Addendum No.1

See Annotations made to the following pages that show current state of utility isolation and deactivation and which are to be used per guidance included within the RFP Statement of Work i.e., the documents describe the scope of work and present an acceptable approach, but the Subcontractor must develop and submit for LBNL approval the appropriate work plans/packages.

Lawrence Berkeley National Laboratory

Mechanical Deactivation Plan
Building 5

Approved by:

Facilities Utilities Manager: Michael Dong

Date: 4/2/2014
4.2.14

In Agreement by:

EHSS Team Lead: Steven Enright (D&D Coordinator)

Date: 3-25-14

EHSS Construction Safety Manager: Dan Thomas

Date: 3-28-14

Facilities Maintenance Manager: Mike Jang

Date: 3/28/14

Construction Manager: Doug Brunkow

Date: 3/25/14

Project Manager: Ted Mankowski

Date: 3/24/2014

Project Director: Joseph Harkins

Date: 3/25/14

Date: March 21, 2014

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Acronym List

ACRONYM	MEANING
AG	Above Grade
CA	Compressed Air
C&C	Cut and cap/cut and plug
CD	Condensate Drain
CI	Cast Iron
CIMJ	Cast Iron, Mechanical Joint
CM	Construction Manager
CU	Copper
CW	Cold Water
BFP	Back Flow Preventer
D&D	Deactivation and Demolition
DCW	Domestic City Water
ECMS	Energy Control Management System
EDP	Electrical Deactivation Plan
EHS	Environmental, Health, and Safety
EPB	Electron Photon Beam
ES&H	Environmental, Safety and Health
FDC	Fire Department Connection
FSP	Fire Sprinkler Piping
FSR	Fire Sprinkler Riser or Fire System Riser
FTDR	Foundation Weep Drain
FUM	Facilities Utility Manager
FW	Fire Water
GAC	Groundwater Activated Charcoal
GW	Ground Water
GWT	Ground Water Treatment
HDPE	High Density Polyethylene
HPCW	High Pressure Domestic Cold Water
HPNG	High Pressure Natural Gas
HW	Hot Water or Heating Water
ID	Industrial Waste Drain
IRR	Landscape Irrigation Water
LBNL	Lawrence Berkeley National Laboratory
LCW	Low Conductivity Water
LPCW	Low Pressure Domestic Cold Water
LOTO	Lockout & Tag Out
LPNG	Low Pressure Natural Gas
MDP	Mechanical Deactivation Plan
MG	Motor Generator
MH	Man Hole
NG	Natural Gas
O.S.	Outside

ACRONYM	MEANING
OXY	Oxygen Gas
PM	Project Manager
PMT	Plant Maintenance Technician
POD	Plan of the Day
RLDR	Rain Leader Drain
RWL	Rain Water Leader
SS	Sanitary Sewer
SD	Storm Drain
TCRLD	Terra Cotta Pipe Rain Leader Drain
TC WEEP	Terra Cotta Pipe Weep Foundation Drain
TR	Treated Water
TW	Tower Water
UG	Under Ground
EMCS	Energy Management Control System
FMCS	Facilities Management Control System

Acronym List - Continued

Revision Log

#	Description	Affected pages	Date

1.0 Introduction and Purpose

Building 5 (B5) will be mechanically isolated and deactivated by air-gapping at identified isolation points, in advance, to facilitate coring of interior concrete slabs for soil testing and characterization. In addition, temporary power has been brought in from B14 to provide lighting and to keep other critical systems operational such as the B5 Ground Water Treatment system (GWT), the B16 Fire Alarm Control Panel (FACP), etc. Most of the mechanical air-gapping will be performed above grade except for cases where pressurized utilities enter below grade. After the demolition contract has been awarded, the demolition subcontractor will be responsible for verifying that air-gapping of all mechanical systems has been completed and that they are at zero energy state. The subcontractor will then be responsible for cutting and capping any remaining piping below grade and for removing any other underground piping that may interfere with foundation removal and where otherwise shown on the plans. Depending on circumstances, some of the air-gapping may be self-performed by LBNL workers. To that end, LBNL-approved Lock-Out procedures may be used in lieu of LOTO permits where work will be "self-performed" by LBNL. Note that to facilitate any *mechanical* air-gapping of "fixed equipment", the interior *electrical* air-gapping of said equipment has already been completed.

The purpose of the Mechanical Deactivation Plan (MDP) is to describe the work processes and controls necessary to efficiently and safely execute isolation, deactivation, and where indicated removal of existing or abandoned mechanical utility services to B5 prior to building demolition. It also includes re-routing of limited utilities that are to remain active during or after deactivation where applicable.

Mechanical deactivation of building utilities will occur in two phases. The first deactivation phase involves air-gapping all mechanical utility services to the building except fire protection, storm drains, sanitary sewers, well monitoring, groundwater treatment equipment, and some foundation drains, which will remain in service as described above. The second phase will take place prior to building demolition, which will involve cutting and capping the remaining systems where shown in the drawings and removing piping where shown on the drawings, primarily to facilitate foundation removal and soil cleanup, if any. Well monitoring and groundwater treatment systems must remain active throughout the project (the groundwater treatment system north of B5 will be relocated during the course of the work.).

This MDP shall be used in conjunction with existing B5 Site Utility Maps and the Deactivation and Demolition (D&D) drawings to describe the work to be done and to avoid damaging any other existing or relocated utilities, including underground, that are to remain active.

It is the explicit intent of the current Old Town Demolition Program to avoid disturbing the existing soil to the maximum extent possible during the B5 and B16/16A utility deactivation, abatement and initial demolition phase. In addition, the current plan

NOTE: The identified items have been mechanically air gapped mostly above grade and are therefore Not In Contract (NIC). However, most locations still need to be cut and capped below grade to accommodate foundation removal.

envisions demolishing the B5 and B16/B16A superstructures and the existing concrete slabs and leaving the retaining structures on the uphill sides of the buildings in place. Any other sub-slab or underground work requiring excavation including possible soil cleanup will occur in a later phase after the sub-slab soils have been properly characterized. All excavation must be performed in accordance with the contract documents and coordinated with LBNL Environmental Health and Safety (EHS) and Radiation Protection Group (RPG) in advance.

2.0 Mechanical Deactivation Plan (MDP) Scope

The scope for D&D of mechanical utilities for B5 is as follows:

2.1 The following mechanical utilities will be isolated to the extent described in this MDP during the deactivation period. Unless noted otherwise, demolition of said utilities are most likely to occur after deactivation, during execution of the subsequent demolition contract. All other mechanical utilities will remain active until building demolition:

2.1.1 Sanitary Sewer (SS)
NIC → 2.1.2 Low Pressure City Water (LPCW)
2.1.3 Abandoned Water Lines and other Abandoned Conduits and Pipes
NIC → 2.1.4 Low Pressure and High Pressure Natural Gas (LPNG and HPNG)
NIC → 2.1.5 Compressed Air (CA)
2.1.6 Low Conductivity Water (LCW)
2.1.7 Industrial Waste Drain (ID)
NIC → 2.1.8 HVAC Equipment piping and refrigerant. Contractor shall confirm that LBNL has removed all refrigerants prior to deactivation and/or demolition.
2.1.9 Vacuum Pumps

2.2 The following mechanical utilities will remain active during building deactivation until directed to be isolated and removed by LBNL the Facilities Utilities Manager (FUM) prior to building demolition:

2.2.1 Storm Drain (SD)
2.2.2 Fire Water (FW)
2.2.3 Ground Water Treatment (GWT)

2.3 The following mechanical utilities will remain in service during both building deactivation and demolition periods:

2.3.1 Monitoring wells
2.3.2 Ground Water Treatment, including pumps and treatment systems
2.3.3 Existing Foundation Weep Drains (FTDR) shall remain intact unless directed otherwise

2.4 The following building mechanical piping systems connected to utilities and traversing under the building interior floor slab will be plugged at the slab during building deactivation periods:

2.4.1 Sanitary Sewer (SS), including floor drains and floor cleanouts.

3.0 Specific Safety Controls

3.1 Work shall be done in accordance with the LBNL Health and Safety Manual, Pub-3000, and Project Specifications shown in Appendix C, plus relevant sections of current governing codes such as Title 24, California Building Code, California Plumbing Code, and California Fire Code, and the National Fire Protection Association (NFPA).

3.2 LBNL policy is to prevent the unintended or unexpected startup or release of hazardous energy during D&D activities. No service, modification, deactivation, or demolition of any utility that may involve an energy hazard shall be performed until it has been de-energized, locked, tagged, and verified to be in a zero energy state in accordance with LBNL PUB-3000, Chapter 18, "LOCKOUT/TAGOUT and VERIFICATION" procedures. All D&D work shall follow Lock Out and Tag Out (LOTO) procedures described in LBNL PUB-3000 and shall be incorporated in the Contractor's approved safety plan.

3.3 LOTO procedures must be performed by each person who works on any energized utility. The following is a summary of the LOTO procedure to follow.

Note: The following summary is for information only and not a substitute for the procedures described in PUB-3000. The Contractor shall be responsible for reading and understanding the procedures in PUB-3000.

3.3.1 All energy sources to the equipment or system being worked on shall be shut off and secured.

3.3.2 All individuals designated as LOTO-Authorized Employee shall be properly trained in the LOTO process to standards equivalent to PUB-3000.

3.3.3 All locks and tags used for LOTO shall be approved for such use. All tags shall contain the LOTO-Authorized Employee owner's name, telephone number and the date the lock was put in place. The LOTO-Authorized Employee shall be responsible for maintaining control over their key.

3.3.4 Administrative locks or tags shall not be used for LOTO.

3.3.5 It is the Contractor's responsibility to determine the types of hazards and controls needed for the work activity being conducted.

3.3.6 LOTO activity sequence shall be as follows (this is a summary only, refer to LBNL PUB-3000 for complete description. Request LOTO permits through the Work Request System):

a. Request LOTO permit in Work Request System.
b. Notify affected personnel of utility outage.
c. Verify that the utility/equipment is safe to shut down.
d. Perform a normal system/equipment shut down.
e. Isolate energy sources.
f. Release any stored energy.
g. Test the LOTO breaker/valve to verify that the LOTO is effective.
h. Test the system/equipment to verify that it is de-energized.

3.3.7 Releasing a utility system or piece of equipment from LOTO shall be as follows (summary only, refer to LBNL PUB-3000 for complete description):

a. Verify that it is safe to re-energize the system/equipment.
b. Clear the area.
c. Remove isolating devices.
d. Replace any safety guards.
e. Notify facility personnel system will be turned on.
f. Remove LOTO devices from the system/equipment.
g. Verify that the system/equipment is operational.

3.4 No work is authorized on ENERGIZED pipe lines.

3.5 The Ground Water Treatment (GWT) systems and monitoring wells in and around B5 and B52 must remain in operation, and are to be protected from all utility rerouting deactivation and demolition activities. The Ground Water Treatment at B5 including, but not limited to, the control panel, pumps, charcoal canisters, tanks, and berm, shall be relocated prior to demolition of the concrete slabs and loading dock. The GWT system is currently being operated on Temp power.

3.6 All utility lines shall be placed in a safe state with the valves in the closed, locked position and the lines depressurized following LBNL LOTO procedures.

Note: LBNL utility personnel shall operate all upstream main line valves.

3.7 Prior to demolition, sawcut around each floor drain and floor cleanout, within the building, block with foam and fill with 6 inches depth of concrete. Sawcutting will prevent pipe breakage during slab demo. Sanitary Sewer piping connected to floor drains shall be filled up to the top of slab. See special procedures in LBNL specifications for sub slab pipe removals. Floor drains and sanitary sewers are contaminated. See Section 6.0 for Rad Advisories.

3.8 All liquid LCW or condensate drained from any contaminated utility line shall be captured in an approved container and disposed of as instructed by the Environmental, Health, and Safety (EHS) Technician.

3.9 Any isolated utility line or component containing a combustible gas or liquid shall be purged with nitrogen before any work is performed on that line.

3.10 If any hazardous material abatement is performed after utility deactivation, the fire water sprinkler system shall remain active until the abatement process has been completed. Once completed, the fire water sprinkler system shall then be isolated and deactivated last. Fire Marshal must be notified **two weeks** prior to deactivating any and all fire protection systems. Refer to B5 EDP for deactivation procedures of fire alarm systems, including smoke alarms, fire alarm control panels (FACP), strobes, outside alarm bells, and horns.

4.0 Notification Procedure

4.1 The Contractor shall give two weeks prior notice to the LBNL PM, the FUM, and all other parties involved in the building D&D. The notice will include the date and time when the work will begin.

4.2 The removal of any mechanical utility lines from B5 shall be coordinated with the following organizations as necessary:

4.2.1 Facilities PMTs for all mechanical utilities.

4.2.2 LBNL Fire Department for fire water systems.

5.0 General Notes

5.1 This MDP provides a "snap-shot" in time of the current mechanical utility systems in B5 facility. The MDP will not be maintained for configuration control or change order management. It is therefore vital that all utility routes and lines be identified prior to performing any work and any discrepancies immediately made known to the LBNL FUM. Underground Oil (UO) Lines (MAY) exist.

5.2 After each phase of deactivation, the Contractor shall provide the LBNL PM with utility "As Built" documentation such as updated area utility drawings and building site plans showing which utilities were deactivated, the portion of piping removed with from/to locations, and cut & cap locations in the active portion of piping. The documents shall be submitted to the LBNL PM at the end of deactivation, of each building.

5.3 As each step is completed on the deactivation, plan, the responsible worker who completed that section of the plan shall date and sign the attached checklist in Appendix A to confirm that each section has been completed.

NOTE: The numbers in superscript indicate where the D&D contractor is to confirm on the sign-off sheet in Appendix A that the appropriate action to complete the step has been successfully executed

5.4 The photographs in this plan are to be used with the Mechanical Deactivation and Demolition Site Plans for locating utilities and mechanical systems to be deactivated and their isolation points.

5.5 All utility lines called out to be cut and capped shall be isolated below grade within 5 feet of the building foundation perimeter or as indicated on the photos and/or plans using the appropriate material.

5.6 Remaining aboveground mechanical piping systems such as natural gas and LCW will be blind-flanged or cut, threaded and capped. Terminations near grade or top of slab shall be approximately **6 inches above grade** or slab. ALL EXPOSED/CAPPED CONDUITS SHALL BE DRILLED/TAGGED WITH PHENOLIC LABEL TO ID THE FORMER USE OF THE CONDUIT.

5.7 Under no circumstances shall existing utilities be shut down without prior approval of the LBNL PM. Submit the request for this approval to the LBNL PM in accordance with Project Specification 01010, "General Requirements" and state the maximum duration of shutdown. Shutdown of LCW requires special coordination to avoid disruptions at B7 - the Advanced Light Source (ALS).

5.8 Contractor shall submit a Deactivation Sequencing Plan. Schedule all outages for utility tie-in work well in advance by first securing University approval of the outage schedule, and then give written notice to the LBNL PM at least 14 days in advance of the scheduled outage. LBNL's approved method of procedure (MOP) may serve as the Deactivation Sequencing Plan.

5.9 Piping described herein and shown on the design drawings are schematic and shall be cut and capped (C&C) and subsequently demolished based on actual field measurements.

5.10 Leaks, gaps and breaks found in piping systems shall be recorded on the As-Built plans.

5.11 At the project's completion, the Contractor shall turn over all: "As Built" documentation; LOTO list; confirmation that the lock/s have been removed; and completed Check Lists to the LBNL PM.

5.12 For detailed information on the electrical and mechanical utilities in and around B5 consult the drawings listed in Appendix C.

6.0 Sanitary Sewer (SS) Isolation and Demolition

6.1 Locate all floor and sanitary drains (toilets, urinals, sinks, floor cleanouts, and shower drains) inside B5 and plug. See Drawing P1.2.

NOTE: Utility Deactivation and Demolition Subcontractors shall assume the presence of mercury and Rad contamination in P-traps, toilets, sinks, urinals, floor drains, sewer lines and process piping and shall coordinate any removal or breach with EHS 2 weeks in advance of work to allow time to review and approve removal procedures. Contractor will be required to possess or take Rad Worker RWI and RWII training prior to cutting and capping any sewer suspected to be radiologically contaminated. All work on the above systems falls under the authority of LBNL/RPG's Radiological Work Authorization (RWA). Absolutely no work shall be performed on the above systems until reviewed, approved, authorized and cleared by RPG.

6.2 Isolate outdoor SS lines and cleanouts below grade. It is critical that the plug for the SS lateral or main be confined to the immediate point of capping. Absolutely no slurry or grout shall be allowed to flow downhill to other sections of the SS. If any of the lines are to be fully filled with grout then the line must be video-taped full length to provide 100% assurance that there are no un-mapped or un-traced laterals or penetrations:

6.3 C&C below grade portion of SS pipe from 4" SS main to within 5 feet of building footing as shown in Photo 6.1:

6.3.1 C&C below grade portion of SS pipe from 4" SS to within 5 feet of building footing as shown in Photo 6.1

6.3.2 Notify LBNL FUM to inspect sealing of below grade piping (see contract documents for timing). Leave exposed until inspected by LBNL FUM[1].

6.3.3 After receiving authorization from LBNL FUM, backfill. In areas subject to ongoing traffic, compact backfill in trench and restore street surface to original condition per LBNL standard specification 333100, Sanitary Sewerage Utilities.

6.3.4 Properly dispose of any piping removed during air-gapping (and subsequent demolition). Follow LBNL underground pipe removal protocols included in the contract documents.

