Drinking Water Quality Control Plan

For:

Harry Reid International Airport (LAS)

Facility Address:
5757 Wayne Newton Boulevard
Las Vegas, Nevada 89119

Clark County Department of Aviation
Las Vegas, Nevada
Environmental, Health, & Safety (EHS) Section

Document Owner: Airport Environmental Specialist
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REVISION LOG

Date	List of Changes
03/08/23	Initial release of written Drinking Water Quality Control Plan to enhance existing policies and procedures, as well as identify DOA and tenant responsibilities.

Airport partners will be notified of revisions to this document via Tenant Bulletin or other means as necessary.

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1.0 INTRODUCTION

1.1 General

The purpose of the Clark County Department of Aviation (DOA) Drinking Water Quality Control Plan is to minimize risks from microbial contamination of aircraft water. This contamination may originate from source waters or may occur during transfer operations or while water is stored on board the aircraft. Any location is at risk if proper procedures and sanitation practices are not continuously followed to ensure the safety of water that is used for drinking and food processing and preparation. It is therefore essential that handling companies adhere to sanitary requirements established in this document. Even if the water at the facility is safe, that does not ensure that it will remain safe during the transfer to the aircraft and storage activities that follow.

This program is intended to ensure compliance with the requirements of the United States Food and Drug Administration (FDA) program and World Health Organization (WHO) guidelines. This document shall be utilized by the DOA and tenants of the DOA to aid in the proper management of potable water outlets associated with the facility. To accomplish this, the Drinking Water Quality Control Plan identifies the existing and potential sources of contamination and the best management practices to be utilized to prevent impacts from these sources. This program shall be revised if there are changes in design, components, or when deemed necessary due to deficiencies observed by the DOA personnel or by regulatory agencies. This document shall be maintained on-site by the Airport Environmental Specialist and shall be made available upon request. A program brief, Potable Water Sampling Program Fact Sheet, is included in Appendix D.

1.2 Regulatory Background

Potable water, also referred to as drinking or tap water, is water that is treated to meet local, state and federal standards for human consumption. The various applicable regulations established for safe drinking water standards in the United States as well as WHO guidelines are described below:

The National Primary Drinking Water Regulations (NPDWR) are legally enforceable primary standards and treatment techniques that apply to public water systems in the United States. These standards protect public health by limiting the levels of contaminants in drinking water. NPDWR water treatment guidelines provide standards for protection from microbial pathogens, and simultaneously, criteria for minimizing health risks to the population from disinfection byproducts. [Code of Federal Regulations (CFR) 40 part 141 Subpart D]

The Safe Drinking Water Act (SDWA) gives individual states the opportunity to set and enforce their own drinking water standards if the standards are at a minimum as stringent as EPA's national standards. [42 U.S.C. §300f et seq. (1974)]

Nevada Source Water Protection Program is an effort to prevent contaminants from entering public drinking water sources. The Source Water Protection Program is administered through the Bureau of Safe Drinking Water (BSDW) at the Nevada Division of Environmental Protection (NDEP). Source water is untreated water from streams, rivers, lakes, springs, or underground aquifers, which is used to supply public drinking water and private wells. [Nevada Revised Statutes (NRS) 445A.425, and Nevada Administrative Code (NAC) 445A.8337]

The Southern Nevada Health District (SNHD) staff works in conjunction with the BSDW to develop and maintain the Safe Drinking Water Program (SDWP). The SNHD also assists the BSDW to ensure that all allocated water systems meet the national Safe Drinking Water standards. SNHD efforts involve but are not limited to; conducting sanitary surveys of water systems, conducting site visits to assess conditions that can attribute to total coliform positive sampling events, reviewing sampling plans, educating operators of water systems, and managing laboratory results for compliance with applicable Nevada regulations. [NRS 445A and NAC 445A.450 to 445A.6731]

The United States Environmental Protection Agency (EPA) Final Aircraft Drinking Water Rule (ADWR) is a comprehensive national program that ensures the safety of drinking water provided to aircraft passengers and crew. The ADWR establishes barriers of protection from disease-causing organisms targeted to the air carrier industry. The United States Food and Drug Administration (FDA) oversees the program and regulates water used in food and drink preparation and water supply lines for aircraft. Periodic audits are conducted by the FDA at DOA facilities. [40 CFR Part 141 Subpart X]

The IATA Drinking-Water Quality Pool (IDQP), administered by the International Air Transport Association (IATA), was created by a number of airlines to share audits on drinking-water quality around the world. IDQP also developed its own standards to be followed to ensure that aircraft drinking-water quality and servicing safety are maintained to an acceptable level. These standards can be found in the IATA Airport Handling Manual (AHM). All international air carriers and ground handlers for international flights should have and utilize the AHM for all international flight operations at LAS. Periodic audits are conducted by IATA at this facility. [IDQP Standard – February 2018].

1.3 Roles and Responsibilities

The first stage in developing a Drinking Water Quality Control Plan is to identify the key members who are involved in each stage of the supply of drinking-water. In this case, many of the representatives consist of internal and external stakeholders with collective responsibility for the water

supply system from source to consumer. The potable water quality team members include water quality specialists, environmental professionals, operational staff, airline representatives, ground service providers, tenants, and individuals with a thorough understanding of facility water supply systems.

The DOA staff, tenants and airlines that have been designated as potable water quality team members are listed below in Table 1.1, along with their responsibilities and duties. Table 1.1 will be updated as needed when there are changes to duties and responsibilities. Airport partners must also designate individuals to be water quality team members in order to implement the requirements of this Drinking Water Quality Control Plan and also any individual company Potable Water Quality Control requirements as necessary.

Table 1.1

Title	Department	Phone Number	Duties and Responsibilities
Airport Manager - EHS	Director's Office	702-261-5166	• Oversight of drinking water quality control program • Duly Authorized Representative
Airport Environmental Specialist	Director's Office	702-261-5692	• Maintaining and updating the plan • Reviewing tenant routine inspections • Coordinating regulatory inspections/audits • Coordinating potable water sampling • Lab analysis data collection and reviewing • Quarterly and annual reporting • Designated water treatment advisor (WTA) • Conducting periodic compliance inspections
Plumbing Supervisor	Facilities Department	702-261-4036	• Directing maintenance and repair activities • Scheduling filter and hose replacements • Coordinating line disinfection operations • Scheduling line flushing activities • Reviewing monthly inspection activities • Recommending signage updates
Service Desk	Facilities Department	702-261-4357	• Scheduling and coordinating repair requests
Airport Tenants	Various	Various	• Implementing BMPs at their respective facilities • Conducting routine inspections at their respective facilities • Conducting routine cleaning activities • Conducting routine disinfecting activities • Providing applicable training for employees

When there are changes to tenant staff or operations, the potable water quality team point of contact(s) must provide such information to the designated water treatment advisor (hereafter referred to as WTA) as soon as possible.

1.4 Use of DOA Equipment

All DOA equipment, specifically potable water cabinets, operated by airlines and ground service providers must be kept in a neat and clean manner, and shall be operated in a safe and orderly manner at all times. Individual airlines will be held responsible for activities conducted by their contracted ground service providers. Periodic inspections, maintenance and cleaning activities must be completed as outlined in Section 3.1. Upon notification from the DOA to an airline concerning the unsafe and/or unclean condition of equipment in their lease area, the airline must immediately remedy the cause of the condition or within a reasonable time frame approved by the DOA.

Following the CCDOA Operating Directive 01-6, repeated violations may lead to monetary penalties up to $1,000 a day per violation. Under Title 20 of the Clark County Code, the Director of Aviation is authorized by the Clark County Board of County Commissioners to promulgate rules and regulations as deemed necessary for the safe and efficient administration, supervision and operation of the Airport and aviation-related properties and facilities. To ensure compliance with all federal, state and local laws, ordinances and regulations, the director of aviation is authorized and empowered to issue contractual penalties and/or administrative assessments upon any commercial lessee, permittee, or other commercial user of the Airport, at the director's discretion, up to $1,000 per violation per day, for any violation.

1.5 Drinking Water Quality Control Plan Availability

This facility operates 24 hours a day, 365 days a year. Copies of documents may be requested from the Airport Environmental Specialist during normal business hours of operation.

Printed copies of this document are UNCONTROLLED. Always refer to the electronic version of the Drinking Water Quality Control Plan in the DOA online document library prior to use to ensure that you are using the most current version.

1.6 Recordkeeping

The DOA utilizes electronic systems for recordkeeping, document management and control.

- Maximo® is an enterprise asset management software system that is used to track repairs and preventative maintenance work.
- Procore™ is an all-in-one construction management software system that is used to document construction activities and new projects.
- Analytical laboratory reports and backflow preventer inspection reports are available on the Team Document Portal (https://team.mccarran.com/Landing/Index).

- The Drinking Water Quality Control Plan is available for download on the Safety web page (https://www.harryreidairport.com/Business/Planning/EHS).

DOA, airline and tenant records must be retained for a minimum of three years. A copy of the CCDOA Laboratory Report Download Fact Sheet is included in Appendix D.

2.0 FACILITY DESCRIPTION

This facility (LAS) is physically located at 5757 Wayne Newton Boulevard in Las Vegas, Nevada with a mailing address of P.O. Box 11005, Las Vegas, Nevada 89111. A Vicinity Map indicating the general location of this facility within the Las Vegas valley is included in Appendix B. The facility is owned by Clark County and operated by the DOA. There are two terminals at LAS consisting of 5 concourses with a total of 108 passenger boarding gates.

Terminal 1 includes 94 passenger gates which are as follows:

A - Concourse – 16 domestic gates;
B - Concourse – 17 domestic gates;
C - Concourse – 18 domestic gates;
D - Concourse – 44 total gates. The D-Concourse is split up into 37 domestic gates (D1 – D18, D32 – D59) and seven international gates (D19 – D22, D24 – D26). Gate D22 has two jet bridges to accommodate larger widebody aircraft. Additionally, Gate D59 is inactive and has no jet bridge, therefore is excluded from the testing and sampling procedures.
E – Concourse (Terminal 3) supports 14 passenger gates, seven domestic (E8 – E12, E14 – E15) and seven international (E1 – E7). Four of these international gates have two jet bridges each to allow for quicker handling of wide-body aircraft (E1, E2, E3 and E5).

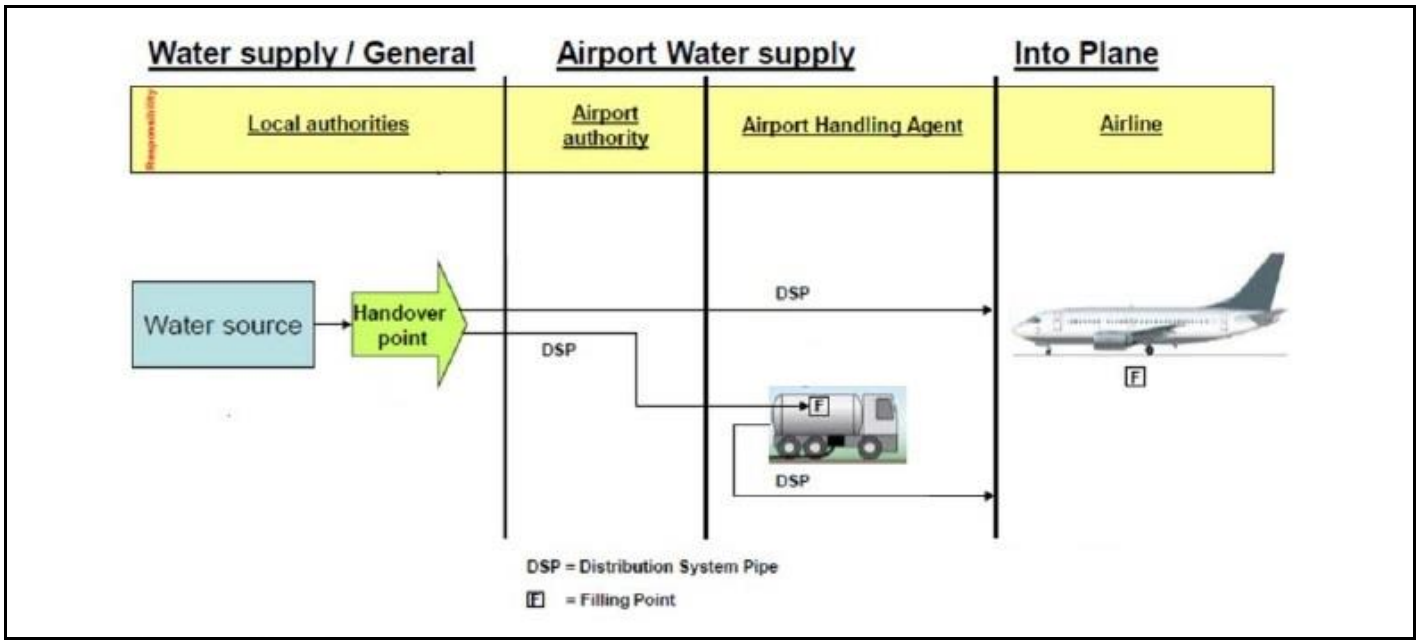
The Airport Environmental Specialist is responsible for ensuring this program is implemented throughout the facility and modifying as needed to accommodate all gates. Jet Bridge Potable Water Cabinet Location Maps are included in Appendix B, and display the locations of each jet bridge potable water cabinet (PWC).

2.1 Potable Water Supply System

Municipal water is supplied by the Las Vegas Valley Water District (LVVWD) water treatment facility. Potable water is treated and filtered to meet and exceed the requirements of the EPA's Safe Drinking Water Act. Water quality is verified by continuous systematic testing at the LVVWD treatment facility. A copy of the current LVVWD Water Quality Report is included in Appendix A.

2.2 Aircraft Potable Water Supply Chain

An understanding of the aircraft potable water supply and transfer chain will help to illustrate the points at which the water can become contaminated during conveyance to the aircraft. The flow diagram below provides an overview of the potable water supply system typical for aircraft at this facility.



Generally, the aircraft potable water supply and transfer chain consist of four major components:

1. The source of water coming from the public water system and into the facility.

2. The Airport Water Supply, which includes the on-site distribution system.

3. The Transfer Point (sometimes referred to as the Watering Point or Filling Point), including the water transfer and delivery system. It is typically a temporary interconnection between the hard-plumbed distribution system of the airport (e.g. at a hydrant), and the aircraft water system, by means of potable water vehicles and carts, refillable containers or direct flexible hose connections. This water transfer process provides multiple opportunities for the introduction of contaminants into the drinking water, by airline and ground handling companies.

4. The aircraft water system, which includes the water service panel, the filler neck of the aircraft finished water storage tank and all finished water storage tanks, including refillable containers/urns, piping, treatment equipment and plumbing fixtures within the aircraft that supply water to passengers or crew.

2.3 Potable Water Filter Systems

Each jet bridge PWC is equipped with an in-line potable water filter system. Filter vessels are epoxy fiber/glass fiber with internal liners and are fitted with a pressure release valve and pop-out clog indicator. American Plumber W20CLHD pleated cellulose filters or equivalent are used at this facility. The filters are designed to be utilized with municipal/chlorinated water and have a filter life of six months or 24,000-gallons. When used, the filters are changed every two months, which is three times more frequent than manufacturer recommendations.

In many cases, particulate filters have been removed from PWCs per request by the air carrier. Studies have shown that filters used in point-of-use treatment devices in high temperature areas will accumulate bacterial nutrients and neutralized disinfectant residuals, thus providing an ideal environment for microbial growth. Examinations of facility potable water for particulates (solid matter) have historically revealed no flakes, specks or fibers suspended in the water or settled out at the bottom (IATA IDQP - RC5. Water Appearance and Smell).

2.4 Potable Water Equipment

Common equipment that may be used to transfer water at this facility includes (but is not limited to) piping, hoses, potable water cabinets, bowsers, tanks, and hydrants (including taps, faucets and filling stations). DOA Facilities maintains all piping, hoses, potable water cabinets and hydrants. Bowsers or tanks are not provided by the DOA and are therefore the responsibility of the individual airline or ground handler that may utilize such equipment.

2.4.1 Potable Water Cabinets

All PWCs at this facility are designed to provide potable water to aircraft while located at passenger jet bridges via reel mounted flexible hoses. Cabinets are constructed of durable stainless steel with two large front-facing lockable doors. Facility PWCs are mounted to the pedestals of each jet bridge and are identified by the gate location as well as individual asset numbers. There are currently 113 individual PWCs which are identified on the Jet Bridge Potable Water Cabinet Location Maps included in Appendix B and schedules in Appendix E.

Potable water distribution pipes and hoses conform to the International Plumbing Code (IPC) and Uniform Plumbing Code (UPC). Only approved materials are used for piping, hoses, fittings and connections. Distribution pipe and hoses shall have a pressure rating of not less than 100 psi (690 kPa) at 180°F (82°C). No lead, cadmium alloys, cadmium plating or galvanized steel shall be in contact with water, nor should zinc material coatings or non-food quality plastic material be used.

Whenever possible, ultraviolet (UV) protected food grade hose will be utilized at jet bridges. Each fill hose end connector is equipped with a dust cap that must be kept in good condition.

Backflow prevention assemblies are required for use at each jet bridge flexible pipe connection. Since their proper function is imperative in order to prevent contamination of the potable water distribution system, testing and inspection of backflow preventers is conducted annually.

2.4.2 Potable Water Servicers

Potable water servicers refer to mobile tanks and bowsers that are used by ground handling companies to distribute fresh drinking water to aircraft. Potable water servicers can also be utilized for introducing and mixing water treatment additives prior to uplifting to aircraft. This facility does not inject sanitization additives into the potable water distribution system. Therefore, it is the responsibility of each airline to determine whether or not to introduce water additives to potable water prior to uplift into any aircraft by utilizing a mobile tanks, bowsers or other equipment. Ground handlers should follow IDQP guidelines when using equipment to introduce and mix water additives.

3.0 TASK CHECKLISTS

As an assurance that water suppliers are maintaining acceptable standards, it is essential that potable water equipment be inspected, cleaned and disinfected at regular intervals. In general, this Drinking Water Quality Control Plan outlines acceptable standards of quality and safety for this facility. The procedures below detail typical quality and safety procedures that should be regularly performed by the DOA and companies providing potable water servicing of aircraft, and for which records should be readily available.

These checklists will be revised when there are changes in the design, components, or processes at the facility, if inspections or compliance evaluations identify deficiencies, if deemed necessary by regulatory agencies, or as the DOA considers compulsory. Dates of inspections and maintenance activities shall be documented for each PWC. Due to the extreme heat at our facilities, labels cannot be placed on the outside panel of enclosure doors, as they would quickly degrade. The DOA may, at its discretion, change, modify, add, or revise the following inspection and maintenance practices outlined below.

3.1 Tenant Checklists

Each tenant must check the condition of their lease area PWCs each day prior to use. It is especially important for users of shared gates to inspect the PWC prior to assuming responsibility for the gate following use by another tenant. Records should be maintained by each tenant for their leased gates. Any incidents, accidents or noncompliant issues must be immediately reported to the Airport Control

Center at 702-261-5125 to avoid being held responsible for deficiencies caused by others. The Daily-Weekly Tenant Checklist template is included in Appendix C.

3.1.1 Daily Checklist

Daily inspections shall ensure, that the fill point areas are adequately maintained. Daily records must at least include the following:

- Cleanliness of PWC
- Coupling in good condition
- Dust cap in place and in good condition
- Cleaning of coupling and dust cap
- The content of the installed potable water supply hose shall be completely flushed at least once per 24 hours for two to three minutes, preferably before the first flight of the day
- Appearance / smell of the potable water shall be checked
- Free chlorine / residual chemical test (if applicable)

3.1.2 Weekly Checklist

Weekly inspection and disinfection must be completed by the tenant and must at least include the following:

- Cleanliness of PWC
- Condition of coupling
- Condition of dust cap
- Condition of cabinet, lockable doors and handle mechanisms
- Hose condition
- Disinfection of fill point connector
- Any other damage or deterioration of equipment

3.2 Department of Aviation Checklists

The DOA will check the condition of the PWCs each month, and also conduct maintenance and disinfection activities as applicable. All DOA maintenance, inspection and disinfection activities must be coordinated with DOA Ramp Control. The Airport Environmental Specialist is the designated water treatment advisor (WTA) and shall review and approve the procedures and schedules prior to initiation of work. Tasks and procedures are established and tracked in Maximo®. Tenants will be notified of any noncompliant issues and could be held responsible for deficiencies caused by their employees. The Monthly, Quarterly and Annual tasks are listed below.

3.2.1 Monthly Checklist

Monthly maintenance and inspections are completed by the DOA and tracked in Maximo®. Records will at least include the following:

- Notify the Airport Control Center and Airlines of any service being done on Jetways
- Cleanliness and condition of PWC, lockable doors and handle mechanisms
- Condition of coupling and dust cap
- Examine condition of flexible hose
- Flush water through potable water hose to ensure proper operation
- Notify Airport Control Center if a Jetway will be "OUT OF SERVICE" for a long period of time for repairs
- Filter change every other month (if applicable)
- Sign and date inspection tags

3.2.2 Quarterly Checklist

Quarterly maintenance and inspections are completed by the DOA and tracked in Maximo®. Records must at least include the following:

- Notify Airport Control Center and Airlines of any service being done on Jetways
- Cleanliness and condition of PWC, lockable doors and handle mechanisms
- Condition of coupling and dust cap
- Examine condition of flexible hose
- Coordinate disinfection and sampling activities with DOA Ramp Control
- Disinfection of flexible water lines (conducted as scheduled or as needed)
- Water samples will be collected quarterly from all international gates
- Notify Airport Control Center if a Jetway will be "OUT OF SERVICE" for a long period of time for repairs
- Sign and date inspection tags

3.2.3 Annual Checklist

Annual records must at least include the following:

- Inspections of backflow preventers
- Water samples will be collected annually from all domestic gates
- Water samples will be collected quarterly from all international gates

3.3 Potable Water Servicing

Airline standard operating procedures (SOPs) as well as regulatory guidelines should be followed for potable water servicing of aircraft. At a minimum, the procedures below should be followed to prevent contamination of aircraft potable water systems.

- Water service should never be performed simultaneously with toilet servicing
- Water service must not be performed by staff that has already performed toilet servicing during the same shift
- Any contagious operator should be removed from servicing operation
- Servicing staff should be dressed in clean working clothes
- Operators' hands should be cleaned before handling potable water equipment
- The aircraft filling port and hose connector must be cleaned /wiped dry with disinfectant wipes before the hose is connected to the aircraft
- The hose needs to be flushed for 2 to 3 minutes before connecting to aircraft
- Only uplift water if authorized by the operating airline
- Replenish the aircraft tank according to the operating airline instructions–any deviation must be reported to the supervisor or airline representative
- Do not park the potable water service unit and the toilet service unit in the same area
- The hose connector must never contact the ground at any time
- Hose end dust caps should be clean, in good condition and replaced when hoses are not in use

4.0 WATER SAMPLES AND ANALYSIS

Regular monitoring of parameters is necessary to ensure that safe water quality is maintained, as each step in the water transfer chain provides an opportunity for contamination. Regular analysis shall be done every 3 months for all international gates, and annually for all domestic gates. A schedule for sampling and analysis of microbial and physiochemical parameters is included in Appendix E. Sampling and analysis frequencies may be adjusted as deemed necessary by the DOA.

4.1 Water Quality Analyses

The tables below represent parameters that are tested by the DOA for both international and domestic gates.

International gates drinking water samples test parameters.

Parameter	Transfer Point to Aircraft	Limit H/R	Action
Coliform Bacteria (*)	0/100 ml	H	No uplift
Escherichia Coli (E-Coli) (*)	0/100 ml	H	No uplift
Enterococci	0/100 ml	H	No uplift
Pseudomonas Aeroginosa	100/250 ml	R	Re-sampling (flushing/disinfection/resampling)
Colony Count @ 22°C (*)	≤500 ml (*)	H	(*) ≥350/ml (cleaning/disinfection, resampling) ≥500/ml - no uplift **(3)**
Colony Count @ 37°C (*)	100/ml	H	≥100/ml - no uplift **(3)**
Residual Chlorine (*)	0.3 mg/l - max. 0.8 mg/l	R	<0.3 mg/l adding of chlorine
pH	6.5-9.5	H	Re-sample Follow up with local water authority

(H) Hard limit: no uplift possible

(R) Recommendation level: for information only, may induce actions by individual airline

(3) No uplift after disinfection and re-sampling. System must be fully evaluated by qualified professionals

Domestic gates drinking water samples test parameters.

Parameter	Transfer Point to Aircraft	Limit H/R	Action
Coliform Bacteria (*)	0/100 ml	R	Re-sampling (flushing/disinfection/resampling)
Escherichia Coli (E-Coli) (*)	0/100 ml	R	Re-sampling (flushing/disinfection/resampling)

(R) Recommendation level: for information only, may induce actions by individual airline

* Each routine, repeat, or follow-up sample is tested for the presence of both total coliform and E. coli. If a sample is positive for total coliform or E. coli, air carrier notification and corrective disinfection and flushing are triggered. The disinfection and flushing procedure must be completed within 72 hours unless air carrier access is restricted.

Analytical laboratory analysis for turbidity and clostridium perfringens will not be conducted, as these parameters are specified when surface water is used as a potable water source. Municipal water at LAS is supplied by the LVVWD water treatment facility. Any additional testing beyond the scope listed below will be the responsibility of the requesting party.

4.2 Sampling Procedures

Sampling is an essential part of ensuring drinking water is of good quality. It indicates whether the effort put into water treatment is effective and if acceptable water is being uplifted to aircraft. The results of these tests are the evidence that is required to satisfy a drinking water assessor, airlines and the traveling public that the water is not a risk to health.

4.2.1 Sample Containers

Typically, sample containers are specific to the analytical testing being requested. Therefore, it is important to have the correct container for the test being performed. Samples for testing for micro-organisms in a drinking-water supply must be collected in containers that are pre-sterilized so that there are no living organisms in the bottles. For some tests the sample containers may contain substances required to stabilize or preserve the sample. Only use sample containers that are prepared by a certified testing laboratory.

4.2.2 Sample Identification and Records

Immediately before or after collecting a sample, label the container clearly with information on:

- Where – The sampling location, including gate number identified on the applicable Jet Bridge Potable Water Cabinet Location Map
- When – The time and date of collection
- Who – The name of the person collecting the sample, company or department (for traceability)

In addition to the container labels on the sample itself, it is important to complete a laboratory chain of custody form. This form includes all the information given on the label plus some additional information to track the progress of the sample and identifies the parties involved. A copy of the DOA chain of custody form is included in Appendix D. Chain of custody forms are also provided by the testing laboratory and required to ensure the quality control of water samples for analysis.

4.2.3 Sample Collection Procedures

The following procedures outline the proper steps for collecting a sample for analytical laboratory testing. Samples must be tested within 24 hours (preferably within six hours) and kept cool while in

transit. The collection must be completed under clean conditions from disinfected hose connector and the samples must be accurately labelled. Prior to sampling, wash your hands, using at least soap and water or an antiseptic foam or alcohol gel.

- **Cleaning the hose connector:** Remove dust cap from the hose connector and use a clean cloth or paper to clean the outlet. Remove any dirt and dust.

- **Sterilizing the hose connector:** Spraying alcohol or any applicable disinfectant (inside and outside) with a 1 percent sodium hypochlorite solution (for example, household bleach diluted one part bleach into two parts water in a spray bottle). Leave to stand for two to three minutes to disinfect the hose connector, and then proceed with the steps below. Ensure that no bleach gets into the sample bottle and handle the bleach with care. Immediately wash off any bleach that comes into contact with skin.

- **Opening the tap; full flush:** Flush old stagnant water out of the system and allow the water to run over the hose connector to wash away any residual disinfectant. Allow the cold water to run wide open for at least two to three minutes. After at least two minutes, reduce the flow of the water to collect a sample. Conduct preliminary check of water for visual impurities or irregular odors. Flush an additional five (5) minutes if necessary and recheck water. Contact DOA Facilities if there are any suspected abnormal visual contaminates or odors.

- **Opening sterilized bottle:** Prior to opening each sample container; put on new, clean, powderless gloves. The containers are carefully prepared to be sterile so take great care in handling it. First, remove any protective cover and discard. Then open the container, with the bottle in one hand and the cap in the other. Do not place the cap on the ground or in your pocket, and do not touch the inside of the lid. Hold the cap with the opening facing down. The inside of the cap can be easily contaminated which, in turn, can contaminate the water sample.

- **Filling the bottle:** After opening, immediately hold the container under the flowing water and fill it to the pre-marked fill line, or to the shoulder, but leave an air space. Do not overflow the bottle. Hold the lid with its open end downwards (to prevent entry of dust that might carry microorganisms).

- **Closing bottles:** Screw the lid firmly onto the container. Keep the container cool (less than 10°C) and in the dark by placing it in a cooler complete with ice or ice packs. Send the sample to the laboratory promptly so that it arrives within 24 hours (preferably within six hours) from the time of sampling. Direct contact with the laboratory is essential to keep all parties aware of the sample's progress. Remember to fill out the label on the container and also the laboratory chain of custody form. Keep the chain of custody form with the sample(s).

5.0 PREVENTATIVE MAINTENANCE AND REPAIRS

All maintenance work will be conducted and scheduled in accordance with the equipment manufacturer's instructions. Maintenance and repairs include filter changes, cleaning, descaling, disinfecting, hose and fitting replacements and other repair requests. A copy of the Jet Bridge Water Cabinet Operations and Maintenance Manual is included in Appendix F.

DOA maintenance work should be scheduled and tracked in the Maximo® asset management software system. Tenants must keep track of all inspections and any disinfection/sanitizing activities. A copy of the Daily/Weekly Checklist Form is included in Appendix C.

5.1 Disinfection/Sanitizing

Chlorine disinfection may be used to prevent low-level contamination and growth within the distribution system. Only products approved by the local health authority may be used for the disinfection of potable water system.

Use clean rags or wipes to clean and disinfect the water fill point connector as needed. Rags should be soaked in a disinfection solution, mixed in accordance with the disinfection mixing guide table in the Line Disinfection - Standard Operating Procedure, included in Appendix C. An alternative disinfection/sanitizing solution may be used if approved in writing by the WTA.

Jet Bridge PWC Disinfection Port Location Maps are included in Appendix B, and display the locations of each international jet bridge disinfection port, to be used during Line Disinfection activities. The Potable Water Line Disinfection Schedule is included in Appendix E. The WTA and DOA Facilities will determine if and when the disinfection of other water lines is necessary on a case-by-case basis.

6.0 TRAINING

Airlines and ground service providers must develop and be responsible for providing and documenting training programs for their employees. Specific training should be provided to the operators and must be recorded. A list of qualified operators shall be available in the station manager's office.

Training should include at least:

- Hygienic principles (personnel sanitary precautions and cleaning equipment procedures),
- Water servicing and water draining procedures
- Safety and security
- Specific equipment and individual equipment

An example of a Potable Water System Training Log and Checklist is included in Appendix D.

7.0 SAFETY AND SECURITY

Airlines and tenants working at this facility require all employees to have a security clearance to access the secure ramp area where PWCs are located. No company without a contract with the DOA can independently give or seek a security clearance, and no individual who is not hired by the DOA, an airline or a tenant can obtain a security clearance. The extensive background investigation takes place before an individual is granted access and the type of background investigation depends on the position's requirements as well as the level of security clearance needed for the position. This process can take several weeks depending on backlog, need for more information, depth of the investigation process and other factors.

Any suspected security breach, where an individual may access a PWC, would result in a thorough assessment of the potable water system at the location in question. The assessment would include inspection, flushing, disinfection and testing of the potable water.

7.1 Lockable Cabinets

Issues regarding security related matters, including vandalism, willful contamination and loss of supply, are minimized by having restricted levels of access to the ramp area. When reviewing the existence of significant vulnerabilities of all major components of the public water system infrastructure in general, the airport facility represents a low-risk target when compared with the number of other less secure structures, plants and devices that might become the target of sabotage. All PWCs are lockable, however, cabinet doors will not be locked at this time to minimize operational delays. However, access to PWCs is restricted, and only authorized personnel may open the cabinets. All PWCs are located within the airport security identification display area (SIDA) and access is restricted only to authorized personnel.

8.0 SPECIAL CIRCUMSTANCES

Emergency situations that are appropriately managed tend to stabilize after a matter of days or weeks. Many develop into long-term situations that can last for several years before a permanent solution is found. Water quality concerns may change over that time, and water quality parameters that pose long-term risks to health may become more important.

8.1 Temporary Water Supplies

During an emergency that impacts the potable water distribution system, the local water utility is responsible for procuring and distributing emergency drinking water for its users provided that emergency drinking water sources are not directly available to its users. The DOA will use whatever resources are available to lead and/or assist in coordination of the distribution of temporary potable water.

8.2 Bottled or Packaged Water

The provision of bottled or packaged water from a reliable source is often an effective way to quickly provide safe, potable water in emergencies and disasters. Bottled and packaged water is kept stocked in the event of a short-term situation where potable water may be needed.

9.0 REFERENCES

- 21 CFR Part 1250 - Interstate Conveyance Sanitation, Subpart D
- Annex 1 B 1 (d) of the International Health Regulations (IHR)
- International Air Transport Association (IATA) Airport Handling Manual (AHM) 440

Copies of the EPA Final Aircraft Drinking Water Rule, and the IATA Drinking Water Quality Pool Safety Standards are included in Appendix G for reference.

Appendix A

Drinking Water Quality Reports

WATER QUALITY
where it matters most

Water Quality Report
2022

LAS VEGAS VALLEY WATER DISTRICT®

The Las Vegas Valley Water District is a not-for-profit water utility

Water delivered by the Las Vegas Valley Water District **meets or surpasses all** State of Nevada and Federal Safe Drinking Water Act **standards**.

Your water was analyzed more than 318,000 times in 2021.

It's monitored in "real time," 24 hours a day, 365 days a year.

It travels through nearly 7,000 miles of pipelines, to arrive at...

The 1 place that matters most: Your home.

That means it's more than numbers to us.

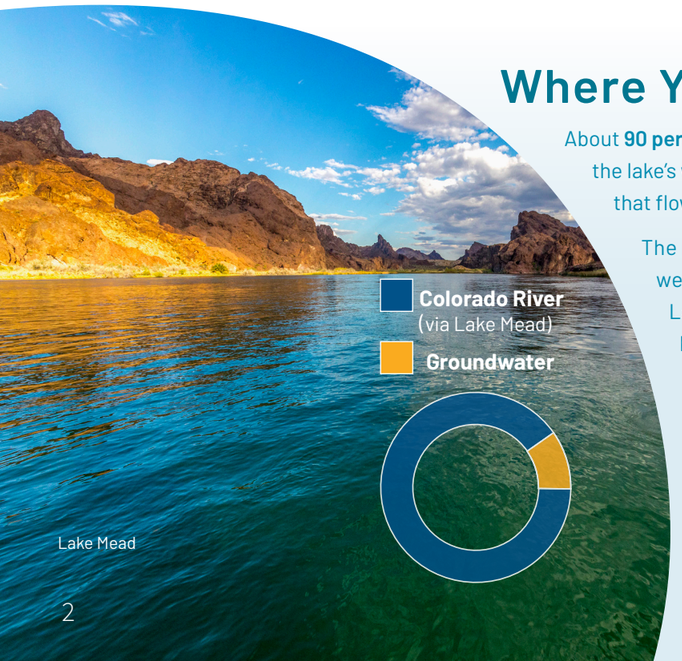
We are proud to provide you and our community with exceptional quality drinking water and to provide you with this annual water quality report.

Your tap water is treated and delivered through one of the most advanced and reliable municipal systems in the nation. The Las Vegas Valley Water District takes a proactive approach to maintaining and upgrading our network of reservoirs, pumping stations and pipelines: The District's $600 million, multiyear capital plan helps safeguard both water quality and reliability by keeping long-term costs and system disruptions low.

Amid a historic drought, we're also doing our part to maintain the highest system energy and water efficiency possible. Our main break rates are eight times lower than the national average, which significantly reduces water losses, while solar power generating systems at five of our large water reservoirs reduce our energy needs and demand on community power supplies. We're also a multiyear recipient of Government Green Fleet Awards, with more than 90 percent of our fleet vehicles powered by alternative fuels.

We encourage you to read this report and visit **lvvwd.com** to learn more about your water quality and about how you can do your part to conserve our community's most precious resource—water.

*This report is based on data collected during the **2021 calendar year**, unless noted otherwise, and is provided in accordance with the Safe Drinking Water Act. Please see the last page for more consumer resources.*



Where Your Water Comes From

About **90 percent** of your water comes from Lake Mead. Nearly all of the lake's water originates as snowmelt in the Rocky Mountains that flows down the Colorado River.

