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Final Project Closeout Report

For the

991 Cluster Closure Project

Revision 0

April 2005

Remediation, Industrial DBD, and Site Services

Kaiser-Hill Company, LLC

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1. Introduction

A. 991 Cluster:

The 991 Cluster was located on the east end of the Rocky Flats Environmental Technology Site (RFETS) approximately 100 yards north of Central Avenue in the southeast corner of the Protected Area (PA) (see RFETS Plot Plan, Appendix 1, Article 1). The cluster was built in a natural depression that formed South Walnut Creek, and consisted of five buildings and two underground tunnels with four vaults. The structures within the 991 Cluster consisted of Building 984, a waste storage facility, Building 985, which contained an exhaust filter plenum, Building 989, the emergency generator for Buildings 991 and 985, Building 991, a storage and shipping facility, and Building 992, the guard post (removed previously except for the slab).

There were two tunnels that were part of Building 991. Corridor "A" went north from the east end of Building 991 and Corridor "C" went to the west from the northwest side of 991. Corridor "B", was a hallway in the shape of an inverted "Y" on the northwest side of Building 991 and tied Building 991 to Corridor "C" with the east leg, while the west leg went outside from Corridor "C". Corridor "A", 190' long, lead to one vault, 998, at the end of the corridor. Corridor "C", 600' long, contained three vaults, 996, 999, and 997, spaced equally through the 600'.

A transformer substation was part of the cluster (no building number) as were propane boilers located outside on separate foundations (no building number). See the Cluster Map (Appendix 1, Article 2) for building locations.

In general, the D&D effort included decontamination and hazardous substance removals, dismantlement of some equipment, ducting, and piping systems, and demolition of the entire cluster to a minimum of 4' below final finish grade. Decontamination was limited to minor radiological clean-up in Building 991, and removal of hazardous substances included asbestos, beryllium, and RCRA items. The most significant effort was the demolition of Building 991, including part of Corridor "A" and most of Corridor "B". The project included removal of the Building 992 concrete slab and the demolition of Buildings 984, 985, and 989. Also removed were the transformers, boilers, foundations, concrete retaining walls, sidewalks, power poles, fencing, and pavement. Finally, the site was filled and rough graded in accordance with the "Land Configuration Design Basis IA Grading and Drainage Concept" (Appendix 1, Article 3).

The 991 Cluster Closure Project was completed in accordance the RSOP for Facility Component Removal, Size Reduction, and Decontamination Activities (DOE 2002c); and the RSOP for Facility Disposition (DOE 2000b). This document summarizes the actions taken and the final condition of the Building 991 Cluster.

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B. Building 984:

Building 984 was built in 1986 for additional waste storage capacity (see Appendix 1, Article 4 for building layout). It was a metal skinned building 75' long by 28' wide and 16' high. Support was provided by eight columns on pier foundations approximately 4' square with a 12" wide by 5' deep stem wall around the perimeter of the building. The floor was 5" of reinforced concrete. There was no radiological or beryllium contamination found in Building 984 and there was no asbestos containing building materials used during the construction of the building.

C. Building 985:

Building 985 was built in 1973 and housed the filter plenum to control air emissions from Corridor "C" and Vaults 996, 997, and 999 (see Appendix 1, Article 5 for building layout). Prior to 1973 exhaust filtering for Corridor "A" and the vaults was done through filtering systems in Room 402 which was the room formed by the two legs of Corridor "B". Building 985 straddled Corridor "B" such that the exhaust duct from Corridor "C" went through Room 402 and up through the floor of Building 985. Building 985 housed the exhaust plenum, a building supply air plenum, the exhaust fans, Health/Physics vacuum pumps, ducting, piping, and electrical service. There was also a pit against the east end of the building which contained a tank to collect plenum deluge water in the event of a fire in the plenum.

Building 985 was 40' wide x 60' long x 16' high. The floor was 8" of reinforced concrete with 1' x 5' reinforced grade beams around the perimeter and four additional internal grade beams, 1' x 5', spanning the short side. Eleven caissons in varying sizes, from 2'-6" dia. x 17' deep to 3'-0" dia. X 34' deep, were spaced around the perimeter grade beams. Two more caissons, 2'-0" dia. x 22' deep were under the entrances, and three, 2'-0" dia. x 13' deep were under the interior walls of the pit. The walls were pre-cast concrete panels nominally 6" thick, and the ceiling was pre-cast concrete Twin Tee's insulated with a built-up bituminous asphalt roofing top surface.

D. Building 989:

Building 989 was a small building, 16' wide x 24' long x 12' high, that housed the emergency generator in case of power loss to Building 991 (see Appendix 1, Article 6 for building layout). The building also housed the generator controls and diesel fuel day tank. Built in 1973, the exterior was 8" concrete block with #5 vertical reinforcing bars placed periodically in grout filled cores. The floor was 6" reinforced concrete with stem wall footers 8" wide x 5'-0" deep. The ceiling was 5" reinforced concrete with built-up bituminous asphalt roofing felts.

Initially, fuel was supplied from an underground tank just to the east of Building 989. That tank, approximately 5' in diameter by 10' long, was filled with foam, closed in 1997, and replaced with an above ground diesel fuel tank.

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E. Building 991:

The primary building in the 991 Cluster was the waste storage facility, Building 991 (see Appendix 1, Article 7 for building layout). Building 991 was one of the original four facilities that began construction in 1951 to establish a site that could manufacture and assemble nuclear weapons trigger components. Building 991 was the first building completed and occupied in 1952, so initially the facility served the machining, assembly, storage, shipping, and administrative functions for weapons component manufacturing. The machining and administrative effort only lasted until other facilities were completed in 1953, at which time the facility served only as the final weapons component assembly, storage, and shipping facility. In 1957 the facility's primary mission shifted to shipping, receiving, and storage. During the 50's and 70's a number of research and development projects were conducted in the building including radiation studies and a beryllium coating process. Early in 1990, production at RFETS was shut down pending rigorous safety upgrades site-wide. With the end of the "cold war" a few years later production never resumed at the site and Building 991 was converted to a waste storage facility to support closure activities for the site.

Building 991 was a cast-in-place concrete building that, in it's final state, was approximately 156' wide by 275' long, not including Corridors "A", "B", and "C" or the covered storage area on the west end of the building. The facility was divided into three functional areas: the south, the middle, and the north areas. The south side served the administrative function and, at one time, included a cafeteria, the middle area was warehouse and mechanical rooms, and the north area was where the classified vaults and NDT Testing Vaults were with additional rooms for some research and development projects. The south section was 4" concrete exterior wall, with interior offices constructed primarily of Transite, which contained asbestos in excess of 1%. The center section was constructed of thicker concrete, and the north section had the thickest concrete ranging from a nominal 12" to 36" in the NDT vaults. Interior walls of both the center and north sections were concrete walls and metal stud walls with metal skins.

All three corridors, "A", "B", and "C" (Appendix 1, Article 8) had walls, floors, and ceilings of nominal 15" concrete. Two-thirds of Corridor "A", a small part of Corridor "B", and all of Corridor "C" were left in place. All four vaults were left in place. Vaults 996 and 997 have walls 14' thick with ceilings and floors at 12' thick; Vault 998 has 24" thick walls, ceiling, and floor; and Vault 999 has 18" and 24" thick walls with 24" thick ceiling, and 6" thick floor.

There were four major additions to Building 991 between 1959 and 1984. In 1959/60 the Radiography addition was built on the northeast corner of the building. The Radiography addition included the two Non-Destructive Testing (NDT) vaults with 3' thick concrete walls. In 1964 the east dock and maintenance shop were built south of the NDT vaults followed the same year by the container storage canopy. The container storage canopy was just a metal roof and columns on the west side of the building extending to and down the concrete retaining wall at the west perimeter of the site. The last addition took place in 1984 when the new shipping warehouse was

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built on the west side of the center section of the building. It was a metal structure with metal roof and metal sides where it extended beyond the north and south sections of Building 991.

F. Building 992:

Building 992, the guard post for Building 991, was completed at the same time Building 991 was (see Appendix 1, Article 9 for foundation layout). The guard post was removed in 2002, but the slab was left in place due to discovery of high volatile count in the soil. The soil was covered and left at the site until the 991 Cluster demolition. The slab was typical stem wall and footing construction 4' deep with a nominal 5" reinforced floor.

G. Miscellaneous Structures:

Eight-foot high wire fencing encompassed the entire cluster. A number of power poles and wiring fed power to the cluster and primary 13.8 kv transmission lines, and "H" structure ran north-south at the east end of the 991 Cluster. A paved road exited the south side of the cluster, turned 90° and went north to the top of the hill where it joined Spruce Avenue. The area around most of the cluster was paved and sidewalks went from the southwest corner of the 991 Cluster site to 10th Avenue and an asphalt walkway went due west to the 750 PAD (see Appendix 1, Article 2).

II. Action Description

A. Utility Isolations

<u>1. Building 984:</u>

The only utilities servicing Building 984 were water (for fire suppression system) and electricity. The water service was air-gapped underground on the west side of the building approximately 20' from the building line. The line from the air-gap to the building was removed with the building demolition and the rest of the line to the PIV was removed during final grading of the site. The electrical feed was to the east side of the building. The overhead feed lines were air-gapped at the power pole approximately 20' east of the building, and then air-gapped inside the facility at the distribution panel to assure there were no other lines feeding the facility. The power pole and power lines were also eventually removed.

<u>2. Building 985:</u>

Utilities servicing Building 985 included water for fire suppression and electrical power. The water line was air gapped underground just outside the west windbreak and removed from there into the building. Primary electrical service came in the east side of the building from Building 991. The secondary electrical source was through the emergency generator in Building 989. Once power was shut down in Building 991 and the electrical generator disconnected from the circuits the service to Building 985 was air-gapped. During demolition all the wiring and conduits to Building 985 were removed.

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3. Building 989:

Utilities servicing 989 included fire suppression piped overhead from the fire suppression system on the east dock of Building 991, and electrical power. There were also fuel oil lines from both the underground tank (out of service) and the new above ground tank. The fire suppression was disconnected at the east side of the Building 991 dock and removed to Building 989. Electrical power for Building 989 was fed underground from 991. The wires were cut at both ends and pulled out of the conduits. The fuel lines from the underground tank were removed along with the underground fuel tank during demolition and the fuel and coolant lines (above ground) for the new aboveground fuel tank were removed prior to removal of the aboveground fuel tank.

4. Building 991:

Utilities servicing Building 991 included water, electricity, steam, natural gas, and sewer. Three water lines provided domestic water and fire water; two lines entered the building on the east side of the south basement utility corridor, and one served the new dock addition, Room 170. Approximately 30' west of the building two of the lines were exposed and air-gapped underground (including the one to the new dock). The third was exposed and air-gapped underground approximately 10' west of the building. All three lines tied into the main 10" domestic water line that entered the site from the west side. Approximately 10' west of Building 991 the water line reduces to 6", and headed south then turned east approximately where the new drainage ditch was constructed during final grading of the site. From that point to where it turned back north (to Building 995) on the east side of Building 991, the line was removed so it did not interfere with the new drainage ditch. Fire hydrants and some post-indicator valves were removed during final grading to completely restore the 991 Cluster site.

Electricity was fed to Building 991 from two transformers on the east side of Building 991. In the event of power loss the emergency generator in Building 989 provided emergency power. The wires were cut at the transformers and pulled back to where they entered Building 991 on the east side. The wires to Building 991 from the emergency generator were also cut and removed from the conduit.

Steam entered the building on the northeast corner, but was shut off in 1998 when the building converted the heating system to natural gas. The steam lines were removed from the site just prior to demolition under a separate project. Natural gas was used to fuel the boilers that replaced the steam heating system until 2002 when gas was replaced with propane using the same line used for natural gas. The natural gas/propane line was routed in overhead stanchions with the steam line and was disconnected near the propane tank farm near 10th Street and the South Patrol Road. The line was then purged all the way to the boilers at Building 991 in October 2003, and subsequently removed with the steam line.

The sewer line was routed through the basement corridors intercepting all floor drains and sanitary waste drains and directing them to the sewer manhole on the northeast corner of the building. A sump was in the northeast corner of the south basement

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corridor and all basement floor drains were run to the sump and from there piped to the sewer. The roof drains were also collected in the basement and routed to the sewer. The building basement floor drains were all left in place with the basement; however the lines all tie into the basement sump. This sump was filled with dirt and the sewer manholes were grouted and disrupted.

The sewer line from the manhole to Building 995 was grouted at both upstream manholes (197 and 198) just outside the building and at the down gradient manhole (148), and the line was left in place at just over 4' below grade. Additionally, two 4-inch sewer lines that were previously abandoned were left in place at more than 3' below final grade.

B. Decontamination and Hazardous Substance Removals

1. Building 984:

No radiological decontamination, beryllium, or asbestos abatement was required in Building 984. RCRA designated hazardous materials removed included fluorescent and incandescent light bulbs, mercury switches, and circuit boards.

2. Building 985:

No decontamination or asbestos abatement was required in Building 985. Even the plenum which had beryllium awareness signs posted on the doors was not contaminated radiologically or with beryllium and neither was any of the ductwork, hood, or Health/Physics vacuum piping. RCRA designated hazardous materials removed included fluorescent and incandescent light bulbs, mercury switches, and circuit boards.

3. Building 989:

No decontamination or asbestos abatement was required in Building 989. RCRA designated hazardous materials removed included fluorescent and incandescent light bulbs and a mercury switch. Fuel from the day tank and the outside aboveground tank was removed and transferred to the B331 group fuel tank.

4. Building 991:

In spite of assembling and storing nuclear components and conducting radiation studies in Building 991, there was very little radiological contamination found in the building. There were four areas in the building that were found to be radiologically contaminated. The small water trough in the west leg of Corridor "B" had several small spots of plutonium contamination that were decontaminated to below releasable levels. The trench, itself, was left in place since the floor of the Corridor "B" was in excess of 20' below proposed final grade for the area. The second area of radiological contamination was uranium contamination under a locker in the Men's Locker Room, Room 156. The uranium was decontaminated to below releasable levels and the concrete was removed and disposed of during demolition. A third area also had uranium contamination on the north wall of Room 170. It was found during Pre-Demolition Surveys and was also decontaminated below releasable levels and the

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wall removed during demolition of the building. The fourth area was caused by a smoke detector inside the exhaust duct in the west leg of Corridor "B". Many years ago the smoke detector, containing americium, failed and the americium was spread through several pieces of ductwork. That ductwork was removed and packaged in a Low Level Waste (LLW) IP-2 container for shipment to the Nevada Test Site (NTS).

The beryllium coatings research resulted in beryllium contamination above releasable limits in the basement, in Room 150, the ductwork from Room 150 to the rooftop filter plenum, the southeast corner of the rooftop plenum, and a couple of elevated samples in the overheads in the north hallway. Dust containing beryllium was found on the top of all the piping in the basement corridors. Asbestos insulation also covered a number of the pipes in the basement, so the beryllium decontamination was conducted in conjunction with asbestos abatement with the exception of the fire sprinkler lines, which had to remain operable until all combustibles were out of the building. All the piping in the basement corridors was removed and either wrapped in plastic (asbestos insulated pipes) or sprayed with a fixative solution and loaded in roll-offs for transport to proper disposal sites. The two fire deluge tanks and pumps in the basement were also removed as beryllium waste as were the sump pumps. Since the basement was left in place it was completely stripped of all equipment, piping, conduit, and lighting.

The beryllium in room 150 was concentrated primarily in ductwork that at one time was connected to a hood in the room that had been previously removed. The ductwork ran through and along the top of the roof into the southwest corner of the rooftop plenum, and was removed utilizing injected foam to plug and contain the beryllium where the ducting was cut apart. Once removed the ends of the duct were wrapped with plastic and taped to the duct. All the duct pieces were disposed of as beryllium contaminated sanitary waste. The plenum was vacuumed in the area of the beryllium contamination and sprayed with a fixative solution to seal the beryllium. The entire plenum was then demolished with the rest of the building.

The area where beryllium was found in the north hallway was sealed off with plastic, including plastic on the floor, and all the ducts, pipes, and conduits were sprayed with a fixative solution to seal the beryllium. All the ducts, pipes, and conduits were removed with the building demolition.

Nearly all the walls in the office area on the south side of the building were Transite containing asbestos in excess of 1%. There were also pipes and equipment insulated with asbestos containing materials throughout the facility. The entire south side of the building, except the cafeteria, which was used as the step-off pad, was sealed off with plastic before the work began. All the Transite walls were removed. Asbestos insulated piping was wrapped in plastic and removed as component removal. Pipes insulated with asbestos, either the entire pipe or just the fittings ran throughout the facility. The component removal process was utilized to remove the piping and/or fittings. The mechanical room, Room 130, contained some piping, ducting, and equipment with asbestos containing insulation. Where possible the insulation was removed with the duct or pipe, however, some equipment required the asbestos insulation to be stripped off. There were also asbestos partitions removed from the

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compartments in one of the old motor control centers. All the asbestos was disposed of as asbestos containing sanitary waste at proper disposal sites.

Due to the age of Building 991 and various additions over the life of the building the floors had both asbestos impregnated tiles and tiles that did not contain any asbestos. Since the asbestos impregnated tiles were considered non-friable unless crushed and/or pulverized, it was decided to leave all the tiles in place during demolition removing what could be easily removed with the heavy equipment and leaving the rest in place. A Contact Record, dated February 11, 2004 (Appendix 2, Article 3), was written to reflect this decision and subsequent approval. Following are the room numbers and description of the floor tiles in Building 991 that tested positive for asbestos (see building map, Appendix 1, Article 7):

- Room 124 – 12" white & green vinyl tile 7% Chrysotile
- Room 124 – 9" white, beige, & tan vinyl tile 12% Chrysotile
- Room 126 – 12" white & green vinyl tile 7% Chrysotile
- Room 131 B – 12" gray & white floor tile 7% Chrysotile
- Room 160 – 12" gray & white floor tile 7% Chrysotile
- Room 153 – 12" gray & white floor tile 7% Chrysotile

Six other samples were taken from 12" tiles in Rooms 124, 242, 245, 247, 266, and 275 that did not detect any asbestos in the tiles. Even though nearly all the rooms in Building 991 had vinyl tile on the floor no other samples for asbestos were taken. It was generally felt that there were other asbestos tiles in the building, but since nearly 100% of the tiles were removed mechanically with heavy equipment during the demolition it was not considered an issue of concern.

The only PCB's that had been in the facility were in the transformers located on the east side of the facility and those had been previously converted some years ago to non-PCB oils. RCRA regulated materials removed from the building included light bulbs, both incandescent and fluorescent, mercury switches, and circuit boards. A number of light ballasts were found to be leaking, were removed, and disposed of as TSCA waste.

C. Dismantlement

1. Building 984:

The only dismantlement activities in Building 984 were limited to removal of a floor mounted jib crane and floor-mounted transformer, both in excellent shape, for resale through Property Utilization and Disposal.

2. Building 985:

Dismantlement activities included removal of a compressor and the Health/Physics pumps for resale. The filters in the filter plenum were also removed and disposed of as sanitary waste since they were not contaminated with beryllium.

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3. Building 989:

Prior to demolition the Emergency Generator, control panel, and the above ground diesel storage tank were removed for resale.

4. Building 991:

A compressor and chiller, ducting, piping, and conduits in Room 130 were removed in order to get to asbestos insulated items during the asbestos abatement. A compressor from the east dock of Building 991, the propane boilers on the east end of the building, and miscellaneous cabinets and furniture were removed for resale.

D. Pre Demolition Survey (PDS)

All the buildings in the Building 991 Cluster were characterized for radiological and hazardous substances and results detailed in a Reconnaissance Level Characterization Report filed previously with CDPHE. Since Buildings 985 and 991 along with Corridors "A", "B", and "C" and Vaults 996, 997, 998, and 999 were designated as Type 2 facilities, a Pre-Demolition Survey was required to be performed, and a Pre-Demolition Survey Report submitted to the CDPHE. Approval to proceed was received from CDPHE prior to beginning the demolition of these facilities. A detailed Pre-Demolition Survey Report for Buildings 985 and 991 along with Corridors "A", "B", and "C" and Vaults 996, 997, 998, and 999 is included in this close-out report under Appendix 3, Articles 1 and 2.

E. Demolition

1. Building 984:

Building 984 was demolished in two steps. The superstructure of the building was demolished to floor level and disposed of as sanitary waste in October 2003, however, the slab was left in place as supplies storage (trailers) for the asbestos abatement crew. In January 2004, the entire floor, stem wall foundation, and the column support piers of the building were demolished. There were no contamination issues with Building 984, but as is policy, the underside of the slab and foundations were surveyed for radiological purposes. There were no radiological issues, and the slab was also disposed of as sanitary waste at the BFI Foothills Landfill. The depressions made by removal of the foundation were back-filled with clean soil from identified borrow areas on the RFETS site.

2. Building 985:

The superstructure of Building 985 was demolished in November 2003, including demolition of the supply and exhaust plenums inside the building, the exhaust fans, the deluge tank in the pit, various pumps, and all the piping, ducting, and conduit. All was disposed of as sanitary waste. Initially, the plans were to only remove the shell of Building 985 and leave the slab and foundations in place since they were at least 4' below the proposed finish grade for the area. Therefore the deluge tank pit was filled with compacted dirt and the slab left in place for a couple of months.

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After the issues with the foam in Corridor "B" of Building 991 (see Building 991 Demolition below) the decision was made to remove the slab. In April 2004, the slab and grade beams were removed entirely and the pit was removed down to just below the top of the Corridor B roof as were the caissons. The underside of the floor and foundations were surveyed for radiological contamination. There were no radiological issues, and the slab was also disposed of as sanitary waste at the BFI Foothills Landfill.

3. Building 989:

Building 989 superstructure and slab was demolished in November 2003; however, the pad for the above ground tank (tank previously removed for resale), the control box, with pad, the previously closed underground diesel storage tank, and all the piping were underneath energized 13.8 Kva power transmission lines. The overhead 13.8 Kva power lines were de-energized in April 2004, and those items were removed at that time. Radiological surveys validated the underside of the concrete was uncontaminated and the rubble was disposed of at the BFI Foothills Landfill.

4. Building 991:

In August 2003, preparations began to close Corridor "C" and Vaults 996, 997, and 999 on the west side of Building 991. The corridor and vaults were stripped of all ducting, piping, lights, conduit, and the asbestos insulated water line that ran the length of the corridor. The damaged and loose asbestos floor tiles in Vault 966 were removed, all of the other asbestos tiles were left in place. Once the strip-out was completed a pre-demolition survey was conducted in the corridor and vaults; the PDSR was prepared and submitted to CDPHE for approval. The PDSR validated the corridor and vaults did not contain any radiological material. In early September 2003, Corridor "C" and the vaults were sealed with a foam plug and left in place. The foam plug was injected right at the main vault type door leading to Corridor "C". The plug was four feet in depth and went wall to wall, floor to ceiling to completely seal the tunnel. A small trench, approximately 4" wide and 2" deep, ran the entire length of the south side of Corridor "C", into Corridor "B", under the vault door, continued down Corridor "B", and exited out into the courtyard. A board was placed over the trench as it passed under the foam plug such that foam would not fill it, and it would continue to allow any accumulated water to flow out of Corridor "C".

Since Corridor "A", Vault 998, Corridor "B", and Room 402 would be 4' to 15' below the final finish grading of the site, it was also planned that they would be left in place and sealed with a foam plug (see Appendix 2, Article 1). All the areas to be left in place were stripped of any asbestos, ducting, piping, conduits, etc., and a PDS was performed. After receiving approval to proceed with the foam plugs the foaming evolution began on February 2, 2004, beginning with the plug in Corridor "A". That foam plug was placed approximately 60' north of the entrance to Corridor "A" from Building 991. The plug was wall to wall (8'), floor to ceiling (18'), and 12'-6" in length. The next foam plug placed was in the entrance to the west end of Corridor "B". That plug was also wall to wall (10'), floor to ceiling (12'), and 18' in length. The plug in the east end of Corridor "B" was wall to wall (8'), floor to ceiling (8'), and approximately 10' deep around a small dogleg to the north. The last foam plug was in

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Room 402 situated between the west and east legs of Corridor "B". As discussed in the Contact Record, dated February 2, 2004 (Appendix 2, Article 2), the entire room was filled with approximately 6' of foam to mitigate subsidence in the event the roof of the room collapsed in the long term (500 to 700 years). Additionally, a plug extending 6" to 12" above and to the side of the door opening by 4' deep was placed at the entrance to the room. That was the final foam plug installed and was completed on February 5.

On February 12, workers at Building 991 detected a strong odor and subsequent investigation revealed smoke emitting from a series of vents in Room 402. An emergency call mobilized the fire department and they began injecting water into a conduit penetration above the door to Room 402. A full report on the incident is included as Appendix 7. After two weeks the smoke ceased and after a number of tests including temperature readings it was determined that it was the west entrance to Corridor "B" where a fire or smoldering of the foam plug had occurred. Once it was determined the fire (smoldering) was complete preparations were made to go in and remove the burned and/or charred foam in the west entrance to Corridor "B". With the foam removed from the west entrance there was no good way to replace the foam. The decision was made to remove the Building 985 slab above Corridor "B", remove the ceiling of Corridor "B", and remove the foam in the east end of Corridor "B" and Room 402.

The decision was also made to leave the foam plug in Corridor "A" in place if the foam could be shown to be in good shape and not burned. Three holes were drilled horizontally into the foam to a depth of 10' to 11' and a fiber optic camera inserted. The camera revealed that the foam had a lot of air pockets toward the back of the plug, but that the front 3' to 4' of the plug was in good shape, properly cured, and with no sign of charring or harmful heat build-up. Permission was requested and received from the CDPHE (Appendix 2, Article 4) to leave the foam in place and proceed with the original plan to leave all but the initial 60' of the corridor and the vault in place.

Demolition of Building 991 began on March 9, 2004, beginning in the southwest corner and working toward the northeast corner of the building. Since part of the building would be 4' or more below final finish grading of the site not all of the building was removed (see Appendix 5, Article 1). The north wall was partially left in place removing only enough of the wall to assure the top of the concrete would be 4' to 6' below finish grade. This resulted in the wall tapering from a height of approximately 12' at the northwest corner to floor level at the east end where the NDT vaults had been. The basement corridors were left in place, as was most of the main floor. The southeast section of the main floor was removed at a diagonal from a point along the south side approximately 80' from the southwest corner to the northeast corner (the NDT Vault, Rm. 165). The main floor portions over the top of the basement corridor were also removed so that the basement corridors could be filled with native soil and compacted. All the interior walls were removed to floor. As reflected in the Contact Record, dated February 11, 2004 (Appendix 2, Article 3), dirt and/or rubble was used as a cushion between the floor and any crawler type equipment to avoid pulverizing the asbestos tiles left on the floor. Additionally, water was used during demolition that kept the tiles wet. The heavy equipment was able to

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remove nearly 100% of the tiles and they were hauled to the landfill with the rest of the rubble as asbestos containing non-routine sanitary waste. Air monitors were set up around the building in various locations during the demolition of the building to monitor for asbestos. There was no asbestos detected by the air monitors during the demolition (see Appendix 4, Article 1 [3 pages]).

The foundation wall on the south side was removed to existing grade from a point approximately 80' from the southwest corner to a point approximately 135' from the southwest corner. From there the remainder of the south and east foundation wall all the way to the east foundation of the NDT Vaults was removed entirely. The underside of all concrete removed from the floors, foundation walls, and footings were surveyed for radiological contamination. Radiological surveys validated the underside of the concrete was uncontaminated and the rubble was disposed of at the BFI Foothills Landfill.

The ceiling of Corridor "A" was removed to within 4' to 6' of the foam plug that had been installed approximately 60' from the entrance into Corridor "A". The side walls were then removed on a diagonal from where the ceiling was left to a point approximately 2' above the floor level at the entrance to Corridor "A" (see Appendix 5, Article 5). As discussed earlier, Building 985 slab was removed exposing the top of corridor "B". The ceiling of Corridor "B" was removed to within 4' to 6' of the foam plug at the entrance to Corridor "C" and the vaults. In addition to the ceiling, the front wall of the west entrance to Corridor "B" and Room 402 was removed in its entirety and the walls of the corridor and Room 402 partially removed (see Appendix 5, Articles 2, 3, and 4). After all the remaining foam in the east entrance to Corridor "B" and the foam in Room 402 was removed, the entire length of Corridor "A" south of the foam plug, Corridor "B", and Room 402 were filled with compacted dirt during backfill operations.

It should be noted that rumors and stories of the early days at RFETS led to the belief that there were possible hidden rooms in the basement of Building 991. Early in the project, holes were drilled in the basement corridor walls around the middle of the building area where it was suspected the hidden room(s) were located. Those initial borings revealed no voids or any sign of hidden rooms. As demolition progressed an effort was made again to find possible voids under the main floor in areas suspected of being hidden rooms. Holes were put through the main floor in northwest corner of the building and again through the center of the building where it appeared patches were put in the floor of Room 134. Again, no voids and no hidden rooms were found. Finally, the last area suspected of having a possible hidden room underneath it was Room 130, the mechanical room, on the east end of the building. In that area the floor was removed entirely revealing only native dirt underneath.

All the fencing in the entire 991 Cluster was removed along with the post foundations. All power poles and wiring was removed except for the primary 13.8 kva feeder lines, "H" structure, and power poles that ran north-south at the east end of the 991 Cluster. The two transformers at the base of the "H" structure that fed power from there to Building 991 were removed, as were the foundations they were resting on. The propane boiler foundations on the east end of Building 991 were also

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removed. All paving and sidewalks were removed including the concrete sidewalk and stairs that went out the southwest comer of the 991 Cluster site all the way to 10th Street, and the asphalt walkway that went due west to the 750 PAD, including the stairway at the west end. The Building 992 slab was also removed along with a shielded cable that ran underground to Building 991. The dirt pile left, due to high readings for volatile compounds, was removed since the high readings had long since subsided. A sampling well had been installed on the east side of the guard post downstream of the dirt pile to assure no volatile compounds had migrated into the groundwater. The samples did validate there were no volatile compounds present in the groundwater and the soil pile was loaded out as sanitary waste. The sampling well was properly abandoned per state regulations and Kaiser-Hill's contract requirements.

The backfill operations for the Building 991 Cluster began in 2004. The first stage used soils from the 371 borrow area and the area was filled to 4' below finish grade. The material was spread and compacted utilizing a sheep's-foot roller and large dozer. The second stage, for the final 4' used soils from RFETS borrow areas at the South Patrol Road and Perimeter Security Zone south of the 991 Cluster site. The site was filled and graded to the final grading profiles as shown in the final Land Configuration Design Basis IA Grading and Drainage Concept, Building 991 (Appendix 1, Article 3).

