Storage, Handlings, and Dispending of Aviation Fuels at Aerodromes**: This standard specifically addresses the storage, handling, and dispensing of aviation fuels at aerodromes. It outlines the necessary safety measures and operational practices to prevent accidents and ensure the safe handling of aviation fuels.
- **National Fire Code – 2023 Alberta Edition:** The National Fire Code – 2023 Alberta Edition (NFC(AE)) is crucial for aircraft refuelling operations as it sets fire safety standards for the storage and handling of flammable and combustible liquids. It ensures that refuelling areas are designed and maintained to prevent fire hazards, including proper ventilation and spill containment. The code also mandates emergency response plans and fire protection equipment to handle potential incidents.
- **National Building Code – 2023 Alberta Edition:** The National Building Code – 2023 Alberta Edition (NBC(AE)) indirectly supports aircraft refuelling operations by setting standards for infrastructure design, fire safety, hazardous materials handling, and emergency response. The code's fire safety and hazardous materials guidelines help mitigate risks associated with flammable aviation fuels. Additionally, accessibility and emergency response requirements ensure that refuelling areas are accessible to emergency personnel and equipment in case of incidents. While not directly governing refuelling, the NBC(AE) enhances overall safety and efficiency.

1.3 OPINION OF PROBABLE COST DISCLAIMER

The provided Opinions of Probable Costs were developed utilizing historic construction cost data. Please note that all the costs outlined below have been developed for discussion purposes only and are accurate to within -20% to +20%.

2 EXISTING SYSTEM DESCRIPTION

WSP Canada Inc. personnel visited the site on February 11th., 2025 to review the existing facility. Numerous photographs of the existing installations were taken to aid in the preparation of the Desktop Study. Due to the amount of snow on the ground it was not possible to assess the slab and drainage to determine condition and code compliance.

As noted above, the Flagstaff Regional Airport provides a 24/7 Carlock system for Aircraft Refueling. The system consists of the following major components:

- 25,000L Doubled walled 110LL Aviation Gasoline Storage Tank. Manufactured by TANKS DIRECT. Presently the tank sits on a gravel pad and appears to be sinking into the ground at the one end. In addition, the tank is not epoxy coated within the interior as per observations from Flagstaff staff.

Image 1: View of AVGAS tank and spill kit

- Static Grounding Reel. Model Number 700-50R Manufactured by LIND E EQUIPMENT.

Image 2: View of Static Grounding Reel

- Aviation Fuel Transfer Pump.

Image 3: View of AVGAS Transfer Pump

- Emergency Shutoff valve. Manufactured by ASCO.

Image 4: View of Solenoid Valve

- One of two 20lb./ 120 BC Fire Extinguishers. Manufactured by BADGER.

Image 5: View of Fire Extinguisher

- Dispenser. Model Number 3/G7221D/8CGHJ/HL Manufactured by WAYNE DI CANADA INC.

Image 6: View of Dispenser Cabinet

- Secure Payment Terminal. Manufactured by CONCEPT DESIGN.

Image 7: View of Payment Terminal

3 NOTED ISSUES FROM CODE COMPLIANCE AND DESKTOP REVIEW

Upon completion of the Site Review, WSP personnel reviewed the provided photographs for compliance with **Canadian Standards Association (CSA) B836-14 – Storage, Handlings, and Dispensing of Aviation Fuels at Aerodromes** and the **National Fire Code – 2023 Alberta Edition.**

Individual code issues are categorized below.

3.1 "CSA B836" ISSUES/ CONCERNS

A detailed review of CSA B836 identified the following concerns:

1. Record Drawings appear to not be kept on Site. (ref. Section 4.1.2 of CSA B836).

2. There is no physical barrier that provides a minimum clearance of 15m from any potential parked aircraft (ref. Section 4.1.3.(e) of CSA B836).