The remaining water—**about 10 percent**—comes from wells that tap a deep groundwater aquifer beneath the Las Vegas Valley. That aquifer is naturally replenished by precipitation in the Spring Mountains and the Sheep Range.

Groundwater is used mainly May 1-Oct. 1 each year to meet peak water demand. If you live or work within several miles of the Water District's offices at Charleston and Valley View boulevards, or in the northwest valley, you may receive a blend of groundwater and treated Lake Mead water.

How We Monitor, Test and Treat Your Water

In 2021, we conducted more than **318,000** analyses on more than **55,360** water samples from Lake Mead, our storage reservoirs and 367 sampling stations throughout our community—including stations in customers' meter boxes. We go beyond tough state and federal Safe Drinking Water Act requirements to ensure water quality, all the way to your meter.

Water drawn from the Las Vegas Valley groundwater aquifer is naturally filtered, so it is simply treated with chlorine as it enters the water distribution system. Water drawn from Lake Mead is treated at the Southern Nevada Water Authority's two advanced water treatment facilities with a leading-edge combination of **ozonation, filtration and chlorination**.

State-of-the-art ozonation is our primary water treatment. Ozone provides a very powerful disinfectant with a superior ability to kill bacteria, *Cryptosporidium* and microscopic organisms that may be present. **Multistage filtration systems** remove particles from the water, and we add **chlorine** as water leaves the treatment facilities, protecting water on the way to your tap. Chlorination is used throughout Southern Nevada's distribution systems: It's **extremely effective at destroying viruses and microorganisms** during treatment and maintaining disinfection throughout the system.

Additional corrosion-control efforts also help maintain water quality through Water District pipelines—all of them lead-free.

Understanding Test Results

In 2021, we **monitored for 91 U.S. EPA-regulated contaminants**; 76 of these have "primary" standards and are listed in this report if they were detected in our water supply. We also monitored for more than 75 unregulated contaminants and for *Cryptosporidium*, which is required by the EPA for water systems that treat surface water. *Cryptosporidium*, a naturally occurring organism that can cause gastrointestinal distress, was not detected in any 2021 source (untreated) water samples. Please visit **lvvwd.com** for a complete Water Quality Summary showing additional monitoring results not required in this report.

Does drought affect our water quality?

Reduced Colorado River flows into Lake Mead, a result of drought and climate change, can impact water quality due to increased pollutant concentrations and warmer surface water. That's why it's important to be able to draw our allotted water from **greater depths**, where water quality is **optimal**—and we have that ability here in Southern Nevada.

To provide long-term protection of our water stored in Lake Mead, the Southern Nevada Water Authority constructed **Intake No. 3** to draw drinking water from deep within the lake. Intake No. 3 began delivering water to our treatment facilities in fall 2015. In tandem with a new **Low Lake Level Pumping Station**, completed in 2020, we are ensuring the community can continue to access high-quality water during unprecedented drought conditions.

Continued declines in Lake Mead's water level are expected as the Colorado River Basin and Southern Nevada experience a permanent transition to a more arid future.

You can be part of the solution by being water smart: Conserving water helps protect our water quality, our economy and our way of life.

How can I conserve water?

Make the biggest impact by conserving water **OUTDOORS!** Here are our **TOP 3 tips!**

1. 

Follow your mandatory watering schedule! It's not "just" the law: Water smart and you can **SAVE UP TO $300 a year on water bills!**

2. **Report water waste** at **lvvwd.com** or on the go with our **free LVVWD App**.

3. **Ditch the grass.** Enroll in the Water Smart Landscapes program at **snwa.com**. Or scan this QR code to get started!

Earn CASH (up to $3/sq. ft.) when you **replace useless grass** with plants—and enjoy big water savings.

Water Quality Test Results

These results represent levels of **regulated contaminants** in the treated water supply, based on 2021 data, except where noted. Visit **lvvwd.com** for a complete Water Quality Summary.

REGULATED CONTAMINANTS	UNIT	MCL (EPA Limit)	MCLG (EPA Goal)	LAS VEGAS VALLEY WATER DISTRICT DISTRIBUTION SYSTEM [1]			LAS VEGAS VALLEY WATER DISTRICT GROUNDWATER (WELLS) [1]		ALFRED MERRITT SMITH WATER TREATMENT FACILITY [1]			RIVER MOUNTAINS WATER TREATMENT FACILITY [1]			POSSIBLE SOURCES
				MINIMUM	MAXIMUM	AVERAGE	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	AVERAGE	MINIMUM	MAXIMUM	AVERAGE	
Alpha Particles	pCi/L	15	0	Entry Point Monitoring Only			0	16 [2][3]	N/D	N/D	N/D	N/D	N/D	N/D	Erosion of natural deposits of certain minerals that are radioactive and may emit a form of radiation known as alpha radiation
Arsenic	ppb	10	0	Entry Point Monitoring Only			0.7	4.0	1	2	1	2	2	2	Erosion of natural deposits
Barium	ppm	2	2	Entry Point Monitoring Only			0.03 [4]	0.08	0.1	0.1	0.1	0.1	0.1	0.1	Erosion of natural deposits; discharge from metal refineries; discharge of drilling wastes
Bromate	ppb	10	0	Entry Point Monitoring Only			N/A (groundwater is not treated with ozone)		2	13 [5]	4 [6]	3	13 [5]	6 [6]	By-product of drinking-water disinfection by ozonation
Chromium (total)	ppb	100	100	Entry Point Monitoring Only			N/D	6 [2]	N/D	N/D	N/D	N/D	N/D	N/D	Discharge from steel and pulp mills; erosion of natural deposits
Copper [7]	ppm	1.3 [8] (Action Level)	1.3	N/D [9]	1.4 [9]	0.8 [9] (90th% value)	Distribution System Monitoring Only		Distribution System Monitoring Only			Distribution System Monitoring Only			Corrosion of household plumbing systems; erosion of natural deposits
Fluoride	ppm	4.0	4.0	0.3	0.7	0.6	0.1	0.5	0.7	0.8	0.7	0.3 [10]	0.8	0.7	Erosion of natural deposits; water additive [11]
Free Chlorine Residual	ppm	4.0 [12] (MRDL)	4.0 [12] (MRDLG)	0.07	2.1	1.0 [6]	Distribution System Monitoring Only		Distribution System Monitoring Only			Distribution System Monitoring Only			Water additive used to control microbes
Haloacetic Acids	ppb	60	N/A [13]	N/D	45	35 [14]	Distribution System Monitoring Only		Distribution System Monitoring Only			Distribution System Monitoring Only			By-product of drinking-water disinfection
Lead [7]	ppb	15 [8] (Action Level)	0	N/D [9]	5.6 [9]	3.9 [9] (90th% value)	Distribution System Monitoring Only		Distribution System Monitoring Only			Distribution System Monitoring Only			Corrosion of household plumbing systems; erosion of natural deposits
Nitrate (as Nitrogen)	ppm	10	10	Entry Point Monitoring Only			0.4	5.6 [15]	0.3	0.4	0.4	0.4	0.5	0.4	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Selenium	ppb	50	50	Entry Point Monitoring Only			N/D	3 [2]	2	2	2	2	2	2	Erosion of natural deposits; discharge from mines; component of petroleum
Radium 226 and Radium 228 (combined)	pCi/L	5	N/A	Entry Point Monitoring Only			N/D	3.7	N/D	N/D	N/D	N/D	N/D	N/D	Erosion of natural deposits
Total Coliforms	percent positive per month	5%	0	0%	0.3%	0%	Distribution System Monitoring Only		Distribution System Monitoring Only			Distribution System Monitoring Only			Naturally present in the environment
Total Trihalomethanes	ppb	80	N/A [13]	2	82 [16]	68 [14]	Distribution System Monitoring Only		Distribution System Monitoring Only			Distribution System Monitoring Only			By-product of drinking-water disinfection
Turbidity	NTU	95% of samples <0.3 NTU [17]	N/A	Treatment Facility Monitoring Only			Treatment Facility Monitoring Only		100% of samples were below 0.3 NTU. Maximum NTU was 0.08 on Sept. 8, 2021.			100% of samples were below 0.3 NTU. Maximum NTU was 0.08 on Jan. 26, 2021.			Soil runoff
Uranium	ppb	30	0	Entry Point Monitoring Only			2	3	3	4	3	3	4	3	Erosion of natural deposits

Key Terms

Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

AMSWTF: Alfred Merritt Smith Water Treatment Facility

Disinfection by-product (DBP): A substance created by the chemicals or processes used to destroy potentially harmful microorganisms.

Locational running annual average: The average of sample results taken at a particular monitoring location for the previous four consecutive quarters.

LVVWD: Las Vegas Valley Water District

Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

Maximum Residual Disinfectant Level (MRDL): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contamination.

N/A: Not applicable

N/D: Not detected. Does not equate to zero, but refers to an amount below analytical reporting limits.

Nephelometric Turbidity Unit (NTU): A measurement of water's clarity.

Ozonation: An advanced water treatment process that involves the addition of ozone, a very powerful gaseous disinfectant, to water to destroy bacteria, *Cryptosporidium* and other pathogens. Ozonation processes began at AMSWTF and RMWTF in 2003.

Part per billion (ppb): A unit used to describe the levels of detected contaminants. Equivalent to 1 cent in $10 million.

Part per million (ppm): A unit used to describe the levels of detected contaminants. Equivalent to 1 cent in $10,000.

Picocuries per liter (pCi/L): A measure of the radioactivity in water. Low levels of radiation occur naturally in many water systems, including the Colorado River.

Running annual average: The average of sample results for 12 consecutive months or four consecutive quarters, based on the monitoring requirements.

RMWTF: River Mountains Water Treatment Facility

Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.

Turbidity: A measure of water clarity, which serves as an indicator of the treatment facility's performance.

Footnotes

(1) Some Safe Drinking Water Act (SDWA) regulations require monitoring from the distribution system, while other SDWA regulations require monitoring at the entry points to the distribution system (LVVWD wells, AMSWTF, RMWTF).

(2) Annual monitoring not required, data from 2017.

(3) This result is not a violation of the MCL. The MCL for alpha particles is based on net alpha particle activity, which excludes uranium's contribution to alpha particle activity. One well in 2017 had a gross alpha particle result of 16 pCi/L. In that sample, uranium's contribution to alpha activity was 1.6 pCi/L. When the uranium contribution was subtracted from the gross alpha particle activity, the net alpha particle activity was 14 pCi/L (below the MCL). SDWA regulations require additional monitoring for radium 226 if gross alpha particle results are greater than 5 pCi/L; all radium 226 test results were below the detection limit (1 pCi/L).

(4) Annual monitoring not required, data from 2020.

(5) Maximum levels greater than the MCL are allowable as long as the running annual average does not exceed the MCL.

(6) This value is the highest running annual average reported in 2021. Reports are filed quarterly.

(7) Samples are from LVVWD customers' taps.

(8) Lead and copper are regulated by a Treatment Technique (TT) that requires systems to control the corrosiveness of their water. If more than 10% of tap-water samples exceed the Action Level, water systems must take additional steps. For copper the Action Level is 1.3 ppm, and for lead it is 15 ppb.

(9) Annual monitoring not required, data from 2019.

(10) RMWTF fluoridation system was out of service at time of collection. Follow-up sampling took place when the fluoridation system returned to service and results were within normal operation range.

(11) By state law, the Southern Nevada Water Authority is required to fluoridate the municipal water supply. This law is not applicable to groundwater.

(12) Chlorine is regulated by MRDL, with the goal stated as a MRDLG.

(13) Although there is no collective MCLG for this contaminant group, there are individual MCLGs for some of the individual contaminants. Trihalomethanes: bromodichloromethane (zero); bromoform (zero); dibromochloromethane (60 ppb); chloroform (70 ppb). Haloacetic acids: dichloroacetic acid (zero); trichloroacetic acid (20 ppb); monochloroacetic acid (70 ppb). Bromoacetic acid and dibromoacetic acid are regulated with this group but have no MCLGs.

(14) This value is the highest locational running annual average reported in 2021. Reports are filed quarterly.

(15) While your drinking water meets EPA standards for nitrate, it does contain low levels of nitrate. Nitrate in drinking water at levels above 10 ppm is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agriculture activity. If you are caring for an infant, you should ask for advice from your health care provider.

(16) Maximum levels greater than the MCL are allowable as long as the locational running annual average does not exceed the MCL.

(17) Turbidity is regulated by a Treatment Technique (TT) requirement: 95% of all samples taken after filtration each month must be less than 0.3 NTU. Maximum turbidity cannot exceed 1.0 NTU.

Additional Test Results

Many large water systems, including ours, also monitor for specific constituents that the U.S. EPA is considering for regulation in drinking water. We provide information to the EPA as part of the Unregulated Contaminant Monitoring Rule (UCMR)—a hallmark of the 1996 amendments to the Safe Drinking Water Act to further protect water quality. The rule has benefited the environment and public health for more than 20 years by providing the EPA with scientifically valid data on contaminants of interest, but not yet regulated, in drinking water.

UCMR 4 monitoring took place in 2018 and 2019; we will report these results over multiple years. Learn more at **epa.gov/dwucmr.**

ADDITIONAL TEST RESULTS - UCMR 4 (Data from 2019)				**LAS VEGAS VALLEY WATER DISTRICT DISTRIBUTION SYSTEM**			**LAS VEGAS VALLEY WATER DISTRICT ENTRY POINTS TO THE DISTRIBUTION SYSTEM**			
MONITORED CONTAMINANTS [18]	**UNIT**	**MCL (EPA Limit)**	**MCLG (EPA Goal)**	**MINIMUM**	**MAXIMUM**	**AVERAGE**	**MINIMUM**	**MAXIMUM**	**AVERAGE**	**POSSIBLE SOURCES**
HAA 5 [19]	ppb	60	N/A [20]	N/D	41	26	N/A	N/A	N/A	By-product of drinking-water disinfection
HAA 6 Br	ppb	N/A	N/A	N/D	29	21	N/A	N/A	N/A	By-product of drinking-water disinfection
HAA 9	ppb	N/A	N/A	N/D	96	44	N/A	N/A	N/A	By-product of drinking-water disinfection
Manganese	ppb	N/A	N/A	N/A	N/A	N/A	2.2	11.0	6.6	Erosion of natural deposits

Footnotes

(18) Monitoring for each of the monitored contaminants in the UCMR 4 table was conducted to comply with the Unregulated Contaminant Monitoring Rule 4 (UCMR 4) set by the U.S. EPA Safe Drinking Water Act. Per the rule, monitoring is conducted within the distribution system and at entry points to the distribution system. Unregulated contaminant monitoring helps the U.S. EPA to determine where certain contaminants occur and whether the agency should consider regulating those contaminants in the future. With the exception of HAA 5, these contaminants have no MCLs or MCLGs.

(19) HAA 5 refers to five specific haloacetic acids that may be found in drinking water. Results for this regulated contaminant in the UCMR 4 table are different from the results in the Water Quality Test Results table because UCMR 4 monitoring required separate locations and monitoring periods than those used for HAA 5 compliance monitoring. Monitoring for the HAA 5 compounds, in conjunction with UCMR 4 Assessment Monitoring, is required under the authority provided in Section 1445(a)(1)(A) of the SDWA.

(20) No collective MCLG but there are MCLGs for some of the individual contaminants. Haloacetic Acids: dichloroacetic acid (0), trichloroacetic acid (300 ppb).

Precautions for Vulnerable Populations

Some people may be more vulnerable to contaminants in drinking water than the general population. Those with compromised immune systems such as cancer patients undergoing chemotherapy, people who have had organ transplants, those with HIV/AIDS or other immune-system disorders, some elderly and infants can be particularly at risk from infections. These people should seek advice from their health-care providers about drinking water.

Call the Safe Drinking Water Hotline at **800-426-4791** for Environmental Protection Agency/Centers for Disease Control guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants.

Source Water Assessment

The federal Safe Drinking Water Act was amended in 1996 and requires states to develop and implement source water assessment programs to analyze existing and potential threats to the quality of public drinking water throughout the state. A summary of the Las Vegas Valley Water District's susceptibility to potential sources of contamination was initially provided by the state of Nevada. The summary of this source water assessment was originally included in an LVVWD Water Quality Report and now may be accessed online at **lvvwd.com**. Call **702-258-3930** if you have questions. Learn more about the Nevada Source Water Assessment Program at **ndep.nv.gov/water/source-water-protection**.

More About Your Source Water

All water originates from a source. Sources for both tap water and bottled water include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves minerals and—in some cases—other contaminants, and can pick up substances resulting from the presence of animals or from human activity.

Tap water as well as bottled water may reasonably be expected to contain at least small amounts of some contaminants—any substances that are not H_2O. It's important to understand that the presence of contaminants does not necessarily indicate that water poses a health risk—particularly in light of claims made by some home water-treatment companies and reports about water quality or the environment.

Before the Las Vegas Valley Water District delivers your tap water, it undergoes a multistage treatment process. We test your water rigorously to ensure it meets strict Safe Drinking Water Act standards. Our goal is to effectively treat and manage contaminants that may be present in source (untreated) water, including:

- **Microbial contaminants** such as viruses and bacteria that may come from wastewater discharges or animal wastes from urban or agricultural runoff;
- **Inorganic contaminants** such as salts and metals that can occur naturally or result from industrial or domestic wastewater discharges, farming or mining;
- **Pesticides and herbicides** that may come from urban stormwater runoff from agricultural and residential uses;
- **Organic chemical contaminants** including synthetic or volatile organic chemicals that are by-products of industrial processes and can come from gas stations, industrial discharges and stormwater runoff;
- **Radioactive contaminants** that can occur naturally or as a result of industrial activities.

To ensure tap-water safety, EPA regulations limit the amount of certain contaminants in water provided by public water systems. Learn more by calling the EPA Safe Drinking Water Hotline at **800-426-4791** or visit the Nevada Division of Environmental Protection website at **ndep.nv.gov/water**.

Food and Drug Administration regulations establish limits for contaminants in bottled water, which must provide similar protection for public health.

Lead and Copper Education Notice

The Las Vegas Valley Water District's water infrastructure does NOT contain lead service lines. The state of Nevada and the EPA require public education for lead and copper, and the Water District monitors for both.

Your water meets state and federal requirements for lead, but if present at elevated levels, lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The Water District is responsible for providing high-quality drinking water but cannot control the variety of materials used in home plumbing components. Homes built before 1986 are more likely to have lead-based plumbing components.

When your water has been sitting for several hours, minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your tap water, have your water tested by a private laboratory. For more information, call the EPA Safe Drinking Water Hotline, **800-426-4791**, or visit **epa.gov**.

In December 2021, the U.S. EPA took a series of actions to improve the Lead and Copper Rule that are intended to better protect families and communities in years to come, particularly those that have been disproportionately impacted by lead in drinking water. Learn more about focus areas, including additional tap sampling and lead service line replacements, at **epa.gov**, and depend on your Water Quality Report to keep you informed.

Make It Taste Great!

It's a fact: Las Vegas has **hard water**, thanks to our primary water source, the mineral-rich Colorado River. Naturally abundant, harmless calcium and magnesium dissolve into river flows, and a bit of that taste may remain. But your hard water (approximately **265 parts per million** or **15 grains per gallon**) poses NO health risk and meets ALL water-quality standards.

Home water-treatment systems aren't necessary but may improve taste and hardness. Have questions? Contact the Southern Nevada Water Authority for a **free** Consumer Reports® filter buying guide and fact sheets (**snwa.com**). Here are a few **easy tips** to make water taste great:

- **CHILL:** Refrigerate a pitcher of tap water to boost flavor and zap chlorine perceptions.
- **FLAVOR:** Add a citrus slice for zest.
- **FILTER:** Try an activated carbon filter, like those in carafe systems.
- **MAINTAIN:** If you have an in-home filtration system, follow its recommended maintenance schedule, including filter replacement.

LAS VEGAS VALLEY WATER DISTRICT
1001 S. Valley View Blvd.
Las Vegas, NV 89153

Inside:
Rely on your water—
the 1 place
it matters most

2022 Water Quality Report

WATER MATTERS: Learn More!

Las Vegas Valley Water District
Website, Report Water Waste **lvvwd.com**
Customer Care **702-870-4194**
Water Quality **702-258-3215**
Public Information **702-258-3930**

Conservation Incentives and Coupons (SNWA)
Website **snwa.com**
English **702-258-SAVE (7283)**
En español **702-258-AGUA (2482)**

Environmental Protection Agency
Website **epa.gov**
Safe Drinking Water Hotline **800-426-4791**

Nevada Division of Environmental Protection
Website **ndep.nv.gov/water**
Bureau of Safe Drinking Water **775-687-9521**

Getting Involved
Open, public meetings of the LVVWD Board of Directors are held at 9 a.m. on the first Tuesday of each month at the Clark County Government Center, 500 S. Grand Central Pkwy. Agendas are posted at least three days before each meeting on **lvvwd.com.** Other questions? Email us via the **lvvwd.com** "Contact Us" link or send mail to:

Las Vegas Valley Water District
Public Services Department
1001 S. Valley View Blvd., MS 780
Las Vegas, NV 89153

LVVWD Board of Directors
Marilyn Kirkpatrick, President
James Gibson, Vice President

Justin Jones
William McCurdy II
Ross Miller
Michael Naft
Tick Segerblom

John J. Entsminger, General Manager

Noticia en Español
Este reporte contiene información muy importante acerca de la calidad del agua. Para recibir una copia en español, llama al **702-258-3838** o visita **lvvwd.com**.

Please recycle.

FPO FSC logo

OUR MISSION: The Las Vegas Valley Water District's mission is to provide world class water service in a sustainable, adaptive and responsible manner to our customers through reliable, cost-effective systems.

Appendix B

Maps

McCarran International Airport Vicinity Map

Clark County Department of Aviation
ERP-GIS

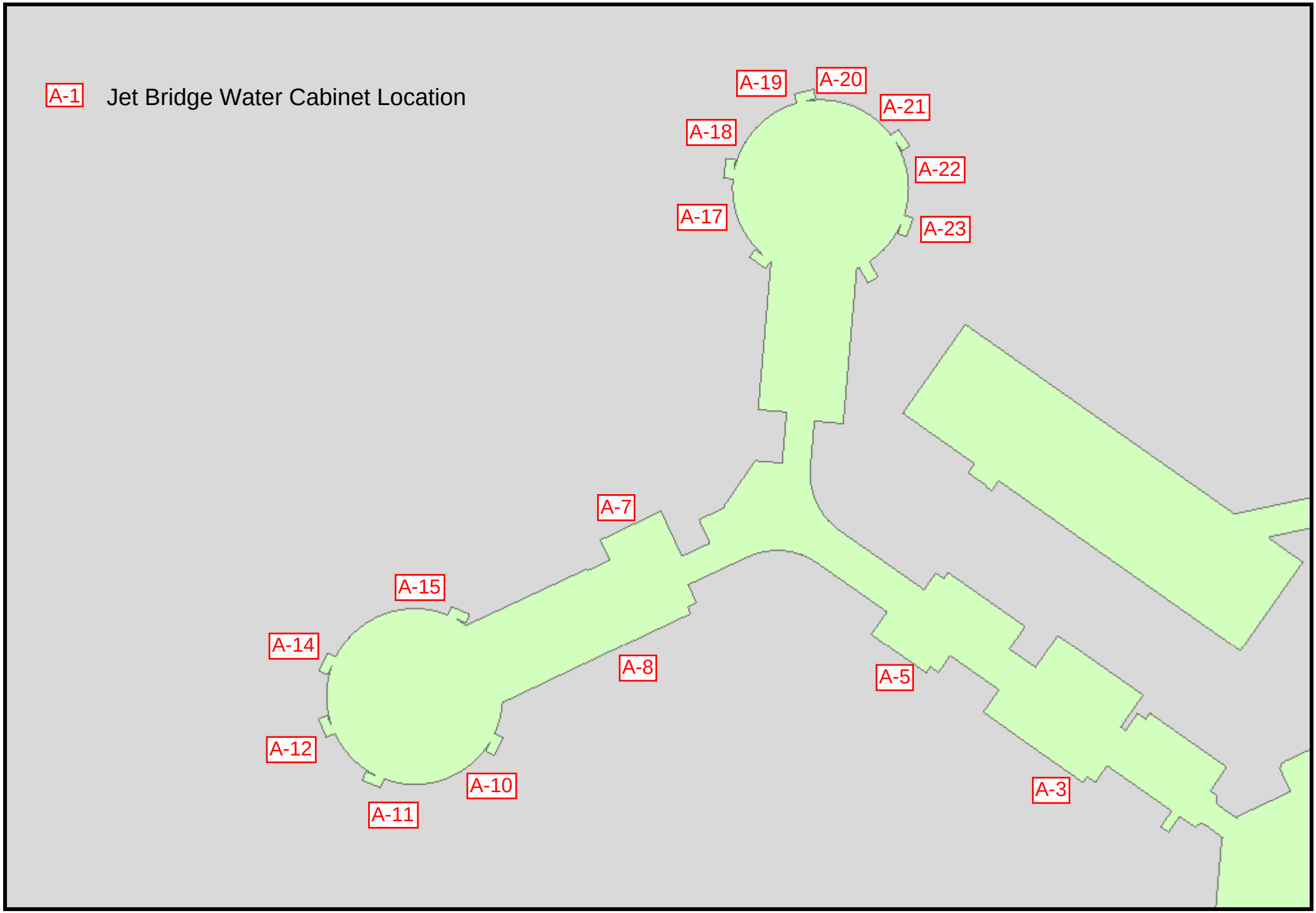
Major Streets

Storm Channel Large
Response Intercept

Date: 8/24/2018
Path: H:\GIS\Projects-18\MISC\MISC-008\Vicinity Map3.mxd

Note: The information portrayed is for display purposes only.
No liability is assumed as to the accuracy of the data delineated hereon.

RAMPART
CHARLESTON
RANCHO
MARTIN L KING
UP RR
FREMONT
PECOS
SAHARA
PARADISE
INDUSTRIAL
MCLEOD
LAMB
DESERT INN
SPRING MOUNTAIN
Flamingo Wash
BUFFALO
FLAMINGO
VALLEY VIEW
MARYLAND
15
FORT APACHE
DURANGO
TROPICANA
FRANK SINATRA
JE NEWTON
EASTERN
SIENNA
BOULDER
BROADBENT
515
RUSSELL
LAS
Duck Creek Wash
RAINBOW
215
JONES
WARM SPRINGS
WINDMILL
DECATUR
LAS VEGAS
BERMUDA
BLUE DIAMOND
DEAN MARTIN
PEBBLE
SILVERADO RANCH
ST ROSE
GREEN VALLEY
HORIZON RIDGE
UP RR/HENDERSON SPUR
SUNSET
VALLE VERDE
STEPHANIE
95
WIGWAM
GIBSON
LAKE MEAD
PASEO VERDE
160
NEVADA



A-Gates

Jet Bridge Water Cabinet Location Map

1:1,332

0 0.0075 0.015 0.03 mi

0 0.0125 0.025 0.05 km

May 1, 2020

Note: The information portrayed is for display purposes only. No liability is assumed as to the accuracy of the data delineated hereon.

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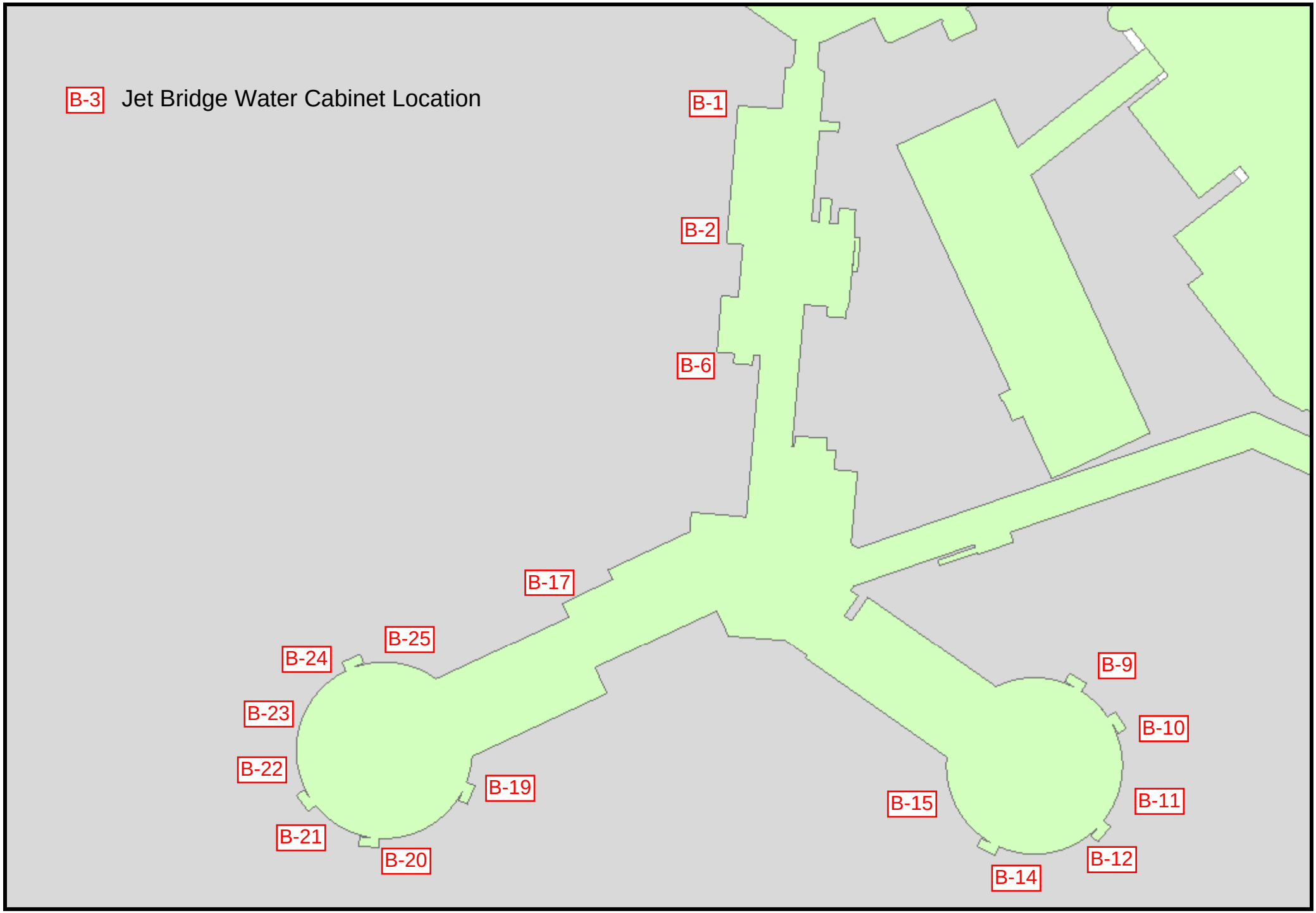


B-Gates

Jet Bridge Water Cabinet Location Map

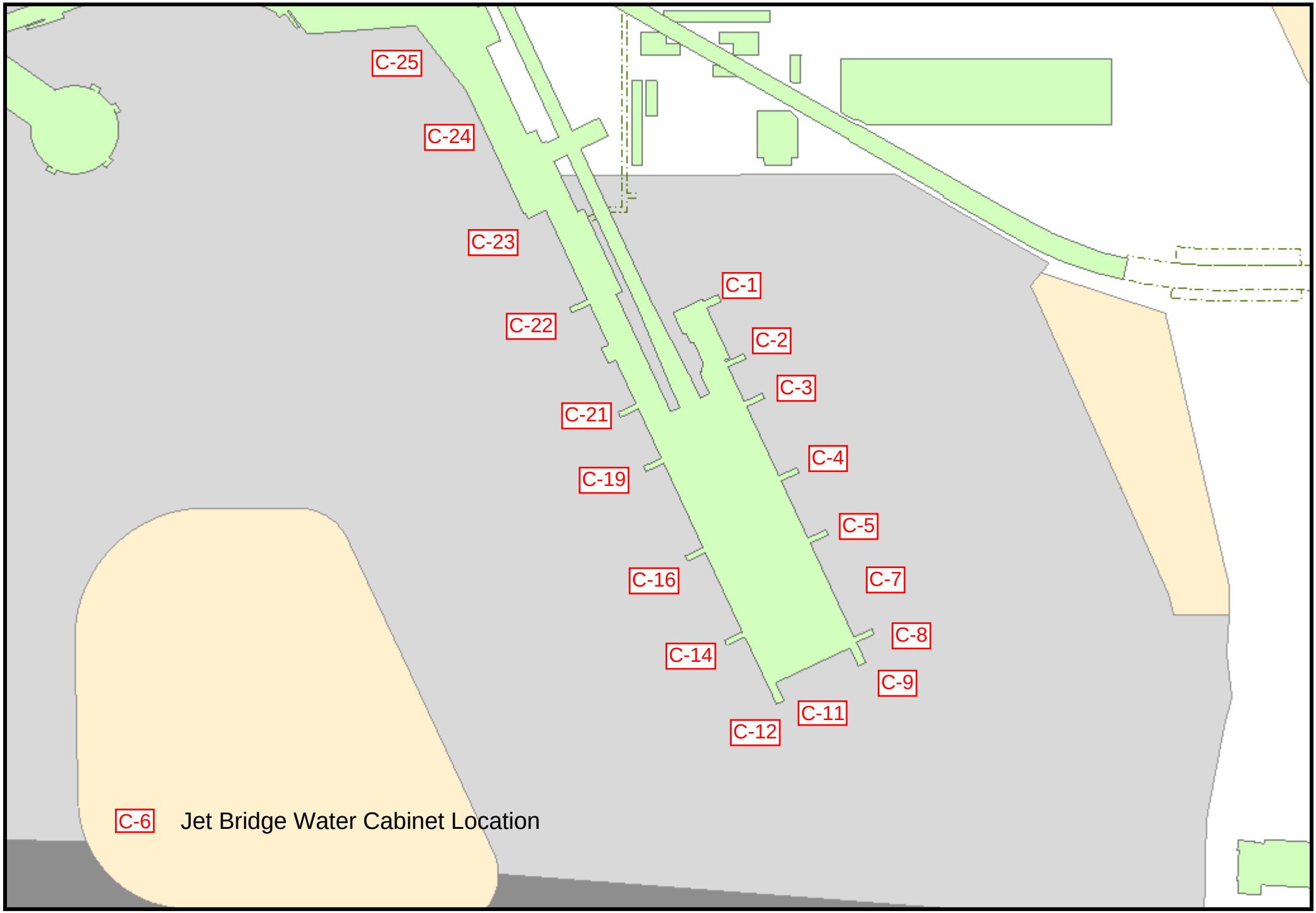
1:1,332

0 0.0075 0.015 0.03 mi

0 0.0125 0.025 0.05 km

May 1, 2020

Note: The information portrayed is for display purposes only. No liability is assumed as to the accuracy of the data delineated hereon.