III. Verification That Action Goals Were Met

Five objectives were established for the 991 Cluster Removal Project prior to beginning the demolition:

A. *Decontamination of the facilities (as necessary) to support release for decommissioning per site approved procedures.*

Only Building 991 had any radiological contamination and it was limited to four areas. Small spots of plutonium over the free release standards were in the trench in the west leg of Corridor "B". A spot of uranium, approximately 12" in diameter, was on the underside of a locker in the Men's room. A spot of uranium, 12" in diameter was found on the north wall of the new warehouse section, Room 170. The fourth area, the exhaust duct in the west leg of Corridor "B", had americium inside the duct from a smoke detector that had failed some years ago. The trench in Corridor "B" was decontaminated to free-release standards and left in place with Corridor "B". The two areas contaminated with uranium were decontaminated to free-release standards and disposed of in the off-site landfill. The ductwork containing traces of americium was removed and put in IP-2 LLW waste boxes and shipped to the LLW repository at NTS (see Section VII.E).

B. *Complete decontamination and decommissioning activities in a manner that is protective of site workers, the public and the environment.*

Decontamination and decommissioning activities were completed within regulatory requirements. Radiological decontamination discussed in III.A above was performed

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by workers in full face respirators, Tyvek coveralls, gloves and booties with Radiological Technicians present full-time during the decontamination activity.

In addition to radiological decontamination, asbestos and beryllium abatement were required in Building 991. Both asbestos and beryllium abatement operations were performed in the same personal protective equipment (PPE) as was the radiological decontamination above. In the basement beryllium contamination was found in Room 150 and on the tops of much of the overhead piping. Abatement activities included application of a wetting solution to control the beryllium before performing any intrusive work activities. Asbestos insulated lines were wrapped in plastic prior to disposal and the non-insulated-piping, conduit, and lighting was sprayed with a fixative solution prior to disposal. All abatement activities in the building were done in containment with filtered air circulation.

There was beryllium contamination in a run of ductwork on top of the building. That beryllium was contained by drilling holes in the duct (under negative air pressure), and injecting foam plugs about 18" long inside the full circumference of the duct thereby sealing the beryllium inside the duct. Once the foam hardened the duct was cut through the foam plug and plastic was taped around the ends to ensure all beryllium was sealed within the ducts. The ductwork was then placed in covered roll-off containers and disposed of at an off-site landfill. Area and personnel air sampling methods were utilized to ensure asbestos and beryllium was contained. Wet methods, via fire hydrant and hoses, were used to control dust and asbestos from the floor tiles during demolition.

During the foam fire in the west Corridor "B", air samples were taken periodically for noxious and harmful products of combustion such as Hydrogen Cyanate. Before efforts to clean out the foam began temperature probes were used to assure the foam had ceased burning. All precautions were taken to ensure harmful substances did not get in the air or water and workers dressed accordingly, even utilizing supplied air packs until the full extent of the products of combustion were analyzed and understood.

C. *Demolish the 991 Cluster facilities structures, utilities and process lines to 4' below grade.*

All concrete from the 991 Cluster was removed to a minimum of 4' below final finished grade as defined by the Land Configuration Design Basis IA Grading and Drainage Concept (Appendix 1, Article 3). As discussed in Section II of this report sections of Building 991 were left in place since they would be 4' or more below final finish grade. Those sections include all of the basement level (filled with compacted dirt), approximately 60% of the main floor (southeast portion removed), the north wall of the building tapered to the east to maintain a minimum of 4' below grade, Corridor "A" and the 998 Vault (except the ceiling and part of the walls for the first 55'), all of the floor and part of the walls in Corridor "B" and Room 402, and all of Corridor "C" and Vaults 996, 997, and 999. See Appendix 5, Articles 1 through 5.

All utilities were removed to 4' below grade, except those noted in Section IX as uncontaminated utilities that were left in place and the approximate depth of those

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utilities. All the Process Drains were self-contained in portable tanks that were removed with Building 991. All floor drains in 991 went into the basement, then into the sewer manholes on the northeast corner of the building; the sewer manholes were grouted and disrupted.

The sewer line from the manhole to Building 995 was grouted at both upstream manholes (197 and 198) just outside the building and at the down gradient manhole (148), and the line was left in place at just over 4' below grade.

D. *Decommissioning the 991 Cluster facilities in accordance with RFCA and applicable or relevant and appropriate requirements.*

RFCA and other relevant requirements were complied with throughout the project. Any deviations from RFCA decision documents are noted in Section VIII.

E. *Coordinate with Environmental Restoration for characterization of soil under slabs. Backfill subsurface structures with clean fill and provide for reclamation of the site by re-contouring and re-vegetation.*

Environmental Restoration took a number of samples under the floor and under the basement of Building 991. There was no radiological or chemical contamination under the slabs (Appendix 4, Article 2). All other dirt on the site was below the Tier II action level and put back in the excavations or mixed with rubble and sent to sanitary waste landfill.

The final grade was achieved with fill dirt from on-site borrow pits. Approximately 7875 cubic yards was required to attain proper grade as defined in the Land Configuration Design Basis IA Grading and Drainage Concept (Appendix 1, Article 3). Once at proper grade the entire area was re-vegetated with native grasses. Final grading and re-vegetation was completed in late April 2005.

IV. Verification of Treatment Process

Suspected Under Building Contamination (UBC), Potential Areas of Concern (PAC), and IHSS areas were all present at the 991 Cluster Closure site. During much of 2003 and early 2004, prior to demolition, extensive borings were taken in the 991 Closure Cluster site (see Appendix 4, Article 2 [3 pages]) to determine if special treatment processes would be necessary to clean radiological or chemical contamination of the area. All of the surveys from the borings indicated levels of radiological or chemical contamination were well within permissible guidelines and no treatment of the area under Building 991 or in the area around it was required.

V. Radiological Analysis

Appendix 3 of this document contains the following Pre-Demolition Survey Reports (PDSR):

- Area 2 - Group 2a Closure Project (991 West Tunnel and Buildings 985, 996, 997, 999), dated August 21, 2003
- Building 991, 991 East Tunnel and 998 Vault Closure Project, dated February 4, 2004

The other facilities in this cluster were covered under the following Type 1 Reconnaissance Level Characterization Reports (RLCR):

- Type 1 Reconnaissance Level Characterization Report (RLCR) for Building 984 Closure Project
- Type 1 Reconnaissance Level Characterization Report (RLCR) for 989, 992, & 993 Closure Project

VI. Demolition Survey Results

Since there were no levels of radiological emissions expected from the demolition of Building 991, there was no specific Air Quality Management (AQM) Program for Performance Monitoring for Radionuclides (PM-rad) set up. There was, however, RFETS perimeter monitoring that goes on continuously at RFETS and there were monitors near 991 during demolition. No activity at or exceeding action level 1 was observed during demolition of Building 991 and no significant contribution to off-site dose resulted from this demolition.

Due to some asbestos tiles being left on the floor of Building 991 during demolition, asbestos air samplers were set up as close to the demolition work as possible to monitor for any asbestos release. Twenty samples were collected during the demolition of Building 991 and the Transition Electron Microscopy (TEM) indicated no asbestos fibers on the any of the sample filters (Appendix 4, Article 1 [3 pages]).

VII. Waste Stream Disposition

A. Sanitary Waste Disposal

Disposal Site:	BFI Foothills, Hwy. 93
Number of shipments:	851
Type of shipment:	Rear dump trucks
Waste Volume:	17,020 cubic yards (estimated)
Waste Weight:	12,129 tons
Dates Shipped:	March 10 through May 7, 2004
Additional Information:	Concrete, rebar, metals, dirt and general rubble

B. Asbestos Containing Material Disposal

Disposal Site:	BFI Tower Road
Number of shipments:	9
Type of shipment:	Roll-Offs
Waste Volume:	260 cubic yards (estimated)
Waste Weight:	53.9 tons
Dates Shipped:	November 10, 2003 through January 12, 2004

C. Beryllium Contaminated Waste Disposal

Disposal Site:	BFI Tower Road
Number of shipments:	3
Type of shipment:	Roll-Offs

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Waste Volume:	90 cubic yards (estimated)
Waste Weight:	2.6 tons
Dates Shipped:	February 10 through February 11, 2004

D. Hazardous Waste Disposal

1. Circuit Boards

Disposal Site:	Kettleman Hills Facility, CA
Number of shipments:	1
Type of shipment:	IP-2
Waste Volume:	4.15 cubic yards
Waste Weight:	750 lbs. (estimated)
Dates Shipped:	Unknown – shipped with other containers from RFETS

2. Lights, Switches, etc.

Disposal Site:	Kettleman Hills Facility, CA
Number of shipments:	3
Type of shipment:	55 gal drum
Waste Volume:	1 cubic yards
Waste Weight:	1,000 lbs. (estimated)
Dates Shipped:	Taken to RTU and combined with like waste

3. PCB Ballast's (TSCA)

Disposal Site:	Kettleman Hills Facility, CA
Number of shipments:	1
Type of shipment:	55 gal drum
Waste Volume:	0.25 cubic yards
Waste Weight:	600 lbs.
Dates Shipped:	Taken to RTU and combined with like waste

4. Burned Foam (benzene count slightly over free-release limit)

Disposal Site:	Kettleman Hills Facility, CA
Number of shipments:	7
Type of shipment:	Roll-Offs
Waste Volume:	150 cubic yards
Waste Weight:	45,000 lbs. (estimated)
Dates Shipped:	July through August 2004

E. Low-Level Waste Disposal

Disposal Site:	Nevada Test Site, Nevada
Number of shipments:	3
Type of shipment:	IP-2's
Waste Volume:	12.5 cubic yards
Waste Weight:	2337 lbs. (net weight)
Dates Shipped:	Unknown – shipped with other IP-2's from RFETS

VIII. Deviations from the Decision Document

The Decision Documents for the 991 Cluster Closure Project consisted of three Rocky Flats Cleanup Agreement (RFCA) Standard Operating Protocol (RSOP) for Facility Disposition Notifications.

- Kaiser-Hill Ltr. # 03-RF-01436, Rocky Flats Cleanup Agreement (RFCA) Standard Operating Protocol (RSOP) for Facility Disposition - Notification Letter for 991 Tunnel - FEG-029-03, dated September 19, 2003
- Kaiser-Hill Ltr. # 04-RF-00146, Rocky Flats Cleanup Agreement (RFCA) Standard Operating Protocol (RSOP) for Facility Disposition - Notification Letter for 998 Tunnel, Corridor B, and Room 402 - FEG-007-04, dated February 3, 2004

Amended by

Kaiser-Hill Ltr. # 04-RF-00355, Rocky Flats Cleanup Agreement (RFCA) Standard Operating Protocol (RSOP) for Facility Disposition-Addendum to Notification (Letter for 998 Tunnel, Corridor B, and Room 402 - FEG-011-04, dated March 23, 2004

- Kaiser-Hill Ltr. # 04-RF-00129, Rocky Flats Cleanup Agreement (RFCA) Standard Operating Protocol (RSOP) for Facility Disposition - Notification, Letter for Building 991 and pre-Demolition Survey Report (PDSR) for Facility 991 - FEG-004-04, dated February 5, 2004

The only deviation from the above Notifications for Facility Disposition was with the 998 Tunnel, Corridor B, and Room 402. While those areas were originally sealed off with a foam plug and planned to be left in place in accordance with the Notification for Facility Disposition, the fire on February 12 in the west end of Corridor B (reference Section II.E.4 above) changed that disposition. As a result of the fire investigation the properties of the remaining foam plugs as installed were questionable and RFETS stopped all foaming operations until a complete analysis of proper foam techniques could be resolved. As a result there was no good way to reseal the west end of Corridor "B" and the decision was made to remove the remaining foam plugs in Corridor "B" and Room 402. That was done along with most of the structure as discussed in Section II.E.4 above.

The foam plug in Corridor "A" was left in place as the best alternative available to seal the tunnel. After a number of tests to ascertain the adequacy of the foam plug and in accordance with Contact Record titled "Agreement to leave foam plug in Corridor A, Building 991", dated March 15, 2004, (Appendix 2, Article 4) the plug was left in Corridor "A" with disposition of the tunnel as stated in the Notification for Facility Disposition.

IX. Description of Site at End of Decommissioning

All above ground buildings and other structures, concrete pads, paving, roads, walkways, power lines, overhead steam lines and electrical lines have been removed. The site has been backfilled, compacted, and rough graded to elevations at least 4' below the contours shown in the Land Configuration Design Basis IA Grading and Drainage Concept (Appendix 1, Article 3). The final grading of the site was with fill dirt to elevations as shown in the Land Configuration Design Basis IA Grading and Drainage Concept. Fill came from approved borrow areas on site. The entire area was seeded, including where the sidewalks were removed to 10th Street, with natural grasses and vegetation.

Some of the original Building 991 structure remains underground as described in Sections II.E.4 and III.C. Generally, that includes the basement level, approximately 60% of the main floor (southeast portion removed), and the north wall of the building tapered to the east to maintain a minimum of 4' below grade. Also remaining in place is Corridor "A" and the 998 Vault (except the ceiling and part of the walls for the first 55'), all of the floor and part of the walls in Corridor "B" and Room 402, and all of Corridor "C" and Vaults 996, 997, and 999 (see Appendix 5, Articles 1 through 5).

As a follow up to the 991 Facility Disposition RSOP Notification dated October 9, 2003 a recommendation was made under the final disposition proposal for the west tunnel. Modeling was performed for the east and west tunnels at 991. No recommendations were required for the east tunnel based on the modeling results. However, the west tunnel could potentially incur groundwater problems if engineering controls were not implemented. The final land configuration at the west tunnel installed a french drain on the north side of the west tunnel. The french drain was excavated April 12 and 13th along the north side of room 997. The dimensions were approximately 60' long x 3' wide and 2.5' deep. The french drain was approximately 4' - 4.5' below the roof surface of room 997. Filter fabric was laid down in the bottom of the french drain and filter rock (3/4" - 1-1/2") was placed on the fabric. The fabric was wrapped over the top of the rock and later backfilled.

Utility lines remaining underground include:

- 991 Building basement floor drains that were all left in place with the basement; however the lines all tie into the basement sump. The sump was filled with dirt.
- 10", 6", 3", and 2" water lines, 4" and 8" sewage lines, and 2" natural gas lines (see Appendix 5, Article 6).

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Appendix 1

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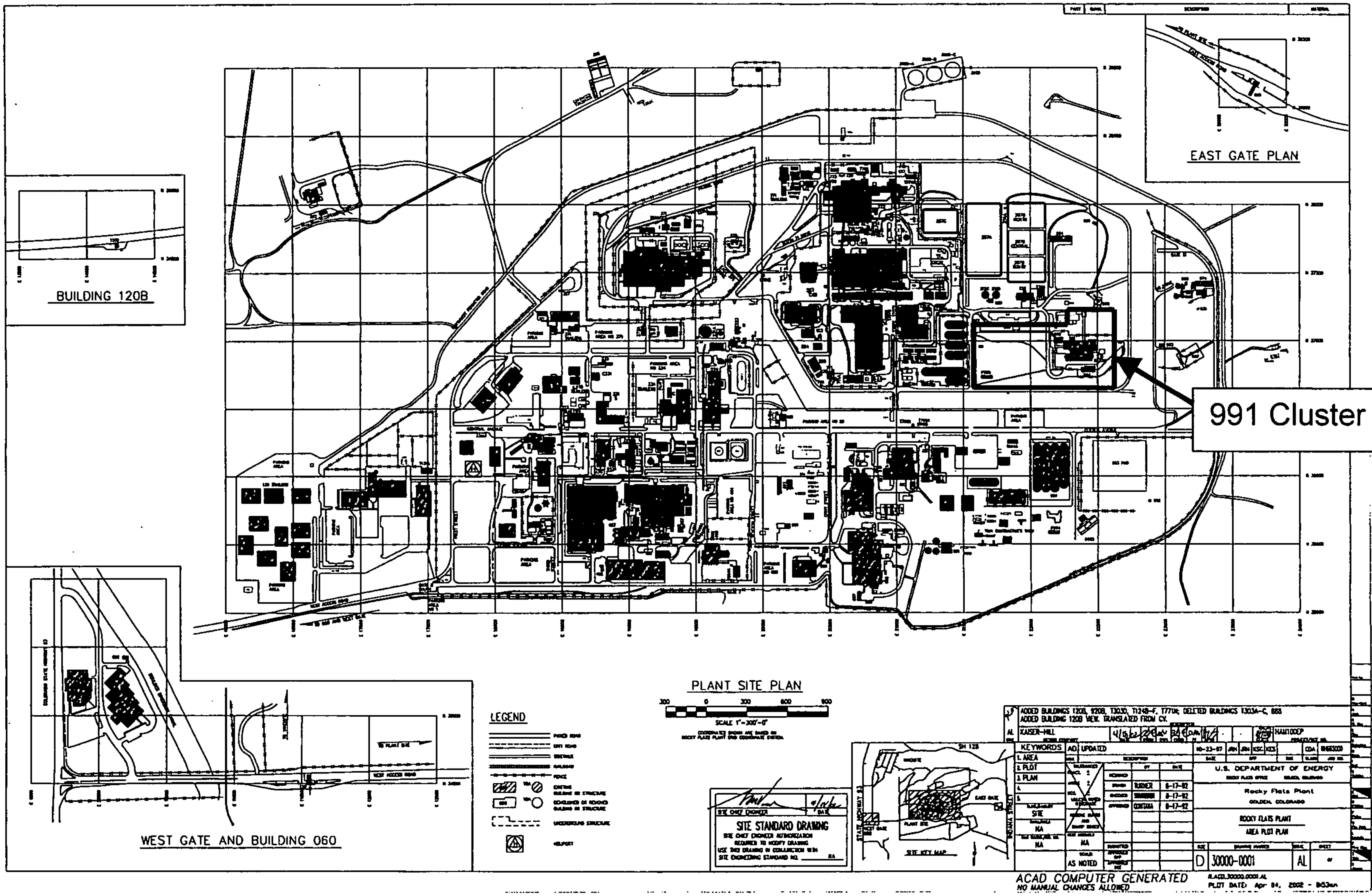
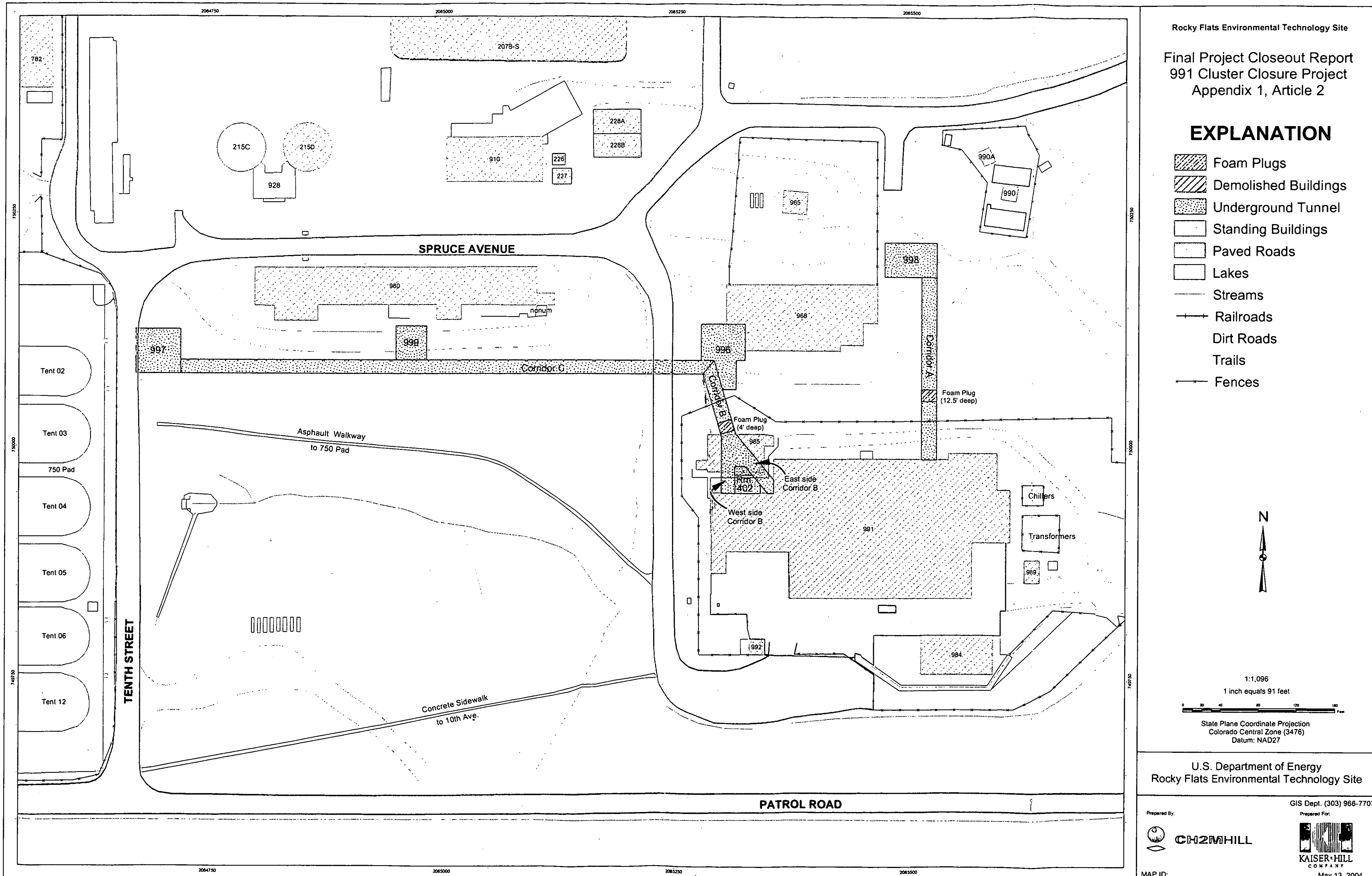

991 Cluster
EAST GATE PLAN
BUILDING 120B
PLANT SITE PLAN
SCALE 1"=300'-0"
LEGEND
WEST GATE AND BUILDING 060
SITE STANDARD DRAWING
SITE KEY MAP
KEYWORDS
KAISER-HILL
U.S. DEPARTMENT OF ENERGY
Rocky Flats Plant
GOLDEN, COLORADO
ROCKY FLATS PLANT
AREA PLOT PLAN
30000-0001
AS NOTED
ACAD COMPUTER GENERATED
NO MANUAL CHANGES ALLOWED



Rocky Flats Environmental Technology Site
Final Project Closeout Report
991 Cluster Closure Project
Appendix 1, Article 2
EXPLANATION
Foam Plugs
Demolished Buildings
Underground Tunnel
Standing Buildings
Paved Roads
Lakes
Streams
Railroads
Dirt Roads
Trails
Fences
N
1:1,096
1 inch equals 91 feet
State Plane Coordinate Projection
Colorado Central Zone (3476)
Datum: NAD27
U.S. Department of Energy
Rocky Flats Environmental Technology Site
GIS Dept. (303) 966-7707
Prepared By:
CH2MHILL
Prepared For:
KAISER-HILL COMPANY
MAP ID:
May 13, 2004
W:\Projects\fy2004\04-0339\Building991-tun-bb.mxd
SPRUCE AVENUE
TENTH STREET
PATROL ROAD
Corridor C
Corridor B
Corridor A
Foam Plug (12.5' deep)
Foam Plug (4' deep)
East side Corridor B
West side Corridor B
Rm 402
Asphault Walkway to 750 Pad
Concrete Sidewalk to 10th Ave.
750 Pad
Tent 02
Tent 03
Tent 04
Tent 05
Tent 06
Tent 12
782
2078-S
215C
215D
928
910
226
227
228A
228B
965
968
990A
990
998
980
nonum
997
999
996
985
991
Chillers
Transformers
989
992
984

Appendix 1 - Article 3

Land Configuration Design Basis IA Grading and Drainage Concept, Building 991

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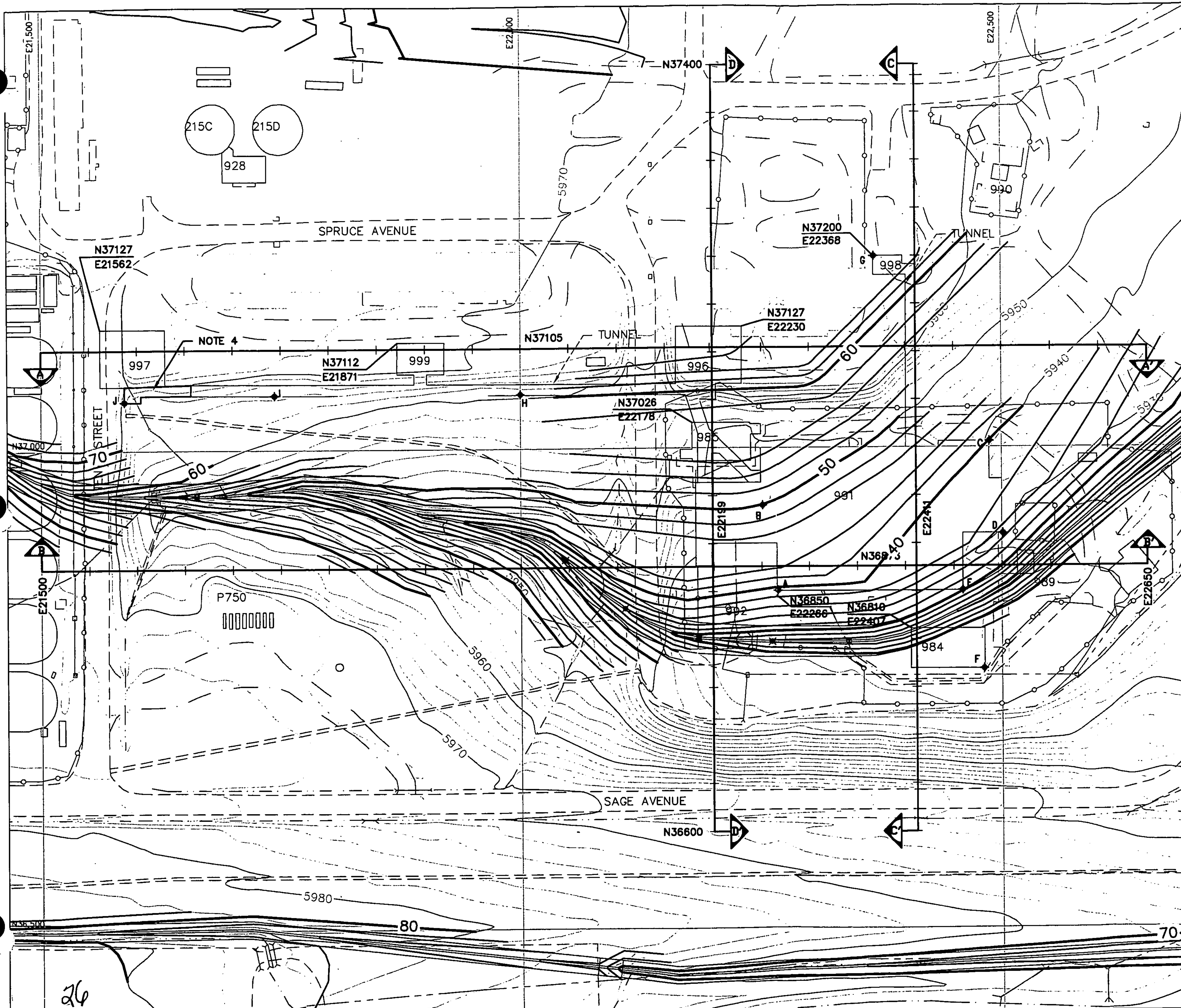


ITEM NO.	QUAN.	DESCRIPTION	MATERIAL

PROPOSED LCDB GRADE AT SELECTED BUILDING COLUMN LOCATIONS

POINT	BLDG	COLUMN	EAST	NORTH	LCDB GRADE ELEVATION
A	991	A-2	22,267	36,851	5939.5
B	991	E-1	22,251	36,940	5950.0
C	991	---	22,487	37,006	5940.0
D	991	---	22,501	36,910	5934.6
E	991	A-10	22,459	36,851	5930.4
F	984	---	22,481	36,769	EXISTING
G	998	---	22,368	37,200	EXISTING
H	TUNNEL	---	22,000	37,057	EXISTING
I	TUNNEL	---	21,744	37,057	EXISTING
J	TUNNEL	---	21,587	37,051	5969.4

NOTES:

1. PLAN AND SECTION DRAWINGS ARE NOT INTENDED TO REPRESENT AS-BUILT CONDITIONS, BUT TO PROVIDE A GENERAL GRAPHICAL DEPICTION OF THE RELATIONSHIP BETWEEN SIGNIFICANT STRUCTURAL BUILDING COMPONENTS AND SUBSURFACE FEATURES WITH RESPECT TO EXISTING AND PROPOSED FINAL GRADE PRESENTED IN THE LCDB GRADING AND DRAINAGE CONCEPT. (SEE DRAWING 51754-CX01 FOR DRAWING LIST).

2. BUILDING SECTION INFORMATION WAS BASED ON THE FOLLOWING DRAWINGS AND HAS NOT BEEN FIELD VERIFIED.

00A05-0001M, REV B	03743-0001	28738-0104, REV C
00A06-0001M, REV B	03844-0001	28738-0105, REV B
00A07-0001J, REV C	13812-0003, REV B	28738-0106, REV B
00S10-0001B, REV C	13812-0004, REV B	28738-0112, REV C
00S11-0001C, REV D	14391-0003	30991-0001, REV C
00S12-0001C, REV B	17701-0002, REV 2	30991-0004, REV J
00S14-0001C, REV C	17702-0004, REV 1	37179-0101, REV B
00S01-001Y, REV C	28738-0101, REV B	51640-0203, REV 0
00S02-001R, REV C		

3. INTERNAL BUILDING WALLS, BEAMS, GIRDERS, EQUIPMENT PADS, AND OTHER MINOR STRUCTURAL FEATURES ARE NOT SHOWN ON SECTION VIEWS (DRAWINGS 51754-C131 AND 51754-C132) FOR CLARITY. BUILDING COLUMNS AND FLOORS ARE REPRESENTATIVE. DASHED FEATURES ARE PROJECTED VIEWS FROM SECTION CUT. SEE ABOVE DRAWINGS FOR SPECIFIC DIMENSIONS AND LOCATIONS.