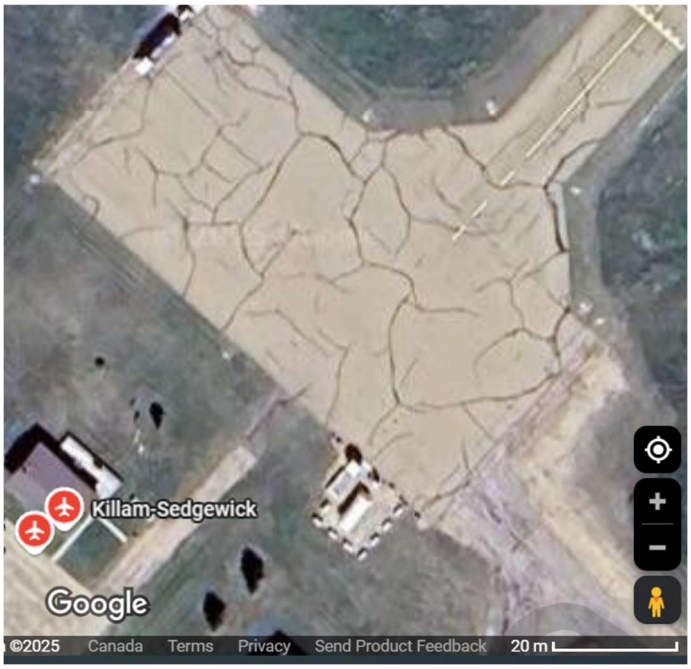

Image 8: View of Proximity of Fuel Tank area to Run-up area adjacent to the runway

3. It appears that there is a lack of “No Smoking” signs posted around the fuel safety zone. (ref. Section 4.1.7. of CSA B836).

4. As per observations from Flagstaff maintenance personnel, the tank is not coated on the interior. Carbon steel fuel storage tanks shall have epoxy-coated internal surfaces. (Ref. Section 4.3.2. of CSAB836.).

5. Piping does not appear to be ASTM A53/A53M Type E, Grade B; API Spec 5L Grade B ERW; ASTM A106/A106M Grade B Seamless; or ASTM A312/A312M Stainless. (ref. Section 4.5.1.4.1. of CSA B836).

