PUREX Heating, Ventilation, and Air Conditioning Consolidation Document

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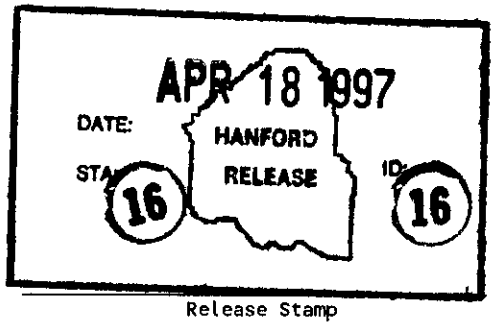
Abstract: This document provides a description of the PUREX modified HVAC system and reflects deactivated systems and new equipment to support the system.



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HNF-SD-CP-CR-037, Rev 1

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Key Terms

μg	-	Micro-gram
AMU	-	Aqueous Makeup
ASHRAE	-	American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc.
cfm	-	Cubic Feet per Minute
D&D	-	Decontamination and Decommissioning
DOP	-	Dioctyl-phthalate
DP	-	Differential Pressure
ECMP	-	East Maintenance Platform
ECN	-	Engineering Change Notice
Elev	-	Elevation
ft	-	Foot
HEPA	-	High Efficiency Particulate Air Filter
hr	-	Hour
HVAC	-	Heating, Ventilation, and Air Conditioning
IEFD	-	Instrument/Electrical Flow Diagram
kW	-	Kilowatt
LSA	-	Low Specific Activity
m	-	Meter
P&O	-	Pipe and Operating
PIV	-	Pulse Infinitely Variable
PMP	-	Project Management Plan
PR	-	Product Removal
PUREX	-	Plutonium/Uranium Extraction Facility
RR	-	Railroad
SCD	-	Steam Condensate
SMACNA	-	Sheet Metal and Air Conditioning Contractors National Association, Inc.
WBS	-	Work Breakdown Structure
WC	-	Water Column

1.0 INTRODUCTION

The Plutonium Uranium Extraction Facility (PUREX) deactivation project includes all of the elements necessary to place the facility in a stable, radiologically and environmentally safe configuration.

This document contains a discussion of consolidation of the existing 11 gaseous effluent streams into one effluent to minimize the risk and surveillance activity during the deactivated facility condition. Section 5.0 provides a general discussion of the criteria used to develop the flowsheet. Section 6.0 provides a detailed discussion of the proposed ventilation flowsheet objectives. This information will be used to control the design of the modified system.

The goal of the actions taken during the deactivation consists of removal of all significant accessible sources, redirecting existing ventilation flows, shutting down all non-necessary ventilation equipment, simplifying the ventilation flowsheet to reduce the risk of effluent releases and to minimize the maintenance, surveillance and repairs on the existing effluent equipment. Building ventilation is simplified to three pressure zones, utilizing series design flow ventilation in place of numerous parallel flow schemes. Air flows from low contamination areas to high contamination areas with the most negative pressure in the high contamination areas.

2.0 PURPOSE

The purpose of this document is to provide the technical flow sheet for the design of the modified ventilation system. Open issues identified in this document will be evaluated via engineering trade studies and the results incorporated as appropriate.

3.0 SCHEDULES

All of the deactivation work is discussed in the project management plan and in the Work Breakdown Structure (WBS) file. Initial schedules were entered into "Quicknet" software and have been transferred to "PX" schedule software.

4.0 BACKGROUND

4.1 Existing System

The ventilation system in the 202-A building is designed and operated to keep normal work areas free of radioactive contamination by maintaining airflow from zones with little potential for contamination into zones of progressively greater contamination potential. The ventilation air is handled through four systems: canyon (system 1), sample gallery/process areas (system 2), service area (system 3) and laboratory (system 4).

Control is provided by maintaining minimum differential pressures between the ventilation zones.

The current operation of the PUREX ventilation system requires a discharge of approximately 217,823 ft^3 per minute (cfm) through 9 ventilation stacks. Therefore, consolidation of the ventilation systems is recommended to minimize the volume of air discharged and the number of stack monitoring stations that must remain active following PUREX deactivation. The proposed plan is to cascade air from one ventilation system area to another with eventual discharge of all air through the canyon and main stack. This ventilation configuration will allow shutdown and deactivation of all stacks except the main stack and will reduce the total airflow discharged to approximately 40,000 cfm. It will allow for possible isolation of the deep bed fiberglass filters from the final exhaust train. The cascade ventilation concept is shown in Figure 1.

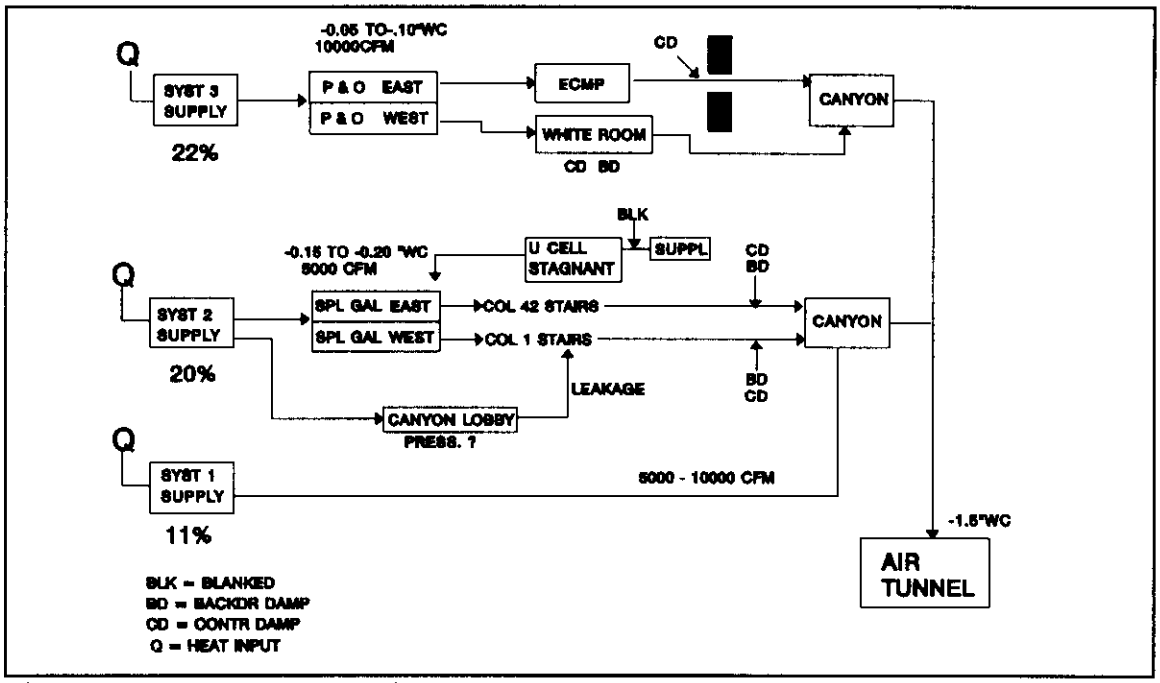

Figure 1. System Flow Diagram, part 1

4.2 Proposed Modified System

The proposed ventilation concept was developed early in the PUREX deactivation project and was endorsed by an independent review team and subsequently adopted as the baseline approach in the Project Management Plan (ref. 1).

The intent of the reduced flow scheme is to provide a limited number of pressure zones with air flowing from zones of low contamination to zones with high contamination thereby maintaining the original pressure zone control design principles.

Selection of the air flow volumes and air flow paths was made based on a knowledge of the radionuclide sources within the 202-A building. The major contamination source areas are in the PUREX laboratory, the sample gallery hoods and exhaust ducts, Q-Cell processing areas, PR room and N Cell. Processing residues remain in the main canyon cells on the floors, walls and exterior of the equipment. The isotope blend varies considerably in different areas. For example in the accessible processing areas the dominant isotopes are Neptunium, Plutonium, and daughter products. In most other areas these product materials are blended with Strontium, Cesium, and other beta-gamma isotopes. This and other facility knowledge has been incorporated into the design of the ventilation deactivation flowsheet. The goal is to contain the known isotope concentrations and prevent migration during the deactivated period.

On-line equipment will be minimized by using a lower air flow with only one of the three building exhaust fans operational. The other two exhaust fans will be maintained as backups and the supply fans will be off. To simplify equipment needs, the supply ducting will be used with induced draft. Most of the existing parallel ventilation flow paths will be eliminated by redirecting the air flow through three pressure zones including the P&O Gallery, the Sample Gallery, and the 673 foot elevation basement zones (Storage Gallery, Cells Q, M, and N, PR Room, and Hot Shop). The Sample Gallery, and lower (673' elevation) building processing areas will be cleaned and decontaminated where possible. Fixants will minimize contamination migration problems as required.

Air will enter the center of the P&O Gallery by induced draft via the supply headers. The air will flow from the center of the P&O Gallery to the ends where it will exit to the Canyon via the East Crane Maintenance Platform (ECMP) and the White Room (west). Likewise, air flow will enter the sample gallery at the midpoint and will flow to the ends, where it will be redirected to the Canyon via existing stairwells #11 and #13 (at column 1 and column 42). Ventilation of the 673' elevation zones is unique in that the air will be introduced to the Storage Gallery and will flow toward the west end of the building to the air tunnel openings in M Cell. Air will flow in series through Q Cell, PR room, PR corridor, N Cell, Hot Shop and M Cell.

As described above, the proposed activity for HVAC modification involves the use of existing air flow pathways wherever possible. Air flows will be redirected primarily by installation of blanks. Figure 1 and 2 show the System Flow Diagram as proposed. Figure 3 represents the simplified flow schematic through the building.

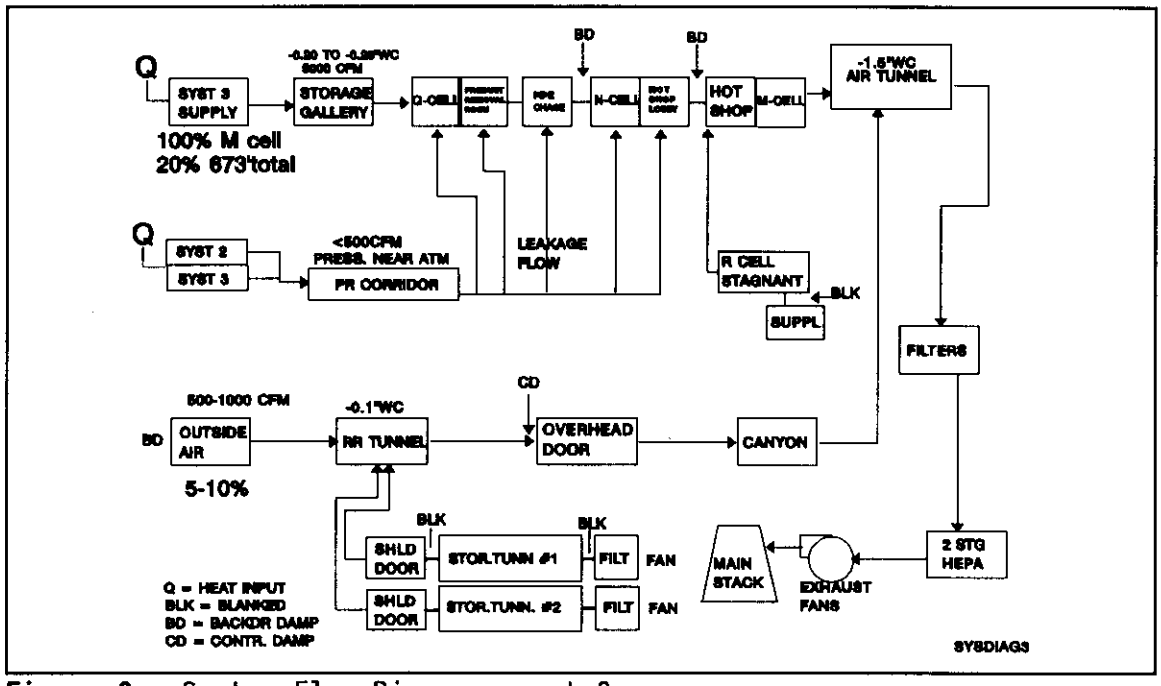

Figure 2. System Flow Diagram, part 2

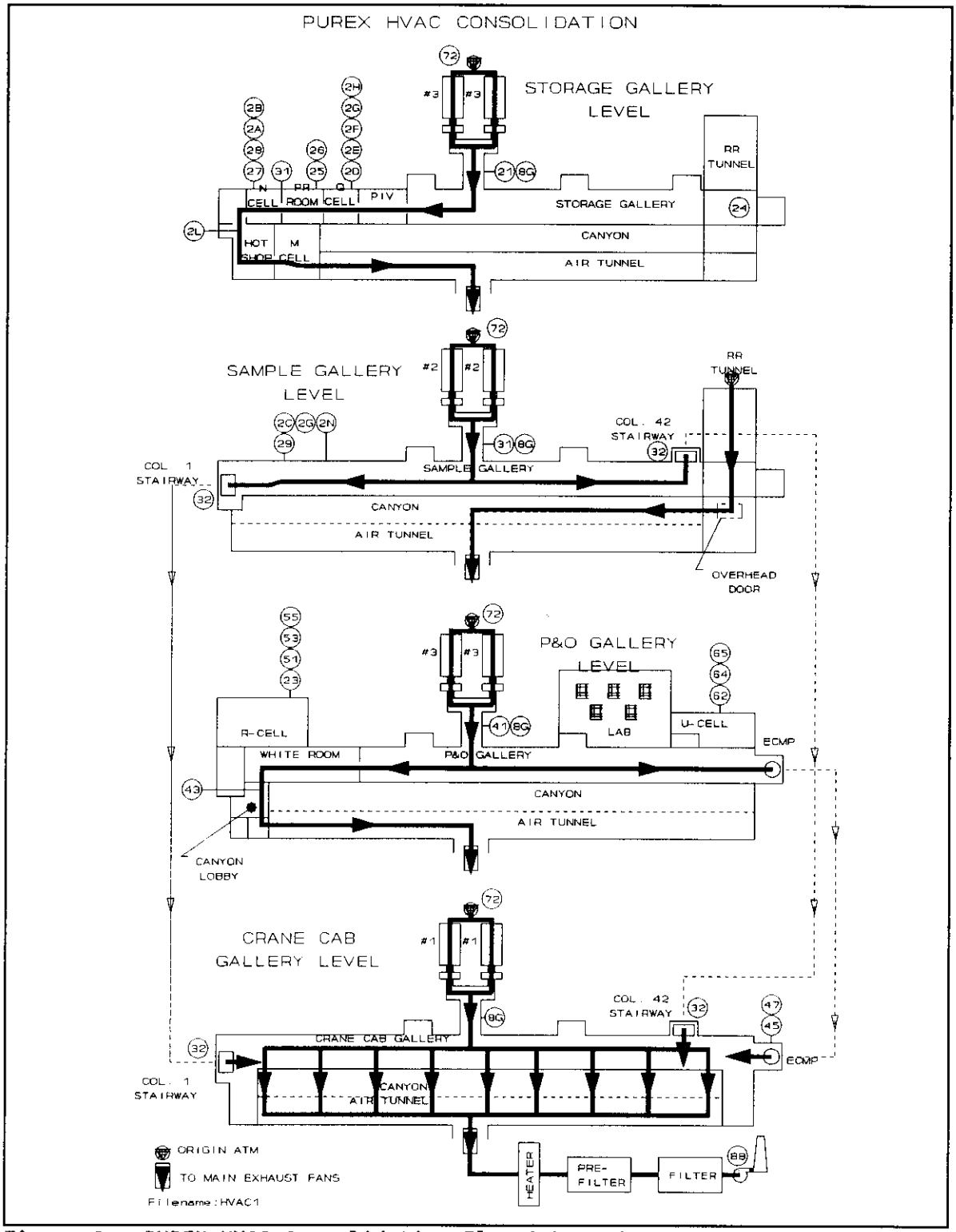

Figure 3. PUREX HVAC Consolidation Flow Schematic

5.0 TECHNICAL GUIDANCE USED TO ESTABLISH THE CONSOLIDATED FLOW SHEET

This section provides a discussion of the primary technical criteria used for the develop of the modified HVAC system design. These primary criteria include confinement, equipment design, etc..

5.1 CONFINEMENT

The principal consideration, in setting up the deactivated ventilation conditions, is to acknowledge the known source areas and maintain the position of the sources. In general, migration of source material with time is an unacceptable condition in the long term especially if the zones must be subsequently decontaminated to a releasable condition. In some cases the possibility of radionuclide migration is recognized and allowed to occur. This represents a financial decision wherein the cost of confinement is weighed against the consequences of radionuclide movement.

5.2 EQUIPMENT DESIGN

The equipment selection shall be consistent with ASHRAE handbook standards (where applicable). Sheet metal work is per SMACNA standards.

5.3 AIR PRESSURE

The existing zone air pressures provide acceptable contamination control. This has been demonstrated over 42 yrs of operation. For consolidation design, the same air pressures are being used with minor adjustments. Total flow rates are being scaled down to correspond to the limits of the air handling equipment.

Air pressure determines the air leakage velocities in the orifices between zones. The higher the pressure difference between the two zones the higher the orifice velocity in the leakage flow passing between the two zones. This is the principal determining factor in contamination control between static zones. If personnel movement occurs, then air turnover, portal velocities, etc. become important. Air reversal was considered.

5.4 OPENINGS-FLOW PATHS

To limit the extent of new ducts and new openings cut in the concrete, the existing openings (doors, equipment hatches etc) will be used to carry the air from one area to another. Concrete cutting or duct installation in controlled areas is much more costly than installations in comparable non rad work zones. This has been minimized.

5.5 THREE ZONES-SIMPLIFIED

The original ventilation flowsheet routes air flow to many rooms or air zones within the plant in parallel flow. Comparable parallel exhaust flow ducting collects air from each of the rooms and/or air spaces and routes it to separate exhaust systems throughout the plant. The simplified deactivation design has reduced the numerous air spaces (pressure zones) to three pressure zones corresponding to the three levels of the plant. The pressures are defined in terms of inches of water column below atmospheric pressure, [i.e. P&O gallery (approx -0.05 to -0.1), Sample gallery (approx -0.05 to -0.2), and bottom (673') level (approx -0.2 to -0.3) water column WC]. Contamination in the P&O level is the least. Sample gallery contamination or sources are significantly higher but are contained in shielded confinements or ducts. Sample gallery sources are both fission product type and high alpha sources corresponding to product material. The lowest level in the building has lower level fission product sources but much higher level alpha emitter sources. They are primarily contained within hoods.

5.6 REDUCE THE OVERALL SYSTEM AIR FLOW TO APPROX 40K CFM

The total ventilation flow will be reduced to the capacity of one main exhaust fan. One exhaust fan is equivalent to approximately 40,000 cfm. Conceivably less flow could be used however total canyon air inleakage is an unknown and some buffer must be retained for control. Efforts will be made to reduce the inleakage to a minimal value, by sealing outside openings. At ventilation switchover, measurements will be made of this parameter. Supply air to the canyon (system #1) will be used for the adjustments since the gallery flows will be preset.

Plans are to establish the three zone pressures by manually set dampers. If further regulation is needed then appropriate equipment will be installed on the inlet dampers.

If the online fan trips then one of the off line units will automatically start and maintain the canyon negative pressure. The control system will be based on at least two electric exhaust fans being available for use. If exhaust fan problems are sensed by the instrumentation, an automatic fan transfer will take place to prevent more damage to the unit.

In the future it is conceivable that lower air flows could be used. Any effort to reduce the air flow should be done in stages after examining the system parameters. Air inleakage will be the determining factor.

5.7 SUPPLY AND EXHAUST FANS

To simplify the control of the overall ventilation system, only one exhaust fan is to be used. No supply fans will be operational. This approach makes the overall system simple and safe from the standpoint of malfunctions and potential pressurization. As an initial design concept, all of the controls will be manually set except the modulation and isolation dampers on the exhaust fans. Exhaust fan draft will maintain a constant negative pressure of approx - 0.35" WC on the canyon air space based on control feedback from two differential pressure cells reading the canyon to atmospheric pressure. Canyon negative will be sampled by dual transmitters to assure valid signals to the acquisition system.

The air inlet will be designed to assure that no snow or debris accumulation occurs.

5.8 SERVICE AREAS OF PLANT

Service areas including process and canyon blower rooms, compressor room, office areas, and aqueous makeup will be non ventilated. Surveillances in these areas should incorporate portable instruments to assure that air quality is adequate. The air will be drawn into the zones through the service and process blower room supply equipment. The flows will be approx. 20% of the normal rates to those zones. There are six air supply modules by Buffalo Forge. Each incorporates a steam preheat coil, a filter bank consisting of a 2" roughing filter and a 4"-- 80% pleated air filter, air washing chamber and reheat coil in some cases. The total supply is normally approx 240,000 cfm including the service areas. Thus, the deactivated flow is approx 15% of the normal capacity. Unused supply ducts to these areas will be blanked or sealed to block unwanted flow.

The HAZARD AND OPERABILITY study (ref. 2) completed in March 95 made a significant point of monitoring the inlet DP of the blower room to provide online data for any type of inlet air restriction. Any such restriction would bias the negative pressures throughout the entire ventilation system. A restriction could be due to insect, dirt, debris, or frost accumulations on the inlet filters. The DP cell signal would be monitored by the central surveillance computer. This issue will be evaluated in a separate engineering trade study and the results incorporated at a later date.

5.8.1 Air Supply Systems

The P&O gallery will be supplied at the center and exhausted at the east and west ends to the canyon. The blower supply rooms will be treated as plenums. Air will travel from the

supply system via existing ducts to the P&O gallery. Since the P&O gallery negative is very small (i.e. -0.1 "WC), little or no dampering will be required. The supply friction will be minimized by dropping the inlet elbows on the P&O supply headers in the P&O gallery. Air will travel a short distance from the blower room to the gallery. The blower room door may be opened to transport the air to the gallery if duct friction losses are too much. Openings in the blower rooms to outside will be caulked.