4. AN ADDITIONAL 18" THICK LAYER OF CONCRETE WAS PLACED OVER ORIGINAL TUNNEL FOR WATERPROOFING. (SEE DRAWING 1-3743-97).

5. COORDINATES ARE PER AS-BUILT DRAWINGS FOR OUTSIDE BUILDING CORNERS.

6. FILL REQUIRED FOR BUILDINGS 985 AND 991 IS ESTIMATED TO BE APPROX. xx,000 CY. (INCLUDES FILLING OF B991 UTILITY TUNNELS). ESTIMATE DOES NOT INCLUDE VOLUME (APPROX. 5,050 CY) OF UG VAULTS (B996, 997, 998, AND 999) AND CONNECTING TUNNELS. ESTIMATE DOES NOT INCLUDE REPLACEMENT FILL FOR UNDER BUILDING CONTAMINATED SOIL, VOIDS, OR REMOVAL OF OTHER SUBSURFACE MATERIALS. VOLUME OF CONCRETE CONTAINED IN BUILDING 991 IS ESTIMATED TO BE 3,500 CY (INCLUDES ABOVE GRADE COMPONENTS, AND INTERIOR SLABS, COLUMNS, BEAMS, AND GIRDERS).

LEGEND:

6000	EXISTING INDEX CONTOUR
	EXISTING 2 FOOT CONTOUR
X 5981.3	EXISTING SPOT ELEVATION
	PAVED ROAD
	UNPAVED ROAD
	EXISTING CULVERT
	PROPOSED CULVERT
80	PROPOSED LCDB INDEX CONTOUR
	PROPOSED LCDB 2 FOOT CONTOUR
X 85.2	PROPOSED LCDB SPOT ELEVATION
	EXISTING DRAINAGE DITCH/CREEK
	PROPOSED DRAINAGE DITCH/SWALE
	FENCE
	CONCRETE

0 25 50 100

ORIGINAL SCALE: 1"=50'
CONTOUR INTERVAL 2'
ROCKY FLATS COORDINATES

ISSUE	DESCRIPTION								CLASS	PROJECT/CHARGE NO.
2	REVISED PROPOSED LCDB GRADE (XREF-IA-GRADING-REV6)									
	PARSONS (DESIGN COMPANY)	DATE	DSGN	DWN	CHKD	IV	APVD			KH900286-018
0	ORIGINAL ISSUE/CONCEPTUAL DESIGN									KH900286-003 (PROJECT/WCF NO.)

KEYWORDS	TOLERANCES	DESIGN COMPANY: PARSONS		
1.LAND	FRACT. ±	DESIGNED BY: K. MARTIN	KAM	9-30-02
2.CONFIGURATION	ANGLE ±	DRAWN BY: R. SOLBERG	RES	9-30-02
3.GRADING	DEC. ±	CHECKED BY: R. STEGEN	RLS	9-30-02
4.DRAINAGE	UNLESS NOTED OTHERWISE	INDEPENDENT VERIFIER		
5.	REMOVE BURRS AND SHARP EDGES	APPROVED BY		
BLDG./FACILITY: 991	NEXT ASSEMBLY: N/A	CLASSIFIER: S CUNNINGHAM	SLC	9-30-02
ROOM/AREA: N/A	SCALE: AS NOTED	ADDITIONAL APPROVALS		
GRID COORD./COL. NO.: N/A				

U.S. DEPARTMENT OF ENERGY
ROCKY FLATS OFFICE GOLDEN, COLORADO

Rocky Flats Environmental Technology Site
GOLDEN, COLORADO

LAND CONFIGURATION DESIGN BASIS
IA GRADING AND DRAINAGE CONCEPT

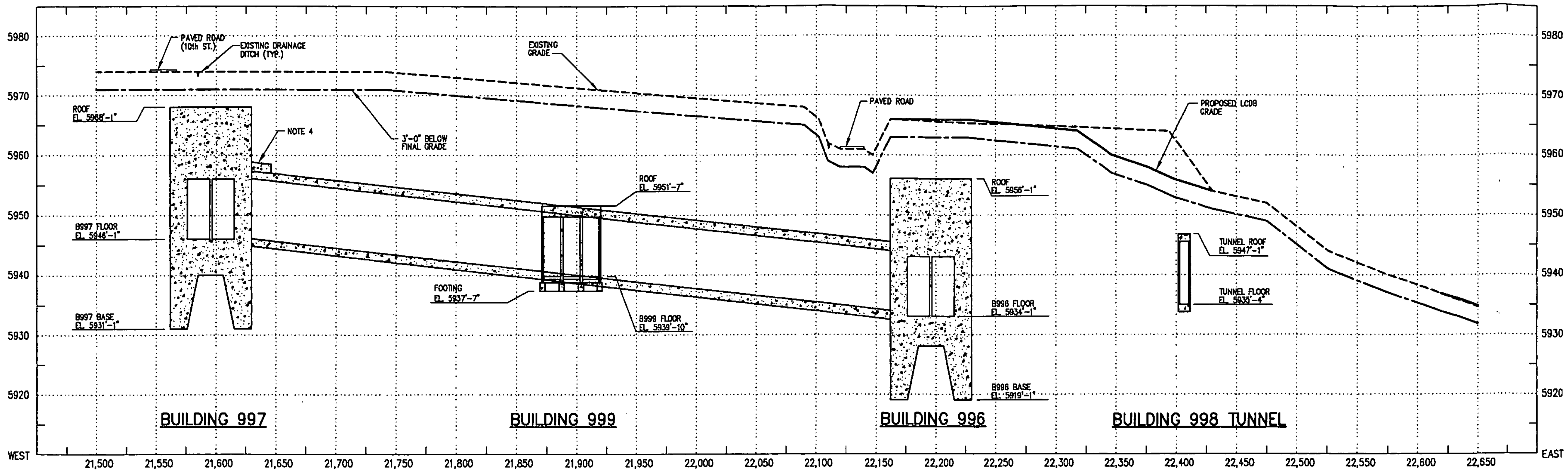
BUILDING 991
PLAN VIEW

SIZE	DRAWING NUMBER	ISSUE
D	51754-C130	2

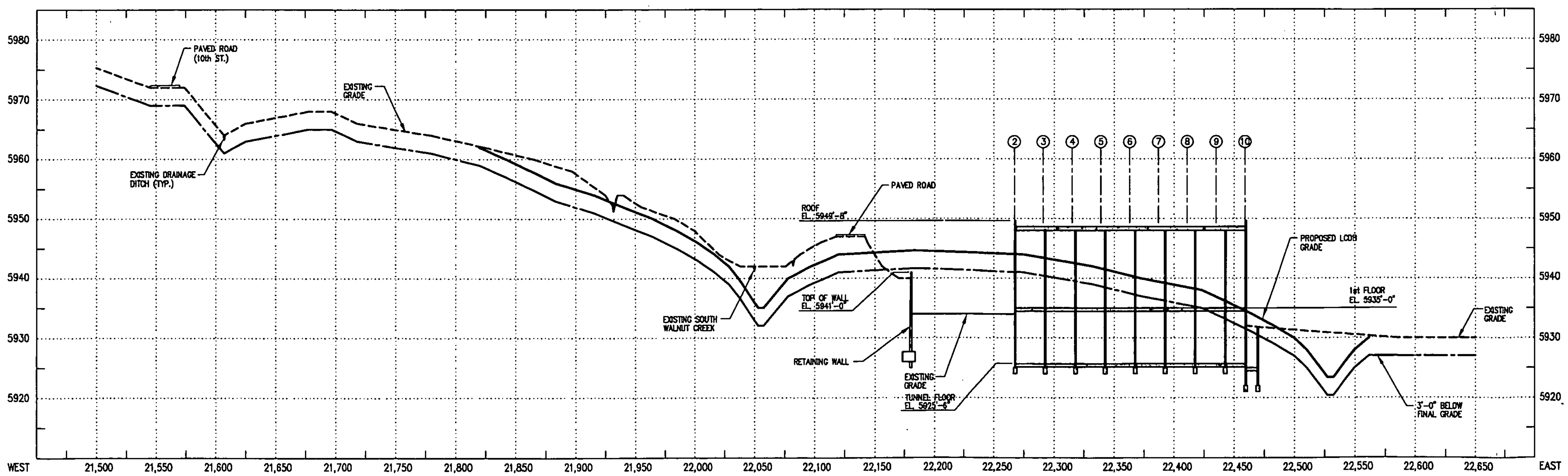
AUTOCAD COMPUTER GENERATED
NO MANUAL CHANGES ALLOWED

Plot date: Sep 19, 2003 - 6:02am

ITEM NO.	QUAN.	DESCRIPTION	MATERIAL



BUILDING 991, SECTION A-A' REVERSED (N37105)
(DRAWING 51754-C130)



BUILDING 991, SECTION B-B' (COLUMN LINE B – N36876)
(DRAWING 51754-C130)

NOTES:

1. SEE DRAWING 51754-C130 FOR GENERAL NOTES.
2. VERTICAL SCALE HAS BEEN EXAGGERATED.
3. SECTION B-B' DOES NOT INCLUDE BUILDING 989.
4. AN ADDITIONAL 18" THICK LAYER OF CONCRETE WAS PLACED OVER ORIGINAL TUNNEL FOR WATERPROOFING. (SEE DRAWING 1-3743-97).

VERTICAL SCALE 0 5 10 20 ORIGINAL SCALE: 1"=10'

HORIZONTAL SCALE 0 25 50 100 ORIGINAL SCALE: 1"=50'

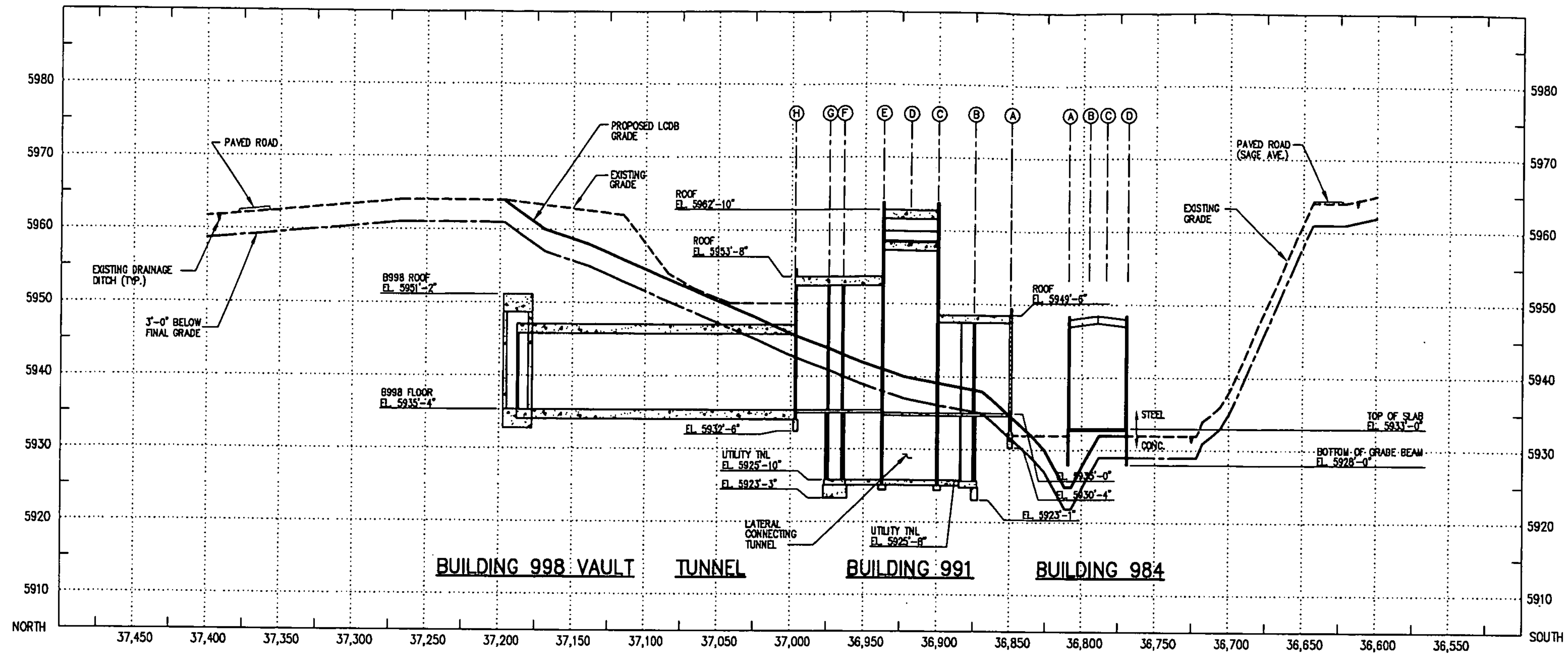
ISSUE	DESCRIPTION								
2	REVISED PROPOSED LCDB GRADE (XREF-IA-GRADING-REV6)								
	PARSONS (DESIGN COMPANY)	DATE	DSGN	DWN	CHKD	IV	APVD	CLASS	KH900286-018 (PROJECT/CHARGE NO.)
0	ORIGINAL ISSUE/CONCEPTUAL DESIGN								KH900286-003 (PROJECT/WCF NO.)

KEYWORDS	TOLERANCES	DESIGN COMPANY: PARSONS			U.S. DEPARTMENT OF ENERGY
1.LAND	FRACT. ±	DESIGNED BY: K. MARTIN	KAM	9-30-02	ROCKY FLATS OFFICE GOLDEN, COLORADO
2.CONFIGURATION	ANGLE ±	DRAWN BY: M. GARCIA	MG	9-30-02	Rocky Flats Environmental Technology Site GOLDEN, COLORADO
3.GRADING	DEC. ±	CHECKED BY: R. STEGEN	RLS	9-30-02	LAND CONFIGURATION DESIGN BASIS IA GRADING AND DRAINAGE CONCEPT
4.DRAINAGE	UNLESS NOTED OTHERWISE	INDEPENDENT VERIFIER			BUILDING 991 SECTIONS "AA" AND "BB"
5.	REMOVE BURRS AND SHARP EDGES	APPROVED BY			
BLDG./FACILITY 991	NEXT ASSEMBLY N/A	CLASSIFIER: S. CUNNINGHAM	SLC	9-30-02	SIZE: D
ROOM/AREA N/A	SCALE: AS NOTED	ADDITIONAL APPROVALS			DRAWING NUMBER: 51754-C131
GRID COORD./COL. NO. N/A					ISSUE: 2

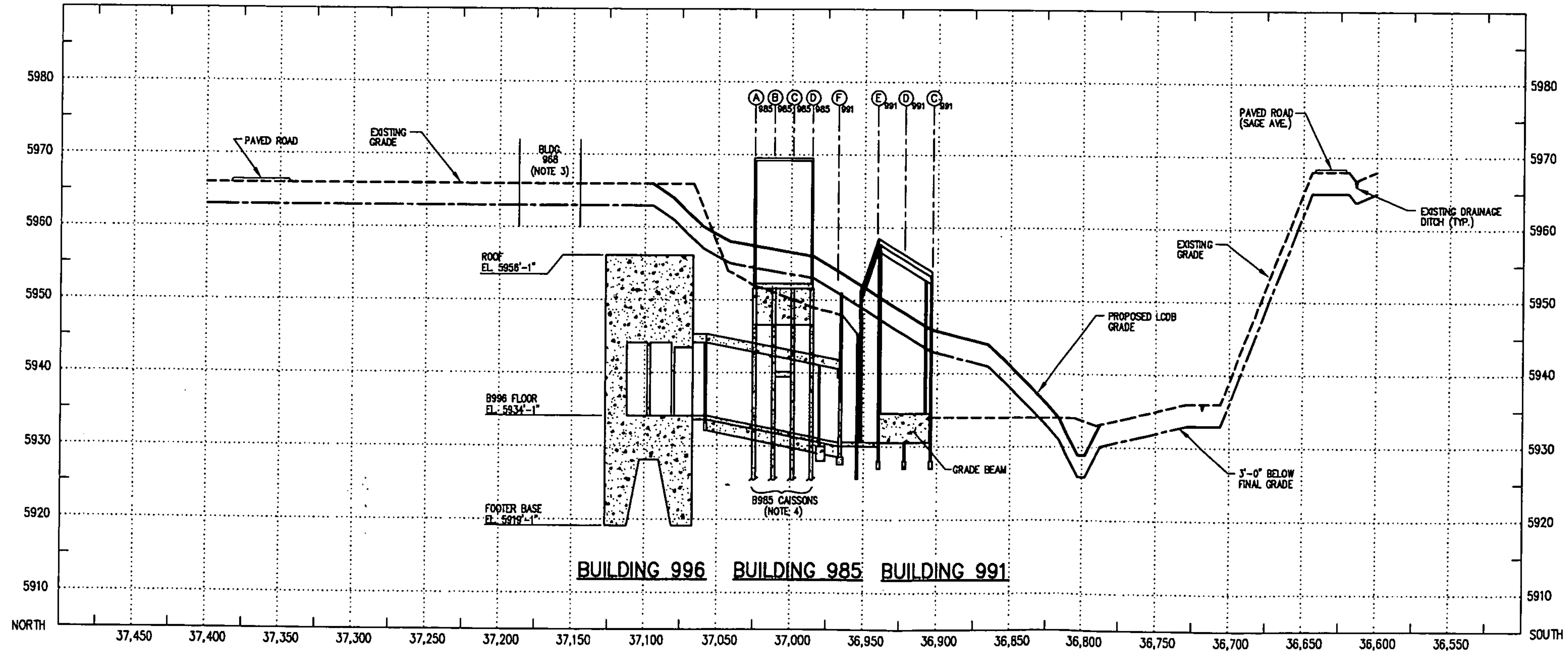
AUTOCAD COMPUTER GENERATED
NO MANUAL CHANGES ALLOWED

Plot date: Sep 19, 2003 - 6:04am

27



BUILDING 991, SECTION C-C' REVERSED (COLUMN LINE 8 – E22,411)
(DRAWING 51754-C130)



BUILDING 991, SECTION D-D' (COLUMN LINE 3W – E22,199)
(DRAWING 51754-C130)

NOTES:

1. SEE DRAWING 51754-C130 FOR GENERAL NOTES.
2. VERTICAL SCALE HAS BEEN EXAGGERATED.
3. SECTION D-D' DOES NOT INCLUDE BUILDING 968.
4. CAISSONS PROJECTED ONTO SECTION C-C' FROM VARIOUS COLUMN LOCATIONS. B985 CONSISTS OF 16 CAISSONS RANGING IN DEPTH FROM 5934'-6" TO 5913'-6".

VERTICAL SCALE 0 5 10 20
ORIGINAL SCALE: 1"=10'

HORIZONTAL SCALE 0 25 50 100
ORIGINAL SCALE: 1"=50'
ROCKY FLATS COORDINATES

ISSUE	DESCRIPTION						
2	REVISED PROPOSED LCDB GRADE (XREF-IA-GRADING-REV8)						
	PARSONS (DESIGN COMPANY)	DATE	DSGN	DWN	CHKD	IV	APVD
0	ORIGINAL ISSUE/CONCEPTUAL DESIGN						

CLASS — KH900286-018 PROJECT/CHARGE NO.
KH900286-003 PROJECT/WCF NO.

KEYWORDS: 1.LAND 2.CONFIGURATION 3.GRADING 4.DRAINAGE 5.
BLDG./FACILITY: 991
ROOM/AREA: N/A
GRID COORD./COL. NO.: N/A
TOLERANCES: FRACT. ± ANGLE ± DEC. ± UNLESS NOTED OTHERWISE
REMOVE BURRS AND SHARP EDGES
NEXT ASSEMBLY: N/A
SCALE: AS NOTED

DESIGN COMPANY: PARSONS

DESIGNED BY	K. MARTIN	KAM	9-30-02
DRAWN BY	R. SOLBERG	RES	9-30-02
CHECKED BY	R. STEGEN	RLS	9-30-02
INDEPENDENT VERIFIER			
APPROVED BY			
CLASSIFIER	S CUNNINGHAM	SLC	9-30-02
ADDITIONAL APPROVALS			

U.S. DEPARTMENT OF ENERGY
ROCKY FLATS OFFICE GOLDEN, COLORADO
Rocky Flats Environmental Technology Site
GOLDEN, COLORADO

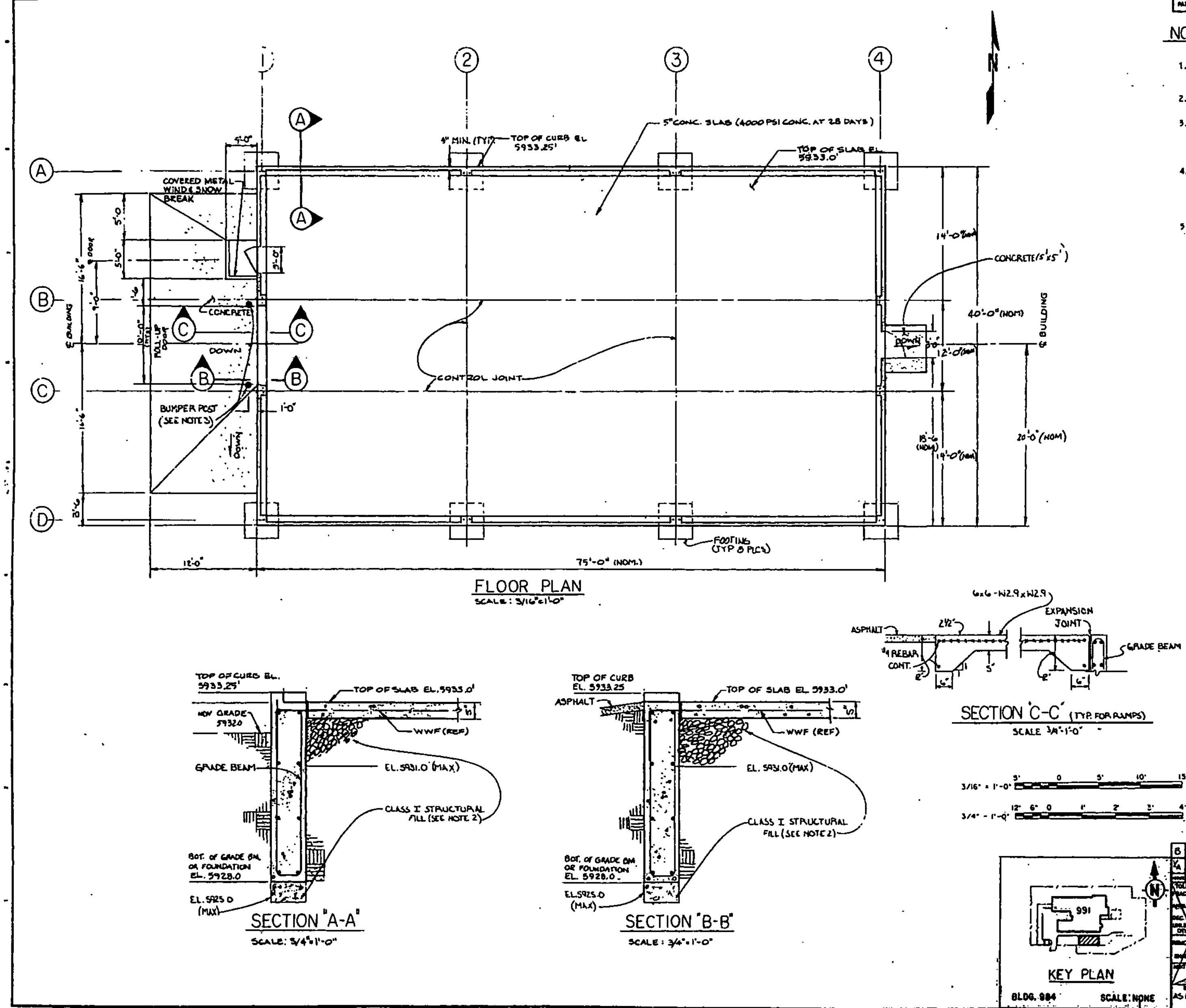
LAND CONFIGURATION DESIGN BASIS
IA GRADING AND DRAINAGE CONCEPT
BUILDING 991
SECTIONS "CC" AND "DD"

SIZE	DRAWING NUMBER	ISSUE
D	51754-C132	2

AUTOCAD COMPUTER GENERATED
NO MANUAL CHANGES ALLOWED

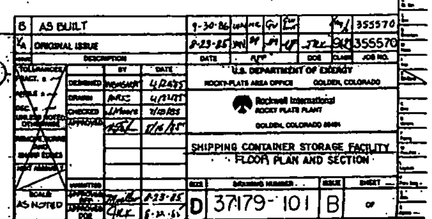
Plot date: Sep 19, 2003 – 8:05am

28

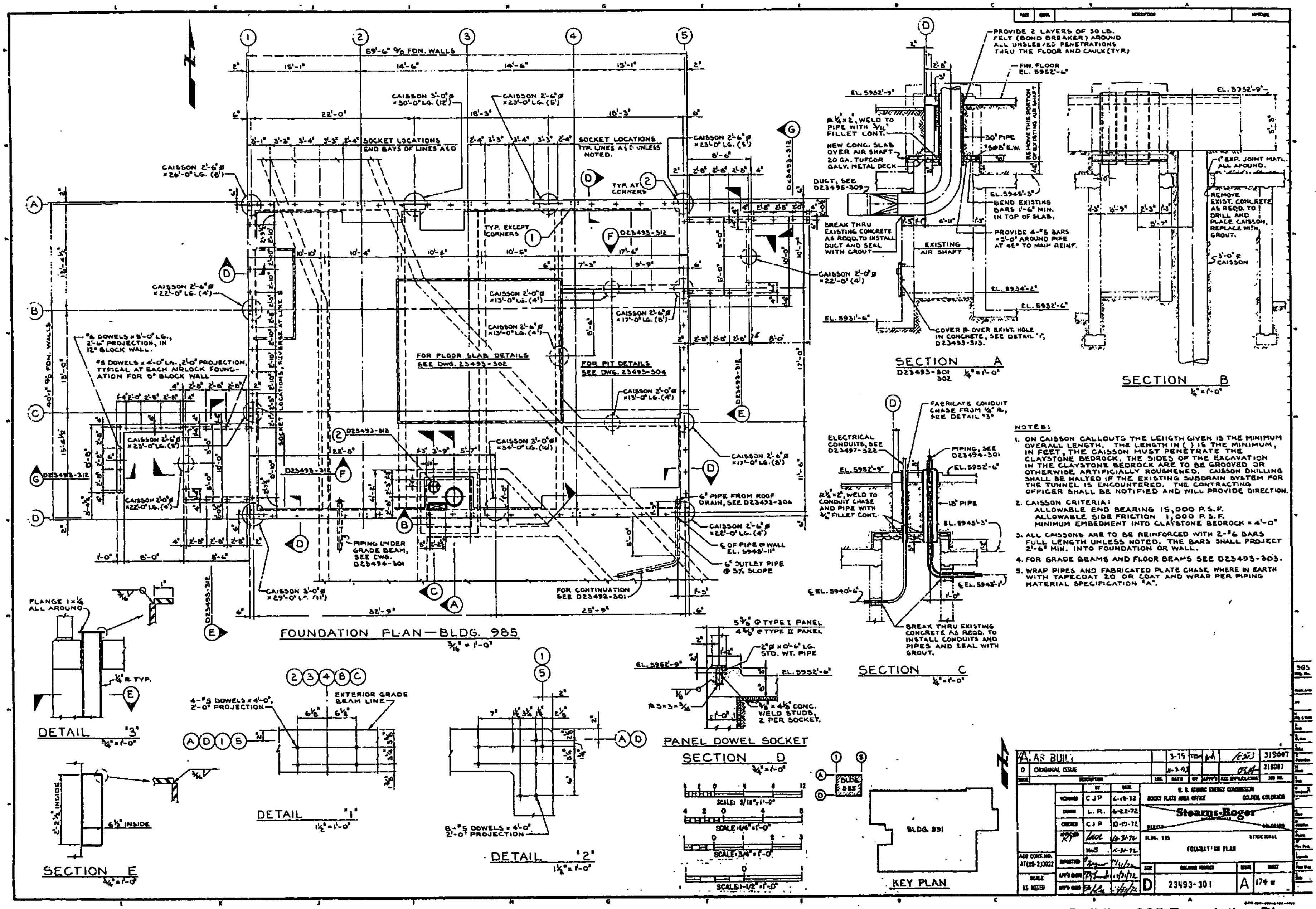


NOTES

1. BUILDING AND FOUNDATION DESIGN SHALL BE PROVIDED BY CONTRACTOR AND APPROVED BY ROCKWELL INTERNATIONAL IN ACCORDANCE WITH THESE DRAWINGS AND THE SPECIFICATIONS.
2. CLASS I STRUCTURAL FILL SHALL BE PROVIDED 2' MINIMUM BELOW SLAB; 3' MINIMUM BELOW GRADE BEAMS AND FOOTINGS.
3. BUMPER POSTS SHALL BE 6"DIA. SCHEDULE 40 STEEL PIPE PROJECTING 4'-0" ABOVE GRADE AND EMBEDDED A MINIMUM OF 4'-0" BELOW GRADE. POSTS SHALL BE CONCRETE FILLED WITH THE TOP ROUNDED OFF AND PAINTED YELLOW ACCORDING TO THE SPECIFICATIONS.
4. A 16GA STEEL SIGN 1' HIGH BY 2' WIDE PAINTED YELLOW ACCORDING TO THE SPECIFICATIONS SHALL BE MOUNTED TO THE BUILDING 4'-0" ABOVE GRADE NEXT TP TJE ROLL UP DOOR BY AT LEAST SIX FASTENERS. ON THE FACE OF THE SIGN IN BLACK LETTERS 1 1/2" HIGH THE FOLLOWING MESSAGE SHALL BE PRINTED: UNCONTAMINATED EMPTY SHIPPING CONTAINERS ONLY ALLOWED.
5. CONCRETE STRENGTH SHALL BE 4000 PSI AT 28 DAYS.