6. Piping does not appear to be Schedule 80 for 50mm and smaller piping. (ref. Section 4.5.1.4.2. of CSA B836).

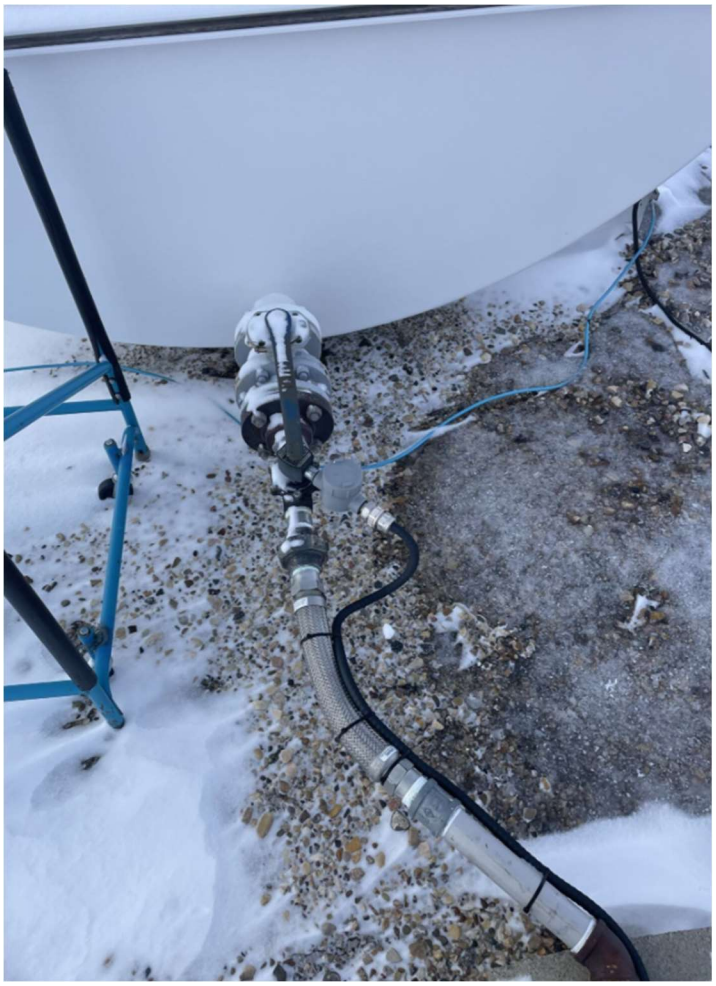

Image 9: View of Piping from Tank

7. The fuel supply piping penetrates the secondary containment of the tank. (ref. Section 4.5.1.14. of CSA B836).

Image 10: View of piping penetrating secondary containment of tank

8. Mesh sizes in strainers and filters should be confirmed to ensure compliance with the relevant code sections. (ref. Section 4.6. and 4.7. of CSA B836).
9. Electrical Bonding should be reviewed as it does not appear to be continuous. (ref. Section 4.10.3. of CSA B836).
10. Maintenance Records should be made available for review (ref. Section 5.16.2. of CSA B836).
11. An Emergency Response Plan should be made available for review (ref. Section 6.3. of CSA B836).
12. An Environmental Plan should be made available for review (ref. Section 6.4. of CSA B836).
13. A Spill Reporting Plan should be made available for review (ref. Section 6.4.2. of CSA B836).
14. Proof of training of all users should be made available for review (ref. Section 8.0. of CSA B836).

3.2 "NATIONAL FIRE CODE – 2023 ALBERTA EDITION" ISSUES/ CONCERNS

A detailed review of the National Fire Code identified the following concerns:

1. The area where fuel is being dispensed does not appear to be capable of accommodating a spill of not less than 1000L (ref. Section 4.6.7. (1) (b) of NFC).
2. A video recording surveillance system shall be provided and connected to a monitoring facility (Ref. Section 4.6.8.2.6. (a) of the NFC).
3. A telephone or other means of direct communication with the fire department shall be provided. (Ref. Section 4.6.8.2.6. (e) of the NFC).
4. An audible alarm actuated by the emergency shut-off switches shall be provided. (Ref. Section 4.6.8.2.6. (f) of the NFC).

5. A Strobe Light actuated by the emergency shut-off switches shall be provided. (Ref. Section 4.6.8.2.6. (g) of the NFC).
6. Intrusion Alarm devices shall be provided on the dispensing pump cabinets and connected to a monitoring system. (Ref. Section 4.6.8.2.6. (h) and (i) of the NFC).
7. Electronic Storage Tank Monitoring shall be provided. (Ref. Section 4.6.8.2.6. (j) of the NFC).
8. Additional signage shall be provided that indicate the location of the master emergency shut-off switch, and emergency instructions in the event of a spill. (Ref. Section 4.6.8.2.8. (b) and (d) of the NFC).

3.3 ADDITIONALLY NOTED ITEMS

In reviewing the provided photographs, it appears that the dispenser and payment terminal are aged and may have exceeded their useable life span. Therefore, it is recommended that they should be replaced.

4 RECOMMENDED REMEDIATION

As noted above, several issues and code violations exist at the Flagstaff Regional airport. In order to remedy these issues in the most cost-effective manner, it is recommended that the Airport purchase a packaged refueling system similar to one fabricated by U-FUEL (https://www.ufuel.com/aviation.phtml) or similar.

In addition, the new fueling system should be placed on a concrete pad that is capable of accommodating a potential fuel spill and relocated to meet Transport Canada standards and recommendations.

Image 11: View of TYPICAL Packaged refueling system

4.1 FUEL DISPENSING SYSTEM REPLACEMENT

OPINION OF PROBABLE COST

NOTE: The provided costs do not include any potential soil remediation as a result of possible, historic fuel spills.

Table 1: Opinion of Probable Cost

ITEM	ESTIMATED COST
Mobilization and Demobilization	$5,000
Demolition	$10,000
New Structural Concrete Pad	$75,000
New Packaged Refuelling System (Tank and Dispenser)	$212,000
Electrical	$10,000
Security Interface	$10,000
Sub-Total	**$322,000**
Contractor Overhead (10%)	$32,200
Contractor Profit (10%)	$32,200
Total	**$386,400**
Contingency (20%)	$77,280
Design, construction administration, field inspection services (20%)	**$64,400.0**
Grand Total	**$528,080**