The sample gallery will be supplied at the center and exhausted at the east and west ends to the canyon via the Col 1 and Col 42 stairwells. System #2 supplies the sample gallery via branch #1 which splits off from the main feeder in the blower room, passes into a caisson adjacent to the North gallery wall, splits to two ducts and enters the sample gallery at about 707'elev (5 ft below the blower room floor). Inlet air ducts penetrate the north sample gallery wall and feed two air supply headers; one passes east and one passes west of the inlet lines. Modifications include removing the 90° elbows of the duct at the header feed points. This will minimize the friction drop of the inlet air to the sample gallery. Air will be drawn into the sample gallery by the negative pressure.
The 673'elev (bottom) level will be supplied at the storage gallery column 20. Ventilation air will flow toward the west end exhausting to the air tunnel in M cell. Air will be drawn into the storage gallery by natural induction. System #3 currently supplies the storage gallery via a duct that passes through the blower room south wall, the P&O floor, the sample gallery, and the storage gallery ceiling at col 20. Supply air is currently discharged at the west end of the PIV room. Ventilation modifications consist of removing the elbow where the supply air enters the storage gallery (about 20 ft above the floor). This will minimize the friction losses in the supply line to the storage gallery. The east end of the storage gallery will remain a stagnant air space. Therefore, any surveillance activity should be done with low voltage portable lights, an oxygen monitor and at least two people.

Preliminary design included heating the supply air to above freezing during the winter months. This topic was considered in a March 95 Value Engineering study (ref. 3), but was not resolved. This issue will be evaluated in a separate engineering trade study and the results incorporated at a later date.

5.9 MINOR STACK RECYCLE /EFFLUENT SHUTDOWN

Minor stacks including east sample gallery hood, west sample gallery hood, east sample gallery room, west sample gallery room, east and west laboratory stacks, and white room will be shut down. The effluent streams will be recycled and or terminated. The PR stack is major and will be discussed further as a separate case. In all cases the effluent will be recycled to the canyon air space except for 293A, the storage tunnel and the lab stacks. The lab exhaust will be shutdown and the sources either removed or fixed. The 293A and storage tunnel exhaust systems will be shutdown (see railroad tunnel section). Minor stack equipment will have the filter elements removed and the equipment will be blanked to isolate it from the environment. Only the main stack remains as the facility effluent.

5.10 DECONTAMINATION, FIXATION, AND VENTILATION OF KNOWN SOURCE AREAS

To control activity migration, sources in the sample gallery, white room, PR room, N Cell, Q Cell, U Cell and R Cell will be removed and/or fixed. U cell and R cell equipment will be flushed and emptied. Q Cell has been empty and dormant for several years. No potting or fixation will occur in these cells. Details are in the following paragraphs. This will minimize the probability of contamination spread in these zones with low air flow and series flow configurations.

Refer to the specific topic in the "Specific System Topics" section (i.e. most of the individual zone discussions are under the 673'elev title).

5.11 INLEAKAGE TO CANYON BUILDING

There are numerous doors and openings in the main canyon envelope. Most of these must be sealed to limit the air inleakage. A few will remain as emergency exit points. An emergency door will be available at the column 1 stairwell and the column 42 stairwell. Normal access will be via the main entrance and the east lab entrance. Canyon openings consist of man-doors, roll-up doors and other penetrations that will allow air inleakage. Engineering details have not been completed at this time. Three major inleakage points, at present, are the overhead door in the railroad tunnel, the north vacuum breaker, and the south vacuum breaker. Current plans include sealing most of the overhead door and all of the north vacuum breaker. The south breaker will be replaced with a new unit to limit leakage rates. Periodic surveillance of this breaker will be included in the surveillance plan in accord with it's increased importance. A heat source on the inlet screen will be used to eliminate snow or frost. All of the non-emergency access points must be secured and as well as

sealed. A foam sealant or tape application will likely be used on most. The north side of the building has auxiliary structures attached to the north canyon wall at several locations. These will be secured and the canyon envelope will be sealed at the north canyon wall (i.e. at section "C"). Only the blower rooms will be treated differently. They will be sealed and one outside door will be available for flow bypass.

5.12 SECURE THE OUTSIDE OPENINGS

Prevention of unauthorized intrusion by people or mammals is the goal. The primary concern is spread of contamination within the building, to the environment and contamination of persons.

5.13 MAIN VENTILATION FILTER #1 AND #2 ISOLATION/FINAL FILTRATION

Preliminary design included heating the supply air to above freezing during the winter months. This topic was considered in a March 95 Value Engineering study (reference 3), but was not resolved. This issue will be evaluated in a separate engineering trade study and the results incorporated at a later date.

5.14 DIRECT THE AIR FLOWS TO ADDRESS THE EXISTING SOURCES AND THEIR PROBABILITY OF MIGRATION.

5.14.1 673' Elevation (basement) The 673 elevation (basement) is configured to move the air from a low level contamination zone toward the air tunnel which is a high contamination zone. The major sources on this level are the PR room and the N cell hoods. Air flow will travel on the following path: PIV room, Q cell rooms, PR north east corridor, PR corridor, N cell, crane rail doors on the upper N cell level, Hot Shop lobby, Hot Shop, M cell, and finally through the ports at the end of the air tunnel. This path is based on the Value Engineering study and is discussed in the following. If Q cell or the PR room has a release, the resulting contamination spread will be limited to the PR corridor, N Cell and Hot shop lobby. Hot shop and M cell are already contaminated. From this point the air will travel to M cell and into the ports at the end of the air tunnel. To limit the migration of hot shop activity to the hot shop lobby, a back draft damper will be placed in the hot shop door. Air flow is set at 5000 cfm because no additional dampering is needed at the air tunnel ports. Plug flow velocity is 10ft/min with 1.25 air changes per hour. This air flow is approx. 20% of the total 673' elevation level flow. (See Figure 1, 2 and 4).

5.14.2 Column 5 Pipe Chase (contains transfer piping and plutonium tanks) The original HVAC plan involved routing the air flow at the 673'elev through two cuts in the column 5 pipe chase between the PR room and N cell. The intent of the path was to restrict any activity release to the processing rooms of the 673'elev. The PR corridor would be retained as an access to these areas and would remain free of contamination. It was also intended that the Column 5 and PR doors be closed and sealed since they are single door entry ways to process areas. The additional advantage of directing the air flow through the column 5 walls would be the complete ventilation of both the PR room and the N cell room areas. No stagnant areas would result.

The Value Engineering study proposed that the air flow be directed from the PR room to the PR corridor to N cell as a pathway. This approach uses the PR corridor as a duct and would certainly contaminate the corridor if a Q or PR release occurred. The approach also does not ventilate the PR room and the east end of N cell. These would be stagnant air areas. This engineering document is implementing the recommendation of the study on the basis of cost savings. Some additional recommendations are in order to implement this approach. (See Figure 4). These are:

1. Make certain that the walls and floors of the PR corridor are sealed with paint to prevent any further penetration of activity.

2. Install surveillance lighting ONLY in the well ventilated areas of the PR room and east N Cell.

3. Surveillance in the two stagnant areas should be done with at least two people, low voltage battery powered lights and an oxygen monitor.

5.14.3 700' Elevation (sample gallery) The sample gallery supply will enter at the center and design flow to the east and to the west. Activity sources within the gallery include the sample station spaces and exhaust ducts. The sample gallery hoods and sample pits with internal contamination have been sealed. The sample gallery exhaust duct also has significant activity internally with the possibility of hygroscopic salts on the duct floor. There are 125 joints along the duct which have original gasket rubber, some of which have leaked in the past (with negative pressure

inside). To minimize the probability of serious contamination spread the sample gallery exhaust hood exhaust duct will be connected to the air tunnel with the exterior joints wrapped. This approach would improve the minimization of release from the sample hoods which have been sealed. It should be noted that the air volumes in the gallery will fluctuate with the daily and annual temperature cycles. This mechanism will move air into and out of all captive spaces. Some unknown concentration of nuclides will travel with the air. If a release does occur it will spread along the gallery and may reach the stairwells leading to the craneway. To minimize the impact on the stairwells they may be painted with epoxy or an equivalent surface protection. Air flow has a design flow velocity of 10.4 ft/min and 1.25 air changes/hr. The flow is approx 20% of normal and may result in correspondingly higher radon levels. This area is discussed further under Specific System Topics, 700' elev. (See Figure 19).

5.14.4 712' Elevation (P&O gallery) The P&O gallery supply air will enter at the center and flow east and west from the midpoint input. This gallery does not have any significant sources other than the whiteroom. Connections to the canyon have been blanked or valved off. The whiteroom is at the extreme west end of the P&O gallery with air flow toward the whiteroom (See Figure 25). If no entries are made to the whiteroom from the P&O side the alpha activity should remain in place. The existing barrier wall will limit air turbulence; however, traffic through the wall could move activity if it is mobile. Air flow has a design flow velocity of 12.5ft/min and 1.5 air changes /hr. Total air flow is approx 20% of normal.

Air will travel toward the east end as well and enter the ECMP via a combination of ducts and openings. The contamination on the ECMP level is significant therefore air reversals or traffic into that area could spread contamination. Backflow dampers are being used to limit the amount of air reversal hazard at the ECMP (See Figure 26).

Air handling at the White room is discussed in a separate section, the Specific System Topics, 712' elev (See Figure 23).

5.15 DOCUMENTATION

The exhaust fan and any other appropriate documentation will be updated:

A. All equipment documentation covering electrical, mechanical, instrumentation etc. will be completed for the active equipment in the main stack, exhaust fans, etc.

5.16 VALUE ENGINEERING STUDIES

Value engineering studies have been compiled and documented for specific topics within this document (ref. 3).

5.17 END POINT CRITERIA

All post deactivation conditions are referenced in the Endpoint Criteria Document for the facility (ref. 4).

6.0 FLOWSHEET OBJECTIVES

This section provides a detailed description of the modified HVAC system flow sheet.

6.1 HVAC MODIFICATION BASEMENT LEVEL 673' ELEVATION

AREAS:
Storage Gallery, Q-Cell, PR Room, N-Cell, Hot Shop Lobby, Hot Shop, M-Cell, To Air Tunnel

DESCRIPTION:
Air will be pulled through the System #3 Supply Fans into the Storage Gallery via existing supply ducting. The ducting within the Storage Gallery will be opened near the entry point (≈ column 20), releasing air to the room. The air will flow from the Storage Gallery into the PIV Room and through open doors through Q-Cell, the NE corner of the PR Room, PR Corridor and part of N-Cell. The crane-way between the N-Cell and the Hot Shop Lobby will be secured open to allow air flow to the hot shop lobby. Air will continue from the Hot Shop Lobby into the Hot Shop and then into M-Cell through open doors. From M-cell the air will flow directly into the air tunnel, to be filtered and released through the main stack. Exhaust Fan EF-V34-1 which exhaust the east end of the Storage Gallery into the Rail Road Tunnel will be blanked. This will leave the east end of the Storage Gallery without any direct ventilation. Exhaust duct work from the Q-Cell, PR Room and the N-Cell must be blanked. R-Cell will be crosstied to the Hot Shop via the R cell exhaust line. Figure 4 below, shows the general flow path for the 673' level. Figure 5 shows the system #3 ducting schematic.

6.1.1 SUPPLY DUCT MODIFICATION, 673' Level

The duct work at the point where the duct enters the Storage Gallery will be removed, dumping the air into the gallery. Extraneous supply ducts will be blanked and modifications to the air handling units will be performed before switch-over.

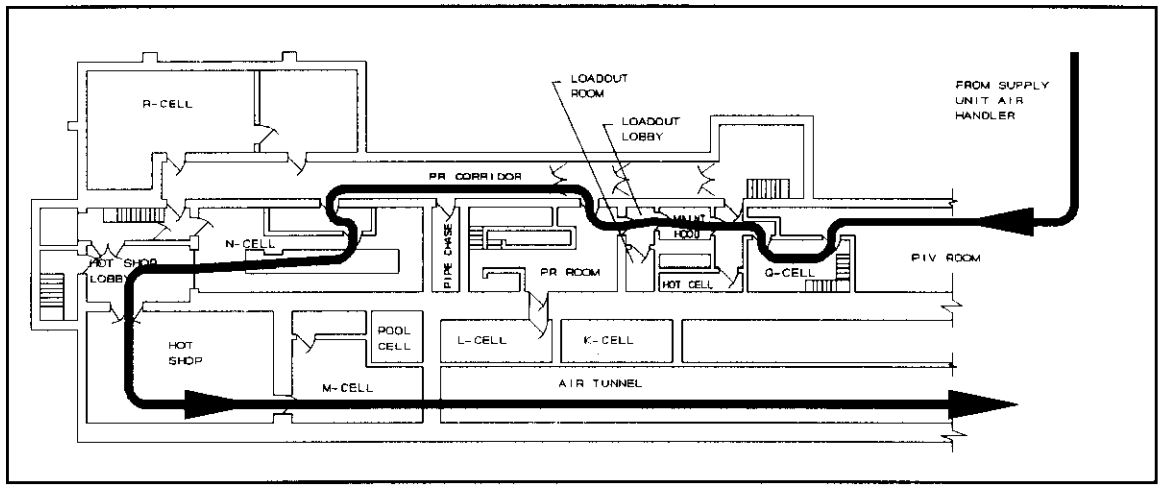

Figure 4. General Flow Path 673' Level.

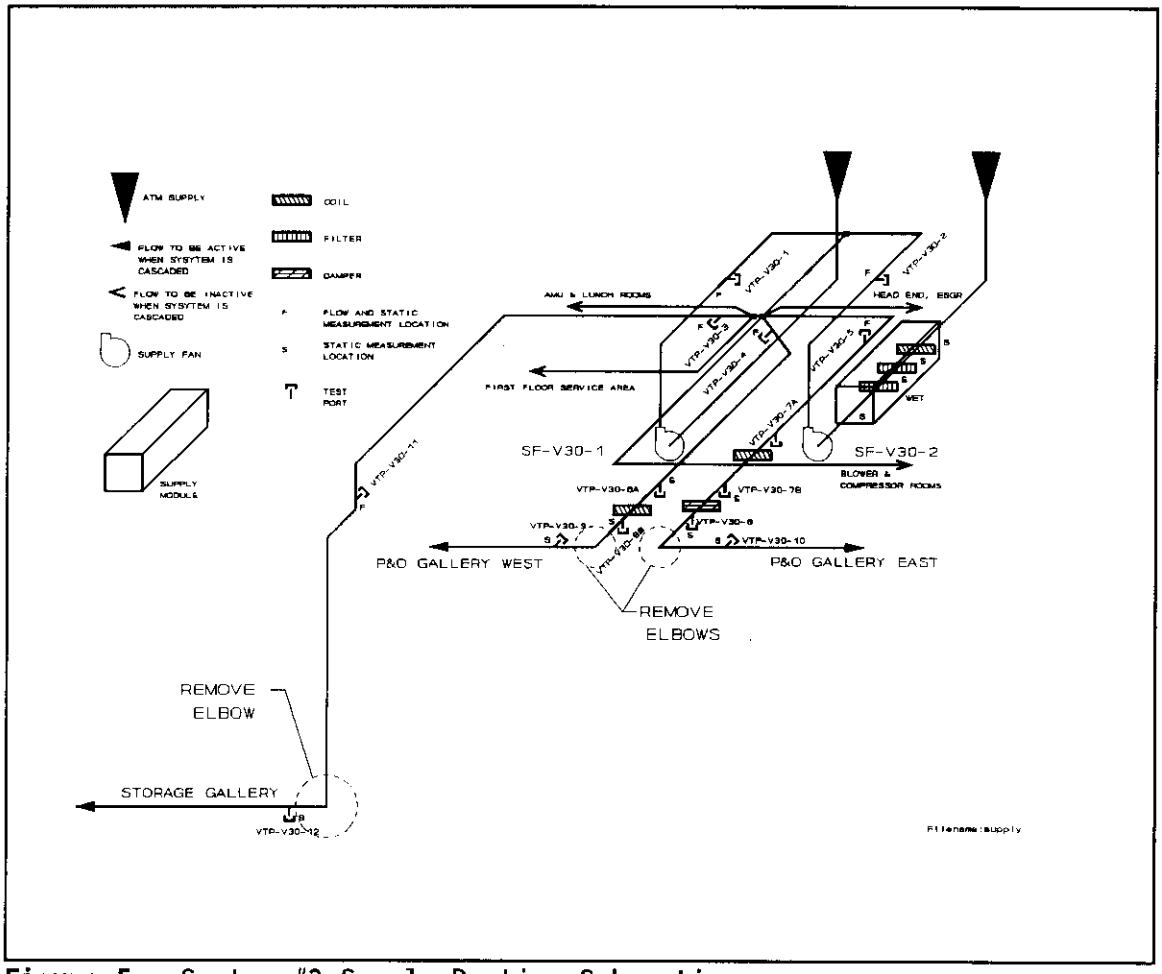

Figure 5. System #3 Supply Ducting Schematic

6.1.2 STORAGE GALLERY EXHAUST FAN MODIFICATION BLANK/SHUTDOWN

Exhaust Fan EF-V34-1 is located in the east end of the Storage Gallery. The exhaust duct exits the building at the northeast corner and crossties to the railroad tunnel. The duct is to be blanked at the north wall of the building (refer to Figure 6 below). This work will be done at switch-over and will leave the east end of the Storage Gallery without any direct ventilation.

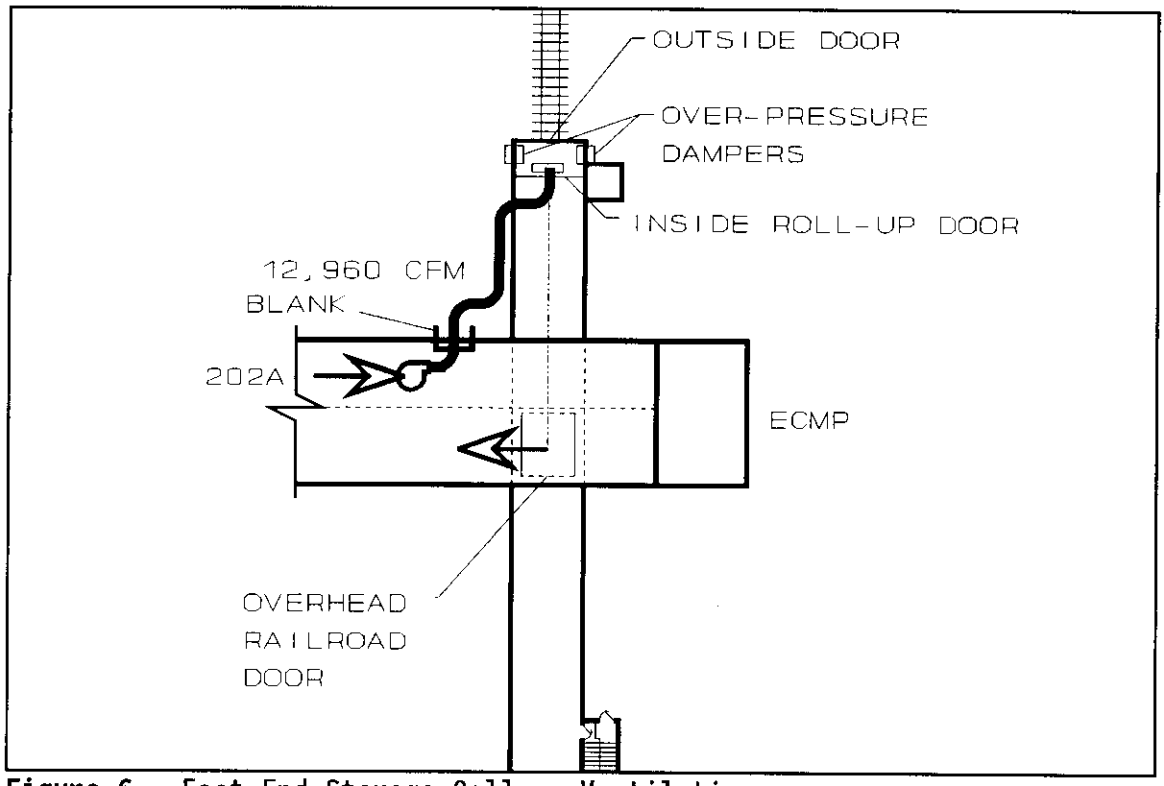

Figure 6. East End Storage Gallery Ventilation

6.1.3 GENERAL FLOW CONSIDERATION, Q-CELL

Figure 7 shows the general concept for ventilation in the Q-Cell area. Air will flow from the PIV Room through Q-Cell via open doorways. The doors will be removed to ensure uninterrupted flow. Flow paths to the Hot Cell, Maintenance Hood and the Load-Out Room will be sealed. Connections to the Q-Cell HEPA Filter remain. The exhaust side of this filter will be opened to the room air. This will allow the air spaces trapped within these areas to breath through the HEPA filter with temperature changes. Figure 8 shows the filter ducting and work locations.

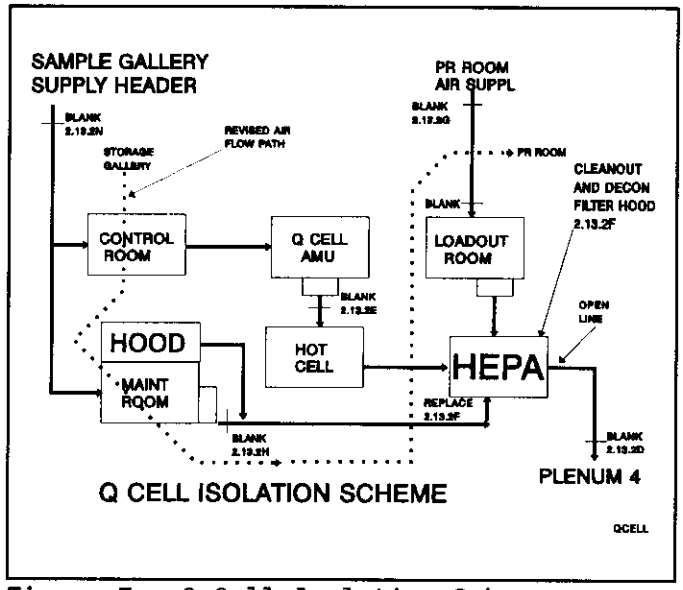

Figure 7. Q-Cell Isolation Scheme

6.1.4 BLANK Q-CELL SUPPLY (SAMPLE GALLERY)

A branch from the Sample Gallery supply header serves as the supply into the Q-Cell control room and the Q-Cell Maintenance Hood Room. The branch will be blanked by removing the control damper, in the Sample Gallery, and blanking both sides. This is necessary to isolate the Sample Gallery level from the Storage Gallery level. This work will be done at switch-over (refer to Figure 7 and Figure 9).

6.1.5 BLANK Q MAINTENANCE ROOM EXHAUST FILTER

The Q-Cell maintenance Hood room is ventilated into the Q-Cell HEPA filter. Two small HEPA filters are mounted on the entrance of a duct that is connected to the large Q-Cell HEPA filter above the Load-out room. The small HEPA will be removed and the entrance to the duct blanked. This work will be done at switch-over (refer to Figure 7 and Figure 8).