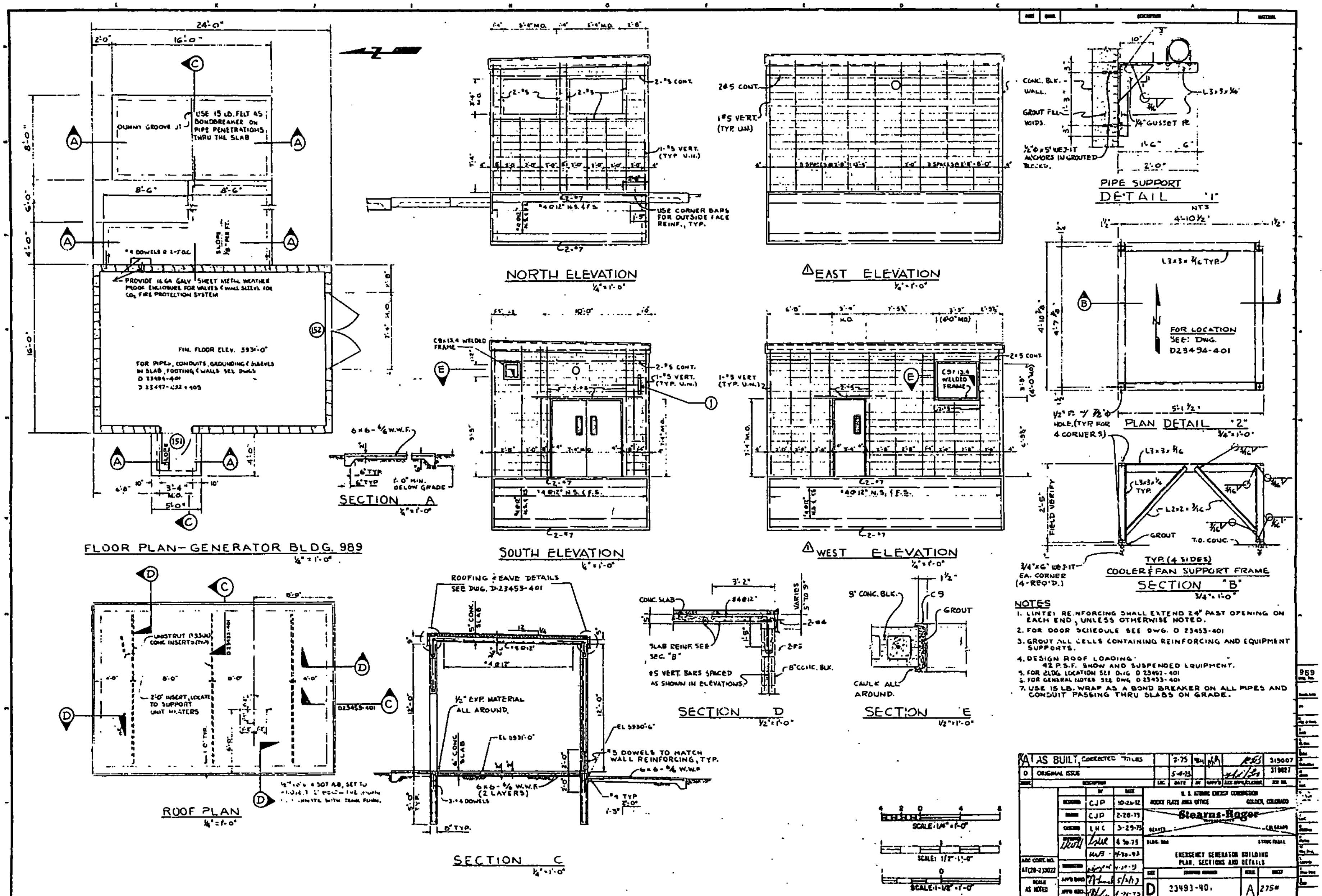


Building 984 Floor/Foundation Plan

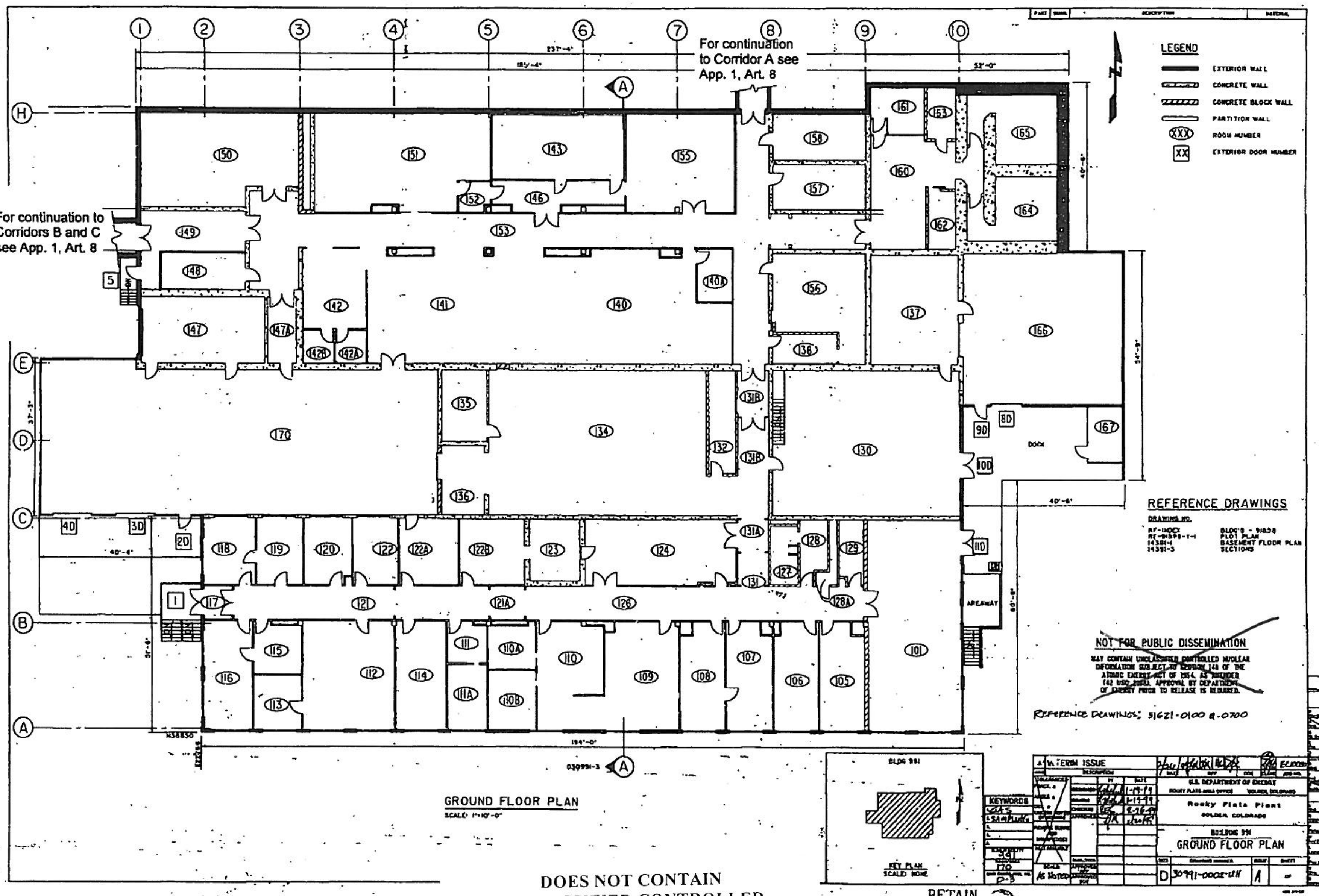


Building 985 Foundation Plan

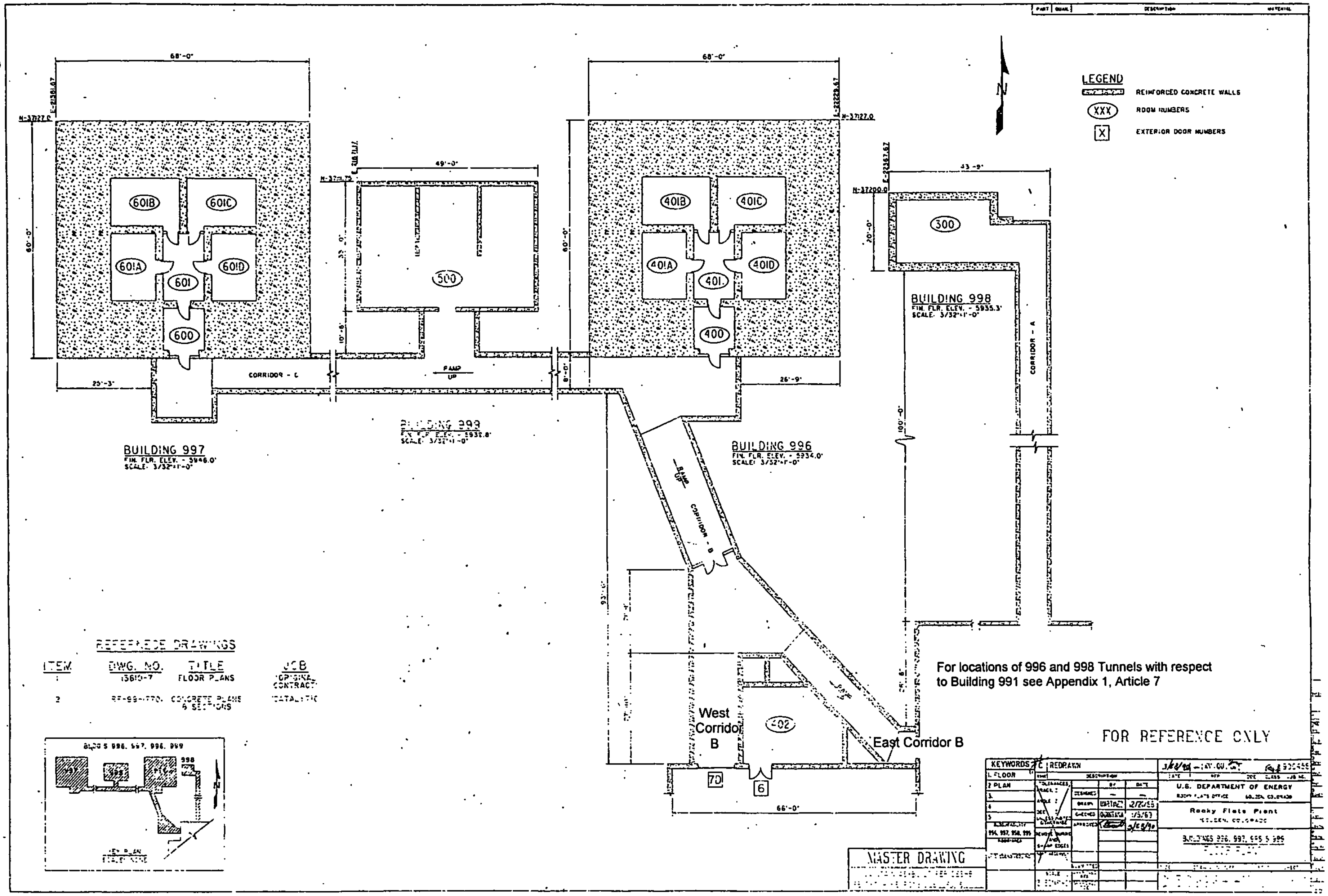
31



Building 989 Floor/Foundation Plan

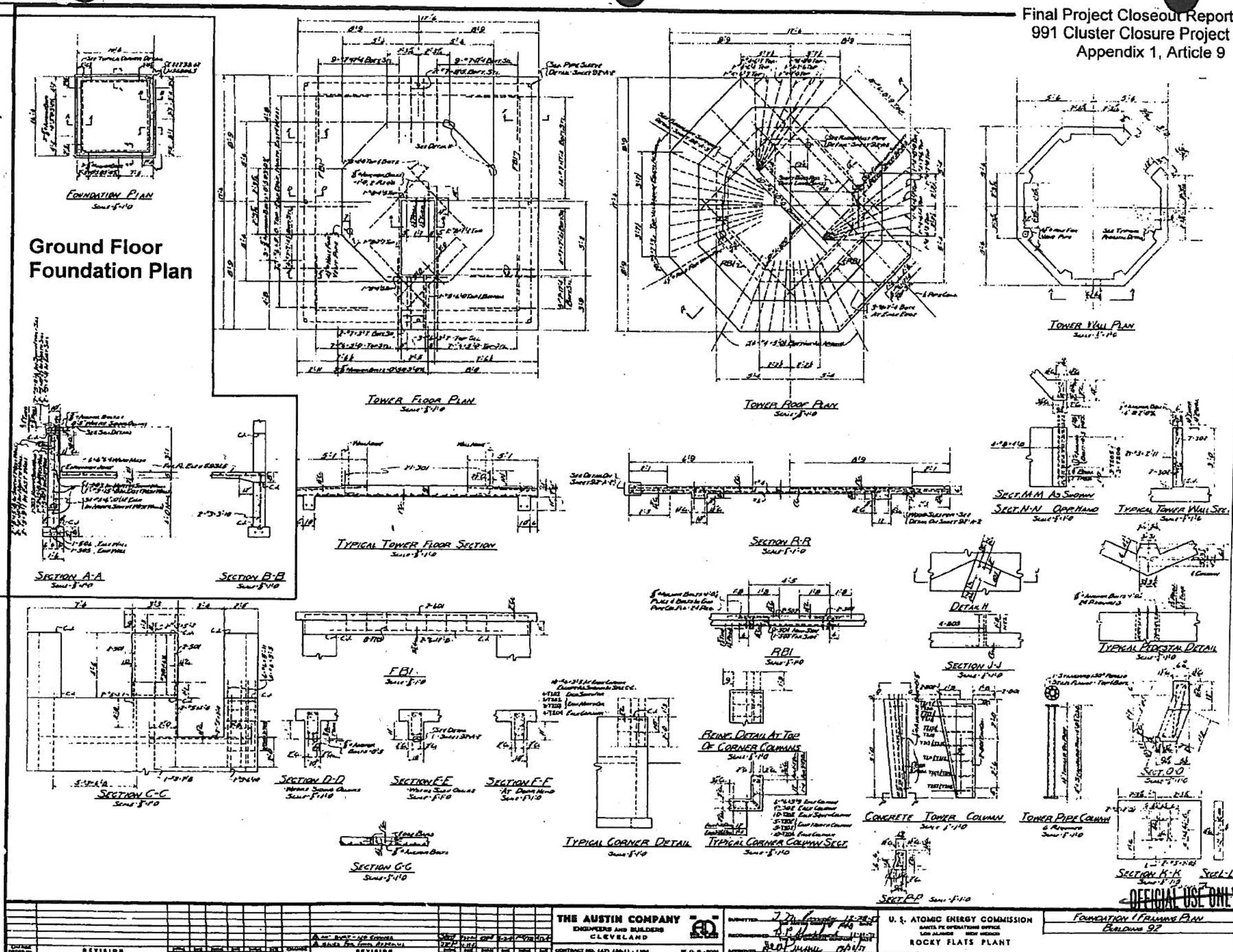


DOES NOT CONTAIN
UNCLASSIFIED CONTROLLED
NUCLEAR INFORMATION
Reviewing Official: [signature] Emar Classif Office
Date: 10-15-08



Floor Plans for Corridors A, B, and C
including Buildings 996, 997, 998, and 999
(aka 996 Tunnel and 998 Tunnel)

34



DECLASSIFICATION REVIEW

1ST REVIEW DATE: 10-15-08

AUTHORITY: ☐ AOC ☒ ADC ☒ ADD

NAME: J.A. Nesheim

2ND REVIEW - DATE: N/A; 2nd Review

AUTHORITY: ADD Not Required

NAME:

DETERMINATION [CIRCLE NUMBER(S)]

1. CLASSIFICATION RETAINED
2. CLASSIFICATION CHANGED TO UNCLASSIFIED
3. CONTAINS NO DOE CLASSIFIED INFO
4. COORDINATE WITH:
5. CLASSIFICATION CANCELLED
6. CLASSIFIED INFO BRACKETED
7. OTHER (SPECIFY):

Appendix 1 - Article 10

Land Configuration Design Basis IA Grading and Drainage Channels

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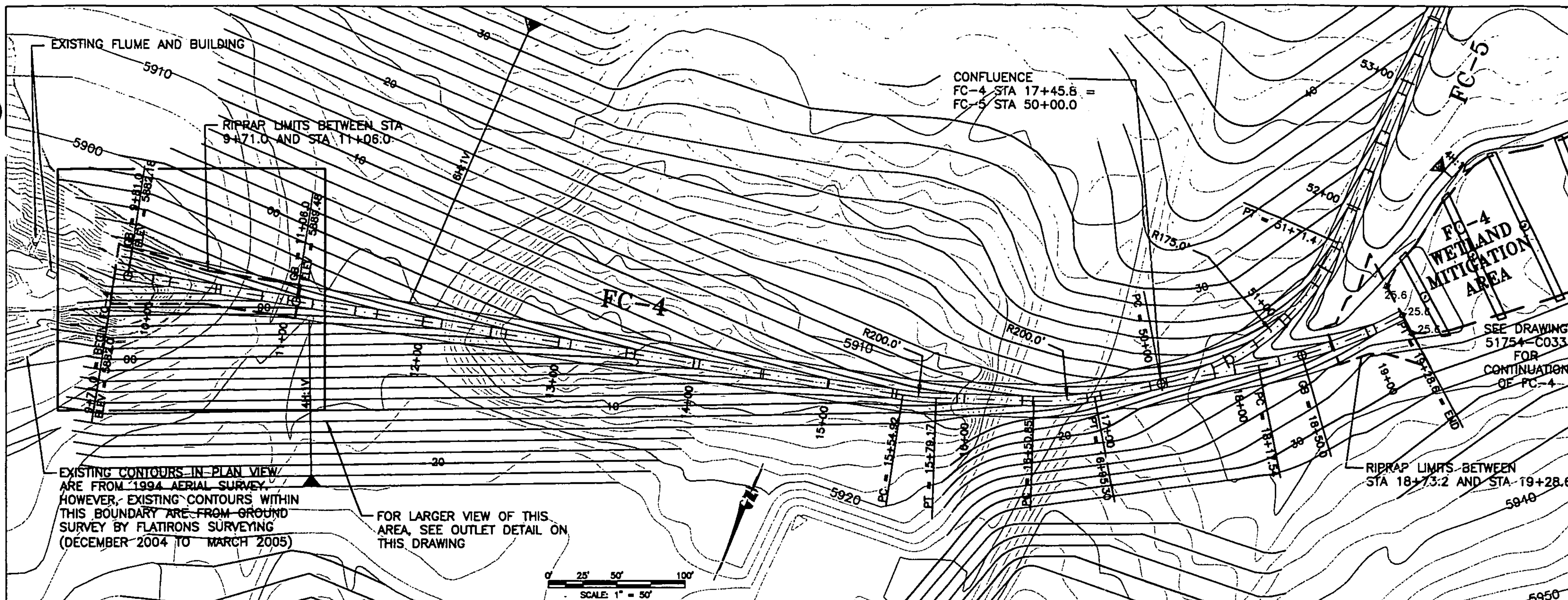
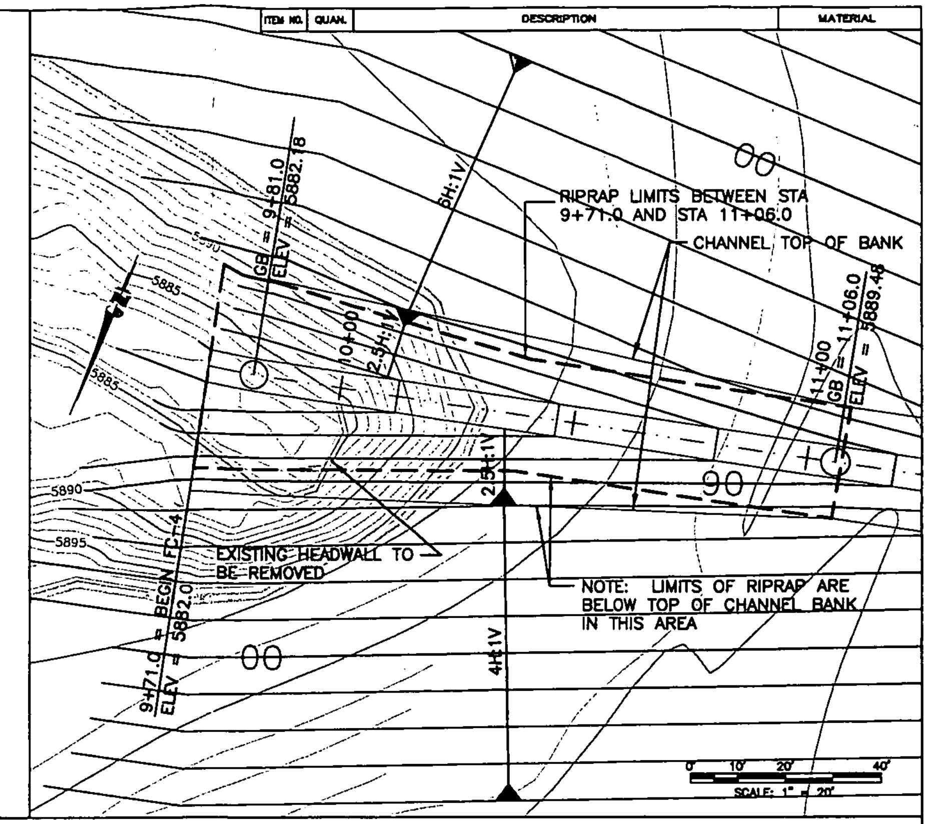
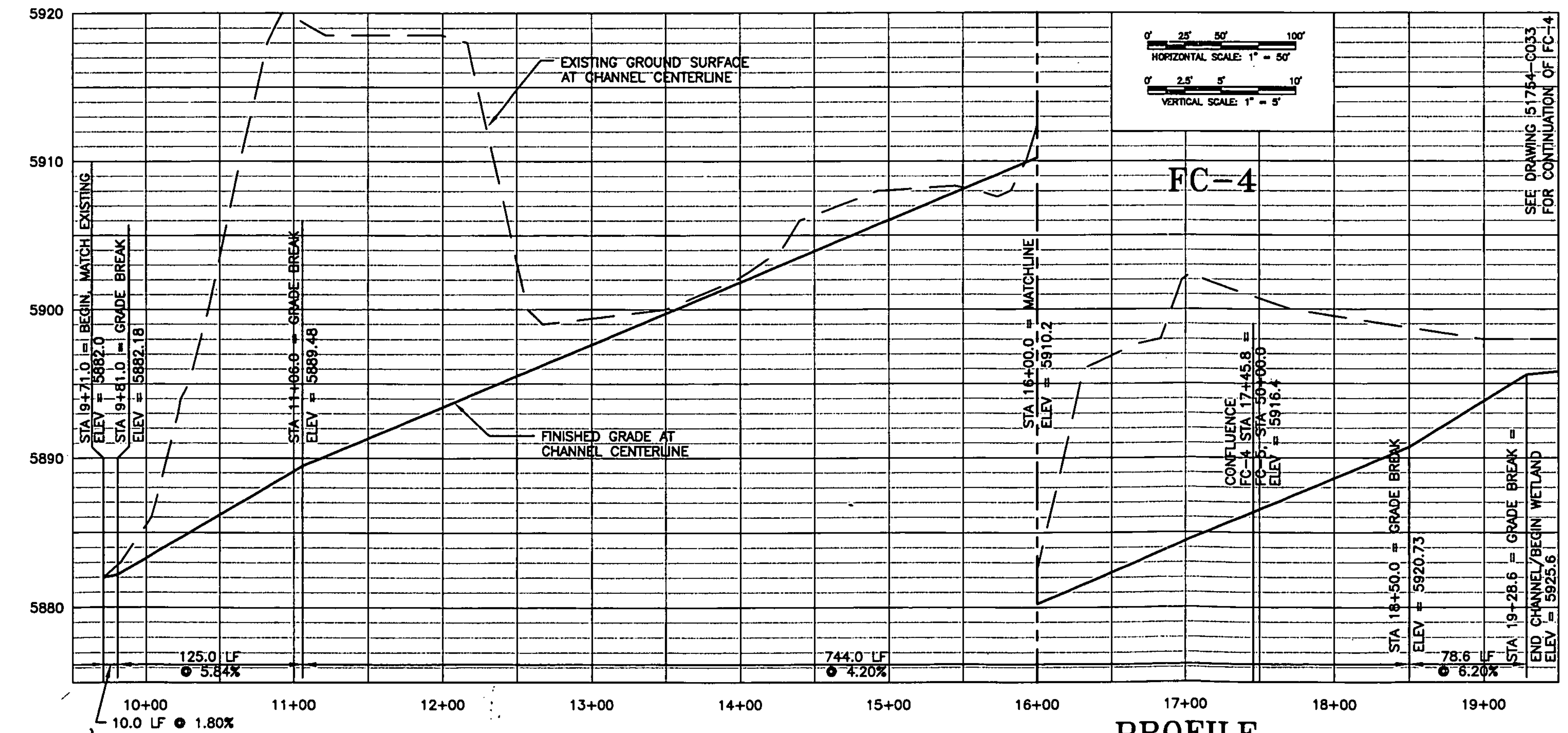


PLAN



OUTLET DETAIL

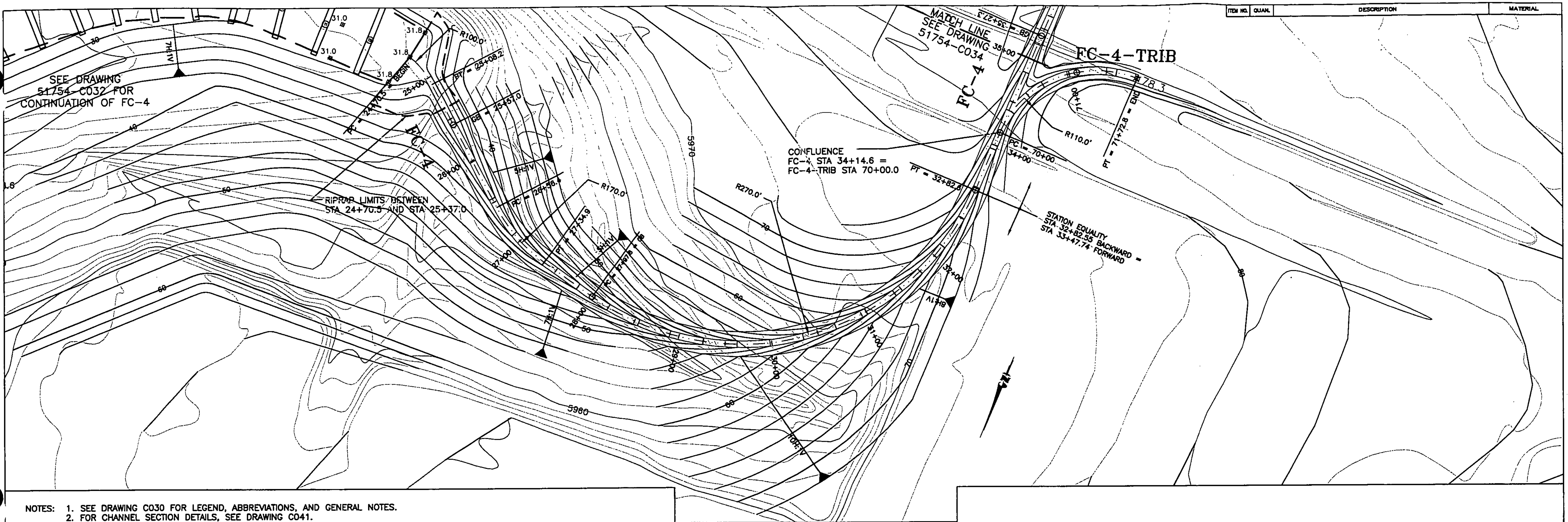
NOTES:
1. SEE DRAWING C030 FOR LEGEND, ABBREVIATIONS, AND GENERAL NOTES.
2. FOR FC-5 PLAN AND PROFILE, SEE DRAWING C035.
3. FOR CHANNEL SECTION DETAILS, SEE DRAWING C041.
4. FOR CHANNEL SECTION SCHEDULE, SEE DRAWING C043.
5. FOR FC-4 WETLAND MITIGATION GRADING PLAN, SEE DRAWING C044.



PROFILE

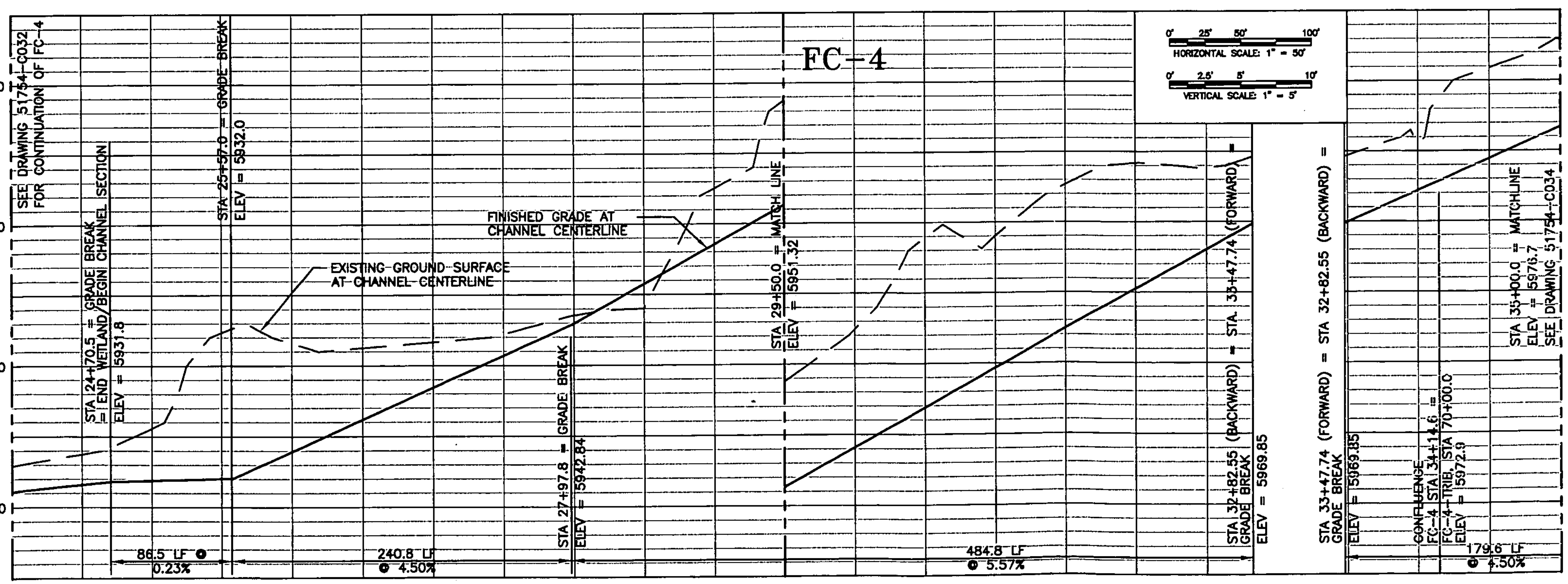
5 ISSUE	ISSUED FOR CONSTRUCTION (DESCRIPTION)	KH900286-018 PROJECT/WCF NO.
KEYWORDS: 1.LAND 2.CONFIGURATION 3.GRADING 4.DRAINAGE 5.CHANNELS	DESIGN COMPANY: PARSONS; DESIGNED BY J. WEHNER JPW; DRAWN BY J. WEHNER JPW; CHECKED BY J. KAPINOS JMK	U.S. DEPARTMENT OF ENERGY, ROCKY FLATS OFFICE, GOLDEN, COLORADO; Rocky Flats Environmental Technology Site, GOLDEN, COLORADO
BLDG./FACILITY: SITE; ROOM/AREA: N/A; GRID COORD./COL. NO.: N/A	NEXT ASSEMBLY: N/A; SCALE: N/A	LAND CONFIGURATION DESIGN BASIS IA GRADING AND DRAINAGE CHANNELS; ENGINEERED CHANNEL FC-4 (SOUTH WALNUT CREEK) PLAN AND PROFILE (1 OF 3)
		SIZE: D; DRAWING NUMBER: 51754-C032; ISSUE: 5

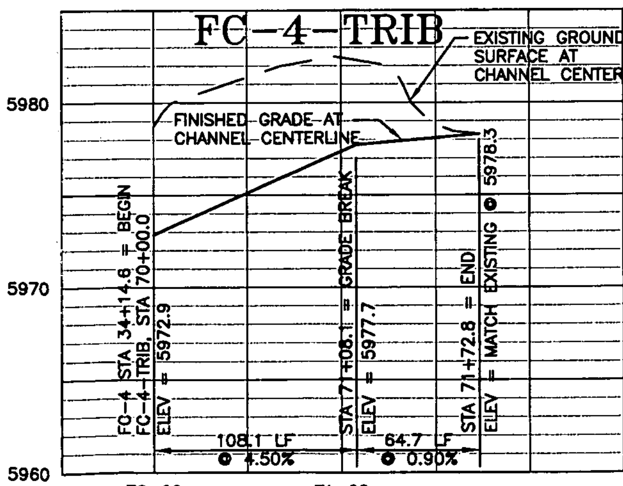
36



NOTES:
1. SEE DRAWING C030 FOR LEGEND, ABBREVIATIONS, AND GENERAL NOTES.
2. FOR CHANNEL SECTION DETAILS, SEE DRAWING C041.
3. FOR CHANNEL SECTION SCHEDULE, SEE DRAWING C043.