6.3.5 When work is completed, notify LBNL FUM for final inspection and acceptance.[2]

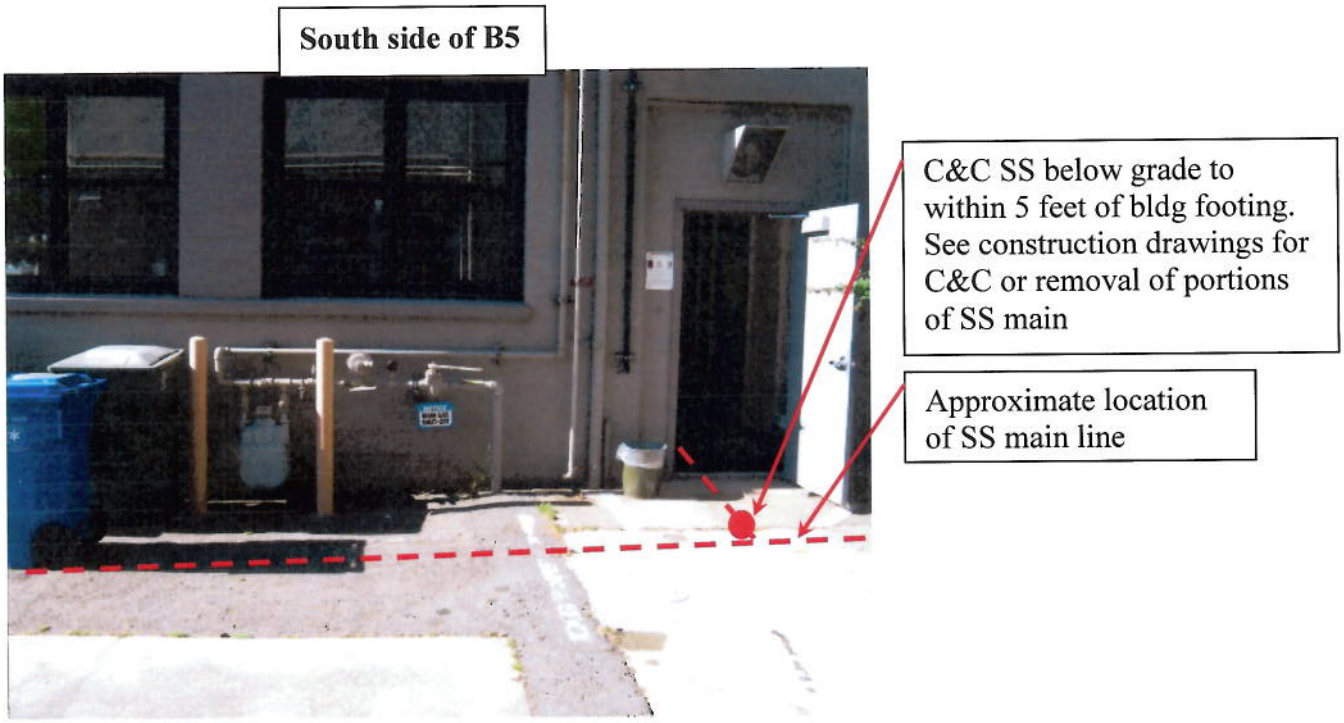


Photo 6.1: SS Isolation at South side of B5

6.4 Locate all floor and sanitary drains (toilets, urinals, sinks, floor drains, floor cleanouts, and shower drains) inside B5 and plug[3].

Isolate indoor SS floor fixtures below grade. Isolate SS of plumbing fixtures above grade at fixture connection to SS. It is critical that the concrete plug for the SS lateral or main be confined to the immediate point of capping. Absolutely no slurry or grout shall be allowed to flow downhill to other sections of the SS. If any of the lines are to be fully filled with grout then the line must be video-taped full length to provide 100% assurance that there are no un-mapped or un-traced laterals or penetrations. If leaks, gaps or breaks are found in any SS lines, then analysis of the P-trap waste for the affected line shall be conducted by LBNL prior to any work:

6.4.1 Fill the below grade SS piping with expansion foam and approximately 6" deep concrete plug up to top of slab, for the floor drains in room 105, shown in photo 6.2.

6.4.2 Fill the below grade SS piping with expansion foam and approximately 6" deep concrete plug up to top of slab for the floor drain in room 118, shown in photo 6.3, and for the floor drain in room 126.

6.4.3 In accordance with LBNL's EHS/IH/RPG protocols and in the presence of EHS oversight, place plastic sheeting and absorbent pads in work area prior to fixture removal. Remove and rotate each sink, urinal and toilet to thoroughly empty fluids (and potential mercury) from their P-Traps into containers and then bag each fixture. Label each container for disposal.

Fill the below grade SS piping with expansion foam and approximately 6" deep concrete plug up to top of slab and floor cleanout in room 122A, shown in photo 6.4.

6.4.4 Fill the SS piping at the sinks, urinals and toilets in Men's Restroom 118 and at the sinks and toilets in Women's Restroom 126 with expansion foam and approximately 6" deep concrete plug as shown in photo 6.3. Note that the cleanout for the Men's Room may be located under the metal floor covering in Room 116A. Fill this cleanout if discovered after removal of the floor plating.

6.4.5 Fill the mop sink SS piping in the Janitor's Closet 120 with expansion foam and approximately 6" deep concrete plug.

6.4.6 Fill the counter sink SS piping in the Room 105 with expansion foam and approximately 6" deep concrete plug.

6.4.7 Fill the counter sink SS piping in the Room 112 with expansion foam and approximately 6" deep concrete.

6.4.8 Notify LBNL FUM to inspect sealing of below grade piping[4].

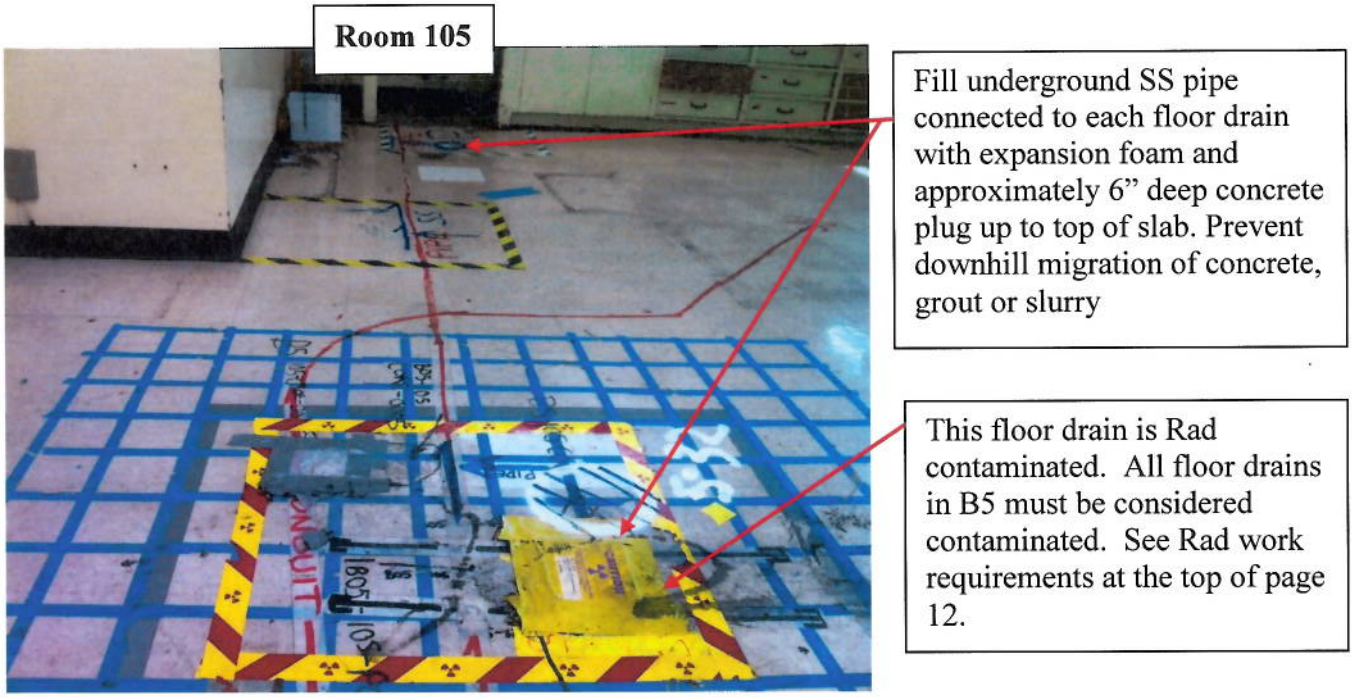


Photo 6.2: Floor drains in room 105

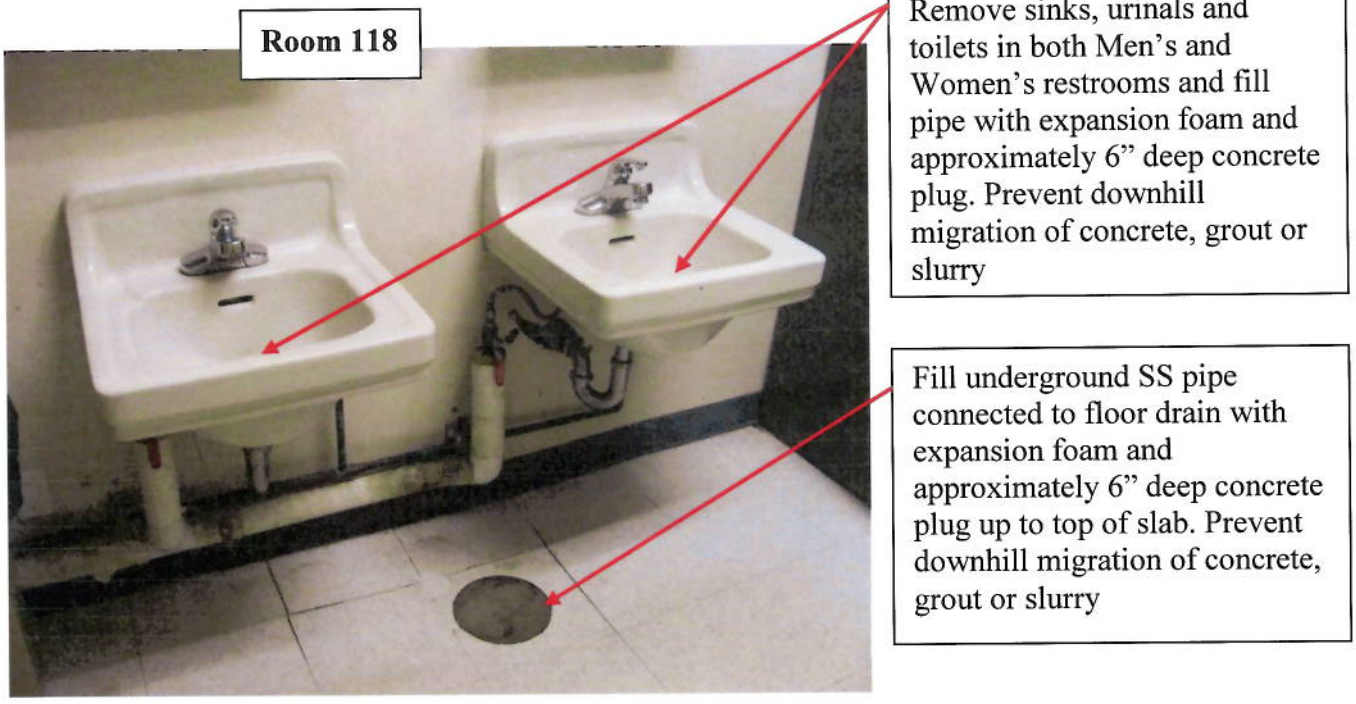


Photo 6.3: Floor cleanout in room 118

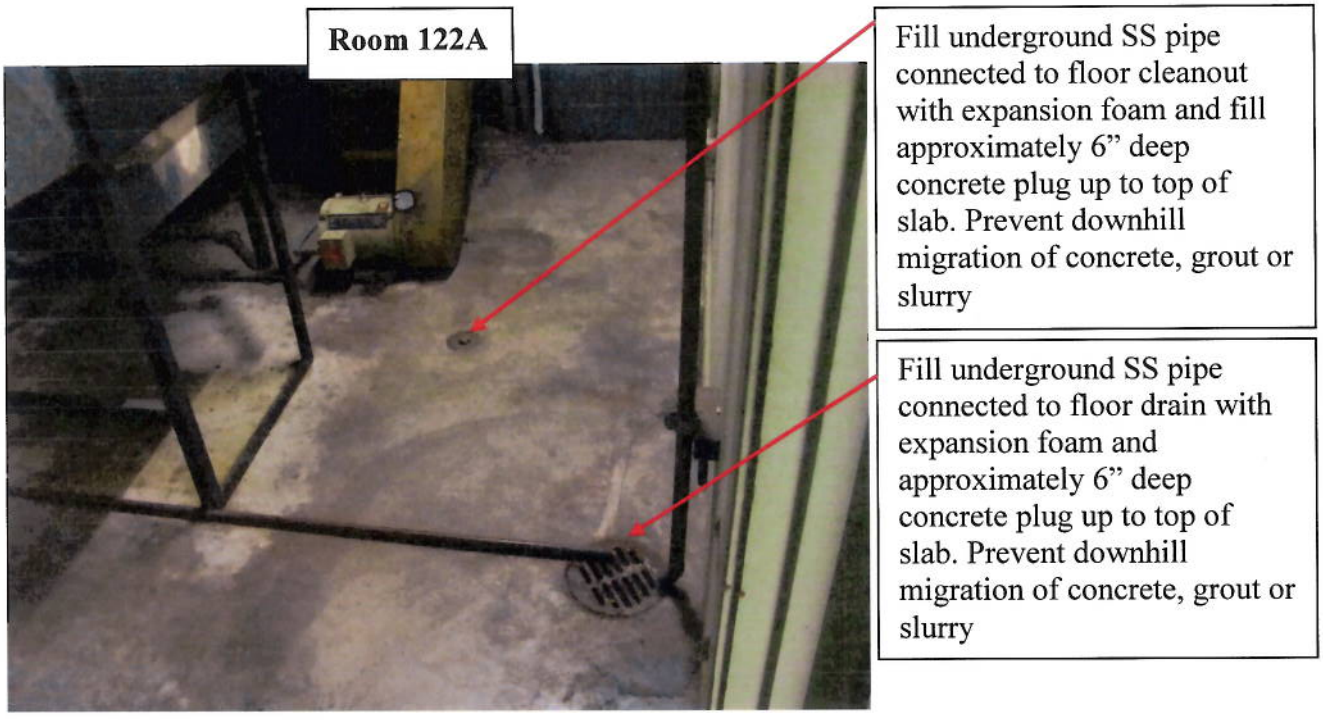


Photo 6.4: Floor drain in room 122A

6.5 C&C 1 foot of 3" SS pipe back from tee inlet above floor in room 150A, shown in photo 6.5

6.5.1 When work is completed, notify LBNL FUM for final inspection and acceptance.[5]

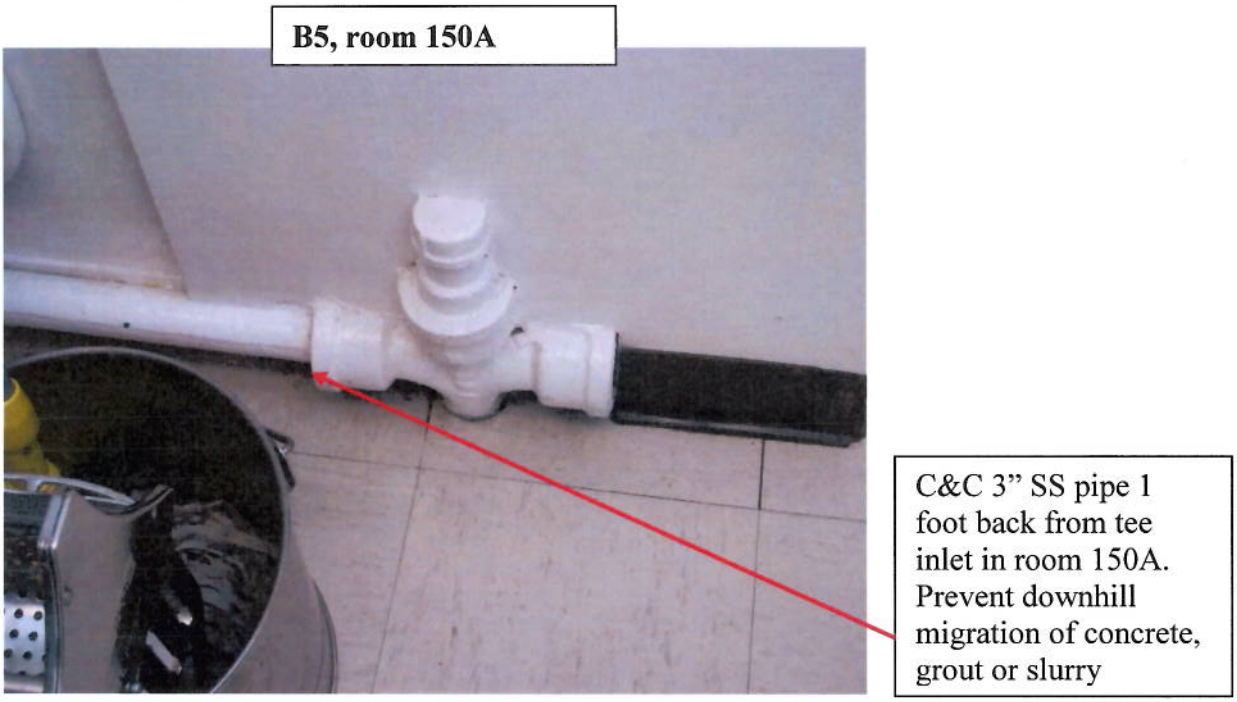


Photo 6.5: 3" SS in room 150A

6.6 C&C both 1/2" condensate drain (CD) pipes and enclosing 1-1/2" SS pipe from floor escutcheon to 1 foot above floor in Room 136, shown in photo 6.6. Plug SS at slab.