C-Gates

Jet Bridge Water Cabinet Location Map

1:2,664

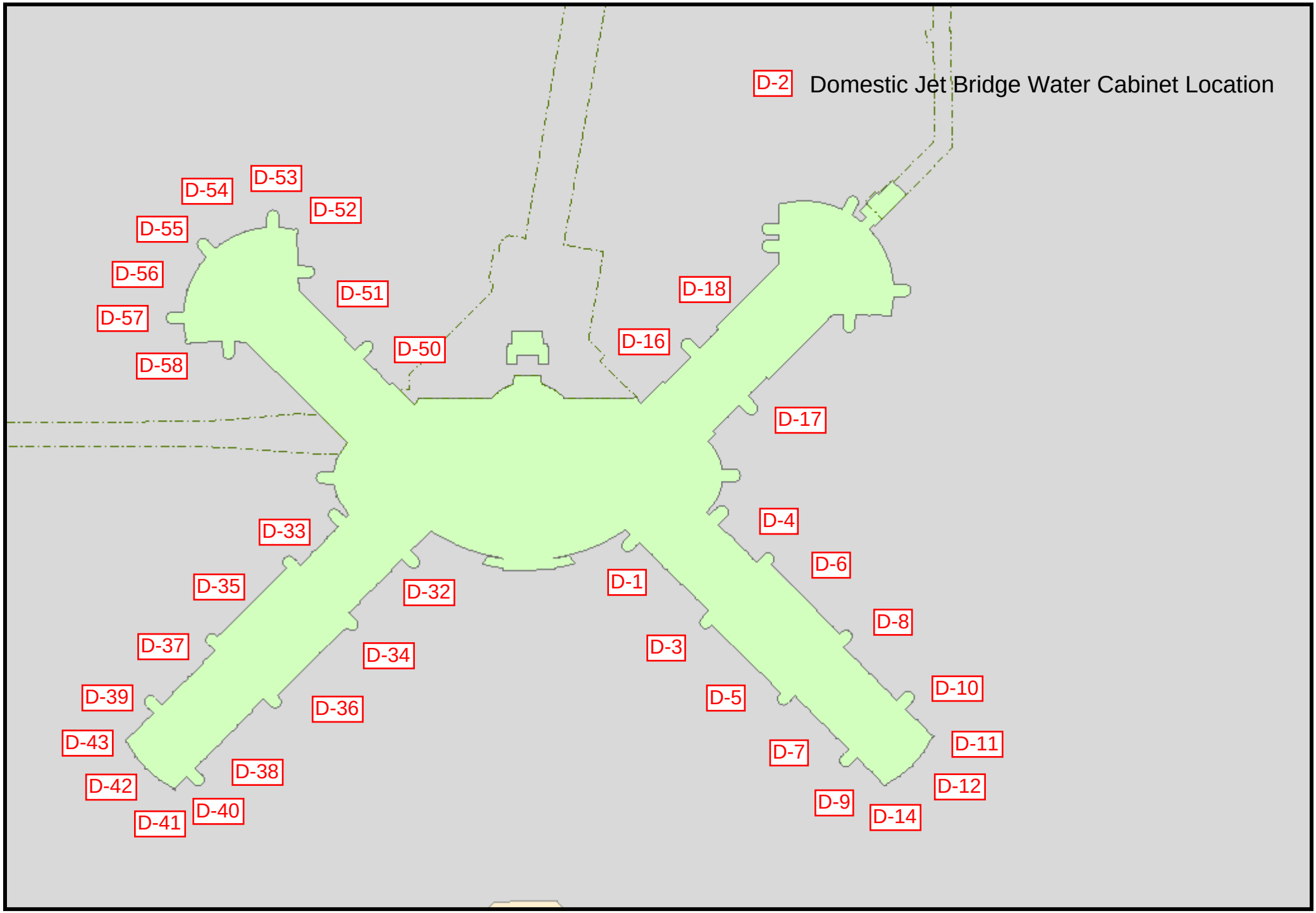
0 0.0175 0.035 0.07 mi

0 0.0275 0.055 0.11 km

May 1, 2020

Note: The information portrayed is for display purposes only. No liability is assumed as to the accuracy of the data delineated hereon.

N



D-Gates - Domestic

Jet Bridge Water Cabinet Location Map

1:2,664

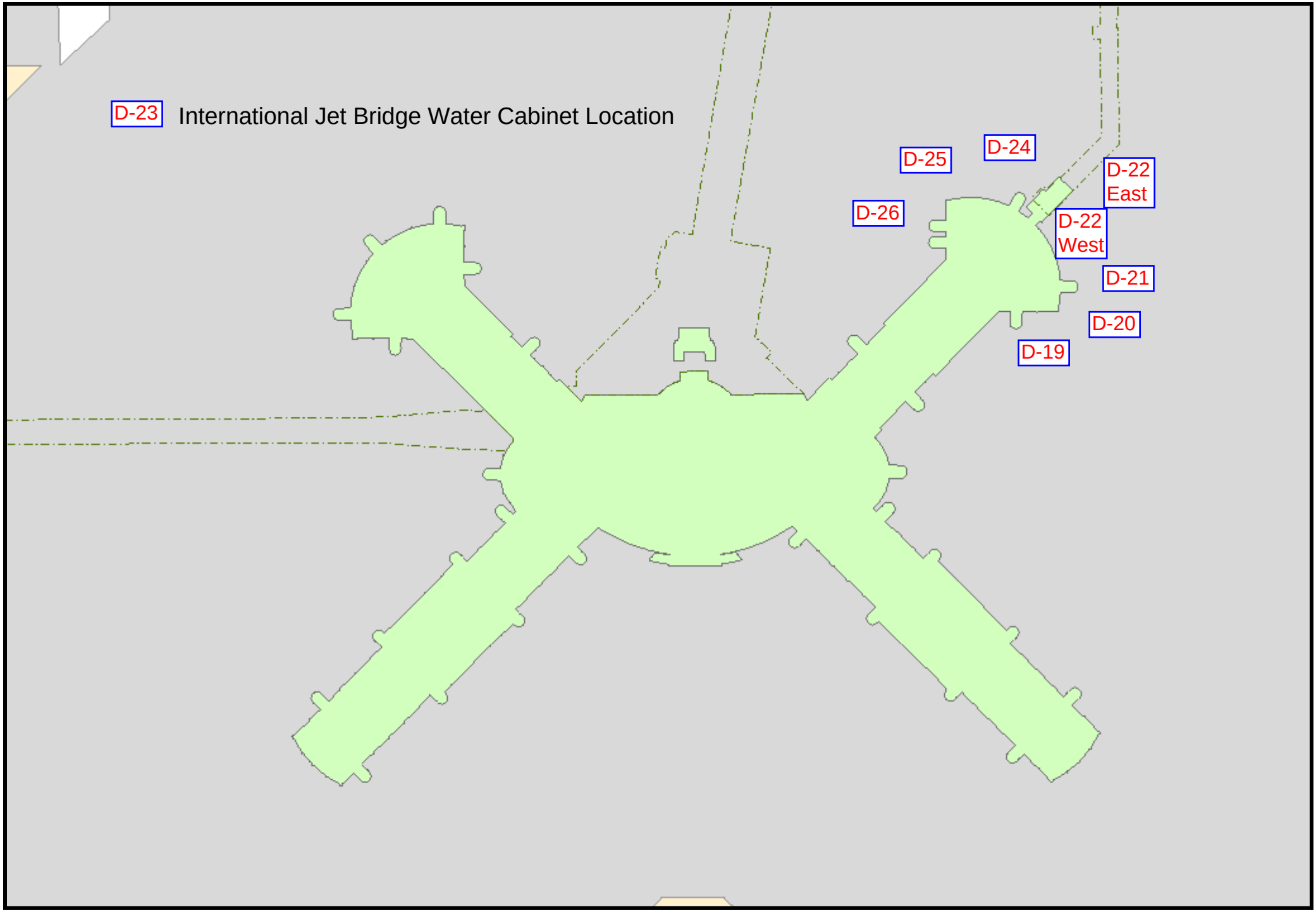
0 0.0175 0.035 0.07 mi

0 0.0275 0.055 0.11 km

May 1, 2020

Note: The information portrayed is for display purposes only. No liability is assumed as to the accuracy of the data delineated hereon.

N



D-Gates - International

Jet Bridge Water Cabinet Location Map

1:2,664

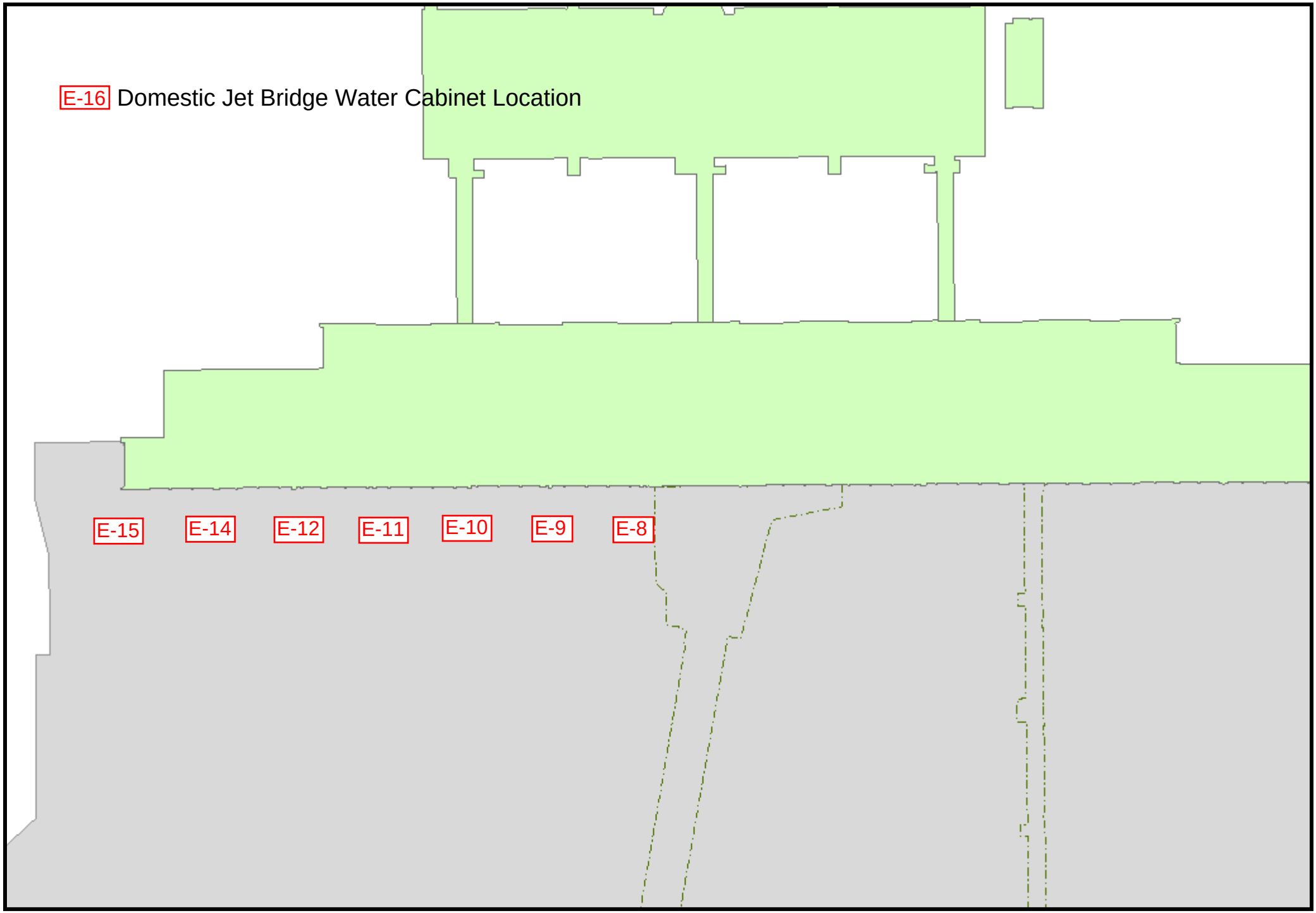
0 0.0175 0.035 0.07 mi

0 0.0275 0.055 0.11 km

May 1, 2020

Note: The information portrayed is for display purposes only. No liability is assumed as to the accuracy of the data delineated hereon.

N



E-Gates - Domestic

Jet Bridge Water Cabinet Location Map

1:2,664

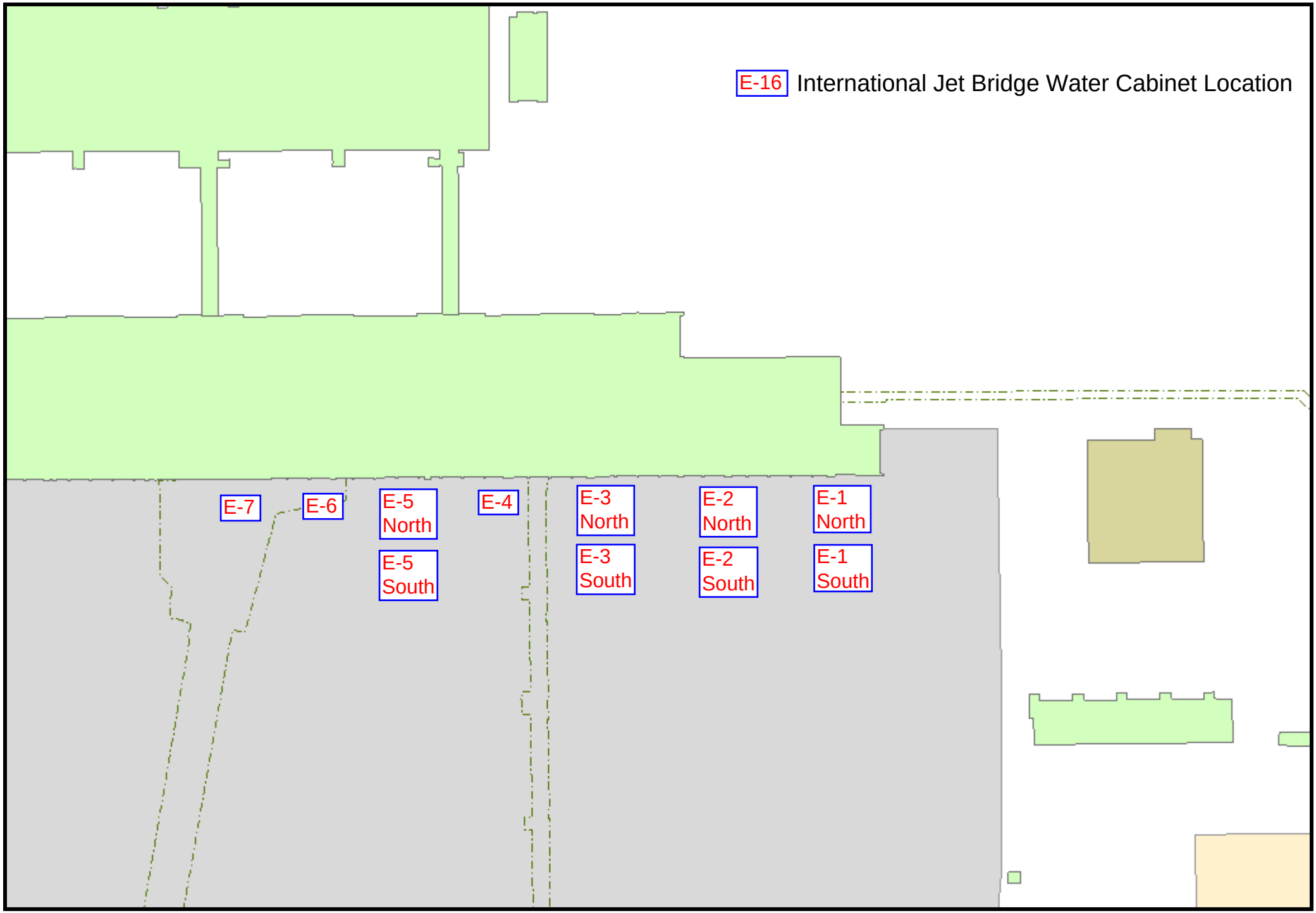
0 0.0175 0.035 0.07 mi

0 0.0275 0.055 0.11 km

May 1, 2020

Note: The information portrayed is for display purposes only. No liability is assumed as to the accuracy of the data delineated hereon.

N



E-Gates - International

Jet Bridge Water Cabinet Location Map

1:2,664

0 0.0175 0.035 0.07 mi

0 0.0275 0.055 0.11 km

May 1, 2020

Note: The information portrayed is for display purposes only. No liability is assumed as to the accuracy of the data delineated hereon.

N

Jet Bridge PWC Disinfection Port Location

D26
D25
D24
D22N
D22S
D21
D20
D19

McCarran International Airport

D-Gates - International

Jet Bridge PWC Disinfection Port Map

1:2,664

0 0.0175 0.035 0.07 mi

0 0.0275 0.055 0.11 km

May 1, 2020

Note: The information portrayed is for display purposes only. No liability is assumed as to the accuracy of the data delineated hereon.

N

Jet Bridge PWC Disinfection Port Location

E7

E5 & E6

E3 & E4

E1 & E2

E-Gates - International

Jet Bridge Water Cabinet Location Map

1:2,664

0 0.0175 0.035 0.07 mi

0 0.0275 0.055 0.11 km

May 1, 2020

Note: The information portrayed is for display purposes only. No liability is assumed as to the accuracy of the data delineated hereon.

N

Appendix C

Inspection Checklists

DRINKING WATER QUALITY CONTROL PLAN
DAILY-WEEKLY INSPECTION CHECKLIST

Gate # _____ **Month:** _____

Location: _____ **Airline/Tenant:** _____ **Year:** _____

Place any comments in the section below table. Keep records on file at the facility. If there are leaks or other damage, call the Airport Control Center at 702-261-5125

	Date																														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Initials of employee doing inspection																															
Enter a "Y" in each box if no problem is found that day. Enter an "N" if there is a problem. If you enter an "N" explain the problem and corrective actions taken below																															
DAILY CHECKLIST																															
Cleanliness of PWC																															
Coupling and dust cap in place and in good condition																															
Cleaning of coupling and dust cap																															
Supply hose flushed at least once each day (24 hours)																															
Appearance / Smell of potable water satisfactory																															
WEEKLY CHECKLIST																															
Cleanliness of PWC																															
Condition of coupling																															
Condition of dust cap																															
Condition of cabinet, lockable doors and handle mechanisms																															
Hose condition																															
Disinfection of fill point connector																															
Free chlorine / residual chemical test (if applicable)																															
Any other damage or deterioration of equipment																															
Comments/Repairs/Notes (Attach additional sheets if necessary)																															

Facilities SOP

	Facilities Clark County Department of Aviation	Document ID: Superintendent:
Page # 1 of 3	SOP Title: Potable Water Cabinet Water Line Disinfection Procedure	Date:

Purpose:

Airports, airlines, and other members of the airport community are partners in addressing water quality events that affect airports. The Clark County Department of Aviation (DOA) can provide an invaluable service to airlines and other tenants by confirming that proper procedures and sanitation practices are continuously followed to ensure the safety of water that is used for drinking and food processing and preparation. It is therefore essential that potable water lines are disinfected and that airport partners adhere to applicable requirements in order to prevent drinking water quality events.

A drinking water quality event is one in which consuming the water presents a potential or certain risk to public health. Once airlines are informed of an event, they can make operational decisions on whether to stop boarding water from that location and take measures to protect the health of passengers and crew on any aircraft that may be affected by the water in question.

Scope:

To provide periodic cleaning, disinfection, and flushing of the water lines after the backflow device feeding water to the jet bridge Potable Water Cabinets (PWCs) including the PWC hoses and aircraft connection nozzles. The subsequent water sampling and testing must provide for negative results for the presence of constituents listed on the Sampling Schedule in the Drinking Water Quality Control Plan. These procedures may also be used for new and re-introduced water lines that require disinfection and testing prior to being put into use.

1. The Airport Environmental Specialist is the designated water treatment advisor (hereafter referred to as WTA) and shall review and approve the procedures and schedules prior to initiation of work.
2. Upon completion of cleaning, chlorination, and flushing of the PWCs, the WTA will collect water samples for bacteriological tests. Based on the results of the analytical laboratory tests, the WTA will provide written notification of a satisfactory or an unsatisfactory result which would require rechlorination of the water system lines.

DOA Facilities' Responsibilities:

Only properly trained personnel will utilize the appropriate equipment and materials for the disinfection of PWC water lines. Throughout the cleaning, disinfection, and flushing of the PWCs, warning signs shall be posted and PWC doors locked at each location for the duration of the entire disinfection process.

1. Adequate notice must be provided to DOA Ramp Scheduling at 702-261-3515 and the WTA prior to disinfection activities and in turn notify them when the disinfection activities are complete. In addition, if the PWC disinfection maintenance process was the only reason for the jet bridge to be taken out of service, the technician shall notify the Airport Control Center and Ramp Control

when the maintenance is completed and let them know that the jet bridge can be placed back in service.

2. Sampling and testing should be scheduled to take place following disinfection activities to verify the efficacy of the disinfection process.

Disinfection (Chlorinating) Agent:

Clorox® (EPA Reg. No. 5813-114) active ingredient sodium hypochlorite 6.05% is authorized for use as an approved disinfectant to mitigate the potential proliferation of bacteria in potable water lines. DOA personnel may use this product provided that the proper PPE is worn, disinfectant concentrations are mixed properly, and the procedures outlined below are strictly followed.

Disinfecting Solution Concentration Mixing Guide (~200 parts per million)	
Water	**Chlorine Bleach (Strength 5.25-6.25%)***
5-Gallon Bucket	1/2 cup
55-Gallon Barrel	5 cups

* Contact the WTA for alternative proportioning guidance if the chlorine bleach is not within the range listed in the table

Preliminary Preparation Procedure:

1. During the any maintenance or repair activities, care shall be taken to keep the inside of pipes, etc., as clean as possible.
2. A suitable service cock or valve upgradient shall be added to the PWC water supply line just after the backflow and must be utilized to introduce the disinfecting agent into the water lines. The line(s) to be treated shall be isolated from the rest of the distribution system with cross-connection control devices in conjunction with ball valves or other appropriate isolation devices.
3. After any maintenance, repairs, or pressure tests and before chlorination, each fixture or outlet shall be flushed until the flow shows only clear water.

Disinfectant Preparation Procedure:

1. Chlorine bleach loses potency quickly after opening if not stored correctly. Always procure new jugs of bleach from the DOA Warehouse prior to disinfection activities.
2. Fresh water for the disinfection solution can be obtained from any of the nearby jet bridge PWC water lines or other facility water spigots, provided there is no evidence of adverse water quality.
3. The disinfectant solution should be mixed according to the measurements outlined in the Disinfecting Solution Concentration Mixing Guide table above and appropriate PPE shall be use at all times while mixing and handling. Fresh disinfectant solution should be mixed prior to following the treatment procedures outlined below.
4. Alternative disinfectants must be approved by the WTA in writing and include a new Solution Concentration Mixing Guide and any modifications to the procedures listed in this document.

Facilities SOP

Treatment Procedure:

1. Post warning signs and lock the PWC doors prior to beginning any disinfection activities begin. Turn off / close the #1 Shut Off Valve (SOV) at the backflow prevention device or the main water supply valve feeding the backflow preventer prior to introduction of the chlorinated water. This condition must be maintained throughout the disinfection period unless the technician is present and working in the cabinet.
2. Remove the nozzle cap and open the valve on the aircraft nozzle to allow chlorinated water to be pumped throughout the entire length of the water line being treated, while simultaneously pushing the untreated water out of the line.
3. Using injection equipment approved by the WTA, the disinfectant shall be injected through an approved point of connection after the buildings backflow preventer supplying the PWC at a slow, even, continuous rate until a test at the farthest outlet shows chlorine residual concentration of at least 200-ppm using chlorine test strips or other measuring method. Test all other outlets for consistency with the 200-ppm residual.
4. Cease injection pumping and close all outlets and valves to retain the chlorinated water. Clean nozzle and end cap with disinfectant at this time and again prior to water sampling activities.
5. After a three-hour disinfection period, the valves should be reopened, and the system flushed with fresh potable water until the chlorine residual is insignificant or equivalent to that of the facility water supply. Test strips should be used to ensure chlorine residual does not exceed facility water supply.
6. The waste chlorinated water may be discharged onto the ramp and into the nearby storm water trench drain, provided it will pass through an oil/water interceptor to be neutralized.
7. If retreatment is necessary, steps 1 through 4 must be repeated with an additional 3-hour treatment period.

Sampling and Testing:

1. Sampling and testing must be scheduled to take place between 9:00 a.m. and 3:00 p.m. on Monday through Wednesday to coincide with analytical laboratory hours of operation. Representative water samples will be collected by the WTA for appropriate analytical testing.
2. Analytical laboratory results will be compared to the applicable requirements for each gate based on the Sampling Schedule in the Drinking Water Quality Control Plan.

Approval:

Upon satisfactory results of analytical laboratory analyses, the WTA will provide written notification to the Facilities Superintendent. Notification of unsatisfactory results will be made verbally, with written follow-up as necessary. In that case, the disinfection shall be repeated until the standards are met. Tenants will be notified in accordance with the Drinking Water Quality Control Plan.

Change Record:

Rev	Date	Description	Revised By

Appendix D

Forms

Potable Water Sampling Program

FACT SHEET

Increased Sampling Frequency & Additional Testing Parameters

Why sample potable water?

A clean source of drinking water is critical to public health. Many pollutants in drinking water go unnoticed, as they have no taste, odor, or color. Only laboratory tests can determine if potentially harmful contaminants are present in the potable water system. In an effort to assist our airline partners in complying with state, federal and international safe drinking water requirements, the Clark County Department of Aviation (DOA) will be increasing our inspection and testing program for jet bridge potable water cabinets and drinking water quality.

Inspections & Operations

A collaborative effort is essential for a comprehensive inspection program

- Jet Bridge Potable Water Cabinet Housekeeping (Airline/Ground Handling Company Responsibility)
- Fill Point Inspections (Both DOA and Airline/Ground Handling Company Responsibility)
- Water Line Flushing (Both DOA and Airline/Ground Handling Company Responsibility)
- Water line system disinfection (DOA Responsibility)
- Backf low Preventer Testing (DOA Responsibility)
- Recordkeeping (Both DOA and Airline/Ground Handling Company Responsibility)
- Incident/Accident Reporting (Both DOA and Airline/Ground Handling Company Responsibility)
- Employee Training (Both DOA and Airline/Ground Handling Company Responsibility)

Maintenance

All records must be kept on file for a minimum of three years. Cleaning, disinfection, and replacement of filters, hoses, and fittings will be conducted by the DOA Facilities Division.

Analytical Laboratory Analyses

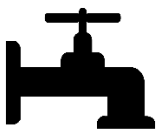
Regular monitoring of each parameter is necessary to ensure that safe water quality is Maintained. The following test schedule will begin in the fourth quarter of 2021.

International Gates (IDQP*)

- ✓ Total Coliforms – (Quarterly)
- ✓ Escherichia Coli (E-Coli) – (Quarterly)
- ✓ Enterococci – (Quarterly)
- ✓ Pseudonomas Aeroginosa – (Annually)
- ✓ Colony Count @ 22°C – (Annually)
- ✓ Colony Count @ 37°C – (Annually)
- ✓ Residual Chlorine – (Annually)
- ✓ pH – (Annually)

Domestic Gates (FDA)

- ✓ Total Coliforms – (Annually)
- ✓ Escherichia Coli (E-Coli) – (Annually)



Current and previous analytical laboratory reports are now available on the Team McCarran Portal

***Additional sampling if requested, will be the responsibility of the requesting party**

LAB REPORT DOWNLOAD INSTRUCTIONS

Analytical laboratory reports for potable water samples collected for previous quarters can be accessed through the Team McCarran Portal at http://team.mccarran.com, by clicking on the Potable Water Quality Reports tile hyperlink.

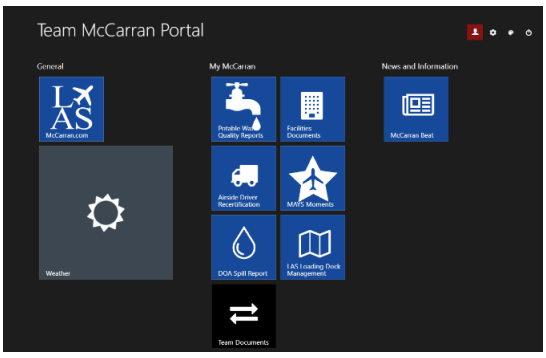
- Subfolders for the potable water reports are located on the left side of the Team Documents Page.
- Individual analytical laboratory reports can be viewed by clicking on the subfolders.
- Reports can also be downloaded from these subfolders.

Reliance Policy

Potable water samples are collected and tested as a courtesy to our airline partners. That relationship includes the exchange of information relating to analytical laboratory testing results for the potable water supply system at Clark County Department of Aviation facilities. Reliance or any use of this information by anyone other than our airline partners, for whom they were compiled, is prohibited. Neither the whole or any part of these analytical laboratory reports or any reference thereto may be included in any public document, circular, statement or published in any way without the prior written approval of the Clark County Department of Aviation.

If you have any questions, please contact:

Airport Environmental Specialist
Clark County Department of Aviation (LAS)
Safety, Environmental, Risk, Fleet & Sustainability
PO Box 11005, Las Vegas NV 89111-1005
Office: 702-261-5166



Clark County Department of Aviation
PO Box 11005
Las Vegas, NV 89111
702-261-5525 Fax: 702-261-5096 www.harryreidairport.com

CCDOA Env COC, Revised 02/2023

CHAIN OF CUSTODY RECORD

COC #: Page _____ of _____

Invoice Information	Report Information (if differs from invoice)	Project Information (where applicable)	Turnaround Time (TAT) Required
Company Name:	Company Name:		☐ **Regular TAT (5 business days)** Most analyses
Contact Name:	Contact Name:		**PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS**
Address:	Address:		**IF RUSH please specify date**
Phone:	Phone:		**Date Required:**
Email:	Email:		**Rush Confirmation #**

Laboratory Use Only

CUSTODY SEAL Y / N		COOLER TEMPERATURES			AVERAGE TEMP	INTEGRITY YES / NO
Present	Intact					
						Integrity Checklist By:

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO LABORATORY

Analysis Requested

	SAMPLE IDENTIFICATION	DATE SAMPLED (DD/MM/YY)	TIME SAMPLED (HH:MM)	MATRIX	# OF CONTAINERS SUBMITTED	FIELD FILTERED &PRESERVED	Lab Filtration Required		Potable Water: T. Coliforms / E-Coli. (P/A) (SM 9223B)	Potable Water: Enterococci (SM 9230D)	Potable Water: Pseudomonas Aeruginosa (IDEXX Pseudalert)	Potable Water: Colony Count 22° (SM 9215C)	Potable Water: Colony Count 37° (SM 9215C)	Potable Water: Total Residual Chlorine (HACH 8167)	Potable Water: pH (SM 4500 H+B)	VOCs (EPA 8260B)	TPH (EPA 8015M)	Ammonia (EPA 350.1)	Nitrate/Nitrite (EPA 300.0)	pH (SM 4500)	T. Phosphorus (Hach 8190)	TDS (EPA 2540C)	T. Inorganic Nitrogen (Calc.)					HOLD- DO NOT ANALYZE
1																												
2																												
3																												
4																												
5																												
6																												
7																												
8																												
9																												
10																												

Regulatory Requirements

COMMENTS

RELINQUISHED BY: (Signature/Print)	DATE: (DD/MM/YY)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (DD/MM/YY)	TIME: (HH:MM)	LABORATORY JOB #

Drinking Water Quality Control Plan - Training Log

Airlines and ground service providers must develop and be responsible for providing and documenting training programs for their employees. Specific training should be provided to the operators and must be recorded. A current list of qualified operators shall be maintained and available in each station manager's office.

Company: _____

Location: _____

Instructor's Name: _____

Instructor's Title: _____

Course Location: _____ Date: _____

Course Length: _____

Training should include at least:

- ✈ Airport Drinking Water Quality Control Plan
  - Regulator background
  - Potable water supply system description
  - Maps
- ✈ Hygienic principles
  - Personnel sanitary precautions
  - Cleaning equipment procedures
- ✈ Recordkeeping
  - Inspection checklists
  - Schedules
- ✈ Water servicing and water draining procedures
  - Water line flushing
- ✈ Safety and security
  - Unauthorized access
- ✈ Roles and responsibilities
  - Equipment
- ✈ Company policies and procedures

Attendee Roster: *(attach additional pages as necessary)*

No.	Name of Attendee	Badge Number
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Appendix E

Schedules

Potable Water Line Disinfection Schedule
LAS Domestic Gates

Jet Bridge PWCs	Location	Disinfection Schedule*	Notes
A Gates	A-3, A-5, A-7, A-8, A-10, A-11, A-12, A-14, A-15, A-17, A-18, A-19, A-20, A-21, A-22, A-23	To be coordinated with Facilities and Ramp Control	
B Gates	B-1, B-2, B-6, B-9, B-10, B-11, B-12, B-14, B-15, B-17, B-19, B-20, B-21, B-22, B-23, B-24, B-25	To be coordinated with Facilities and Ramp Control	
C Gates	C-1, C-2, C-3, C-4, C-5, C-7, C-8, C-9, C-11, C-12, C-14, C-16, C-19, C-21, C-22, C-23, C-24, C-25	To be coordinated with Facilities and Ramp Control	
D Gates - Domestic	D-1, D-3, D-4, D-5, D-6, D-7, D-8, D-9, D-10, D-11, D-12, D-14, D-16, D-17, D-18, D-32, D-33, D-34, D-35, D-36, D-37, D-38, D-39, D-40, D-41, D-42, D-43, D-50, D-51, D-52, D-53, D-54, D-55, D-56, D-57, D-58	To be coordinated with Facilities and Ramp Control	
E Gates	E-8, E-9, E-10, E-11, E-12, E-14	To be coordinated with Facilities and Ramp Control	

*** Disinfection should be coordinated to take place prior to sample collection**

Potable Water Line Disinfection Schedule
LAS International Gates

Jet Bridge PWC	Location	Quarterly Disinfection Schedule*				Notes
		1st	2nd	3rd	4th	
D-19	On Support Post for Jet Bridge at Gate D19	To be coordinated with Facilities and Ramp Control				
D-20	On Support Post for Jet Bridge at Gate D20	To be coordinated with Facilities and Ramp Control				
D-21	On Support Post for Jet Bridge at Gate D21	To be coordinated with Facilities and Ramp Control				
D-22N	On Support Post for Jet Bridge at Gate D22N	To be coordinated with Facilities and Ramp Control				
D-22S	Inside PWC at Support Post for Gate D22S	To be coordinated with Facilities and Ramp Control				
D-24	On Support Post for Jet Bridge at Gate D24	To be coordinated with Facilities and Ramp Control				
D-25	On Support Post for Jet Bridge at Gate D25	To be coordinated with Facilities and Ramp Control				
D-26	On Support Post for Jet Bridge at Gate D26	To be coordinated with Facilities and Ramp Control				
E-1	Inside Closet at Door #T3-E-L1-509A	To be coordinated with Facilities and Ramp Control				
E-2	Inside Closet at Door #T3-E-L1-509A	To be coordinated with Facilities and Ramp Control				
E-3	Hallway Adjacent to Door #T3-E-L1-400A	To be coordinated with Facilities and Ramp Control				
E-4	Hallway Adjacent to Door #T3-E-L1-400A	To be coordinated with Facilities and Ramp Control				
E-5	Hallway Adjacent to Door #T3-E-L1-312A	To be coordinated with Facilities and Ramp Control				
E-6	Hallway Adjacent to Door #T3-E-L1-312A	To be coordinated with Facilities and Ramp Control				
E-7	Recessed Area Adjacent to Door #T3-C-L1-390A	To be coordinated with Facilities and Ramp Control				

*** Disinfection should be coordinated to take place ahead of sample collection**

ANALYTICAL LABORATORY WATER TESTING PARAMETERS

Sample Locations	# of Gates	Parameters	Test Method	Sampling Frequency
A Gates (A3 - A23)	16	Total Coliforms E. Coli	SM-9223B SM-9223B	Annually
B Gates (B1 - B25)	17	Total Coliforms E. Coli	SM-9223B SM-9223B	Annually
C Gates (C1 - C25)	18	Total Coliforms E. Coli	SM-9223B SM-9223B	Annually
E Gates (E8 - E15)	7	Total Coliforms E. Coli	SM-9223B SM-9223B	Annually
D Gates East - Domestic (D1 - D18)	15	Total Coliforms E. Coli	SM-9223B SM-9223B	Annually
D Gates West - Domestic (D32 - D59)	22	Total Coliforms E. Coli	SM-9223B SM-9223B	Annually
International Gates Supplemental Sampling (E1 - E7 & D19 - D26)	19	Total Coliforms	SM-9223B	Quarterly
		Escherichia Coli (E-Coli)	SM-9223B	
		Enterococci	SM-9230B	
		Pseudonomas Aeroginosa	SM-9213E	Annually
		Colony Count @ 22°C	SM-9215B	
		Colony Count @ 37°C	SM-9215B	
		Residual Chlorine	Method 334.0	
		pH	Method 150.3	

Appendix F

Operations & Maintenance Manual

FMC

JET JET

POTABLE WATER

JF300

JETWAY SYSTEMS

1. Operation

A. Ensure the ball valve inside of the potable water cabinet is open.

B. Pull the service end of the potable water hose to the aircraft.

CAUTION: **DO NOT PULL HOSE BY THE NOZZLE OR BY THE HANDLE OF THE BALL VALVE. DO NOT ALLOW THE NOZZLE TO CONTACT OR DRAG ON THE GROUND.**

C. Remove the cap from the hose nozzle and inspect for any foreign material that could contaminate the water.

D. Open the ball valve (nearest the nozzle) to start the flow of water.

E. Flush the hose.

1. Flush the hose for at least two minutes prior to connecting to aircraft. (Flushing the hose will remove any stagnant water in the system.)

2. After flushing is complete, close the ball valve.

F. Remove the fill cap from the aircraft and connect the hose nozzle to the aircraft.

G. Reopen the ball valve.

H. When aircraft filling operation is completed, close ball valve and remove the nozzle from the aircraft.

I. Replace the nozzle cap and turn it clockwise to lock it.

J. Return the nozzle to the water cabinet prior to rewinding the hose.

CAUTION: **DO NOT PULL HOSE BY THE NOZZLE OR BY THE HANDLE OF THE BALL VALVE. DO NOT ALLOW THE NOZZLE TO CONTACT OR DRAG ON THE GROUND.**

H. Ensure the hose is clear for rewind.

NOTE: A snagged hose may cause the rewind motor to burn out.