PLAN





PROFILE

ISSUE	5
DESCRIPTION	ISSUED FOR CONSTRUCTION
PROJECT/WCF NO.	KH900286-018
KEYWORDS	1.LAND 2.CONFIGURATION 3.GRADING 4.DRAINAGE 5.CHANNELS
TOLERANCES	FRACT. ± / ANGLE ± / DEC. ± / UNLESS NOTED OTHERWISE / REMOVE BURRS AND SHARP EDGES
DESIGN COMPANY	PARSONS
DESIGNED BY	J. WEHNER JPW
DRAWN BY	J. WEHNER JPW
CHECKED BY	J. KAPINOS JMK
INDEPENDENT VERIFIER	
APPROVED BY	
BLDG./FACILITY	SITE
ROOM/AREA	N/A
GRID COORD./COL NO.	N/A
NEXT ASSEMBLY	N/A
SCALE	N/A
CLASSIFIER	
ADDITIONAL APPROVALS	

U.S. DEPARTMENT OF ENERGY
ROCKY FLATS OFFICE GOLDEN, COLORADO
Rocky Flats Environmental Technology Site
GOLDEN, COLORADO

LAND CONFIGURATION DESIGN BASIS
IA GRADING AND DRAINAGE CHANNELS
ENGINEERED CHANNEL FC-4 (SOUTH WALNUT CREEK) PLAN AND PROFILE (2 OF 3)

SIZE	DRAWING NUMBER	ISSUE
D	51754-C033	5

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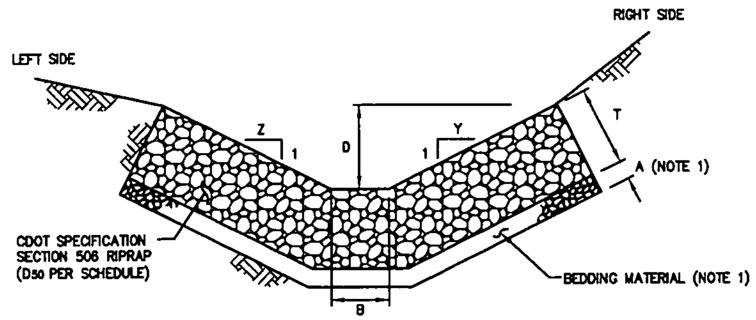
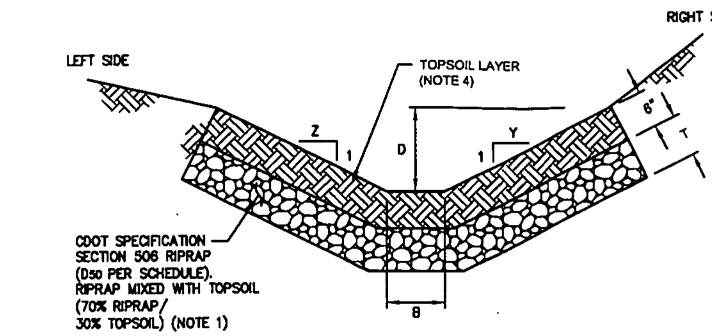
ITEM NO.	QUAN.	DESCRIPTION	MATERIAL



1. RIPRAP BEDDING THICKNESS A SHALL BE IN ACCORDANCE WITH TABLE C041-1. CONTRACTOR SHALL PREPARE SUBGRADE AND ALLOW OWNER OR ENGINEER TO INSPECT PRIOR TO PLACEMENT OF FILTER MATERIAL.
2. CHANNEL SECTION CUT LOOKING UPGRADIENT.
3. SEE CHANNEL SECTION SCHEDULE FOR DIMENSIONAL INFORMATION.

1 RIPRAP LINED CHANNEL DETAIL

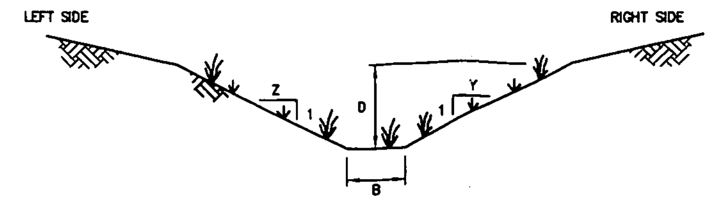
SCALE: NTS



1. USE VIBRATOR TO COMPACT RIPRAP/TOPSOIL MIXTURE LAYER AND TOPSOIL LAYER. VEGETATE TOPSOIL LAYER.
2. CHANNEL SECTION CUT LOOKING UPGRADIENT.
3. SEE CHANNEL SECTION SCHEDULE FOR DIMENSIONAL INFORMATION.

2 SOILED RIPRAP LINED CHANNEL DETAIL

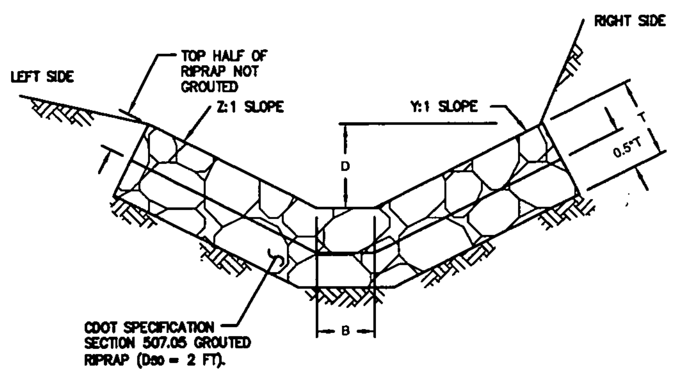
SCALE: NTS



1. CHANNEL SECTION CUT LOOKING UPGRADIENT.
2. SEE CHANNEL SECTION SCHEDULE FOR DIMENSIONAL INFORMATION.

3 GRASS LINED CHANNEL DETAIL

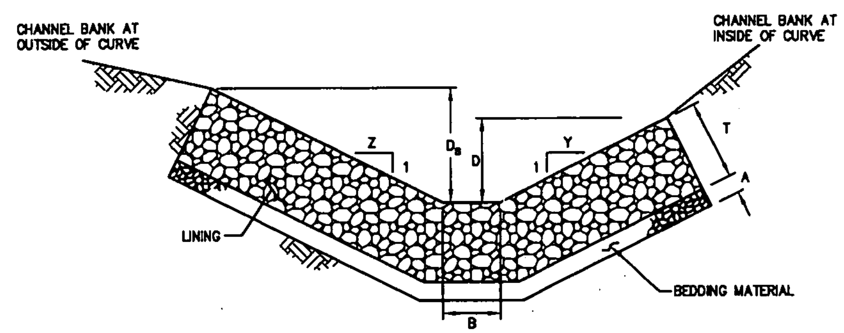
SCALE: NTS



NOTES:
1. CHANNEL SECTION CUT LOOKING UPGRADIENT.
2. SEE CHANNEL SECTION SCHEDULE FOR DIMENSIONAL INFORMATION.
3. GROUT SHALL BE IN ACCORDANCE WITH CDOT SPECIFICATION SECTION 507.05, EXCEPT THE MINIMUM 28 DAY COMPRESSIVE STRENGTH SHALL BE 3200 PSI AND UP TO 25 PERCENT FLY ASH (TYPE C) MAY BE SUBSTITUTED FOR THE PORTLAND CEMENT.

4 GROUTED RIPRAP LINED CHANNEL DETAIL

SCALE: NTS



1. RIPRAP LINING AND BEDDING SHOWN. HOWEVER LINING TYPE SHALL BE IN ACCORDANCE WITH CHANNEL SECTION SCHEDULE.
2. SEE SUPERELEVATION SCHEDULE FOR Ds. FOR ALL OTHER DIMENSIONS, SEE CHANNEL SECTION SCHEDULE AND APPROPRIATE CHANNEL DETAIL.

5 TYPICAL CHANNEL SUPERELEVATION DETAIL

SCALE: NTS

GROUT PLACEMENT SPECIFICATIONS

1. BEFORE GROUTING, CLEAN ALL DIRT AND MATERIALS FROM ROCK THAT COULD PREVENT THE GROUT FROM BONDING TO ROCK.
2. GROUT SHALL BE DELIVERED BY MEANS OF A LOW PRESSURE (LESS THAN 10 psi) GROUT PUMP USING A 2-INCH DIAMETER NOZZLE.
3. FULL DEPTH PENETRATION OF THE GROUT INTO THE ROCK VOIDS SHALL BE ACHIEVED BY INJECTING GROUT STARTING WITH THE NOZZLE NEAR THE BOTTOM AND RAISING IT AS GROUT FILLS, WHILE VIBRATING GROUT INTO PLACE USING A PENCIL VIBRATOR.
4. AFTER GROUT PLACEMENT, EXPOSED ROCK FACES SHALL BE CLEANED WITH A WET BROOM.
5. ALL GROUT BETWEEN ROCK SHALL BE TREATED WITH A BROOM FINISH.
6. ALL FINISHED GROUT SURFACES SHALL BE SPRAYED WITH A CLEAR LIQUID MEMBRANE CURING COMPOUND AS SPECIFIED IN ASTM C-309.
7. SPECIAL PROCEDURES SHALL BE REQUIRED FOR GROUT PLACEMENT WHEN THE AIR TEMPERATURES ARE LESS THAN 40°F OR GREATER THAN 90°F. CONTRACTOR SHALL OBTAIN PRIOR APPROVAL OF THE GROUT PROTECTION MEASURES FROM THE ENGINEER OR OWNER.

TABLE C041-1
GRANULAR BEDDING FOR RIPRAP*

RIPRAP DESIGNATION	MINIMUM BEDDING THICKNESS (INCHES)		
	FINE-GRAINED SUBGRADE**		COARSE-GRAINED SUBGRADE***
	TYPE I	TYPE II	TYPE II
D_{50} <= 9-IN	4	4	6
D_{50} = 12-IN	4	4	6
D_{50} = 18-IN	4	6	8
D_{50} = 24-IN	4	6	8

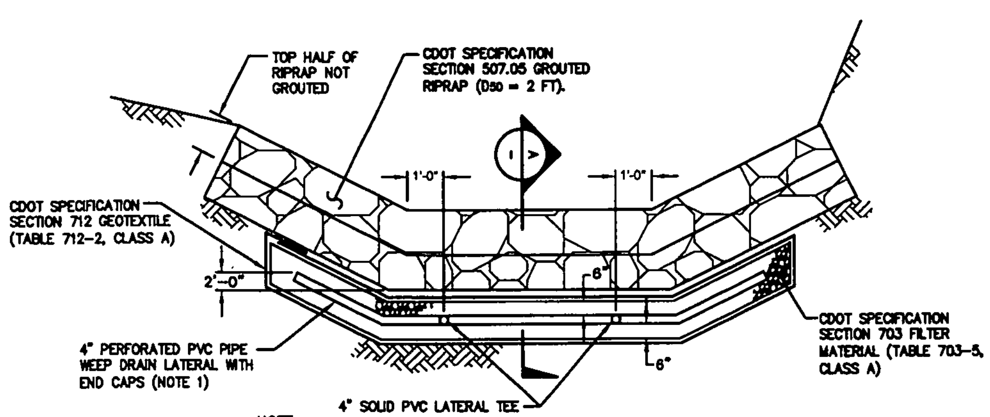
* GRANULAR BEDDING NOT REQUIRED BENEATH GROUTED RIPRAP OR GROUTED BOULDERS.

** FOR A TWO LAYER SYSTEM, TYPE I MATERIAL IS BENEATH TYPE II MATERIAL. MAY SUBSTITUTE ONE 12-INCH LAYER OF TYPE II BEDDING FOR TWO LAYER SYSTEM. THE SUBSTITUTION OF ONE LAYER OF TYPE II BEDDING SHALL NOT BE PERMITTED AT DROP STRUCTURES. THE USE OF A COMBINATION OF FILTER FABRIC AND TYPE II BEDDING AT DROP STRUCTURES IS ACCEPTABLE.

*** FIFTY PERCENT OR MORE (BY WEIGHT) COARSE SAND AND GRAVEL RETAINED ON THE #40 SIEVE.

TYPE I BEDDING: CDOT SECTION 703.01 FINE AGGREGATE FOR CONCRETE, TABLE 703-1.

TYPE II BEDDING: CDOT SECTION 703.09 CLASS A FILTER MATERIAL, TABLE 703-5.

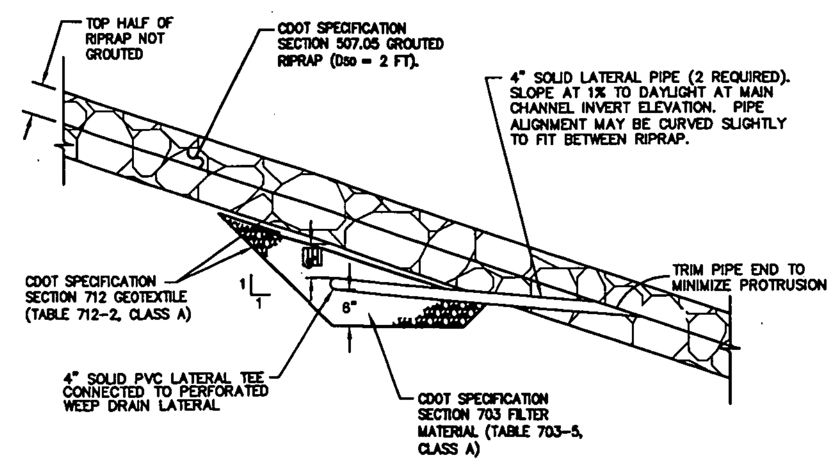


NOTE:
1. SEE PROFILE FOR LOCATION OF WEEP DRAIN LATERALS.

6 WEEP DRAIN LATERAL DETAIL

C036

SCALE: NTS



A SECTION

SCALE: NTS

5 ISSUE	DRAFT ISSUE/FINAL DESIGN (DESCRIPTION)	KH900286-018 (PROJECT/WCF NO.)
KEYWORDS: 1.LAND 2.CONFIGURATION 3.GRADING 4.DRAINAGE 5.CHANNELS	TOLERANCES: FRACT. ± ANGLE ± DEC. ± UNLESS NOTED OTHERWISE; REMOVE BURRS AND SHARP EDGES	U.S. DEPARTMENT OF ENERGY, ROCKY FLATS OFFICE, GOLDEN, COLORADO
BLDG./FACILITY: SITE	DESIGN COMPANY: PARSONS; DESIGNED BY: J. WEHNER JPW; DRAWN BY: J. HARSCH JLH; CHECKED BY; INDEPENDENT VERIFIER; APPROVED BY; CLASSIFIER; ADDITIONAL APPROVALS	Rocky Flats Environmental Technology Site, GOLDEN, COLORADO
ROOM/AREA: N/A	NEXT ASSEMBLY: N/A	LAND CONFIGURATION DESIGN BASIS IA GRADING AND DRAINAGE CHANNELS; CHANNEL DETAILS
GRID COORD./COL. NO.: N/A	SCALE: N/A	SIZE: D; DRAWING NUMBER: 51754-C041; ISSUE: 5

AUTOCAD COMPUTER GENERATED

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FC-2/FC-3 CHANNEL SECTION SCHEDULE

FROM STA	TO STA	LINING TYPE/CHANNEL DETAIL TO USE	D50 (IN)	T (IN)	D (FT)	B (FT)	Z	Y	COMMENTS
FC-3									
76+68.1	76+78.1	RIPRAP	12	31.50	6.0	10	2.5	2.5	RIPRAP KEY AT FLUME
76+78.1	76+98.1	GROUTED RIPRAP	24	24.00	6.0	10	2.5	2.5	GROUTED RIPRAP AT GRADE BREAK
76+98.1	77+18.1	GROUTED RIPRAP	24	24.00	6.0 TO 3.0	10	2.5	2.5	GROUTED RIPRAP AND TRANSITION CHANNEL. SUPERELEVATED CHANNEL (NOTE 1).
77+18.1	78+92.0	GROUTED RIPRAP	24	24.00	3.0	10	2.5	2.5	GROUTED RIPRAP. SUPERELEVATED CHANNEL (NOTE 1).
78+92.0	79+82.0	RIPRAP	24	42.00	3.0	10	2.5	2.5	SUPERELEVATED CHANNEL (NOTE 1).
79+82.0	80+12.0	RIPRAP	24	63.00	3.0 TO 5.0	10	2.5	2.5	RIPRAP KEY AT GRADE BREAK AND TRANSITION CHANNEL. SUPERELEVATED CHANNEL (NOTE 1).
80+12.0	81+15.0	RIPRAP	24	63.00	5.0	10	2.5	2.5	CONTINUE RIPRAP KEY AT CHANNEL CONFLUENCE
81+15.0	81+35.0	RIPRAP	12	31.50	5.0	10	2.5	2.5	RIPRAP KEY
81+35.0	81+50.0	RIPRAP	12	31.50	5.0	10 TO 8	2.5	2.5	CONTINUE RIPRAP KEY AND TRANSITION CHANNEL
81+50.0	81+55.0	RIPRAP	12	31.50	5.0	8	2.5	2.5	CONTINUE RIPRAP KEY
81+55.0	83+05.0	SOILED RIPRAP	6	12.0	5.0	8	2.5	2.5	
83+05.0	83+20.0	RIPRAP	24	63.00	5.0	8	2.5	2.5	RIPRAP KEY
83+20.0	83+30.0	RIPRAP	24	63.00	5.0 TO 4.25	8 TO 7	2.5	2.5	CONTINUE RIPRAP KEY AT GRADE BREAK AND TRANSITION CHANNEL
83+30.0	83+40.0	RIPRAP	24	63.00	4.25 TO 3.5	7	2.5	2.5	CONTINUE RIPRAP KEY AND TRANSITION CHANNEL
83+40.0	89+17.0	RIPRAP	24	42.00	3.5	7	2.5	2.5	SUPERELEVATED CHANNEL (NOTE 1)
89+27.0	89+42.0	RIPRAP	24	63.00	3.5	7	2.5	2.5	RIPRAP KEY
89+42.0	89+52.0	RIPRAP	24	63.00	3.5 TO 4.5	7 TO 8	2.5	2.5	CONTINUE RIPRAP KEY AT GRADE BREAK AND TRANSITION CHANNEL
89+52.0	89+57.0	RIPRAP	24	63.00	4.5	8	2.5	2.5	CONTINUE RIPRAP KEY
89+57.0	92+22.0	SOILED RIPRAP	6	12.0	4.5	8	2.5	2.5	
92+22.0	92+31.0	SOILED RIPRAP	6	36.00	SEE COMMENTS	8	SEE COMMENTS		SOILED RIPRAP KEY AT GRADE BREAK AND TRANSITION CHANNEL. SIDE SLOPES, DEPTH, AND RIPRAP LIMITS PER GRADING PLAN.
92+31.0	92+53.0	GRASS	N/A	N/A	SEE COMMENTS	8 TO 11.3	SEE COMMENTS		TRANSITION CHANNEL. SIDE SLOPES AND DEPTH PER GRADING PLAN.
FC-3-TRIB									
95+00.0	95+25.5	RIPRAP	24	63.00	5.0	7	2.5	2.5	RIPRAP KEY AT CONFLUENCE WITH FC-3 AND GRADE BREAK
95+25.5	95+50.0	RIPRAP	24	63.00	5.0	7	2.5	2.5	CONTINUE RIPRAP KEY
95+50.0	95+70.0	RIPRAP	24	63.00	5.0 TO 2.5	7	2.5	2.5	CONTINUE RIPRAP KEY
95+70.0	96+49.5	RIPRAP	12	21.00	2.5	7	2.5	2.5	
96+49.5	96+59.5	RIPRAP	12	31.50	2.5	7	2.5	2.5	RIPRAP KEY
96+59.5	96+69.5	RIPRAP	12	31.50	2.5 TO EX	7 TO EX	2.5 TO EX	2.5 TO EX	CONTINUE RIPRAP KEY AND TRANSITION CHANNEL TO EXISTING
96+69.5	96+89.5	RIPRAP	12	31.50	EXISTING	EXISTING	EX	EX	CONTINUE RIPRAP KEY IN EXISTING CHANNEL
FC-2									
109+34.9	109+49.9	RIPRAP	12	31.50	EXISTING	EXISTING	2.5	2.5	RIPRAP KEY IN EXISTING CHANNEL
109+49.9	109+59.9	RIPRAP	12	31.50	EX TO 2.5	EX TO 7	2.5	2.5	CONTINUE RIPRAP KEY AT GRADE BREAK AND TRANSITION CHANNEL TO PROPOSED
109+59.9	109+69.9	RIPRAP	12	31.50	2.5 TO 2.0	7	2.5	2.5	CONTINUE RIPRAP KEY
109+69.9	110+57.9	RIPRAP	12	21.00	2.0	7	2.5	2.5	
110+57.9	110+77.9	RIPRAP	12	31.50	2.0	7	2.5	2.5	RIPRAP KEY AT GRADE BREAK
110+77.9	114+16.3	RIPRAP	12	21.00	2.0	7	2.5	2.5	
114+16.3	114+26.3	RIPRAP	12	31.50	2.0	7	2.5	2.5	RIPRAP KEY
114+26.3	114+36.3	RIPRAP	12	31.50	2.0 TO 2.5	7 TO 8	2.5	2.5	CONTINUE RIPRAP KEY AT GRADE BREAK AND TRANSITION CHANNEL
114+36.3	114+51.3	RIPRAP	12	31.50	2.5	8	2.5	2.5	CONTINUE RIPRAP KEY
114+51.3	119+20.7	SOILED RIPRAP	6	12.0	2.5	8	2.5	2.5	
119+20.7	119+30.7	SOILED RIPRAP	6	15.75	2.5	8	2.5	2.5	RIPRAP KEY AT GRADE BREAK
119+30.7	119+51.7	SOILED RIPRAP	6	15.75	2.5 TO 1.0	8 TO 20.5	2.5	2.5	BEGIN DAYLIGHTING CHANNEL TO EXISTING GRADE. PLACE RIPRAP IN CHANNEL BOTTOM AND UP SIDE SLOPES TO ELEV. 6007.0 FT
119+51.7	119+61.3	GRASS	N/A	N/A	1.0 TO 0.0	20.5 TO 37.3	2.5	2.5	FINISH DAYLIGHTING CHANNEL TO EXISTING GRADE

NOTES:
1. SEE SUPERELEVATION SCHEDULE FOR SUPERELEVATED CHANNEL INFORMATION.
2. WHERE A RANGE IS USED IN THE SCHEDULE (e.g. 6 TO 3), PROVIDE LINEAR TRANSITION OVER STATION INTERVAL.

SUPERELEVATION SCHEDULE

FROM STA.	TO STA.	CHANNEL CENTERLINE CURVE RADIUS (FT)	D_S (FT)
FC-3			
76+98.1	77+52.5	80.0	4.0
77+53.9	77+76.6	80.0	4.0
78+03.7	78+18.9	200.0	4.0
78+61.0	78+80.8	150.0	4.0
78+88.5	79+18.6	150.0	4.0
79+25.7	79+57.8	150.0	4.0
79+67.4	80+12.0	150.0	4.0
83+86.9	85+04.5	200.0	4.0

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FC-4/FC-5 CHANNEL SECTION SCHEDULE

FROM STA	TO STA	LINING TYPE/CHANNEL DETAIL TO USE	D50 (IN)	T (IN)	D (FT)	B (FT)	Z	Y	COMMENTS
FC-4									
9+71.0	9+81.0	RIPRAP	24	63.00	SEE COMMENTS	7	2.5	2.5	RIPRAP KEY AND TRANSITION FROM EXISTING TO PROPOSED CHANNEL SECTION. RIPRAP LIMITS AND DEPTH PER GRADING PLAN.
9+81.0	10+36.0	RIPRAP	24	63.00	SEE COMMENTS	7	2.5	2.5	RIPRAP KEY AND TRANSITION CHANNEL. RIPRAP LIMITS AND DEPTH PER GRADING PLAN.
10+36.0	11+06.0	RIPRAP	24	42.00	SEE COMMENTS	7	2.5	2.5	RIPRAP KEY AND TRANSITION CHANNEL. RIPRAP LIMITS AND DEPTH PER GRADING PLAN.
11+06.0	17+15.8	RIPRAP	24	42.00	3.5	7	2.5	2.5	
17+15.8	17+25.8	RIPRAP	24	63.00	3.5 to 4.5	7	2.5	2.5	RIPRAP KEY AND TRANSITION CHANNEL
17+25.8	18+73.2	RIPRAP	24	63.00	4.5	7	2.5	2.5	CONTINUE RIPRAP KEY AND CONFLUENCE W/ FC-5
18+73.2	19+28.6	RIPRAP	24	63.00	SEE COMMENTS	7	SEE COMMENTS		CONTINUE RIPRAP KEY AND TRANSITION FROM CHANNEL SECTION TO WETLAND. SIDE SLOPES, DEPTH, AND RIPRAP LIMITS PER GRADING PLAN.
24+70.5	24+98.0	RIPRAP	24	63.00	SEE COMMENTS	SEE COMMENTS	SEE COMMENTS		RIPRAP KEY AND TRANSITION FROM WETLAND TO CHANNEL SECTION USING GRADING PLAN. RIPRAP LIMITS PER GRADING PLAN.
24+98.0	25+37.0	RIPRAP	24	63.00	SEE COMMENTS	7	SEE COMMENTS		CONTINUE RIPRAP KEY. SIDE SLOPES, DEPTH, AND RIPRAP LIMITS PER GRADING PLAN.
25+37.0	25+57.0	RIPRAP	24	63.00	5.5	7	2.5	2.5	CONTINUE RIPRAP KEY AT GRADE BREAK
25+57.0	25+77.0	RIPRAP	24	63.00	5.5 TO 4.0	7	2.5	2.5	CONTINUE RIPRAP KEY AND TRANSITION CHANNEL.
25+77.0	27+87.8	RIPRAP	24	42.00	4.0	7	2.5	2.5	
27+87.8	28+07.8	RIPRAP	24	63.00	4.0	7	2.5	2.5	RIPRAP KEY AT GRADE BREAK
28+07.8	32+77.6	RIPRAP	24	42.00	4.0	7	2.5	2.5	
32+77.6	32+82.6	RIPRAP	24	63.00	4.0	7	2.5	2.5	RIPRAP KEY AT GRADE BREAK
STATION EQUALITY 32+82.6 = 33+47.7									
33+47.7	33+62.7	RIPRAP	24	63.00	4.0 TO 3.5	7	2.5	2.5	CONTINUE RIPRAP KEY AND TRANSITION CHANNEL
33+62.7	33+99.6	RIPRAP	18	31.50	3.5	7	2.5	2.5	
33+99.6	35+17.3	RIPRAP	18	47.25	3.5	7	2.5	2.5	RIPRAP KEY AND CONFLUENCE WITH FC-4-TRIB
35+17.3	35+27.3	RIPRAP	18	47.25	3.5	7 TO 8	2.5	2.5	CONTINUE RIPRAP KEY AT GRADE BREAK AND TRANSITION CHANNEL
35+27.3	35+37.3	RIPRAP	18	47.25	3.5 TO 2.5	8	2.5	2.5	CONTINUE RIPRAP KEY AND TRANSITION CHANNEL
35+37.3	35+42.3	RIPRAP	18	47.25	2.5	8	2.5	2.5	CONTINUE RIPRAP KEY
35+42.3	41+81.3	SOILED RIPRAP	6	12.0	2.5	8	2.5	2.5	
41+81.3	41+91.3	SOILED RIPRAP	6	15.75	2.5	8	2.5	2.5	SOILED RIPRAP KEY AT GRADE BREAK
41+91.3	42+36.3	SOILED RIPRAP	6	12.0	2.5	8	2.5	2.5	
42+36.3	42+46.3	SOILED RIPRAP	6	12.0	2.5 TO 2.0	8	2.5	2.5	TRANSITION CHANNEL
42+46.3	46+26.3	SOILED RIPRAP	6	12.0	2.0	8	2.5	2.5	
46+26.3	46+36.3	SOILED RIPRAP	6	15.75	2.0	8	2.5	2.5	SOILED RIPRAP KEY AT GRADE BREAK
46+36.3	46+52.3	SOILED RIPRAP	6	15.75	2.0 TO 1.0	8 TO 12.9	2.5	2.5	BEGIN DAYLIGHTING CHANNEL TO EXISTING GRADE. PLACE RIPRAP IN CHANNEL BOTTOM AND UP SIDE SLOPES TO ELEV. 5990.7 FT
46+52.3	46+68.8	GRASS	N/A	N/A	1.0 TO 0.0	12.9 TO 16.6	2.5	2.5	FINISH DAYLIGHTING CHANNEL TO EXISTING GRADE
FC-5									
50+00.0	51+00.0	RIPRAP	24	63.00	4.5	7	2.5	2.5	RIPRAP KEY AT CONFLUENCE WITH FC-4
51+00.0	51+30.0	RIPRAP	24	63.00	4.5 TO 2.0	7	2.5	2.5	CONTINUE RIPRAP KEY AND TRANSITION CHANNEL
51+30.0	56+75.0	RIPRAP	12	21.00	2.0	7	2.5	2.5	
56+75.0	56+80.0	RIPRAP	12	31.50	2.0	7	2.5	2.5	RIPRAP KEY
56+80.0	57+00.0	RIPRAP	12	31.50	2.0 TO 2.5	7 TO 8	2.5	2.5	CONTINUE RIPRAP KEY AT GRADE BREAK AND TRANSITION CHANNEL
57+00.0	57+15.0	RIPRAP	12	31.50	2.5	8	2.5	2.5	CONTINUE RIPRAP KEY
57+15.0	58+89.5	SOILED RIPRAP	6	12.0	2.5	8	2.5	2.5	
58+89.5	58+94.5	SOILED RIPRAP	6	15.75	2.5	8	2.5	2.5	SOILED RIPRAP KEY AT GRADE BREAK
58+94.5	59+14.5	SOILED RIPRAP	6	15.75	2.5 TO EX	8 TO EX	EX	EX	CONTINUE SOILED RIPRAP KEY AND TRANSITION TO EXISTING CHANNEL SECTION
59+14.5	59+19.5	SOILED RIPRAP	6	15.75	EXISTING	EXISTING	EX	EX	CONTINUE SOILED RIPRAP KEY IN EXISTING CHANNEL SECTION
59+19.5	61+82.0	EXISTING	N/A	N/A	EXISTING	EXISTING	EX	EX	EXISTING CHANNEL
61+82.0	61+87.0	SOILED RIPRAP	6	15.75	EXISTING	EXISTING	EX	EX	SOILED RIPRAP KEY IN EXISTING CHANNEL SECTION
61+87.0	61+97.0	SOILED RIPRAP	6	15.75	EX TO 2.0	EX TO 8	EX	EX	CONTINUE SOILED RIPRAP KEY AND TRANSITION TO PROPOSED CHANNEL SECTION
61+97.0	62+07.0	SOILED RIPRAP	6	15.75	2.0	8	2.5	2.5	CONTINUE SOILED RIPRAP KEY AT GRADE BREAK
62+07.0	62+59.0	SOILED RIPRAP	6	12.0	2.0	8	2.5	2.5	
62+59.0	62+69.0	SOILED RIPRAP	6	15.75	2.0	8	2.5	2.5	SOILED RIPRAP KEY AT GRADE BREAK
62+69.0	65+12.9	SOILED RIPRAP	6	12.0	2.0	8	2.5	2.5	
65+12.9	65+22.9	SOILED RIPRAP	6	15.75	2.0	8	2.5	2.5	SOILED RIPRAP KEY AT GRADE BREAK
65+22.9	65+41.2	SOILED RIPRAP	6	15.75	2.0 TO 1.0	8 TO 19.0	2.5	2.5	BEGIN DAYLIGHTING CHANNEL TO EXISTING GRADE. PLACE RIPRAP IN CHANNEL BOTTOM AND UP SIDE SLOPES TO ELEV. 5975.0 FT
65+41.2	65+59.0	GRASS	N/A	N/A	1.0 TO 0.0	19.0 TO 29.7	2.5	2.5	FINISH DAYLIGHTING CHANNEL TO EXISTING GRADE
FC-4-TRIB									
70+00.0	70+98.1	RIPRAP	18	47.25	3.5	7	2.5	2.5	RIPRAP KEY AT CONFLUENCE WITH FC-4
70+98.1	71+08.1	RIPRAP	18	47.25	3.5 TO 2.5	7 TO 8	2.5	2.5	CONTINUE RIPRAP KEY AT GRADE BREAK AND TRANSITION CHANNEL
71+08.1	71+23.1	RIPRAP	18	47.25	2.5	8	2.5	2.5	CONTINUE RIPRAP KEY
71+23.1	71+62.8	SOILED RIPRAP	6	12.0	2.5	8	2.5	2.5	
71+62.8	71+72.8	SOILED RIPRAP	6	15.75	2.5	8	2.5	2.5	SOILED RIPRAP KEY AT GRADE BREAK
71+72.8	71+87.8	SOILED RIPRAP	6	15.75	2.5	8 TO EX	2.5	2.5	CONTINUE SOILED RIPRAP KEY AND TRANSITION TO EXISTING CHANNEL SECTION
71+87.8	71+92.8	SOILED RIPRAP	6	15.75	EXISTING	EXISTING	2.5	2.5	CONTINUE SOILED RIPRAP KEY AND TIE-INTO EXISTING