6.6.1 When work is completed, notify LBNL FUM for final inspection and acceptance.[6]

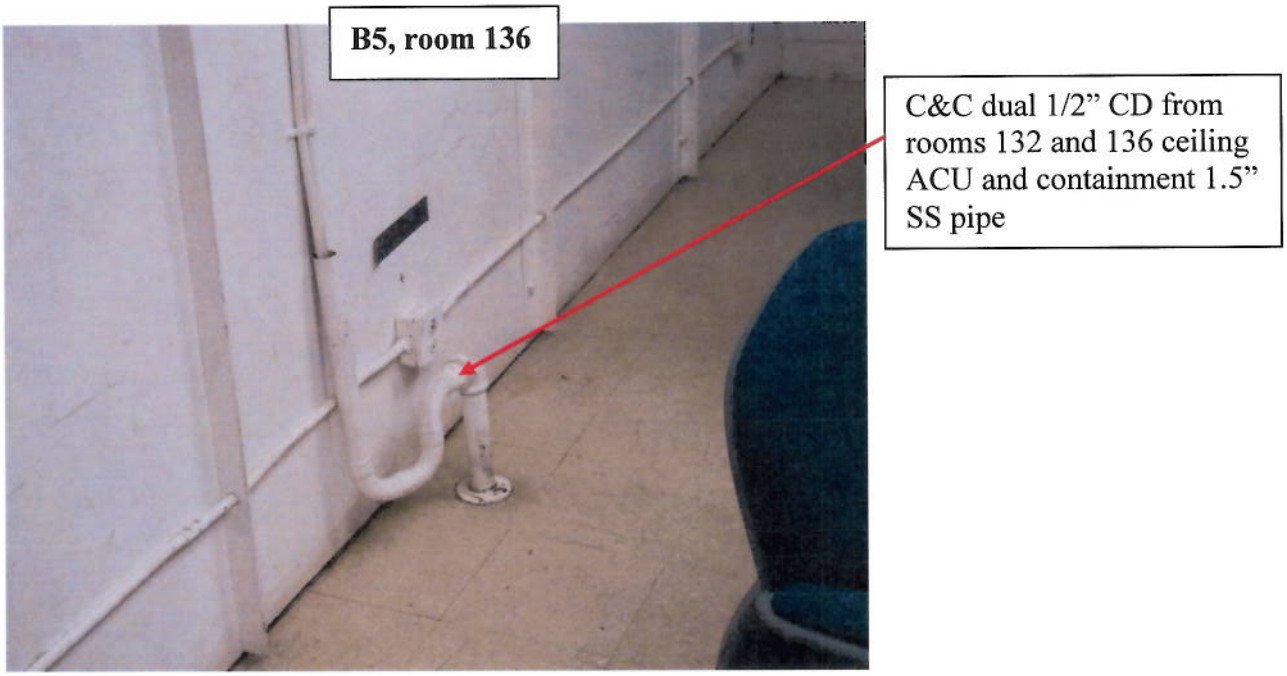


Photo 6.6: ACU CD to SS in room 136

7.0 Low Pressure City Water (LPCW) and High Pressure City Water (HPCW) Isolation and Demolition

The following describes the isolation and demolition of the Low Pressure City Water (LPCW) service from the buried isolation valve in valve box VM59 across from the West side of B5, see drawing sheet P1.1.

7.1 Isolate LPCW supply to B5:

7.1.1 Locate valve box VM59 and close valve in valve box using LBNL LOTO procedures described in section 3.0 of this Plan[7].

7.1.2 Verify all lines downstream of isolation valve VM59 have been de-energized before proceeding by opening all valves, faucets, and hose bibs inside and outside (hose bibs) of the building.

NOTE: If any energized LPCW lines are found in B5 after deactivation, stop work and contact the LBNL PM and FUM before proceeding

7.2 Cut and Cap LPCW line along southwest side of B5:

7.2.1 Air gap LPCW as shown in Photo 7.2. Subsequently prior to hard demolition, C&C line on discharge side of isolation valve VM59 from below grade to within 5 feet of building footing at South side of B5 as shown on Photo 7.2, to exterior of building wall pipe penetration, see drawing sheet P1.1.

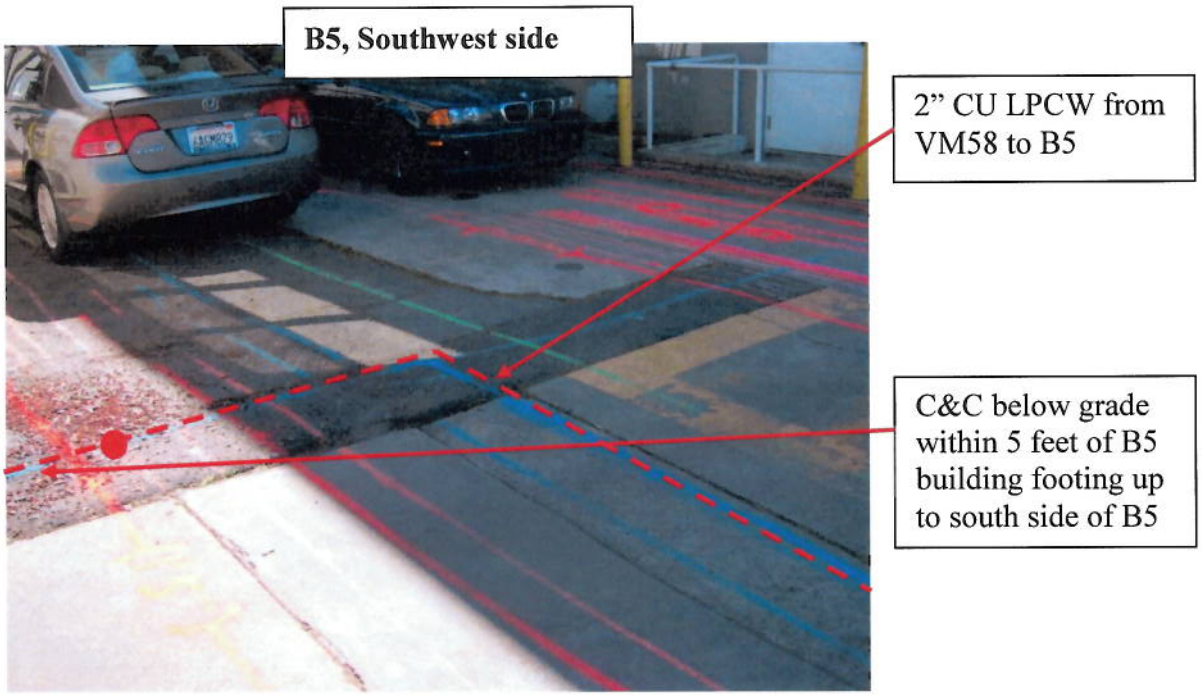


Photo 7.1: LPCW supply at South side of B5

Note: Soil in the vicinity of B5 is assumed to be contaminated. All excavation in the area of B5 shall be performed in accordance with the Soil Management Plan and must be pre-approved in advance by LBNL's EHS, ESG and RPG groups.

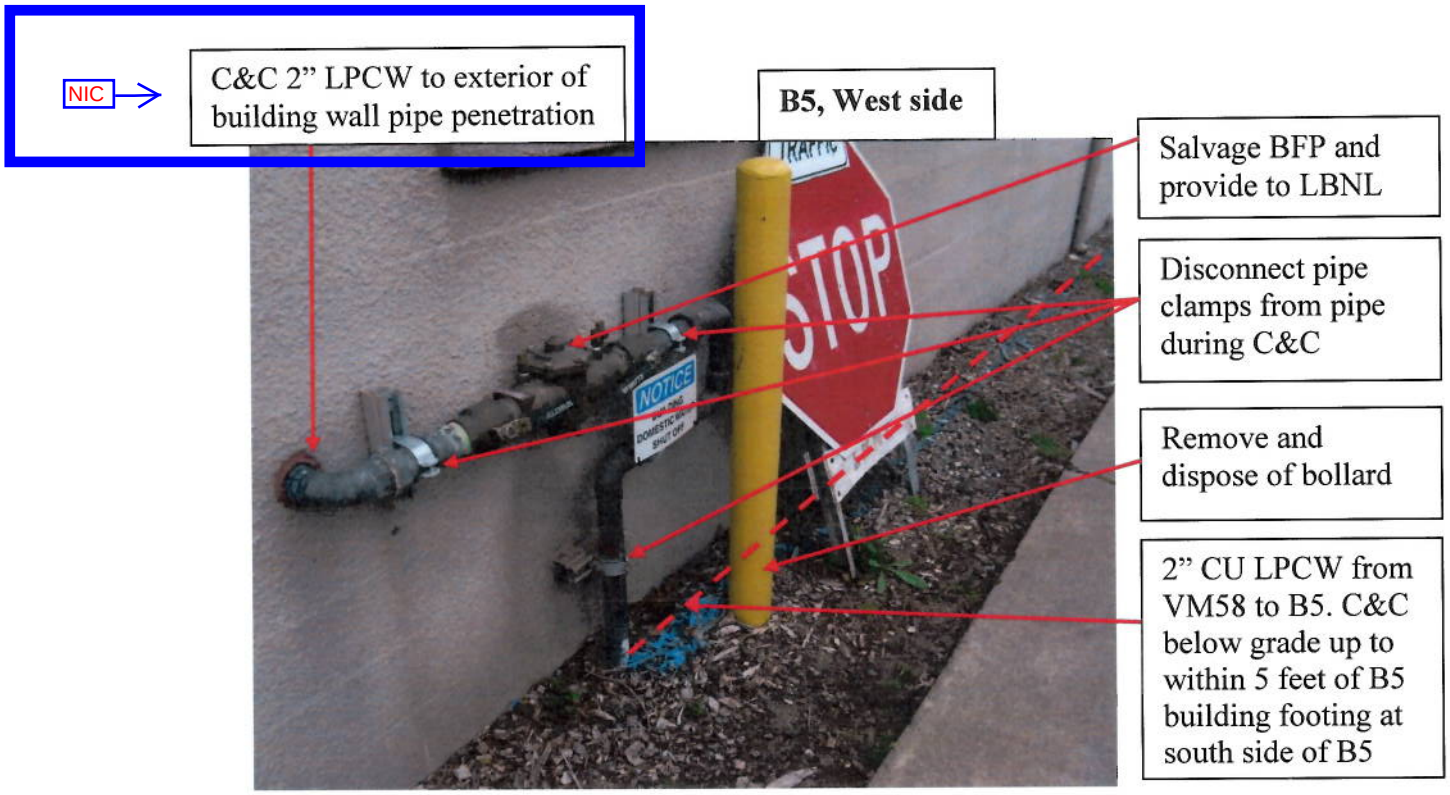


Photo 7.2: LPCW supply to West side of B5

7.2.2 Remove above ground portion of 2" LPCW shown in Photo 7.3. Salvage BFP and provide to LBNL.

NOTE: Maintain internal cleanliness of active portion of piping to avoid contamination

7.2.3 Remove and dispose of above ground piping.

7.2.4 Follow soil management plan and compact soil after cutting and capping below grade piping. Notify LBNL FUM to inspect demolition and C&C connections[8]

7.3 Prior to Demolition, demolish 1/2" LPCW line to B5 GWT:

7.3.1 Note that GWT must remain in operation throughout D&D. Therefore, prior to hard demo, demolition contractor shall install new rerouted 1/2" LPCW to the new location. After GWT relocation is complete, reconnect 1/2" CU LPCW as indicated on plan to provide continuous service to GWT. Demolition contractor shall then C&C above ground portion of 1/2" LPCW shown in Photos 7.4 and 7.5 to ground level at B5 roadside.

7.3.2 C&C above ground portion of 1/2" LPCW from ground penetration at road, on fence as shown on Photo 7.6, to location shown on Photo 7.7.

NOTE: Maintain internal cleanliness of active portion of piping to avoid contamination