1. Operation (Continued)

   I. Push the button on the control to start the hose rewind operation while using a glove to guide the hose as it rewinds. (This will ensure even stowage on the hose reel.)

   NOTE: If problems occur, release rewind button immediately. The reel can be rewound manually if the reel will not rewind when the rewind button is depressed.

   K. After the nozzle rewinds into the cabinet, close and secure cabinet doors.

   CAUTION: DO NOT DRIVE THE PASSENGER BOARDING BRIDGE UNLESS THE HOSE IS COMPLETELY AND PROPERLY STOWED.

2. Preventive Maintenance

   NOTE: Preventive maintenance must be performed and a record must be kept. Failure to keep accurate maintenance records may void the warranty.

   A. Quarterly

      (1) Replace the water filter (Replace sooner if local codes or conditions warrant).

      (2) Inspect the backflow preventer per local plumbing codes.

      (3) Inspect the entire system for leaks and damage.

      (4) Lubricate any and all grease zerks.

   B. Annually

      (1) For heated units, ensure the circuit breakers are turned on each Fall.

      (2) Clean the strainers in the pressure regulator and backflow preventer.

      (3) Lubricate the reel motor chain. Adjust if required.

2. Preventive Maintenance (Continued)

B. Annually (Continued)

(4) Clean the system.

a. Fill the entire potable water system from the backflow preventer to the nozzle with a solution of 100 PPM of pressure.
b. Flush with clean water. Clean system when replacing hoses.

3. Troubleshooting

A. Water Delivery System

(1) If little or no water flows out of the nozzle, check the following:
a. Inspect hoses for twists or kinks.
b. Verify water pressure at the terminal.
c. Ensure that all plumbing at the teminal endmanifold and the cabinet mounted ball valve is open.

(2) If the water has a strange taste:
a. Inspect for foreign growth in the system.
b. Clean system as describedin item (H) of the preventive maintenance section. (See page 3.)

(3) If there is no electrical power, check for power at the terminal disconnect and fuses.

B. Heating Systems (Heated systems only.)

WARNING: WHEN THE HEATED HOSE IS TURNED ON, THERE MUST ALWAYS BE WATER IN THE HOSE. SHOULD THE HOSE BE DRAINED OF WATER WHILE THE HEATED HOSE IS STILL ACTIVE, THE HOSE WILL MELT AND BE DAMAGED BEYOND REPAIR.

3. Troubleshooting (Continued)

B. Heating Systems (Heated systems only.)(Continued)

(1) If there is insufficient cabinet heat:
a. Check for power at the terminal disconnect and fuses.
b. Verify that the thermostats located at the terminal end and the cabinet are both set for 40 degrees F.
c. Ensure that the capillary bulb is taped securely to the potable water hose at the terminal end. (This bulb must be on the outside.)
d. Inspect for, and replace any dented or deformed thermostat bulbs.

(2) If there is insufficient hose heat:
a. Note the terminal end thermostat setting and turn the thermostat to 10 degrees F above ambient temperature.
b. Measure the voltage between two leads going from the terminal to the hose. The Voltage should be 277V.
c. Rectify the voltage if it is incorrect.
d. Return the thermostat setting to its former position.

(3) If there is still insufficient hose heat:
a. Check the hose power consumption. Power usage should be 25 watts/foot of hose. Isolation of the heater to ground should be infinite.
b. Replace the hose if the values are outside these parameters.

(4) If there is still insufficient cabinet heat:
a. Note the thermostat setting and turn the thermostat to 10 degrees above ambient temperature. The voltage across the leads to each heater should be 240V.
b. Replace the heater if 240V present.
c. Replace the thermostat if 240V not present.

4. Removal and Installation

A. For replacing the hose on the cable carrier system, turn off the water pressure at the terminal then see Chapter 4, Section 2, Paragraph 6.

4. Removal and Installation (Continued)

   B. To remove potable water cabinet:

      1. Turn off the water pressure at the terminal.

      2. Disconnect the electrical cable connectors and the water line at the rear of the cabinet.

      3. Remove the four mounting cap screws, and lift the cabinet off the mounting frame.

5. Procedure For Ordering Spare Parts

   A. Direct all spare parts orders to:

      Spare Parts Department
      FMC - JETWAY SYSTEMS
      1805 West 2550 South
      P.O. Box 9368
      Ogden, Utah 84409-0368

      Telephone: (801) 627-6600

      Telex: 3734431

      FAX: (801) 629-3474

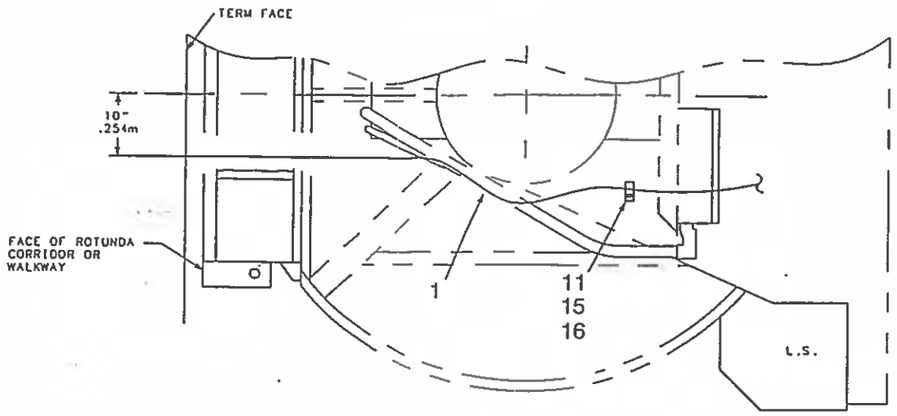
   B. Order all replacement or spare parts by using the correct JETWAY SYSTEMS part number, a description of the part, the serial number of the unit, and whenever possible a purchase order number.

FMC

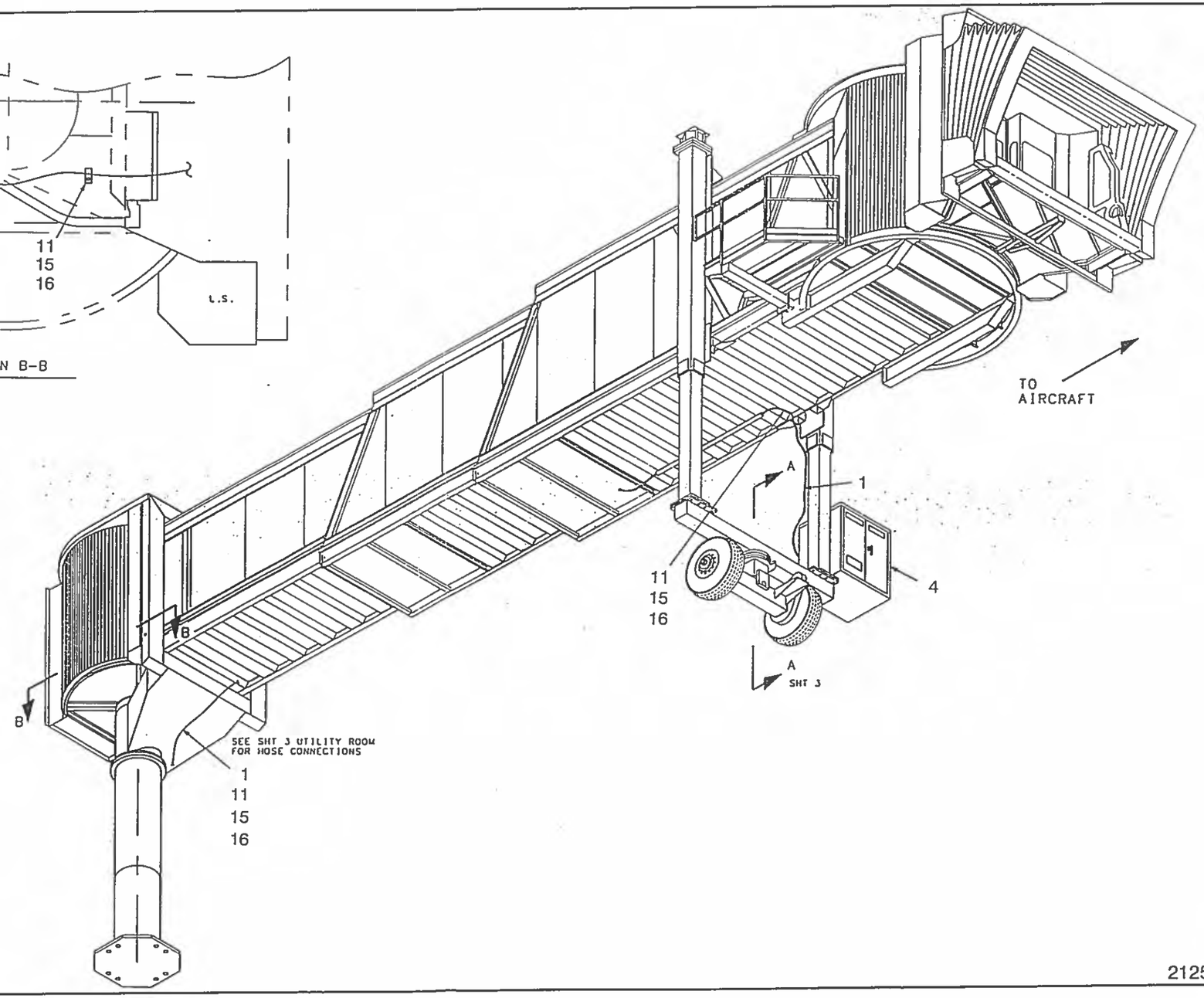
JETWAY SYSTEMS®

JETFLO™

JF300 Potable Water

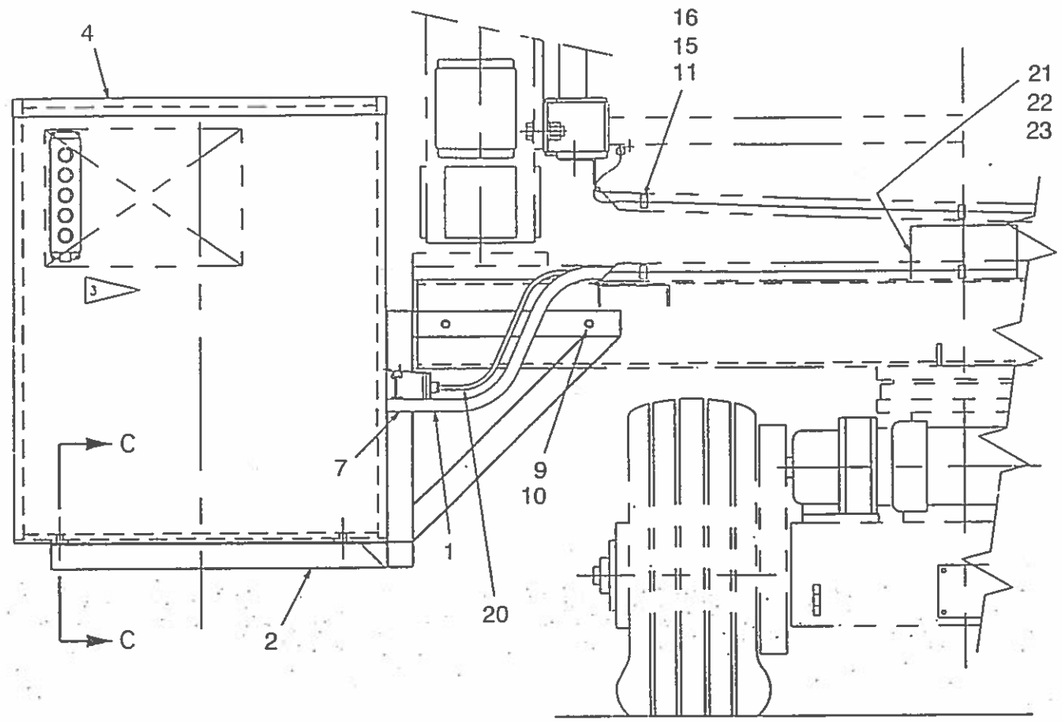


SECTION B-B

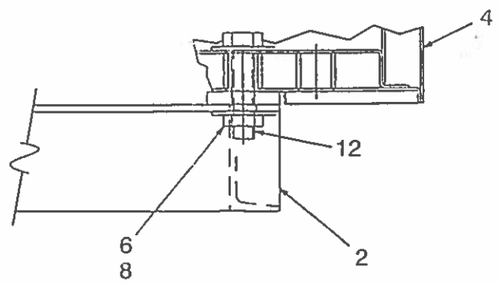


2125797 A

JF300 Field Installation

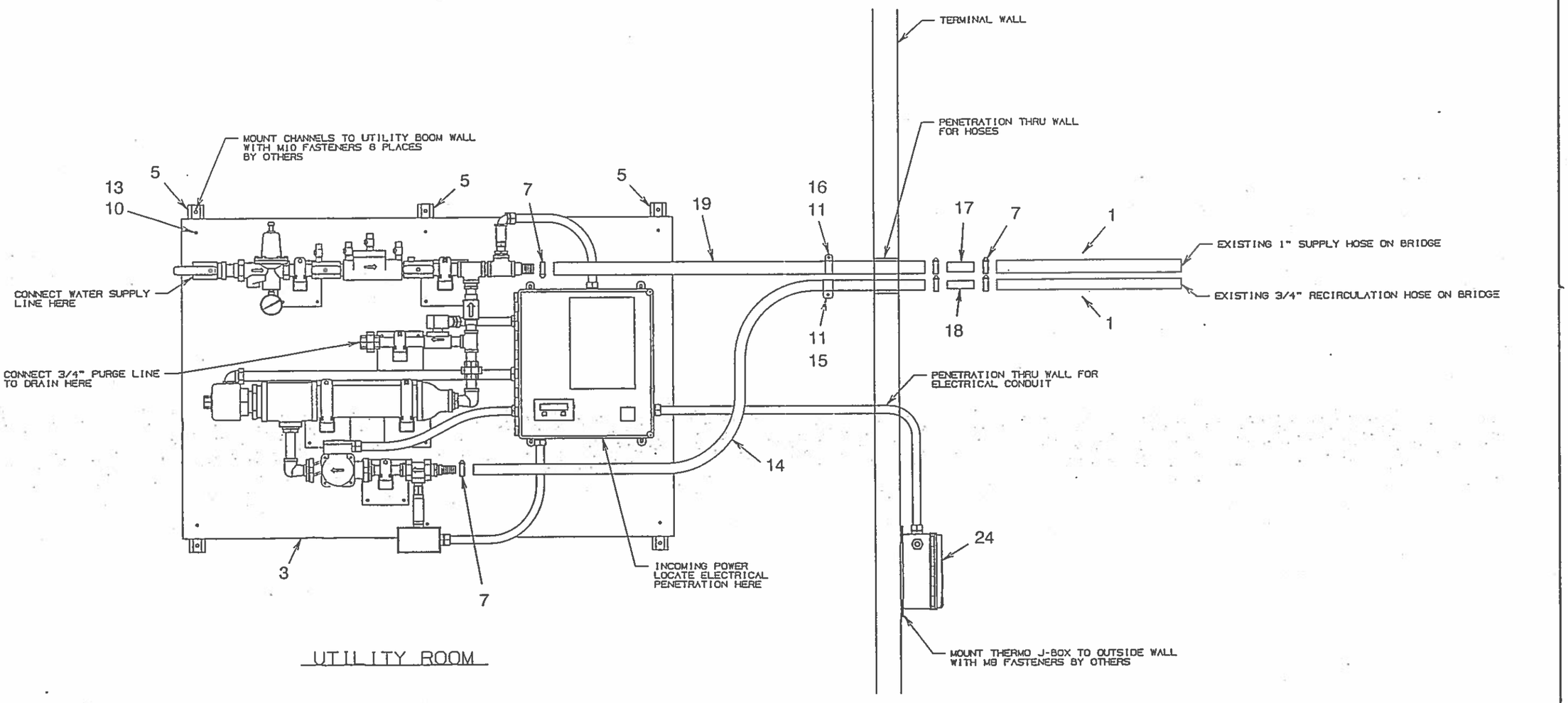


SECTION A–A
(SHT 1)



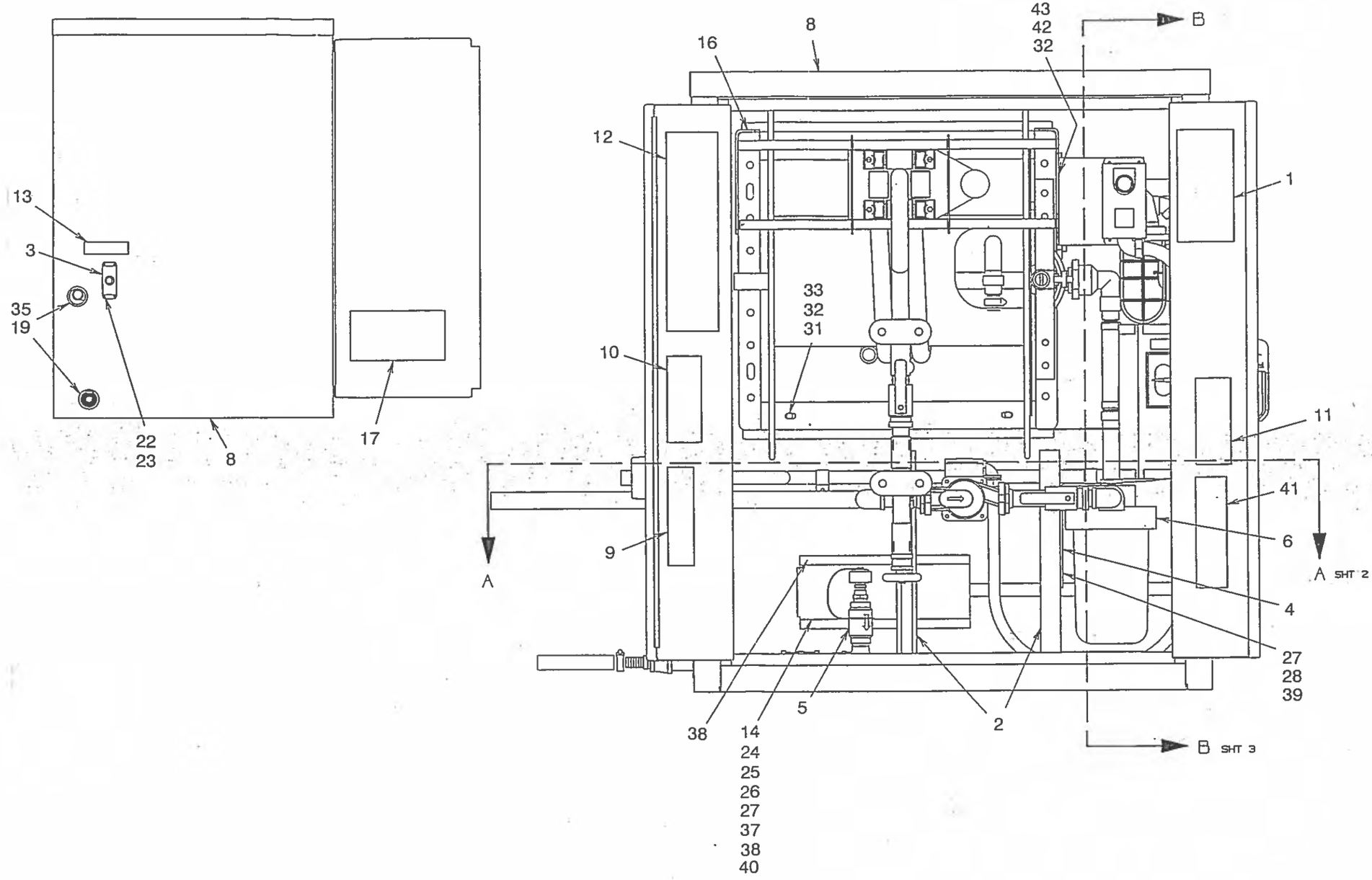
SECTION C–C

2125797 A



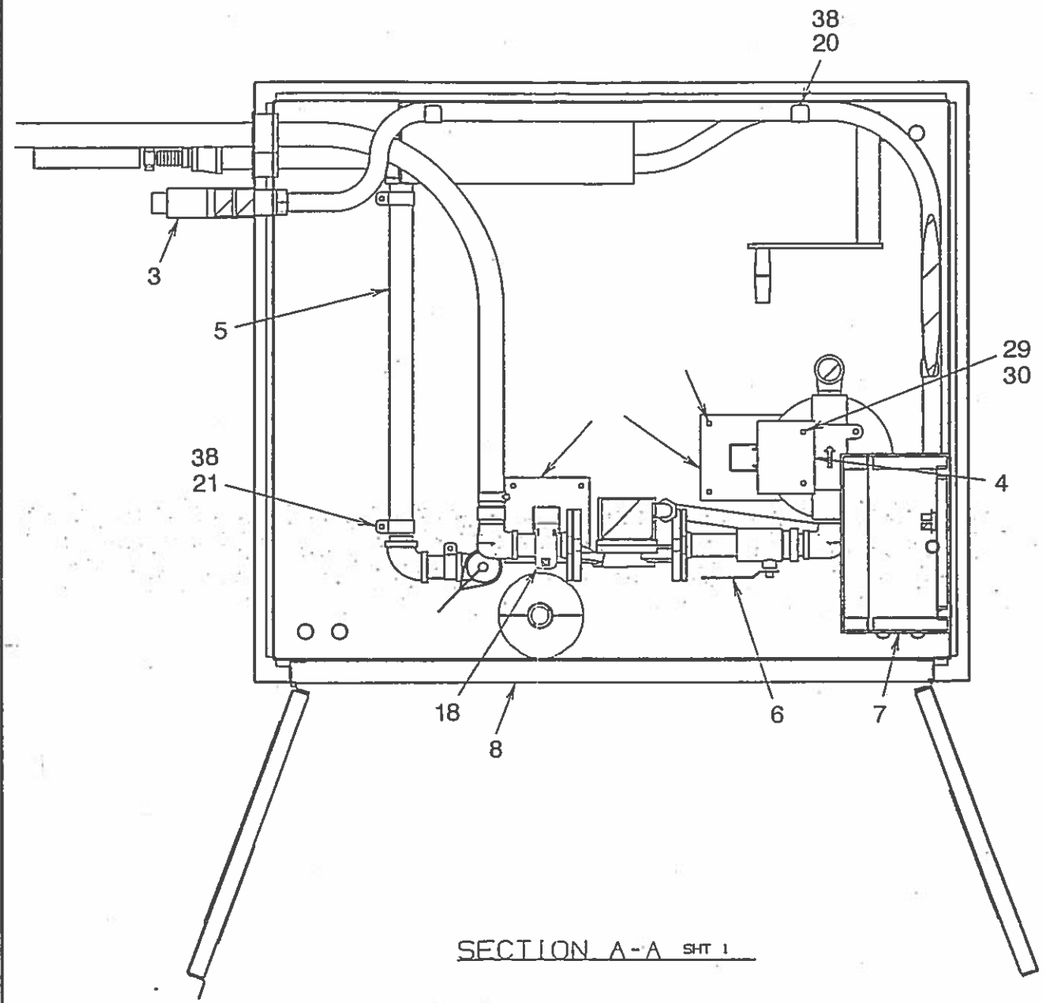
JF300 Field Installation (3633124 & 3633125)

FIG & IND NO.	AIRLINE PART NUMBER	PART NUMBER	DESCRIPTION AND MANUFACTURER	UNITS PER ASSY	USE ON CODE
1		2113608	SLV HOSE 50'0 DWG 2113608 ELASTOMER PRODUCTS	2	
2		3622364	FR MTG LS POTW DR COL PNT	1	
3		2125450	RECIRCULATION CMPNT ASSY POTW	1	
4		3632329	CB POTW CMPNT ASSY MALPENSA	1	
5		2125784	CHAN STRUT 1 5/8X3'2 P1000	2	
6		3611916	WSHR FLAT 5/8 SST	4	
7		3616092	CLP HOSE #12 5/8-1 1/4 DIA	8	
8		3616475	NUT M16 HEX JAM	4	
9		3616477	WSHR FLAT M10 SST	6	
10		3622195	SCR CAP M10X30MM HEX A2-70 SST	12	
11		3616768	SCR DRTPG M6X38MM HEXWSHR	32	
12		3616859	SCR CAP M16X65MM HEX GR8.8	4	
13		3616864	NUT M10 W/SPR (UNISTRUT)	6	
14		4160257	TBG PVC NYL 3/4X1.125X200'0 KURITEC K3130-12 KAMAN INDUSTRIAL TECHNOLOGY	A/R	
15		4060133	CLP PIPE 1 1/4 RBR INSUL	16	
16		4060220	CLP PIPE 1 RBR INSUL	16	
17		4070161	CONN HOSE 1 BRS GREAT WESTERN PLUMBING SUPPLY	1	
18		4070361	CONN HOSE 3/4 BRS	1	
19		4160199	TBG PVC NYL 1X1.375X200'0 KURITEC K3130-16	A/R	
20		4170688	CA 18AWG 4PR 300V NEWARK ELECTRONICS	A/R	
21		4060166	CONN CA .750-.880X1 T & B 2546 ROYAL WHOLESALE ELECTRIC	1	
22		4060208	RING SEALING 1 KAMAN INDUSTRIAL TECHNOLOGY	1	
23		4060088	LKNT 1 CND	1	
24		2125804	THERMO J BOX ASSY POTW JERRY'S PLUMBING SPECIALTIES	1	

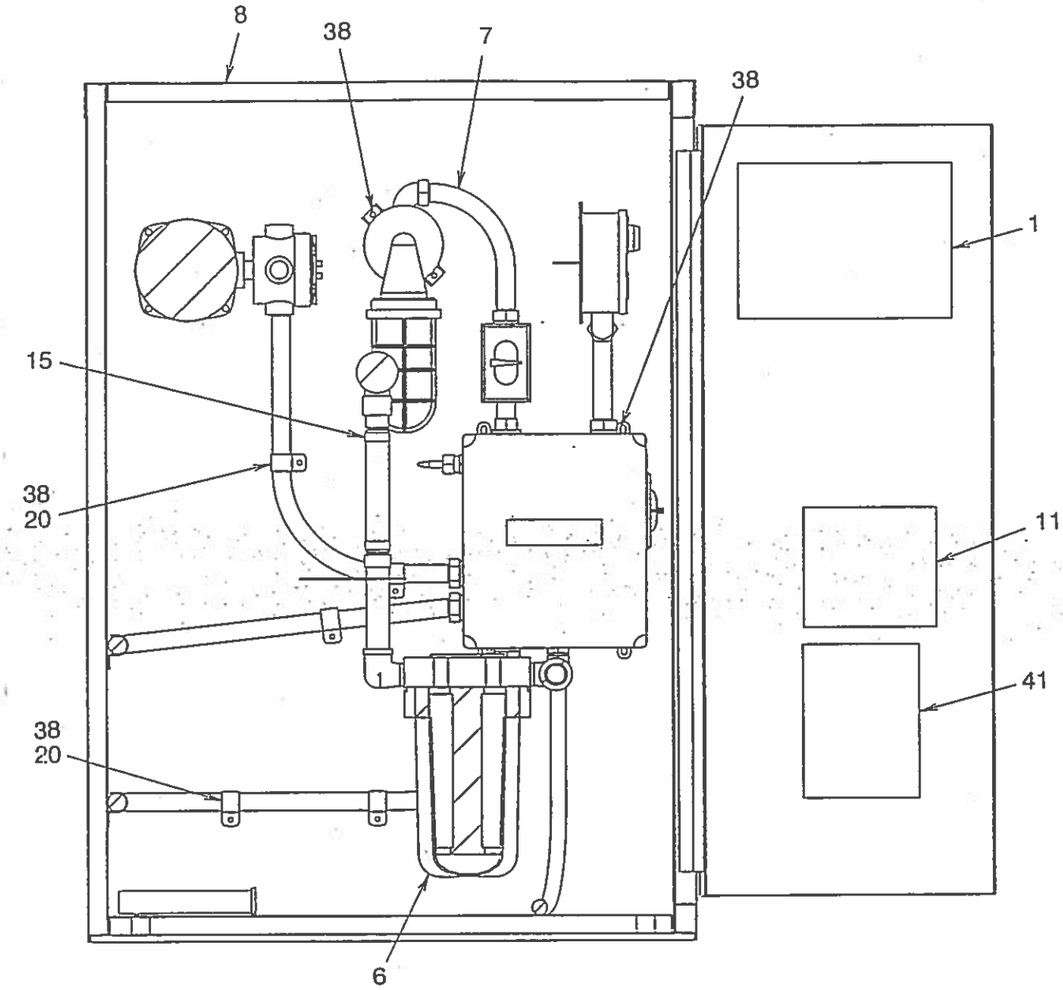


2125780 A

Cabinet Component Assembly



SECTION A-A SHT 1



SECTION B-B SHT 1

2125780 A

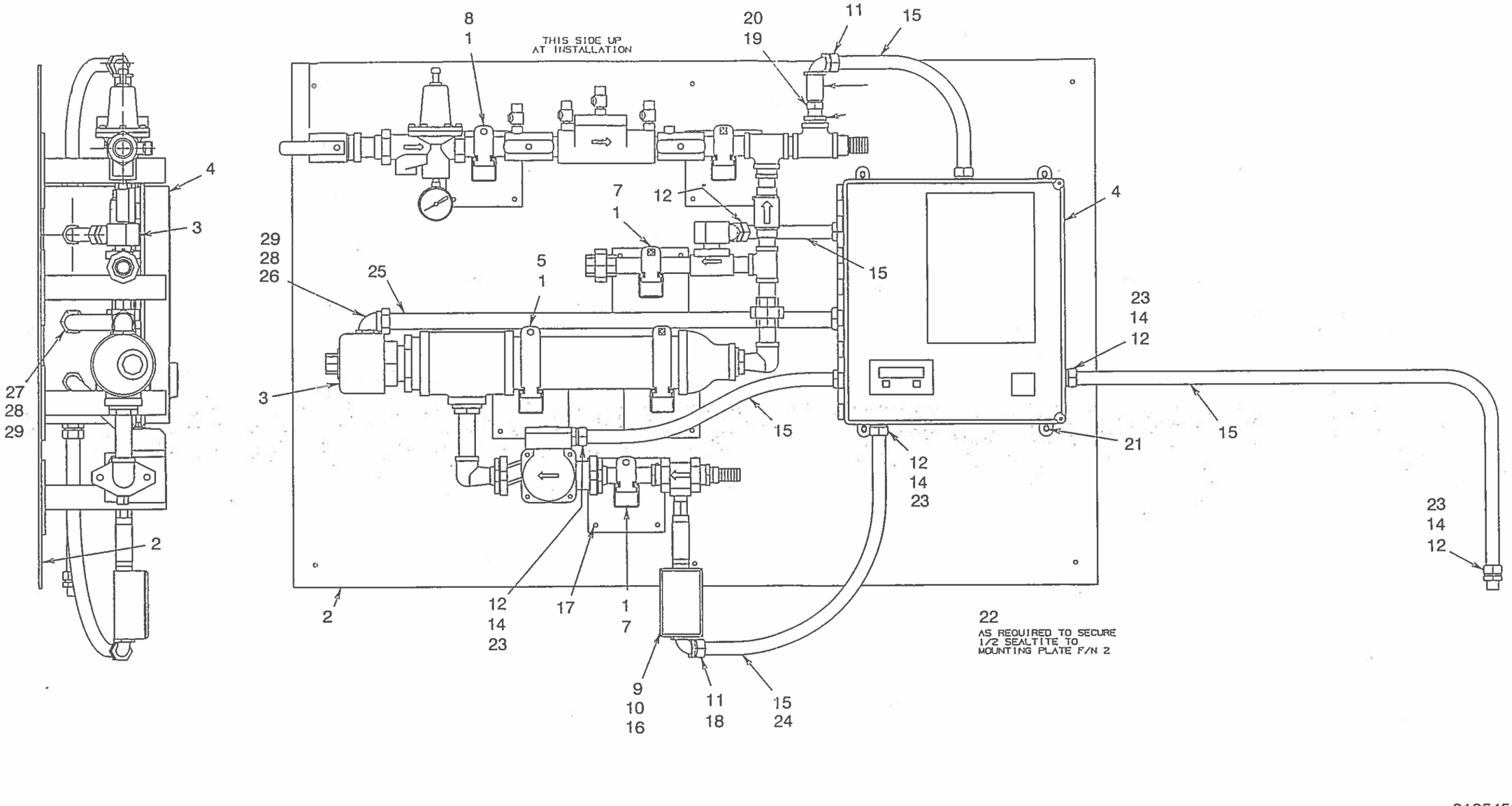
Cabinet Component Assembly

Cabinet Component Assembly (3632329)

FIG & IND NO.	AIRLINE PART NUMBER	PART NUMBER	DESCRIPTION AND MANUFACTURER	UNITS PER ASSY	USE ON CODE
1		2125526	LABEL "WRN" POTW ITALIAN1 WINMARK INC.		
2		2122597	WLDMT SPRT CHAN POTW	2	
3		2124339	PNL DISC MTG JETFLO	1	
4		2124606	PL 3/16X4 1/4X11 1/4	1	
5		2125444	PURGE ASSY JETFLO	1	
6		2125781	PIPING ASSY JETFLO 1	1	
7		2125782	ELEC ASSY JETFLO FJ303 230V	1	
8		2125785	CB POTW SST MET CON TRO FAB	1	
9		2125787	LABEL POTW CMPT	1 EA Z	
10		2125788	DWG SCHED JETFLO RECIRCULATION	1 EA Z	
11		2125789	DWG SCHEMATIC JETFLO ITALIAN	1 EA Z	
12		2125790	LABEL OPER PROCEDURE POTW ITAL WINMARK INC.	1	
13		2125281	NPL "CAUTION" DISC ELEC PWR ANAGRAPHICA INC	2	
14		2119745	SH SST 13GAX1'3 3/8X1'6 3/16	1	
15		3616092	CLP HOSE #12 5/8-1 1/4 DIA		
16		3631575	REEL ASSY JF300 1 HOSE 230V 1		
17		3661508	DECAL "JETFLO" WINMARK INC.	1	
18		3669743	CLP CND 1 RGD (UNISTRUT)	1	
19		3671231	BRG FLGE 2ID NYL SPC BIGF3201 KAMAN INDUSTRIAL TECHNOLOGY	2	
20		4060075	STRAP RGD 3/4 1 HOLE	8	
21		4060076	STRAP RGD 1 1 HOLE	3	
22		3616765	WSHR LOCK M4 INTERNAL T SST	4	
23		3616893	SCR MACH M4X12MM PNH PHH SST	4	
24		3616481	NUT M6 HEX A2-70 SST	2	
25		3616847	SCR CAP M6X20MM HEX A2-70 SST	2	
26		4142374	HTR STRIP FIN 240V 600W CHROMALOX	1	
27		3616478	WSHR LOCK M6 SST	2	

Cabinet Component Assembly (3632329)

FIG & IND NO.	AIRLINE PART NUMBER	PART NUMBER	DESCRIPTION AND MANUFACTURER	UNITS PER ASSY	USE ON CODE
28		3616490	SCR CAP M6X30MM HEX A2-70 SST	2	
29		3616479	WSHR LOCK M8 SST	2	
30		3616492	SCR CAP M8X20MM HEX A2-70 SST	2	
31		3616477	WSHR FLAT M10 SST	4	
32		3616500	WSHR LOCK M10 SST	6	
33		3622195	SCR CAP M10X30MM HEX A2-70 SST	4	
34		7300006	ME THDLOCKER-REMOVABLE	1	
35		7300028	SEALANT CLEAR SILICONE	1	
36		7300057	ADH CONSTRUCTION 10.5 OZ	1	
37		2120526	COV HTR MOD	1	
38		5070041	SCR DRTPG M6X19MM HEXWSHR	39	
39		3631560	NUT M6 W/SPR (UNISTRUT)	2	
40		2119182	SH SST 16GAX1 1/2X4	2	
41		2125792	DWG JETFLO SCHEMATIC JF303 ITA	1 EA Z	
42		3616483	NUT M10 HEX SST	2	
43		3616491	SCR CAP M10X20MM HEX A2-70 SST	2	