NOTES:
1. WHERE A RANGE IS USED IN THE SCHEDULE (e.g. 6 TO 3), PROVIDE LINEAR TRANSITION OVER STATION INTERVAL.

ITEM NO.	QUAN.	DESCRIPTION	MATERIAL

5 ISSUED FOR CONSTRUCTION

KEYWORDS: 1.LAND 2.CONFIGURATION 3.GRADING 4.DRAINAGE 5.CHANNELS

SITE N/A

DESIGN COMPANY: PARSONS
DESIGNED BY: J. WEHNER JPW
DRAWN BY: J. HARSCH JLH
CHECKED BY
INDEPENDENT VERIFIER
APPROVED BY
CLASSIFIER
ADDITIONAL APPROVALS

SCALE N/A

KH900286-018 PROJECT/WO NO.

U.S. DEPARTMENT OF ENERGY
ROCKY FLATS OFFICE GOLDEN, COLORADO

Rocky Flats Environmental Technology Site
GOLDEN, COLORADO

LAND CONFIGURATION DESIGN BASIS
IA GRADING AND DRAINAGE CHANNELS

CHANNEL SECTION SCHEDULE AND SUPERELEVATION SCHEDULE

SIZE D DRAWING NUMBER 51754-C043 ISSUE 5

AUTOCAD COMPUTER GENERATED

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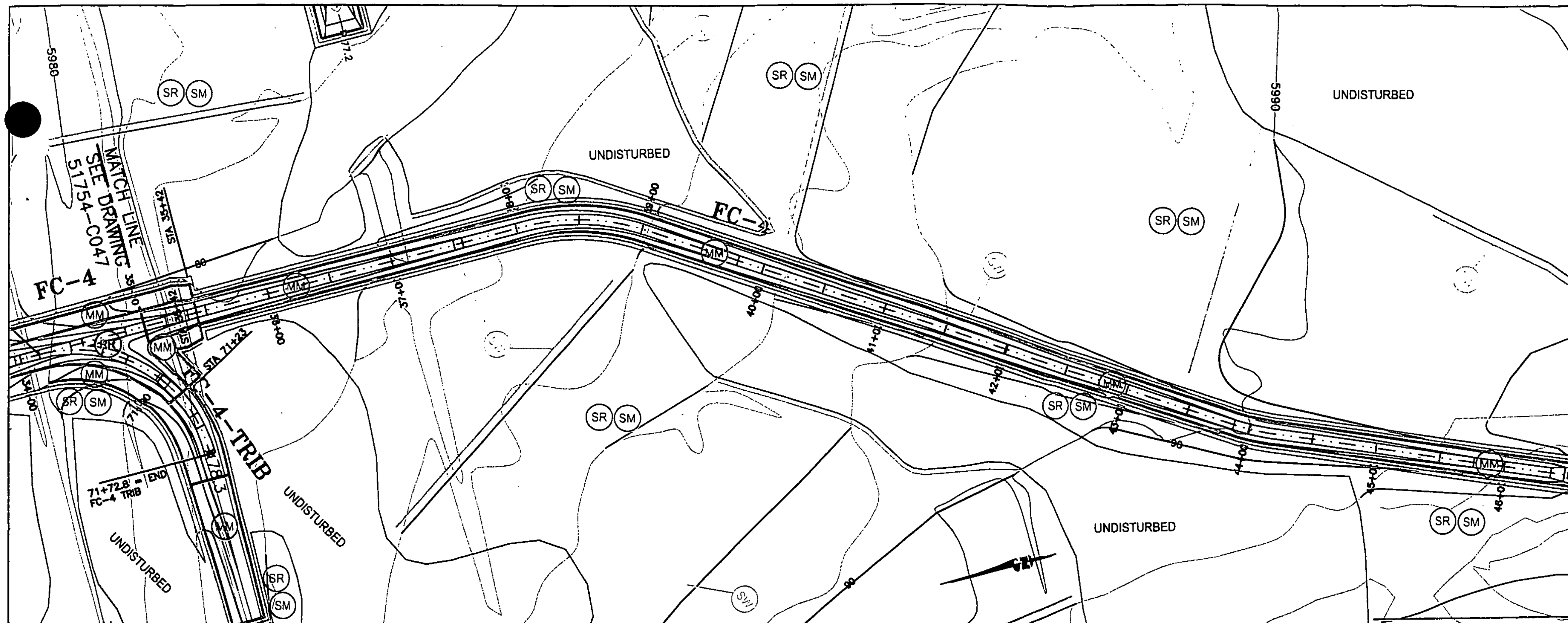


A ISSUE	ISSUED FOR REVIEW DESCRIPTION	KH900286-018 PROJECT/WCF NO.

KEYWORDS	TOLERANCES	DESIGN COMPANY: PARSONS	U.S. DEPARTMENT OF ENERGY ROCKY FLATS OFFICE GOLDEN, COLORADO
1.LAND	FRACT. ±	DESIGNED BY J. KAPINOS JMK	Rocky Flats Environmental Technology Site GOLDEN, COLORADO
2.CONFIGURATION	ANGLE ±	DRAWN BY R. SOLBERG RES	
3.GRADING	DEC. ±	CHECKED BY J. KAPINOS JMK	LAND CONFIGURATION DESIGN BASIS IA GRADING AND DRAINAGE CHANNELS
4.DRAINAGE	UNLESS NOTED OTHERWISE	INDEPENDENT VERIFIER	FC-4 (STA 35+00 TO STA 46+68.8) AND FC-5 EROSION AND SEDIMENT CONTROL PLAN
5.CHANNELS	REMOVE BURRS AND SHARP EDGES	APPROVED BY	
BLDG./FACILITY SITE	NEXT ASSEMBLY	CLASSIFIER	SIZE D
ROOM/AREA N/A	N/A	ADDITIONAL APPROVALS	DRAWING NUMBER 51754-C048
GRID COORD./COL. NO. N/A	SCALE: N/A		ISSUE A

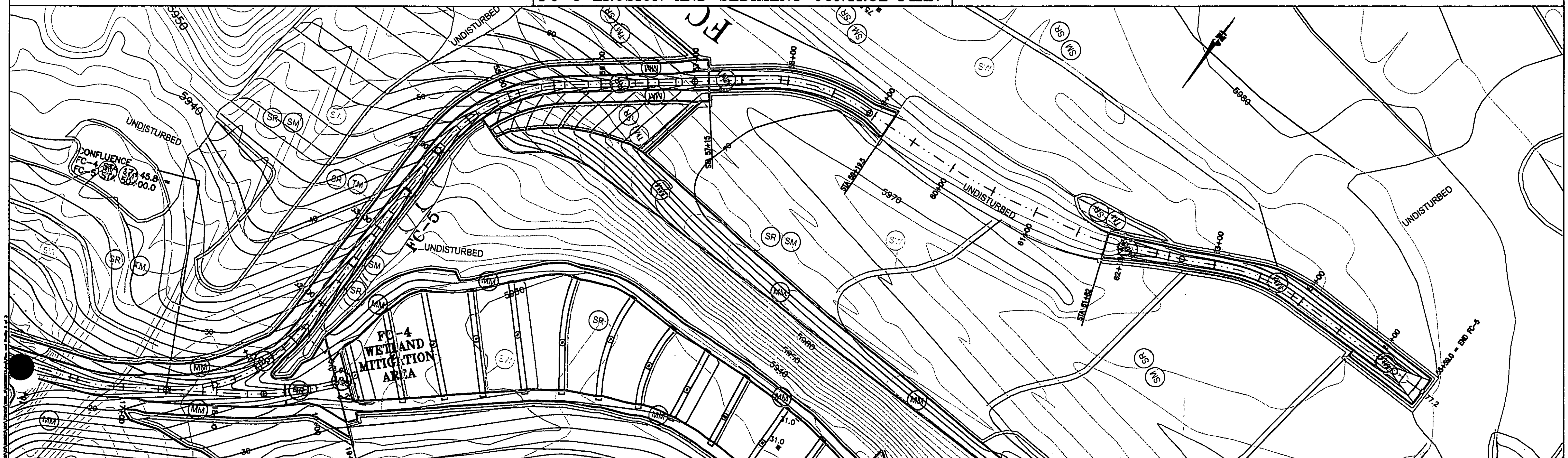
EROSION AND SEDIMENT CONTROL LEGEND

- (MM) MATTED MULCH
- (SW) STRAW WATTLE
- (RR) RIPRAP (GROUTED OR UNGROUTED)
- (TM) TACKIFIER MULCH
- (SM) STRAW MULCH
- (SR) SURFACE ROUGHENING

NOTES:
1. FOR GENERAL LEGEND AND ABBREVIATIONS, SEE DRAWING C030.
2. FOR FC-4 PLAN AND PROFILE (STA 35+00 TO STA 46+68.8), SEE DRAWING C034.
3. FOR FC-5 PLAN AND PROFILE, SEE DRAWING C035.
4. FOR EROSION AND SEDIMENT CONTROL NOTES AND DETAILS, SEE DRAWINGS C052 AND C053.

FC-4 (STA 35+00 TO STA 46+68.8) EROSION AND SEDIMENT CONTROL PLAN

FC-5 EROSION AND SEDIMENT CONTROL PLAN



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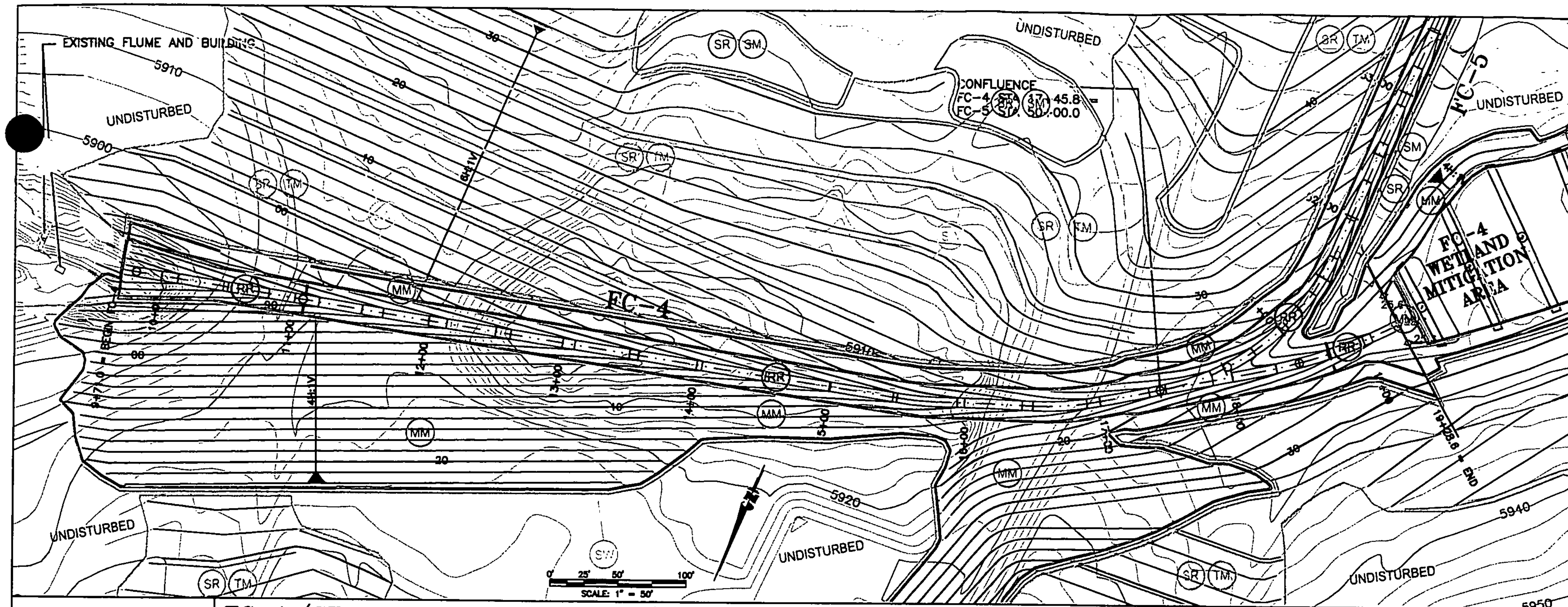
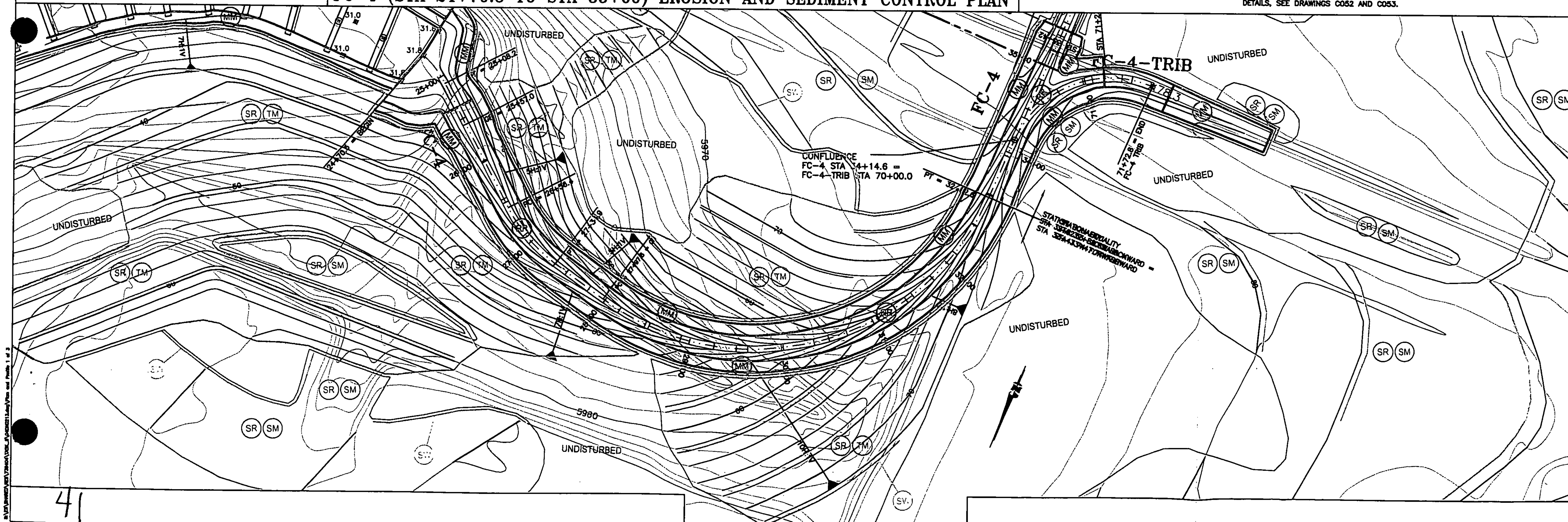


FC-4 (STA 9+71 TO STA 19+28.6) EROSION AND SEDIMENT CONTROL PLAN

FC-4 (STA 24+70.5 TO STA 35+00) EROSION AND SEDIMENT CONTROL PLAN



A ISSUE	ISSUED FOR REVIEW DESCRIPTION		KH900286-018 PROJECT/WOF NO.
KEYWORDS	TOLERANCES FRACT. ± ANGLE ± DEC. ± UNLESS NOTED OTHERWISE	DESIGN COMPANY: PARSONS	U.S. DEPARTMENT OF ENERGY ROCKY FLATS OFFICE GOLDEN, COLORADO
1.LAND		DESIGNED BY J. KAPINOS JMK	Rocky Flats Environmental Technology Site GOLDEN, COLORADO
2.CONFIGURATION		DRAWN BY R. SOLBERG RES	
3.GRADING		CHECKED BY J. KAPINOS JMK	LAND CONFIGURATION DESIGN BASIS IA GRADING AND DRAINAGE CHANNELS
4.DRAINAGE		INDEPENDENT VERIFIER	FC-4 (STA 9+71 TO STA 35+00) EROSION AND SEDIMENT CONTROL PLAN
5.CHANNELS	REMOVE BURRS AND SHARP EDGES	APPROVED BY	
BLDG./FACILITY SITE	NEXT ASSEMBLY N/A	CLASSIFIER	SIZE D
ROOM/AREA N/A		ADDITIONAL APPROVALS	DRAWING NUMBER 51754-C047
GRID COORD./COL. NO. N/A	SCALE: N/A		ISSUE A

EROSION AND SEDIMENT CONTROL LEGEND

- (MM) MATTED MULCH
- (SW) STRAW WATTLE
- (RR) RIPRAP (GROUTED OR UNGROUTED)
- (TM) TACKIFIER MULCH
- (SM) STRAW MULCH
- (SR) SURFACE ROUGHENING

NOTES:
1. FOR GENERAL LEGEND AND ABBREVIATIONS, SEE DRAWING C030.
2. FOR FC-4 PLAN AND PROFILE (STA 9+71 TO STA 35+00), SEE DRAWING C032 AND C033.
3. FOR EROSION AND SEDIMENT CONTROL NOTES AND DETAILS, SEE DRAWINGS C052 AND C053.

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Appendix 2

Article 1	**Contact Record, January 7, 2004** Agreement to plug the 998 tunnel (Corridor A), Corridor B, and Room 402 with foam
Article 2	**Contact Record, February 2, 2004** Agreement to apply foam plugs in Corridor B and Room 402, Building 991
Article 3	**Contact Record, February 11, 2004** Leaving Non-Friable Tiles in Place in Building 991
Article 4	**Contact Record, March 15, 2004** Agreement to leave foam plug in Corridor A, Building 991
Article 5	**CERCLA Administrative Record for 991 Complex**

Note: For ease of reference only Contact Records referenced in this Final Closeout Report for the 991 Cluster Closure Project are included in this appendix. Other Contact Records regarding the 991 Cluster Closure Project were distributed at the time the record was established.

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
REGULATORY CONTACT RECORD

Date/Time:	January 7, 2004 / 1:00 p.m.		
Site Contact(s):	J.R. Marschall	Gary Morgan	Karen Wiemelt
Phone:	303-966-2372	303-966-6003	303-966-9883
Regulatory Contact:	David Kruchek		
Phone:	303-692-3328		
Agency:	CDPHE		

Purpose of Contact: Agreement to plug the 998 Tunnel (Corridor A), Corridor B, and Room 402 with foam

Discussion

At the January 7, 2004, Bi-Weekly D&D Meeting with CDPHE and DOE, K-H personnel made a presentation discussing the effects of leaving the 998 Vault, Corridor A (partial), Corridor B, and Room 402 in place. The presentation consisted of an analysis of the effect on ground water and VOC plume movement during a wet year caused by the structures left in place and a structural analysis on when those structures might be expected to fail. Based of direction of ground water flow and the depth of bedrock in those areas it was determined the structures left in place would have little effect and would not cause slumping and erosion of the topsoil. Transport simulations showed the VOC plume movement from the north into the Building 991 area does not occur, due to the local northerly flow direction in the plume area. The structural analysis showed a high probability that the structures would not fail for up to 1000 years.

Based on these results Dave Kruchek agreed that K-H could proceed with the foaming of Corridor A, Corridor B (2 places), and Room 402 thereby leaving those structures in place after demolition of Building 991. Foam plugs will be placed as follows:

- 998 Tunnel (Corridor A) will be plugged with foam 60' north of the entrance to the tunnel from Building 991. The foam plug will be approximately 8'w. x 10'h. x 12.5'deep. The southern 60' of the tunnel will then be demolished along with Building 991 and be back-filled with compacted soil to the foam plug.
- Corridor B will be plugged with foam in two places; at the roll-up door entering from the courtyard under the canopy, and at the double door on the east end entering from Building 991. The foam plug at the roll-up door will be approximately 10'w. x 12'h. x 18'deep and placed against the roll-up door. The foam plug at the east doors will be approximately 8'w. x 8'h. x 10'deep encompassing the 45° turn, and placed against the double doors. When demolition is complete both entrances will have compacted back-fill up against the doors.
- Room 402 will be plugged with foam at the double door entrance. The foam plug will be approximately 10'w. x 10'h. x 12'deep. The double door is next to the roll-up door in Corridor B and will also have compacted back-fill against it.

Contact Record Prepared By: J.R. Marschall

Required Distribution:

M. Aguilar, USEPA
S. Bell, DOE-RFFO
B. Birk, DOE-RFFO
C. Deck, K-H Legal
D. Foss, K-H 707/776/777
C. Gilbreath, K-H 771/774
S. Gunderson, CDPHE
L. Kilpatrick, DOE-RFFO
G. Kleeman, USEPA
J. Legare, DOE-RFFO
R. Leitner, K-H 371/374
D. Maxwell, DOE-RFFO
J. Mead, K-H ESS
S. Nesta, K-H RISS
K. North, K-H ESS/MS
R. Schassburger, DOE-RFFO
D. Shelton, K-H ESS
C. Zahm, K-H Legal

Additional Distribution:

Gary Morgan, DOE-RFFO
Karen Wiemelt, K-H RISS

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
REGULATORY CONTACT RECORD

Date/Time: February 2, 2004 / 12:00

Site Contact(s):	J.R. Marschall	Gary Morgan	Karen Wiemelt
Phone:	303-966-2372	303-966-6003	303-966-9883

Regulatory Contact: Dave Kruchek
Phone: 303-692-3328

Agency: CDPHE

Purpose of Contact: Agreement to apply foam plugs in Corridor B and Room 402, Building 991.

Discussion

The above parties met on February 2, 2004, to continue discussions on effects of leaving Corridor B and Room 402 in place, and plugging the entrances with foam (reference Contact Record dated January 7). Duane Parsons also attended the meeting and provided preliminary reports that the Pre-Demolition Surveys had been completed in the subject areas with results below free-release limits.

Keith MacLeod, who performed the structural calculations, reported that the east leg of Corridor B with less free span would not collapse for 1000 to 1500 years. The west leg of Corridor B under the Building 985 slab (left in place) would not collapse for at least 700 years. The remaining portion (approximately 20') of the west leg would not support the earthen burden after corrosion of the reinforcing bars and would collapse after a minimum of 500 years. Room 402 with greatest span of the three areas, would also not support the earthen burden after corrosion of the reinforcing bar, and would last a minimum of 500 years. The issue with the collapse of Room 402 is that it was projected to leave a depression some 35' across and 12'-6" deep.

A depression that deep concerned Dave Kruchek and he requested that the depression be minimized somehow. It was decided that Room 402 would be filled to a depth of 6' throughout the room with foam and the entrance plugged completely as discussed in the Contact Record of January 7. This would limit the size of the depression to approximately 6' deep. With a compressive strength of nearly 3500 pounds/cubic foot the foam is not expected to compress much, if at all, with soil and concrete on top of it at 100 and 180 pounds/cubic foot respectively. Dave agreed to this resolution for Room 402 and approved the foam plugs for each end of Corridor B as described in the Contact Record of January 7. Dave also requested and it was agreed that the west end of Corridor B would be allowed to drain off any accumulated water behind the foam plug by making sure the small trough against the west wall would be kept open.

Contact Record Prepared By: J.R. Marschall

Required Distribution:		Additional Distribution:
M. Aguilar, USEPA	J. Legare, DOE-RFFO	
S. Bell, DOE-RFFO	R. Leitner, K-H 371/374	
B. Birk, DOE-RFFO	D. Maxwell, DOE-RFFO	
C. Deck, K-H Legal	J. Mead, K-H ESS	
D. Foss, K-H 707/776/777	S. Nesta, K-H RISS	
C. Gilbreath, K-H 771/774	K. North, K-H ESS/MS	
S. Gunderson, CDPHE	R. Schassburger, DOE-RFFO	
L. Kilpatrick, DOE-RFFO	D. Shelton, K-H ESS	
G. Kleeman, USEPA	C. Zahm, K-H Legal	

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
REGULATORY CONTACT RECORD

Date/Time: February 11, 2004 / 14:45

Site Contact(s): J. R. Marschall
Phone: 303-966-2372

Regulatory Contact: Dave Kruchek
Phone: 303-692-3328

Agency: CDPHE

Purpose of Contact: Leaving Non-Friable Tiles in Place in Building 991

Discussion

Kaiser-Hill proposed a deviation from the RSOP requirement to remove all ACM from Building 991, and leave the vinyl floor tiles in place during the demolition of the building. None of the tile is friable asbestos; however, some of the tiles contain amounts of asbestos ranging from 7 to 12% Chrysotile, but the majority of the tile being left is non-ACM. Additionally, the tiles left in place will be a minimum of 3' to 4' below the final proposed grade for the area, and since the site will be a wild life refuge there will be no buildings, homes, or other structures that could possibly disturb the tiles.

During the demolition, in addition to normal dust suppression, only rubber-tired equipment will be allowed on the tile to avoid potential pulverization that crawler or track type vehicles would create. Tiles may be broken during load out, but they will not be pulverized. Rubber-tired loaders will be utilized to remove the rubble from the floor area to the haul trucks and to move dirt into the basement tunnels that will be back-filled to grade level. Rubber-tired loaders will also spread a layer, 6" to 12", of dirt over the floor such that tracked vehicles can access the floor area without pulverizing the tiles and continue demolition of the superstructure. The waste from the building will be sent to a sanitary landfill as potentially containing asbestos. None of the concrete that could contain asbestos will be used as recycled fill on site. Finally, the 991 Close-Out Report will include specific locations of asbestos containing tile left in place.

Based on the tile and mastic being uncontaminated, the asbestos being non-friable in the tile and mastic, the limited amount of asbestos containing tile and mastic to remain, and utilizing appropriate demolition and debris removal techniques to prevent this asbestos from becoming friable/airborne, for this specific situation at Building 991, Dave Kruchek agreed that non-friable asbestos containing tile may be left in place.