7.3.3 Remove and dispose of above ground piping.

7.3.4 Notify LBNL FUM to inspect demolition and C&C connections[9]

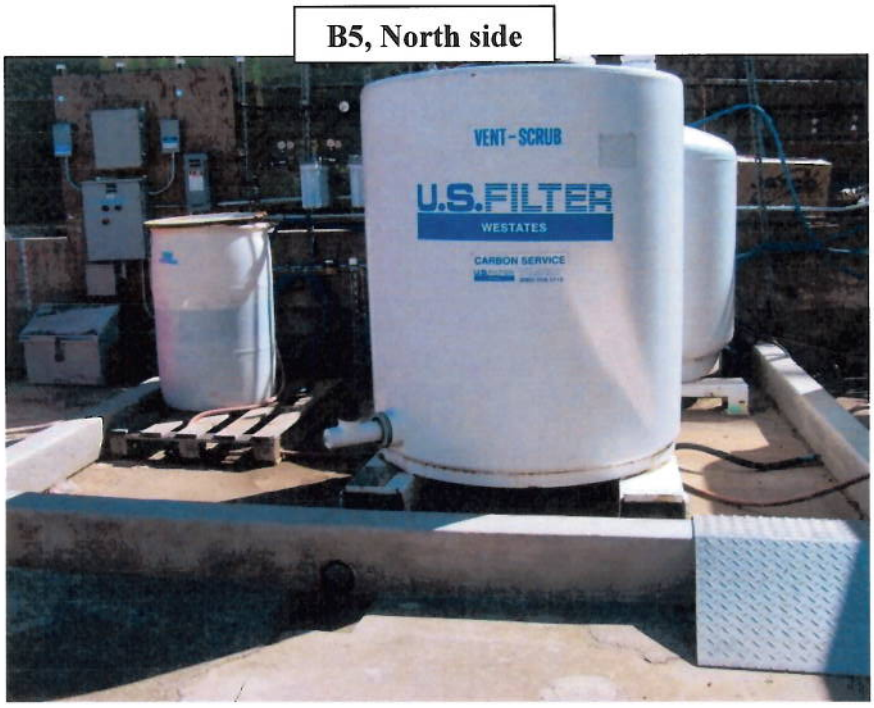


Photo 7.3: Groundwater Treatment Station by B5

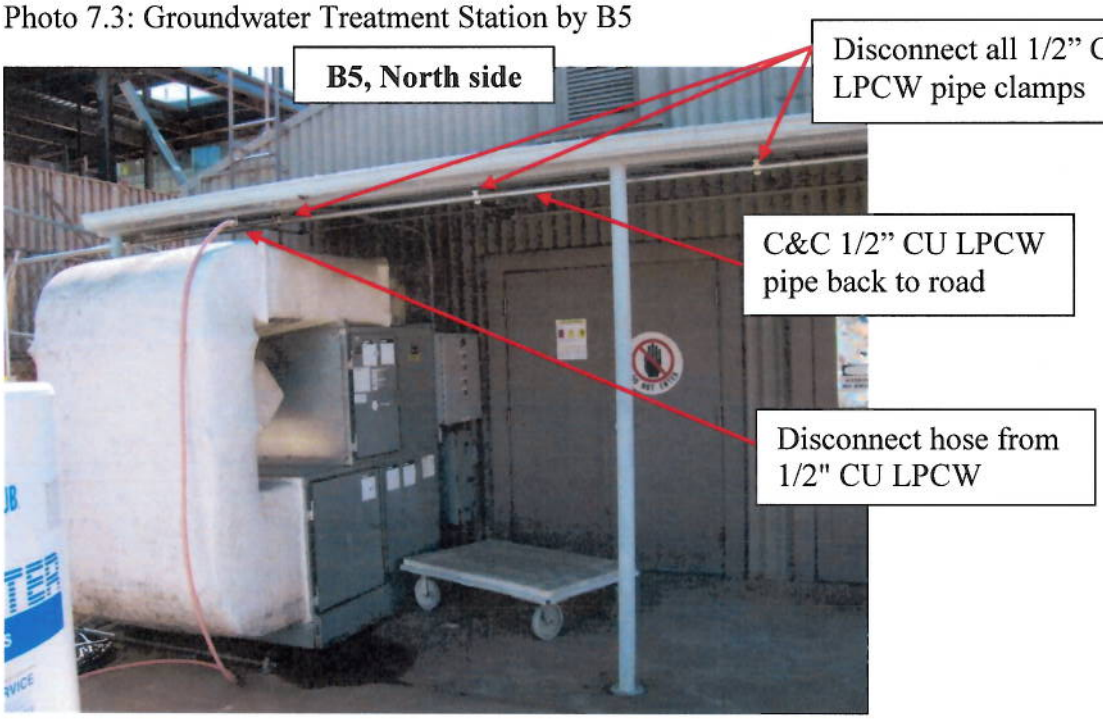


Photo 7.4: 1/2" LPCW supply on North side of B5

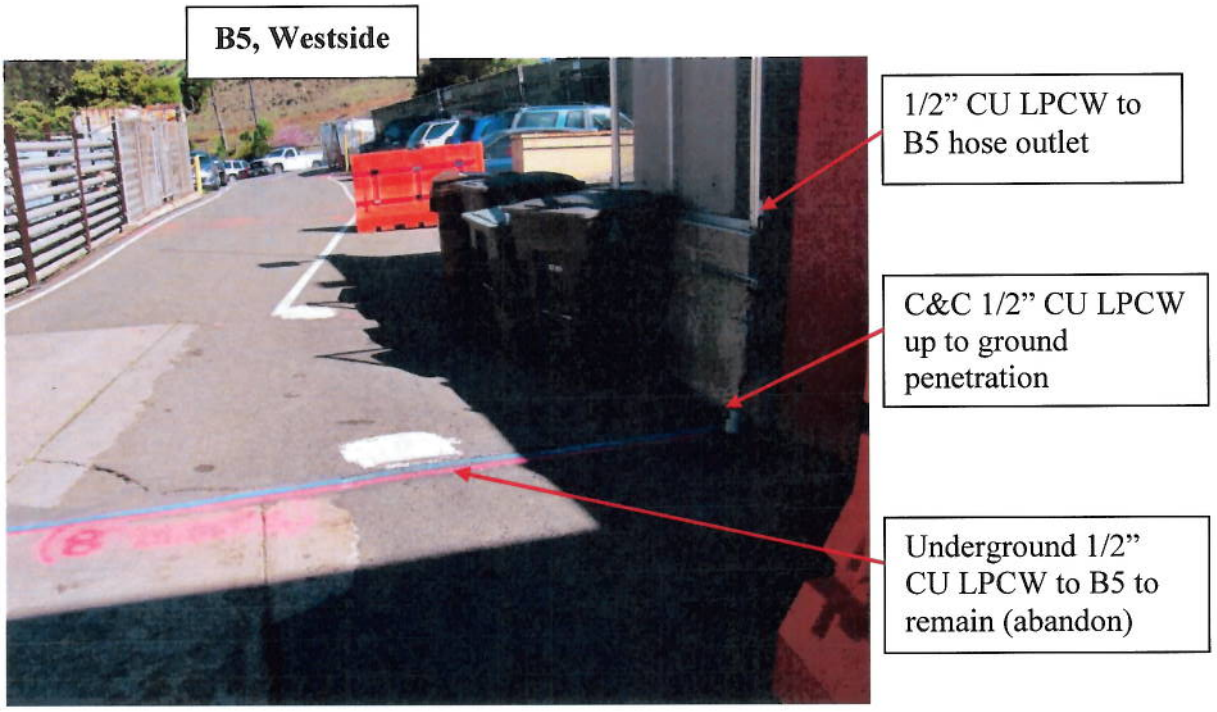


Photo 7.5: Buried 1/2" LPCW supply to West side of B5

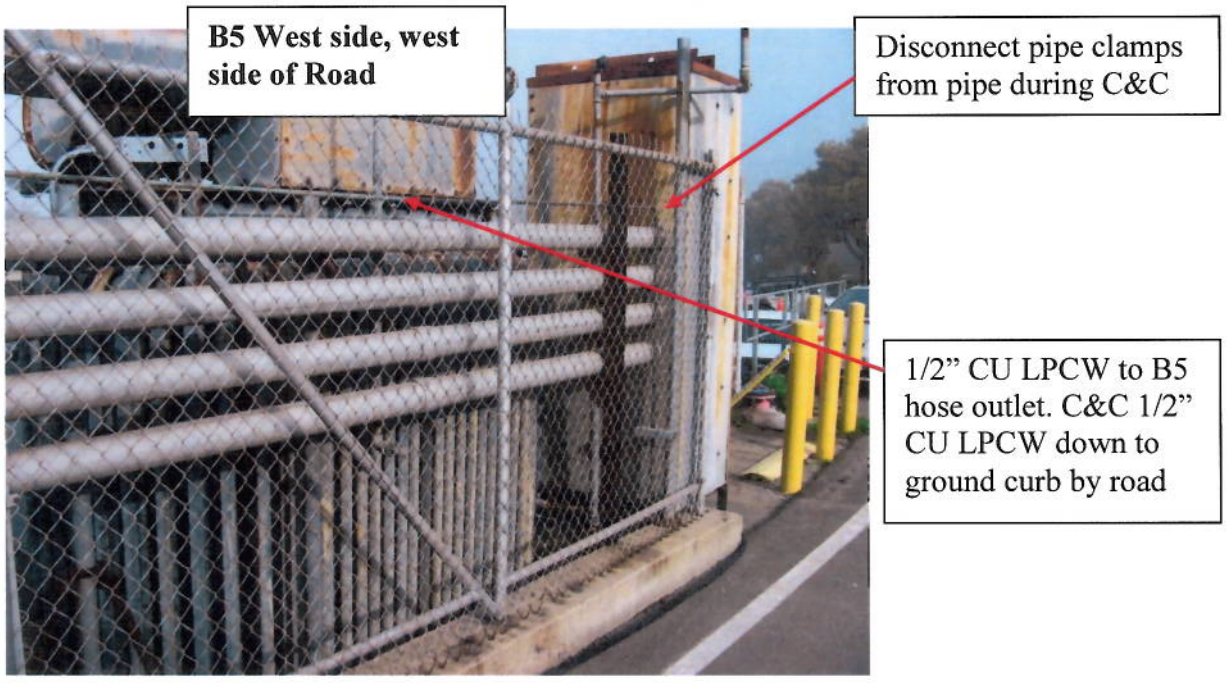


Photo 7.6: 1/2" LPCW supply to B5 GW filters hose outlet

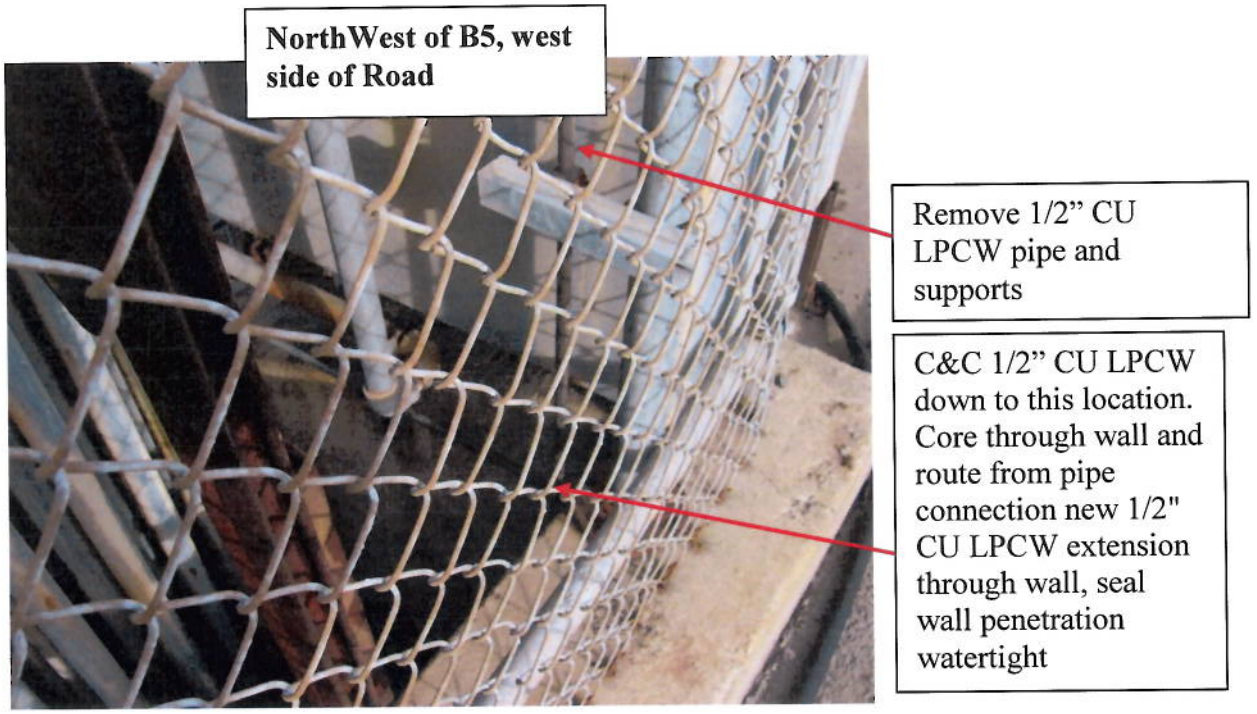


Photo 7.7: 1/2" LPCW supply to B5 GW filters hose outlet

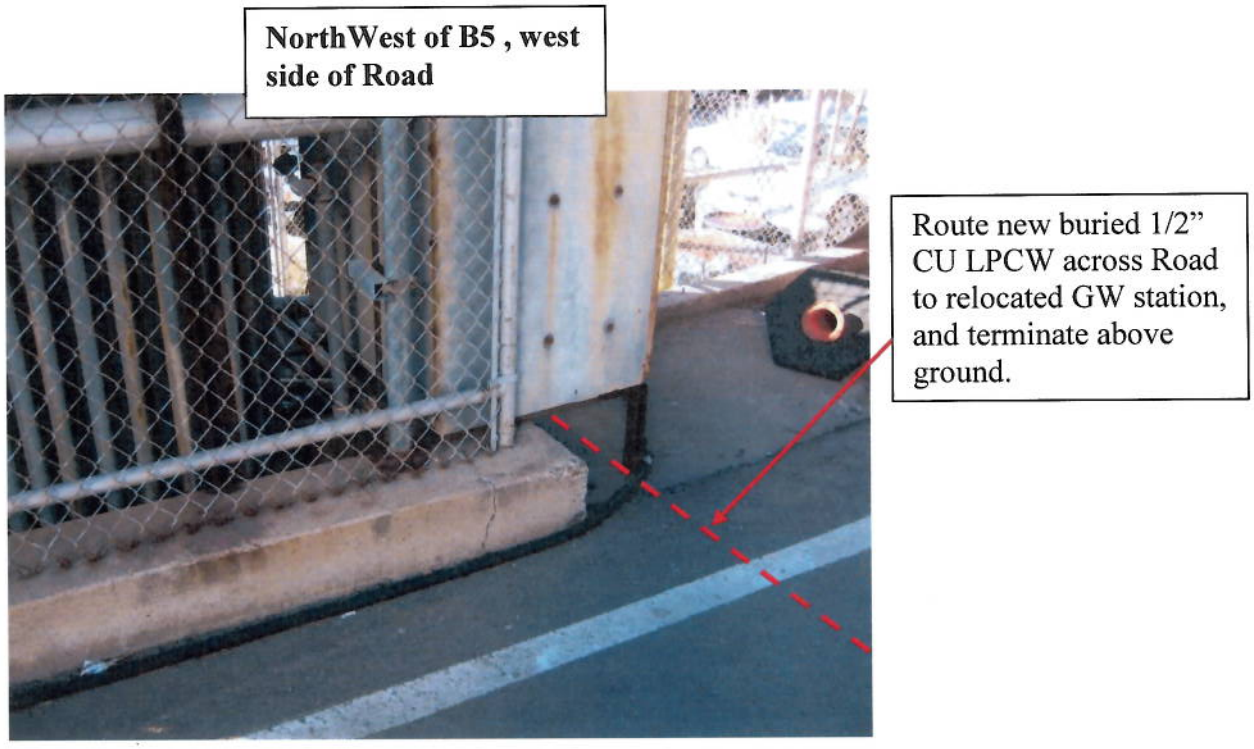


Photo 7.8: New 1/2" LPCW supply route to future GW filters location

The following describes demolition of the abandoned High Pressure Cold Water (HPCW) and Cold Water lines from the building exterior on the West side of B5, see drawing sheet P1.1.

7.4 Demolish abandoned 6" HPCW line on West side of B5:

7.4.1 C&C below ground abandoned 6" HPCW pipe from 5 feet within B5 footing and at across Road, shown in Photo 7.9.

7.4.2 C&C below ground abandoned 4" CW pipe from 5 feet within B5 footing, shown in Photo 7.9.

7.4.3 Remove and dispose of piping

7.4.4 Follow soil management plan and compact soil after cutting and capping below grade piping. Notify LBNL FUM to inspect demolition, C&C connections, and for acceptance.[10]

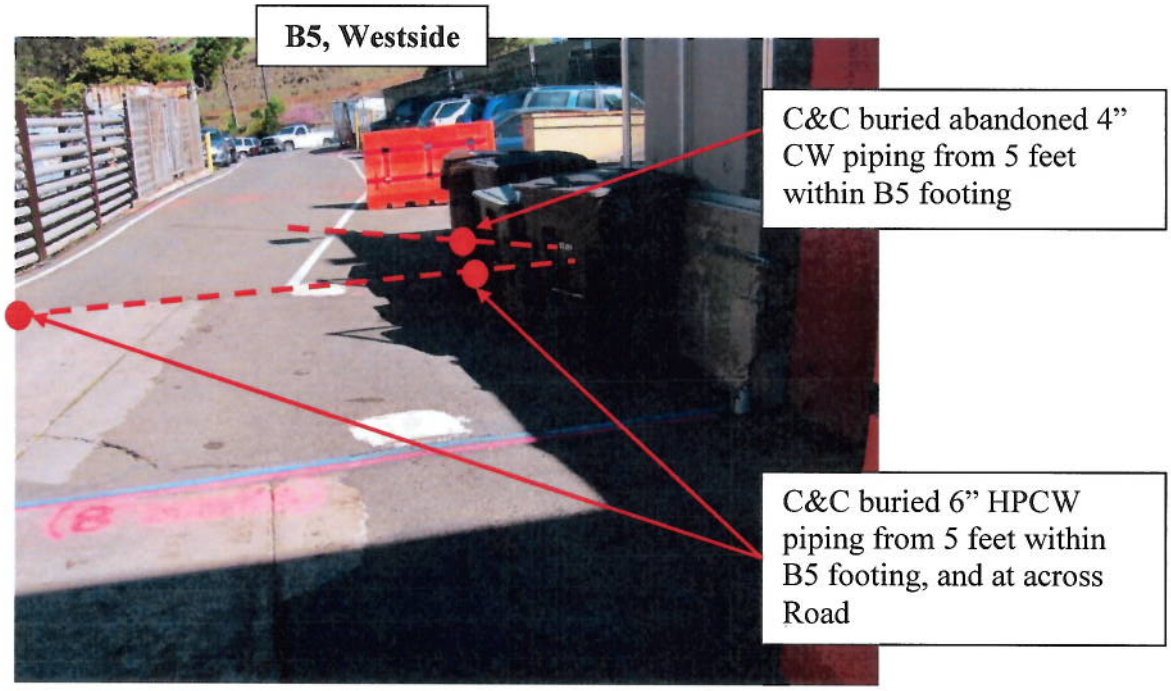


Photo 7.9: Underground abandoned 6" HPCW and 4" CW

8.0 Industrial Waste Drain (ID) Isolation

The following describes the isolation and demolition of the Industrial Waste Drain (ID) service from the exposed ID piping and isolation valves in the ID valve box on the Northwest side of B5, and the buried ID piping to the circular secondary-containment underground pits, see drawing sheet P1.2.

NOTE: Lines marked "CONTAMINATED" on drawing P1.2 are known to be Rad Contaminated. Contractor is to receive instruction from LBNL EHS/RPG regarding disconnecting, removing, and disposing of pipe before continuing. All work on ID process piping falls under the authority of LBNL/RPG's Radiological Work Authorization (RWA). Absolutely no work shall be performed on the ID process piping until reviewed, approved, authorized and cleared by LBNL's EHS, RPG and ESG groups.

NOTE: All of the stainless steel piping in the valve vault has been found **not** to be pressurized. Nevertheless, prior to hard demo and after abatement, demolition contractor shall verify all lines upstream of valve box have been de-pressurized by opening all valves inside the building (including any that may be located behind existing sheetrock). In accordance with strict Rad Protection protocols and pre-approvals, ID piping shall then be removed in accordance with this MDP and other construction documents. Containment, cutting, handling, bagging, labeling, manifesting and ultimate disposal of the piping shall be performed by the demolition contractor in strict accordance with the contract documents. Demolition contractor shall submit a work plan delineating the sequence of how the ID piping, valve box and circular secondary-containment pits will be removed, handled, disposed, backfilled and stabilized. Following is a generalized sequence that shall be refined by the demolition contractor.

8.1 After initial mechanical deactivation (during demolition) C&C ID from B5:

8.1.1 Coordinate with LBNL EHS, RPG and ESG groups and then remove stainless steel ~1.5" ID lines and associated valves in ID valve box, aboveground 1.5" ID line to the exterior of B5 on west side of B5, and below grade in other areas, as shown in photos 8.3 and 8.4. Note that ID lines may be 1.25" or larger diam. Contractor to verify. Also note that some of the ID piping in the vault has already been removed pursuant to earlier characterization activities.

8.1.2 Dispose of the stainless steel ID piping from the valve box interior out to the exterior of B5 following LBNL procedures, shown in photo 8.4.

8.1.3 Notify LBNL EHS and FUM to inspect demolition and removal of piping[11].

8.1.4 Remove valve box, ID piping and circular steel secondary-containment pits shown in photos 8.1 and 8.4. Notify LBNL CM and FUM to inspect demolition, C&C connections, and removal of piping[12].

8.1.5 Following Rad scanning, soil management plan and other LBNL clearances, backfill with CDF or clean soil and compact soil. Stabilize site in accordance with the contract documents.