2125450 C

Recirculation Component Assembly

FMC

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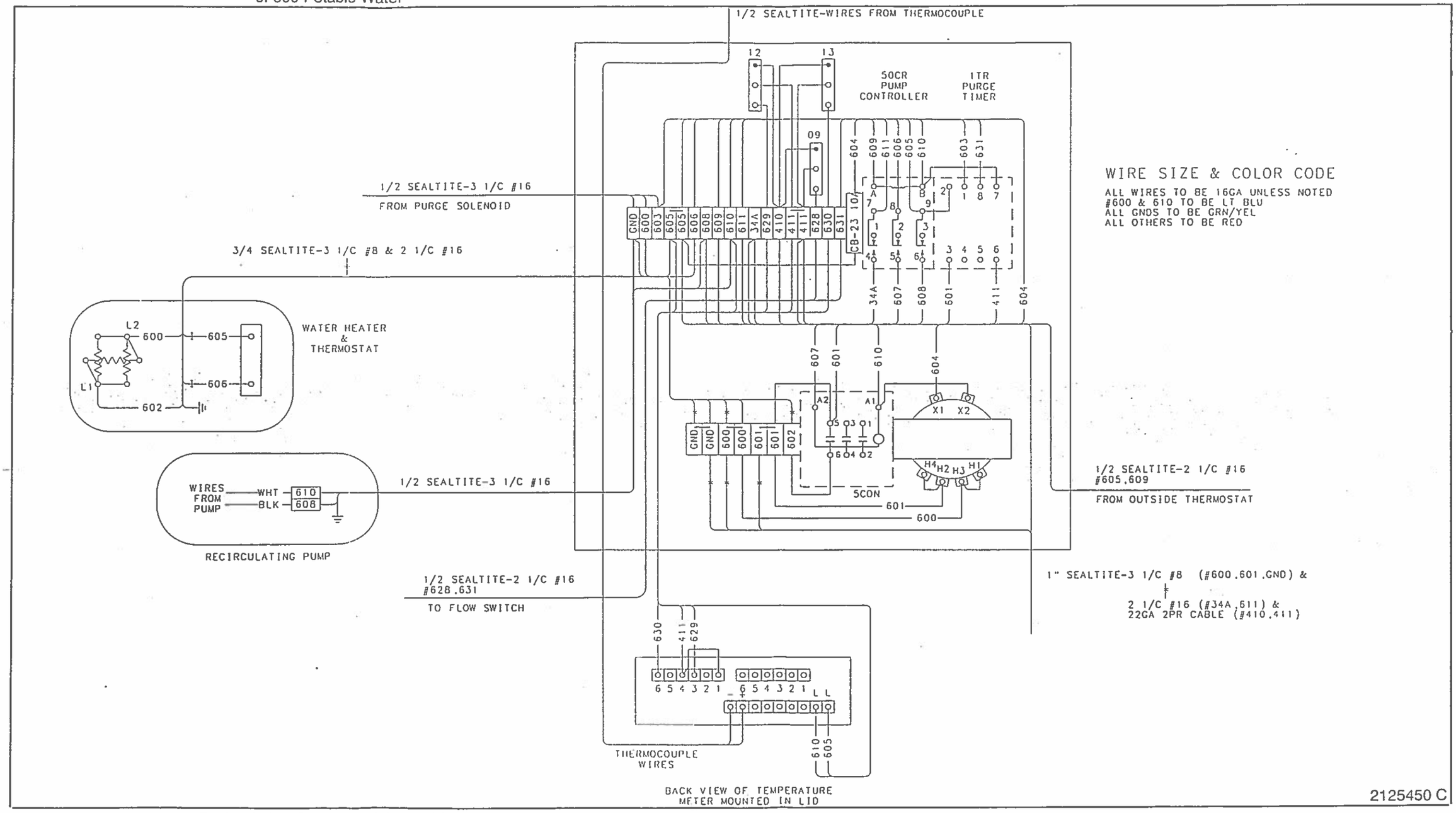
JETFLO™

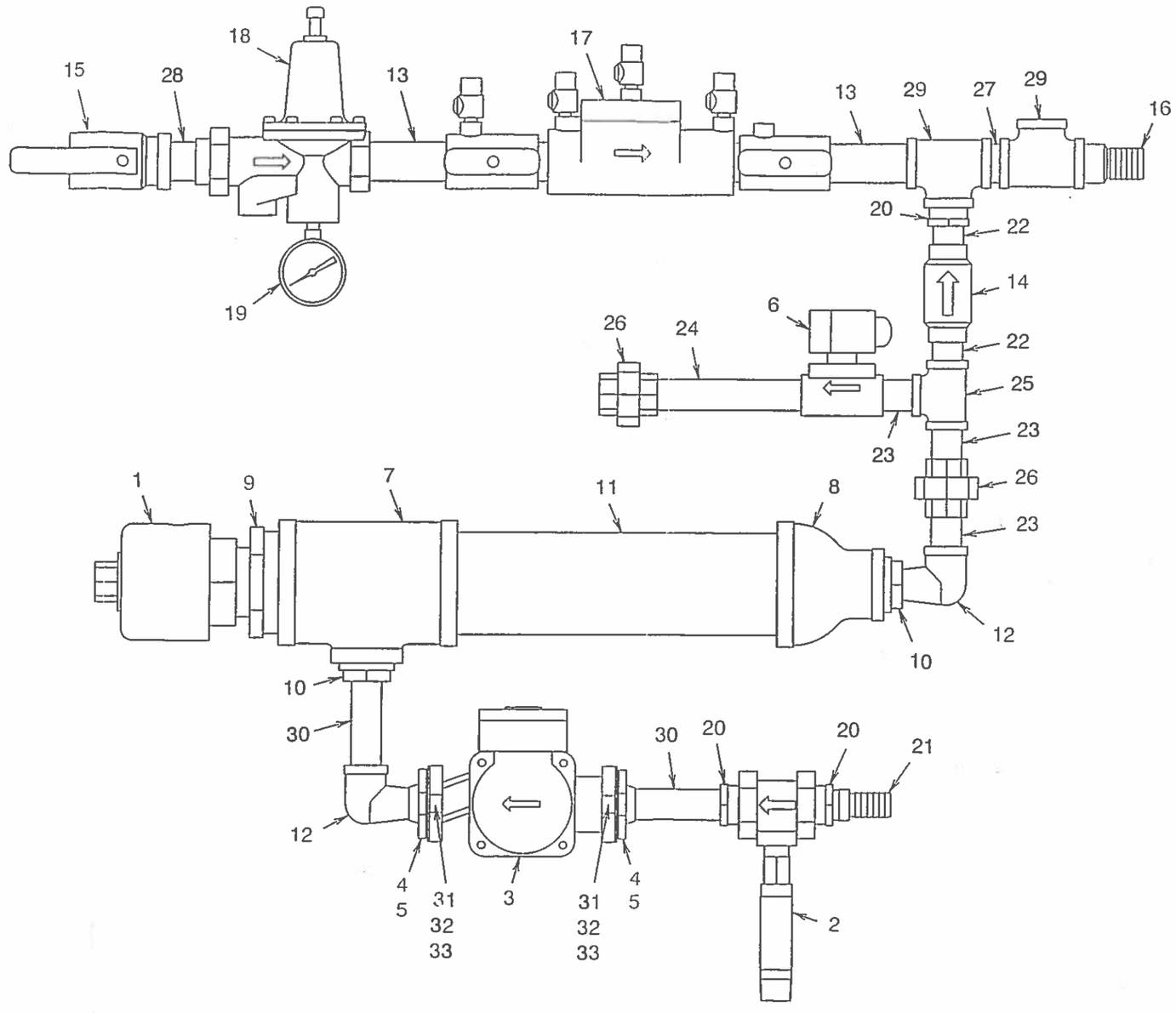
JF300 Potable Water



Recirculation Component Assembly

Recirculation Component Assembly (2125450)

FIG & IND NO.	AIRLINE PART NUMBER	PART NUMBER	DESCRIPTION AND MANUFACTURER	UNITS PER ASSY	USE ON CODE
1		2125448	WLDMT SPRT JETFLO	6	
2		2125452	PL 3/16X2'11X4'5 A36	1	
3		2125680	RECIRCULATION ASSY POTW	1	
4		2125779	BOX JCT ASSY 16X14X8 POTW	1	
5		3613516	CLP CND 3 RGD (UNISTRUT)	2	
6		3632598	BSHG BRS HEX HD 1X1/2NPT	1	
7		3664472	CLP CND 3/4 RGD (UNISTRUT)	2	
8		3669743	CLP CND 1 RGD (UNISTRUT)	2	
9		4010036	COV BLANK ALUM 1 GANG	1	
10		4130205	BOX OUTLET 2 3/4X4 1/2X2	1	
11		4060055	CONN CND 1/2X90 SEALTITE	2	
12		4060058	CONN CND 1/2 STR SEALTITE	10	
13		4060139	CPLG CND 1/2 RGD	1	
14		4060206	RING SEALING 1/2	10	
15		4050001	CND 1/2 SEALTITE FLEX UL/CSA	6 FT F	
17		5070041	SCR DRTPG M6X19MM HEXWSHR	53	
18		4060049	BSHG RDCG 3/4MALE TO 1/2FEM	1	
19		3632596	THERMO SNSR TYPE T .062 SHEATH TECH SALES OF UTAH	1	
20		3632597	FTG SPR LOADED 1/2X1/2NPT SST	1	
21		4503482	SCR MACH M6X14MM PNH PHH	4	
22		4060074	STRAP RGD 1/2 1 HOLE	5	
23		4060086	LKNT 1/2 CND	7	
25		4050002	CND 3/4 SEALTITE FLEX UL/CSA ROYAL WHOLESALE ELECTRIC	3 FT F	
26		4060056	CONN CND 3/4X90 SEALTITE	1	
27		4060059	CONN CND 3/4 STR SEALTITE	1	
28		4060087	LKNT 3/4 CND	2	
29		4060207	RING SEALING 3/4	2	
30		4060087	LKNT 3/4 CND	1	
31		4060429	PLUG CLOSE UP 3/4 KILLARK CUP-2 ROYAL WHOLESALE ELECTRIC	1	
32		4120131	STRIP TERM 300V 40AMP 12 WAY NEWARK 31F2436 NEWARK ELECTRONICS	1	

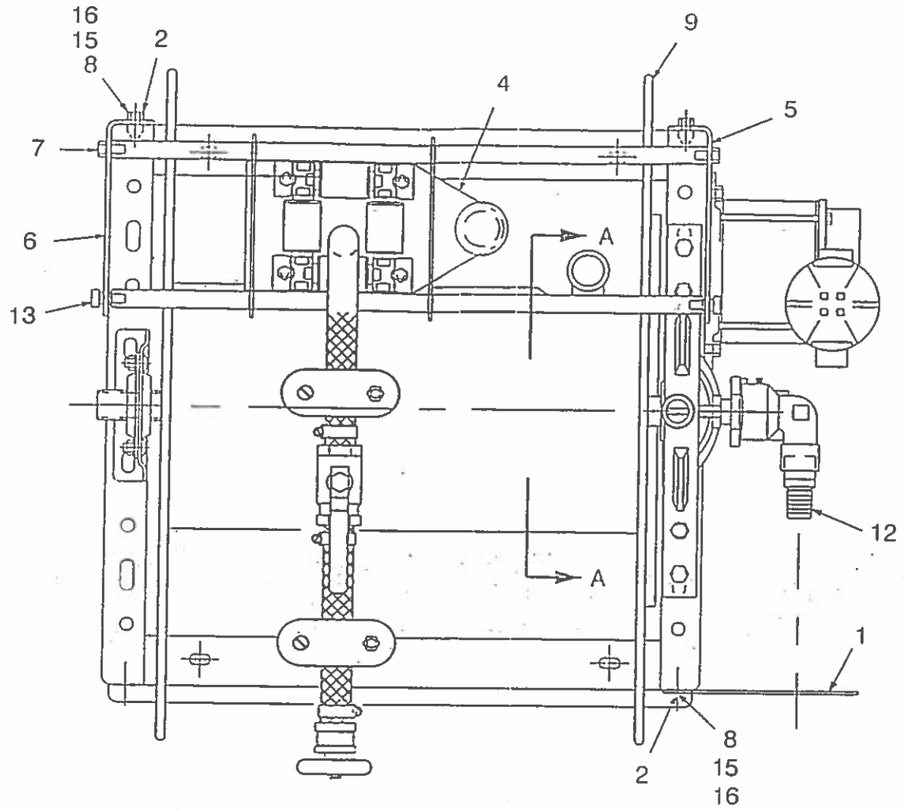


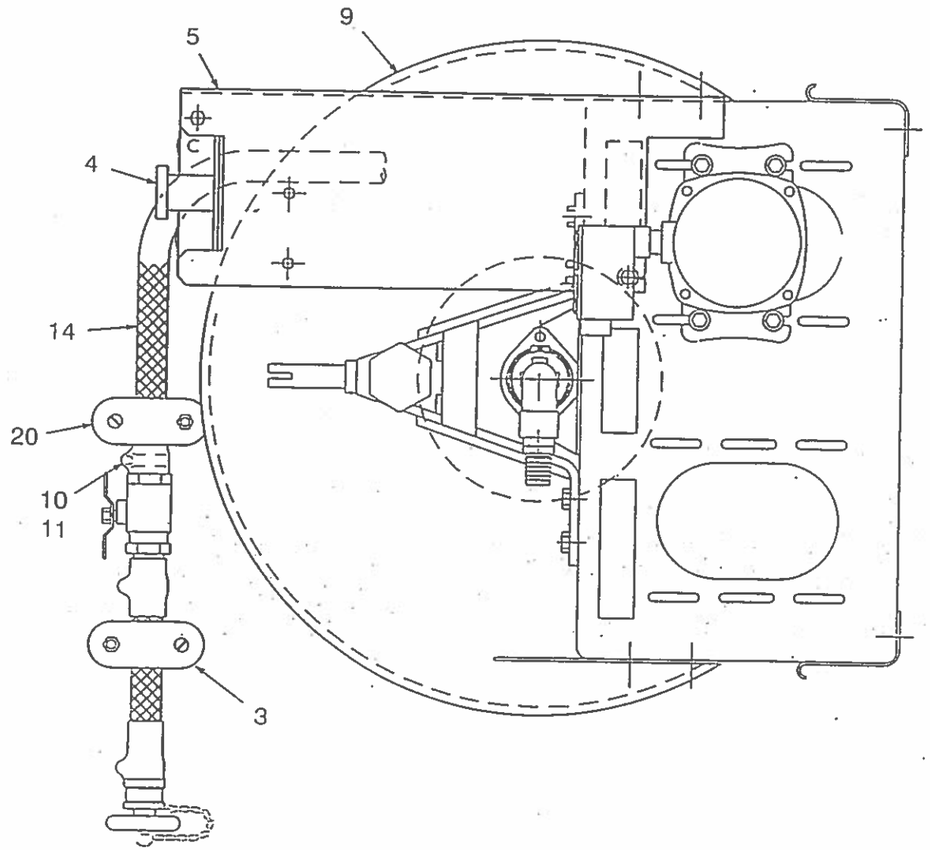
2125680 NC

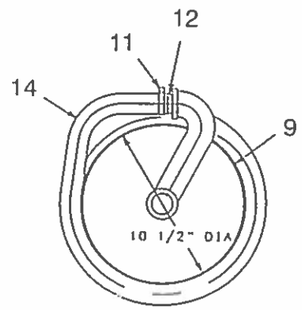
Recirculation Assembly

Recirculation Assembly (2125680)

FIG & IND NO.	AIRLINE PART NUMBER	PART NUMBER	DESCRIPTION AND MANUFACTURER	UNITS PER ASSY	USE ON CODE
1		3631557	HTR W/THERMO 240V MCMASTER-CARR SUPPLY COMPANY	1	
2		3631558	SW FLOW BRS 3/4NPT 220V	1	
3		3631559	PUMP BOOSTER POTW 115V	1	
6		3631563	VALVE SOLENOID 2WAY 3/4 220V	1	
7		3631564	TEE BRS 3NPTX1 1/2NPT	1	
8		3631565	RDCR BELL PIPE 3NPT X 1 1/2NPT	1	
9		3631566	BSHG BRS 3NPTX2NPT	1	
10		3631567	BSHG BRS 1 1/2NPT X 3/4NPT	2	
11		3631568	NIP BRS 3NPT X 12	1	
12		3631569	ELB STREET BRS 3/4NPT	2	
13		3631571	NIP BRS 1NPTX4	2	
14		3632584	VALVE CHK 3/4 SPR LOADED	1	
15		3669737	VALVE BALL RGLTR 1NPT	1	
16		3669739	FTG HOSE 1X1NPT BRS	1	
17		3669745	VALVE CHK BFP 1	1	
18		3669762	VALVE PRESS RGLTR USA	1	
19		3669763	GA 0-160 PSI USA UW 3669762	1	
20		3670192	BSHG BRS HEX HD 1X3/4NPT	3	
21		3678039	FTG TBG 3/4X3/4 BRS	1	
22		5600036	NIP CLOSE BRS 3/4NPT	2	
23		5600038	NIP BRS 3/4NPTX2	3	
24		5600039	NIP BRS 3/4NPTX6	1	
25		5600042	TEE BRS 3/4NPT	1	
26		5600044	UNION PIPE 3/4 CLASS 1 BRS	2	
27		5600234	NIP CLOSE BRS 1NPT	1	
28		5600239	NIP BRS 1NPTX2	1	
29		5600240	TEE BRS 1NPT	2	
30		5600252	NIP BRS 3/4NPTX4	2	
31		3616483	NUT M10 HEX SST	4	
32		3616488	SCR CAP M10X40MM HEX A2-70 SST	4	
33		3616500	WSHR LOCK M10 SST	4	







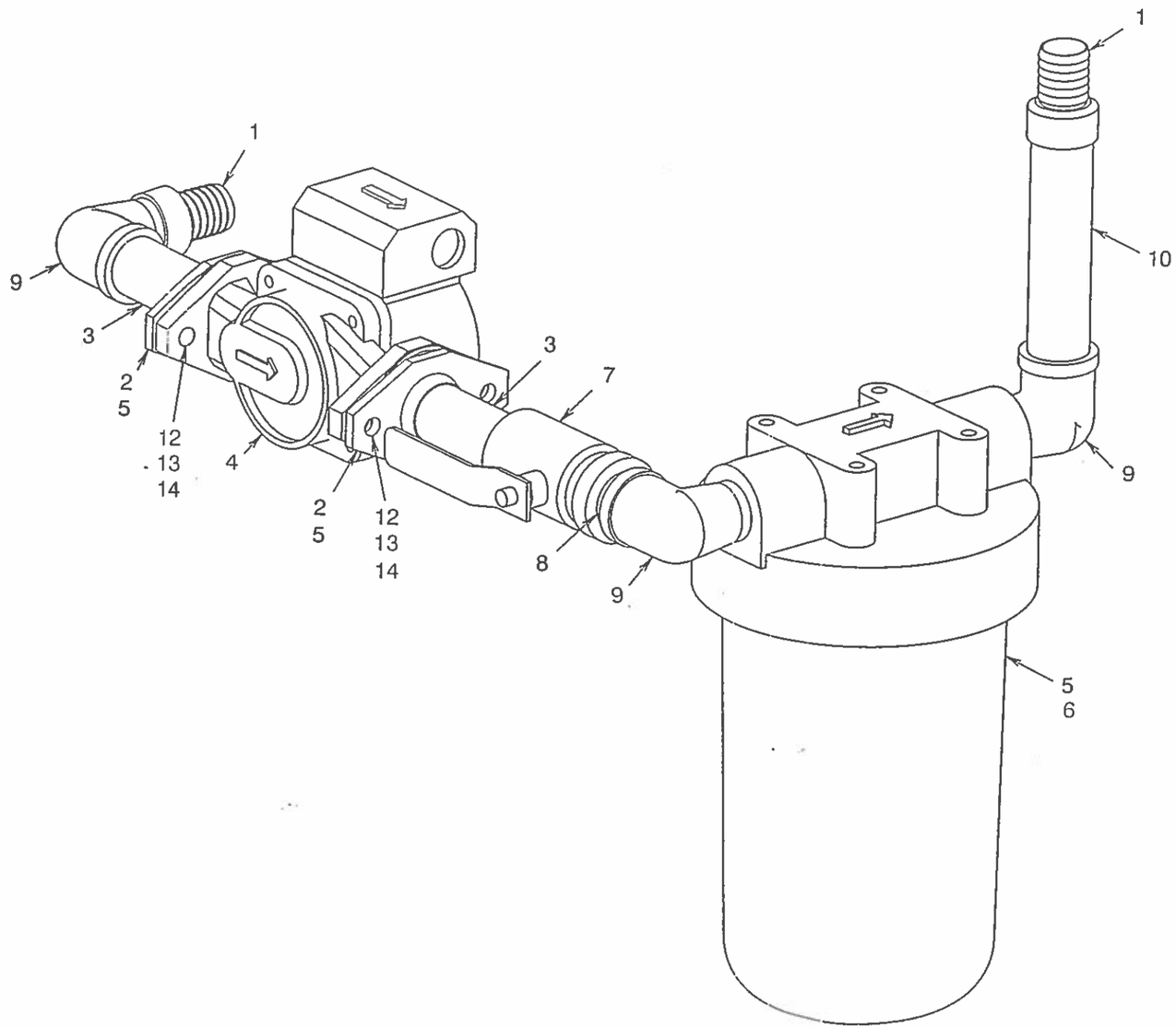
SECTION A–A

2124536 A

Hose Reel Assembly

Hose Reel Assembly (3631575)

FIG & IND NO.	AIRLINE PART NUMBER	PART NUMBER	DESCRIPTION AND MANUFACTURER	UNITS PER ASSY	USE ON CODE
1		2122770	SH SST 12GAX3 1/4X10 13/16	1	
2		2122818	NUT PL SST	3	
3		2123644	HOSE STOP RBR ASSY POTW	1	
4		2123668	RLR ASSY POTW	1	
5		2125278	PL SST 3/16X10X1'11 1/4 304	1	
6		2125277	PL SST 3/16X10X1'11 1/4 304	1	
7		3611914	SCR CAP 3/8-16X1 HEX SST	4	
8		3612276	WSHR LOCK 1/2 SST	6	
9		3631577	REEL HOSE 1 POTW SST DISC 230V EP6028-30-31-RT HANNAY REELS	1	
10		3618017	TBG HT SHRINK 2IDX4'0X.155	A/R	
11		3616092	CLP HOSE #12 5/8-1 1/4 DIA	2	
12		3669739	FTG HOSE 1X1NPT BRS GREAT WESTERN PLUMBING SUPPLY	2	
13		3682061	SCR SHLDR 1/2X1/2X3/8-16 SCH	2	
14		4160199	TBG PVC NYL 1X1.375X200'0 2 KURITEC K3130-16 KAMAN INDUSTRIAL TECHNOLOGY	A/R	
15		4501759	SCR CAP 1/2-13X1 1/4 HEX SST	6	
16		5150090	WSHR FLAT 1/2 SST	6	
17		5150129	WSHR LOCK 3/8 SST	2	
18		5250227	NUT 3/8-16 HEX NYLOC SST	2	
20		3669765	HOSE STOP 5OD W/1 1/4 BORE	1	

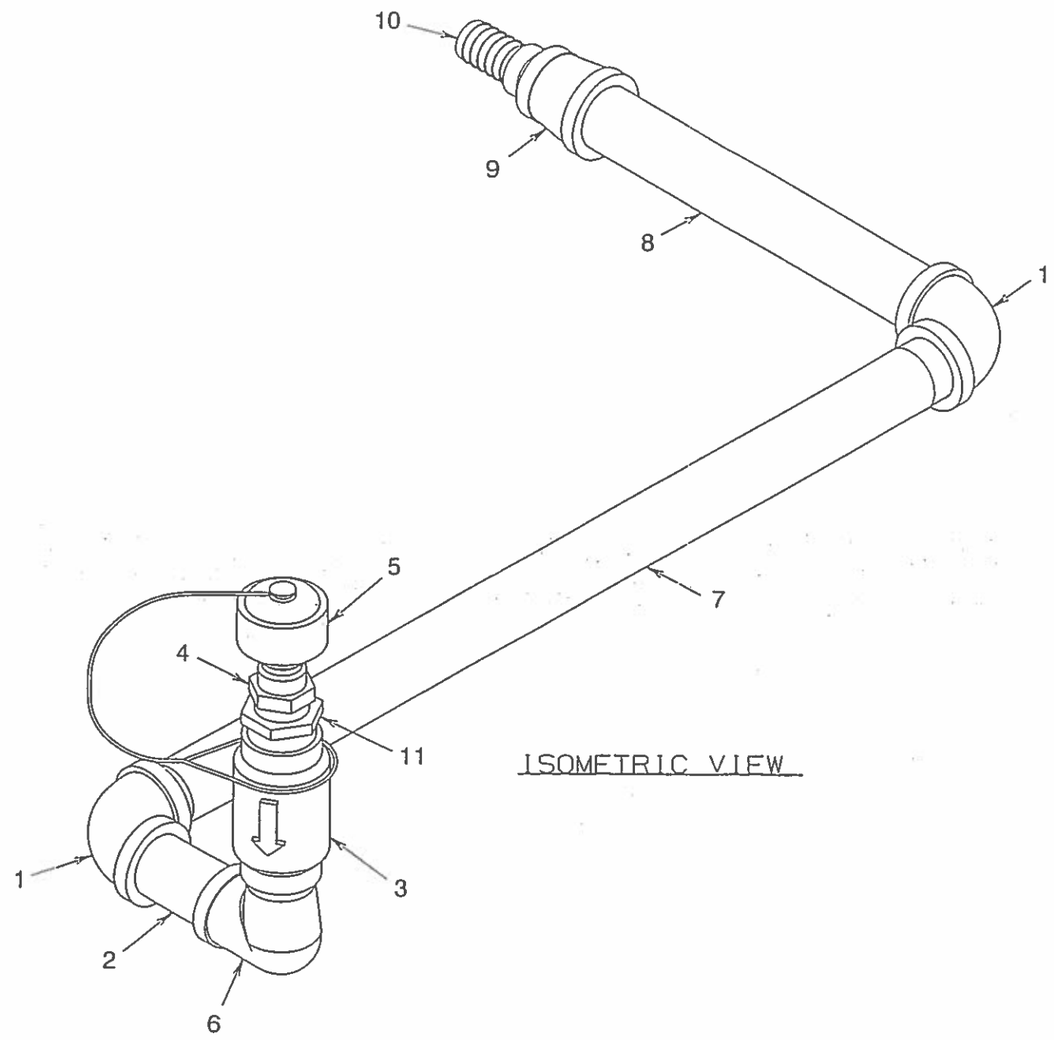


2125781 NC

Piping Assembly

Piping Assembly (2125781)

FIG & IND NO.	AIRLINE PART NUMBER	PART NUMBER	DESCRIPTION AND MANUFACTURER	UNITS PER ASSY	USE ON CODE
1		3612287	FTG HOSE 1X1FNPT BRS	2	
3		3631571	NIP BRS 1NPTX4	2	
4		3632592	PUMP BOOSTER POTW	1	
6		3669734	FLTR CARTRIDGE 4 1/2ODX9 3/4 155053-03 (R50-BB) JERRY'S PLUMBING SPECIALTIES	1	
7		3669735	FLTR HSG 1NPT IN/OUT 150237 C H SPENCER COMPANY	1	
8		3669737	VALVE BALL RGLTR 1NPT B6000 600WOG 1" GREAT WESTERN PLUMBING SUPPLY	1	
9		5600234	NIP CLOSE BRS 1NPT	1	
10		5600236	ELB STREET BRS 90 DEG 1NPT	3	
11		5600238	NIP BRS 1NPTX6	1	
12		3616483	NUT M10 HEX SST	4	
13		3616488	SCR CAP M10X40MM HEX A2-70 SST	4	
14		3616500	WSHR LOCK M10 SST	4	



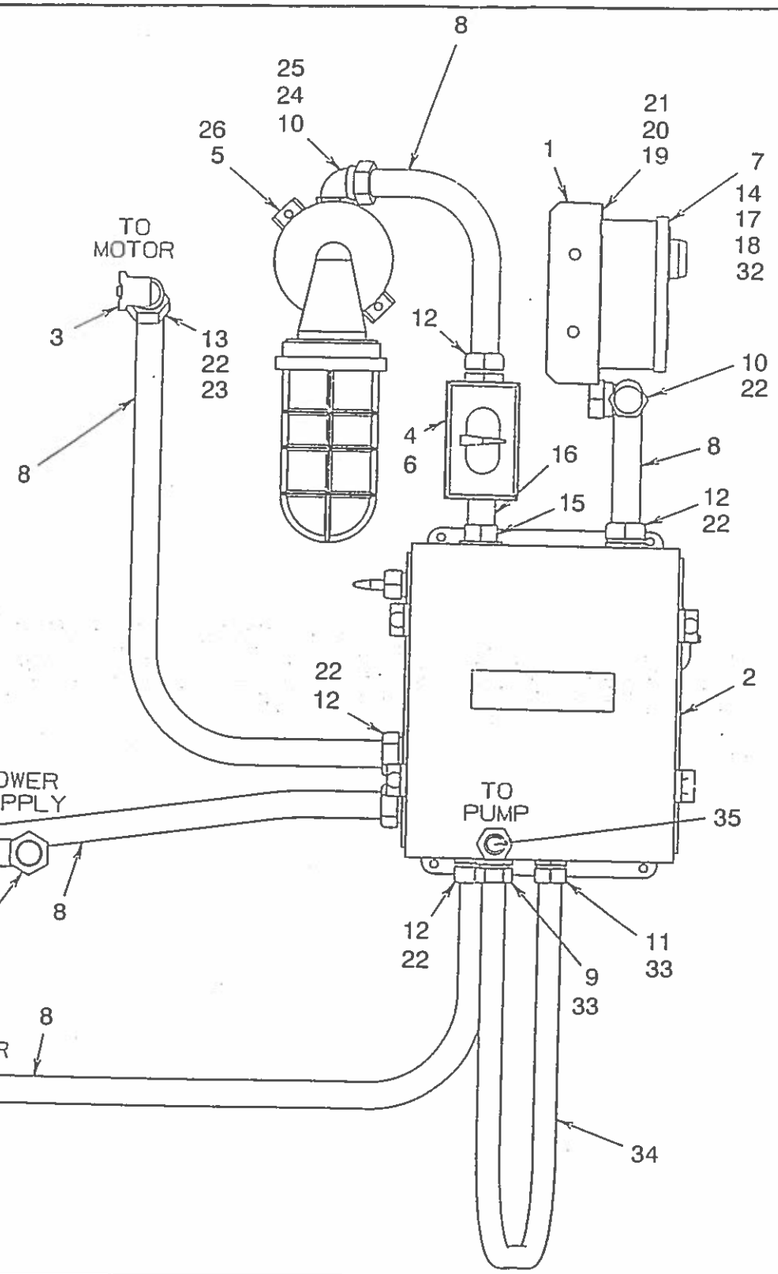
ISOMETRIC VIEW

2125444 A

Purge Assembly

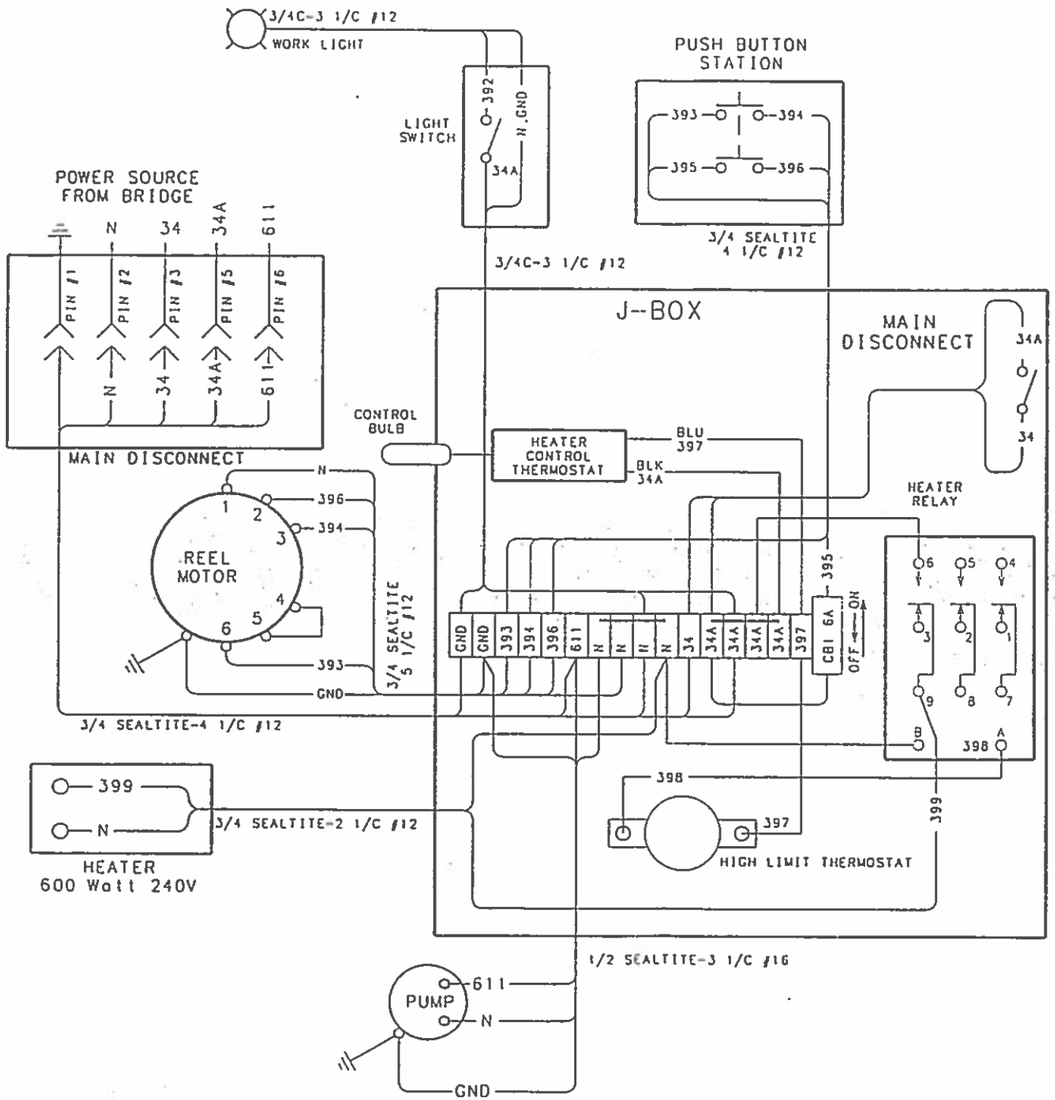
Purge Assembly (2125444)

FIG & IND NO.	AIRLINE PART NUMBER	PART NUMBER	DESCRIPTION AND MANUFACTURER	UNITS PER ASSY	USE ON CODE
1		3612286	ELB 1NPT BRS 90 DEG	2	
2		3612298	NIP BRS 1NPTX3 BRASS 1X3"NIPPLE	1	
3		3632585	VALVE CHK 1 SPR LOADED	1	
4		3624403	NIP SST 3/4 QUICK DISC 3/4 NPT	1	
5		3624404	CAP ASSY QUICK DISC 3-4 ALUM AIRLINX	1	
6		2125791	PIPE BRS 1XSCHED40X1'10	1	
7		3624406	CLPG PIPE RDCR 1X.75 BRS	1	
8		3678039	FTG TBG 3/4X3/4 BRS	1	
9		5600236	ELB STREET BRS 90 DEG 1NPT BRASS STR EL 1NPT 90	1	
10		5600246	NIP BRS 1NPTX10	1	
11		3670192	BSHG BRS HEX HD 1X3/4NPT	1	



2125782 B

Electrical Component Assembly



INTERCONNECTION DIAGRAM

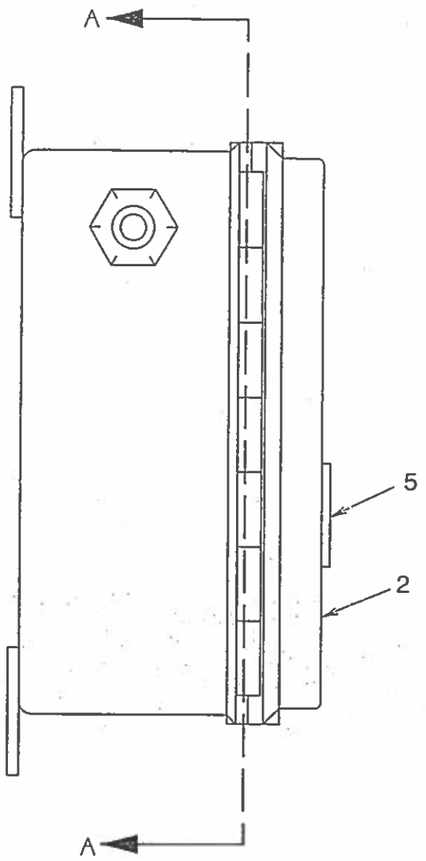
2125782 B

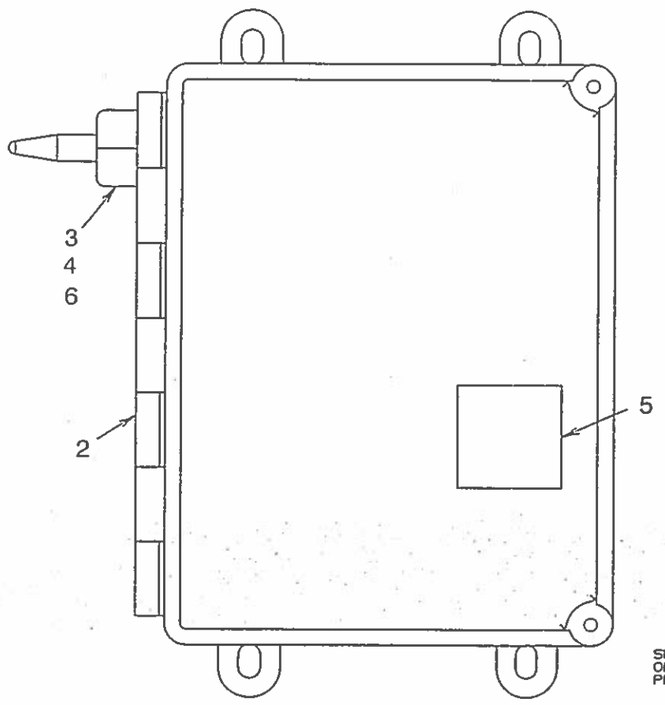
Electrical Assembly (2125782)