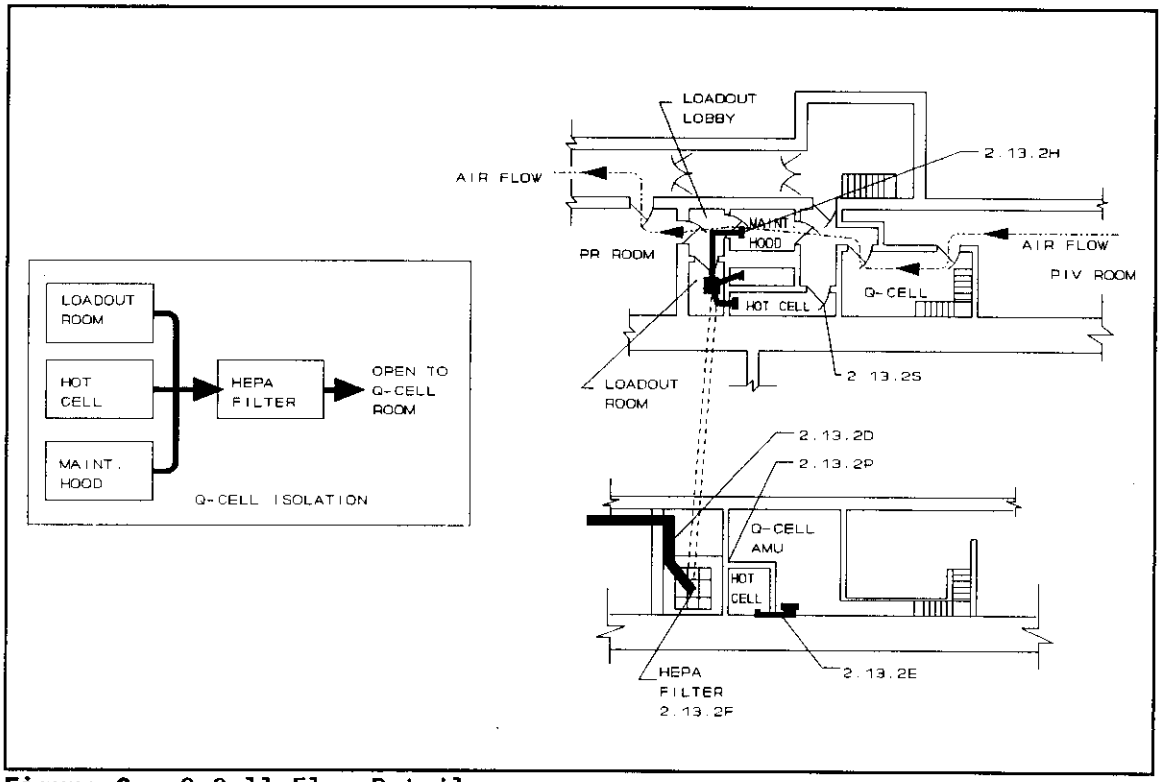

Figure 8. Q-Cell Flow Details

6.1.6 BLANK Q AMU DUCT TO HOT CELL

The Q-Cell AMU room is located over the Q-Cell control room. Air from the AMU is drawn into the Hot Cell, through a wall mounted HEPA filter. Blank opening between the two rooms at the wall mounted HEPA. This work will be done at switch-over (refer to Figure 7 and Figure 8).

6.1.7 Q-CELL FILTER SYSTEM

Clean/Decontaminate the Q-Cell HEPA filter, located above the Load-out room in the Q-Cell area. Load the

housing with new filters and open the exhaust line leading into the PR Room, to room Pressure. This work will be done at switch-over (refer to Figure 7 and Figure 8).

6.1.8 BLANK Q EXHAUST DUCT TO PR

An existing exhaust line from the Q-Cell filter, high in the Load-out lobby, passes through the wall into the PR room. The line eventually terminates in Plenum #4. This duct is to be blanked between the opening and the pass-through into the PR Room. This work will be done at switch-over (refer to Figure 7 and Figure 8).

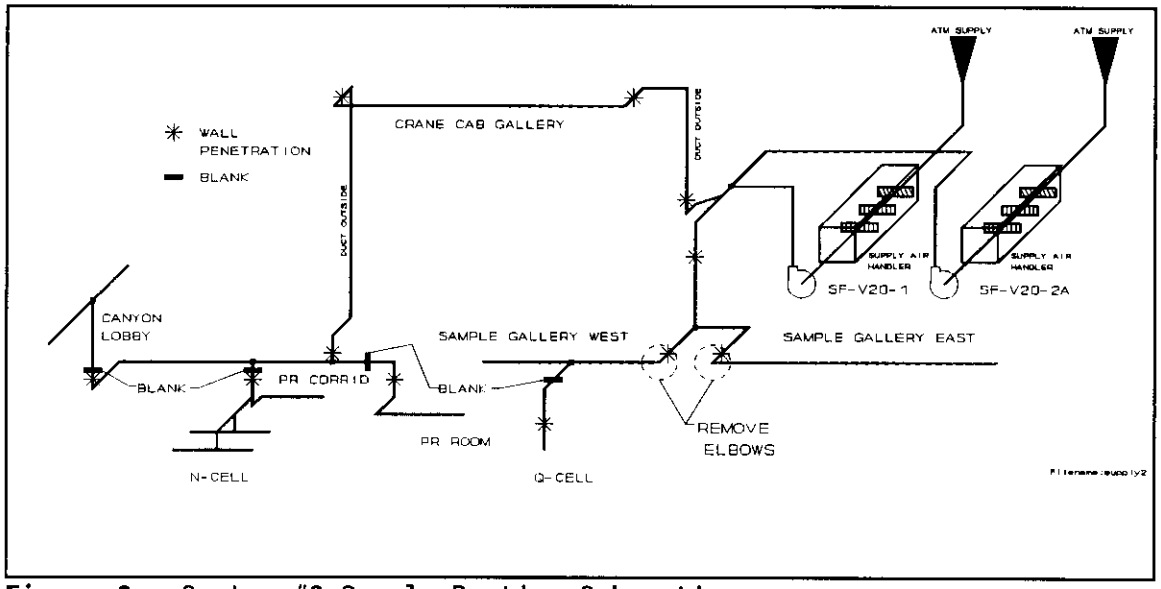

Figure 9. System #2 Supply Ducting Schematic

6.1.9 Q-CELL AMU CRACK REPAIR

In the South-West corner of the Q-Cell AMU room a vertical crack in the corner allows air to be drawn into the hot cell corridor. The Q-Cell AMU room over the Q-Cell control room, exhausts into the Hot Cell, through a wall mounted HEPA filter. The crack will be sealed in order to maintain contamination in the hot cell. This work will be performed before switch-over.

6.1.10 Q-CELL HOT CELL DOOR SEAL

Air can be heard passing by the edge of the Hot Cell door. The Hot Cell is ventilated to the Q-Cell HEPA

filter. This HEPA will be opened to room pressure to allow this space to breath. The door to the Hot Cell will be sealed in order to maintain contamination in the hot cell. This work will be performed before switch-over.

6.1.11 Q-CELL MAINTENANCE HOOD AND LOAD-OUT HOOD SEAL

The Q-Cell Maintenance hood and the Load-out room hood are exhausted through the main Q-Cell HEPA filter. Supply air inlets to these two hoods will be sealed. The Load-out hood also has a supply HEPA that will be blanked. This work will be done at switch-over.

6.1.12 BLANK PR SUPPLY (SAMPLE GALLERY)

The PR room supply duct originates in the sample gallery and has a branch passing into the Load-out Room. The PR supply duct will be blanked in the Sample Gallery (refer to Figure 7). This work will be done at switch-over.

6.1.13 BLANK/FOAM PR DUCTS ENTERING PLENUM 4

Exhaust ducts from the L9, L10, L11, L14, Load-out hoods and Q-Cell room enter Plenum 4, in the PR room (refer to Figure 10). It is assumed that Plenum 4 is highly contaminated. The ducts connecting to the plenum are also likely to be contaminated. The task includes blanking ducts from Q-Cell, L9;L10;L11 Hoods, and L14 Load-out Hood entering Plenum 4. This work will be done at switch-over.

6.1.14 FOAM PLENUM 4

Plenum #4 is a concrete box on the outside of the building just below the maintenance annex (refer to Figure 11). High levels of contamination are known. All of the entry ducts at the bottom of the Plenum are to be blanked. This Task will also complete the fixation of the contamination in place by filling the void space within the Plenum. This will prevent spread of contamination due to changes in air volume and differential pressure. Access to the plenum will be gained through the duct elbow in the sample gallery which is attached to an opening in the 3 foot thick north shield wall of the sample gallery. The opening in the shield wall terminates in the upper part of plenum #4. This work will be done at switch-over..

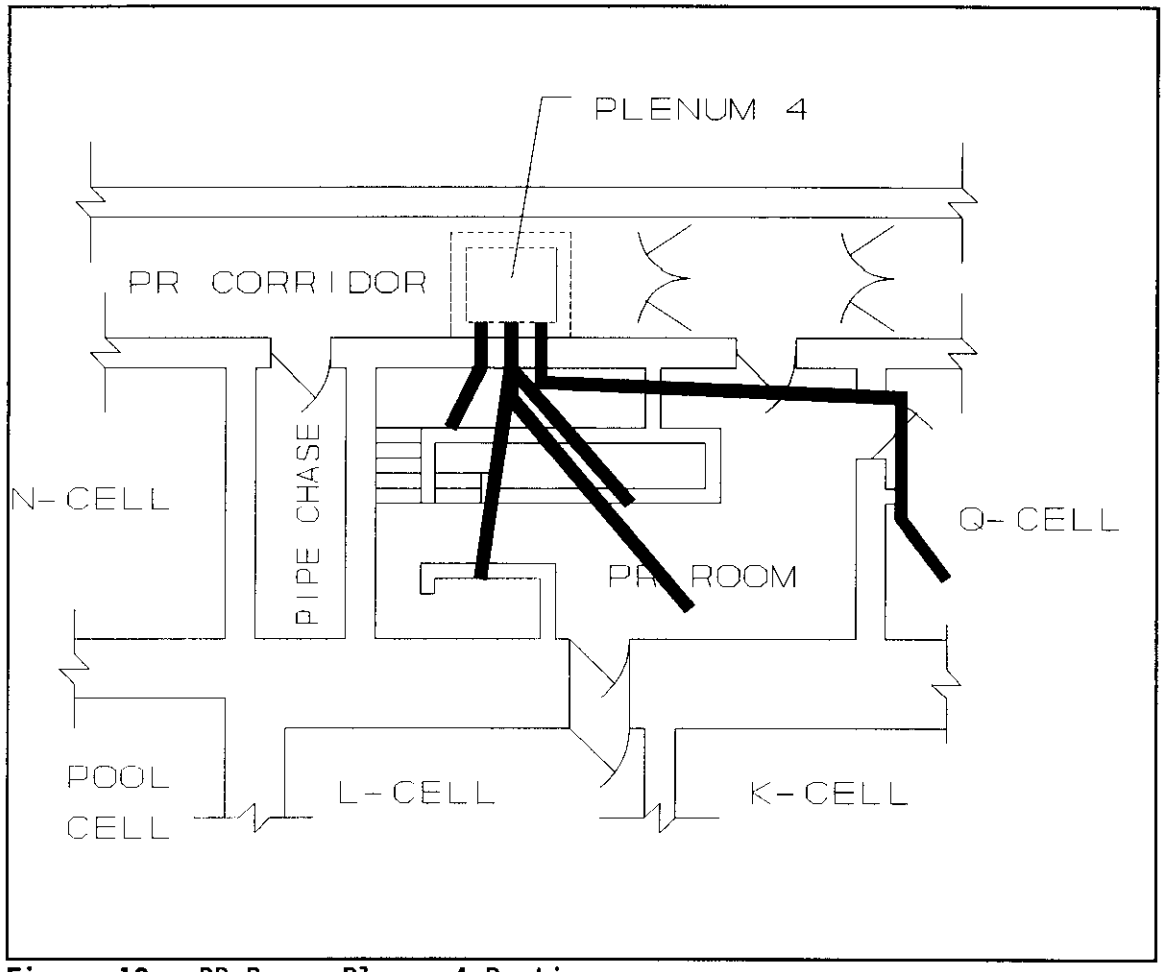

Figure 10. PR Room, Plenum 4 Ducting

6.1.15 PR FAN DEACTIVATION/DECONTAMINATION (OUTSIDE)

The PR fan is located on the top of R-Cell. The filters and the duct leading to the filters are suspected of being contaminated. The top of R-Cell has been contaminated. This task will include fixing the contamination, cleaning out the filters, blanking the fans, and shutting down the stack. Major considerations include, guarding against animal intrusion, fixing the contamination and stabilizing the equipment. This work will be done at switch-over.

6.1.16 BLANK N HOOD EXHAUST IN R CELL

The exhaust from the N-Cell hoods passes through the north canyon wall into R-Cell and then connects with a 24" original duct routed to the bottom of Plenum #4 (refer to Figure 11). The exhaust for the N-Cell hoods are to be isolated using "bubble tight" butterfly valves connected to each hood, therefore, isolating the hood exhaust's from Plenum #4. This work will be done during N-Cell deactivation.

6.1.17 FOAM PR DUCT TO FILTER BOX 1 & 2 AND LINE TO R

The PR exhaust system is highly contaminated. The large volume of air within the ducts will breath with temperature and differential pressure changes, resulting in contamination migration. Duct differential pressure will be reversed when the PR exhaust fan is shutdown (refer to Figure 11). The contamination in the following ducts must be fixed and the void space filled:

1). The Duct from the PR room exhaust to the main exhaust duct.
2). The main exhaust from Plenum #4 to Filter Hoods #1 and #2.
3). The exhaust duct from Filter Hoods #1 and #2 to the final PR Filter on the R-Cell cover blocks.

This work will be done at switch-over.

6.1.18 STABILIZE SAMPLE GALLERY FILTER BOX 1 &2

Filter Hoods #1 and #2, located in the sample gallery, are highly contaminated. The large volume of air within the filter housings will breath with temperature changes and differential pressure, resulting in probable contamination migration. The duct differential pressure will be reversed when the PR exhaust fan is shutdown. This task is to remove the filters and clean/Decon the filter housing and then fill the void spaces (refer to Figure 11). This work will be done at switch-over.

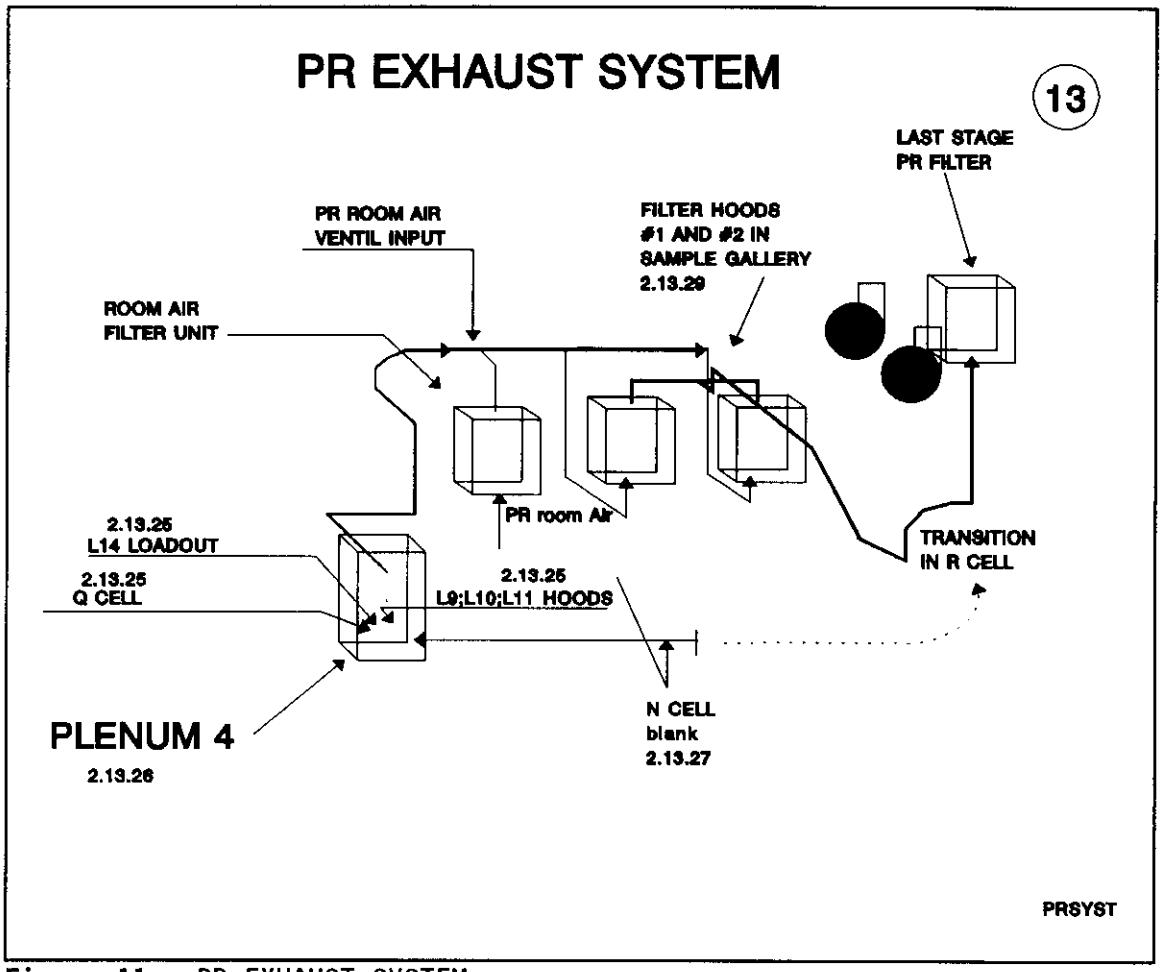

Figure 11. PR EXHAUST SYSTEM

6.1.19 BLANK N SUPPLY (SAMPLE GALLERY)

The supply duct for the N-Cell passes through the sample gallery. In order to isolate the sample gallery and lower pressure zones within the building, this duct will be blanked in the sample gallery (refer to Figure 12). (A section of duct could be removed and both ends blanked.) This work will be done at switch-over.

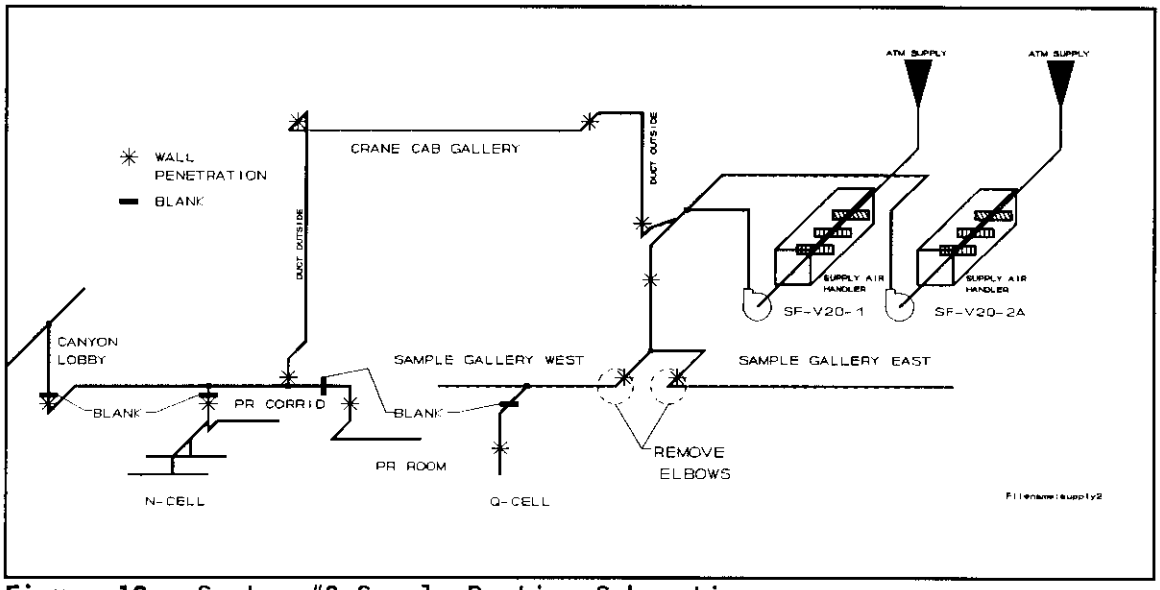

Figure 12. System #2 Supply Ducting Schematic

6.1.20 BLANK N ROOM EXHAUST/CLEAN-OUT

This task is to clean-out and blank the HEPA filter housing (FH-V21-10, 11, 12) located in the Hot Shop Lobby (refer to Figure 13). The inlet to the filter will be blanked close to the Filter box. The outlet of the filter will also be blanked in the hot shop lobby area. The outlet duct penetrates the Hot Shop lobby wall into the Hot Shop. Installation of the blank for the filter outlet, in the Hot Shop, will be coordinated with removing the elbow in the Hot Shop. This work will be done at switch-over.