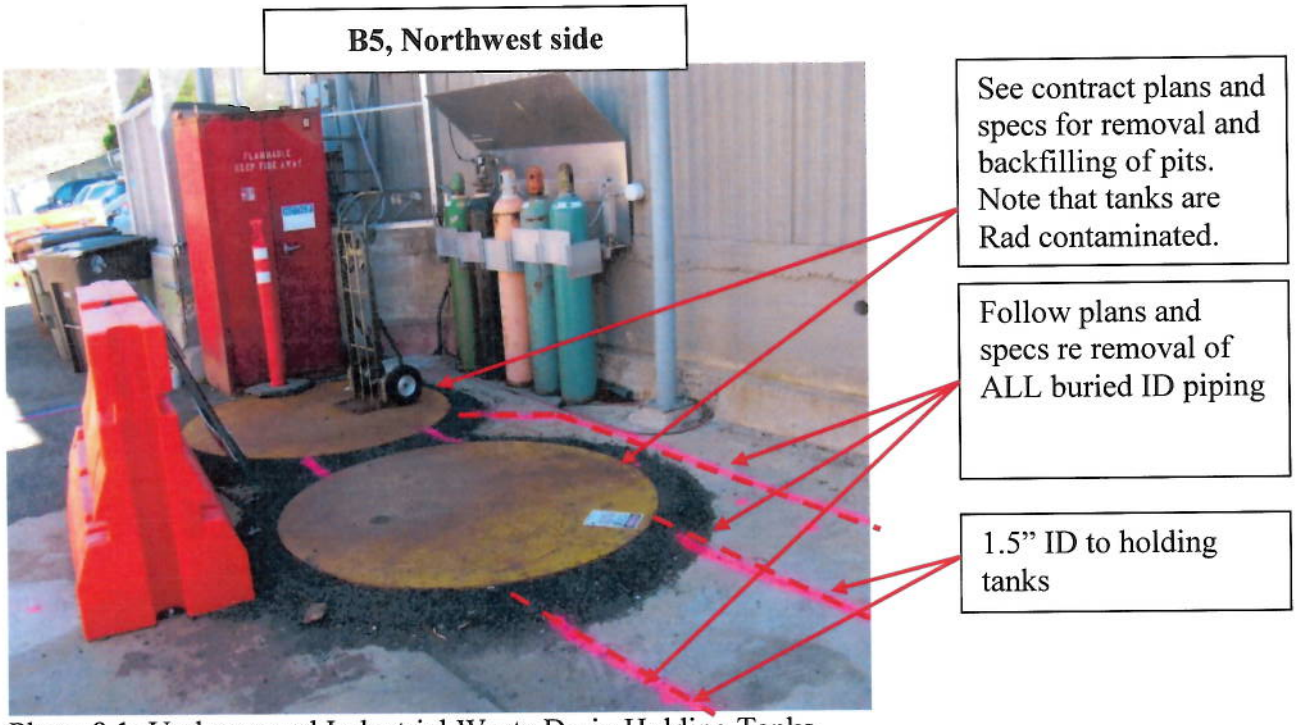


Photo 8.1: Underground Industrial Waste Drain Holding Tanks

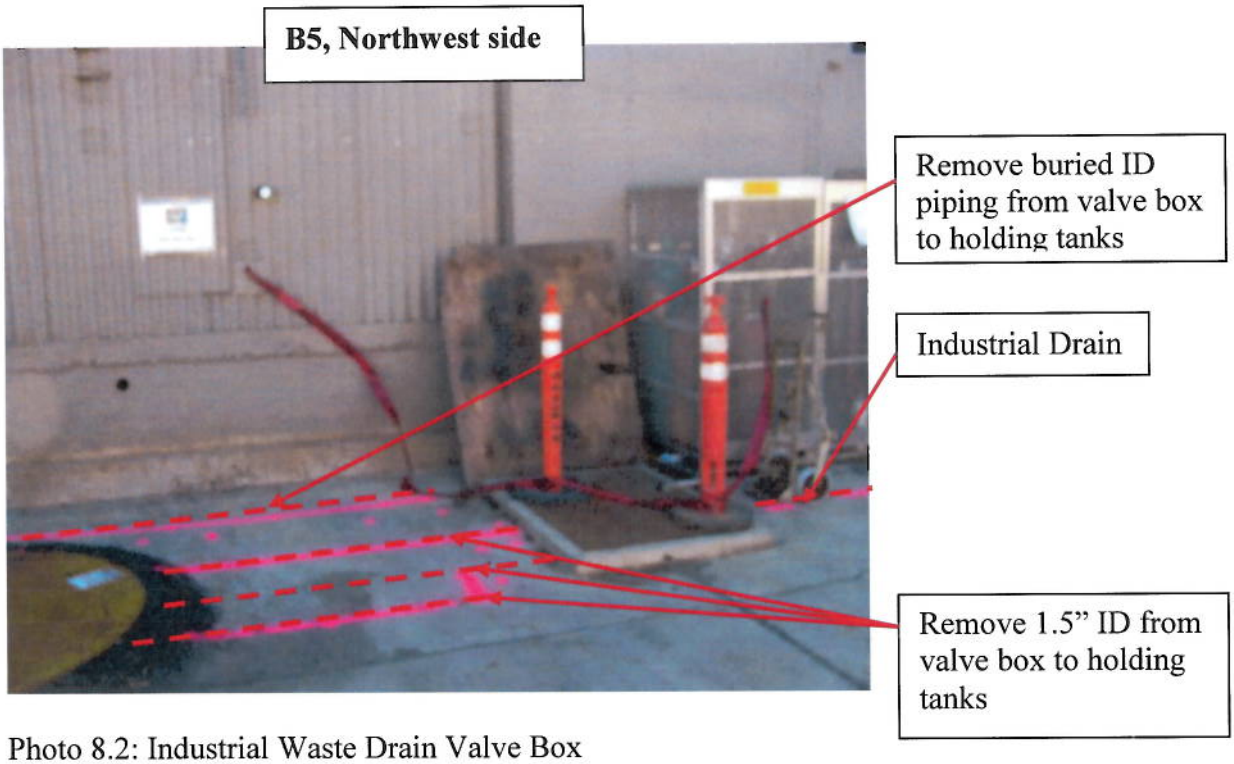


Photo 8.2: Industrial Waste Drain Valve Box

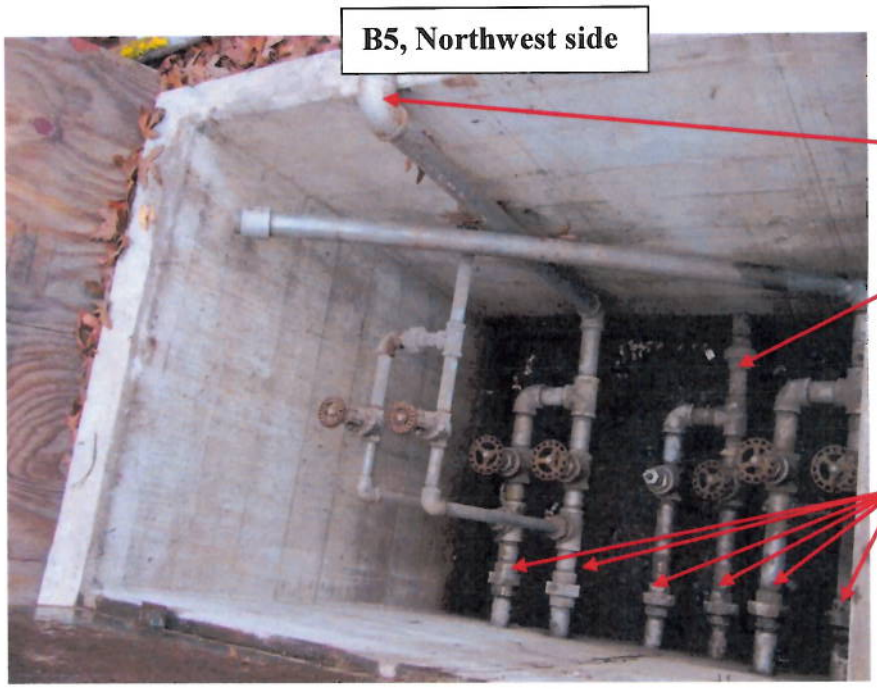


Photo 8.3: Industrial Waste Drain Valve Box

Photo 8.4: Industrial Waste Drain Valve Box

9.0 Low Pressure and High Pressure Natural Gas (LPNG and HPNG) Isolation and Demolition

The following describes the isolation and demolition of the aboveground LPNG and HPNG lines to B5; see drawing sheet P1.1.

9.1 Coordinate with LBNL FUM and follow LOTO procedures when isolating HPNG supply to B5

9.1.1 HPNG supply to buildings B4, B14, and B16 will be temporarily shut off when isolation valve VG84 is closed, therefore approval from LBNL FUM is required before proceeding[13]

9.2 After receiving approval from LBNL FUM, proceed as follows:

9.2.1 Isolate the HPNG supply by closing VG 84 in street on the West side of B16 following LBNL LOTO procedures[14].

9.2.2 Contractor to purge the gas line with N2 from VG84 to B5 using LBNL gas line purging procedures. Contractor to submit HPNG and LPNG cutting and purging plan to FUM for review and approval 2 weeks prior to perform any work.

9.2.3 C&C the HPNG line on the South end of B5 from below grade, from within 5 feet from building footing, to wall penetration at B5 exterior, including demolition of gas meter, regulator, valves and appurtenances, see Photo 9.1

NIC

9.3 Coordinate with LBNL FUM and follow LOTO procedures when isolating B5 LPNG. After receiving approval from LBNL FUM, proceed as follows:

NIC

9.3.1 Apply LOTO, purge as necessary and then C&C the LPNG line from V137G to B5 wall exterior on East side of B5, see Photo 9.2. Remove and dispose of V137G valve and LPNG line including all below grade and above ground piping.

9.4 Follow soil management plan and compact soil after cutting and capping below grade piping. Notify LBNL FUM to inspect demolition, C&C connections, and removal of piping, and acceptance[15].

9.5 After receiving approval from LBNL FUM, open valve VG84 to restore service to other buildings. In coordination with LBNL PMTs check buildings for anomalies.

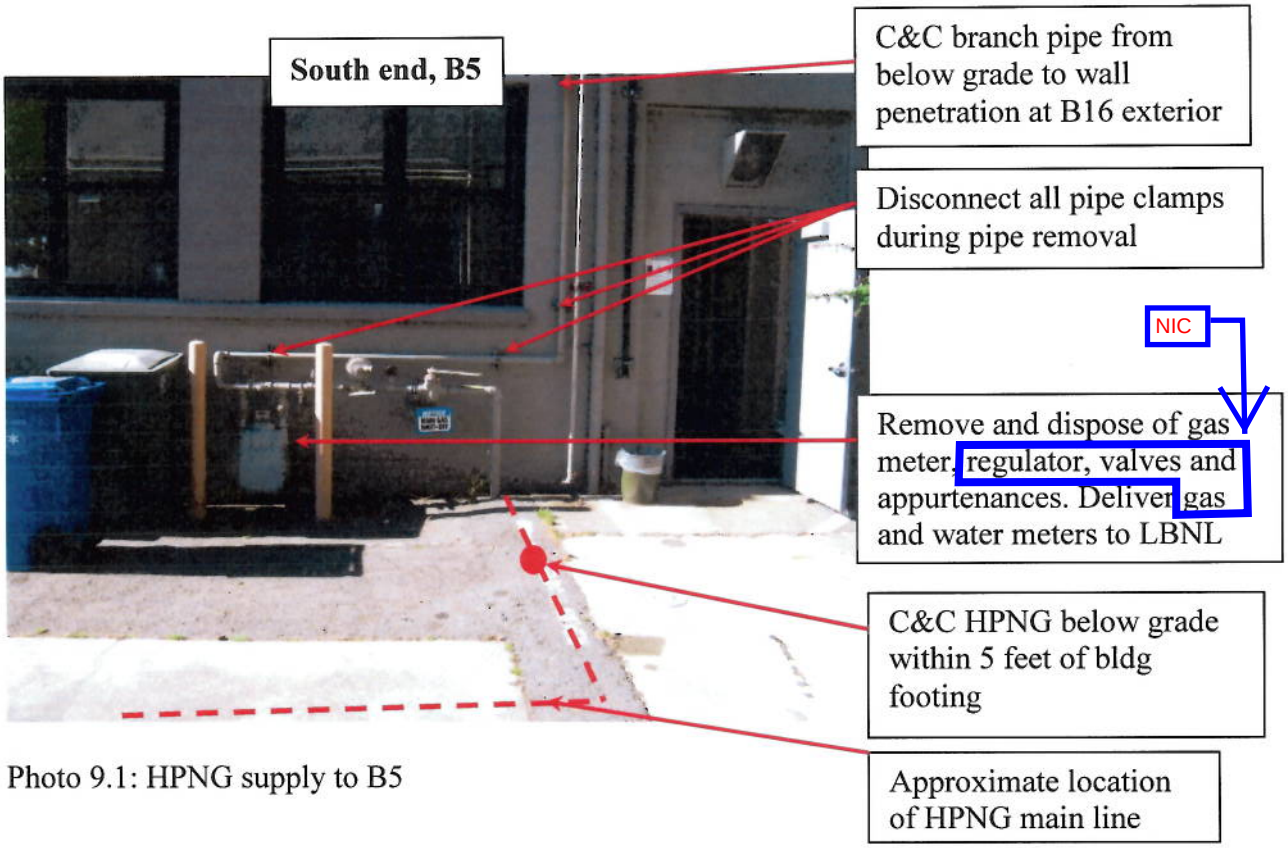


Photo 9.1: HPNG supply to B5

NIC

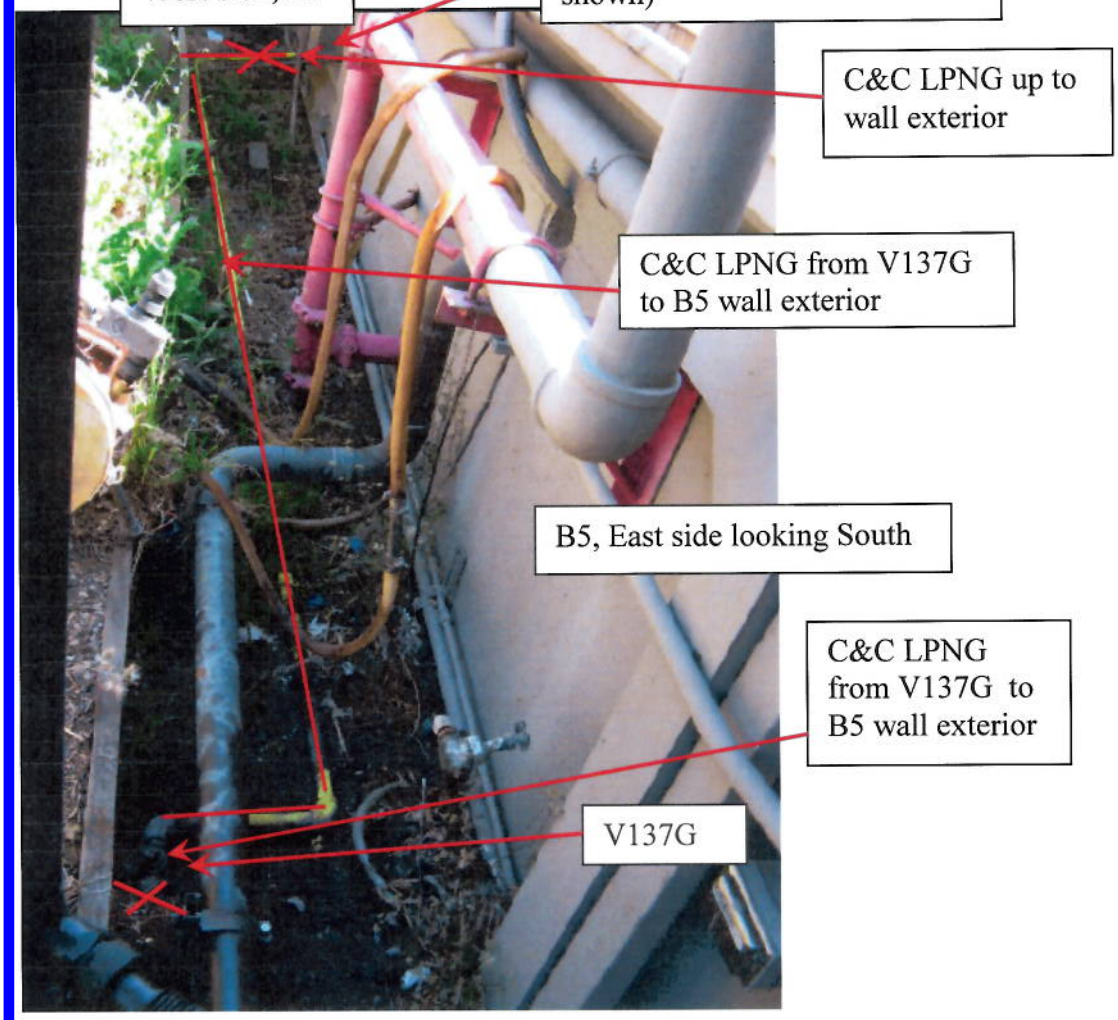


Photo 9.2: LPNG from B5 attic on East side to V137G

NIC

10.0 Compressed Air (CA) and Oxygen Isolation and Demolition

The following describes the isolation and demolition of the Compressed Air (CA) and Oxygen service from building 4, across to the south side of B5, see drawing sheet P1.1.

10.1 Coordinate with LBNL FUM when isolating CA and oxygen supply to B5 .

10.1.1 CA and oxygen supply to building B5, shall both be shut off at the ceiling in Room 102 at the northeast corner of B4. Note that underground CA isolation valve VA23 (at the northwest corner of B4) is secured and abandoned. Note that there is no known oxygen service in B4 to the B5 oxygen line. Air-gapping contractor to confirm.[16]

10.2 After receiving approval from LBNL FUM, proceed as follows:

NIC

10.2.1 Isolate the CA and Oxygen supply by closing valves noted at the ceiling in note 10.1 LBNL LOTO procedures[17].

10.3 Demolish 2" CA and 5/8" Oxygen line to B5:

10.3.1 C&C overhead portion of 2" CA and 5/8" oxygen shown, from exterior of B5 wall to exterior of B4 wall.

10.3.2 If coordinated to occur during the same CA shutdown period, C&C below ground portion of CA from B4 to B16 as described in the B16 MDP.

NOTE: Maintain internal cleanliness of active portion of piping to avoid contamination

10.3.3 Remove and dispose of piping.

10.3.4 Notify LBNL FUM to inspect demolition and C&C connections[18]

10.4 When work is completed notify LBNL FUM for final inspection and acceptance[19].

NIC

11.0 Low Conductivity Water (LCW) Isolation and Demolition

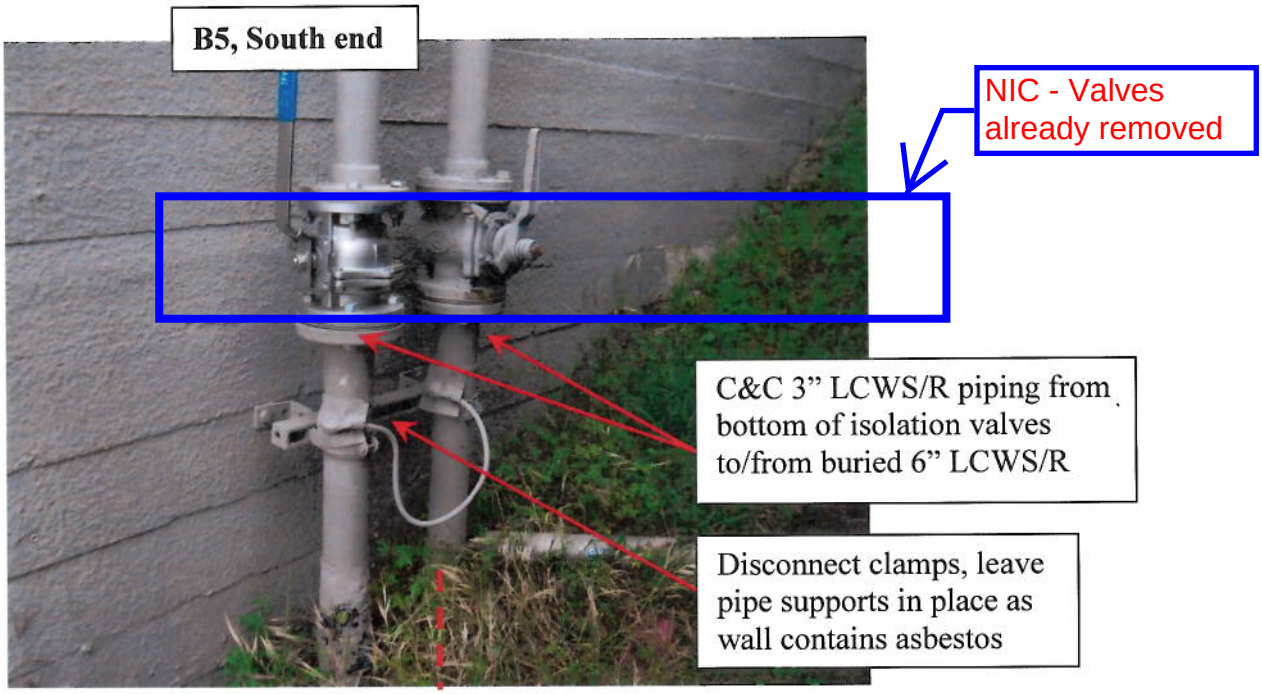
Remove above ground and below grade portions of 3" LCW-Supply and LCW-Return piping at the South end of B5 as follows, see drawing sheet P1.1. Shutdown of LCW requires special 2 week advanced coordination with FUM to avoid disruptions at the ALS (preferably during regular ALS shutdown period).