Contact Record Prepared By: J. R. Marschall

Required Distribution:

M. Aguilar, USEPA
S. Bell, DOE-RFFO
B. Birk, DOE-RFFO
C. Deck, K-H Legal
D. Foss, K-H 707/776/777
C. Gilbreath, K-H 771/774
S. Gunderson, CDPHE
L. Kilpatrick, DOE-RFFO
G. Kleeman, USEPA
J. Legare, DOE-RFFO
R. Leitner, K-H 371/374
D. Maxwell, DOE-RFFO
J. Mead, K-H ESS
S. Nesta, K-H RISS
K. North, K-H ESS/MS
R. Schassburger, DOE-RFFO
D. Shelton, K-H ESS
C. Zahm, K-H Legal

Additional Distribution:

David Kruchek, CDPHE
Gary Morgan, DOE-RFFO
Karen Wiemelt, K-H RISS

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
REGULATORY CONTACT RECORD

Date/Time:	March 15, 2004 / 13:30		
Site Contact(s):	J.R. Marschall	Steve Nesta	Karen Wiemelt
Phone:	303-966-2372	303-966-6386	303-966-9883
Regulatory Contact:	Dave Kruchek		
Phone:	303-692-3328		
Agency:	CDPHE		

Purpose of Contact: Agreement to leave foam plug in Corridor A, Building 991.

Discussion

The above parties met on March 15, 2004, to discuss the foam plug in Corridor A (998 Tunnel). Options included leaving the foam in place or removing the foam and replacing it with another media, i.e. soil, rip-rap, or concrete. This discussion was the result of the foam that burned in the west entrance to Corridor B (Door 7). An investigation into causal factors for the Corridor B incident uncovered several anomalies in the application of the foam that brought into question the integrity of the foam plug in Corridor A. Did the foam cure properly, did it maintain compressive strength, did it mix thoroughly and, if not, was it now to be considered hazardous waste?

At the beginning of the application of the foam in Corridor A, the valve that provided the isocyanate to mix with the resin had plugged for several minutes and only resin was applied. This condition was corrected, but over the next several days unmixed resin seeped out under the wall onto the floor. The resin was tested for hazardous constituents and found to be non-hazardous. This is consistent with the MSDS for the resin part of the two part foam components.

Two inch holes were bored at three places ten feet into the foam to determine if the foam had any signs of charring and/or improper or incomplete curing. A fiber-optic camera w/lighting was inserted into the holes and pulled out slowly so that charring or incomplete curing could be seen. A video was made and the video presented to Dave Kruchek at this meeting. The video revealed no signs of charring or incomplete curing. Turnings collected during the boring operation supported these findings. What was revealed was that the foam plug had a number of voids from 3" to 4" up to perhaps 2', but virtually all the voids were toward the back of the foam. The front 4' or so had much better consistency.

Based on these findings it was determined that the foam plug, though not as robust as at once believed it would be, was still the best option available for plugging the corridor. Dirt, rip-rap, and even concrete have their own inadequacies that would not improve what currently exists. For these reasons it was decided to leave the foam plug in place and proceed as originally planned.

Contact Record Prepared By: J.R. Marschall

Required Distribution:

M. Aguilar, USEPA
S. Bell, DOE-RFFO
B. Birk, DOE-RFFO
C. Deck, K-H Legal
D. Foss, K-H 707/776/777
C. Gilbreath, K-H 771/774
S. Gunderson, CDPHE
L. Kilpatrick, DOE-RFFO
G. Kleeman, USEPA
J. Legare, DOE-RFFO
R. Leitner, K-H 371/374
D. Maxwell, DOE-RFFO
J. Mead, K-H ESS
S. Nesta, K-H RISS
K. North, K-H ESS/MS
R. Schassburger, DOE-RFFO
D. Shelton, K-H ESS
C. Zahm, K-H Legal

Additional Distribution:

Dave Kruchek, CDPHE
J. R. Marschall, K-H RISS
Gary Morgan, DOE-RFFO
Karen Wiemelt, K-H RISS

There are 91 records in this set and a total of 2572 pages.

Doc. No. / Date	Routine	Internal Code	Author(s)	Recipient(s)	Title / Subject
B980 A 00041 11/16/2004 8 Pages PRELIM	YES, ROUTINE	04-DOE-00863; 00563-RF-04	LEGARE, JOSEPH A.	GUNDERSON, STEVE	Forwards: Please find enclosed a Rocky Flats Cleanup Agreement (RFCA) Building Slab Disposition Closeout Report for Building 980, which is being provided for Colorado Department of Public Health and Environment (CDPHE) review. The Building 980 slab has been used for concrete rubble storage. The slab itself was used for fill material for both Building 881 and Building 991.
BZ A INFO 09/29/1999 0 Pages PUBLIC	YES, ROUTINE	RF/RMRS-99-428.UN; SW-A-003379	ENVIRONMENTAL RESTOR	DISTRIBUTION	Information Only Entry: Fourth Annual Update to the Historical Release Report (HRR) for the Rocky Flats Plant (RFP): August 1, 1998 through August 1, 1999 Revision 0 - Oil Burn Pit No. 2 (PAC 900-153). Drums containing oil contaminated with Uranium were burned in an open pit located north of Central Avenue and southeast of Building 991. These activities took place adjacent to the Mound (PAC 900-113). The oil burn pit was actually two trenches excavated parallel to each other. The oil in the drums was dumped into the pit and ignited. Oil was burned at night so smoke would not cause alarm. On the order of 80 drums of oil was burned in a typical month. The drums were reused by the originating buildings until they were flattened and buried in trenched onsite (PAC NE-110, and PAC NE-111). An October 1960 study stated that organic liquids were stored due to the lack of proper facilities to burn the wastes. In February 1961, a study performed by the Health Physics group assured the operators that open pit burning was safe. A second oil-burning pit was cut in November 1961 and may be a reference to the parallel trench. The materials contained in the drums were coolant, still bottoms, and waste oils from Building 444 and Building 881. Attempts were made to burn only non-radioactively contaminated oils. During a burning test on February 1961, a direct count value monitored from the test was three times as high as the value from the

There are 91 records in this set and a total of 2572 pages.

Doc. No. / Date	Routine	Internal Code	Title / Subject
BZ A INFO 09/08/2000 0 Pages PUBLIC	YES, ROUTINE Author(s) ENVIRONMENTAL RESTOR	KH-00-900.UN; SW-A-004154 Recipient(s) DISTRIBUTION	Information Only Entry: Fifth Annual Update to the Historical Release Report (HRR) for the Rocky Flats Plant (RFP): August 1, 1999 through August 1, 2000 Revision 0 - Septic Tank East of Building 991 (PAC 900-1311). This structure is referred to in several documents by a variety of names including "temporary sewage disposal bed", "sewage test area", "septic tank" and wooden septic tank. During a recent interview, the carpenter believed to have been contracted, for construction of a wooden septic tank recalled that the location of the structure was approximately 200-300 yards east of B991. The carpenter described a brownish, odorous liquid flowing from a roughly 4-inch diameter metal pipe into the wooden structure where the carpenters were working during construction of the tank. At that time, an employee made a reference to the liquid needing to be kept away from the creek and nearby cattle. The project was then not completed, as it was believed to be bringing exposure to men working and being exposed to a potentially dangerous liquid. Based on review of waste disposal documents during 1952, the fluid flowing into the temporary sewage disposal bed is believed to have been sewage. No documentation was identified which noted the termination of usage or removal of the septic tank, however the Building 995 activated sewage sludge treatment system may have replaced the use of this tank in 1953. Sampling of this area showed concentrations below the risk-based concentration and is recommending No Further Action (NFA) in accordance with RFCA.

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There are 91 records in this set and a total of 2572 pages.

Doc. No. / Date	Routine	Internal Code	Author(s)	Recipient(s)	Title / Subject
IA A 000176 05/24/1999 3 Pages PUBLIC	YES, ROUTINE	PLN-97-001	NOT INDICATED	DISTRIBUTION	Rocky Mountain Remediation Service (RMRS) Building 991 Training Implementation Plan (TIP), May 24, 1999 - Implements an Rocky Mountain Remediation Service (RMRS) Training and Qualification (T&Q) Program that can be adjusted to the changing activities inB991. [Appendix 1, B991 Core Training Matrix; Appendix 2, B991 Job-Specific Training Matrix.]
IA A 000788 05/23/2001 3 Pages PUBLIC	YES, ROUTINE	N/A	GUNDERSON, STEVE	LEGARE, JOSEPH A.	Colorado Department of Public Health and Environment (CDPHE) submits comments on the Sampling and Analysis Plan (SAP) for the Decontamination and Decommissioning (D&D) Groundwater Monitoring of Buildings 881, 991 and 559.
IA A 000791 07/18/1995 7 Pages PUBLIC	YES, ROUTINE	95-RM-TA-0001-KH; 95-RM-TA-0001-JLM	MCANALLY, JAMES L.	CARD, ROBERT G.	Rocky Mountain Remediation Services, L.L.C. (RMRS) distributes a status report of projects with the distribution list which Technical Assurance is currently reviewing for National Environmental Policy Act (NEPA) determination.
IA A 000803 08/28/1997 384 Pages PUBLIC	YES, ROUTINE	TWO-045-97	OVERLID, T. W.	CROWE, STEVE	Transmits the Final Safety Analysis Report (FSAR) for the Building 991 Complex for review and approval. Also enclosed with the FSAR is the Draft for B991 Complex Fire Hazards Analysis, the FSAR Implementation Plan and the Criticality Safety Evaluation dated August 27, 1997.
IA A 000873 12/18/2001 4 Pages PUBLIC	YES, ROUTINE	01-DOE-02244; 00815-RF-01	LEGARE, JOSEPH A.	GUNDERSON, STEVE	Forwards the attached list of activities that are currently planned under the Decommissioning Program Plan (DPP) for Fiscal Year 2002 (FY02).

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There are 91 records in this set and a total of 2572 pages.

Doc. No. / Date	Routine	Internal Code	Title / Subject
IA A 000875 03/12/1998 9 Pages PRELIM	REJECT, NON- Author(s) OVERLID, T. W.	USQD-991-98.0413-MRA; TWO-011-98 Recipient(s) CROWE, STEVE	Positive Unreviewed Safety Question Determination (USQD), that addresses the installation of two weatherproof boilers outside Building 991. It is necessary to install the boilers because the underground section of the steam system has developed leaks over the years and appears to have further deterioration.
IA A 000935 04/17/2002 2 Pages PUBLIC	YES, ROUTINE Author(s) GUTHRIE, C. "VERN"	N/A Recipient(s) KRUCHEK, DAVID	Purpose of Contact: To present and discuss the proposed characterization actions for the Building 991 Complex. The facilities included are B991, 991 Tunnels, 984, 985, 989, 992, 993, 996, 997, 998 and 999.
IA A 001076 09/30/2002 1 Pages PUBLIC	YES, ROUTINE Author(s) BUTLER, J. LANE	02-RF-02154; JLB-057-02 Recipient(s) DISALVO, RICHARD	Submits the attached [001077] Industrial Area (IA) Characterization and Remediation Strategy FY02 Update Appendix C, September 2002. This document is an end-of-the-year requirement, but there is no requirement for Regulatory Agency review or approval.
IA A 001077 09/01/2002 40 Pages PUBLIC	YES, ROUTINE Author(s) NOT INDICATED	Ref: 02-RF-02154; JLB-057-02 Recipient(s) DISTRIBUTION	Industrial Area (IA) Characterization and Remediation Strategy FY02 Update Appendix C, September 2002 - This report was developed to provide a roadmap for final closure of the Rocky Flats Environmental Technology Site (RFETS/Site). IA to ensure integration of remediation activities, including facility decommissioning, characterization, remediation and Regulatory Agency and stakeholder participation. This is being incorporated as Appendix C of the IA strategy for October 1, 2001 through September 30, 2002.
IA A 001138 09/01/2002 41 Pages PUBLIC	YES, ROUTINE Author(s) NOT INDICATED	PADC-1999-02570 Recipient(s) DISTRIBUTION	Industrial Area (IA) Characterization and Remediation Strategy FY02 Update, Appendix C September 2002 - This FY02, October 1, 2001 through September 30, 2002 IA Strategy Update describes progress on components and changes to the IA Strategy and the major accomplishments.

There are 91 records in this set and a total of 2572 pages.

Doc. No. / Date	Routine	Internal Code		Title / Subject
IA A 001239 01/09/2003 1 Pages PUBLIC	YES, ROUTINE Author(s) BUTLER, J. LANE	03-RF-00034; JLB-005-03	Recipient(s) DISALVO, RICHARD	Submits the attached [001240, 001241] Draft Industrial Area Sampling and Analysis Plan (IASAP) FY03 Addendum No. IA-03-03, IHSS Group 900-1 dated December 2002. This also includes the Environmental Restoration (ER) Rocky Flats Cleanup Agreement Standard Operating Protocol (RSOP) for Routine Soil Remediation FY02 Notification No. 03-05, IHSS Group 900-1 dated January 2003.
IA A 001240 12/01/2002 17 Pages PUBLIC	YES, ROUTINE Author(s) NOT INDICATED	Ref: 03-RF-00034; JLB-005-03	Recipient(s) DISTRIBUTION	Draft Industrial Area Sampling and Analysis Plan (IASAP) FY03 Addendum No. IA-03-03, Individual Hazardous Substance Site IHSS Group 900-1. The 900-1 Group consists of Under Building Contaminant (UBC) 991, Weapons Assembly and R&D (including Vault Buildings 996, 997, 998 and 999, and assembly tunnels). Also in Group 900-1 are Radioactive Site Buildings 991, IHSS 900-173, Steam Cleaning Area 900-184, Enclosed Area PAC 900-1301 and Explosive Bonding Pit PAC 900-1307, Building 993.
IA A 001241 01/01/2003 12 Pages PUBLIC	YES, ROUTINE Author(s) NOT INDICATED	Ref: 03-RF-00034; JLB-005-03	Recipient(s) DISTRIBUTION	Environmental Restoration (ER) Rocky Flats Cleanup Agreement Standard Operating Protocol (RSOP) for Routine Soil Remediation FY02 Notification No. 03-05, Individual Hazardous Substance Site IHSS Group 900-1, January 2003. The 900-1 Group consists of Under Building Contaminant (UBC) 991, Weapons Assembly and R&D (including Vault Buildings 996, 997, 998 and 999, and assembly tunnels). Also in Group 900-1 are Radioactive Site Buildings 991, IHSS 900-173, Steam Cleaning Area 900-184, Enclosed Area PAC 900-1301 and Explosive Bonding Pit PAC 900-1307, Building 993.

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There are 91 records in this set and a total of 2572 pages.

Doc. No. / Date	Routine	Internal Code	Author(s)	Recipient(s)	Title / Subject
IA A 001242 01/08/2003 1 Pages PUBLIC	YES, ROUTINE	03-RF-00024; JLB-004-03	BUTLER, J. LANE	DISALVO, RICHARD	Submits the attached [001241] Environmental Restoration (ER) Rocky Flats Cleanup Agreement Standard Operating Protocol (RSOP) for Routine Soil Remediation FY02 Notification No. 03-05, Individual Hazardous Substance Site IHSS Group 900-1 for review.
IA A 001253 01/21/2003 1 Pages PUBLIC	YES, ROUTINE	03-DOE-00048; 00027-RF-03	DISALVO, RICHARD	GUNDERSON, STEVE	Forwards the attached [001240, 001241] Draft Industrial Area Sampling and Analysis Plan (IASAP) FY03 Addendum No. IA-03-03, IHSS Group 900-1 dated December 2002. This also includes the Environmental Restoration (ER) Rocky Flats Cleanup Agreement Standard Operating Protocol (RSOP) for Routine Soil Remediation FY02 Notification No. 03-05, IHSS Group 900-1 dated January 2003.
IA A 001267 01/30/2003 2 Pages PUBLIC	YES, ROUTINE	00093-RF-03	GUNDERSON, STEVE	DISALVO, RICHARD	The Colorado Department of Public Health and Environment (CDPHE) approves the Draft Industrial Area Sampling and Analysis Plan (IASAP) FY03 Addendum No. IA-03-03, Individual Hazardous Substance Site IHSS Group 900-1 and the Environmental Restoration (ER) Rocky Flats Cleanup Agreement Standard Operating Protocol (RSOP) FY02 Notification No. 03-05 IHSS Group 900-1.
IA A 001269 02/04/2003 1 Pages PUBLIC	YES, ROUTINE	03-DOE-00065; 00086-RF-03	DISALVO, RICHARD	GUNDERSON, STEVE	Forwards the attached [001505] Reconnaissance Level Characterization Report (RLCR) for Building 991 and the Building 991Tunnels 985, 996, 997, 998 and 999, Revision 1 dated January 14, 2003 for approval. Theses buildings are characterized as Type 1 facilities with the exception of Building 991, which is characterized as a lightly contaminated Type 2 facility in accordance with the Decommissioning Program Plan (DPP).

There are 91 records in this set and a total of 2572 pages.

Doc. No. / Date	Routine	Internal Code	Title / Subject
IA A 001290 02/01/2003 20 Pages PUBLIC	YES, ROUTINE Author(s) RISS, D&D GROUP	Ref: 02-RF-00336; JLB-014-03 Recipient(s) DISTRIBUTION	Final Industrial Area Sampling and Analysis Plan (IASAP) Fiscal Year 2003 Addendum No. IA-03-03 for Individual Hazardous Substance Site IHSS Group 900-1, February 2003. This IASAP Addendum includes IHSS Group-specific information, sampling locations, and Potential Contaminants of Concern (PCOC) for IHSS, Potential Area of Concern (PAC), and Under Building Contamination (UBC) sites proposed for characterization during FY03. This Addendum is a supplement to the IADAP (DOE, 2001) and includes data and proposed sampling locations for IHSS Group 900-1 and associated IHSS, PAC, and UBC sites listed: UBC 991, Weapons Assembly and R&D (including Vault Buildings 996, 997, 998, and 999, and associated tunnels); Radioactive Site Building 991, IHSS 900-173; Radioactive Site 991 Steam Cleaning Area, IHSS 900-184; Building 991 Enclosed Area, PAC 900-1301; and Explosive Bonding Pit, PAC 900-1307 (Building 993).
IA A 001343 03/21/2003 1 Pages PUBLIC	YES, ROUTINE Author(s) GUNDERSON, STEVE	00287-RF-03; Ref: 03-DOE-00065; 00086-RF-03 Recipient(s) DISALVO, RICHARD	The Colorado Department of Public Health and Environment (CDPHE) grants partial approval of the Reconnaissance Level Characterization Report (RLCR) for Building 991 and the Building 991 Tunnels 985, 996, 997, 998 and 999, Revision 1 dated January 14, 2003. Approval is provided for the Building 991 Type 2 facility. The division is however concerned that the other facilities have not been properly investigated to change their status from potential Type 2 to Type 1 facilities. They are not convinced that the Tunnels and storage vaults should be identified as buildings separate from B991. Therefore, the division cannot at this time concur that B985 is a Type 1 facility, or that the 991 Tunnels and Storage Vaults (Buildings) 996, 997, 998 and 999 are Type 1 facilities or uncontaminated areas of B991.

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There are 91 records in this set and a total of 2572 pages.

Doc. No. / Date	Routine	Internal Code	Author(s)	Recipient(s)	Title / Subject
IA A 001346 02/01/2003 15 Pages PUBLIC	YES, ROUTINE	N/A	NOT INDICATED	DISTRIBUTION	Environmental Restoration (ER) Rocky Flats Cleanup Agreement Standard Operating Protocol (RSOP) for Routine Soil Remediation FY03 Notification No. 03-05, Individual Hazardous Substance Site IHSS Group 900-1, February 2003. The 900-1 Group consists of Under Building Contaminant (UBC) 991, Weapons Assembly and R&D (including Vault Buildings 996, 997, 998 and 999, and assembly tunnels). Also in Group 900-1 are Radioactive Site Buildings 991, IHSS 900-173, Steam Cleaning Area 900-184, Enclosed Area PAC 900-1301 and Explosive Bonding Pit PAC 900-1307, Building 993.
IA A 001504 01/15/2003 1 Pages PUBLIC	YES, ROUTINE	03-RF-00072; DWF-001-03	FERRERA, DENNIS W.	TOWER, STEVE	Submits the attached [001505] Reconnaissance Level Characterization Report (RLCR) for Building 991 and the Building 991 Tunnels 985, 996, 997, 998 and 999, Revision 1 dated January 14, 2003 for approval. Theses buildings are characterized as Type 1 facilities with the exception of Building 991, which is characterized as a lightly contaminated Type 2 facility in accordance with the Decommissioning Program Plan (DPP).
IA A 001505 01/14/2003 244 Pages PUBLIC	YES, ROUTINE	Ref: 03-RF-00072; DWF-001-03	NOT INDICATED	DISTRIBUTION	Reconnaissance Level Characterization Report (RLCR) Area 2, Group 2 Closure Project 991, 991 Tunnels 985, 996, 997, 998 and 999, Revision 1 dated January 14, 2003 - This report includes the Historical Site Assessment, Radiological and Chemical Characterization Hazards, Physical Hazards, Facility Classification, and Maps.
IA A 001547 07/21/2003 1 Pages PUBLIC	YES, ROUTINE	N/A	CASTANEDA, NORMA	POTTORFF, ELIZABETH T.	Contact Record: Discusses the approved No Further Accelerated Action (NFAA) for Individual Hazardous Substance Site IHSS Group 900-1, Building 991 Tunnel characterization data.

There are 91 records in this set and a total of 2572 pages.

Doc. No. / Date	Routine	Internal Code	Author(s)	Recipient(s)	Title / Subject
IA A 001565 08/04/2003 6 Pages PUBLIC	YES, ROUTINE	03-DOE-00944; 00727-RF-03	LEGARE, JOSEPH A.	GUNDERSON, STEVE	Forwards the enclosed completed Rocky Flats Cleanup Agreement Standard Operating Protocol (RSOP) for Component Removal Notification Form for Building 991 Tunnel, including vaults 996, 997 and 999 for RSOP implementation.
IA A 001566 07/31/2003 1 Pages PUBLIC	YES, ROUTINE	N/A	WIEMELT, KAREN	KRUCHEK, DAVID	Contact Record: Discusses the 991 Tunnel Rocky Flats Cleanup Agreement Standard Operating Protocol (RSOP) Notification for Component Removal and requests verbal approval from the Colorado Department of Public Health and Environment (CDPHE) to begin the removal.
IA A 001580 08/08/2003 1 Pages PUBLIC	YES, ROUTINE	00747-RF-03	GUNDERSON, STEVE	LEGARE, JOSEPH A.	Re: Building 991 Tunnel including Vaults 996, 997, and 999 Notification of Intent to Invoke the Facility Component Removal, Size Reduction, and Decontamination Activities RSOP concurrence. The Colorado Department of Public Health and Environment (CDPHE) Hazardous Waste Management Division (HZMD) has received August 4, 2003 letter notifying them of DOE's intent to utilize the component RSOP for removal of utility lines and ducts. Although verbal approval that this work may proceed was given per the July 31, 2003 Contact Record, they are hereby providing written concurrence that this activity may proceed utilizing the RSOP.
IA A 001617 09/05/2003 17 Pages PUBLIC	YES, ROUTINE	03-RF-01344; FEG-026-03	GIBBS, FRANK E. TOWER, STEVE	LEGARE, JOSEPH A. KRUCHEK, DAVID	Submits the enclosed draft letter to the Colorado Department of Public Health and Environment (CDPHE) for the Rocky Flats Cleanup Agreement Standard Operating Protocol (RSOP) Notification of Component Removal, Size Reduction, and Decontamination Activities for Buildings 991 and 998, and RCRA Closure for Units 991.1 and 984.1.

There are 91 records in this set and a total of 2572 pages.

Doc. No. / Date	Routine	Internal Code	Author(s)	Recipient(s)	Title / Subject
IA A 001625 09/10/2003 1 Pages PUBLIC	YES, ROUTINE	03-DOE-01095; 00840-RF-03	LEGARE, JOSEPH A.	GUNDERSON, STEVE	Forwards the attached [001655] Pre-Demolition Survey Report (PDSR) for Building 991 west tunnel, plenum building 985 and vaults 996, 997 and 999 for approval.
IA A 001639 09/16/2003 1 Pages PUBLIC	YES, ROUTINE	00859-RF-03	GUNDERSON, STEVE	LEGARE, JOSEPH A.	The Colorado Department of Public Health and Environment (CDPHE) has reviewed the Pre-Demolition Survey Report (PDSR) for Area 2, Group-2a Closure Project (991 West Tunnel and Buildings 985, 996, 997 and 999), Revision 0 dated August 21, 2003. Based on the information contained in this PDSR, the division approves this PDSR.
IA A 001648 09/19/2003 1 Pages PUBLIC	YES, ROUTINE	03-RF-01436	GIBBS, FRANK E.	LEGARE, JOSEPH A.	Submits the attached [001649] 991 Tunnel Rocky Flats Cleanup Agreement Standard Operating Protocol (RSOP) Notification for Facility Disposition. The purpose of this notification is to invoke this RSOP for demolition of the facility.
IA A 001649 09/17/2003 55 Pages PUBLIC	YES, ROUTINE	Ref: 03-RF-01436	NOT INDICATED	DISTRIBUTION	991 Tunnel Rocky Flats Cleanup Agreement Standard Operating Protocol (RSOP) Notification for Facility Disposition - This RSOP Notification addresses leaving the 991 Corridor C Tunnel and Vaults 996, 997 and 999 in place as final disposition of structures. This notification also discusses the physical condition of the tunnel and vaults along with the Pre-Demolition Survey (PDS) results and environmental, structural, and groundwater analyses.
IA A 001652 08/28/2003 1 Pages PUBLIC	YES, ROUTINE	03-RF-01265; DWF-059-03	FERRERA, DENNIS W.	TOWER, STEVE	Submits the attached [001655] Pre-Demolition Survey Report (PDSR) Area 2 Group-2a Closure Project (991 West Tunnel and Buildings 985, 996, 997 and 999), Revision 0 dated August 21, 2003 for review and approval.

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There are 91 records in this set and a total of 2572 pages.

Doc. No. / Date	Routine	Internal Code	Title / Subject
IA A 001655 08/21/2003 66 Pages PUBLIC	YES, ROUTINE Author(s) NOT INDICATED	Ref: 03-RF-01265; DWF-059-03; 00859-RF-03; 03-DOE- Recipient(s) DISTRIBUTION	Pre-Demolition Survey Report (PDSR) Area 2 Group-2a Closure Project (991 West Tunnel and Buildings 985, 996, 997 and 999), Revision 0 August 21, 2003 - This report characterizes the physical, chemical and radiological hazards associated with these buildings. In addition to summarizing the characterization activities, this report also defines the Data Quality Objectives (DQO) developed for this characterization, and presents the data quality assessment, and verification and validation of results.
IA A 001700 10/17/2003 2 Pages PUBLIC	YES, ROUTINE Author(s) GUNDERSON, STEVE	00977-RF-03 Recipient(s) LEGARE, JOSEPH A.	Notification by Rocky Flats Environmental Technology Site to invoke the Rocky Flats Cleanup Agreement Standard Operating Protocol (RSOP) for Facility Component Removal Sizes Reduction and Decontamination Activities for Buildings 984, 991, and 998, including Closure of Permitted Hazardous/ Mixed Waste container Storage

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Doc. No. / Date	Routine	Internal Code	Author(s)	Recipient(s)	Title / Subject
IA A 001702 10/17/2003 2 Pages PUBLIC	YES, ROUTINE	N/A	GUNDERSON, STEVE	LEGARE, JOSEPH A.	Notification by Rocky Flats Environmental Technology Site (RFETS/Site) to invoke the Rocky Flats Cleanup Agreement Standard Operating Protocol (RSOP) for Facility Component Removal, Sizes Reduction, and Decontamination Activities for Buildings 984, 991, and 998, including Closure of Permitted Hazardous/Mixed Waste Container Storage Units 984.1 and 991.1-Concurrence. We formally agree that Units 984.1 and 991.1 are hereby administratively closed and that the component removal/size reduction and decontamination activities described in the notification may proceed utilizing the Component RSOP. The consultative process must continue to be utilized to keep us informed of the decommissioning strategy, planning, and activities for this project.
IA A 001714 10/09/2003 1 Pages PUBLIC	YES, ROUTINE	00947-RF-03	GUNDERSON, STEVE	LEGARE, JOSEPH A.	he Colorado Department of Public Health and Environment (CDPHE), Hazardous Materials and Waste Management Division has reviewed October 7, 2003 letter notifying that the Facilities Disposition Rocky Flats Cleanup Agreement Standard Operating Protocol (RSOP), will be utilized for the disposition of the Building 991. West Tunnels and Vaults 996, 997, 999. The State hereby agreed that B991 West Tunnels and Vaults 996, 997, and 999 may be dispositioned utilizing the Facility Disposition RSOP and as identified in this Notification. Although the State agree that the B991 West Tunnels and Vaults 996, 997, and 999 may remain in place, and the activities indicated to be preformed, the specific engineering controls for stabilizing the ground surface on the west end of the tunnel to indicate comments and agreements. As also indicated, this and any other issues that may arise should be addressed utilizing the consultative process.