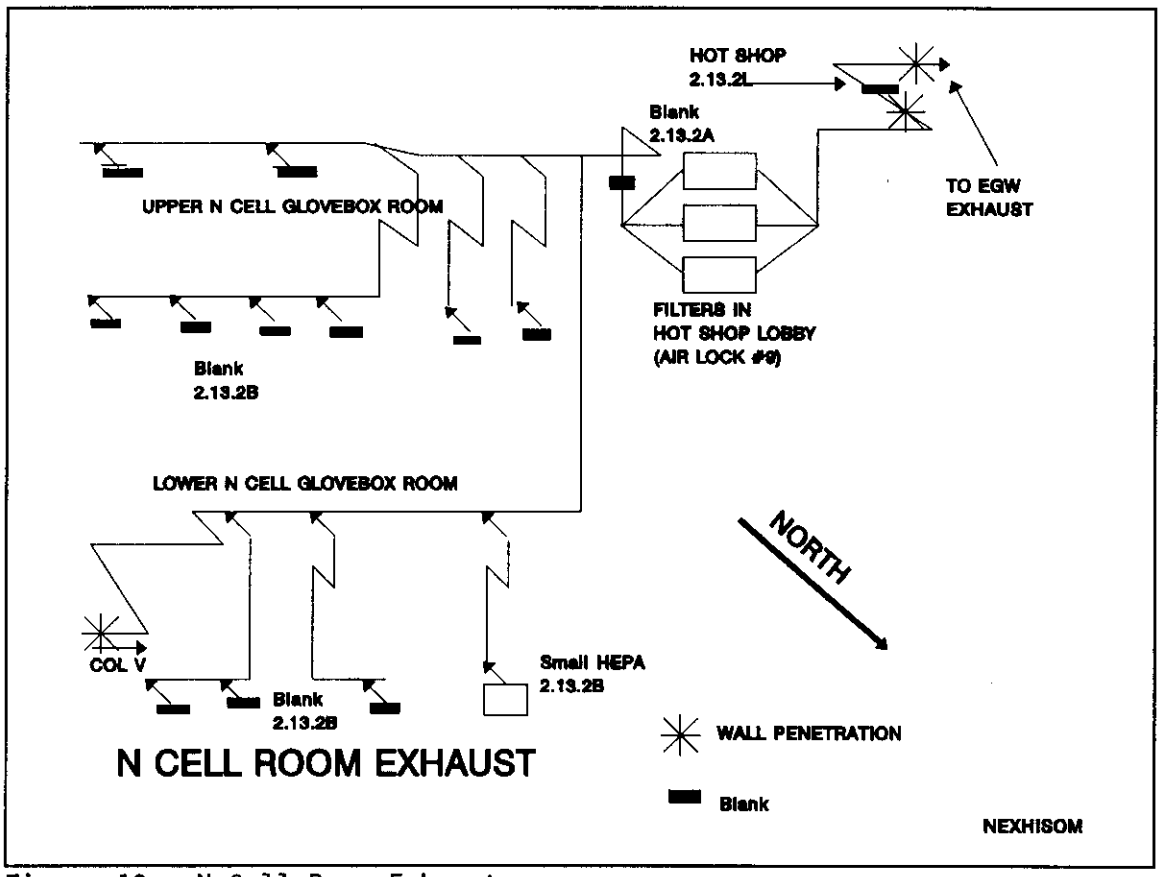

Figure 13. N-Cell Room Exhaust

6.1.21 ISOLATE N ROOM EXHAUST PORTS (ADD SMALL HEPA)

There are numerous grills and test ports on the upper and lower N-Cell room exhaust ducting. These ducts are known to be contaminated. The large volume of air within the filter housings will breath with temperature changes, resulting in possible contamination migration. All inlet port and grills to the room exhaust ducting, except one, are to be blanked and sealed. One port is to be selected and a small hepa filter installed between the duct and the room air. This will allow the volume of air in the system to breath through the filter and avoid contamination release (refer to Figure 13). This work will be done at switch-over.

6.1.22 HOT-SHOP LOBBY MODIFICATIONS (AIRLOCK #9)

An opening between N-Cell and the Hot Shop Lobby will be created to route air into the Hot Shop Lobby. There is an over head crane way between the upper level of N-Cell and the Hot Shop Lobby. The upper pass-through doors will be secured open. A back-draft damper will be mounted in the door between the Hot Shop Lobby and the Hot Shop. Air flow will come through the open crane-way doors and will continue from the Hot Shop Lobby into the Hot Shop through the back-draft dampers (refer to Figure 14). This work will be performed before switch-over.

6.1.23 REMOVE THE ELBOW IN HOT-SHOP

The Upper and Lower N-Cell room exhaust header passes through filter housing FH-V21-10,11,12 located in the Hot Shop Lobby. The exhaust from this housing passes through the wall between the Hot Shop Lobby and the Hot Shop, and then makes a 90 degree turn into Plenum #2. This Elbow will be removed, indirectly connecting the air space within N-Cell to the space within the Hot Shop. This will maintain N-Cell lower than atmospheric pressure be means of the connecting duct (refer to Figure 13 and Figure 15). This work will be done at switch-over.

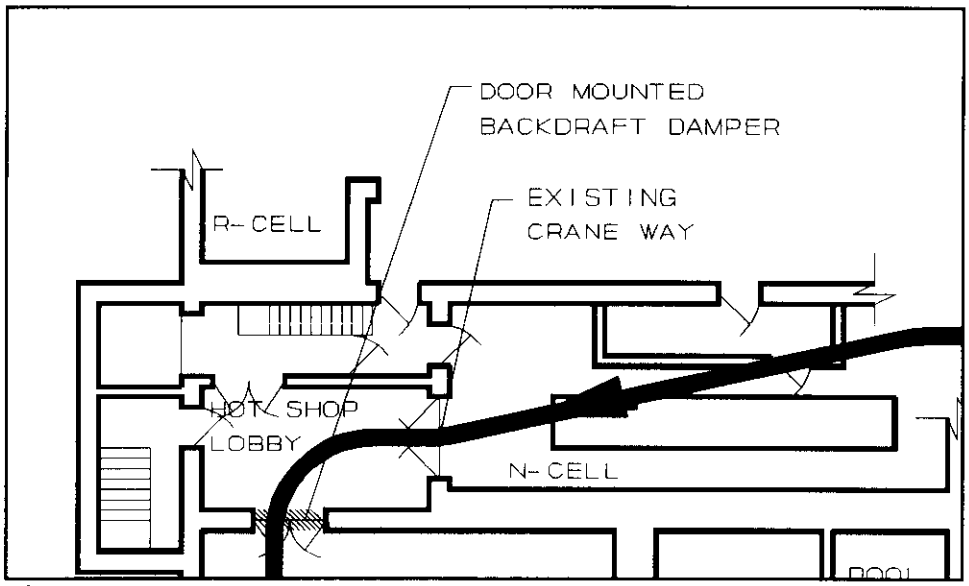

Figure 14. HOT SHOP LOBBY

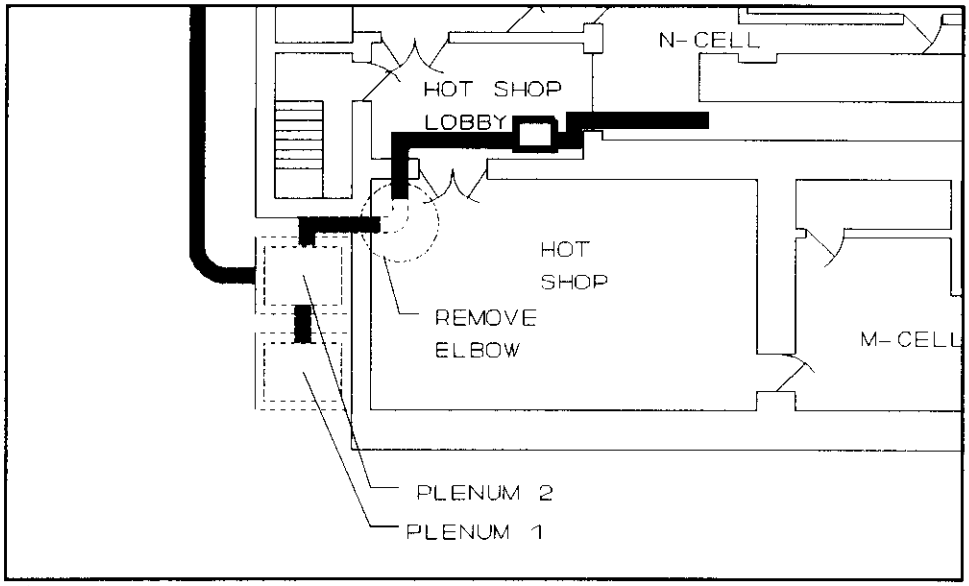

Figure 15. Elbow in Hot Shop

6.1.24 M-CELL COVER BLOCK INSTALL AND SEAL

The ceiling in M-Cell is open to the canyon. This will drive the M-Cell pressure to be the same as that of the Canyon. If M-Cell connects only to the air tunnel, the pressure will be lower than canyon pressure. Because the M-Cell room is the last area at the end of the 673" level flow path (refer to Figure 16), a lower pressure will exist. Therefore it is important that all the cover-blocks that make up the ceiling of M-Cell and hot shop are in place and sealed. This will ensure that the lower air tunnel pressure is available to be used as the motive force to properly ventilate the 673' level and minimize upper canyon contamination spread to M cell. Sealing the cover-blocks with foam or an acceptable alternate must be investigated. This work will be performed before switch-over.

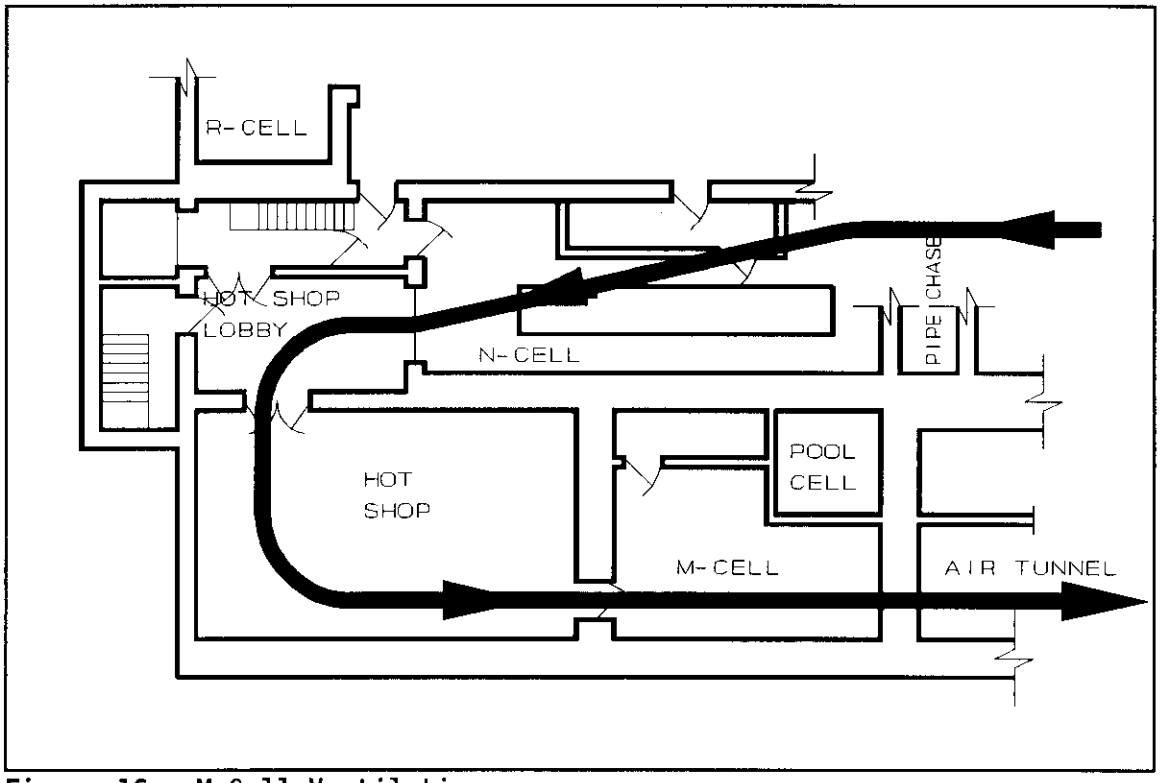

Figure 16. M-Cell Ventilation

6.1.25 CANYON LOBBY EXHAUST BLANK

Blank Canyon Lobby room exhaust air. Exhaust air flows to plenum #2 at the west end of the 202A canyon building where it combines with the R Cell air and N cell room air (refer to Figure 17 and Figure 18). The canyon lobby room air exhaust must be blanked because it is on the 712 level, whereas, the others are on the 673 level. These areas are to be isolated in the deactivated flow scheme. The blank will be done by removing a duct section and blanking ends. This work will be done at switch-over.

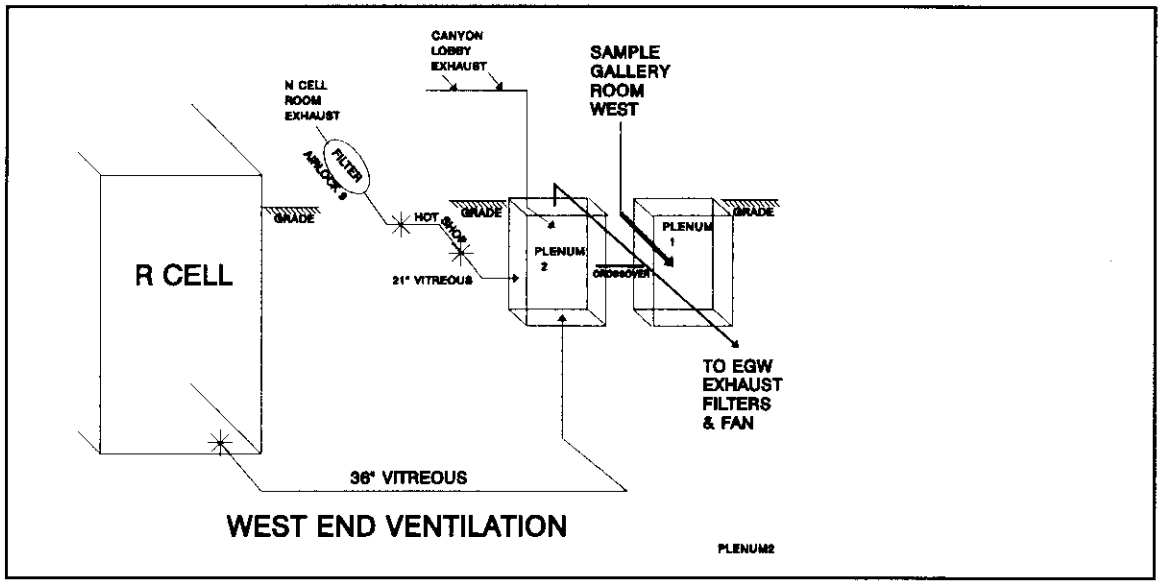

Figure 17. West End Ventilation

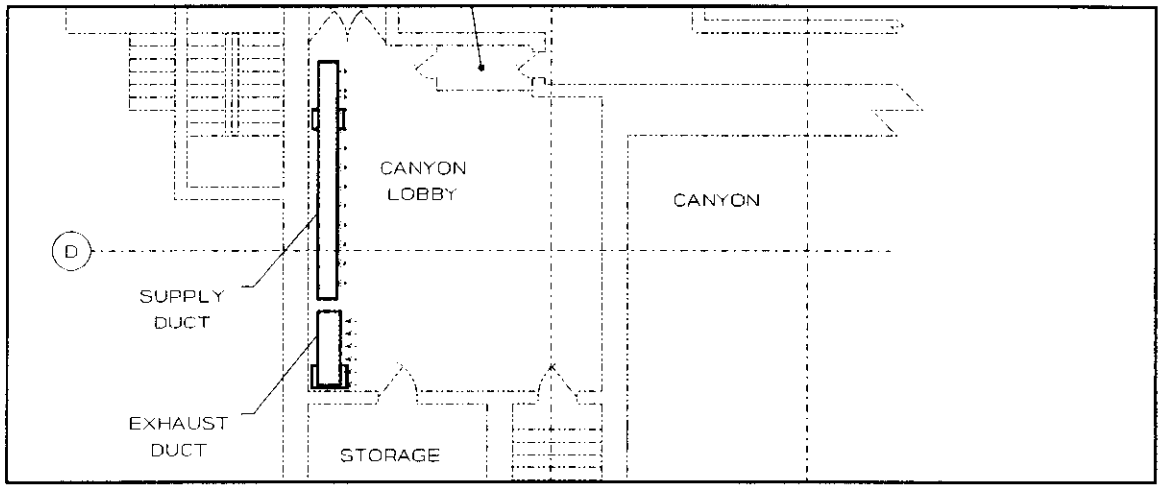

Figure 18. Canyon Lobby Ventilation

6.2 HVAC MODIFICATION SAMPLE GALLERY LEVEL 700' ELEVATION

AREAS:
Sample Gallery level, Stairway at Column 1 and 42, Sample Gallery Hood Exhaust Duct.

DESCRIPTION:
Air will be pulled through the System #2 Supply fan plenums into the Sample Gallery via existing supply ducting. The ducting within the Sample Gallery will be opened near the entry point (≈ column 22, 23), releasing the air into the room. Air will flow east and west from this point. On the west end the stairways at Column 1 will be used to move the air into the Crane Cab Gallery. On the east end the stairway at column 42 will be used. Control dampers will be installed in doorways to provide flow regulation. From the Crane Cab Gallery the air will exhaust to the environment through the final canyon filtration system. Figure 19 represents this flow path.

6.2.1 SUPPLY DUCT MODIFICATION, 700' Level

Air will be pulled through the supply fan plenums air handlers into the Sample Gallery via existing supply ducting. The ducting within the Sample Gallery will be opened near the entry point, releasing air into the room. Figure 20 shows existing duct dropping from the Process Blower at ≈ column 22, splitting, and turning 90° east and west. These 90° inlet elbows will be removed in the Sample Gallery. Air will flow into the Sample Gallery at this point. Extraneous supply ducts will be blanked and modifications to the air handling units will be made. This work will be performed at switch-over.

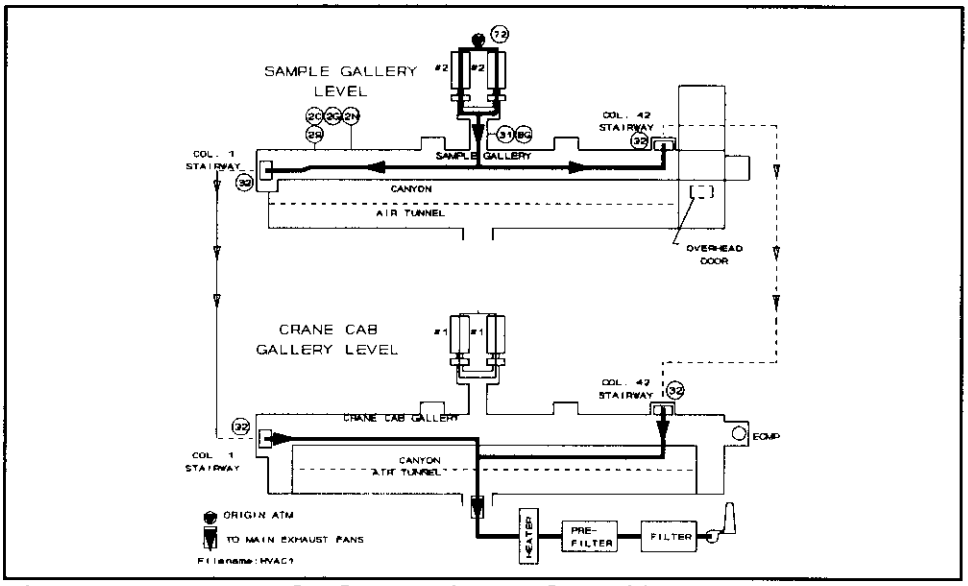

Figure 19. General Flow Path Sample Gallery, 700' Level.

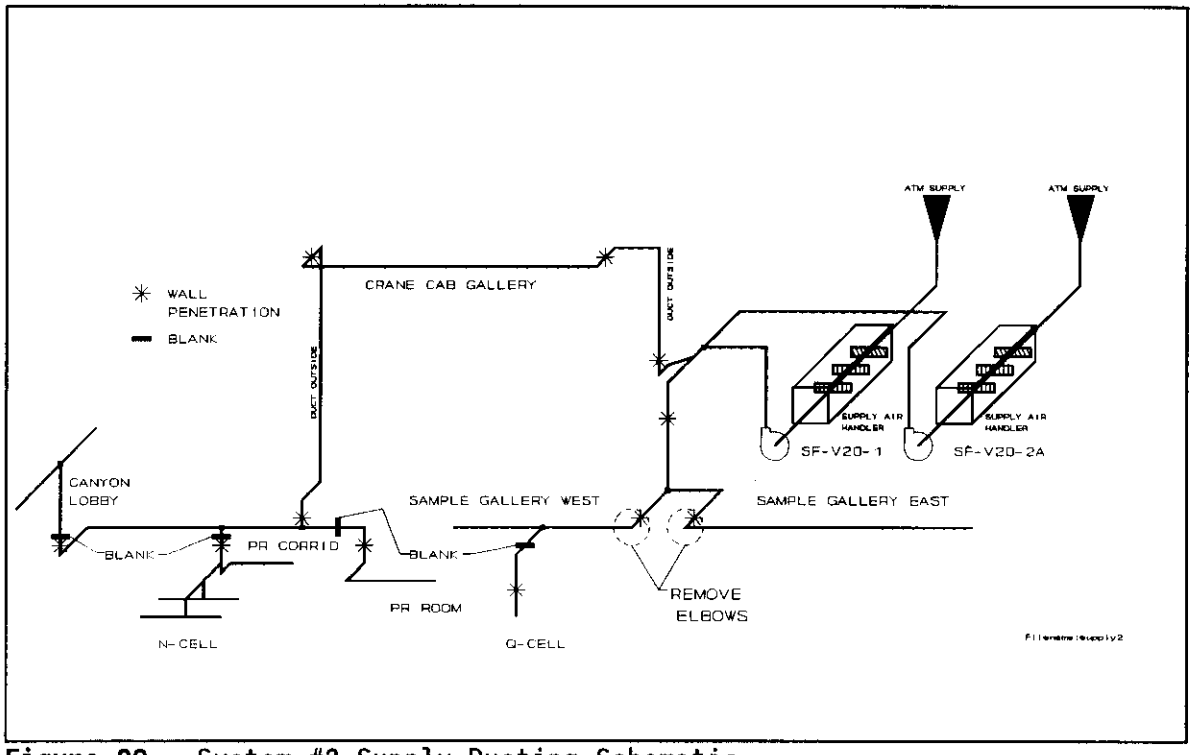

Figure 20. System #2 Supply Ducting Schematic

6.2.2 COLUMN 1: COLUMN 42 STAIRWELL MODIFICATIONS

Stairways at Column 1 and Column 42 will be modified and used as ducts to provide a passage way for air from the Sample Gallery into the Crane Cab Gallery (refer to Figure 21). The door will be opened and locked into the appropriate position for proper air flow. A coating will be placed on the walls of the stairway to minimize decontamination effort. This work will be performed at at switch-over.