11.1 Isolate the 3" LCW supply and return lines to B5 by closing the isolation valves in the 3" supply and return piping following LBNL LOTO procedures[20], see Photo 11.1.

11.2 Drain lines and C&C both 3" branch connections at exterior wall penetrations to below grade at connection to 6" LCWS/R main lines. Seal open pipe ends with blind flanges. LCW shall be drained to SS. ~~Also see B16 MDP for constructing LCW bypass at Sally's Alley – see Photo 11.2~~

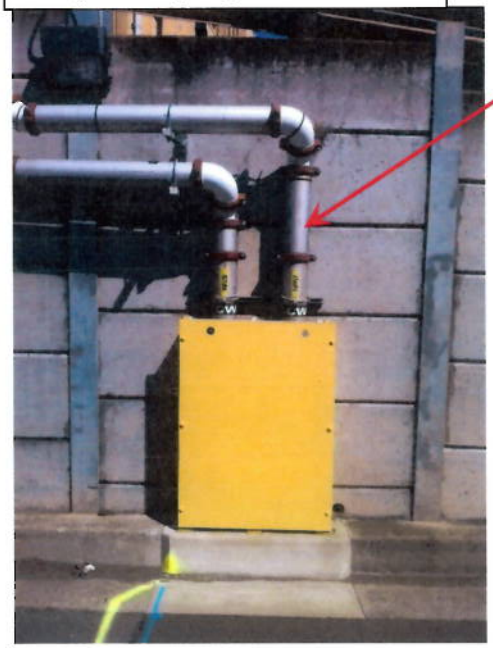
NIC

11.3 Follow soil management plan and compact soil after cutting and capping below grade piping. Notify LBNL FUM to inspect demolition, C&C connections, and removal of piping, and acceptance. When work is completed notify LBNL FUM for final inspection and acceptance[21].



NIC

Photo 11.1: 3" LCWS/R lines at South end of B5



Air-gap and install bypass in accordance with B16 MDP and with drawings shown in contract documents and Contract Drawing P2.3. Prior to air-gapping LCWS/R and installing bypass, shut off and air-gap existing cathodic protection system and rectifier located in B37 second floor. Include air-gapping of cathodic protection system in LCW LOTO application.

Photo 11.2: LCWS/R lines at Sally's Alley

12.0 Foundation Weep Drains (FTDR)

The current plan is to keep the uphill retaining structure of B5 in place to serve as a retaining wall until the site is redeveloped. To eliminate hydrostatic pressure behind the retaining structure, the Foundation Weep Drain (FTDR) must remain in place and functional. However, if the wall is removed and the slope graded then the FTDR may be removed. If the retaining structure is removed, the following describes demolition of the FTDR from the building exterior on the West side of B5, see drawing sheet P1.1.

12.1 Demolish 4" Foundation Weep Drain line on West side of B5:

12.1.1 C&C above ground portion of 4" Foundation Weep Drain pipe shown in Photo 12.1 from above ground termination to 5 feet within B5 footing.

NOTE: Maintain internal cleanliness of active portion of piping to avoid contamination

12.1.2 Remove and dispose of piping

12.1.3 Follow soil management plan and compact soil after cutting and capping below grade piping. Notify LBNL FUM to inspect demolition, C&C connections, and for acceptance.[22]

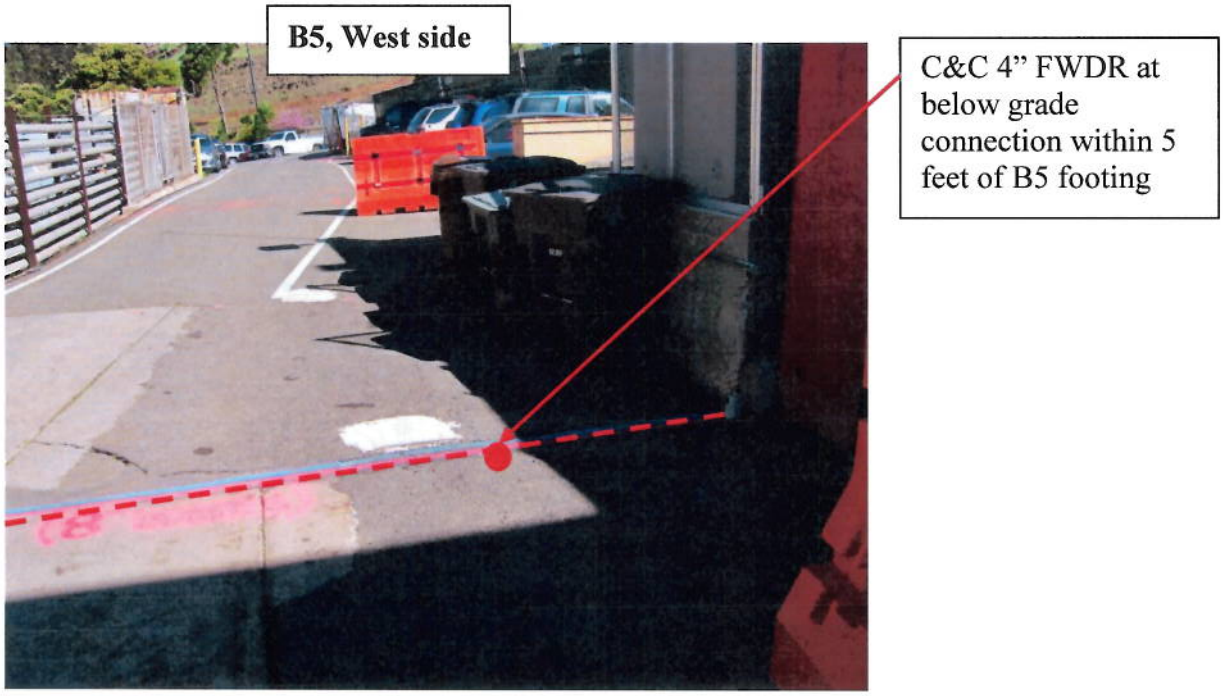


Photo 12.1: Weep Drain from B5 to B16 retaining wall

Note: Do not remove FTDR unless directed to do so.

13.0 Storm Drains (SD) Isolation and Demolition

B5 roof drains will be demolished during building demolition and are not a part of this plan

14.0 Fire Water (FW) Isolation and Demolition

The FW system shall remain active during B5 deactivation. See Drawings FP1.1. Prior to building demolition and by LBNL direction the FW will be isolated and removed as follows.

The B5 fire suppression system is a wet pipe system and does not require compressed air

14.1 Isolate FW system to B5 by closing shutoff valve in valve box VM768 using LBNL LOTO procedures described in section 3.0 of this Plan[23].

14.2 Verify FW system is de-energized by opening all inspector test stations.

NOTE: If any FW lines are energized after closing valve VM768, stop work and contact the LBNL FUM before proceeding

14.3 C&C FW line below grade at riser connection to underground lateral, including removal of BFP, FDC, and outdoor sprinklers, from 6" FW pipe flange at grade to reducer on 3" FW at B5 room 200 patio overhang, as shown in photos 14.1, 14.2, and 14.3.

14.4 Remove 1 1/4" and 1" FSP and connected outdoor fire sprinklers as shown in photo 14.4.

14.5 Seal 6" FW flange with 6" blind flange, and 3" reducer with 3" plug. Remove and dispose of all piping and appurtenances.

14.6 Follow soil management plan and compact soil after cutting and capping below grade piping. Notify LBNL FUM to inspect demolition, C&C connections, and for acceptance[24].

14.7 Keep valve VM768 closed and maintain LOTO on valve.

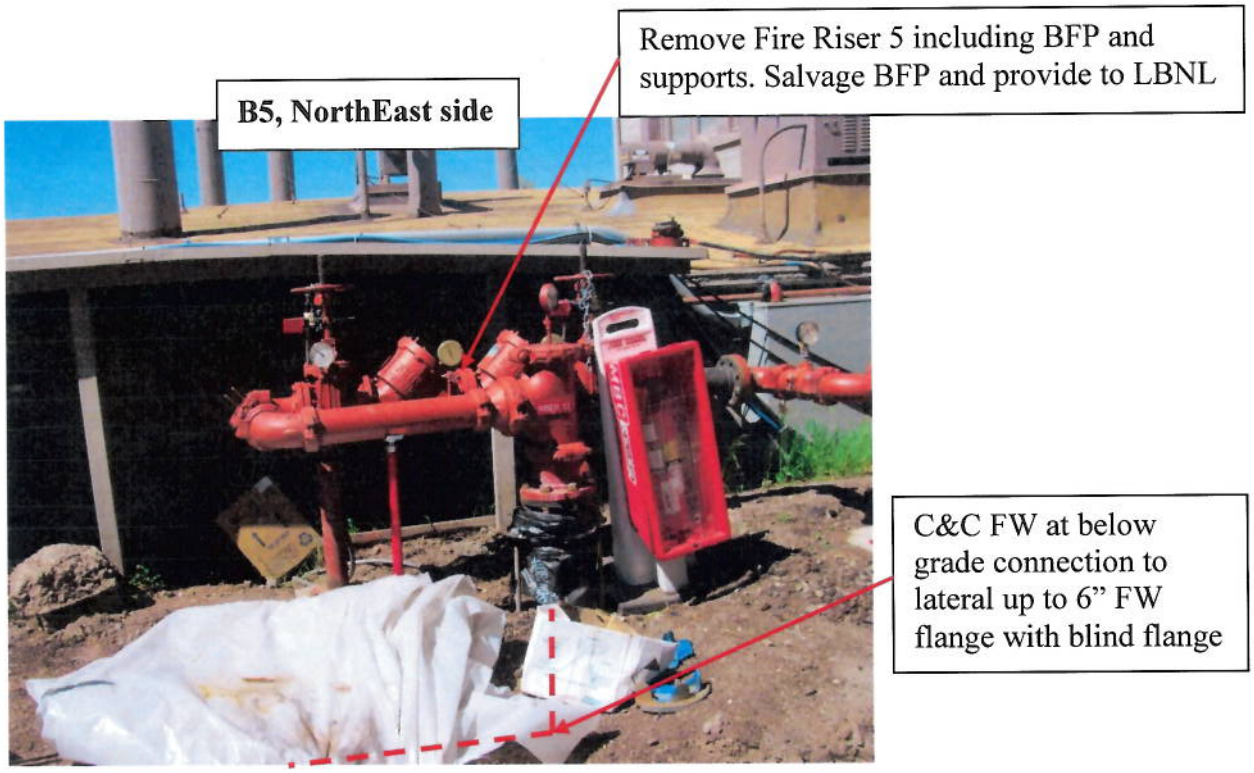


Photo 14.1: FW BFP at NorthEast end of B5

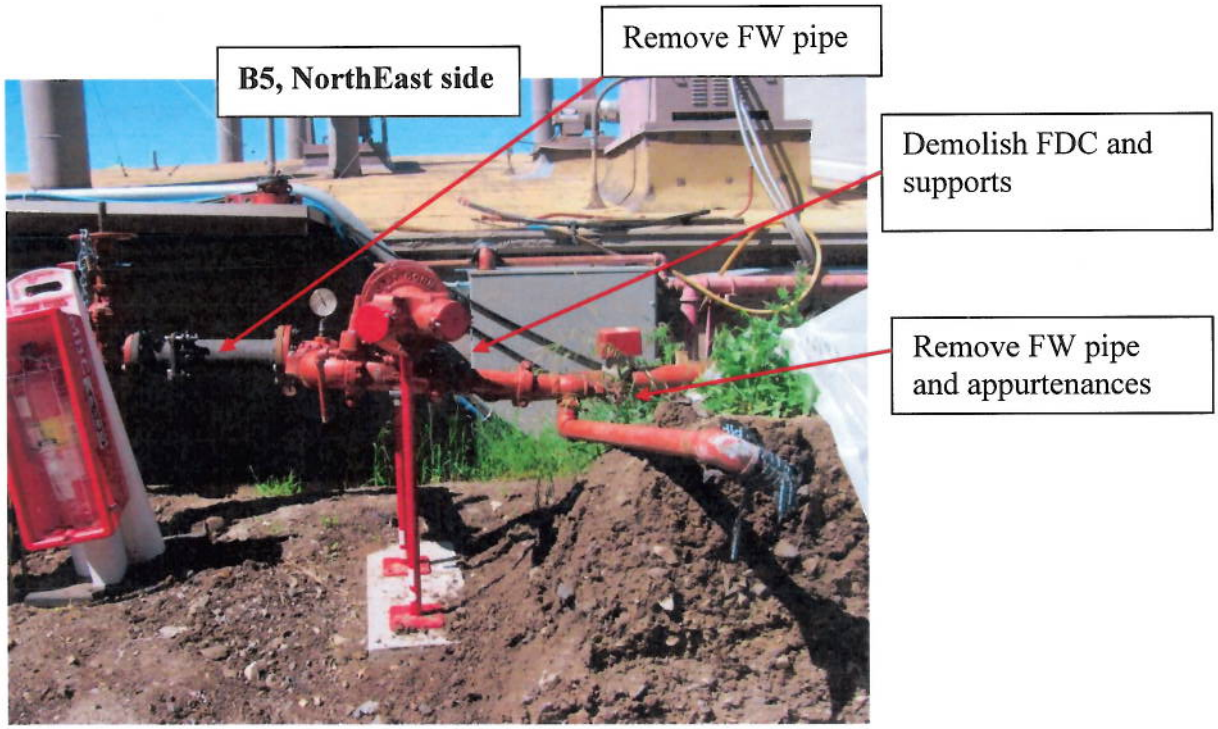


Photo 14.2: FW FDC at NorthEast end of B5

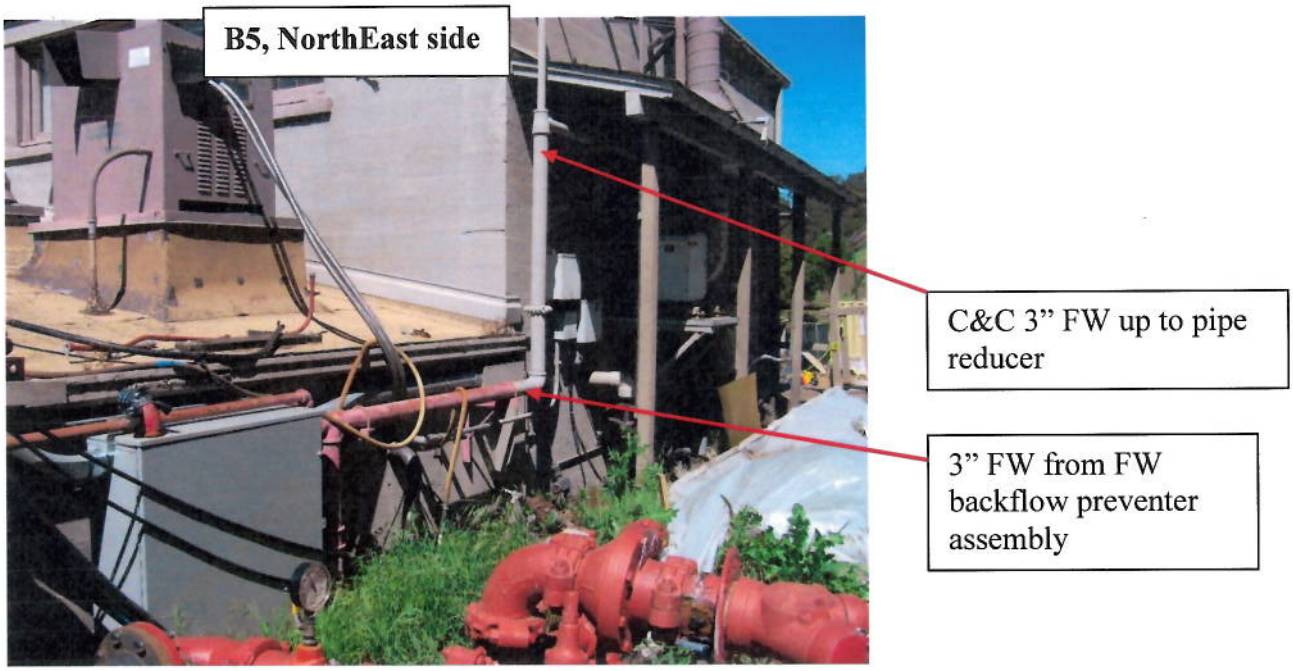


Photo 14.3: 2" FW line at NorthEast end of B5

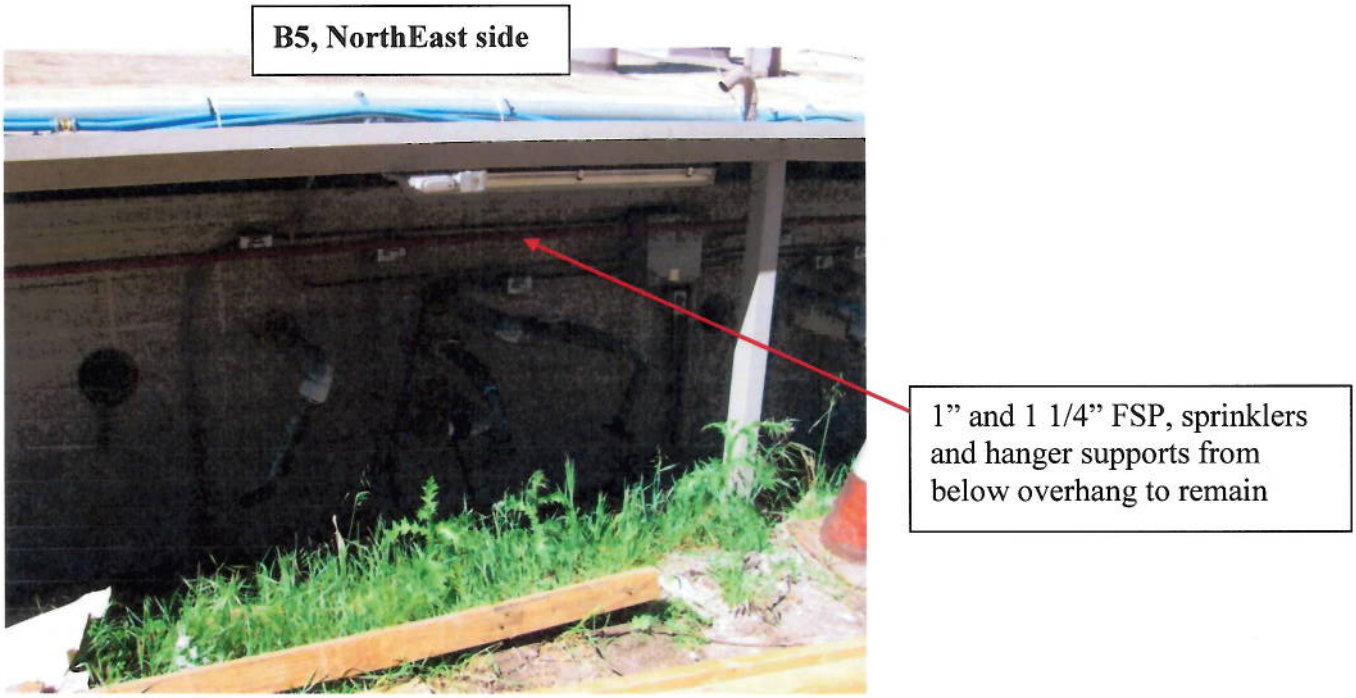


Photo 14.4: 1" and 1 1/4" FSP line at NorthEast end of B5

15.0 Vacuum Pump Isolation

The following describes the isolation of vacuum pumps on the Northeast side of B5 and the overhead 2" vacuum service from B4. All vacuum lines, pump piping, lines and vents are expected to be oily inside. Appropriate coordination and precautions must be taken during deactivation and demolition to properly handle these lines, and to prevent ground contamination.