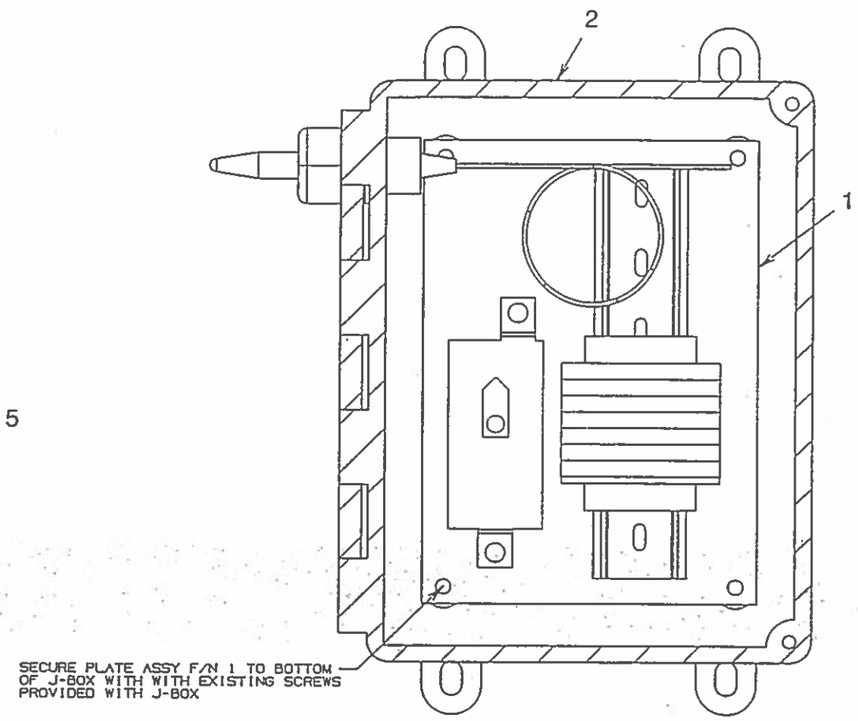
FIG & IND NO.	AIRLINE PART NUMBER	PART NUMBER	DESCRIPTION AND MANUFACTURER	UNITS PER ASSY	USE ON CODE
1		2125443	WLDMT BRKT SW SPRT	1	
2		2125794	BOX JCT ASSY JETFLO	1	
3		2125795	BLOCK TERM 5 POSN	1	
4		3613746	SW LVR W/COV 10AMP 2 P 5137 ROYAL WHOLESALE ELECTRIC	1	
5		3615111	FXTR LT CAST WL MTG HUBBELL VWX-152G ROYAL WHOLESALE ELECTRIC	1	
6		4130205	BOX OUTLET 2 3/4X4 1/2X2	1	
7		4010175	BOX ENCL 5 3/4X3 1/4X2 3/4 HOFFMAN E2PB ROYAL WHOLESALE ELECTRIC	1	
8		4050002	CND 3/4 SEALTITE FLEX UL/CSA	16 FT F	
9		4060055	CONN CND 1/2X90 SEALTITE	1	
10		4060056	CONN CND 3/4X90 SEALTITE	2	
11		4060058	CONN CND 1/2 STR SEALTITE	1	
12		4060059	CONN CND 3/4 STR SEALTITE	7	
13		4060064	CONN CND 3/4X45 SEALTITE	1	
14		4060229	PLUG HOLE 1 1/2 SQ SST	1	
15		4060477	CONN CND 3/4 RGD HUB	1	
16		4060617	NIP CND GALV 3/4X3	1	
17		4140331	OPER PB FULL GUARD KR1U ROYAL WHOLESALE ELECTRIC	1	
18		4141628	NPL RAISE	1	
19		3616499	NUT M5 HEX SST	4	
20		3616766	WSHR LOCK M5 EXTERNAL T SST	4	
21		3617795	SCR MACH M5X20MM PHN PHH SS	4	
22		4060207	RING SEALING 3/4	9	
23		4060387	CONN WIRE 14-16 LKGFK 10	1	
24		4060388	CONN WIRE 10-12 LKGFK 10	7	
25		4060429	PLUG CLOSE UP 3/4	1	
26		4080264	LT LAMP BULB 100W 230V	1	
27		4120021	TY RAP 1/16-1 3/4 RNG BLK NYL	8	
28		4170615	WIRE STRD WHT 12 UL/CSA/PNYA	A/R	

Electrical Assembly (2125782)

FIG & IND NO.	AIRLINE PART NUMBER	PART NUMBER	DESCRIPTION AND MANUFACTURER	UNITS PER ASSY	USE ON CODE
29		4170616	WIRE STRD RED 12 UL/CSA/PNYA	A/R	
30		4170651	WIRE STRD GRN/YEL 12 UL/CSA/PN	A/R	
31		3613774	MARKER WIRE HT SHRINK WHT 1/4	1	
32		4140323	BLOCK CNTOR 1N/O 1N/C KA1 ROYAL WHOLESALE ELECTRIC	2	
33		4060206	RING SEALING 1/2	2	
34		4050001	CND 1/2 SEALTITE FLEX UL/CSA	3 FT F	
35		4120130	STRIP TERM 300V 20AMP 4 WAY 2740.2 TYPE HK 3/4 INTEGRATED ELECTRONICS INC	1	







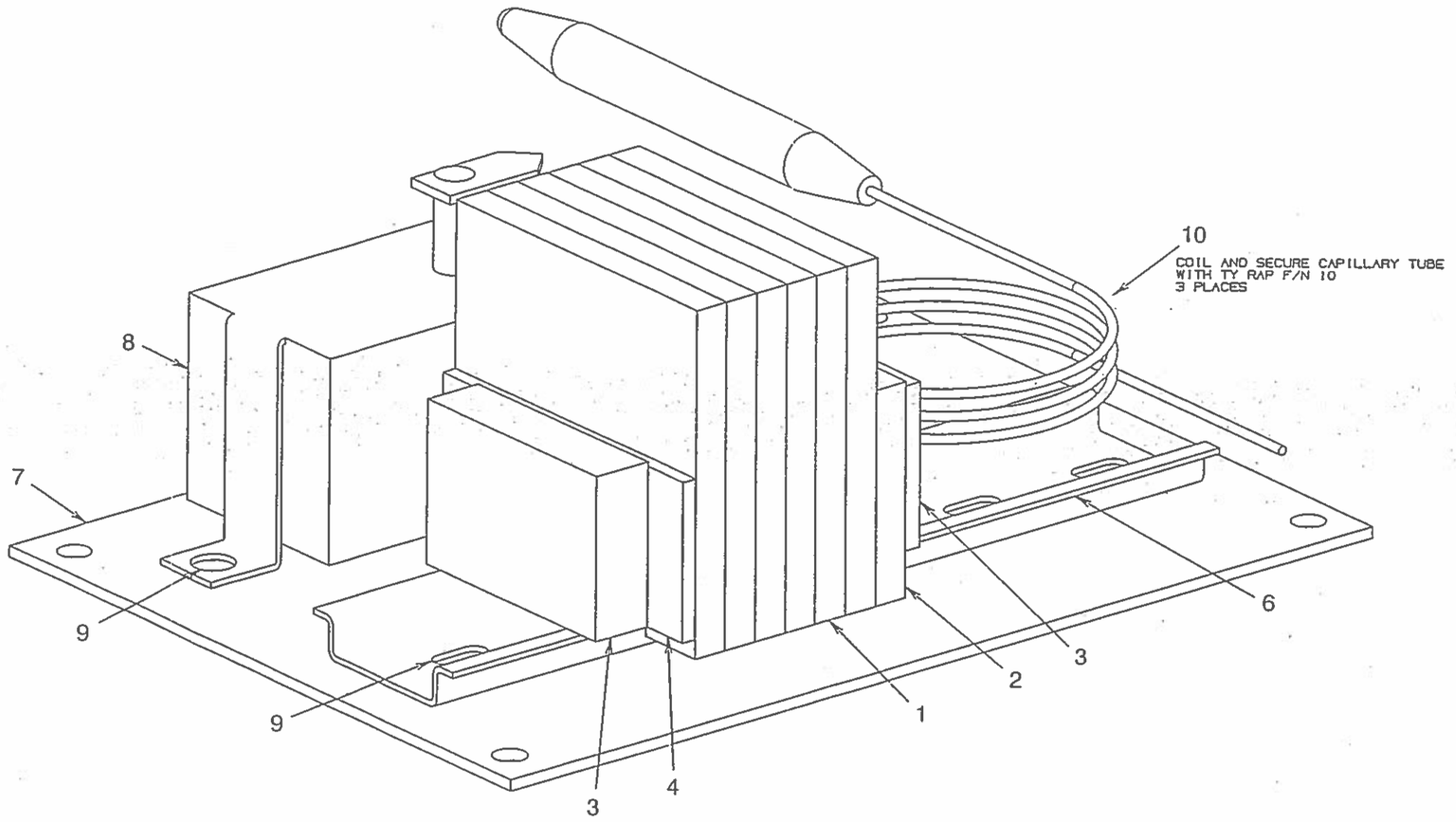
SECTION A-A

2125804 NC

Thermo J-Box Assembly

Thermo J-Box Assembly (2125804)

FIG & IND NO.	AIRLINE PART NUMBER	PART NUMBER	DESCRIPTION AND MANUFACTURER	UNITS PER ASSY	USE ON CODE
1		2125803	PL ELEC THERMO ASSY	1	
2		4010228	BOX ENCL 8X6X4 HOFFMAN A-864CHSCFG ROYAL WHOLESALE ELECTRIC	1	
3		4060152	CONN CA .375-.500X1/2 T&B 2522 NO SUB ROYAL WHOLESALE ELECTRIC	1	
4		4060206	RING SEALING 1/2	1	
5		4142537	LABEL TRIANGLE SIGN W/LTNG R.S. HUGHES CO INC	1	
6		4060086	LKNT 1/2 CND	1	

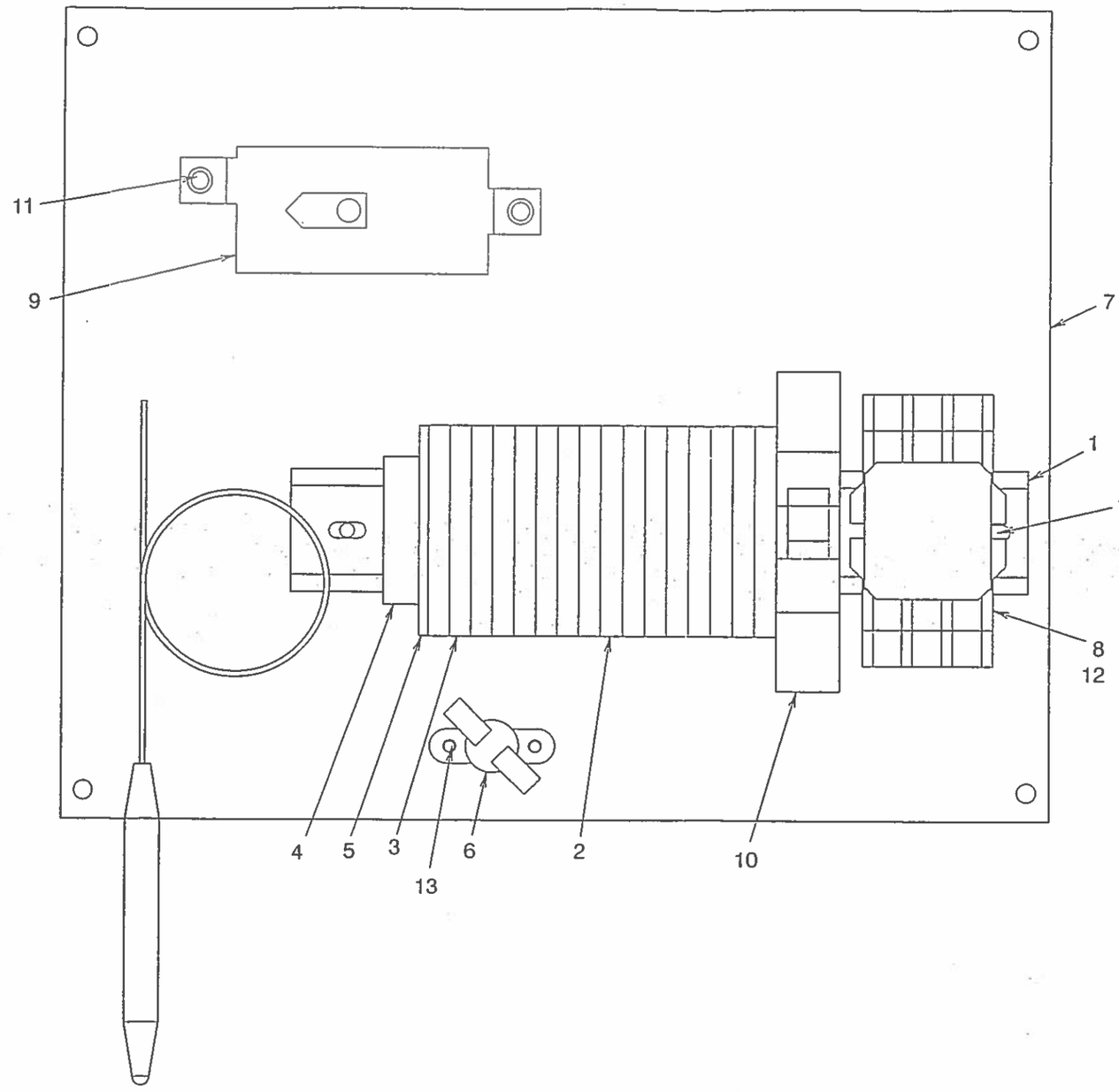


2125803 NC

Plate Electrical Thermostat Assembly

Plate Electrical Thermostat Assembly (2125803)

FIG & IND NO.	AIRLINE PART NUMBER	PART NUMBER	DESCRIPTION AND MANUFACTURER	UNITS PER ASSY	USE ON CODE
1		3611369	TERM BLOCK 26-12 2C 281-901 TECHNISYS	6	
2		3611371	TERM BLOCK 26-12 2C GND 281-907 TECHNISYS	1	
3		3611372	TERM BLOCK END CLP 249-117 TECHNISYS	2	
4		3611374	TERM BLOCK END COV 26-12 2C 281-329 TECHNISYS	1	
5		3612605	MARKER PLSTC TERM BLOCK WAGO	7	
6		3632570	CHAN MTG DIN RAILX6	1	
7		4010227	PNL J-BOX INSERT 4.88X6.75 HOFFMAN A-8P6 ROYAL WHOLESALE ELECTRIC	1	
8		4142189	THERMO 22-25AMP 1P CAP BULB 2E998 W W GRAINGER	1	
9		3618014	SCR MACH M5X10MM PHN PHH SS	4	
10		4501298	TY RAP 1/16 TO 1 1/8 RNGBLKNYL	3	

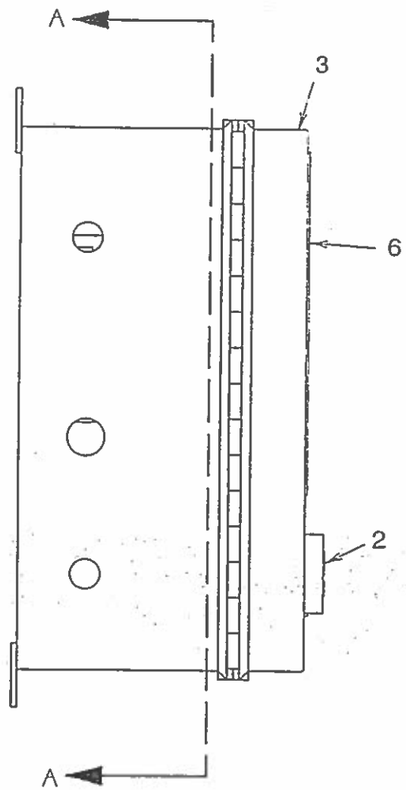


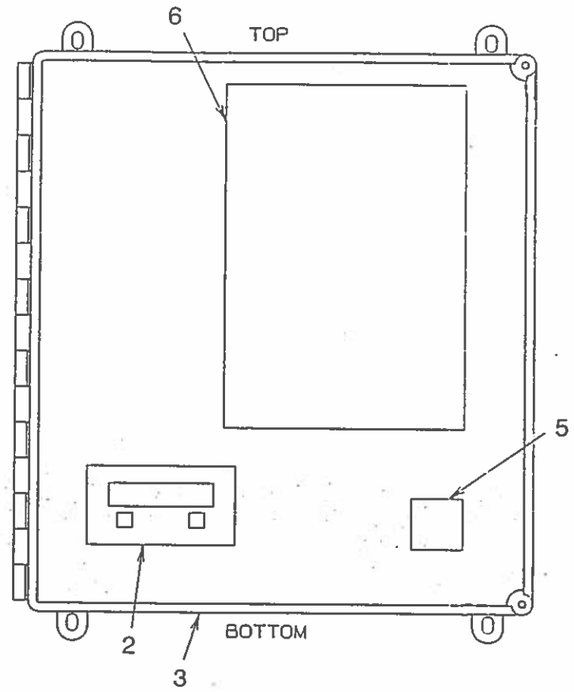
2125793 A

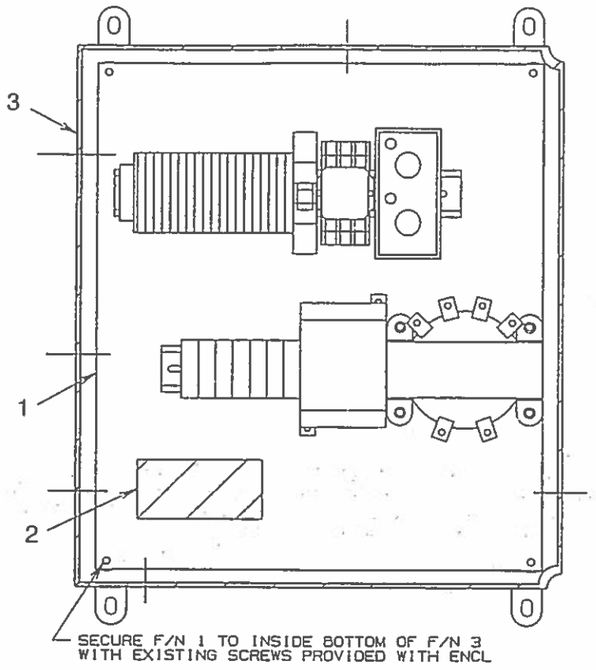
Plate Enclosure Electrical Assembly

Plate Enclosure Electrical Assembly (2125793)

FIG & IND NO.	AIRLINE PART NUMBER	PART NUMBER	DESCRIPTION AND MANUFACTURER	UNITS PER ASSY	USE ON CODE
1		3013371	CHAN MTG DIN RAILX8	1	
2		3611369	TERM BLOCK 26-12 2C 281-901 TECHNISYS	14	
3		3611371	TERM BLOCK 26-12 2C GND 281-907 TECHNISYS	2	
4		3611372	TERM BLOCK END CLP 249-117 TECHNISYS	1	
5		3611374	TERM BLOCK END COV 26-12 2C 281-329 TECHNISYS	1	
6		3615399	THERMO 175 DEG F 46F6635 NEWARK ELECTRONICS	1	
7		2126042	PNL MOD J-BOX 10.75X8.88	1	
8		4141041	RLY 3PDT 120V 10AMP P&B KUP14A15-120 STANDARD SUPPLY CO	1	
9		4142189	THERMO 22-25AMP 1P CAP BULB 2E998 W W GRAINGER	1	
10		4142519	CKT BRKR IEC 6AMP 1P ABB S281-K6 ABB CONTROL	1	
11		3618014	SCR MACH M5X10MM PHN PHH SS	2	
12		4501486	SKT RLY KU TYPE DIN MTG 46F3616 STANDARD SUPPLY CO	1	
13		3616893	SCR MACH M4X12MM PNH PHH SST	4	







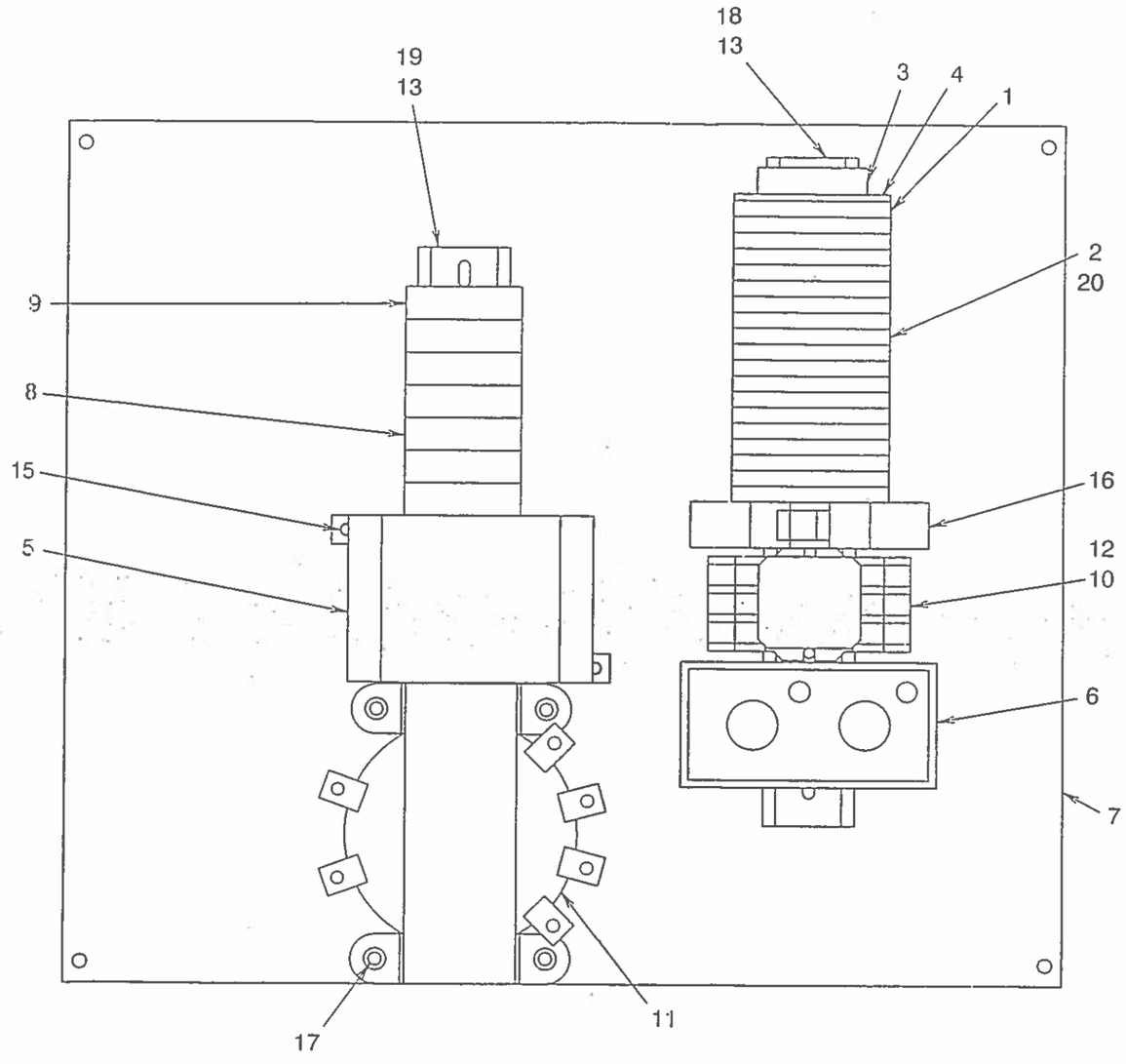
SECTION A-A

2125779 D

J-Box Assembly

J-Box Assembly (2125779)

FIG & IND NO.	AIRLINE PART NUMBER	PART NUMBER	DESCRIPTION AND MANUFACTURER	UNITS PER ASSY	USE ON CODE
1		2125778	PL ELEC CMPNT ASSY POTW	1	
2		3632594	MTR TEMP 120V POTW	1	
3		2126035	ENCL MOD POTW RECIRCULATION	1	
5		4142537	LABEL TRIANGLE SIGN W/LTNG	1	
6		2126028	LABEL SCHEMATIC JETFLO MALPENS	1	



2125778 E

Plate Electrical Component Assembly

Plate Electrical Component Assembly (2125778)

FIG & IND NO.	AIRLINE PART NUMBER	PART NUMBER	DESCRIPTION AND MANUFACTURER	UNITS PER ASSY	USE ON CODE
1		3611370	TERM BLOCK 26-12 3C GND 281-687 TECHNISYS	1	
2		3611369	TERM BLOCK 26-12 2C 281-901 TECHNISYS	18	
3		3611372	TERM BLOCK END CLP 249-117 TECHNISYS	1	
4		3611374	TERM BLOCK END COV 26-12 2C 281-329 TECHNISYS	1	
5		3616056	CNTOR 37 AMP IND / 50 AMP RES CL45A310MJ CRESCENT ELECTRIC SUPPLY CO.	1	
6		3631570	TIMER REPEAT CYCLE POTW 120V	1	
7		2126049	PNL MOD J-BOX 14.75X12.88	1	
8		4120113	TERM BLOCK #18-#6 GA PHOENIX 3006043 ROYAL WHOLESALE ELECTRIC	5	
9		4120118	BLOCK GND #16-#4 GA	2	
10		4141041	RLY 3PDT 120V 10AMP P&B KUP14A15-120 STANDARD SUPPLY CO	1	
11		4141605	XFMR PWR .2KVA 480/240V-120V	1	
12		4501486	SKT RLY KU TYPE DIN MTG	1	
13		3616893	SCR MACH M4X12MM PNH PHH SST	4	
15		3616769	SCR MACH M4X20MM PNH PHH SST	2	
16		4142508	CKT BRKR IEC 10AMP 1P S281-K10 ABB CONTROL	1	
17		3618014	SCR MACH M5X10MM PHN PHH SS	4	
18		4141976	CHAN MTG DIN RAIL 1 MTR	1	
19		4141976	CHAN MTG DIN RAIL 1 MTR	1	
20		3611384	JUMPER TERM BLOCK 26-12 HORIZ 281-402 TECHNISYS	3	

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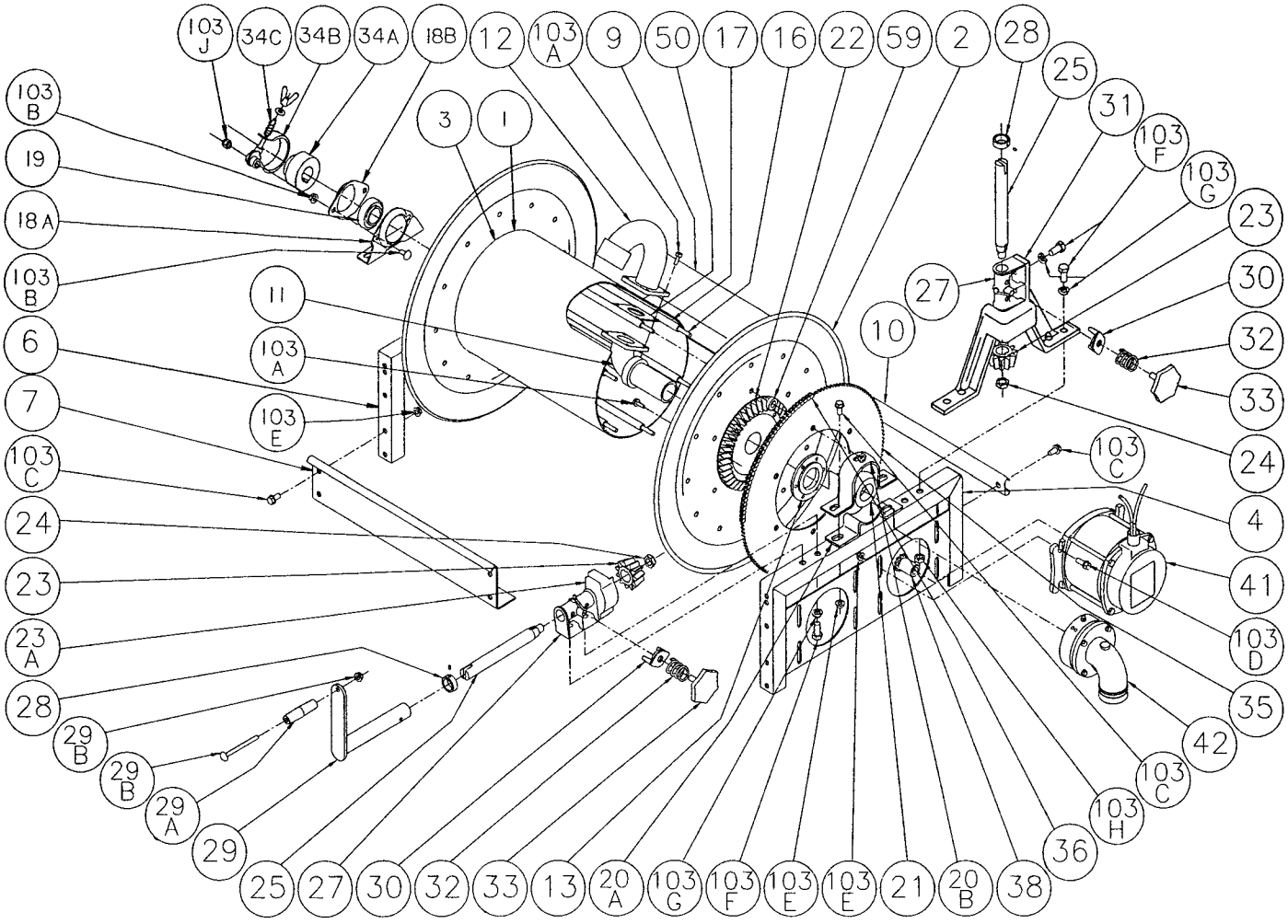
ISO 41

PARTS LIST

1 1/2" HOSE REELS
With Fabricated Frame & Ball Bearing Swivel Joint



When ordering parts BE SURE TO SPECIFY COMPLETE MODEL NUMBER and SERIAL NUMBER OF REEL. USE PART NUMBER!

Item No.	Description	PART NUMBER	Quantity
1	Drum, 10-1/2" Diameter (Specify Model)	9905.3131	1
2	Front Disc, 19-20 Series	9903.0821	1
2	Front Disc, 23-24 Series	9903.1121	1
2	Front Disc, 25-26 Series	9903.1321	1
2	Front Disc, 28-29 Series	9903.1521	1
2	Front Disc, 30-31 Series	9903.1621	1
2	Front Disc, 33-34 Series	9903.1831	1
3	Back Disc, 19-20 Series	9903.0821	1
3	Back Disc, 23-24 Series	9903.1121	1
3	Back Disc, 25-26 Series	9903.1321	1
3	Back Disc, 28-29 Series	9903.1521	1
3	Back Disc, 30-31 Series	9903.1621	1
3	Back Disc, 33-34 Series	9903.1831	1

PARTS LIST
ISO-41
1-1/2" Hose Reel

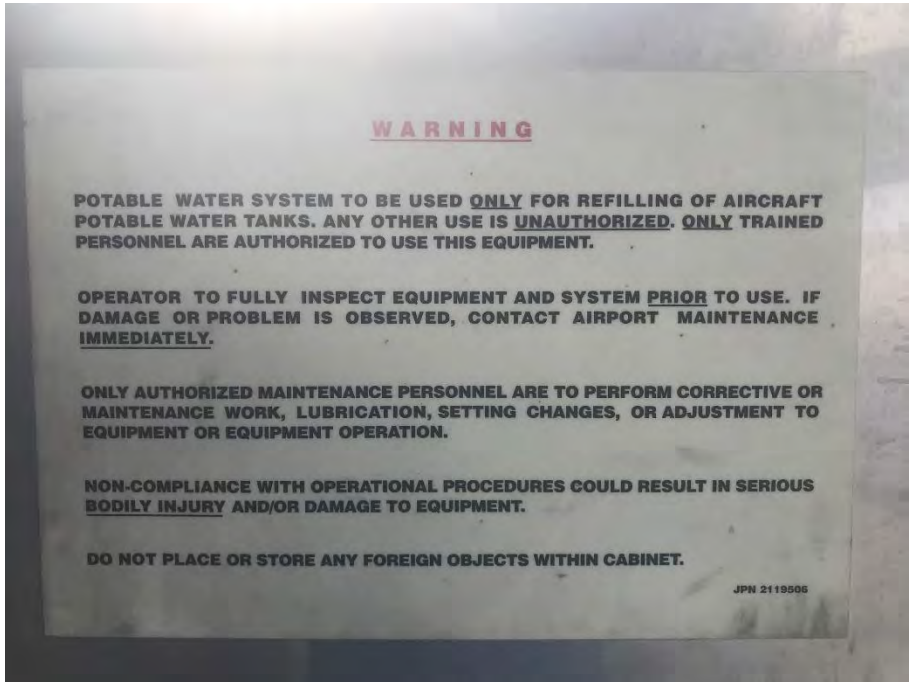
When ordering parts

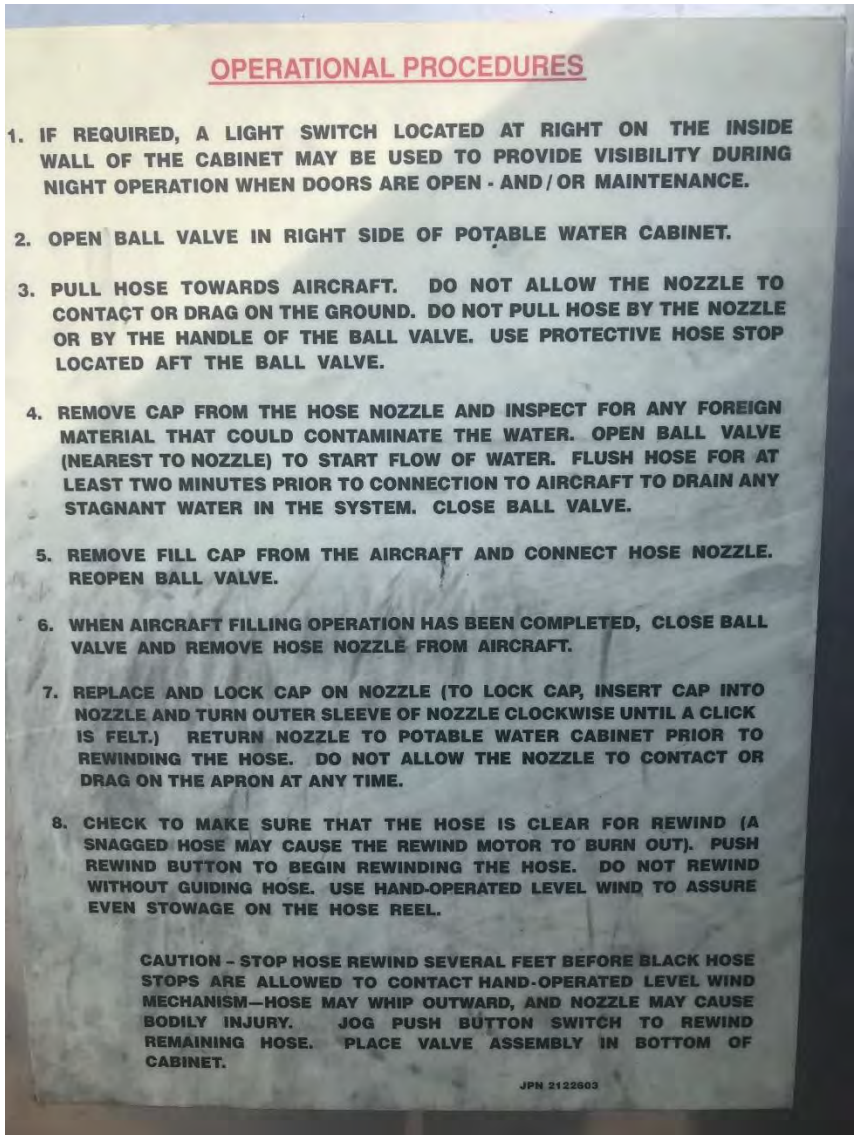
BE SURE TO SPECIFY COMPLETE MODEL NUMBER and SERIAL NUMBER OF REEL.