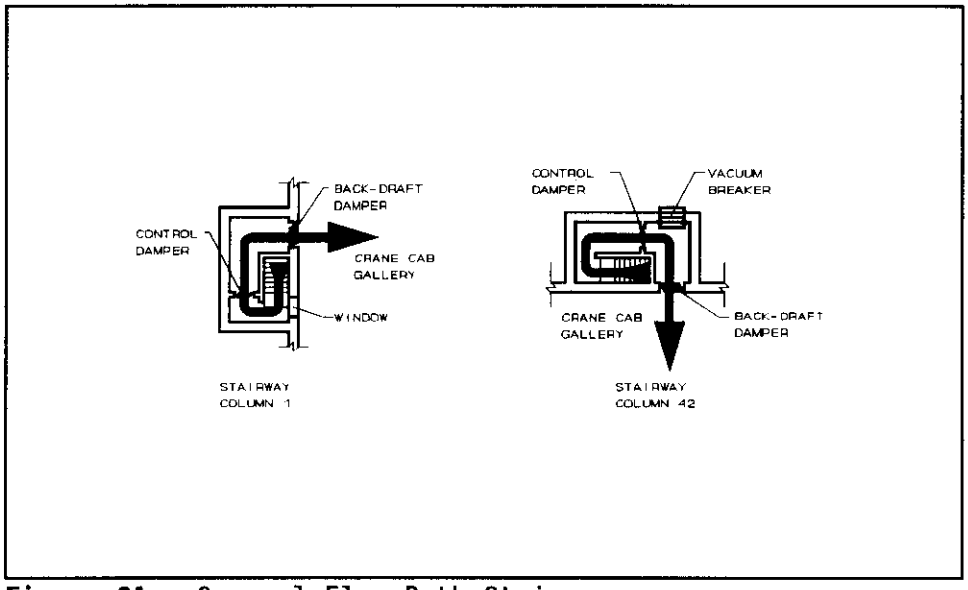

Figure 21. General Flow Path Stairways

6.2.3. ISOLATE SAMPLE GALLERY

The Sample Gallery has several openings that must be sealed to reduce ventilation communication between levels. Some of these connections or openings include, the dumb waiter to the PUREX lab, The doorway to R-Cell, the doorway to the AMU basement, and elevator shafts. This work will be performed before switch-over.

6.2.4 FIX SAMPLE GALLERY HOOD EXHAUST DUCT

The Sample Gallery Hood exhaust duct runs the full length of the Sample Gallery (refer to Figure 22). The duct is mounted close to the ceiling and exhausts all sampling hoods. These ducts are highly contaminated, therefore stabilizing them is required.

All joints will be sealed with a aluminum tape seal. The west end of the exhaust header will be connected to the air tunnel in M cell. This work will be done at switch-over.

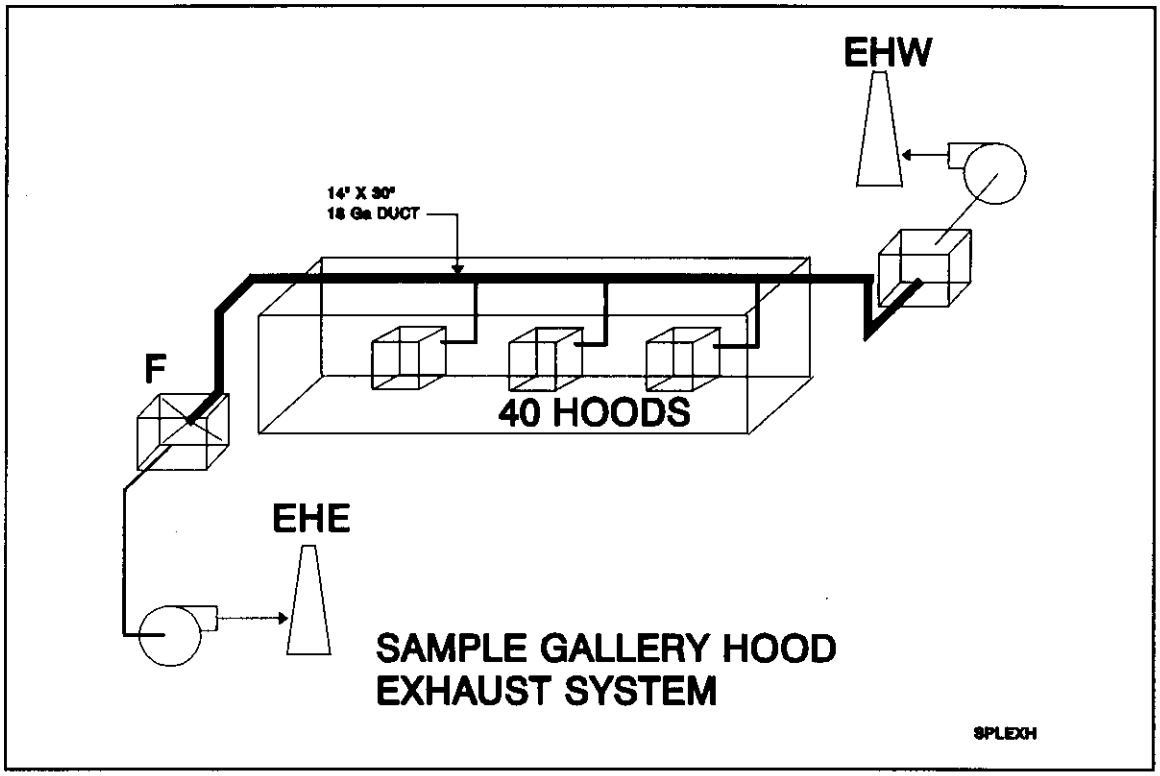

Figure 22. SAMPLE GALLERY HOOD EXHAUST SYSTEM.

6.3 HVAC MODIFICATION P&O GALLERY LEVEL 712' ELEVATION

AREAS:
P&O Gallery, White Room, Canyon Lobby, ECMP

DESCRIPTION:
Existing duct work from the System #3 Supply fan into the P&O gallery will be used to provide ventilation to the P&O Gallery. Two large supply ducts enter the gallery approximately at the mid point. The supply ducts will be opened as they enter the gallery. Air will be dumped into the room and make its way East and West. The west end of the P&O Gallery will be ventilated by drawing air through the White Room across the Canyon Lobby, through the air lock and into the PUREX main Canyon. The east end of the P&O Gallery will be ventilated through the ECMP. Supply ducting to the ECMP will be opened to provide a pathway. The three shield doors between the Canyon and the ECMP will be closed. A damper

will be placed in the air path to the ECMP to provide control over the air flow. Duct blanking to simplify air flow will be performed as required (refer to Figure 23).

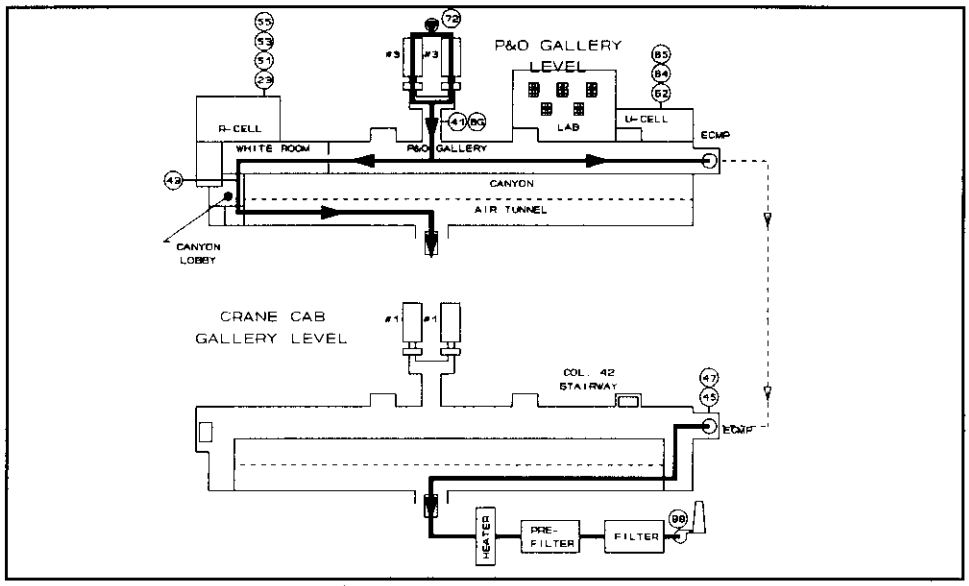

Figure 23. General Flow Path P&O Gallery, 712' level.

6.3.1 SUPPLY DUCT MODIFICATION, 712' Level

Air will be pulled through the supply fans air handlers into the P&O Gallery via existing supply ducting. The ducting within the Gallery will be opened near the entry point, releasing air into the room. Figure 24 represents the current configuration. Air will be simply flow into the Sample Gallery at this point. Extraneous supply ducts will be blanked and modifications to the air handling units will be made. This work will be performed at switch-over.

6.3.2 WHITE ROOM FLOW DIVERSION

The west end of the P&O Gallery will be ventilated by drawing air through the White Room across the Canyon Lobby, through the air lock and into the PUREX main Canyon through doors #7 and #9 (refer to Figure 25). This work will be performed before switch-over.

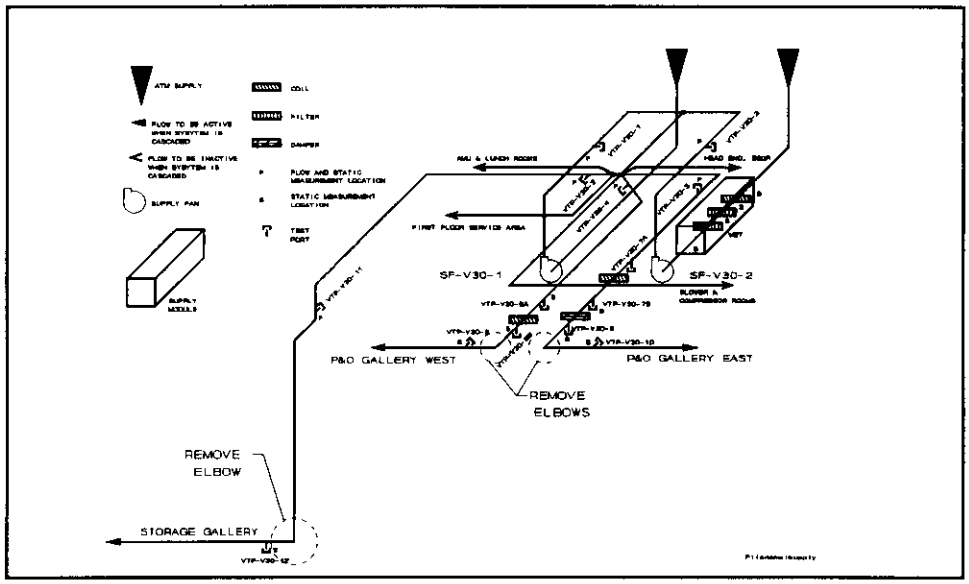

Figure 24. System #3 Supply Ducting Schematic

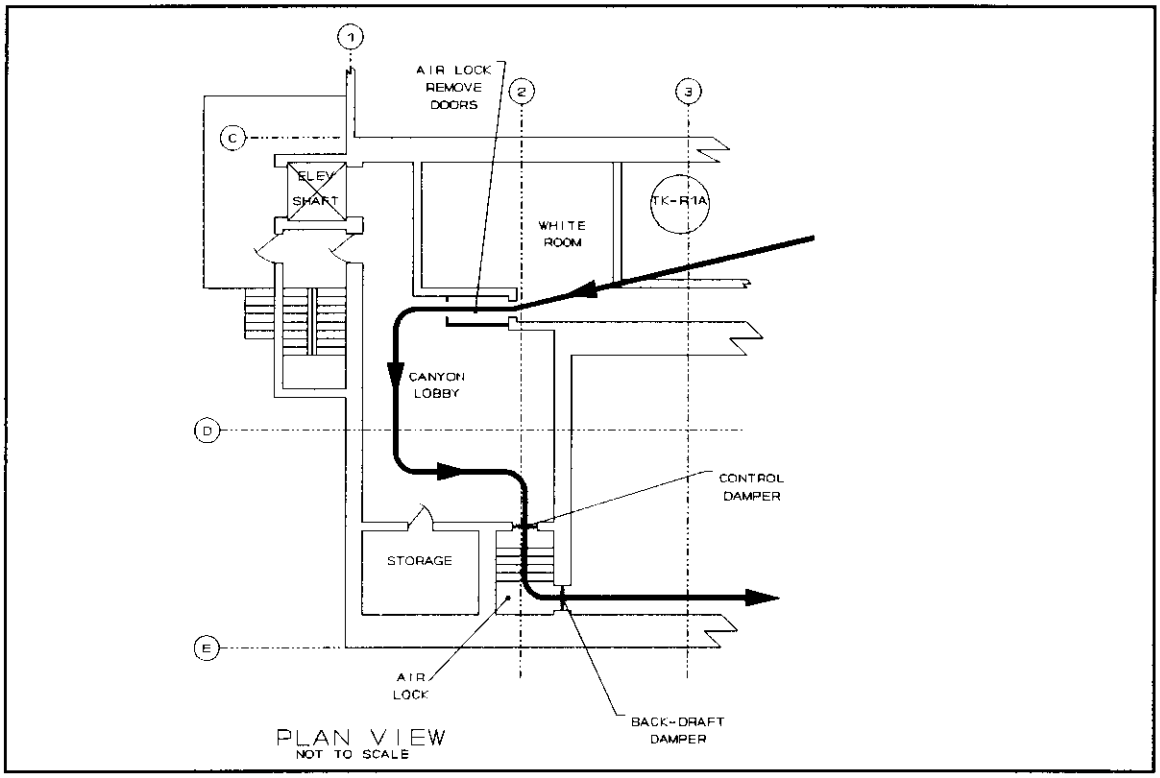

Figure 25. White Room Ventilation

6.3.3 ECMP FLOW REGULATION

The existing supply ducts will be opened in the P&O gallery at the midpoint of the gallery. Air will plug flow from the midpoint to the ECMP (east crane maintenance platform) zone near column 42 and ultimately enter the canyon similar to the present configuration. The existing dampers will be altered for fixed operation. The figure "ECMP Ventilation" represents the present configuration. The duct will be opened to allow air to flow from the 712" level into the ECMP. Flow regulation will probably be done at the entry opening at the east end of the ECMP air handlers. This work will be performed at switch-over.

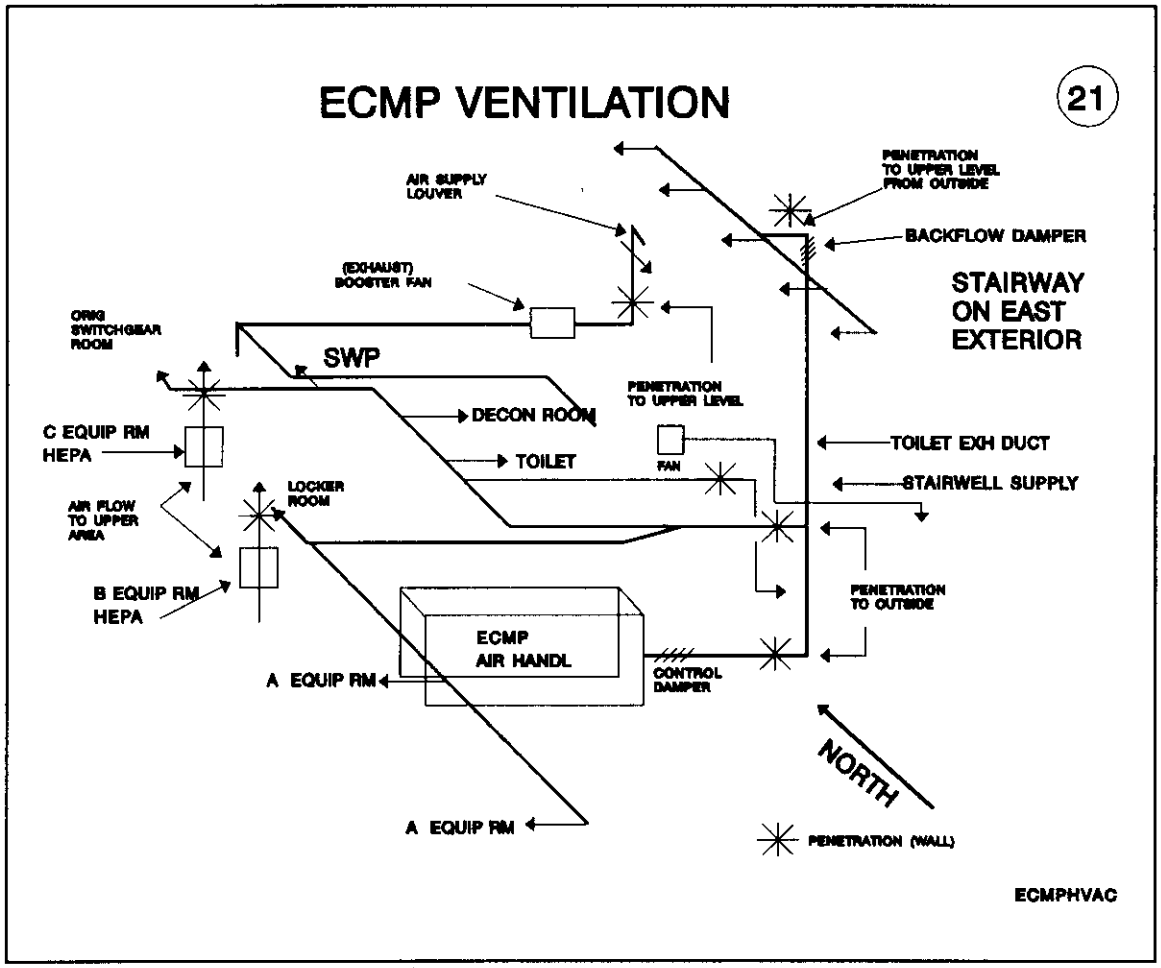

Figure 26. ECMP Ventilation

6.3.4 ECMP ZONE ISOLATION

This task is to set up a ventilation purge flow through the ECMP and on into the upper canyon air space. Air flow will be directed via the supply duct to the ECMP upper level and will be orficed at the "C" shielding door. A separate engineering trade study will be completed for the ECMP equipment including the 60T main shield door (door "A") hoisting equipment, the hydraulic systems for shielding doors "B" and "C" and the results incorporated later (refer to Figure 27).

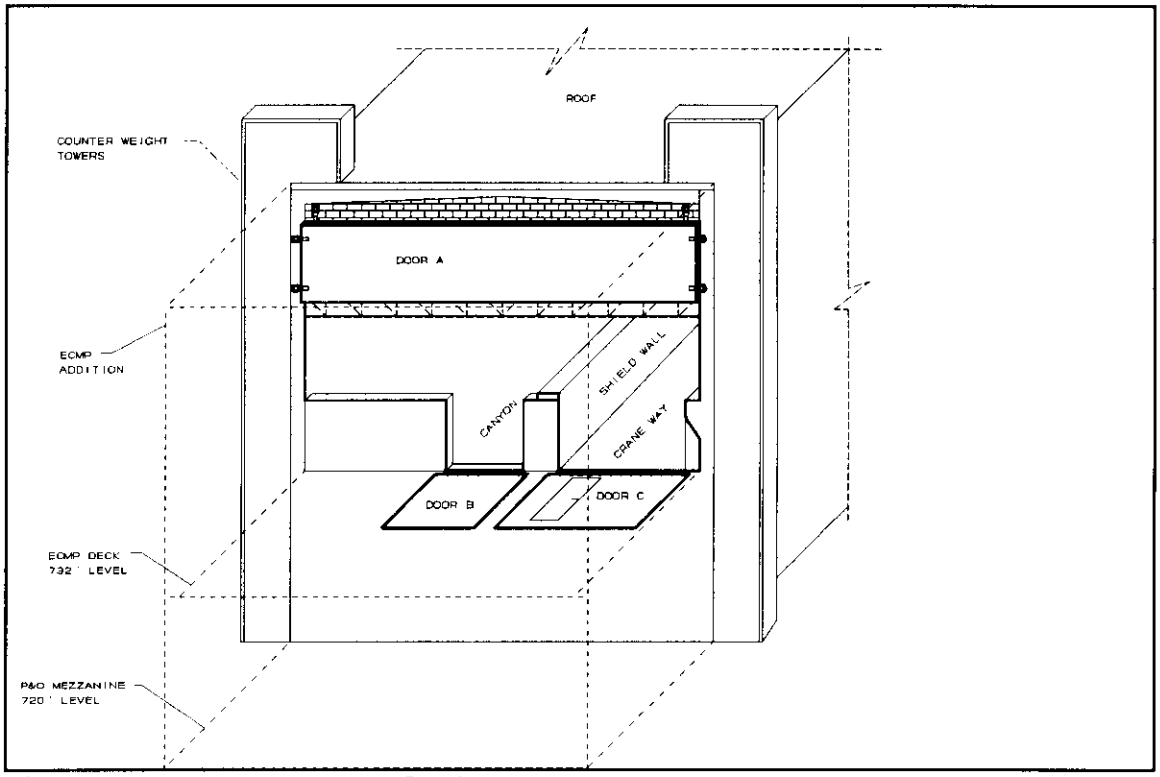

Figure 27. ECMP Zone Isolation.

6.4 HVAC MODIFICATIONS R-CELL

AREA:
R-Cell, and PR Corridor

DESCRIPTION:
R-Cell is a concrete vault enclosure at the northwest corner of the building. The ceiling of R-Cell is made up of cover blocks at approximately 5 feet above grade level.

6.4.1 SEAL COVER BLOCKS, R-Cell

This task is to ensure the seal of the R-Cell cover blocks, to guard against water and air intrusion. This work will be performed before switch-over.

6.4.2 SEAL OFF R-CELL VENTILATION SUPPLY

R-cell ventilation supply and all openings will be sealed. The supply air handler is currently out of service. Two large duct connect the supply air to the R-Cell as shown in the Figure 28. These ducts are to be removed and the openings blanked. This work will be performed before switch-over.

6.4.3 REMOVE R CELL INTERNAL HVAC FILTERS

R-Cell exhaust ventilation connects to plenum 2, as shown in Figure 28, via an underground vitreous line. Potential pressure drops across this duct are to be eliminated. Inside R-Cell the "rock stopper" filters will be removed along with and other obstruction in the exhaust duct-work in R-Cell. The small duct that exhausts the PR Corridor will be blanked. This work will be performed at switch-over.