15.1 Isolate outdoor vacuum pumps:

15.1.1 Overhead 2" vacuum service from B4 to building B5 shall be shut off at the ceiling in Room 102 at the northeast corner of B4. Note that there is no known vacuum service in B4 at this time. However, Contractor must notify EHS/RPG 2 weeks in advance of cutting the vacuum line to obtain clearance and approval prior to opening, cutting and capping this line. With regard to other vacuum systems in the B5, C&C each of the vacuum pumps hose up to hard pipe connection, and plug hard pipe connection with NPT plug, as shown in photos 15.1 and 15.2.

15.1.2 Notify LBNL FUM to inspect demolition and C&C connections, and for acceptance[25].

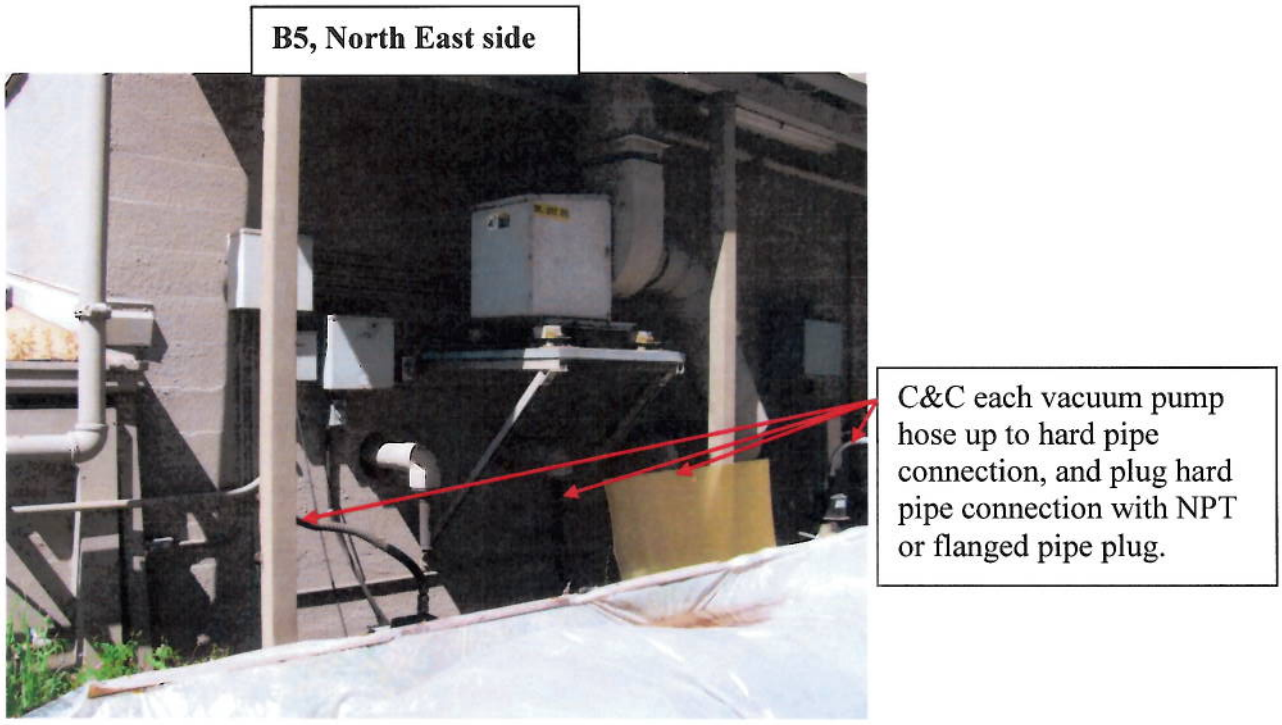


Photo 15.1: Vacuum pump piping and hoses

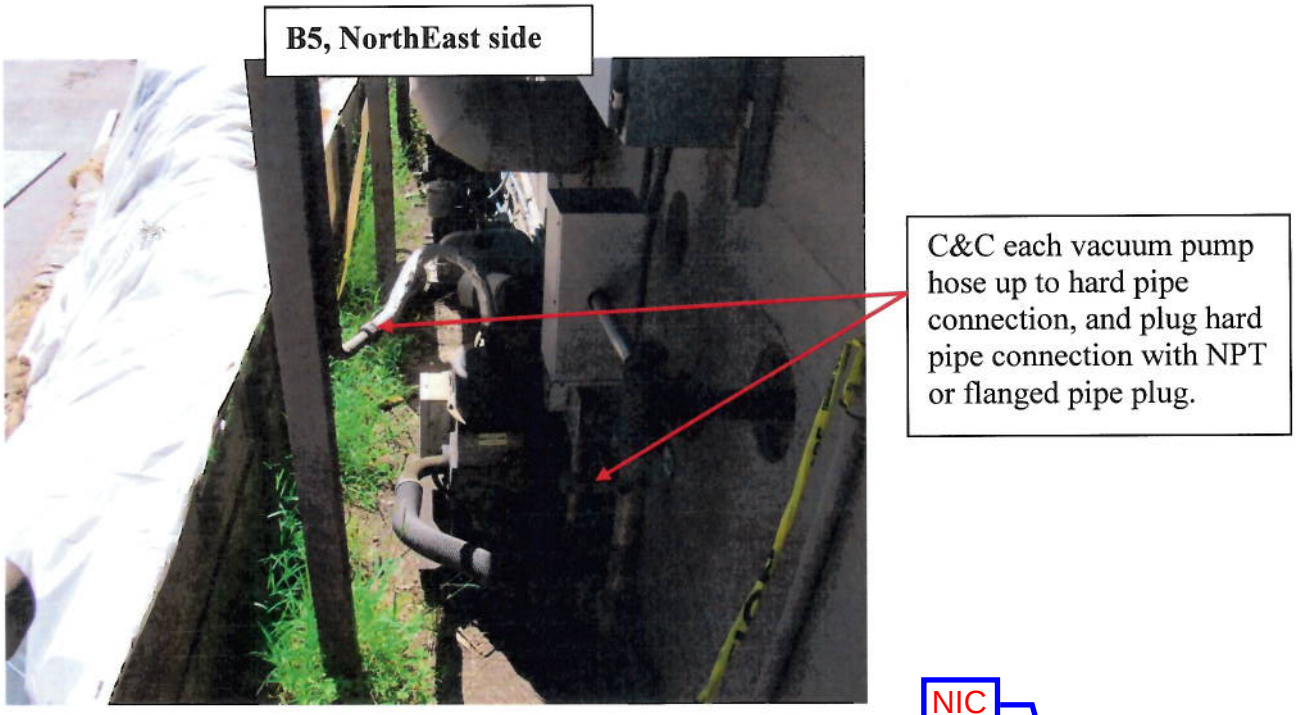


Photo 15.2: Vacuum pump piping and hoses

NIC

16.0 HVAC Refrigerant Piping Demolition and Isolation

The following describes the isolation and demolition of the refrigerant piping connected to the Condensing Unit and Air Handler on the North side of B5. All refrigerant lines are expected to contain refrigerant. Appropriate coordination and precautions must be taken during deactivation and demolition to properly handle these lines.

16.1 Isolate and demolish outdoor Condensing Unit refrigerant piping:

16.1.1 C&C each of the refrigerant pipes between Condensing Unit and Air Handler at B5 up to equipment pipe connections, and plug hard pipe connections with NPT or soldered plugs, as shown in photos 16.1 and 16.2.

16.1.2 Evacuate refrigerant piping of refrigerant, and dispose of refrigerant in accordance with LBNL disposal regulations.

16.1.3 Notify LBNL FUM to inspect demolition and C&C, and for acceptance.[26]

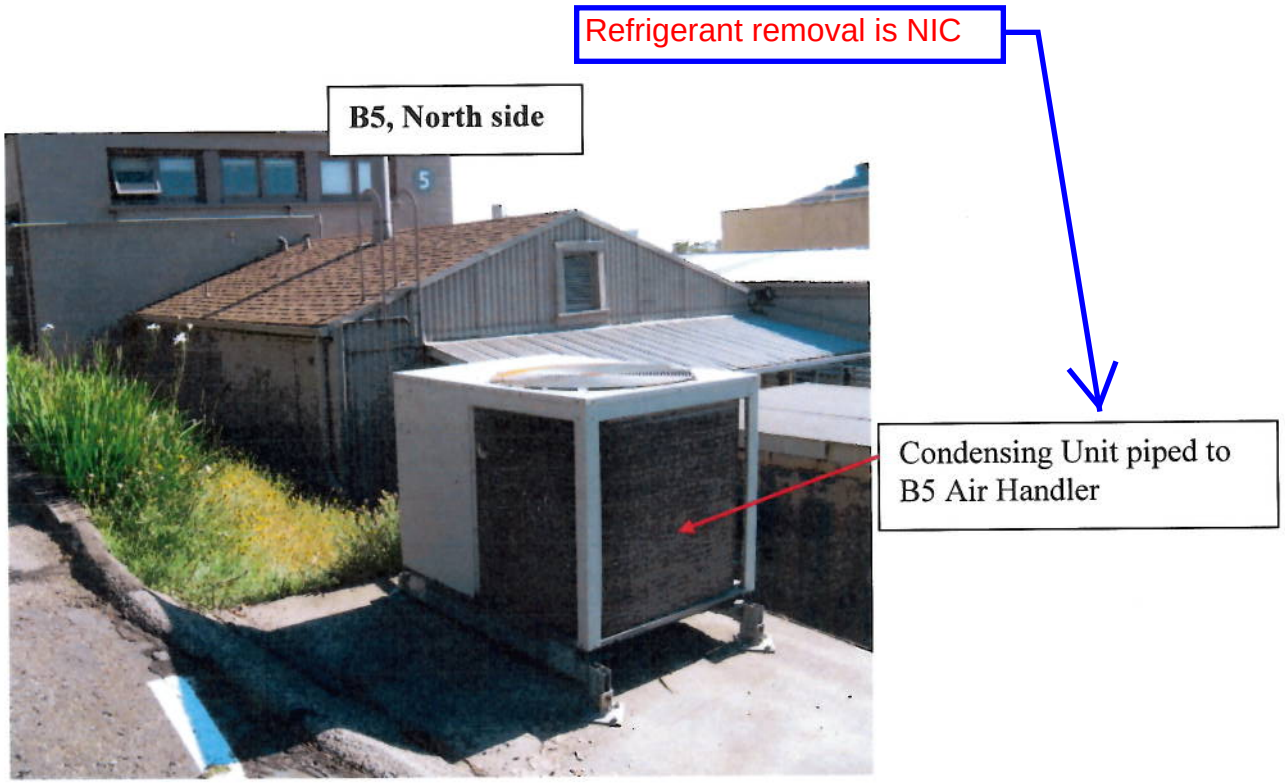


Photo 16.1: Condensing Unit piped to B5 Air Handler

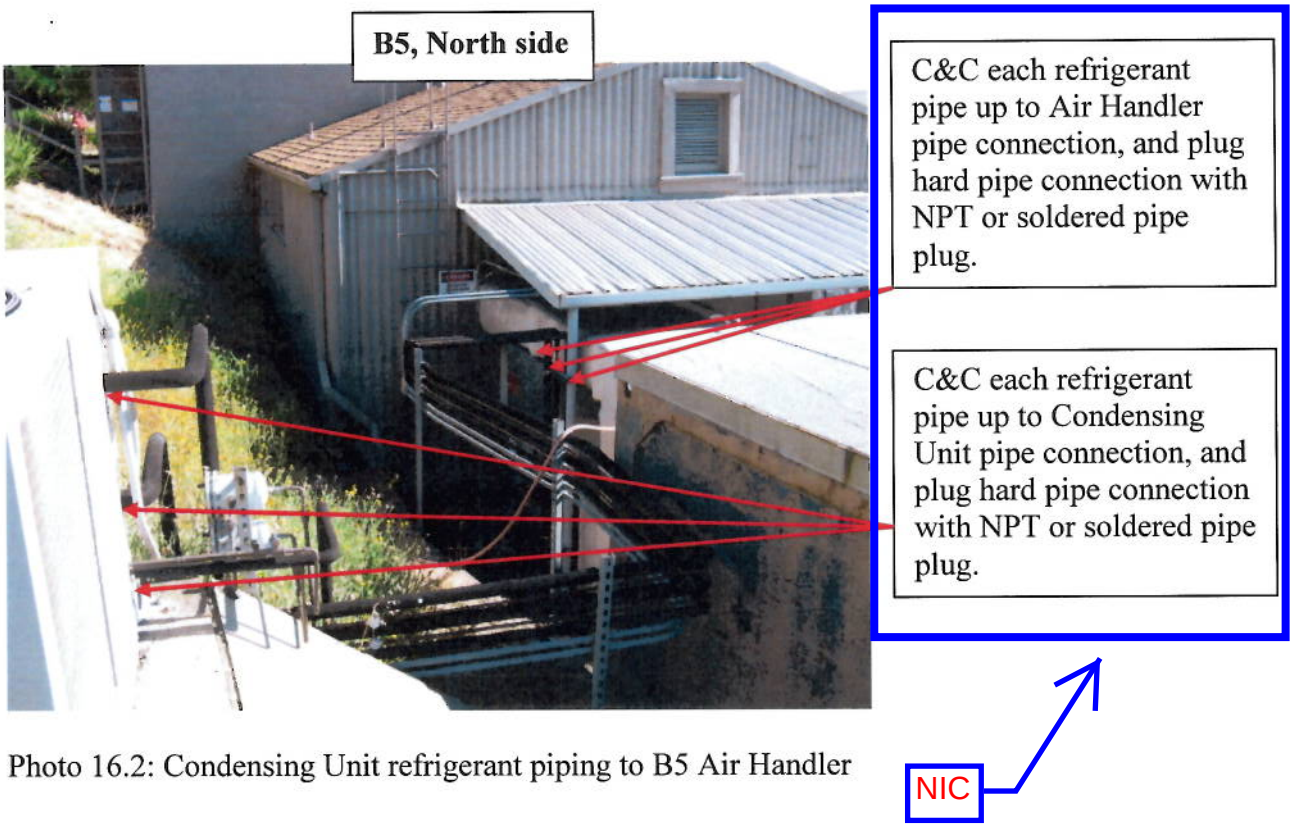


Photo 16.2: Condensing Unit refrigerant piping to B5 Air Handler

17.0 HVAC Controls Isolation and Salvage

The following describes the isolation and salvaging of the B5 HVAC control components. B5 Facility Management Control System (FMCS) communications are landed on Lanstar located in B4. Return all salvaged components to LBNL.

17.1 Isolate and Salvage all B5 Energy Management Control System (ECMS) temperature sensors:

17.1.1 C&C each of the control wires at each B5 room temperature sensor, including sensor shown on Photo 17.1, and disconnect temperature sensor from wall.

17.1.2 Salvage temperature sensors and provide to LBNL Facilities Department.

17.1.3 When work is completed notify LBNL FUM for final inspection and acceptance[27]

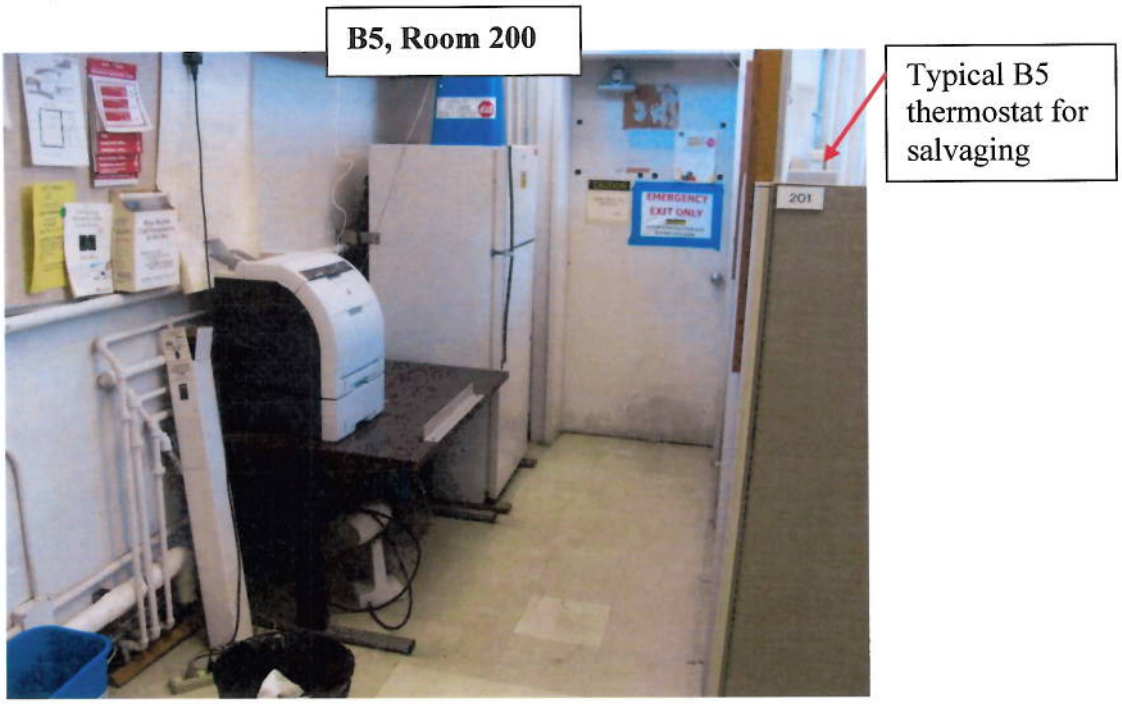


Photo 17.1: Typical B5 Thermostat

17.2 Isolate and Salvage B5 ECMS :

17.2.1 Disconnect and cut each of the power and control conduit, and disconnect each of the associated power and communication wires at Room 122 ECMS control panel FPU-02-05 as shown in photo 17.2. Disconnect control panel from wall.