USE PART NUMBER!

Item No.	Description	PART NUMBER	Quantity
4	Front Frame, 19-20 Series	9906.1081	1
4	Front Frame, 23-24 Series	9906.1111	1
4	Front Frame, 25-26 Series	9906.1121	1
4	Front Frame, 28-29 Series	9906.1141	1
4	Front Frame, 30-31 Series	9906.1151	1
4	Front Frame, 33-34 Series	9906.1161	1
6	Back Frame, 19-20 Series	9906.0081	1
6	Back Frame, 23-24 Series	9906.0111	1
6	Back Frame, 25-26 Series	9906.0121	1
6	Back Frame, 28-29 Series	9906.0141	1
6	Back Frame, 30-31 Series	9906.0151	1
6	Back Frame, 33-34 Series	9906.0161	1
7	Front Foot (Specify Model)	9907.3000	1
9	Back Foot (Specify Model)	9907.3000	1
10	"C" Channel Brace (Specify Model)	9907.7000	2
11	1-1/2" Flange Hub Only (Specify Model)	9901.3640	1
12	1-1/2" FNPT Iron Pipe Riser Only	9901.3760	1
13	EH-936 Washer	9965.0015	2
16	3/8"-16 Carriage Bolt w/Nut	Specify Model	6
17	3/8" Spacer Pipes (Specify Model)	9904.3200	6
18	Back Bearing Complete	9902.1400	1
18A	Self-Aligning Pillow Block, Back	9902.2900	1
18B	Self-Aligning Bearing Holder, Back	9902.2800	1
19	Back Bearing Insert Only	9902.1500	1
20	Front Bearing Complete	9902.1610	1
20A	Bearing Holder (Bottom Strap), Front	9902.2950	1
20B	Bearing Holder (Top Strap), Front	9902.2955	1
21	Front Bearing Insert Only (With Grease Fitting)	9902.1700	1
22	Ring Gear, H-26 (Up to 25-26)	9914.0372	1
22	Ring Gear, H-28	9914.0382	1
23	Pinion Gear, H-27 (Up to 25-26)	9914.0393	1
23	Pinion Gear, H-29	9914.0403	1
23A	Gear Guard	9914.0618	1
24	5/8"-18 SAE Hex Nut (ESNA)	9904.5600	1
25	Pinion Shaft (Specify Model)	9914.0250	1
27	Side Pinion Bearing	9914.0243	1
28	Collar & Set Screw	9914.0351	1
29	Crank Handle, H-18 Complete	9914.0011	1
29A	Hand Crank Handle	9914.0506	1
29B	Hand Crank Handle Bolt w/Nut	9914.0511	1
30	Brake Pad, H-3	9914.0433	1
31	Vertical Rewind Bracket	9914.0233	1
32	Brake Spring, H-31	9914.0451	1
33	Brake Wheel	9914.0413	1
34A	Comet Brake Hub	9947.0038	1
34B	Comet Brake Strap only	9947.0091	1
34C	Comet Brake Tention Adjuster (Bolt,Spring,Washer,Wing Nut)	9947.0092	1
35	112T35 Disc Sprocket	9910.1321	1
35	138T35 Disc Sprocket	9910.1423	1
35	180T35 Disc Sprocket	9910.1526	1
36	Chain, #35	Specify Model	1
38	Motor Sprocket, 11T35 x 1-5/16	9910.1118	1
41	Motor, 12 Volt Explosion-Proof	9915.0003	1
42	1-1/2" 90 Deg. FxF Swivel Joint	9930.4210	1
50	Gasket	9965.0021	1
59	Sprocket Spacer	9954.0017	6
103A	5/16"-18 x 1/2" Hex Head Bolt	9904.1101	9
103B	3/8"-16 x 3/4" Carriage Bolt w/Nut (w/o Comet Brake)	9904.0201	2
103B	3/8"-16 x 2" Carriage Bolt w/Nut (w/Comet Brake)	9947.0093	1
103C	3/8"-16 x 3/4" Spinlock Bolt	9904.2201	18
103D	3/8"-16 x 1" Spinlock Bolt	9904.2202	4
103E	3/8"-16 Spinlock Nut	9904.6200	20
103F	1/2"-13 x 1" Hex Head Bolt	9904.1402	6
103G	1/2" Lock Washer	9954.0030	6
103H	1/2"-13 Hex Nut	9904.5400	4
103J	3/8"-16 ESNA Nut	9904.5201	1

Potable Water Cabinet Signage





Appendix G

Reference Documents

FACT SHEET: FINAL AIRCRAFT DRINKING WATER RULE

United States Environmental Protection Agency

The Environmental Protection Agency (EPA) published the final National Primary Drinking Water Regulations (NPDWRs) for Aircraft Public Water Systems under the Safe Drinking Water Act (SDWA) on October 19, 2009. Aircraft public water systems are subject to the requirements of SDWA and the NPDWRs.

Why did EPA issue the Aircraft Drinking Water Rule (ADWR)?

The primary purpose of the Aircraft Drinking Water Rule (ADWR) is to ensure that safe and reliable drinking water is provided to aircraft passengers and crew. This entails providing air carriers with a feasible way to comply with SDWA and the NPDWRs. The existing NPDWRs were designed for traditional, stationary public water systems (PWSs), not mobile aircraft water systems that are operationally very different. Aircraft must maintain rigorous operating schedules. They fly to multiple destinations throughout the course of any given day and may board drinking water from sources at any of these destinations. Aircraft board water from airport watering points via temporary connections. Aircraft drinking water safety depends on a number of factors including the quality of the water that is boarded from these multiple sources, the care used to board the water, and the operation and maintenance of the onboard water system and the water transfer equipment (such as water cabinets, trucks, carts, and hoses). These unique operational characteristics present different challenges that necessitate tailoring the NPDWRs for aircraft PWSs in the final ADWR.

What concerns does the ADWR address?

In 2004, EPA found all aircraft PWSs to be out of compliance with the NPDWRs. According to the air carriers, it is not feasible for them to comply with all of the monitoring that is required in the existing regulations. Subsequently, EPA tested 327 aircraft of which 15 percent tested positive for total coliform. EPA considers this to be a high percentage of positive samples. In response to these findings, EPA embarked on an accelerated process to tailor the existing regulations for aircraft public water systems. In the interim, EPA placed 45 air carriers under Administrative Orders on Consent (AOCs). Until the final ADWR compliance dates, air carriers remain subject to the existing national primary drinking water regulations or their respective AOCs.

Who is affected by this rule?

Aircraft which convey passengers in interstate commerce and are public water systems that board only finished water will be affected by this final ADWR. Aircraft that do not provide water for human consumption or those with water systems that do not regularly serve an average of at least twenty-five individuals daily do not meet the definition of a PWS. The final ADWR only addresses aircraft within U.S. jurisdiction; however, EPA supported an international effort led by the World Health Organization to develop international guidelines for aircraft drinking water.

The ADWR applies to the aircraft's onboard water system only. The components include: water service panel, storage tanks, pipes, valves, treatment devices, and plumbing fixtures within the aircraft that supply water to passengers or crew. The Food and Drug Administration (FDA) is responsible for regulating the watering points that include the water cabinets, carts, trucks, and hoses

from which aircraft board water. EPA and the states are responsible for regulating the public water systems that supply drinking water to the airport watering points.

How much will the ADWR cost air carriers and consumers?

EPA assumes that air carriers will pass on some or all of the costs of a new regulation to their passengers in the form of ticket price increases. EPA estimates that 708.4 million passengers travel each year on aircraft that are affected by the ADWR. EPA estimates air carriers' total annualized cost to implement the ADWR to be about $6.95 million using a 7 percent discount rate. The cost passed on to passengers can be roughly estimated by dividing the air carriers' annualized costs incurred by the number of passengers traveling each year. Based on this approximation, EPA estimates that passengers could face a relatively negligible increase of about one cent per ticket.

What does the final rule require?

The rule combines coliform sampling, best management practices, corrective action, public notification, operator training, and reporting and recordkeeping to improve public health protection. EPA believes that this rule provides the flexibility to meet the ever changing needs of the air carrier industry while still providing adequate barriers of protection.

What is the frequency required for coliform sampling?

The frequency of coliform monitoring is tied to the frequency of disinfection and flushing of the aircraft water system, as follows:

Routine Disinfection and Flushing and Routine Sample Frequencies	
Minimum Routine Disinfection & Flushing Per Aircraft	**Minimum Frequency of Routine Samples Per Aircraft**
At least 4 times per year = At least once within every three-month period (quarterly)	At least 1 time per year = At least once within every twelve-month period (annually)
At least 3 times per year = At least once within every four-month period	At least 2 times per year = At least once within every six-month period (semi-annually)
At least 2 times per year = At least once within every six-month period (semi-annually)	At least 4 times per year = At least once within every three-month period (quarterly)
At least 1 time per year or less = At least once within every twelve-month period (annually)or less	At least 12 times per year = At least once every month (monthly)

Two coliform samples are taken per monitoring period: One sample must be taken from a lavatory and one sample from a galley. Any total coliform-positive sample must be further analyzed for the presence of *E. coli*. The air carrier must conduct disinfection and flushing of the aircraft water system in accordance with, or consistent with, the water system manufacturer's recommendations. This allows for equipment-specific designs and for flexible implementation with the evolution of technology. In cases where a recommended routine disinfection and flushing frequency is not specified by the aircraft water system manufacturer, the air carrier is given the flexibility to choose a disinfection and flushing frequency, and corresponding monitoring frequency, specified in the above table.

What triggers corrective action and public notification?

Initial Corrective Action and Public Notification Requirements for Aircraft Water Systems *Additional corrective actions based on repeat sample results or follow-up sample results are not reflected in this table.		
Monitoring Result or Failure	**Corrective Action**	**Public Notification**
If any routine sample is total coliform-positive and *E. coli*-negative	-- Perform disinfection and flushing no later than 72 hours after being notified by lab of total coliform-positive result, and collect follow-up samples; or -- Restrict public access to the water system no later than 72 hours after being notified by lab of total coliform-positive result; all public access restrictions must remain in-place until the aircraft water system has been disinfected and flushed and a complete set of follow-up samples has been collected; or -- Collect 3 repeat monitoring samples no later than 24 hours after being notified by lab of total coliform-positive result.	If the air carrier chooses to restrict public access to the water system, the air carrier must initiate public notification at that time (i.e., no later than 72 hours after being notified by lab of total coliform-positive result) and continue until the aircraft water system is returned to unrestricted public access.

Initial Corrective Action and Public Notification Requirements for Aircraft Water Systems *Additional corrective actions based on repeat sample results or follow-up sample results are not reflected in this table.		
Monitoring Result or Failure	**Corrective Action**	**Public Notification**
If any routine sample is *E. coli*-positive	-- Restrict public access to the water system no later than 24 hours after being notified by lab of *E. coli*-positive result; all public access restrictions must remain in-place until the aircraft water system has been disinfected and flushed and a complete set of follow-up samples is total coliform-negative; and -- If the aircraft water system cannot be physically disconnected or shut-off, or the flow of water otherwise prevented through the tap(s), the air carrier must disinfect and flush the system no later than 72 hours after the lab notifies the air carrier of the *E. coli*-positive result; and -- Collect follow-up samples.	Initiate public notification when restriction of public access is initiated (i.e., no later than 24 hours after being notified by lab of *E. coli*-positive result) and continue until a complete set of follow-up samples is total coliform-negative. At that time, the aircraft water system may be returned to unrestricted public access.
Failure to perform routine disinfection and flushing or failure to collect and analyze the required routine coliform samples	Restrict public access to the water system no later than 72 hours after discovery of the failure; all public access restrictions must remain in-place until the aircraft water system has been disinfected and flushed and a complete set of follow-up samples has been collected.	Initiate public notification when restriction of public access is initiated (i.e., no later than 72 hours after discovery of the failure) and continue until the aircraft water system is returned to unrestricted public access.

Initial Corrective Action and Public Notification Requirements for Aircraft Water Systems *Additional corrective actions based on repeat sample results or follow-up sample results are not reflected in this table.		
Monitoring Result or Failure	**Corrective Action**	**Public Notification**
Failure to collect and analyze the required follow-up samples as a result of an *E. coli*-positive result	-- Restrict public access to the water system no later than 24 hours after discovery of the failure; all public access restrictions must remain in-place until the aircraft water system has been disinfected and flushed and a complete set of follow-up samples is total coliform-negative; and -- If the aircraft water system cannot be physically disconnected or shut-off, or the flow of water otherwise prevented through the tap(s), the air carrier must disinfect and flush the system no later than 72 hours after the lab notifies the air carrier of the *E. coli*-positive result; and -- Collect follow-up samples.	Initiate public notification when restriction of public access is initiated (i.e., no later than 24 hours after discovery of the failure) and continue until a complete set of follow-up samples is total coliform-negative. At that time, the aircraft water system may be returned to unrestricted public access.
Failure to collect and analyze the required repeat or follow-up samples as a result of a total coliform-positive and *E. coli*-negative result	Restrict public access to the water system no later than 72 hours after discovery of the failure; all public access restrictions must remain in-place until the aircraft water system has been disinfected and flushed and a complete set of follow-up samples has been collected.	Initiate public notification when restriction of public access is initiated (i.e., no later than 72 hours after discovery of the failure) and continue until the aircraft water system is returned to unrestricted public access.

Initial Corrective Action and Public Notification Requirements for Aircraft Water Systems *Additional corrective actions based on repeat sample results or follow-up sample results are not reflected in this table.		
Monitoring Result or Failure	**Corrective Action**	**Public Notification**
When the air carrier becomes aware of an *E. coli*-positive event resulting from: (1) boarding water from a watering point not in accordance with FDA regulations (21 CFR part 1240 subpart E), or (2) boarding water that does not meet NPDWRs applicable to transient non-community water systems (§§141.62 and 141.63, as applied to TNCWS), or (3) boarding water that is otherwise determined to be unsafe due to non-compliance with the procedures specified in §141.804(b)(6).	-- Restrict public access to the water system no later than 24 hours after discovery of the failure; all public access restrictions must remain in-place until the aircraft water system has been disinfected and flushed and a complete set of follow-up samples is total coliform-negative; and -- If the aircraft water system cannot be physically disconnected or shut-off, or the flow of water otherwise prevented through the tap(s), the air carrier must disinfect and flush the system no later than 72 hours after the lab notifies the air carrier of the *E. coli*-positive result; and -- Collect follow-up samples.	Initiate public notification when restriction of public access is initiated (i.e., no later than 24 hours after discovery of the failure) and continue until a complete set of follow-up samples is total coliform-negative. At that time, the aircraft water system may be returned to unrestricted public access.

Initial Corrective Action and Public Notification Requirements for Aircraft Water Systems *Additional corrective actions based on repeat sample results or follow-up sample results are not reflected in this table.		
Monitoring Result or Failure	**Corrective Action**	**Public Notification**
When the air carrier becomes aware of a non-*E. coli*-positive event resulting from: (1) boarding water from a watering point not in accordance with FDA regulations (21 CFR part 1240 subpart E), or (2) boarding water that does not meet NPDWRs applicable to transient non-community water systems (§§141.62 and 141.63, as applied to TNCWS), or (3) boarding water that is otherwise determined to be unsafe due to non-compliance with the procedures specified in §141.804(b)(6).	Restrict public access to the water system no later than 72 hours after discovery of the failure; all public access restrictions must remain in-place until the aircraft water system has been disinfected and flushed and a complete set of follow-up samples has been collected.	Initiate public notification when restriction of public access is initiated (i.e., no later than 72 hours after discovery of the failure) and continue until the aircraft water system is returned to unrestricted public access.

What coliform sampling plans and operations and maintenance plans need to be developed?
Each air carrier, for each aircraft that it owns or operates, must have a coliform sampling plan and an aircraft water system operation and maintenance plan within 18 months after the final rule is published for each existing aircraft public water system, and within the first calendar quarter of initial operation for new aircraft PWS. These plans must be included in a Federal Aviation Administration-accepted aircraft operations and maintenance program. The frequency for routine coliform sampling and routine disinfection and flushing must also be reported to EPA.

What types of inspections or audits are required by the ADWR?
Each air carrier must conduct a self-inspection of each aircraft water system no less frequently than once every 5 calendar years. In addition, EPA may conduct compliance audits as deemed necessary. The air carrier must address significant deficiencies found as a result of routine compliance audits or self-inspections within 90 days of identification of the deficiency, or where such deficiency is identified during extended or heavy maintenance, before the aircraft is put back into service.

How will information (inventory data, sampling data, etc) be transmitted to EPA?
As the primacy agency, EPA has oversight responsibility for aircraft PWS reporting information. To facilitate collection and analysis of aircraft PWS data, EPA is developing an internet-based electronic data collection and management system. This approach is similar to that used under the EPA SDWIS/STATE (Safe Drinking Water Information System/State version) reporting program. This is intended to reduce the reporting errors and limit the time involved in investigating, checking, and correcting errors at all levels. If an air carrier determines that it or its laboratory does not have the capability to report data electronically, the air carrier can submit a request to EPA to use an alternate reporting format. Regardless of the reporting process used, air carriers are to report the required information based on the schedule as stipulated in the ADWR.

What are the compliance dates for the ADWR?
Each air carrier must report a complete inventory of existing aircraft by 18 months following publication of the ADWR. In addition, the air carrier must report that it has developed a coliform sampling plan and an operations and maintenance plan that cover each existing aircraft. Air carriers must comply with all remaining requirements (e.g., routine disinfection and flushing, routine sampling) beginning 24 months following publication of the ADWR.

How can I get more information?
EPA's ADWR and other supporting information are available on EPA's Web site at http://www.epa.gov/safewater/airlinewater/index.html. For additional information about the final rule, contact the Safe Drinking Water Hotline toll free Monday through Friday, 10:00 am to 4:00 pm eastern time (except Federal holidays) at 1-800-426-4791.

IATA DRINKING WATER QUALITY POOL
SAFETY STANDARDS

Issue Number 8
February1 2018

THESE ARE THE STANDARDS TO BE FOLLOWED TO ENSURE THAT AIRCRAFT DRINKING-WATER QUALITY AND SERVICING SAFETY ARE MAINTAINED TO AN ACCEPTABLE LEVEL (These were formerly known as Procedures).

GENERAL

Access to safe drinking water is essential to health, a basic human right and a component of effective policy for health protection.

One of the significant risks to aviation is posed by the potential for microbial contamination of aircraft water by animal or human excreta. This contamination may originate from source waters or may occur during transfer operations or while water is stored on board the aircraft. Waterborne disease burdens in many parts of the world include cholera, enteric fevers (Salmonella), bacillary and amoebic dysentery and other enteric infections. However, any location is at risk if proper procedures and sanitation practices are not continuously followed to ensure the safety of water that is used for drinking and food processing and preparation.

It is therefore essential that the potable water is disinfected and that handling companies adhere to sanitary requirements established by the World Health Organization (WHO) or those issued by the local authority if these are more stringent.

Even if the water at the airport is safe, that does not ensure that it will remain safe during the transfer to the aircraft and storage activities that follow. An understanding of the aircraft drinking water supply and transfer chain will help to illustrate the points at which the water can become contaminated en route to the tap on board the aircraft.

Generally, the aircraft drinking water supply and transfer chain consists of four major components:

1 The source of water coming into the airport.

2 The airport water system, which includes the on-site distribution system. It may also include treatment facilities if the airport produces its own potable system.

3 The transfer point (sometimes referred to as the watering point), including the water transfer and delivery system. It is typically a temporary interconnection between the hard-plumbed distribution system of the airport (e.g. at a hydrant), and the aircraft water system, by means of potable water vehicles and carts, refillable containers or hoses. This water transfer process provides multiple opportunities for the introduction of contaminants into the drinking water.

4 The aircraft water system, which includes the water service panel, the filler neck of the aircraft finished water storage tank and all finished water storage tanks, including refillable containers/urns, piping, treatment equipment and plumbing fixtures within the aircraft that supply water to passengers or crew.

5 All processes, procedures shall be in line with AHM 440 latest revision.

1. INTRODUCTION

1.1. Annex 1 B 1 (d) of the IHR (WHO, 2005) requires every designated airport location worldwide to develop the capacity to provide potable water for the aircraft that use their facilities. However, it is the responsibility of each aircraft operator to ensure that these standards are being upheld.

1.2. As an assurance that water suppliers are maintaining acceptable standards, it is essential that servicing facilities be inspected at regular intervals. In general, the major companies' operating regulations establish acceptable standards of quality and safety. Experience has shown that these standards are not always adhered to and there is an increasing number of national companies where it may not be possible to obtain contractual agreements that would establish even minimum standards.

1.3. This procedure will detail typical quality and safety procedures that should be regularly performed by the handling companies and for which records should be readily available. Also suggested, are typical levels of performance. The airfield inspection should ensure that similar procedures are performed regularly and efficiently and that suitable records are retained.

Where discrepancies are found that do not present a hazard to aircraft and passengers, agree remedial action and time-scale with the local company management. If the discrepancies present a hazard, do not accept drinking water servicing until a thorough investigation is carried out in conjunction with a representative of the supplier, to ensure an acceptable drinking water and servicing procedure. In this case, take action as per paragraph 3, Reporting.

Their Operating Standards are generally given by the WHO standard for drinking water.
Delivery to the airfield can be done by the national or regional water supply system, a private's one or the airport installation.

Ensure that the water supplied corresponds to the specification of the product ordered and to the Analysis Certificate or the last Full Specification test.

Draining of aircraft tanks may become necessary locally for cleaning and disinfecting or for operational or maintenance reasons.

The drained water shall not be recovered in the water servicing tank, but shall be drained in a dump tank identified "Non Drinking water".

Establish if the service of water draining, cleaning and disinfecting of the a/c tank is offered by the company.

1.4. Audit procedure

1.4.1. At a large installation/airfield the amount of equipment will render it impossible to carry out a complete check on every item at each inspection. One or perhaps two storage tanks (if any) or water tower, filters or vehicles should be picked at random, but in the event of not being satisfied, deeper probing will be required and remedial action agreed.

1.4.2. Dependent on the frequency of inspection, different tanks or vehicles can be chosen on each occasion, which should enable a very large cross section of the equipment to be checked.

2. RESPONSIBILITIES

(To be issued by each individual Member Airline. Airline responsibility will be included in an HACCP process document)

3. REPORTING

(To be issued by respective IDQP Inspector)

The Report shall be published in IDQP Database. The letter(s) of the report will be sent automatically to the inspected party respective IDQP member airlines defined by the finding level's:

Finding description	Publishing limits after inspection:	Letter content	Name of the published letter & distribution
Level 1 (Critical finding)	Within 7 days	Level 1, 2 & 3 findings	IDQP Level 1 letter
Level 2 (Finding)	Within 14 days	Level 2 & 3 findings	IDQP Level 2 letter
Level 3 (Observation)	Within 30 days	all	IDQP Level 3 letter
No findings	Within 30 days	all	IDQP closing letter

If all findings of an open report has been fixed, the report will be closed and an automatic IDQP closing letter will be send to the relevant parties.

3.1 Definition of Finding Levels

Level 1 (Critical finding)

- Is any non-compliance with the IDQP or AHM440 standard (or national regulation) which lowers the safety standard by directly influencing health of passengers and crew.
- Non compliance of laws, minimum WHO or local health standards

Level 2 (Finding)

Is any non-compliance with the IDQP or AHM440 standard (or national regulation) which may lower the safety standard but without influencing direct health effect.

Level 3 (Observation)

An observation is a recommendation whilst not a non-conformance as such, indicates that potentially one might arise if the situation is not adjusted.

4. WATER SAMPLES AND ANALYSIS

4.1. Water samples that may be required from a Supplier should be mutually agreed and taken from the a/c servicing hose end and at the airport source(s) (where the vehicles are filled). A sterile food quality bottle of 1liter should be used for each kind of analysis (chemical, physical and microbial analysis) for each sampling point. The Supplier should retain a sample at the same time. The point of sampling and date should be noted on each bottle.

4.2. Definitions

- **Chlorite**

  "Chlorite" is a name used for a group of sheet silicate minerals with similar properties. They are primarily found in weakly metamorphosed rock and form from the alteration of clay-rich sedimentary rocks. It has very few industrial uses. It's usually used as a filler and as a constituent of clay.

- **Chlorine**

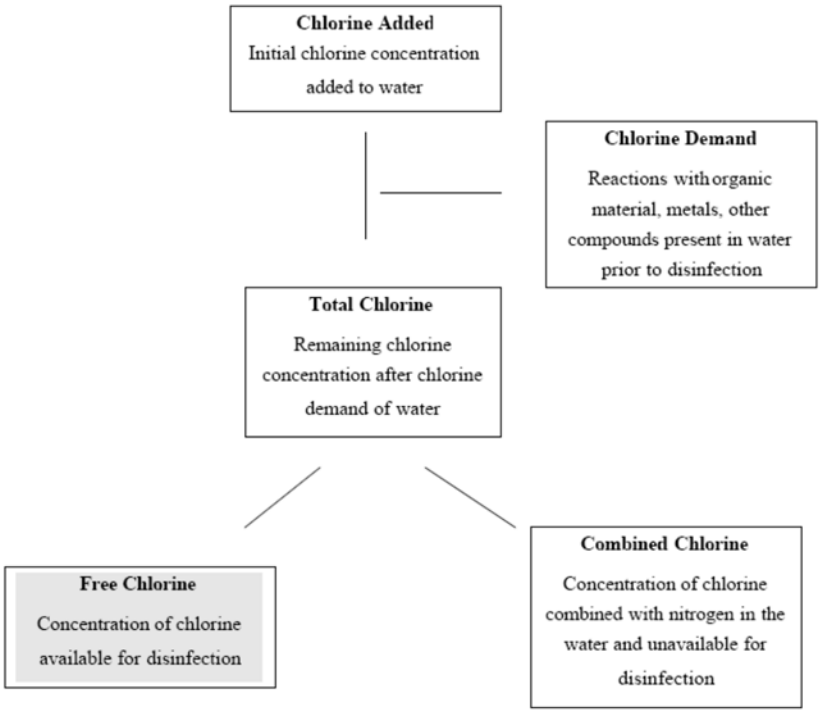
  Chlorine is a poisonous, greenish-yellow gas described as having a choking odor. It is a very corrosive, hazardous chemical. Usually combined with other chemicals, it is used to disinfect water, purify metals, bleach wood pulp and make other chemicals. Because of its reactivity, Chlorine does not exist in the free elemental state in nature, although it is widely distributed in combination with other elements. Chlorine is available in a number of different forms. Granular, liquid or tablet for example Household bleach, is a 5% solution of a stabilized form of chlorine.

- **Free Chlorine**

  Chlorine in water may be present in two forms, free and combined. Free chlorine does the hard work of killing bacteria and oxidizing contaminants. When you add chlorine to water, you are actually adding free chlorine.

- **Total Chlorine**

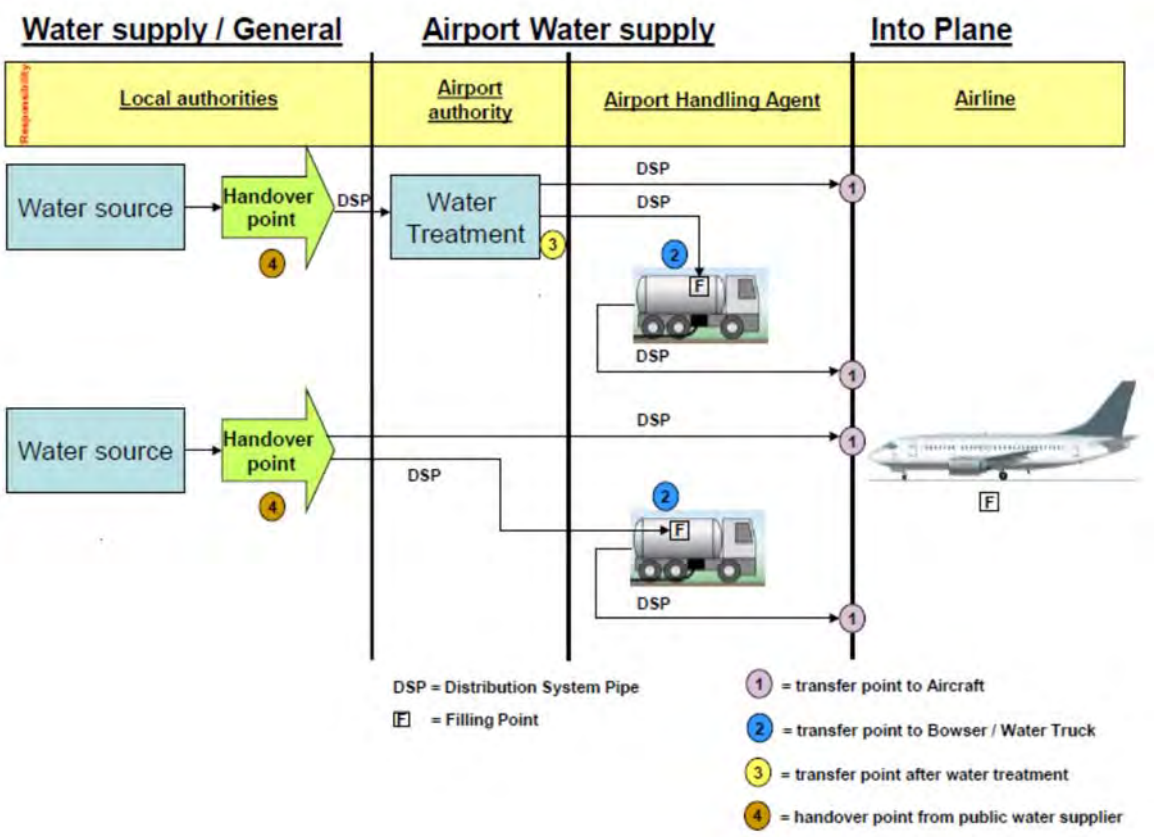
  When the free chlorine combines with contaminants, it becomes combined chlorine, or chloramines. In water, this form of chlorine has very little sanitizing ability, and no oxidizing ability. Total chlorine is just the sum of both combined chlorine and free chlorine.



Chlorine Residual Testing Fact Sheet. CDC SWS Project

4.3 Sampling

4.3.1. Sampling points



Definitions of the different sampling points:

1: Transfer Point to aircraft means:
The hose end coupling at the connecting point from water truck, water bowser or fixed hose, which is connected to the gate position.

2: Transfer Point to Bowser / water Truck means:
The hose/pipeline end that fills the water truck or water bowser

3: Transfer point after water treatment means:
The location **directly** after the treatment Unit. (Mostly a water faucet).
*Note: In opposite to Sampling point 2 this is the point, **before** the hose/pipeline is connected*.

4: Hand over point from public water supplier:
Connection between public water supply and airport potable water facilities.

4.3.2. Preparation

a) Before water sampling, it is mandatory:
   - To have clean hands
   - To use only sterile sampling bottles provided by the laboratory or other approved sources

b) Disinfect / sterilize:
   - Using disinfecting/cleaning towelettes or cleaning paper soaked with bleach, clean and disinfect the water tap.
   - Wipe your hands with disinfecting towelettes or equivalent.

c) Let the water run at low flow for a few seconds, then at medium flow during 2 to 3 minutes so as to flush the line and eliminate the disinfectant.

4.3.3. Sampling

a) Use the two sterile bottles (1 physico-chemical factors and 1 microbial analysis)

> **CAUTION:**
> During all sampling operation, there shall be no contact between the sterile bottle (border and inside of cap), and the fingers or any other non-sterile part of the sampling area.

b) Present the bottle under the water tap and fill it without previous rinsing while letting a little quantity of air at the top.

c) Write on the bottle labels: date and time of sampling, airport, location of sampling (airport water network or water servicing vehicle), serviced a/c and airline if any.

4.3.4. Sample conservation and sending to laboratory

a) Samples will be kept at 5° C in melting ice or equivalent in an isothermal container.

b) Until transportation is possible, keep the samples in a refrigerator.

c) The bottles will be sent together with the analysis report form (see annex).

d) Bring the samples as quick as possible to the laboratory. Analysis shall be done within 24 h after sampling.

(For more detailed procedure on sampling refer to ANNEX 1)

4.3.5. Drinking water samples should be tested for the following parameters:

Parameter	Requirements		Limit (1) H/R	Action
	(4) (3) (2) Transfer point to Bowser / Water Truck (5)	(1) Transfer point to A/C (5)		
Coliform Bacteria (*)	0/100ml	0/100ml	H	No uplift
Escherichia Coli (E-Coli) (*)	0/100ml	0/100ml	H	No uplift
Enterococci	0/100ml	0/100ml	H	No uplift
Pseudomonas Aeroginosa	0/250ml	100/250ml	R	Re-sampling (flushing/disinfection/re-sampling
Colony Count @ 22°C (*)	100/ml	≤500/ml (*)	H	(*) ≥350/ml (cleaning/disinfection, re-sampling) ≥500/ml - no uplift (4)
Colony Count @ 37°C (*)	20/ml	100/ml	H	≥100/ml - no uplift (4)
Clostridium Perfringens (2)	0/100ml	0/100ml	R	Contact local authorities, re-sampling
Residual Chlorine (*)	0,3 mg/l - max. 0,8 mg/l	0,3 mg/l - max. 0,8 mg/l	R	<0.3 mg/l adding of chlorine
pH	6,5 - 9,5	6,5 - 9,5	H	
Turbidity (2)	1,0 NTU (3)	1,0 NTU (3)	R	>1 NTU re-sampling ((flushing/disinfection/re-sampling)
Odour /Taste	no abnormal	no abnormal	-	Re-sampling (flushing/disinfection/re-sampling

(1) **Limit Definitions: (H) Hard limit**: no uplift possible
(R) Recommendation level: for information only, may induce actions by individual airline
(2) necessary if surface water is used
(3) **NTU =** Nephelometric Turbidity Unit
(4) no uplift after re-sampling
(5) sampling points

***Note**: Analysis may be delegated to the handling company, provided it is carried out by the local health authorities or by a qualified laboratory approved by the two parties.*

(*) These requirements are in line with the Guidelines for Drinking Water Quality of the World Health Organization Latest Edition

5. CHECKLIST ITEMS

5.1. General

STATION NAME:	IATA 3 letter code	
INSPECTION DATE:	Date of the inspection (DD/MMM/YYYY)	
INSPECTED BY:	Name of certified IDQP inspector	
AIRLINE:	Airline name	
Type of inspection:	*Initial*:	first time scheduled inspection of an airport or an Water provider / Servicer
	Scheduled:	According to the interval defined by IDQP
	Other:	could be a follow up / ad hoc or any "other" inspection
Name of Company:	Name of the inspected potable water provider.	
Water uplift via:	Vehicle or cabinet: Have to be marked which way of water uplift is possible at the specific airport.	
Type of Company:	See Checklist	
Findings:	This section needs to be completed after the IDQP inspection has been performed.	
Repeated Findings:	Are findings which have been already identified during the past inspection.	
Repeated Observations:	Are observations which have been already identified during the past inspection.	
Follow up audit required:	Follow up is required if more than 3 different critical findings are observed. A follow up inspection shall be performed within the next 3 month and shall contain the findings of the previous inspection only. *NOTE: If a follow-up is not successful, then its recommended to the IDQP member airlines not to uplift potable water at this specific handling agent / airport.*	
List of Member airlines:	Shall be used to identify those airlines which has a contract with the inspected water provider..	
Addresses:	All necessary details needs to be filled in! *NOTE: For further preparations it is essential to have two different contact addresses / mails. Should be not the same name twice!!*	

Accredited Laboratory used for quarterly reports:	All necessary details needs to be filled in!
Additives:	Please note down all relevant information for the used Additives which will / have been added to the potable water plus at which point in the process it is added. (Storage / Fill point / Vehicles) Disinfection is an effective barrier to many pathogens (especially bacteria) during drinking water treatment and should be used for surface water and for ground water subject to fecal contamination. Residual disinfection is used to provide a partial safeguard against low-level contamination and growth within the distribution system. The use of chemical disinfectants for water treatment usually results in the formation of chemical by-products. However, the risks to health from these by-products are extremely small in comparison with the risks associated with inadequate disinfection. Record water additive and the concentration, or treatment. Only products approved by the local health authority may be used for the disinfection of drinking water. Some disinfectants such as chlorine can be easily monitored and controlled as a drinking water disinfectant, and frequent monitoring is recommended wherever chlorination is used. Free chlorine content at the point of filling into the aircraft must be in the range of 0,3 to 0,8 mg/l (0,3 mg/l minimum for sample taken from a/c) or 0,1 to 0,3 mg/l of Hydrogen Peroxide. When a disinfection agent is added in the potable water servicing vehicle, this should be done immediately after filling and the water should be circulated within the servicing vehicle during a minimum time of 30 minutes in order to have a full dilution and to allow the disinfection agent to react.
Review of previous inspection:	

PR - Procedures and Documentation

PR1 Potable Water procedure manuals of IDQP Member Airlines

List the 3 – Letter airline code, document name, revision status and date of the manuals available at the handling company:

PR2 Potable Water Manuals from Service Company:

Verify if following documents are available and the latest revision is available.