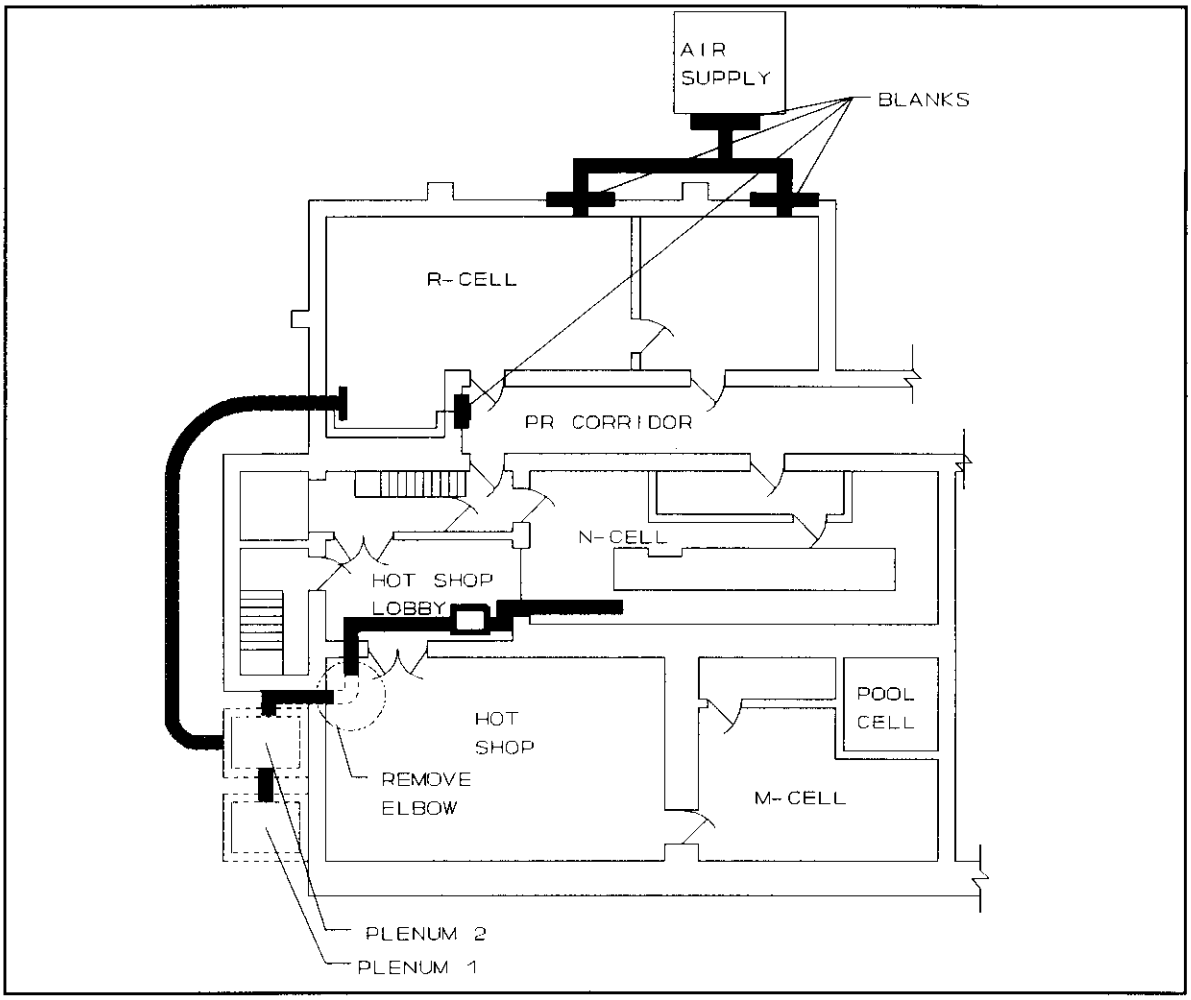

Figure 28. R-Cell VENTILATION

6.5 HVAC MODIFICATIONS U-Cell

AREA:
U-Cell, Fractionator

DESCRIPTION:
U-Cell is a concrete vault enclosure at the northeast corner of the building and is connected to the Fractionator Facility. The Ceiling of U-Cell is make up of cover blocks at approximately 1 feet above grade level.

6.5.1 SEAL COVER BLOCKS, U-Cell

This task is to ensure the seal of the U-Cell cover blocks, to guard against water and air intrusion. This work will be performed before switch-over.

6.5.2 SEAL OFF U-Cell VENTILATION SUPPLY

Seal the U-Cell ventilation supply as it connects to the Fractionator. The supply air handler is currently out of service. A large duct connects the supply air to the Fractionator as shown in Figure 29. A section of this duct is to be removed and the openings blanked. This work will be performed before switch-over.

6.5.3 REMOVE U CELL INTERNAL HVAC FILTERS

U-Cell exhaust ventilation connects to a plenum 3, as shown in Figure 29. The current ventilation draws air into the supply air handler, through the fractionator, and into U-Cell. From U-Cell the air is drawn into plenum 3. Air from the Sample Gallery room is also drawn into plenum 3. A negative pressure will be maintained on the U cell vault and the fractionator building by the opening connecting plenum 3 to the east sample gallery room air. Pressure drop across this access port must be eliminated. The "rock stopper" filters inside U-Cell are to be removed with any other obstruction in the exhaust duct-work in U-Cell. This work will be performed at switch-over.

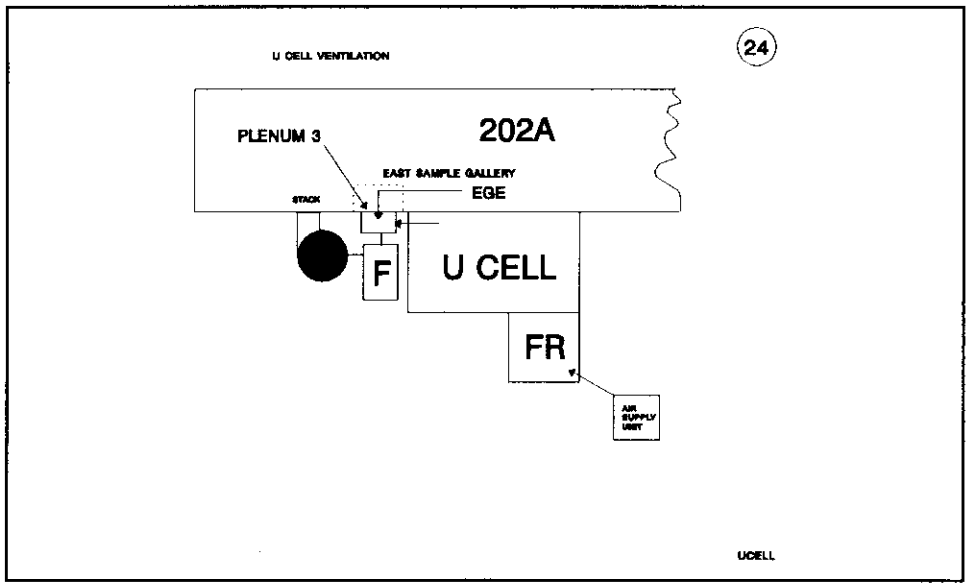

Figure 29. Current U-Cell Ventilation.

6.6 HVAC MODIFICATION SUPPLY AIR and MAIN CANYON FILTERS

AREA:
Process Blower room, Service Blower room, Deep Bed filter #1, #2, and #3, HEPA Filter #4.

DESCRIPTION:
It is critical that the supply end of this draw through system remains open, and the produced pressure drop is minimized. Any dust, ice or moisture loading on the system pre-filters would have a large impact on the flow rates and pressures of the system. Steps must be taken to ensure safe operation of the consolidated HVAC system.

Deep Bed filter #1 and #2 have a significant quantity of radioactive contamination deposited with in the filter depth. This potentially releasable contamination along with canyon inventory is the main basis behind a requirement for a costly and complicated continuous air monitoring system. If the Deep Bed filters can be removed from service, the potential for releases would be significantly reduced, and may lesson the requirement for a continuous air monitor. Effort spent on upgrading the final filtering system, making it safer and more reliable will improve the long term safety of the facility. Having a system that will provide dependable long term service is paramount.

This issue will be evaluated in a separate engineering trade study and the results incorporated at a later date.

6.7 HVAC MODIFICATION RAILROAD TUNNEL

AREAS:
Currently the Rail Road Tunnel is ventilated from the EF-V34-1 East End Storage Gallery Exhaust Fan. Tempered air is taken from the Storage Gallery and forced into the tunnel. (Refer drawing H-2-76952, 53, 54 and H-2-52305, 326). The tunnel was exhausted by the leaks around the overhead railroad door into the canyon. Back-draft dampers in the tunnel would protect the tunnel from becoming over-pressurized should the exhaust to the canyon be interrupted. The supply, from the storage gallery, was introduced, into the rail road tunnel, between the two outside rail road tunnel doors. (See flow diagram H-2-76952)

DESCRIPTION:
This task includes the blanking of the East End Storage Gallery Exhaust Fan, modifying the overhead railroad tunnel door, ensuring proper seal on the #1 and #2 storage tunnel shield doors, and blanking the #1 and #2 storage tunnel exhaust fans. All water and steam lines in the Rail Road tunnel must be blown down and cleared, because there will be no freeze protection. For current flow and ventilation details of the railroad tunnel refer to Figure 30.

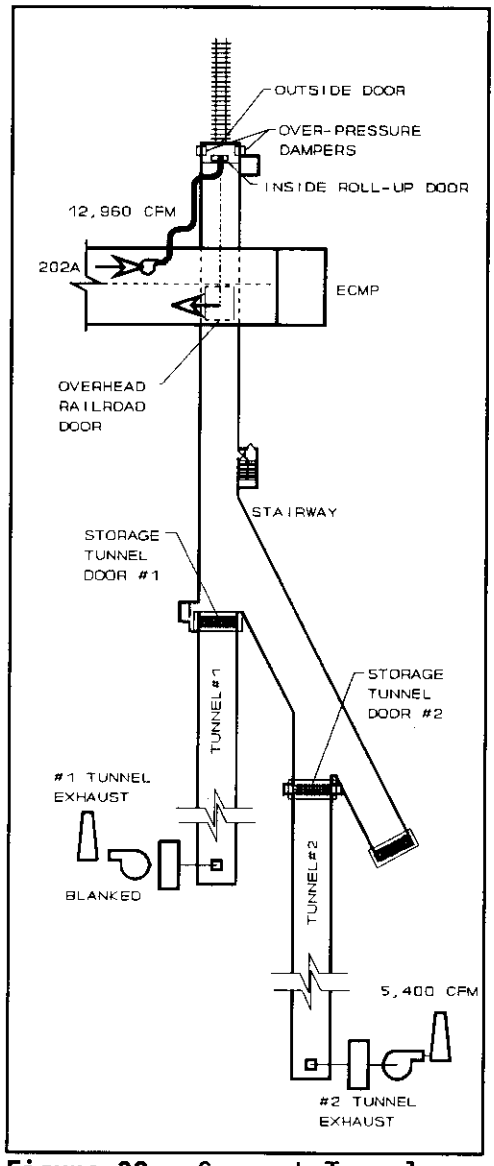

Figure 30. Current Tunnel Configuration

Inquiries have been made concerning the storage of waste material within Storage Tunnel #2 after deactivation. It is possible that additional waste will be stored in the #2 storage tunnel. The original plan was to ventilate the tunnels into the 202A Canyon and seal all extraneous doors and openings.

The following items A through N outline the baseline case for the railroad tunnel ventilation applicable to the deactivated facility (refer to Figure 31). After the possibility of future tunnel operations was requested, a group of options were outlined in a letter (ref. 5) to DOE/RL to obtain a decision on the best option

to use during the interim storage tunnel operations period. DOE/RL has chosen option 3A with provisions which ventilates the railroad tunnel common area via air flow control in the overhead door. An additional 3000 to 5000 cfm will be available using the existing tunnel #2 exhaust fan.

6.7.1 STORAGE GALLERY EXHAUST FAN MODIFICATION BLANK/SHUTDOWN

Exhaust Fan EF-V34-1 is located in the east end of the Storage Gallery. The exhaust duct exits the building at the northeast corner and crossties to the railroad tunnel. The duct is to be blanked at the north wall of the building in the Storage Gallery. This work will be done at switch-over. This will leave the east end of the Storage Gallery without any direct ventilation.

6.7.2 MODIFY DUCT-WORK AND INSTALL BACK DRAFT DAMPERS

Remove the elbow of existing duct adjacent to the canyon building. The entrance of duct will be modified and one Back-draft damper will be installed in the flow inlet. A snow hood and bird screen will also be installed. This work will be performed at switch-over.

6.7.3 SEAL RAILROAD OUTSIDE TUNNEL DOORS

There are two doors in series at the entrance of the RR tunnel. The outside roll-up door must be sealed. This door is a four segmented vertical door held in place by channels. The lowest segment has a crack in it that will be repaired. The perimeter must be sealed to reduce inleakage. This work will be performed before switch-over.

6.7.4 SEAL RAILROAD TUNNEL BACK-DRAFT DAMPERS

There are two back-draft dampers mounted in the wall of the RR tunnel. These dampers are protection against over-pressurizing the RR tunnel. The dampers will be removed and/or blanked. This work will be performed at switch-over.

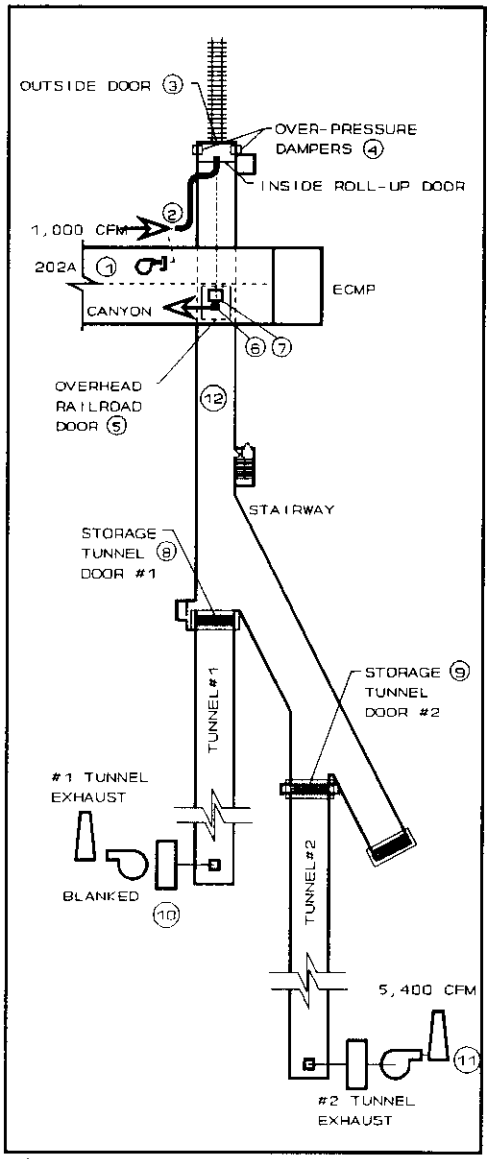

Figure 31. Ventilate Tunnel to Canyon

6.7.5 OVERHEAD RAILROAD DOOR MODIFICATION

It is currently estimated that ≈13,000 cfm of air enters the canyon through the railroad tunnel overhead door (refer to Figure 32). A development of significant negative pressure in the RR tunnel is not desired because of the large activity sources in the burial tunnels. If a significant negative develops then potential leakage may occur around the shield doors because the normal exhausters will be off on the burial tunnel outer ends. The goal is to set a moderately low negative pressure on the RR tunnel (i.e. -.05 to -.10 " H_2O) and maintain this pressure

with non-regulated dampers on the outer RR door and the overhead RR door. Leakage through the overhead door must be limited by partially sealing the overhead Door. This work will be performed before switch-over.

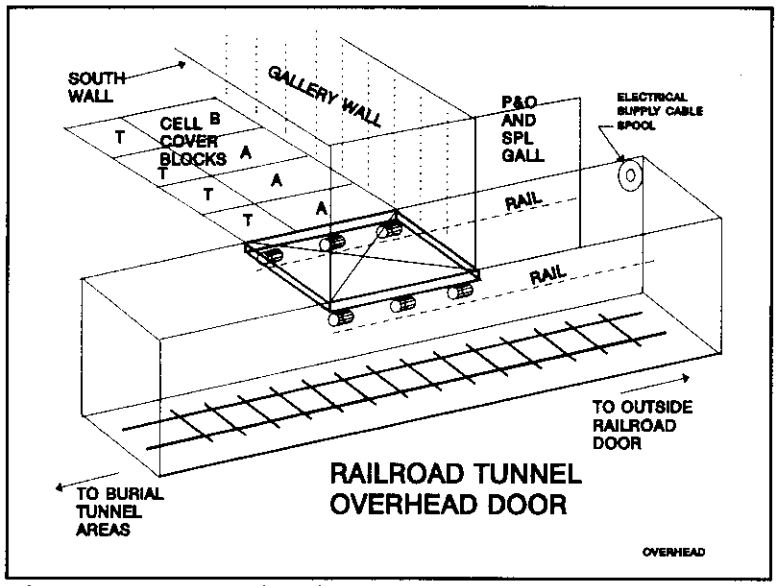

Figure 32. Overhead Door, Railroad tunnel

6.7.6 MOUNT A CONTROL DAMPER IN THE OVERHEAD RAILROAD DOOR

When the tunnel is not in use, approximately 1,000 cfm of air will be ventilated to the canyon. This will be accomplished by mounting a damper device in the sealed overhead door. This work will be performed before switch-over.

6.7.7 REMOVABLE PANEL IN OVERHEAD DOOR

When the tunnel is in use a flow of approximately ≈10,000 cfm is needed to ventilate the tunnel space. A removable panel or flashing will be placed in the overhead door to provide that extra flow.

6.7.8 BURIAL TUNNEL SHIELD DOORS #1

Shield Door #1 is currently sealed. This task is to verify that the seal will be sufficient for shut down. The door will also be checked to ensure that the water with in the door has been drained. The shield water will be removed to reduce corrosion and freeze damage. The area will be posted for radiation dose rates. This work will be performed before switch-over.

6.7.9 BURIAL TUNNEL SHIELD DOOR #2

Shield Door #2 is currently available for use. Because of projected utilization of the tunnel, this door will be secured with a removable seal or the #2 tunnel exhaust fan will remain in operation, so that the seal can be easily removed. There is no water currently in this door. This work will be performed before switch-over.

6.7.10 TUNNEL #1 EXHAUST BLANK

There is an exhaust fan at the far end of the #1 railroad tunnel that has been out of service for some time. This fan and filter will be blanked and deactivated in a proper manner. This work will be performed before switch-over.

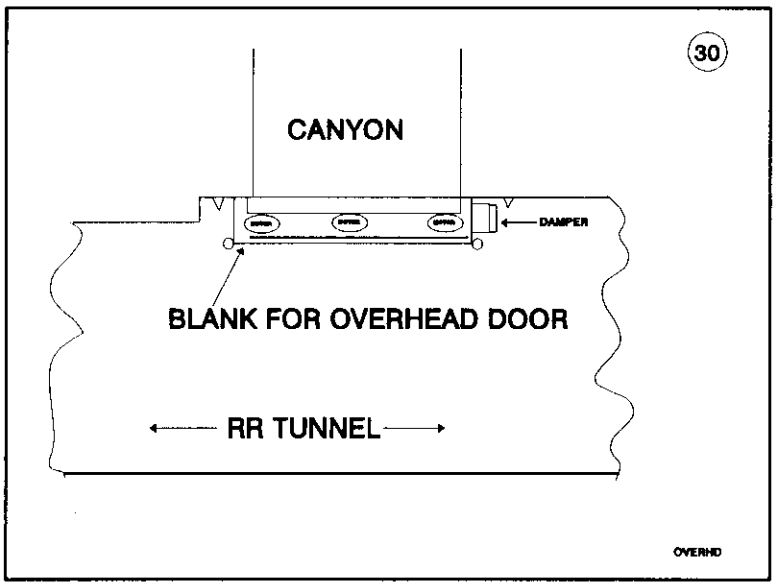

Figure 33. Overhead Door

6.7.11 TUNNEL #2 EXHAUST BLANK

There is an exhaust fan at the far end of the #2 railroad tunnel. This fan must be operated to properly ventilate the tunnel, while adding or removing tunnel inventory. After the facility is shut-down, it is probable that there will be additions to the tunnels inventory. When adding material to the tunnel the exhaust fan will remain in operation. During periods when material is not being added to the tunnel, the exhaust fan will be shutdown and the shield door sealed. After tunnel operations are complete the #2 fan and filter will be blanked and the shield door sealed, while allowing the alternative of

reactivating the fan, including access to the shutdown power grid. This work will be performed before switch-over.

6.7.12 FIX CONTAMINATION, RAILROAD TUNNEL

There is contamination within the RR tunnel. Due to the reduced flow after consolidation, it would be prudent to fix the contamination within the tunnel. Current plans include general housekeeping and fixation in the outer tunnel area. This work will be performed before switch-over.

6.7.13 INSTALL PLUGS IN TUNNEL ENTRY DRAINS

There are a number of drains in the floor of the railroad tunnel. To ensure that the tunnel contamination does not spread through the drain system (drains are connected to the old SCD effluent header), this task is to plug each of the floor drains in entry room areas of storage tunnel #1 and #2. This work will be performed before switch-over.

6.7.14 DEACTIVATE DOOR INSTRUMENTS AND CONTROLS

Deactivate the instruments and controls in the RR Tunnel and change drawings to reflect the changes. Inadvertent operation must be avoided. The outer door and #2 storage shield door will be tied into the deactivated electrical system. This work will be performed before switch-over.

6.8 HVAC MODIFICATION MISC 202A HVAC ITEMS/DOOR & OPENINGS

AREAS:
Multiple areas

DESCRIPTION:
Several unrelated yet important task required for HVAC consolidation are listed here.

6.8.1 INSPECT 202A ROOF

With no heat provided in the building after consolidation the wall and joints will be under added stress. This task is to inspect 202A building roof and expansion joints to ensure good repair and function. If required an arrangement for an expert roof evaluator to inspect, evaluate, and document the roofs condition will be completed. This work will be performed before switch-over.

6.8.2 AIR IN-LEAKAGE TO 202A/INCLUDE VACUUM BREAKER

A significant task related to building air inleakage is the Building Vacuum Breaker Design and other inleakage points. The existing vacuum breakers are a significant inleakage point and must be either modified or totally replaced to achieve the low ventilation flows we are targeting (refer to Figure 43). This task focuses specifically on the canyon in-leakage to: Generally seal up and patch all points of entry into the buildings. To prevent intrusion of: 1) rodents, birds, etc... 2) unauthorized personnel. 3) uncontrolled air flow. Many building portals and penetrations are involved. This work will be performed before switch-over.