17.2.2 Remove all communication conductors between FPU-02-5 and the EMCS Lanstar 04 control panel FPU-01A-04 in Building 4 room 111A. No communication conductors shall remain in the associated conduit(s).

17.2.3 Salvage control panel FPU-02-05 and components and provide to LBNL Facilities Department.

17.2.4 When work is completed notify LBNL FUM for final inspection and acceptance[28].

17.3 Isolate and Salvage B5 PA equipment:

17.3.1 Unplug and C&C each of the power and control wires and conduit at Room 122 PA equipment as shown in photo 17.2, and disconnect PA equipment.

17.3.2 Salvage PA equipment and provide to LBNL.

17.3.3 When work is completed notify LBNL FUM for final inspection and acceptance[29].

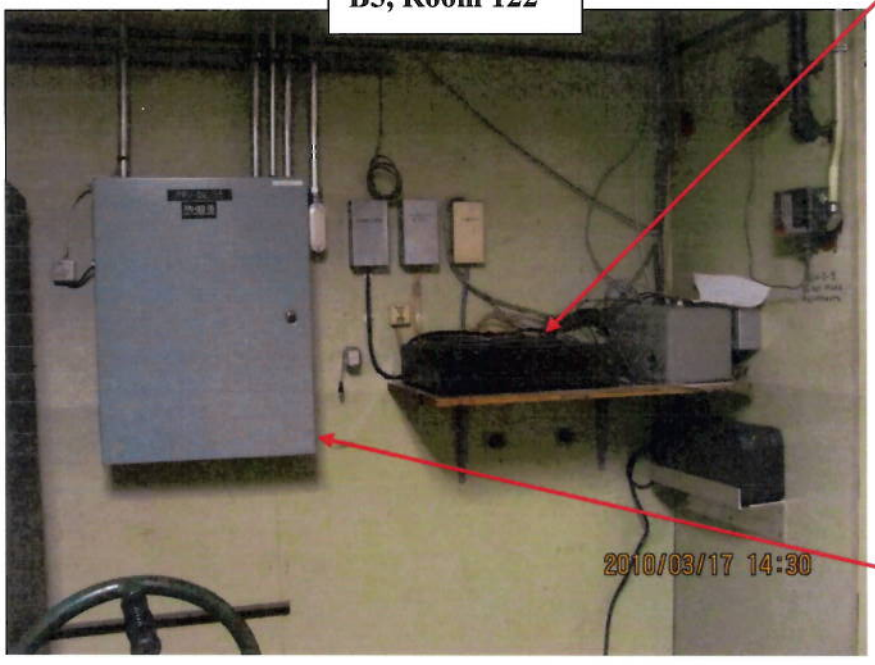


Photo 17.2: B5 ECMS Control Panel and PA Equipment

18.0 Monitoring Wells

Several GWT monitoring wells are located around B5, but more than five feet from B5. All monitoring wells are to remain in service during deactivation and are to be protected during all deactivation activities.

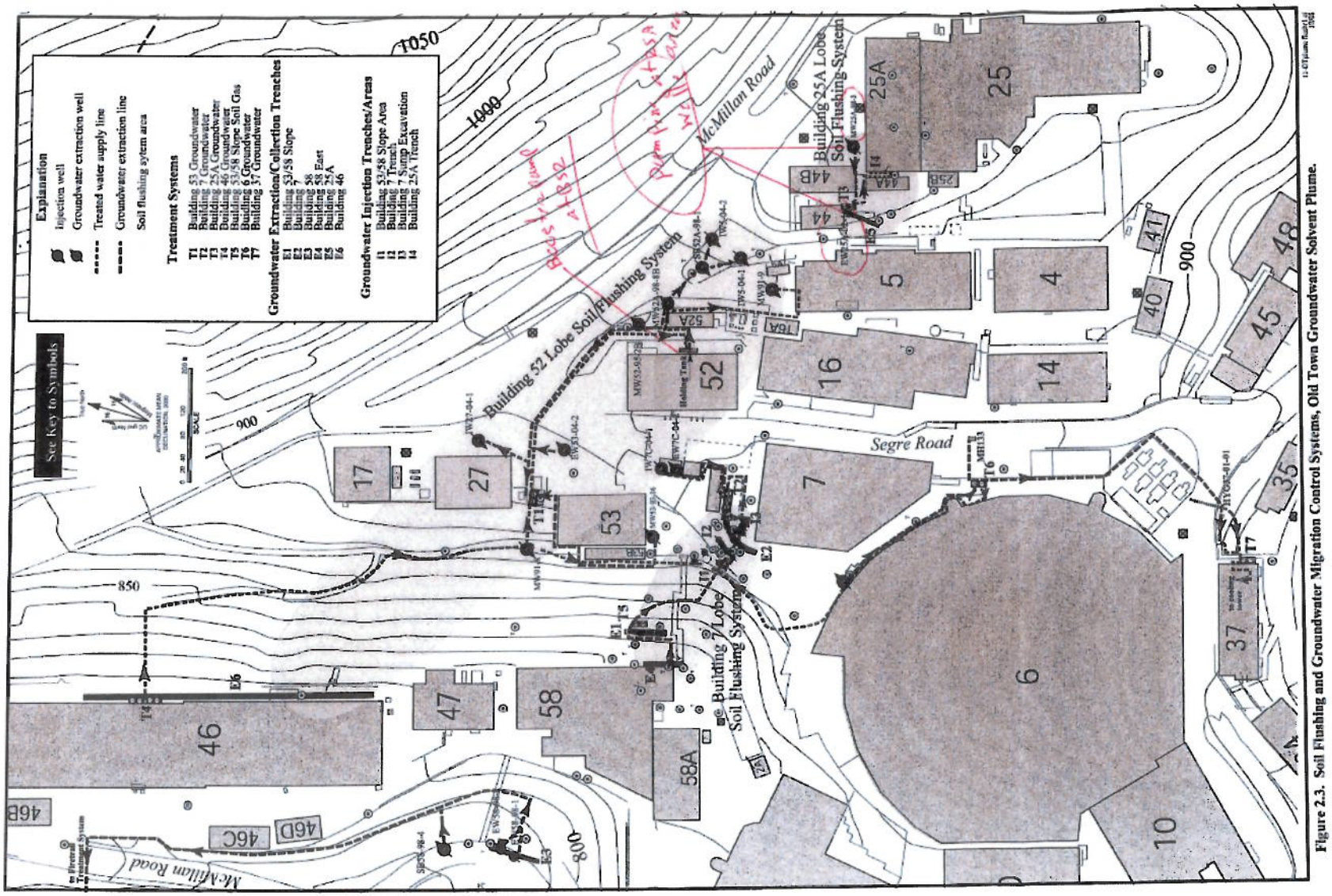


Figure 2.3. Soil Flushing and Groundwater Migration Control Systems, Old Town Groundwater Solvent Plume.

Figure 18-1: Pumping and Monitoring Well Location Map of the Building 5 Area

19.0 Drawing Updates

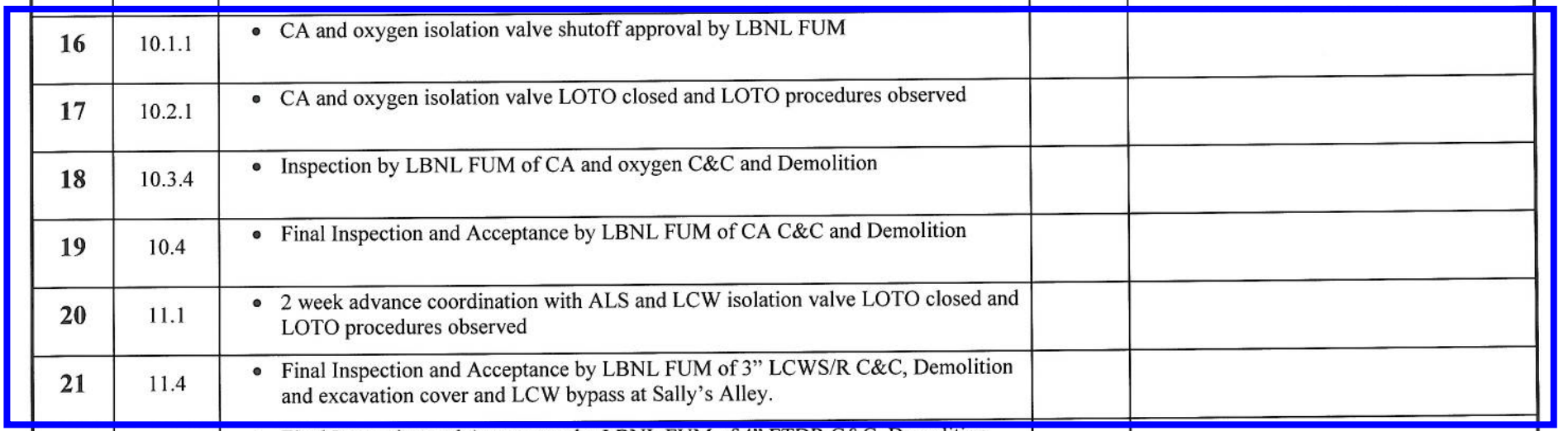
19.1 The contractor and the LBNL FUM shall work with the crafts personnel and the LBNL PM to insure that all documents impacted by the equipment removal are updated.[30]

20.0 Field Notes

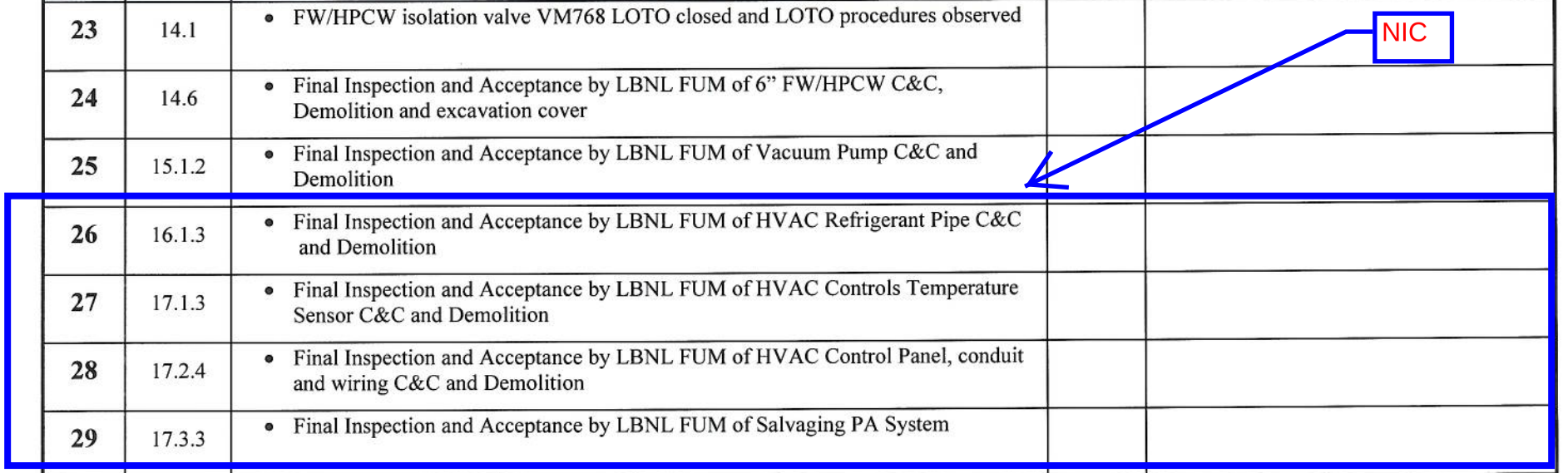
Appendix A -- Sign Off Sheet

Task	Section	Task	DATE	Signature
1	6.3.2	• LBNL FUM inspection and acceptance of C&C and sealing of 4" SS		
2	6.3.5	• Final inspection and acceptance by LBNL FUM		
3	6.4	• Locate all floor and SS drains		
4	6.4.8	• LBNL FUM inspection and acceptance of concrete plugging of all floor drain, cleanouts, and SS drains of plumbing fixtures (including sinks, water closets, and urinals)		
5	6.5.1	• Final inspection and acceptance by LBNL FUM of 3" SS C&C		
6	6.6.1	• Final inspection and acceptance by LBNL FUM of 1 /2" CD and 1 1/2" SS C&C		
7	7.1.1	• LPCW isolation valve VM59 LOTO closed and LOTO procedures observed		
8	7.2.4	• Final inspection and acceptance by LBNL FUM of excavation cover		
9	7.3.4	• Final inspection and acceptance by LBNL FUM of C&C, Demolition and rerouting of 1/2" LPCW to GWT and confirm operational.		
10	7.4.4	• Final inspection and acceptance by LBNL FUM of abandoned 6" HPCW and 4" CW C&C, and excavation cover		

Task	Section	Task	DATE	Signature
11	8.1.3	• Final inspection and acceptance by LBNL FUM of C&C and Demolition of ID		
12	8.1.4	• Final inspection and acceptance by LBNL FUM of C&C, Demolition and excavation cover		
13	9.1.1	• HPNG isolation valve VM84 shutoff approval by LBNL FUM		
14	9.2.1	• HPNG isolation valve VM84 LOTO closed and LOTO procedures observed		
15	9.4	• Final inspection and acceptance by LBNL FUM of C&C, Demolition and excavation cover		
16	10.1.1	• CA and oxygen isolation valve shutoff approval by LBNL FUM		
17	10.2.1	• CA and oxygen isolation valve LOTO closed and LOTO procedures observed		
18	10.3.4	• Inspection by LBNL FUM of CA and oxygen C&C and Demolition		
19	10.4	• Final Inspection and Acceptance by LBNL FUM of CA C&C and Demolition		
20	11.1	• 2 week advance coordination with ALS and LCW isolation valve LOTO closed and LOTO procedures observed		
21	11.4	• Final Inspection and Acceptance by LBNL FUM of 3" LCWS/R C&C, Demolition and excavation cover and LCW bypass at Sally's Alley.		
22	12.1.3	• Final Inspection and Acceptance by LBNL FUM of 4" FTDR C&C, Demolition and excavation cover		



Task	Section	Task	DATE	Signature
23	14.1	• FW/HPCW isolation valve VM768 LOTO closed and LOTO procedures observed		
24	14.6	• Final Inspection and Acceptance by LBNL FUM of 6" FW/HPCW C&C, Demolition and excavation cover		
25	15.1.2	• Final Inspection and Acceptance by LBNL FUM of Vacuum Pump C&C and Demolition		
26	16.1.3	• Final Inspection and Acceptance by LBNL FUM of HVAC Refrigerant Pipe C&C and Demolition		
27	17.1.3	• Final Inspection and Acceptance by LBNL FUM of HVAC Controls Temperature Sensor C&C and Demolition		
28	17.2.4	• Final Inspection and Acceptance by LBNL FUM of HVAC Control Panel, conduit and wiring C&C and Demolition		
29	17.3.3	• Final Inspection and Acceptance by LBNL FUM of Salvaging PA System		
30	19.1	• Updated documents to LBNL FUM		



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Appendix C – Reference LBNL Drawings

Drawing	Drawing Number	Description
1		Sheet T1 – Phase 1 Demolition Project for Bldgs 5 & 16/16A – Title Sheet
2		Sheet P0.1 – Phase 1 Demolition Project for Bldgs 5 & 16/16A – Mechanical General Notes, Abbreviations, and Legend
3		Sheet P1.1 - B5 Mechanical Site Plan Demolition
4		Sheet P1.2 - B5 Mechanical Building Plan Demolition
5		Sheet FP0.1 - Phase 1 Demolition Project for Bldgs 5 & 16/16A – Fire Protection General Notes, Abbreviations, and Legend
6		Sheet FP1.1 - B5 Fire Protection Site Plan Demolition
7		Sheet FP1.2 - B5 Fire Protection Building Plan Demolition
8		Sheet U1 - MASTU105 Area Utilities Map (4B00U105)
9		Sheet U2 - MASTU127 Area Utilities Map (4B00U127)
10		Sheet U4 - MASTU149 Area Utilities Map (4B00U149)

Appendix D -- Utility Deactivation Completion Checklist Sign Off Sheet

Project Name: Phase 1 Demolition of Old Town Buildings 5 and 16/16A

Mechanical Utility Deactivation Checklist
Building 5

SCOPE OF WORK

The project scope includes isolation and air-gapping of all mechanical systems serving the building (primarily above grade) to allow coring of concrete slabs and sub-surface soil characterization. While some cutting and capping of mechanical utilities below grade outside of the building footprint will be performed now, much of it will be subsequently performed as part of hard demolition. It should be noted that all of the "fixed equipment" inside of the building has already been de-energized and air-gapped by LBNL electricians. Except for fire sprinkler systems which are to be left active, the mechanical portion of the project scope is to conduct a planned shut-down, to close and LOTO valves as needed, to check for zero energy state and then to cut and air-gap conduits and piping primarily above grade.

Drawing Sheet Note Number	Mechanical or Plumbing Utilities	Fed from	Utility Air-Gapped (√)	Plumber's Signature	Inspector's Signature
P1.1 ITM 1	Compressed Air	Hill Air	✓		
P1.1 ITM 2	LPCW	City water	✓		
P1.1 ITM 3	LCW	B-37	✓		
P1.1 ITM 4	HPNG	Hill Gas	✓		
P1.1 ITM 5	NG	B-5	✓		