- Servicing Company Quality Control Manual
- Water servicing manual
- Airline notification procedure

A system should be established which ensures that airline customers are notified of any impending risk of water supply being disrupted. Whatever the reason, be it staff industrial action, breakdown of equipment, pollution, fire, financial or political, the airlines should be informed in good time to be able to make alternative arrangements for water uplift.

In addition, if any damage to a vehicle is discovered during or after an aircraft servicing, such that there is a possibility that parts may have entered an aircraft water system, or have damaged aircraft connectors, the Airline should be notified immediately. This action may prevent further damage incurred to the aircraft at the next servicing, in flight water system blockages or incident. It is important to first check that missing parts have not fallen onto the apron, but that the Airline is notified as soon as possible and in any event, if possible, before the next servicing on the aircraft involved in the incident. Observed damage to the aircraft servicing connectors should also be reported to the airline.

This is done either by direct contact with the local representatives of the airlines or via the airport authority or through the supplier.

RC - General and Airport records

RC1 Does the provider follow a System which contains following items:

The operator has to have a system which for IDQP minimum contains:

- Safety Policy, Details could be found e.g. in ICAO Annex 19
- Safety Manager, Details could be found e.g. in ICAO Annex 19

  Quality control shall be done by an approved authority or certified employees. Record organization's name.
- Safety Training & Awareness

  Specific training should be provided to the operators. Trainings and qualified operators shall be recorded. List of qualified operators shall be available in the foreman office.

  An employee training record must be maintained for every employee ; that record indicates which tasks training has been given and the date of such training, the

signature of the trainer, a „yes/no“ assessment of whether the trainee demonstrated satisfactory understanding of the training, and the signature of the trainee. Training must contain theoretical and practical chapters and regular refreshers. For details please refer to AHM 611.

Training should include at least:

- Hygienic principles (personnel sanitary precautions and cleaning equipment procedures),
- Water servicing and water draining procedures
- Safety and security,
- Specific equipment and individual equipment
- Fire extinguishers are needed for mobile powered servicing trucks used for water servicing. Operators shall be trained to use them and will be aware of the fire extinguishers available on the tarmac and their locations.

- Incident / Accident reports

  Incidents and accidents should be reported immediately. This applies to:

  - Major accidents
  - Fatal or serious injury to personnel
  - Excessive damage to property, plant and equipment including aircraft.
  - Accidental contamination during water uplift.
  - Major spills
  - Breaches of security due to criminal or malicious action
  - Minor incidents and accidents
  - A near miss which might otherwise have resulted in any of the above

  Detailed reporting and investigation procedures including forms for reporting and investigating incidents should be included in the procedure manual of the operation. Forms should be readily available locally so that staff can get familiar with accident reporting procedures.

  Spillage: Under freezing temperature, any water spillage will be treated as soon as possible. A specific procedure to dam and recover the spillage shall be provided.

If spillage is not treated, this fact shall be reported to the airline and the airport tarmac officer.

RC2 Water supply:

The potable water for airport installations could be provided by:

- the Airport itself if the airport has his own source and water treatment.
- the City delivers potable water via a public or dedicated water pipe to the airport.
- Others: Could e.g. water bottles or any external company delivers water with any suitable devices to the airport.

The water transfer points between the airport source and the aircraft onboard storage and distribution system present significant opportunities for contamination. Common equipment used to transfer water includes (but is not limited to) piping, hoses, potable water cabinets, bowsers, tanks, filling stations, refillable urns and jugs, and hydrants (including taps and faucets). Record the drinking water origin.

RC3 Last water supply analysis results.

Regular monitoring of each parameter is necessary to ensure that safe water quality is maintained, as each step in the water transfer chain provides an opportunity for contamination.

Regular analysis shall be done every 3 months for all parameters microbial and physico-chemical . The sampling and analysis frequencies may be increase if the need arise.

The water analysis certificate with the parameter values and parameter limits shall be displayed or available.

Should an analysis failed, water servicing must be interrupted immediately and corrective action done accordingly. Water servicing shall be resumed after subsequent analysis has shown acceptable results for the involved parameters

Records shall be maintained at least for three years.

Report name of company / laboratory / authority.

Note: See also WHO – Guide to Hygiene and sanitation in Aviation – Section 2.2.2

RC4 Filters and/or water special treatments

Water should preferably be delivered into storage through a filter system. Some systems incorporate only a filter on the inlet side whilst others incorporate both a filter and a water softener.

The filter in this instance is generally used to remove the bulk of the sediment, thus prolonging the life of expensive water softener. The addition of an automatic chlorine injection system can sometimes be found.

Filter vessels shall be of stainless steel, anodized aluminum construction or epoxy fiber/glass fiber with an internal liner. They should also be fitted with a pressure release valve and a pop-out device or equivalent as a clogging indicator.

Generally disinfection is done by adding chlorinated agents such as bleach and chlorine dioxide. Other treatments use hard UV light or ozone injection. Those two latter processes do not provide residual disinfection.

Check for filter change frequency.

RC5. Water appearance and smell

a) Sample check

Samples should be taken in a suitable, clean dry clear glass jar. It is not necessary to use a sterile bottle for this check.

Ensure that the sample drain pipework is first flushed during 2 to 3 minutes at medium flow rate to obtain a representative sample.

Allow the sample to settle in the container to ensure freedom from entrained air. Inspect in a good light. A flash light beam may be used to detect colloids in suspension.

b) Visual check

For the water to be acceptable it should be of appropriate colour, visually clear, bright and free from solid matter and noticeable odour.

A sample from the sump of each tank should be checked for cleanliness and pollution -, (Clear and Bright). If visible particulates or other pollution are detected, let the water settle for 10 minutes and take another sample. If visible particulates or other pollution are still present, the source supply shall not be used and the installation Manager should be notified.

c) Liquid pollution

Water may be polluted by foreign liquids. Petroleum products are easily detected by an iridescent water surface. Some heavy solvents may settle at the bottom of the sampling bottle.

d) Particulates

Particulates (solid matter) appear as flakes, specks or fibers suspended in the water or settled out at the bottom. Examination can be facilitated by swirling the sample to form a vortex, any solid matter concentrating itself at the centre.

Sources of solid contaminants are normally:

- rust and scale from inside pipes and tanks.
- rubber particles from hoses and gaskets.
- dust, dirt and sand drawn in through vents.
- fibers from rags and filters.
- wear particles from pumps and meters.

e) Micro-organisms

Micro-organisms may enter in improper sealed or cleaned systems. They can be detected only by specific microbial analysis. Some portable field microbial detectors are under evaluation and not yet fully approved.

f) Chemical Checks for disinfectant content

Use test kits appropriate for the chemical that has been added for disinfection.

RC6 Fill point hose condition

Fill point hoses (if any) should be maintained in good condition, with no cracks and kinks, and should be checked regularly. Hoses should be Type Food Quality (examples: BS EN 13618; NSF/ANSI standard 61; KTW DVGW; FDA or equivalent).

About “Aquapal” hoses made by Continental. They do give an in service life-time of three years, but do not give any storage lifetime. They do also talk about a regular disinfection/cleaning of the hose, but they do provide a little details about how to do but nothing about time intervals.

Fill hoses end should be capped or secured on a dummy connector. Hose end dust caps should be clean, in good condition and replaced when hoses are not in use.

If a dummy connector is been used, it should be in a receptor filled with a disinfecting solution (permanganate or equivalent).

Fill point and fill point hoses shall be secured in a metal pest proof and lockable enclosure to prevent accidental contamination, pest infestation and unauthorized access.

When not in use, all fill point/transfer point hoses shall be secured and locked.

RC.7 Water Installation constructed from appropriate Material

Potable Water Installation shall be constructed of appropriate materials (e.g. corrosion-resistant materials) certified for this application, properly designed, operated, labeled, maintained and used for no other purpose that might adversely affect the quality of the water.

No lead, cadmium alloys, cadmium plating or galvanized steel shall be in contact with water, nor should zinc material coatings or non-food quality plastic material be used.

RC8 Airfield Storage; Airfield Water supply system and storage records

General cleanliness and tidiness of the storage area is often a guide to good housekeeping.

In some airports, pressurized storage tanks are used for storage and delivery.

Tanks should be designed so they can be disinfected and flushed and should be provided with a drain that permits complete drainage of the tank.

The inlet and outlet to the tank should terminate in a downward direction or gooseneck and should be provided with caps or closures with keeper chains for protection against contamination.

The inlet and outlet should be equipped with couplings of a type that permits quick easy attachment and removal of the hose.

Storage tanks, pipework, walkways and handrails should be re-painted regularly and tank bound areas should be kept free of vegetation.

Tanks should have the panel “DRINKING WATER” displayed and all pipework should be color coded accordingly f with the flow direction arrows.

Each tank should be clearly identified with a number and date of last inspection/cleaning should be stenciled on the storage tank shell.

Water obtained by draining and sampling shall not be returned to the tank. This water may be used for other purpose than drinking water.

Security arrangements have to be adequate to protect the personnel, assets and operation of the

facility

Airfield water supply system maybe constituted by (but not limited to) piping, hoses, potable water cabinets, bowsers tanks, filling stations, refillable urns and jugs and hydrants. The lines capacity should be such to maintain positive pressure at all times to reduce the risk of backflow. There should be no connections between the potable water system and others piping system. Backflow of contaminated water into potable water system needs to be prevented by proper installation of piping, backflow prevention devices and plumbing.

If airfield supply system includes water storage the following items should be verified.

a) Check records of the daily tasks.

b) Hoses: If any, they shall be in good condition, of food quality (check for marking) with no crack and kink. Hoses should be Type Food Quality.

c) Drinking water shall be routinely analyzed according to the WHO standard or equivalent, see paragraph 4.2.5 & 5.1- (A.2). In some countries, more analysis can be performed depending upon the local circumstances. Analysis shall be done every time pollution is detected or suspected on the water delivery system. The analysis reports shall be available at the main delivery center.

FP Potable Water- Fill point / transfer point.

Filling areas should be dedicated for this purpose only and should be free of food manufacturing waste and by-products, general waste and cleaning agents. They should be designed and maintained in accordance with health regulations.

FP1 /FP2. Operator of Fill Point

Check ownership, operating company and quality control of the fill point(s).

FP3 Number of Fill Point

Record number of Fill Points allocated for potable water supply.

FP4 Location of fill point

Fills points shall be clearly identified and can be referenced on a map at the handling company operation room. Fill point connectors shall be at least one meter above the ground level and at more than 30 m from waste storage or treatment, water toilet servicing and trucks, etc.

A wall up to the roof which prevents the air exchange between the 2 areas is also acceptable.

FP5 Fill point label

Check for panel “For Aircraft Drinking water only”. Fill point/Transfer point should be clearly identified. Potable water servicing vehicle must not be filled up from unknown taps or from the one used for toilet servicers or equivalent wording. (e.g. local language)

FP6 Protection and cleanliness of the area

Check protection and cleanliness of the area. Advising panels such as “Keep clean” and / or “Do not litter“ are recommended.

Check the area drainage. Precautions should be taken in the construction of the fill point to ensure drainage from the area to prevent flooding during heavy rain. The fill point should not be located in a low point.

FP7 Fill point hoses in metal / pest proof enclosure

Fill point and fill point hoses shall be secured in a metal pest proof and lockable enclosure (or room/ cabinet) to prevent accidental contamination, pest infestation and unauthorized access.

When not in use, all fill point/transfer point hoses shall be secured and locked.

Access to the lockable enclosure (or room / cabinet) is only permitted by nominated personal.

FP8 Fill point hose end capped or secured in a disinfection solution

Fill hoses end shall be capped or secured on a dummy connector. Hose end dust caps should be clean, in good condition and replaced when hoses are not in use.

If no dummy connector is been used, shall be in a receptor filled with a disinfecting solution (permanganate, high chlorine concentration or equivalent).

FP9 Fill point inspection

The inspection shall ensure, that the fill point area is adequately maintained. Dates of last / next inspections of the filling point shall be labeled on the outside panel of the enclosure door.

The inspection shall at least include as a minimum but not limited to:

Daily:

- Cleanliness
- Coupling damaged / available / correct connected
- Treatment devices shall be functional
- Hoses, if any, should be completely flushed
- Appearance / smell of the potable water shall be checked
- Free chlorine / residual chemical test

Weekly:

- Disinfection

Monthly:

- Cleaning & Disinfection

FP10 Filters or other devices.

Check for filters or other devices (water treatment), record type and name.

Date of last / next inspection and change of the filters (if any) shall be labeled on the outside panel of the enclosure door

FP11 Potable Water Hoses

See RC6

FP12 Water sample

A water sample shall be taken to perform a chlorine test. Free chlorine content shall be in the range of 0,3 to 0,8 mg/l

Some airports add hydrogen peroxide. (0,1 and 0,3 mg/l) This method allows a good safety and prevents any risk of contamination during servicing; it has no remnant effect as free chloride does. IDQP requires to meet at least 0,5 mg/l free chlorine at the fill point and / or at the transfer point to the aircraft in order to ensure that at the end of a flight the free chlorine content inside the aircraft water system is at least 0,3 mg/l.

Note: *Some airports do not use sanitation additive according to local or national laws. It is the responsibility of each airline to decide to have a water additive or not.*

FP13 / FP14. Laboratory analysis Microbiological / Chemical

Check that the last analysis results are displayed (check with the analysis records). Microbial analysis shall be performed at least every 3 months for all parameters microbial and physico-chemical. See RC3

In case the Lab analysis is out of limit is an appropriate process in place to ensure that the required limits are met before using the equipment again.

FP15 Analysis records are filed for 3 years minimum.

FP16 Inspection records must be kept to ensure the fill point is maintained in good condition for safe and reliable service.

All maintenance work should be scheduled in accordance with the equipment manufacturer's instructions.

a) This list of daily checks should be carried out on the fill point each day and recorded.
   - Disinfectant detector kit – Check that it is available and that reagents are up to date
   - Dust caps should be replaced on all points
   - Daily checks will include technical and mechanical aspect of the fill point.

b) Methods of cleaning, scaling and disinfecting, frequency and chemicals (trade name and concentrations) shall be recorded and filed. A procedure should be available.

WS POTABLE WATER SERVICER(S)

The inspected Vehicle ID shall be reported in the report. It is recommended to randomly inspect different vehicles during the inspections.

WS1 /WS2. Operator of Vehicles

Check ownership, operating company and quality control of vehicles.

WS3/WS4 / WS5 Number of vehicles

Record number of vehicles allocated for potable water servicing and individual capacity.

Note: Draining carts are vehicles which are used to drain potable water from aircraft to the drain cart.

Suction drain devices are not permitted for use on aircraft systems.

WS6 Vehicles condition

Check vehicle condition. Vehicles should be identifiable by a fleet number and Company name. Vehicles should be maintained to a generally accepted standard of mechanical reliability, safety and be leak free.

This will cover all daily and weekly serviceability checks through to periodic preventative maintenance of engine, chassis and pumping/servicing equipment.

- Record the registration number of the inspected vehicle.
- The vehicles have the proper labels “Drinking Water Only” or “A/C drain Water” Only, do not reuse as drinking water”. Or equivalent in local languages.
- Check that tank roof area water drains (if any) are clear.
- Check tank lids/dome cover gaskets and proper operation of tank vents.
- Vehicles should be in a roadworthy condition.

WS7 / WS8 Vehicles Parking Area

Potable water servicing vehicles must NOT be parked in the same area of other water servicing vehicles. Potable servicing vehicles must be parked in a specific clean, shaded and secured area. Toilet trucks and Water trucks/carts shall never be at less than 30 m each other in distance in any way.

WS9 Vehicles disinfection / cleaning

Check that the servicing vehicle tanks are disinfected at least weekly in accordance with disinfection/cleaning procedures and that the last / next cleaning disinfection dates are displayed.

Vehicles cleaning

Check if the water tank interiors are scoured at least once a month to remove any scale or deposit.

Rust and lime scale inside of water bowsers can contaminate the water.

Inspect visually through the upper opening that the internal surfaces are well maintained and clean.

Water tanks shall be designed to allow easy cleaning, scaling and sanitizing. Material shall be of smooth stainless steel.

Best methods for removing scale build up are:

- Manual scraping
- Steam
- Chemical usage (Citric acid based chemicals)

WS10 Filter Change expiry date

Check when the filters have been changed last time and if the next filter change due date is labeled.

Special water treatments have to be recorded.

WS11 Vehicle hose condition

Check hoses quality. They must be of food quality, BS EN 13618; NSF/ANSI standard 61; KTW DVGW; FDA or equivalent (check for marking). Check hoses condition: they should not have cracks and/or kinks

See also RC6

WS12 Hoses connectors

Hose connectors have to apply to standard ISO 17775.

- Hoses connectors have flat connecting valves and are not worn. Intermediate connector adaptors are prohibited. Intermediate parts used to add chlorination may be used. Check for cleanliness and storage if any.

WS13 Fill hoses end shall be capped and/or secured on a dummy connector in clean and protected storage compartment. Hose end dust caps should be clean, in good condition and used when hoses are not in use.

WS14 If no dummy connector is been used, shall be in a receptor filled with a disinfecting solution (permanganate, high chlorine concentration or equivalent).

WS15 Take a sample and do a chemical test.

Free Chlorine result shall be 0.3 to 0.8 mg/l. If peroxide is added for disinfection result shall be 0.1 to 0.3 ml/l H_2O_2.Provider shall test personally by drinking

WS16 Vehicle Drain Port

- Check that the draining port has no leakage, is at the lowest point and will allow a full drainage.
- Tanks should be designed so that they can be disinfected and flushed and should be provided with a drain that permits complete drainage of the tank.

WS17 Water Truck drainage

Make sure that the used potable water truck is fully drained and refilled within 24hours.

WS18 Check if for the daily, weekly and monthly tasks procedures are available.
If the water level glass or plastic tube is installed, special attention needs to be taken. Due to the construction of this “indicator” it is very often a place where microbiological contamination starts.

WS19 / WS20

Microbial analysis, frequency and record filed. Corrective actions or procedures should be available if and when analysis shows contamination.

Water samples should be taken on a regular basis (at least every 3 months) from each bowser and sent to the laboratory for microbiological and physico-chemical examination.

The samples are used to verify the adequacy and effectiveness of the disinfection and water treatment procedures.

Even if the first set of samples meet standard, it does not mean that the water will always be of good quality.

Micro-samples are only useful if they are taken on a regular basis.

Taking a sample from the bowser immediately before a regular disinfection will tell you whether or not the bowser needs to be disinfected more regularly.

If the sample fails, then the bowser needs to be disinfected more often.

Taking a sample from the bowser immediately after disinfection will tell you whether the disinfection is being done properly. If the sample fails, the disinfection has not been done properly.

WS21 Scheduled and unscheduled maintenance records available:

Log books and inspection records must be kept to ensure vehicles are maintained in good condition for safe and reliable service.

All maintenance work should be scheduled in accordance with the equipment manufacturer's instructions.

The logbook should record details of work carried out, including servicing, repairs and replacement parts.

a) This list of daily checks should be carried out on the vehicle each day and recorded.
- Maintenance checks – ensure that the vehicle is serviceable and that past faults have been rectified.
- Disinfectant detector kit – Check that it is available and that reagents are up to date
- Check ALL points – water servicing carts equipment shall be drained of sediment from all low points daily. After loading, the vehicle should be allowed to stand for about 10 minutes for the water to settle. A cargo tank sump sample should then be drawn and checked for sediment (also trailers Ensure all low points are drained and samples C&B).
- Dust caps should be replaced on all points
- Daily checks will include technical and mechanical aspect of the vehicle and of the water tank and water delivery system.

b) Methods of cleaning, scaling and disinfecting, frequency and chemicals (trade name and concentrations) shall be recorded and filed. A procedure should be available.

WC POTABLE WATER CABINET (IF APPLICABLE)

WC1

See WS1 for details

WC2

See WS2 for details

WC3

See WS3 for details

WC4

See WS6 for details

WC5

The content of the installed potable water supply hose shall be completely flushed at least once per 24 hours.

WC6

See FP6 for details

WC7

See FP7 for details

WC8

See FP8 for details

WC9

See FP9 for details

WC10

See FP10 for details

WC11

See WS11 for details

WC12

See WS15 & FP12 for details

WC13

See FP13 for details

WC14

See FP14 & WS20 for details

WC15

See WS21 for details

WU Potable water servicing

Water service should never be performed simultaneously with toilet servicing.

WU1 Before servicing begins, perform the following:

Check vehicle markings and water servicing ports designation as necessary, to ensure potable water will be delivered.

Check that private mobile phones have not been taken out to the aircraft.

The use of mobile phone whilst driving a servicing vehicle is strictly prohibited.

Also check that the vehicle delivery meter (if any) has been set to zero.

Vehicle(s) should be stopped prior to engagement to an aircraft, to test the brakes and then be positioned safely and correctly with an unobstructed exit maintained at all times except if agreed by the Airport Authority. Vehicles should not be reversed onto or from the aircraft unless marshaled.

WU2 Servicing staff

Servicing staff should be dressed with clean working clothes in accordance with the WHO

- Drinking Water Quality Standard and should be devoted only to the drinking water servicing.
- Operators' hands should be cleaned before connecting.
- For hygiene reasons, if operators conduct both toilet and water servicing functions, operators must service potable water before servicing aircraft toilets or after performing toilet service he needs to have a shower and change clothes. The clothes shall be stored in 2 separate lockers / rooms.

WU3 Potable Water uplift

Make sure the water servicing bowser was filled less than 24 hours (check date and filling time). The content of the treated or untreated potable water servicing vehicle must be delivered to an aircraft or drained not later than 24 hours after filling.

WU4 Filling port

Aircraft filling port shall be cleaned /wiped dry with septic wipes before the hose is connected to the aircraft adaptor.
Supply pressure of the pumps to the aircraft must be checked on regular basis to ensure they do not exceed the limits stated on AHM 970 6.5.
Vacuum /suction draining from the aircraft potable water system with a connector is prohibited at all time

> ***Note*** **:** Cleaning may be done either by wiping with a clean cotton rag or equivalent soaked with a disinfecting solution or by wiping with a disinfectant pre-soaked "towelette". The spray-and-wipe procedure is not recommended

WU5 Flushing of Filling hose.

The hose needs to be flushed in a basket or waste container before connecting the hose to the aircraft filling port.

NOTE: Flushing is not necessary unless recently used, or temperature less than 0°C.

WU6 Hose Connectors

Hose connectors shall be checked for cleanliness before connecting to the aircraft fillport. The hose connector shall never contact the apron at any time!

WU7 Leak Test

Before the first a/c servicing of the day, the servicing valve will be opened and the servicing hose flushed. Servicing valve will be closed after flushing. In cold weather, flushed water shall be collected in a small side-tank to avoid icing.

The water line will be pressurized and check for leak. If it is satisfactory, servicing can proceed. If leaks are detected, hose or connector will be changed accordingly.

Maximum servicing pressure should not exceed 7 bars downstream.

- Servicing pressure should be monitored throughout the operation. If indicated pressure exceeds 7 bars, check the vehicle on test rig or vehicle records, to ensure downstream pressure does not exceed 7 bars.

Check vehicle, water delivery points, couplings, pipework, joints, fittings and hoses for leaks during servicing.

Check unrolled hoses during servicing for leaks, abrasion, cuts, blisters and kinks.

Hoses shall be kept under observation during the servicing operation. Should a weakness, leak or defect be observed, delivery through the defective hose must be stopped and the hose replaced.

WU8 Disconnection Procedure

Hoses should be capped or secured on a dummy connector. Hose end dust caps should be clean, in good condition and replaced when hoses are not in use.

If a dummy connector is been used, it shall be in a receptor filled with a disinfecting solution (permanganate or equivalent).

Hose filling line shall be drained before stowing only **after the last a/c servicing of the day**.

WU9 After the stowing of hoses and connector, check that the a/c filling port is wiped dry and plugged.

WU10 The A/C water filling port access door is closed and locked correctly.

WU11 Vehicle is driven correctly from the A/C

Servicing vehicles shall be driven forward safely. If they have to be driven in rear direction, they shall be marshaled

MI MISCELLANEOUS

MI1 Records for water servicing training available.

See details for records under RC1 and AHM 611.

MI2 Are records for ramp safety training available

Details can be found under AHM611

MI3 Records for hygienic principles.

See details for records under RC1.

MI4 Specific individual equipment available

See details for records under RC1. E.g. clothes, lockers

MI5 Employees medical checkup

Any contagious operator should be removed from servicing operation.

MI6 Personal equipment, storage and maintenance

Toilets, hand washing stands and other hygienic amenities should be provided and maintained clean and disinfected daily

IATA IDQP
IATA Drinking-Water Quality Pool

ANNEX 1

(Sampling Procedure)

A.1. Sampling for micro-organisms

Sampling is an essential part of ensuring drinking-water is of good quality. It tells you whether the effort put into water treatment is effective and if you are providing acceptable water. The results of these tests are the evidence that is required to satisfy a drinking water assessor and your community that the water is not a risk to health.

Sampling can give rise to as much error in your results as careless analysis. The drinking water standards require water suppliers to monitor the quality of their water. The frequency and timing, however, are subject to various conditions and may vary from supply to supply. Sampling programmes intended to demonstrate compliance with the standards should be agreed with a drinking-water assessor at a public health unit before they are started.

A.2. How to Collect Samples Correctly

A.2.1 Sampling containers

Before any sampling is undertaken it is important to discuss the reason for sampling with the laboratory that will analyse the sample. Usually the sample containers are specific to the tests. Therefore, it is important to get the right container for the test being done. The correct sample container for each type of analysis will be provided by the laboratory. For microbiological tests, the sample bottle/container needs to be a wide-mouth vessel of at least 200 mL capacity and with a screw cap. For general chemical tests, a sample of 1–2 litres is usually required.

Samples for testing for micro-organisms in a drinking-water supply must be collected in containers that are pre-sterilised so that there are no living organisms in the bottles.

Then any 'micro-organisms' found in the samples must have come from the water being tested (or from contamination while the sample was being taken). For some tests the sample bottles may contain substances required to stabilise or preserve the sample.

Sample bottles for microbiological tests may contain sodium thiosulphate to neutralise any chlorine in the sample. For tests for some chemical contaminants, preservatives are included in the sample container. These will be added by the laboratory.

Whatever is being sampled for, the act of collection must be done with utmost care to reduce the possibility of contaminating the sample.

A.2.2 Sample identification and records

Immediately before or after collecting a sample, label the container clearly with information on:

- **where** – the sampling location, with sufficient detail to be able to repeat the sample from the same location, including the site code where possible.
- **why** – the reason for sampling (complaint, routine test, process control or compliance)
- **when** – the time and date of collection
- **who** – the name of the person collecting the sample (for traceability)
- **how** – the method of sample collection (ie, grab, first flush or full flush)
- **other** – weather conditions and any other useful observations.

In addition to this label and the sample itself, it is important to send laboratory delivery form. This form includes all the information given on the label plus some additional

information that keeps track of the progress of the sample and identifies everyone who must deal with it, as illustrated in Example 1.

Example 1: Information on a sampling, analytical and laboratory delivery form

Date and time	*31 February 2001 at 1430*
Person undertaking sampling	*Jo Smith*
WINZ supply code	*WAI004RE*
Specific location	*Outside tap of Sam Taylor's house, 75 Standard Street*
General location	*Zyzville*
Weather at time of sampling	*Fine*
Weather related observations	*Heavy rain two days ago*
Number of samples taken	*One*
Actions taken to collect sample	*Full flush*
Type of sample	*Grab*
Any sample preservation?	*Sterile bottle*
FAC level	*Zero (non-chlorinated)*
Label on bottle	*Yes*

Laboratory delivery

Date/time handed to courier	*31 February 2001 at 1600*
Laboratory destination	*LAB (Lloyds Analytical Blueville)*
Courier company	*GTE ('Get-there-eventually') couriers*
Courier ticket number	*Attach sticky label to package*
Date/time arrived at laboratory	*Lab to fill*
Who received sample	*Lab to fill*

A.2.3 Sampling location

When planning a sampling programme it is necessary to need to plan for a range of factors in addition to the test itself. For example, where is the sample to be collected from, are there any safety issues related to collecting this sample, are any tests to be done on site – such as temperature, pH or chlorine?
Transporting the sample to the laboratory as quickly as possible is essential, as is cooling it down and keeping it out of the sunlight. So part of the preparation is to prepare a 'chilly bin' and cooler packs to keep the sample below 10°C until it arrives at the laboratory.
The sampling site needs to be representative of the part of the water supply that is being monitored.

A.2.4 Sampling from a reservoir (water truck):

When taking a sample from a reservoir service line, it is necessary to flush any stale water out of the line and to ensure the reservoir water is drawn all of the way to the sample tap. Generally, 2–3 minutes of free flow is sufficient to produce about 20 litres of water.
Sometimes it may be useful to calculate the amount of water that needs to be flushed
from a pipe. This can be done by estimating the volume to be flushed by substituting the pipe's radius (*r*, half the diameter) in the equation πr^2 and multiplying the result by the length of the pipe to the sampling point, then multiplying the second result by five.

Example for sampling from an aircraft filling hose of a water truck.
For example, for an aircraft filling hose that is one inch in diameter and 10 m long:

Use πr^2 x length, where r (half the diameter) = 1.27cm:
$\pi \times (1.27)^2 \times 1000 = 4906.25\ cm^3$
Convert to litres (l) by dividing by 1000:
4906.25 / 1000 = 4.91 l

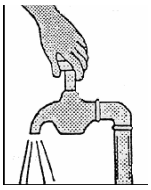
Then calculate the volume to flush out:

Water flow (l/min) from the filling hose is approximately 60l/min.
To flush out 5 l of water, 5 seconds would be sufficient to flush out the complete water content from the a/c filling hose. SO for a good sample this would be 25 seconds.

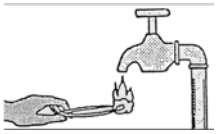
A.2.5 Microbiological sampling procedure (o/b aircraft)
The following information is for sampling for microbiological quality from taps. Samples for chemical analysis have different procedures depending on the chemical being tested for and the reason for the test. When sampling for chemical parameters it is important to discuss the situation with a testing laboratory and have them outline the specific sampling procedure for the analysis being done.
Samples must be tested within 24 hours (preferably within six hours) and kept cool while in transit. The collection must be completed under clean conditions from disinfected taps and the samples must be accurately labelled. Prior to sampling, wash your hands, using at least soap and water or an antiseptic foam or alcohol gel.
Choose a suitable tap; preferably an unpainted metal tap that is not leaking. It should also be one that is used regularly and is not subject to contamination, for example from greasy hands or animals rubbing against it.

1. Cleaning the tap: Remove any attachments from the tap that may cause splashing. Use a clean cloth or paper to clean the outlet. Remove any dirt

2. Opening the tap; full flush:. Flush as hot as possible until water temp. drops. (this means, the water heater is empty) and allow the cold water to run for 1-2 minutes



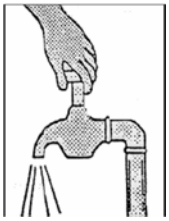
3. Sterilising the tap: For a metal tap, sterilise the tap for about 15 seconds with the flame from an ignited cotton-wool swab that has been soaked in 70 percent alcohol; alternatively, a gas burner may be used on a gentle flame. The aim is to heat up the water until it boils and forms steam to kill any bacteria on the tap; the aim is not to make the metal glow. Spraying alcohol or any applicable disinfectant from a spray bottle or wiping with alcohol gel may also be suitable if the samples are for coliform bacteria detection as these micro-organisms are easy to kill. However, flaming is preferred when samples are to be analysed for other



organisms. If flaming the tap is impractical, it is possible to disinfect the tap by swabbing it (inside and outside) with a 1 percent sodium hypochlorite solution (for example, household bleach diluted one part bleach into two parts water in a spray bottle). Leave to stand for two to three minutes to disinfect the tap, and then proceed with Step 4 as below. Ensure that no bleach gets into the sample bottle and handle the bleach with care. Immediately wash off any bleach that comes into contact with skin.

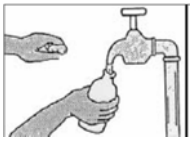
4. Opening the tap prior to sampling: Carefully turn on the tap to a medium flow rate and allow the water to flow. Then reduce the flow rate. Do not change the flow rate while filling the bottle, as deposits may be dislodged.

If there is no carbon filter upstream, you can measure the content of "Free Chlorine" in the tank system. If a carbon filter is used, you have a control of the effect.

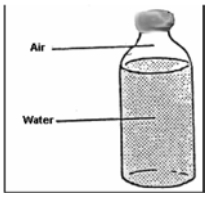


5. Opening sterilised bottle: The bottle will have been carefully prepared to be sterile until this moment so take great care in handling it. First, remove any protective cover and discard. Then open the container, with the bottle in one hand and the cap in the other. Do not place the cap on the ground or in your pocket, and do not touch the inside of the lid with your fingers. Hold the cap with the opening facing down. The inside of the cap can be easily contaminated which, in turn, can contaminate the water sample.

6. Filling the bottle: After opening, immediately hold the container under the flowing water and fill it to the shoulder but leave an air space. Do not overflow the bottle. Hold the lid with its open end downwards (to prevent entry of dust that might carry microorganisms).



7. Closing bottles: Screw the lid firmly onto the container. Keep the container cool (less than 10oC) and in the dark by placing it in a chilly bin complete with ice or chilled cooler pads. Send the sample to the laboratory promptly so that it arrives within 24 hours (preferably within six hours) from the time of sampling. Direct contact with the laboratory is essential to keep all parties aware of the sample's progress. Remember the laboratory delivery form (see Section 4.3).



8. Transportation: The samples should be cooled during transport to the lab, but not frozen.

ACRONYMS AND DEFINITIONS

ADWR – Aircraft Drinking Water Rule – A comprehensive national program in the United States that ensures the safety of drinking water provided to all aircraft passengers and crew

BSDW – Bureau of Safe Drinking Water – A regulatory authority tasked with protection of streams, rivers, lakes, springs, or underground aquifers

CFR – Code of Federal Regulations – Codes and regulations published in the Federal Register by the executive departments and agencies of the federal government of the United States.

Contaminant – Any physical, chemical, biological, or radiological substance or matter in water

CWA – Clean Water Act – The primary federal law in the United States governing water pollution

EPA – United States Environmental Protection Agency – An independent executive agency of the United States federal government tasked with environmental protection matters

FDA – United States Food and Drug Administration – A federal agency of the Department of Health and Human Services

IATA – International Air Transport Association - A trade association of international airlines

IDQP – IATA Drinking-Water Quality Pool – Audits and processes established to ensure that potable water provided by member airlines is free from chemical substances and micro-organisms

NAC – Nevada Administrative Code – The codified administrative regulations of the Executive Branch of the State of Nevada

NDEP – Nevada Division of Environmental Protection – State agency tasked with the stewardship of the natural resources of the State

NPDWR – National Primary Drinking Water Regulations – legally enforceable primary standards and treatment techniques that apply to public water systems

NRS – Nevada Revised Statutes – Current codified laws of the State of Nevada

O&M – Operations and Maintenance – A formulated plan of training, cleaning, work practices, and surveillance to maintain equipment in good condition

PWS – Public water system means a system for the provision to the public of water for human consumption

SDWA – Safe Drinking Water Act – Principal federal law in the United States intended to ensure safe drinking water for the public

SNHD – Southern Nevada Health District – Local agency which investigates, plans for, responds to, and educates the community and key partners about water-, food-, and insect-borne diseases

WHO – World Health Organization – A specialized agency of the United Nations responsible for directing international health within the United Nations' system and to lead partners in global health responses