6.8.3 ELECTRICAL DAMPER MODIFICATIONS

The damper controls for the main exhaust fans are currently pneumatic. After shutdown, the air supply will be unavailable. New electric actuators instruments and controls must be installed, for use after shutdown. This work will be performed at switch-over.

6.8.4 202A OUTSIDE DOORS/OPENINGS/SECURE

Secure all outside openings to the building. The review of all outside building openings has three purposes.

1. Exclusion of all rodents and birds entering the building.
2. Restriction of all unauthorized personnel from the building. This is a significant hazard when public access to the area is allowed.
3. Regulation of air flows entering the building from all sources.

This work will be performed before switch-over.

6.8.5 ALTERATION/BLANK EXTRANEOUS SUPPLY DUCTS

This task includes alterations to all supply systems to blank extraneous duct, to ensure that there are no unwanted pathways, and/or cross-ties. This work will be performed at switch-over.

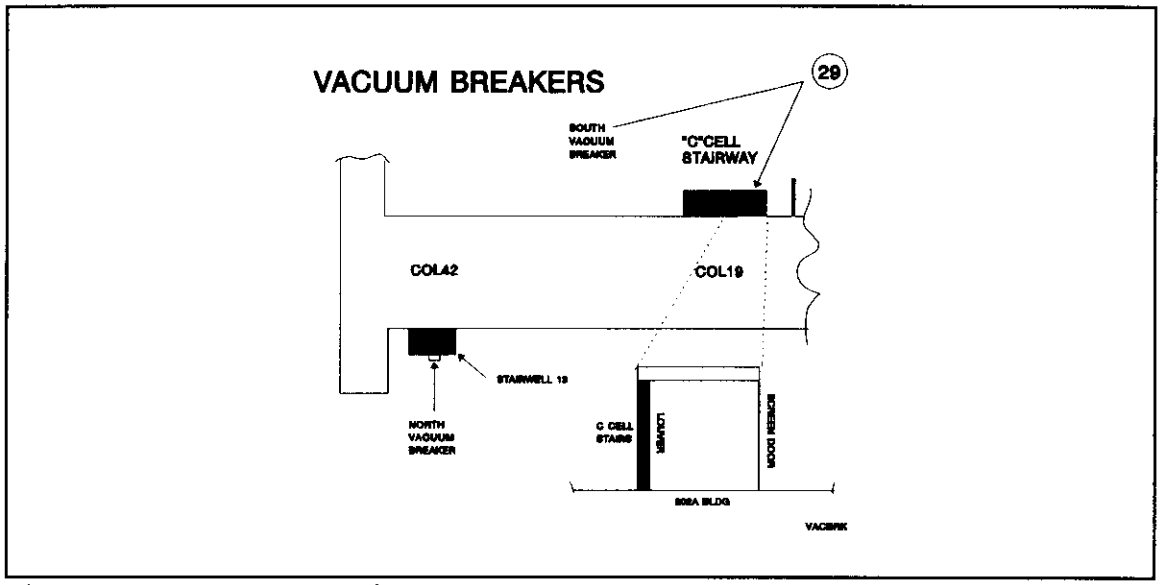

Figure 34. Vacuum Breakers

6.8.6 DUCT HOLE CUTTING (&FB1;FB2)(PR DUCT SAMPLE GAL)

This task includes conception and design of a device to make openings in duct-work for foam addition. Present plans include foam addition to the PR duct system with extensive use in the lab. This work will be performed before switch-over.

6.8.7 SIGNS & CHAINS AROUND FILTERS

Place signs and barriers around underground filters, reducing the likelihood of accidently breaching the underground 291-A filter building containment. This work will be performed before switch-over.

6.8.8 MODIFICATION OF SUPPLY AIR HANDLING UNITS

To offset the effects of inlet filters the current design involves using the blower rooms as an inlet plenum to normalize all filter banks. If any one bank of filters has more loading the others will provide the flow.

The HAZARD AND OPERABILITY study made a significant point of monitoring the inlet DP of the blower room to provide online data for any type of inlet air restriction. Any such restriction would bias the negative pressures throughout the entire ventilation system and could over stress the blower room structure. A restriction could be due to insect, dirt, debris, or frost accumulations on the inlet filters. This task should include an assessment of

the blower room structure, especially the roof. This work will be performed before switch-over.

6.8.9 BUILDING/AIR SWITCH-OVER

Changing the HVAC system over from the current configuration to the consolidated flow, will be accomplished through a series of work plans. The plans will be formatted and updated as design proceeds. The changes will be issued after final design review and immediately prior to the their use.

6.8.10 IEFD UPDATE

Modifications to the HVAC system will be performed, via ECNs written against specific affected drawings. These ECNs will most likely not be incorporated into the drawings. In order to maintain configuration control, new IEFDs will be produced to reflect the consolidated airflow paths. This work will be performed in a parallel effort with switch-over.

7.0 REFERENCES

1. Westinghouse Hanford Co., HNF-SP-1011, Rev. 0, PUREX Project Management Plan, dated August 1994.

2. Westinghouse Hanford Co., Hazard and Operability Analysis of the Modified PUREX Ventilation System, dated March 15, 1995.

3. Westinghouse Hanford Co., HVAC Modified Value Engineering Study, dated June 1995, by KCM Inc.

4. Westinghouse Hanford Co., HNF-SD-WM-TPP-053, Rev. 1, PUREX Deactivation End Points, dated August 23, 1995.

5. Westinghouse Hanford Co., Letter 9552170, PUREX Deactivation Engineer to DOE/RL, dated May 19, 1995.

APPENDIX

The following appendix consists of BHI, Transition, comments on the PUREX consolidation design as described in this document. Upon resolving the enclosed BHI comments/issues and/or if the design configuration changes, this document will be revised in the future to show resolution/changes.

Appendix 1 - Endpoint Matrix

202-A Facility Exterior

s/s	Case	Task	End Point	Closed	Comment	Page#	Team
202-A Facility Exterior	3	5	Isolate vent lines to the atmosphere		FCO 2A-97-06 See Note 1	112	Field Work Team
202-A Facility Exterior	3	5	Isolate HVAC and building potential pathways to the environment		FCO 2A-97-06 Task MISC.97 Door Disposition list 2A-95-00485 2A-97-00001 2A-95-00425 2A-95-00426 2A-95-00427 2A-95-00428 2A-95-00429 2A-95-00430 2A-95-00479 2A-95-00338 2A-95-00336 2A-95-00485 See Note 1	112	Field Work Team
202-A Facility Exterior	3	5	Seal entrance to the facility except the ones identified for use by surveillance and maintenance activities		Door Disposition list See Note 2	112	Field Work Team

Note 1. Refer to the PUREX Heating, Ventilation, and Air Conditioning (HVAC) System Consolidation Document. WHC-SD-CP-CR-037, Rev 1.

Note 2. A copy of the Door Disposition list has been given to the End Point Team Leader (Barger). This list has been given to the Surveillance people (Ethington) and has been discussed with Lloyd Zinsli. An operator for the End Point team is currently walking down the door to verify that they have been sealed.

AMU (Aqueous Make-up)

s/s	Case	Task	End Point	Closed	Comment	Page#	Team
AMU	1	5	Seal exterior doors and isolate potential pathways to the environment		FCO 2A-97-06 Task MISC.97 Door Disposition list See Note 2	387	Field Work Team
AMU	3	5	Isolate interfaces with the sample gallery		Work Package 2A-95-00431 FCO 2A-97-06 Task MISC.97 Door Disposition list See Note 2	387	Field Work Team

Canyon

s/s	Case	Task	End Point	Closed	Comment	Page#	Team
Canyon	2	5	Isolate potential pathways to the environment		FCO 2A-97-06 Task MISC.97 Door Disposition list See Note 2	425	Field Work Team
Canyon	2	5	Isolate/seal doorways and other access points		Work Package 2A-95-00431 FCO 2A-97-06 Task MISC.97 Door Disposition list See Note 2	425	Field Work Team
Canyon	2	6	Vacuum breakers operational		Work Package 2A-95-00485 See Note 3	425	Field Work Team

Note 3 The North vacuum breaker is currently in service and has been in service for 40 years. No test of performance measurement was made. The South breaker has been sealed.

Canyon Lobby

s/s	Case	Task	End Point	Closed	Comment	Page#	Team
Canyon Lobby	1	6	Secure storage room door in the open position for surveillance viewing		See Note 4	469	Field Work Team

Note 4 This task was not defined by the HVAC Team. A new work package or J3 must be generated.

Case 4 System-Operational

s/s	Case	Task	End Point	Closed	Comment	Page#	Team
202-A Ventilation	4	6	Define system calibration and preventive maintenance requirements		See Note 5	921	Field Work Team
202-A Ventilation	4	7	Isolate/blank U-Cell inlet duct		2A-95-00336	923	Field Work Team
202-A Ventilation	4	7	Provide system spare parts inventory listing		See Note 6	922	Field Work Team
202-A Ventilation	4	7	Isolate/blank lines, ducts between pressure zones to minimize interaction between zones.		2A-95-00479 2A-95-00480 2A-95-00363 2A-95-00367 2A-95-00340 2A-95-00355 2A-95-00420 2A-96-00135 2A-96-00008 2A-95-00431 2A-96-00005 2A-95-00482 2A-96-00063 2A-95-00338 2A-95-00336 RRTN.8E 2A-96-00044 See Note 1	922	Field Work Team
202-A Ventilation	4	7	Establish three pressure zones		2A-95-00479 2A-95-00480 2A-95-00363 2A-95-00367 2A-95-00340 2A-95-00355 2A-95-00420 2A-96-00135 2A-96-00008 2A-95-00431 2A-96-00005 2A-95-00482 2A-96-00063 2A-95-00338 2A-95-00336 RRTN.8E 2A-96-00044 See Note 1	922	Field Work Team

202-A Ventilation	4	7	Isolate/blank R-cell inlet duct		2A-95-00338	923	Field Work Team
202-A Ventilation	4	7	Isolate/blank supply routings; Branch D to ESWGR, Branch H to process blower room, Branch B to AMU, Branch G to AMU, Branch to office.		See Note 1 See Note 7 2A-96-00044 ECN 639413	922	Field Work Team

Note 5 The system Calibration will be defined by the Samcons unit. The preventive maintenance requirements are the same as the current procedure.

Note 6 Same as the current spare parts listed for the main exhaust fans.

Note 7 The large door between the Process and Service Blower rooms has been secured open. Air for the system will be pulled form these rooms. Ventilation to the office, AMU, and compressor areas, have been abandon in place and require no Isolation/blanking.

Case 6 System-Abandoned in Place

s/s	Case	Task	End Point	Closed	Comment	Page#	Team
FH-V11-1 (#1 Filter)	6	3	Remove/fix source material to mitigate contamination migration using the reasonable best effort methodology		See Note 8 2A-96-00006	943	Field Work Team
FH-V11-1 (#1 Filter)	6	5	Maintain negative pressure		2A-96-00006 See Note 1	944	Field Work Team
FH-V11-1 (#1 Filter)	6	5	Isolate/blank filter outlet		2A-96-00006	944	Field Work Team
FH-V11-2 (#2 Filter)	6	3	Remove/fix source material to mitigate contamination migration using the reasonable best effort methodology		See Note 8	946	Field Work Team
FH-V11-2 (#2 Filter)	6	5	Maintain negative pressure		See Note 1	947	Field Work Team
FH-V11-2 (#2 Filter)	6	5	Isolate/blank filter outlet		See Note 1 See Note 9	947	Field Work Team

Note 8 All contaminated material with the #1 deep bed filter is inaccessible to personnel.

Note 9 The #2 Deep Bed filter is to remain in service.

Labs

s/s	Case	Task	End Point	Closed	Comment	Page#	Team
Lab HVAC Equipment	6	5	Isolate stacks (296-A-5A & 296-A-5B).		2A-95-00425 2A-97-00001	574	Field Work Team

N-Cell

s/s	Case	Task	End Point	Closed	Comment	Page#	Team
N-Cell Room Exhaust	6	5	Remove HEPA filter and Isolate		See Note 10 2A-95-00369 2A-95-00432	646	Field Work Team
N-Cell Room Exhaust	6	5	Isolate/blank supply ventilation		2A-95-00363 2A-95-00367	646	Field Work Team

Note 10 Filters surveyed and left in place.

PR Room (Product Removal Room)

s/s	Case	Task	End Point	Closed	Comment	Page#	Team
PR-Room Exhaust	6	3	Remove/fix source material to mitigate contamination migration using the Reasonable Best Effort methodology		2A-96-00128	711	Field Work Team
PR-Room Exhaust	6	4	Isolate/blank exhaust ducts		2A-95-00480 2A-96-00128	713	Field Work Team
PR-Room Exhaust	6	5	Isolate Stack 296-A-1		2A-95-00478	713	Field Work Team
PR-Room Exhaust	6	5	Isolate/plug fan housing floor drain to R-Cell sump		??	713	Field Work Team
PR-Room Exhaust	6	5	Remove HEPA filters and isolate		2A-95-00478 See Note 10	713	Field Work Team
PR-Room Gloveboxes	6	5	Remove inlet HEPA's and Blank		??	719	Field Work Team
PR-Room Gloveboxes	6	5	Remove Exhaust HEPA's and blank main exhaust duct		??	719	Field Work Team
PR-Room Gloveboxes	6	5	Ensure system to maintain negative pressure in gloveboxes is in place		2A-96-00128	720	Field Work Team

Note 10 Filters surveyed and left in place.

Q-Cell

s/s	Case	Task	End Point	Closed	Comment	Page#	Team
Q-Cell Gloveboxes	6	5	Remove inlet HEPA's and blank. Leave one HEPA.		2A-95-00340 2A-95-00365 2A-95-00341 2A-95-00354 See Note 10	711	Field Work Team

Note 10 Filters surveyed and left in place.

R-Cell

s/s	Case	Task	End Point	Closed	Comment	Page#	Team
R-Cell Equipment	6	5	Isolate ventilation from environment		2A-95-00338	765	Field Work Team

Note 10 Filters surveyed and left in place.

Railroad Tunnel

s/s	Case	Task	End Point	Closed	Comment	Page#	Team
Railroad Storage Tunnel #1 & #2	6	5	Isolate/remove stack (296-A-9 & 296-A-10)		2A-95-00423 2A-97-00002	968	Field Work Team
Railroad Storage Tunnel #1 & #2	6	5	Remove HEPA filters and isolate		2A-95-00423 2A-97-00002 See Note 10	968	Field Work Team
Railroad Storage Tunnel #1 & #2	6	5	Isolate Number one and two fans		2A-95-00423 2A-97-00002	968	Field Work Team
Railroad Tunnel (Between Vertical	2	5	Isolate/seal doors and other access points		2A-95-00424 2A-95-00484 RRTN.82 RRTN.87 RRTN.88 RRTN.8E	980	Field Work Team

Note 10 Filters surveyed and left in place.

Sample Gallery

s/s	Case	Task	End Point	Closed	Comment	Page#	Team
Sample Gallery	2	5	Isolate/seal access points		2A-95-00431	776	Field Work Team
Sample Gallery Hood HVAC	6	5	Blank East and West end ducts		2A-95-00426 2A-95-00428	786	Field Work Team
Sample Gallery Hood HVAC Station	6	3	Remove/fix source material to mitigate contamination migration using the Reasonable Best Effort methodology		2A-96-00128	789	Field Work Team
Sample Gallery Hood HVAC Station	6	5	Isolate stacks (296-A-2 & 296-A-3)		2A-97-00001	980	Field Work Team
Sample Gallery Room Exhaust	6	2	Remove/shield source material to mitigate radiation exposure using the Reasonable Best effort methodology		2A-96-00128	810	Field Work Team
Sample Gallery Room Exhaust	6	3	Remove/fix source material to mitigate contamination using the Reasonable Best effort methodology		2A-96-00128	811	Field Work Team
Sample Gallery Room Exhaust	6	5	Isolate stacks (296-A-6 & 296-A-7)		2A-97-00001	812	Field Work Team

Storage Gallery

s/s	Case	Task	End Point	Closed	Comment	Page#	Team
Storage Gallery Systems	6	5	Isolate/blank ventilation duct to tunnel		2A-95-00479	850	Field Work Team

Ventilation Supply Rooms

s/s	Case	Task	End Point	Closed	Comment	Page#	Team
HVAC Air Supply	4	6	Define system calibration and preventive maintenance requirements		Samcons	874	Field Work Team
HVAC Air supply	4	7	Provide system spare parts inventory listing		Prefilter part number	874	Field Work Team
Process Blower Room	1	5	Isolate/plug floor drains		??	868	Field Work Team
Process Blower Room	1	5	Seal external doors and isolate potential pathways from the environment		Door Disposition list	868	Field Work Team
Service Blower Room	1	5	Isolate/plug floor drains		??	872	Field Work Team
Service Blower Room	1	5	Seal external doors and isolate potential pathways from the environment		Door Disposition list	868	Field Work Team

White Room

s/s	Case	Task	End Point	Closed	Comment	Page#	Team
White Room	6	5	Isolate existing room exhaust		2A-95-00430	894	Field Work Team
White Room HVAC	6	5	Isolate Stack (296-A-8)		2A-95-00430	894	Field Work Team
White Room HVAC	6	5	Remove HEPA Filters and isolate		2A-95-00430 See Note 10	894	Field Work Team

Note 10 Filters surveyed and left in place.

Appendix 2 - Door Disposition

PUREX PROPOSED DOOR DISPOSITION

- All door numbers are per drawing H-2-75734, figure 1 and 2.
- The Surveillance Path is clearly marked by paint on the floor and/or chain.
- The following signs or equivalent are to be placed on each door.

SIGNS/AIDS

Sign #1	Not an EXIT Do not Open
Sign #2	Air Lock Door Keep Door Closed for Ventilation Control Do Not Loiter in Flow Path
Sign #3	Ventilation Flow Path Do Not Obstruct Do Not Loiter in Flow Path
Sign #4	Exit

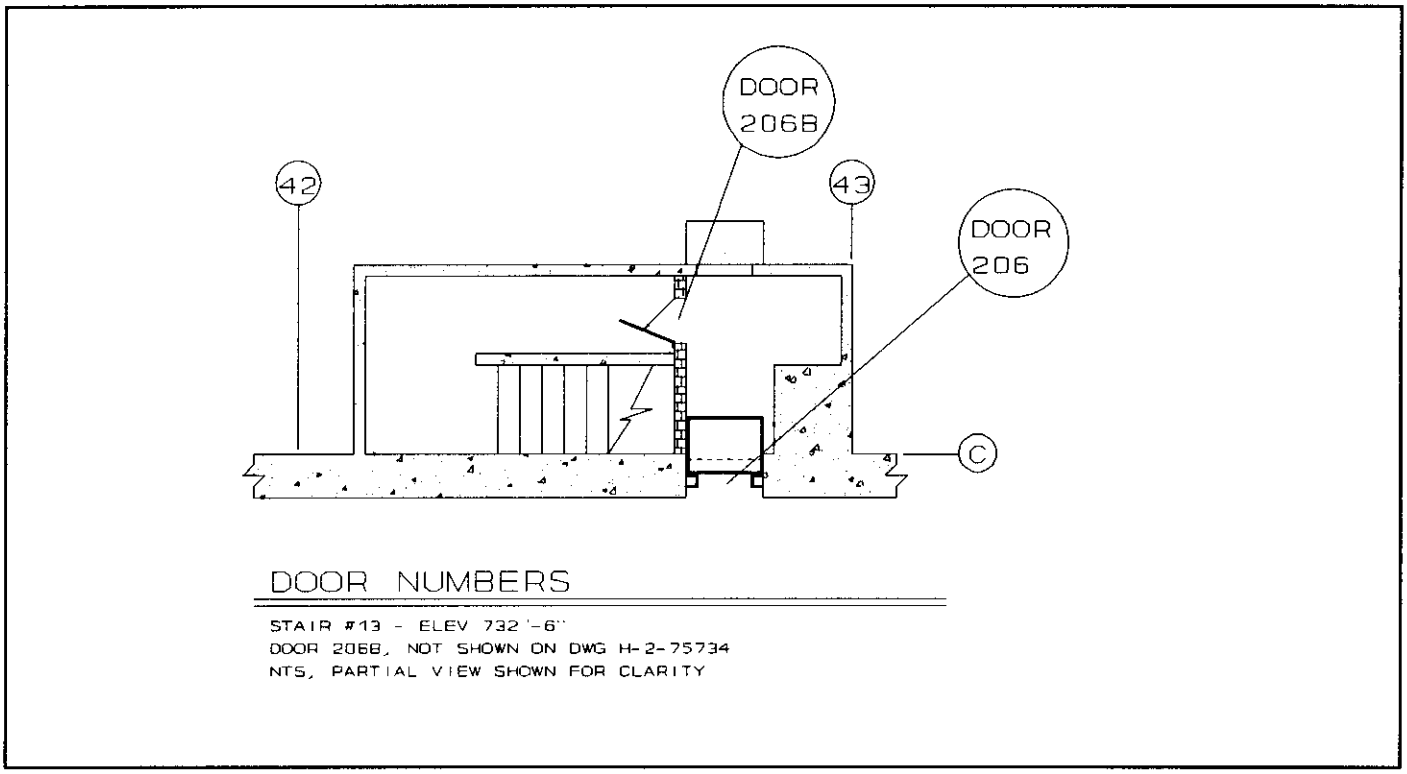

Figure 1, ADDITIONAL DOOR NUMBER, STAIRWELL AT COLUMN 42

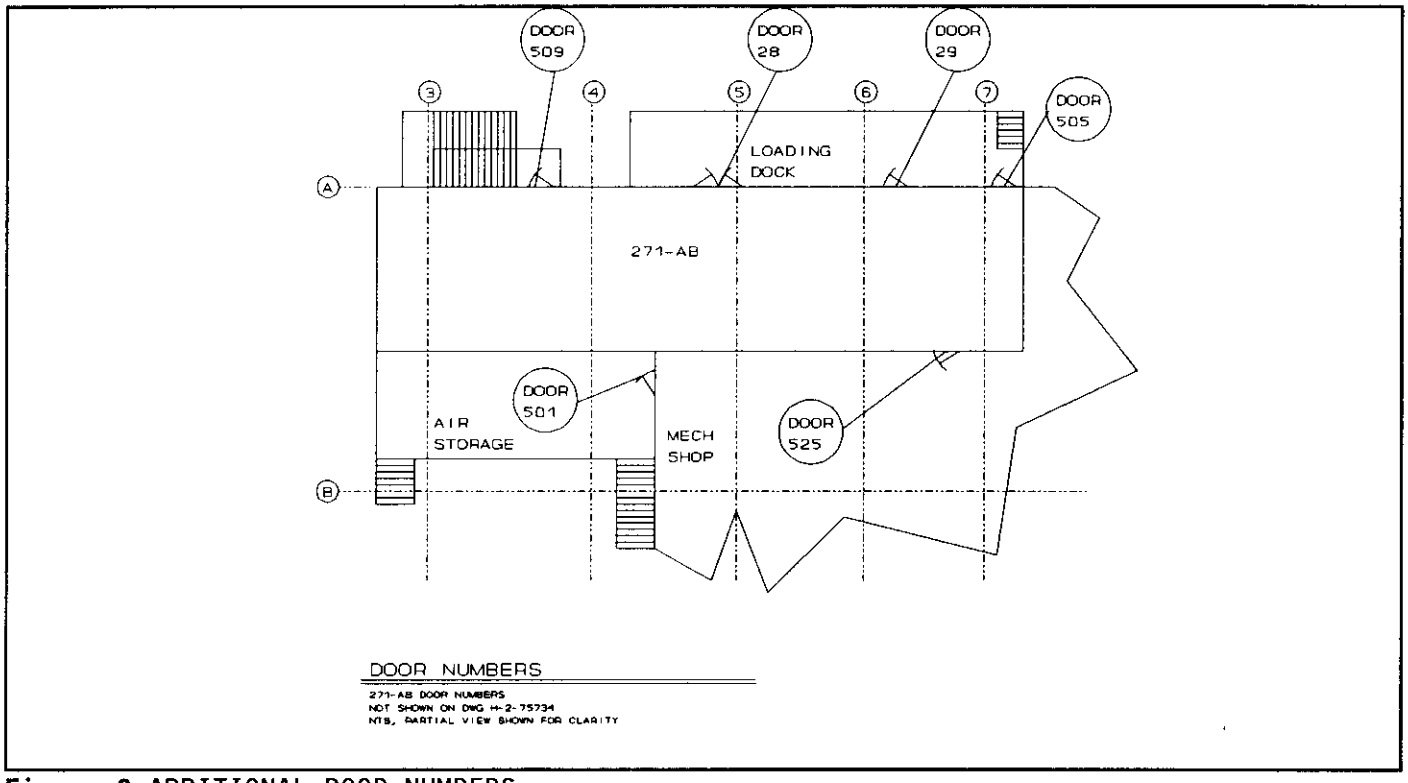

Figure 2 ADDITIONAL DOOR NUMBERS

HRW filename:doordis.lst

DOOR DISPOSITION, PUREX HVAC TEAM			
Door #	Action reqd.	Sign #	Comment
1	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
2	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
3	Sweeps and Seals	#2	Sealed for ventilation, Air Lock Door.
4	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
5	Seal with Aluminum Tape	#1	Door Sealed, Not and Exit
6	Secure door open or remove.	#3	Ventilation flow path
7	Flow Control Point	#3	Laminar flow
9	Flow Straightener	#3	Laminar flow
11	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open. (done)
12	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
13	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
14	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
15	Sweeps and Seals	#4 #2	Emergency Exit
16	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
18	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
19	Sweeps and Seals	#4 #2	Emergency Exit
20	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
21	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
22	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
24	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
26	Secure door open or remove.	#3	Ventilation flow path

HRW filename:doordis.lst

DOOR DISPOSITION, PUREX HVAC TEAM			
Door #	Action reqd.	Sign #	Comment
28	Seal with Aluminum Tape	#1	Door Sealed, Not and Exit
29	Seal with Aluminum Tape	#1	Door Sealed, Not and Exit
41	Sweeps and Seals	#2	Sealed for ventilation, Air Lock Door.
42	Sweeps and Seals	#2	Sealed for ventilation, Air Lock Door.
43	Seal with Aluminum Tape	#1	Door Sealed, Not and Exit
44	Sweeps and Seals	#4 #2	Emergency Exit
60	Seal with Aluminum Tape	#1	Door Sealed, Not and Exit
61	Seal with Aluminum Tape	#1	Door Sealed, Not and Exit
69	Sweeps and Seals	#4 #2	Emergency Exit
70	roll up door?????	#4 #2	Emergency Exit
72	Sweeps and Seals	#4 #2	Emergency Exit
75	Seal with Aluminum Tape	#1	Door Sealed, Not and Exit
76	Sweeps and Seals	#4 #2	Emergency Exit
77	Secure door open or remove.	#3	Ventilation flow path
83	Sweeps and Seals	#4 #2	Emergency Exit
84	Seal with Aluminum Tape	#1	Door Sealed, Not and Exit
102	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
108	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
125	Sweeps and Seals	#4 #2	Emergency Exit
126	Sweeps and Seals	#4 #2	Emergency Exit
130	Sweeps and Seals	#4 #2	Emergency Exit
131	Sweeps and Seals	#4 #2	Emergency Exit
137	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.

HRW filename:doordis.lst

DOOR DISPOSITION, PUREX HVAC TEAM			
Door #	Action reqd.	Sign #	Comment
145	Seal with Aluminum Tape	#1	Door Sealed, Not and Exit
148	Seal with Aluminum Tape	#1	Door Sealed, Not and Exit
149	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
150	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
158	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
160	Secure door open or remove.	#3	Ventilation flow path
161	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
162	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
163	Sweeps and Seals	#2	Sealed for ventilation, Air Lock Door.
164	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
173	Seal with Aluminum Tape	#1	Door Sealed, Not and Exit
174	Seal with Aluminum Tape	#1	Door Sealed, Not and Exit
175	Sweeps and Seals	#4 #2	Emergency Exit
200	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
201	Flow Straightener	#3	Laminar flow
202	Sweeps and Seals	#4 #2	Emergency Exit
203	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
204	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
205	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open. (optional)
206	Flow Straightener	#3	Laminar flow
206B	Flow Control Point	#3	Laminar flow

DOOR DISPOSITION, PUREX HVAC TEAM			
Door #	Action reqd.	Sign #	Comment
207	Seal with Aluminum Tape	#1	Door Sealed, Not and Exit
236	Sweeps and Seals	#2	Sealed for ventilation, Air Lock Door.
237	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
241	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
244	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
246	Sweeps and Seals	#2	Sealed for ventilation, Air Lock Door.
263	Sweeps and Seals	#4 #2	Emergency Exit
274	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
275	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
300	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
301	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
326	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
327	Flow Control Point	#3	Laminar flow
328	Sweeps and Seals	#4 #2	Emergency Exit
330	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
331	Sweeps and Seals	#4 #2	Emergency Exit
400	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
402	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
408	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
409	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
501	Sweeps and Seals	#4 #2	Emergency Exit
505	Seal with Aluminum Tape	#1	Door Sealed, Not and Exit

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DOOR DISPOSITION, PUREX HVAC TEAM			
Door #	Action reqd.	Sign #	Comment
509	Seal with Aluminum Tape	#1	Door Sealed, Not and Exit
525	Seal with Aluminum Tape	#1	Door Sealed, Not and Exit
B1	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
B2	Secure door open or remove.	#3	Ventilation flow path
B3	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
B4	Sweeps and Seals	#4 #2	Emergency Exit
B5	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
B6	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
B7	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
B8	Sweeps and Seals	#4 #2	Emergency Exit
B9	Secure door open or remove.	#3	Ventilation flow path
B11	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
B12	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open. (OPTIONAL)
B13	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
B14	Sweeps and Seals	#2	Sealed for ventilation, Air Lock Door.
B16	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
B18	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
B21	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
B28	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
B47	Secure door open or remove.	#3	Ventilation flow path

DOOR DISPOSITION, PUREX HVAC TEAM			
Door #	Action reqd.	Sign #	Comment
B48	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
B49	Secure door open or remove.	#3	Ventilation flow path
B50	Sweeps and Seals	#4 #2	Emergency Exit
B100	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
B101	Sweeps and Seals	#2	Sealed for ventilation, Air Lock Door.
B102	Flow Straightener/damper control	#3	Laminar flow
B104	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
B108	Secure door open or remove.	#3	Ventilation flow path
B109	Secure door open or remove.	#3	Ventilation flow path
B111	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
B112	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
B113	Sweeps and Seals	#4 #2	Emergency Exit
B114	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
B115	Sweeps and Seals	#4 #2	Emergency Exit
B119	Sweeps and Seals	#4 #2	Emergency Exit
B120	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
B124	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
B126	Secure door open or remove.	#3	Ventilation flow path
B127	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.
B128	Secure door open or remove.	#3	Ventilation flow path

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DOOR DISPOSITION, PUREX HVAC TEAM			
Door #	Action reqd.	Sign #	Comment
B129	Secure door open or remove.	#3	Ventilation flow path
B130	Secure door open or remove.	#3	Ventilation flow path
B133	Sweeps and Seals	#2	Sealed for ventilation, Air Lock Door.
B134	Sweeps and Seals	#2	Sealed for ventilation, Air Lock Door.
B135	Sweeps and Seals	#2	Sealed for ventilation, Air Lock Door.
B136	Secure door open or remove.	#3	Ventilation flow path
B137	Sweeps and Seals	#2	Sealed for ventilation, Air Lock Door.
B138	Secure door open or remove.	#3	Ventilation flow path
B139	Sweeps and Seals	#2	Sealed for ventilation, Air Lock Door.
B140	Sweeps and Seals	#2	Sealed for ventilation, Air Lock Door.
B144	Secure door open or remove.	#3	Ventilation flow path
B145	Secure door open or remove.	#3	Ventilation flow path
B146	Sweeps and Seals	#2	Sealed for ventilation, Air Lock Door.
B147	Sweeps and Seals	#2	Sealed for ventilation, Air Lock Door.
B148	Sweeps and Seals	#4 #2	Emergency Exit
B149	Sweeps and Seals	#2	Sealed for ventilation, Air Lock Door.
B150	Secure door open or remove.	#3	Ventilation flow path
B151	Seal with Aluminum Tape	#1	Sealed for ventilation, Not an Exit, Do Not Open.

SIGNS/AIDS

Sign #1 Not an Exit, Do not Open
Sign #2 Air Lock Door. Keep Door Closed for Ventilation Control
Do Not Loiter in Flow Path
Sign #3 Ventilation Flow Path,
Do Not Obstruct,
Do Not Loiter in Flow Path
Sign #4 Exit

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Appendix 3 - Task Index

HVAC Consolidation, ESR PO-1179, Task#/Work Package#/ECN# Report					
Task #	Title	Work Package #	ECN #	DWG #	EP Page#
673.21	SUPPLY DUCT MODIFICATION, 673' Level	2A-95-00342	600482 615370	H-2-52305 H-2-75821	-
673.23	PR FAN DEACTIVATION/DECONTAMINATION (OUTSIDE) (616865 SUPERSEDED)	2A-95-00478	624220	H-2-52324 H-2-65318 H-2-66017 H-2-68199 H-2-70110	713
673.24	STORAGE GALLERY MODIFICATION BLANK/SHUTDOWN EXHAUST FAN (600486 SUPERSEDED)	2A-95-00479	624059	H-2-52326 H-2-76953 H-2-76954	112 850 922
673.25	ISOLATE PR DUCTS ENTERING PLENUM 4 (616854 SUPERSEDED)	2A-95-00480	639411	H-2-76226 H-2-76223	922 713
673.26	FOAM PLENUM 4 (TASK DESCOPED)	ϕ	ϕ	ϕ	ϕ
673.27	BLANK N HOOD EXHAUST IN R CELL (TASK DESCOPED CANCEL ECN 616859)	ϕ	624046	H-2-65314	ϕ
673.28	FOAM PR DUCT TO FILTER BOX 1 & 2 AND LINE TO R (TASK DESCOPED ECN CANCELED) (616863)	2A-95-00481	639410	H-2-57924	ϕ
673.29	STABILIZE SAMPLE GALLERY FILTER BOX 1 & 2 (TASK DESCOPED)	ϕ	ϕ	ϕ	ϕ
673.2A	BLANK N ROOM EXHAUST/CLEAN-OUT (600498 and 624041 Superseded)	2A-95-00369 2A-95-00432	624045 629096	H-2-93210 H-2-65315	646
673.2B	ISOLATE N ROOM EXHAUST PORTS (ADD SMALL HEPA)	2A-95-00369	624045	H-2-93210 H-2-65315	646
673.2C	BLANK N SUPPLY (SAMPLE GALLERY)	2A-95-00363 2A-95-00367	624042	H-2-65314 H-2-65315	922 646

HVAC Consolidation, ESR PO-1179, Task#/Work Package#/ECN# Report					
Task #	Title	Work Package #	ECN #	DWG #	EP Page#
673.2D	BLANK Q EXHAUST DUCT TO PR (616857 Superceded)	2A-95-00340	624055	H-2-59556 H-2-59557	711 922
673.2E	BLANK Q AMU DUCT TO HOT CELL (616931 SUPERSEDED)	2A-95-00365	624223	H-2-59556 H-2-59557	-
673.2F	Q FILTER SYSTEM (SAME AS 673.2D)	2A-95-0341	616857	H-2-59556 H-2-59557	711
673.2G	BLANK PR SUPPLY (SAMPLE GALLERY)	2A-95-00364	616856	H-2-52314	-
673.2H	BLANK Q MAINTENANCE ROOM EXHAUST FILTER	2A-95-00354	616881	H-2-59556 H-2-59557	711
673.2K	HOT-SHOP LOBBY MODIFICATIONS (AIRLOCK #9) ECN 600494 & 624053 superseded by ECN 629089	2A-96-00007	629089	H-2-65253	-
673.2L	REMOVE THE ELBOW IN HOT-SHOP (drop Elbow) (616853 SUPERSEDED)	2A-95-00363	629094	H-2-52306	922 646
673.2N	BLANK Q-CELL SUPPLY (SAMPLE GALLERY)(616862 Superseded)	2A-95-00355	624043	H-2-59556	922
673.2P	Q-CELL AMU CRACK REPAIR (J3, NO ECN REQD)		ϕ	ϕ	-
673.2R	M-CELL COVER BLOCK INSTALL AND SEAL (ON HOLD)	ϕ	ϕ	ϕ	ϕ
673.2S	Q-CELL HOT CELL DOOR SEAL (J3, NO ECN REQD.)		ϕ	ϕ	-
673.2T	CANYON LOBBY EXHAUST BLANK (616915 SUPERSEDED)	2A-95-00420 2A-96-00135	639401 624221	H-2-52328	922
673.2U	Q-CELL MAINTENANCE HOOD AND LOAD-OUT HOOD SEAL (TASK MOVED TO WESTRA'S Q-CELL SCHEDULE)	ϕ	ϕ	ϕ	ϕ

HVAC Consolidation, ESR PO-1179, Task#/Work Package#/ECN# Report					
Task #	Title	Work Package #	ECN #	DWG #	EP Page#
700.31	SUPPLY DUCT ANALYSIS/MODIFICATION	2A-95-00421	615373 615372	H-2-74235 H-2-52315	-
700.32	COLUMN 1: COLUMN 42 STAIRWELL MODIFICATIONS (624208 SUPERSEDED) (624209 SUPERSEDED)	2A-96-00008	162169 162168	H-2-57572 H-2-52211	922
700.34	ISOLATE SAMPLE GALLERY (J3 No ECN Reqd)	2A-95-00431	619498	H-2-75734	387 425 776 922
700.36	FIX SAMPLE GALLERY HOOD EXHAUST DUCT (624218 SUPERSEDED)	2A-96-00128	624049 639402	H-2-52313	711 713 720 789 810 811
712.41	SUPPLY DUCT MODIFICATION/ANALYSIS	2A-95-00422	615374 615375	H-2-52331 H-2-52333 H-2-75821	-
712.43	WHITE ROOM FLOW DIVERSION (624054 SUPERSEDED)	2A-96-00005	162170	H-2-52328	922
712.45	ECMP FLOW REGULATION	2A-95-00482 2A-96-00063	616929 629091	H-2-57099 H-2-57115 H-2-57116 H-2-76246 H-2-76248	922
712.47	ECMP ZONE ISOLATION (no action required, door to be left in place 1-29-96) SAFETY ISSUE	ϕ	ϕ	ϕ	ϕ
RCELL.51	SEAL COVER BLOCKS, R-Cell (J3, NO ECN REQD)	2A-95-00339	ϕ	ϕ	-

HVAC Consolidation, ESR PO-1179, Task#/Work Package#/ECN# Report					
Task #	Title	Work Package #	ECN #	DWG #	EP Page#
RCELL.53	SEAL OFF R-CELL VENTILATION SUPPLY	2A-95-00338	600489 624039 629095	H-2-52324 H-2-74236	112 765 922
RCELL.55	REMOVE R CELL INTERNAL HVAC FILTERS	2A-95-00337	616851 624040	H-2-64906 H-2-74236	-
UCELL.62	SEAL COVER BLOCKS, U-CELL (J3, NO ECN REQD)	2A-95-00419	ϕ	ϕ	-
UCELL.64	SEAL OFF U-CELL VENTILATION SUPPLY	2A-95-00336	600491 624037	H-2-3937 H-2-74236	112 922 923
UCELL.65	REMOVE U-CELL INTERNAL HVAC FILTERS	2A-95-00335	600483 624038	H-2-96902 H-2-74236	-
UCELL.67	FRACTIONATOR VENTILATION	2A-95-00483	616930	H-2-64908 H-2-76247 H-2-64905	-
HTFF.72	PROVIDE SHUTDOWN AIR/PREHEAT ELECTRICAL CASE (TASK DESCOPED)	ϕ	ϕ	ϕ	ϕ
HTFF.74	ENGINEERING SUPT DEACTIVATION #1, Design Effort	2A-96-00006	624050	H-2-55040 H-2-53469	943
HTFF.76	ENGINEERING SUPT CONVERT #3 FILTER, Design Effort	ϕ	ϕ	ϕ	ϕ
RRTN.81	BURIAL TUNNEL SHIELD DOORS #1 (NO ECN REQD.)	ϕ	ϕ	ϕ	ϕ
RRTN.82	BURIAL TUNNEL SHIELD DOOR #2 (J3, NO ECN REQD.)		ϕ	ϕ	980

HVAC Consolidation, ESR PO-1179, Task#/Work Package#/ECN# Report					
Task #	Title	Work Package #	ECN #	DWG #	EP Page#
RRTN.83	TUNNEL #1 EXHAUST BLANK ECN 616914 and ECN 624044 is changed by ECN 626902	2A-95-00423	626902	H-2-58134	968
RRTN.84	TUNNEL #2 EXHAUST BLANK	2A-97-00002	639416	H-2-58134 H-2-94433	968
RRTN.85	INSTALL PLUGS IN TUNNEL ENTRY DRAINS	2A-95-00424	619452	H-2-53371 H-2-66058 H-2-58206	980
RRTN.87	SEAL RAILROAD TUNNEL BACK-DRAFT DAMPERS	2A-95-00484	619496	H-2-76953	980
RRTN.88	SEAL RAILROAD OUTSIDE TUNNEL DOORS (J3, NO ECN REQD.)		ϕ	ϕ	980
RRTN.8D	OVERHEAD RR DOOR INSPECTION (NO ECN REQD)	ϕ	ϕ	ϕ	ϕ
RRTN.8E	OVERHEAD RAILROAD DOOR MODIFICATION (J3 NO ECN REQD)		619499	ϕ	922 980
MISC.91	INSPECT 202A ROOF (NO ECN REQD)	ϕ	ϕ	ϕ	ϕ
MISC.93	AIR IN-LEAKAGE TO 202A/INCLUDE VACUUM BREAKER (624210 SUPERSEDED)	2A-95-00485	616891 622801	H-2-57572	112 425
MISC.97	202A OUTSIDE DOORS/OPENINGS/SECURE (FCO-J3 Door Disposition List)	FCO 2A-97-06			112 387 425
MISC.99	ALTERATION/BLANK EXTRANEOUS SUPPLY DUCTS (616932 SUPERSEDED)	2A-96-00044	639417 639413	H-2-52337 H-2-52338 H-2-52340 H-2-52368 H-2-52339	711 765 922

HVAC Consolidation, ESR PO-1179, Task#/Work Package#/ECN# Report					
Task #	Title	Work Package #	ECN #	DWG #	EP Page#
MISC.9A	DUCT HOLE CUTTING (&FB1;FB2)(PR DUCT SAMPLE GAL) (TASK DESCOPED)	ϕ	ϕ	ϕ	ϕ
MISC.9C	SIGNS & CHAINS AROUND FILTERS (NO ECN REQD)	ϕ	ϕ	ϕ	ϕ
MISC.9E	MODIFICATION OF SUPPLY AIR HANDLING UNITS	2A-96-00121	624225	H-2-52338 H-2-52339 H-2-52396 H-2-52398	765
MISC.9G	CAP MISC. STACKS	2A-97-00001	639415	H-2-62931 H-2-52365	112 574 812 980
DOC.S1	BUILDING/AIR SWITCH-OVER (WORK PLAN)	ϕ	ϕ	ϕ	ϕ
DOC.S5	IEFD UPDATE	ϕ	ϕ	H-2-825908	-
ELE/ELW .A21	LABORATORY HOOD EXHAUST SYSTEM (ELE/ELW) (616885 SUPERSEDED)	2A-95-00425	639409	H-2-52357 H-2-52394 H-2-58273 H-2-92440	112 574
EGE.A23	EAST SAMPLE GALLERY ROOM EXHAUST (EGE) (616888 SUPERSEDED)	2A-95-00426	639407	H-2-64905 H-2-93293	112 786
EGW.A25	WEST SAMPLE GALLERY ROOM EXHAUST (EGW) (616893 SUPERSEDED)	2A-95-00428	624049	H-2-52328 H-2-76245 H-2-76247 H-2-64906 H-2-76660	112

HVAC Consolidation, ESR PO-1179, Task#/Work Package#/ECN# Report					
Task #	Title	Work Package #	ECN #	DWG #	EP Page#
EHE.A27	EAST SAMPLE GALLERY HOOD EXHAUST (EHE) (624051 CANCELED) (616884 SUPERSEDED)	2A-95-00427	639408	H-2-96848 H-2-52317 H-2-92510 H-2-52326	112
EHW.A28	WEST SAMPLE GALLERY HOOD EXHAUST (EHW) (624052 CANCELED) (616886 SUPERSEDED)	2A-95-00429	639412	H-2-96849 H-2-52313 H-2-92510 H-2-52328	112
EW.A29	WHITE ROOM EFFLUENT (EW)	2A-95-00430	616879	H-2-75933 H-2-75926 H-2-98915	112 894