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Doc. No. / Date	Routine	Internal Code	Title / Subject
IA A 001964 02/03/2004 115 Pages PUBLIC	YES, ROUTINE Author(s) NOT INDICATED	04-RF-00146; FEG-007-04 Recipient(s) DISTRIBUTION	This Rocky Flats Cleanup Agreement Standard Operating Protocol (RSOP) Notification for Facility Disposition addresses leaving Corridor A (north-south tunnel) and Vault 998 in place as a final disposition of these structures. The 991 Corridor A is an underground, reinforced concrete structure connecting Building 991 to Vault 998. The tunnel is 7 feet six inches wide and 180 feet long. The walls, and roof and floor of the tunnel are 15 inches thick..
IA A 001969 02/06/2004 1 Pages PUBLIC	YES, ROUTINE Author(s) GUNDERSON, STEVE	00071-RF-04 Recipient(s) LEGARE, JOSEPH A.	The Colorado Department of Public Health and Environment (CDPHE) Hazardous Material (HM) Waste Management (WM) Division has reviewed the February 3, 2004 notification that the Facility Disposition Rocky Flats Cleanup Agreement Standard Operating Protocol (RSOP) will be utilization for the disposition of the 998 Tunnel (Corridor A) and Vault, Corridor B and Room 402 of Building 991.
IA A 001973 02/12/2004 1 Pages PUBLIC	YES, ROUTINE Author(s) GUNDERSON, STEVE	00087-RF-04 Recipient(s) LEGARE, JOSEPH A.	The Colorado Department of Public Health and Environment (CDPHE) Hazardous Material (HM) and Waste Management (WM) Division has reviewed the Pre-Demolition Survey Report (PDSR) for Building 991, 991 East Tunnel and 998 Vault Closure Project, Revision 0 dated February 4, 2004, and the Notification of intent to utilize the Facility Disposition Rocky Flats Cleanup Agreement Standard Operating Protocol (RSOP) for demolition of B991. Based on the information contained in this PDRS (and as modified on February 12, 2004), CDPHE are hereby approving the PDSR for Building 991, 991 East Tunnel and 998 Vault.
IA A 001974 02/10/2004 1 Pages PUBLIC	YES, ROUTINE Author(s) LEGARE, JOSEPH A.	04-DOE-00113; 00090-RF-04 Recipient(s) GUNDERSON, STEVE	Forwards: Please find the Facility Disposition Rocky Flats Cleanup Agreement Standard Operating Protocol (RSOP) notification letter for Building 991 [FEG-004-04] demolition, a Type 2 facility, based upon the Pre-Demolition Survey Report (PDSR). Note that the 998 Tunnel, Corridor B, and Room

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Doc. No. / Date	Routine	Internal Code	Title / Subject
IA A 001977 02/05/2004 1 Pages PUBLIC	YES, ROUTINE	04-RF-00129; FEG-004-04; [See IA-A-001980] Author(s): GIBBS, FRANK E. Recipient(s): MORGAN, GARY	Attached [001980] is a Rocky Flats Cleanup Agreement Standard Operating Protocol (RSOP) Notification for Building 991 Facility Disposition, required to be submitted by US Department of Energy (DOE) to Colorado Department of Public Health and Environment (CDPHE), prior to implementing the activities to this document. The Rocky Flats Environmental Technology Site (RFETS/Site) received concurrence from CDPHE that the 991 facility was a Type 2 facility (March 21, 2003). The purpose of this notification is to invoke this RSOP for demolition of the facility; based on the (PDRS), which is also included in this submittal. The PDSR shows the facility meets the free-release criteria.
IA A 001980 02/05/2004 8 Pages PUBLIC	YES, ROUTINE	04-RF-00129; FEG-004-04 Author(s): NOT INDICATED Recipient(s): DISTRIBUTION	This Rocky Flats Cleanup Agreement Standard Operating Protocol (RSOP) Notification for Facility Disposition addresses the remaining of the Building 991 facility. This notification discusses the physical condition of the facility and includes the Pre-Demolition Survey (PDS) results for the remaining of the facility that was not addressed in the previously submitted Facility Disposition RSOP Notification Letter (03-RF-01436 and 04-RF-00146).
IA A 001981 02/04/2004 1 Pages PUBLIC	YES, ROUTINE	00087-RF-04; [001982] Author(s): GUNDERSON, STEVE Recipient(s): LEGARE, JOSEPH A.	The Colorado Department of Public Health and Environment (CDPHE) Hazardous Material (HM) and Waste Management (WM) Division has reviewed the Pre-Demolition Survey Report (PDSR) for Building 991, 991 East Tunnel and 998 Vault Closure Project, Revision 0 dated February 4, 2004, and the Notification of intent to utilize the Facility Disposition Rocky Flats Cleanup Agreement Standard Operating Protocol (RSOP) for demolition of B991. Based on the information contained in this PDSR (and as a modified on February 12, 2004), we are hereby approving the PDSR for 991, 991 East Tunnel and 998 Vault.

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Doc. No. / Date	Routine	Internal Code	Title / Subject
IA A 001982 02/04/2004 145 Pages PUBLIC	YES, ROUTINE Author(s) NOT INDICATED	00087-RF-04 Recipient(s) DISTRIBUTION	As part of the Rocky Flats Environmental Technology Site (RFETS) Closure Project, numerous facilities will be removed. A Pre-Demolition Survey (PDS) was performed to enable compliant disposition and Waste Management (WM) of Building 991, 991 East Tunnels and 998 Vault. Because these Type 2 facilities will be decommissioned, the characterization was performed in accordance with the Pre-Demolition Survey Plan (PDSP) (MAN-127-PDSP) to supplement the Reconnaissance Level Characterization (RLC) of these Type 2 facilities. Building surfaces characterized as part of this PDS included floors, ceilings and roofs. Environmental media and surrounding the facilities were not within the scope of this PDS and will be addressed using the Soil Disturbance Permit Process and incompliant with Rocky Flats Cleanup Agreement (RFCA).
IA A 001989 02/19/2004 1 Pages PUBLIC	YES, ROUTINE Author(s) LEGARE, JOSEPH A.	04-DOR-00139; 00101-RF-04 Recipient(s) GUNDERSON, STEVE	Forwards: Please find the pages changes to the Pre-Demolition Survey Report (PDSR) for Building 991, based upon discussions between Kaiser-Hill Company, L.L.C. (K-H), the US Department of Energy (DOE) and the Colorado Department of Public Health and Environment (CDPHE).
IA A 002013 02/11/2004 2 Pages PUBLIC	YES, ROUTINE Author(s) MARSCHALL, J. R.	N/A Recipient(s) KRUCHEK, DAVID	Purpose of Concoct: Leaving Non-Friable Tiles in Place in Building 991. Kaiser-Hill Company, L.L.C. (K-H) propose a deviation from the Rocky Flats Cleanup Agreement, Standard Operating Protocol (RSOP), requirement to remove all Asbestos-Containing Material (ACM) from Building 991, and leave the vinyl floor tiles in place during the demolition of the building.

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Doc. No. / Date	Routine	Internal Code	Author(s)	Recipient(s)	Title / Subject
IA A 002061 04/08/2004 1 Pages PUBLIC	YES, ROUTINE	N/A	PRIMROSE, ANNETTE L.	KRUCHEK, DAVID	Purpose of Contact: Transformer Pads at Building 991 Potential Area of Concern (PAC), 900-1306. There are two pads located east of Building 991 in a small area of five small slabs. Six samples were collected at this location immediately adjacent to the slab and were biased to the areas with the highest potential for contamination including stained areas. The highest PCB concentration was Aroclor 1260 at 510 ppb, which an action levels, is 12,400 ppb.
IA A 002097 03/15/2004 2 Pages PUBLIC	YES, ROUTINE	N/A	MARSCHALL, J. R. NESTA, STEVE WIEMELT, KAREN	KRUCHEK, DAVID	Purpose of Contact: During a meeting March 15, 2004, the foam plug in Corridor A (998 Tunnel, Building 991) was discussed. Options included leaving the foam in place or removing the foam and replacing it with another media, i.e., soil, rip-rap, or concrete. This discussion was the result of the foam that burned in the west entrance to Corridor B (Door 7). Based on enclosed findings it was determined that the foam plug, though not as robust as at once believed it would be, was still the best option available for plugging the corridor. For these reasons it was decided to leave the foam plug in place and proceed as originally planned.
IA A 002364 10/07/2004 1 Pages PRELIM	YES, ROUTINE	N/A	WIEMELT, KAREN	KRUCHEK, DAVID	Purpose of Contact: Backfill at Building 991. Kaiser-Hill proposed using the remaining 980 concrete slab as part of the backfill for 991. This concrete has been surveyed, meets the unrestricted release criteria, and may be recycled. CDPHE agreed. CDPHE re-iterated the requirement of covering/not disturbing any remaining non-friable asbestos tiles that may remain on the 991 slab.
IA A INFO 01/01/1992 0 Pages PUBLIC	YES, ROUTINE	PAC 900-173; SW-A-000189	ENVIRONMENTAL RESTOR	DISTRIBUTION	Information Only Entry: Historical Release Report (HRR) for the Rocky Flats Plant (RFP); January, 1992 - The 900 Area: South Dock Building 991 (IAG Name: Radioactive Site - 900 Area). Building 991 and the associated storage vaults (Building 997, 998 and 999) are original plant structures.

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Doc. No. / Date	Routine	Internal Code	Title / Subject
IA A INFO 01/01/1992 0 Pages PUBLIC	YES, ROUTINE	PAC 900-184; SW-A-000189 Author(s): ENVIRONMENTAL RESTOR Recipient(s): DISTRIBUTION	Information Only Entry: Historical Release Report (HRR) for the Rocky Flats Plant (RFP); January, 1992 - The 900 Area: Building 991 Steam Cleaning Area. Radioactively-contaminated equipment and drums may have been steam cleaned at a location near Building 992 southwest of Building 991. The effluent from the steam cleaning process was collected in a sump and entered the original process waste system. The EPA aerial photography from August 6, 1971 indicates a darkened area along the dirt road from Building 992. The connection between the darkened area on the photograph and this IHSS is not known. No radioactive hot spots were detected in this area by a radiometric survey performed site-wide during the period 1977 through 1984. This survey was intended to detect extremely contaminated areas of the plant site.
IA A INFO 01/01/1992 0 Pages PUBLIC	YES, ROUTINE	PAC 900-1301; SW-A-000189 Author(s): ENVIRONMENTAL RESTOR Recipient(s): DISTRIBUTION	Information Only Entry: Historical Release Report (HRR) for the Rocky Flats Plant (RFP); January, 1992 - The 900 Area: Building 991 Enclosed Area. An enclosed area believed to be approximately 50 feet wide along the south side of Building 991 was used for storage of various radioactively contaminated waste and materials. The earliest document found regarding this area indicated that November 1953, 79 drums of concrete waste was stored. Monthly reports from the Waste Disposal Co-Ordination Group document that no drums were added to the area or taken away until January 1961 when the drums were moved to the mound (PAC 900-113). It is believed that these drums were only stored at the mound (see Comments section in PAC 900-113) as opposed to buried in the mound. No documentation was found which detailed a release to the environment from these drums. Other materials were in storage in the same general area. This included storage of shipping crates and carrying cases

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Doc. No. / Date	Routine	Internal Code	Title / Subject
IA A INFO 01/01/1992 0 Pages PUBLIC	YES, ROUTINE Author(s) ENVIRONMENTAL RESTOR	PAC 900-1303; SW-A-000189 Recipient(s) DISTRIBUTION	Information Only Entry: Historical Release Report (HRR) for the Rocky Flats Plant (RFP); January, 1992 - The 900 Area: Natural Gas Leak. A gas leak in the pipeline to Building 991 occurred in July 1961. Natural gas is piped between Buildings 995 and 991. The leak was apparently present for years and had permeated the ground under the pavement. In April 1971, Utilities identified a major problem with corrosion in the pipeline neat B991 due to inadequate wrapping. Natural gas was released to the environment. The Pipe Shop repaired the pipe and on-site contractors were given the task of replacing 400 feet of gas line near B991 in 1971. No document was found which detailed the fate of constituents released to the environment.
IA A INFO 01/01/1992 0 Pages PUBLIC	YES, ROUTINE Author(s) ENVIRONMENTAL RESTOR	PAC 900-1304; SW-A-000189 Recipient(s) DISTRIBUTION	Information Only Entry: Historical Release Report (HRR) for the Rocky Flats Plant (RFP); January, 1992 - The 900 Area: Chromic Acid Spill - Building 991. A portable 500-gallon receiving vessel located outside Building 991 overflowed during a transfer. The portable containers are not equipped with site gages or visible indicators. The container was actively being used for the transferring of liquids generated in the building. The low-level alarm, indicating approaching capacity, was activated approximately one week prior to the incident. The high level alarms malfunctioned and did not activate. Several gallons of chromic acid laboratory waste from General Metallurgy spilled into a cement pit. The chemical constituents of the waste were not identified in the safety report. The RCRA/CERCLA representative reviewed the incident and determined that outside agency notification was not required and that the cement berm functioned properly. The event occurred on a Saturday and was reported the

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Doc. No. / Date	Routine	Internal Code	Title / Subject
IA A INFO 01/01/1992 0 Pages PUBLIC	YES, ROUTINE Author(s)	PAC 900-1305; SW-A-000189 Recipient(s)	Information Only Entry: Historical Release Report (HRR) for the Rocky Flats Plant (RFP); January, 1992 - The 900 Area: Building 991 Roof. The roof of Building 991 received a prime coating in July 1982. Fumes from a spill entered an air intake conduit on the roof and affected the climate inside the building. The odor was observed by building occupants. Approximately five gallons of the primer Tremco Temprime spilled in an area under the intake. The primer contained mineral spirits as a solvent. The primer was spread around and dried and the odor diminished. No documentation was found which detailed the fate of constituents released to the environment.
IA A INFO 01/01/1992 0 Pages PUBLIC	YES, ROUTINE Author(s) ENVIRONMENTAL RESTOR	PAC 900-1306; SW-A-000189 Recipient(s) DISTRIBUTION	Information Only Entry: Historical Release Report (HRR) for the Rocky Flats Plant (RFP); January, 1992 - The 900 Area: Transformers 991-1 and 991-2. Leaks were observed on pipe flanges, valves, gages, and bushing compartments of these transformers. Large amounts of oil were noted on the ground under the two transformers. The oil in Transformer 991-1 and Transformer 991-2 contained Polychlorinated Biphenyls (PCB) at concentrations of 114 and 60 parts per million, respectively. The PCBs were to be cleaned up and the transformers repaired by an outside contractor. No documentation was found which detailed the fate of the constituents released to the environment.
IA A INFO 04/01/1994 0 Pages PRELIM	YES, ROUTINE Author(s) ENVIRONMENTAL RESTOR	Ref: SW-A-002622; 94-RF-04917 Recipient(s) DISTRIBUTION	Information Only Entry: Seventh Quarterly Update to the Rocky Flats Plant (RFP) Historical Release Report (HRR), January 1, 1994 through March 31, 1994: Id. 900-1311, Septic Tank East of Building 991. A sewage related structure existed east of Building 991 during 1952. This structure is referred to in several documents by a variety of names including "temporary sewage disposal bed", "sewage test

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Doc. No. / Date	Routine	Internal Code	Title / Subject
IA A INFO 09/26/1997 0 Pages PUBLIC	YES, ROUTINE Author(s) ENVIRONMENTAL RESTOR	PAC 700-123.1; SW-A-002435; RF/RMRS-97-073.UN; 97 Recipient(s) DISTRIBUTION	Information Only Entry: Second Annual Update to the Historical Release Report (HRR) for the Rocky Flats Plant (RFP); August 1, 1996 through August 1, 1997 - Valve Vault 7 (IHSS 123.1; OU08). Valve Vault 7 controls the 800 Areas main process line and on April 4, 1983, a check valve in Valve Vault 7 malfunctioned allowing process water to backflow into the sump. The high water level alarm in the system was apparently inoperative at the time of the overflow. The process wastewater drained into an adjacent storm runoff collection system ditch near Eight St. and Sage Ave. and flowed east toward South Walnut Creek. Runoff was noticed flowing across the former 750 Parking Lot through the Building 991 normal runoff drainage. The release consisted of process wastewater from the 800 and 400 areas which typically contains Uranium (U), solvents, oils, Beryllium (Be), nitric acid, hydrochloric acid and fluoride. The transfer of liquid waste from the holding tanks at Building 881 was discontinued after personnel verified that wastewater was flowing out of Valve Vault 7. Temporary dikes were constructed to contain the overflow. As documented in the Operable Unit OU08 Data Summary Report, IHSS 123.1 was sampled in seven locations for inorganics, radionuclides, volatile organic compounds, and semi-volatile organic compounds. The recommendation for No Further Action NFA is consistent with the criteria for recommending NFA decisions present in RFCA.
IA A INFO 09/29/1999 0 Pages PUBLIC	YES, ROUTINE Author(s) ENVIRONMENTAL RESTOR	RF/RMRS-99-428.UN; SW-A-003379 Recipient(s) DISTRIBUTION	Information Only Entry: Fourth Annual Update to the Historical Release Report (HRR) for the Rocky Flats Plant (RFP); August 1, 1998 through August 1, 1999 Revision 0 - Storm Drains (PAC 000-505). There are two hundred thirty-nine storm drains that provide site drainage from roads, parking lots, and other areas and discharge into the creeks

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Doc. No. / Date	Routine	Internal Code	Title / Subject
IA A INFO 09/29/1999 0 Pages PUBLIC	YES, ROUTINE Author(s) ENVIRONMENTAL RESTOR	RF/RMRS-99-428.UN; SW-A-003379 Recipient(s) DISTRIBUTION	Information Only Entry: Fourth Annual Update to the Historical Release Report (HRR) for the Rocky Flats Plant (RFP): August 1, 1998 through August 1, 1999 Revision 0 - Septic Tank East of Building 991 (900-1311). Sewage related structure existed east of Building 991 during 1952. This structure is referred to in several documents by a variety of names including "temporary sewage disposal bed", "sewage test area", "septic tank" and wooden septic tank. During a recent interview, the carpenter believed to have been contracted, for construction of a wooden septic tank recalled that the location of the structure was approximately 200-300 yards east of B991. The carpenter described a brownish, odorous liquid flowing from a roughly 4-inch diameter metal pipe into the wooden structure where the carpenters were working during construction of the tank. At that time, an employee made a reference to the liquid needing to be kept away from the creek and nearby cattle. The project was then not completed, as it was believed to be bringing exposure to men working and being exposed to a potentially dangerous liquid. Based on review of waste disposal documents during 1952, the fluid flowing into the temporary sewage disposal bed is believed to have been sewage. No documentation was identified which noted the termination of usage or removal of the septic tank, however the Building 995 activated sewage sludge treatment system may have replaced the use of this tank in 1953. Sampling of this area showed concentrations below the risk-based concentration and is recommending No Further Action (NFA) in accordance with RFCA.

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Doc. No. / Date	Routine	Internal Code	Title / Subject
IA A INFO 03/01/2001 0 Pages PUBLIC	YES, ROUTINE Author(s) NOT INDICATED	(Ref: IA-A-000752, IASAP) Recipient(s) NOTE TO FILE	Information Only Entry: IA Group 900-1 consists of: Under Building Contaminant UBC 991: Weappons Assembly and Research and Development (R&D); Radioactive Site, Building 991 (Operable Unit OU08, Individual Hazardous Substance Site IHSS 173, 900-173); Radioactive Site B991, Steam Cleaning Area (OU08, IHSS 184, 900-184); B991 Enclosed Area (900-1301)
IA A INFO 02/04/2002 0 Pages PRELIM	Author(s) DELLAGUARDIA, GARY	N/A Recipient(s) NOTE TO FILE	Note to File: Property Id. 984 - TRU Waste Storage Facility MS/RISS D&D 984, RISS Area: 2; Group-2, Cluster: 991 Facility Grouping No.: FGN-17, Facility Area: 1-3-5-9, Facility Type 1 and 2
IA A INFO 02/04/2002 0 Pages PRELIM	Author(s) DELLAGUARDIA, GARY	N/A Recipient(s) NOTE TO FILE	Note to File: Property Id. 985 - Filter Plenum B996/997/999 MS/RISS D&D 985, RISS Area: 2; Group-2, Cluster: 991 Facility Grouping No.: FGN-17, Facility Area: 1-3-5-9, Facility Type 1 and 2
IA A INFO 02/04/2002 0 Pages PRELIM	Author(s) DELLAGUARDIA, GARY	N/A Recipient(s) NOTE TO FILE	Note to File: Property Id. 989 - Emergency Generator B991 MS/RISS D&D 989, RISS Area: 2; Group-4, Cluster: N/A Facility Grouping No.: FGN-17, Facility Area: 1-3-5-9, Facility Type 1
IA A INFO 02/04/2002 0 Pages PRELIM	Author(s) DELLAGUARDIA, GARY	N/A Recipient(s) NOTE TO FILE	Note to File: Property Id. 991 - Product Warehouse MS/RISS D&D 991, RISS Area: 2; Group-2, Cluster: N/A Facility Grouping No.: FGN-17, Facility Area: 1-3-5-9, Facility Type 2

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IA A INFO 02/04/2002 0 Pages PRELIM	Author(s) DELLAGUARDIA, GARY	N/A	Recipient(s) NOTE TO FILE	Note to File: Property Id. 991TUN - Tunnels Between 991 Cluster Buildings MS/RISS D&D 991TUN, RISS Area: 2; Group-2, Cluster: N/A Facility Grouping No.: FGN-17, Facility Area: 1-3-5-9, Facility Type 2
IA A INFO 02/04/2002 0 Pages PRELIM	Author(s) DELLAGUARDIA, GARY	N/A	Recipient(s) NOTE TO FILE	Note to File: Property Id. 996 - Storage Vault - Building 991 MS/RISS D&D 996, RISS Area: 2; Group-2, Cluster: N/A Facility Grouping No.: FGN-17, Facility Area: 1-3-5-9, Facility Type 2
IA A INFO 02/04/2002 0 Pages PRELIM	Author(s) DELLAGUARDIA, GARY	N/A	Recipient(s) NOTE TO FILE	Note to File: Property Id. 997 - Storage Vault - Building 991 MS/RISS D&D 997, RISS Area: 2; Group-2, Cluster: N/A Facility Grouping No.: FGN-17, Facility Area: 1-3-5-9, Facility Type 2
IA A INFO 02/04/2002 0 Pages PRELIM	Author(s) DELLAGUARDIA, GARY	N/A	Recipient(s) NOTE TO FILE	Note to File: Property Id. 998 - Storage Vault - Building 991 MS/RISS D&D 998, RISS Area: 2; Group-2, Cluster: N/A Facility Grouping No.: FGN-17, Facility Area: 1-3-5-9, Facility Type 2
IA A INFO 02/04/2002 0 Pages PRELIM	Author(s) DELLAGUARDIA, GARY	N/A	Recipient(s) NOTE TO FILE	Note to File: Property Id. 999 - Storage Vault - Building 991 MS/RISS D&D 999, RISS Area: 2; Group-2, Cluster: N/A Facility Grouping No.: FGN-17, Facility Area: 1-3-5-9, Facility Type 2

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IA A INFO 02/04/2002 0 Pages PRELIM		N/A	DELLAGUARDIA, GARY	NOTE TO FILE	Note to File: Property Id. Tank 149 - Liquid Waste Chromium Storage NDT 906 (south of 991) out of service MS/RISS D&D Tank 149, RISS Area: 2; Group-N/A, Cluster: N/A Facility Grouping No.: FGN-17, Facility Area: 1-3-5-9, Facility Type N/A
IA A INFO 02/04/2002 0 Pages PRELIM		N/A	DELLAGUARDIA, GARY	NOTE TO FILE	Note to File: Property Id. Tank 334 - Met Lab Waste Water Storage Tank (south of 991) out of service MS/RISS D&D Tank 334, RISS Area: 2; Group-N/A, Cluster: N/A Facility Grouping No.: FGN-17, Facility Area: 1-3-5-9, Facility Type N/A
IA A INFO 05/07/2002 0 Pages PUBLIC	YES, ROUTINE	Ref: 02-RF-01867; DWF-075-02; IA-A-001073	RISS, D&D GROUP	DISTRIBUTION	Information Only Entry: D&D RISS Facility Characterization Historical Site Assessment (HSA) Report, May 2002. The Building 991 Cluster is comprised of Type 1 facilities: 984, 985, 992, 993, and 989; and Type 2 facilities: 991, 991TUN, 996, 997, 998, and 999. This facility-specific HSA has been performed in accordance with: Decontamination and Decommissioning Characterization Protocol (DDCP), RFETS MAN-077-DDCP, latest version, and RFETS Facility Disposition Management Plan (FDMP), RFETS MAN-076-FDPM, latest version. This document is found under Attachment B of the August 20, 2002 Building 989, 992 and 993 Closure Project Reconnaissance Level Characterization Report (RLCR), Revision 0.
IA A INFO 05/07/2002 0 Pages PUBLIC	YES, ROUTINE	Ref: 02-RF-01867; DWF-075-02; IA-A-001073	RISS, D&D GROUP	DISTRIBUTION	Information Only Entry: D&D RISS Facility Characterization Historical Site Assessment (HSA) Report, May 2002. Constructed and put into service in 1952, Building 991 is listed as the Product Warehouse for the Rocky Flats Environmental Technology Site (RFETS/Site) on the Closure Projects Facility List. Situated in a land depression or natural

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There are 91 records in this set and a total of 2572 pages.

Doc. No. / Date	Routine	Internal Code	Title / Subject
IA A INFO 05/07/2002 0 Pages PUBLIC	YES, ROUTINE Author(s) NOT INDICATED	IA-A-001657; Ref: 03-RF-01299 Recipient(s) DISTRIBUTION	Information Only Entry: Reconnaissance Level Characterization Report (RLCR) for the building 984 Closure Project, Historical Site Assessment (HSA) Report dated May 7, 2002. Building 991 is listed as the Product Warehouse for RFETS on the Closure Projects Facility List. It was constructed and put into service 1952. Building 991 was the original final assembly building. Plutonium, enriched Uranium, depleted U and components from other materials, which would include Beryllium, were assembled into final products and stored for off-site shipment. Final assemblyoperations in 991 were discontinued in 1958 and moved to 777. Historacally, Building 991 also housed nondestructive testing operations, a metallography laboratory, production control operations, and other support operations. ER concerns that could affect facility characterization: UBC 991, PACs 900-184, 900-173, 900-1301, 900-1302, 900-1303, 900-1304, 900-1305, 900-1306, and 900-1307.
IA A INFO 04/01/2003 0 Pages PUBLIC	YES, ROUTINE Author(s) NOT INDICATED	03-DOE-00449; 00397-RF-03 Recipient(s) DISTRIBUTION	Information Only Entry: Final Projects Closeout Report for the Building 993 Closure Project, April 2003; Historical Site Assessment (HSA) Report, May 7, 2003 - Constructed and put into service in 1952, Building 991 is listed as the Product Warehouse for RFETS on the Closure Projects Facility List. Building 991 was the original final assembly building, Plutonium (Pu), Enriched Uranium, Depleted U and components from other materials, which would include Beryllium, were assembled into final products and stored for off-site shipment. Final assembly operations in 991 were discontinued in 1958 and moved to 777. Historically, Building 991 also housed non-destructive testing operations, a metallography laboratory, production control operations, and other support operation.

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There are 91 records in this set and a total of 2572 pages.

Doc. No. / Date	Routine	Internal Code		Title / Subject
OU08 A 000185	YES, ROUTINE	92-RF-9421; JMK-0783-92		Request for approval to relocate mixed residues involved with the Building 991 Relocation Project. Draft letter to the Colorado Department of Health (CDH) requesting the attached.
08/13/1992	Author(s)		Recipient(s)	
2 Pages	KERSH, JACK M.		VAETH, TERRY	
PUBLIC				
OU08 A 000264	YES, ROUTINE	PLN-97-001		Building 991 Training Implementation Plan (TIP), Rev. 0, June 9, 1997.
06/10/1997	Author(s)		Recipient(s)	
12 Pages	NOT INDICATED		NOT INDICATED	
PUBLIC				
SW A 001217	YES, ROUTINE	N/A		Building histories for Buildings 371, 444, 447, 460, 707, 771, 776/777, 881, 883, and 991. Historical Release Report (HRR), November, 1994.
11/01/1994	Author(s)		Recipient(s)	
210 Pages	NOT INDICATED		NOT INDICATED	
PUBLIC				
SW A 002491	YES, ROUTINE	PLN-97-001		RMRS Building 991 Training Implementation Plan (TIP), September 12, 1997 - Implements a Rocky Mountain Remediation Service (RMRS) Training and Qualification (T&Q) Program that can be adjusted to the changing activities in B991.
09/17/1997	Author(s)		Recipient(s)	
12 Pages	NOT INDICATED		NOT INDICATED	
PUBLIC				
SW A 002492	YES, ROUTINE	PLN-97-001		RMRS Building 991 Training Implementation Plan (TIP), September 29, 1997 - Implements an Rocky Mountain Remediation Service (RMRS) Training an Qualification (T&Q) Program that can be adjusted to the changing activities in B991.
09/29/1997	Author(s)		Recipient(s)	
13 Pages	NOT INDICATED		NOT INDICATED	
PUBLIC				

There are 91 records in this set and a total of 2572 pages.

Doc. No. / Date	Routine	Internal Code		Title / Subject
SW A 002567	YES, ROUTINE	RF/RMRS-97-060; RF/RMRS-97-071; RF/RMRS-97-072		Appendix 2, Qualification / Certification Requirements Matrix for Nuclear Facilities at the Rocky Flats Environmental Technology Site (RFETS) and Compliance Matrix for US Department of Energy (DOE) Order 5480.20A; August 28, 1997
08/28/1997	Author(s)		Recipient(s)	
27 Pages	NOT INDICATED		DISTRIBUTION	
PUBLIC				
SW A 004030	YES, ROUTINE	NSTR-011-98		Rocky Mountain Remediation Services (RMRS) submits Nuclear Technical Report Safety Analysis for the Building 991 Complex Final Safety Analysis Report No NSTR-011-98, Revision 2, dated September 1999. This Report includes Hazard Analysis, Accident Analysis.
09/01/1999	Author(s)		Recipient(s)	
478 Pages	BAIER, KEN B.		NOT INDICATED	
PUBLIC	HORTON, WILLIAM H.			
	SWANSON, D. R.			
SW A 004031	YES, ROUTINE	MW-119-99; NSTR-011-98		Rocky Mountain Remediation Services (RMRS) submits Revision 1 of Building 991 Complex Final Safety Analysis Report (FSAR) for US Department of Energy (DOE), Rocky Flats Field Office (RFFO) Approval.
09/15/1999	Author(s)		Recipient(s)	
2 Pages	NOT INDICATED		NOT INDICATED	
PUBLIC	WHEELER, MARTIN		PARKER, ALAN M.	
SW A 004032	YES, ROUTINE	MW-119-99; NSTR-011-98		Rocky Mountain Remediation Services (RMRS) submits Final Safety Analysis Report Revision 1, dated September 13, 1999, Meeting 99-45. This report includes Hazard Analysis, Safety Structures, Systems and Components, Derivation of Technical Safety Requirements.
09/01/1999	Author(s)		Recipient(s)	
399 Pages	NOT INDICATED		NOT INDICATED	
PUBLIC	NOT INDICATED			
SW A 004302	YES, ROUTINE	96-RF-03210; MRS-084-96		Kaiser-Hill Company, L.L.C. (K-H) submits a summary of the Defense Nuclear Facility Safety Board (DNFSB) Staff Meeting held on May 9, 1996. The purpose of this meeting was to review drum storage issues, the master drum plan, storage capacity, generation rates, drum venting status and waste certification.
05/23/1996	Author(s)		Recipient(s)	
11 Pages	STEELMAN, MARK R.		SARGENT, D. W.	
PUBLIC				

There are 91 records in this set and a total of 2572 pages.

Doc. No. / Date	Routine	Internal Code	Author(s)	Recipient(s)	Title / Subject
SW A 004355 07/01/2001 148 Pages PUBLIC	YES, ROUTINE	N/A	NOT INDICATED	DISTRIBUTION	Draft Environmental Restoration (ER) Rocky Flats Cleanup Agreement Standard Operating Protocol (RSOP) for Routine Soil Remediation dated July 2001. This draft addresses routine remediation of soil and associated debris at Individual Hazardous Substance Sites (IHSSs), Potential Areas of Concern (PACs), Under Building Contaminant (UBC) sites and other areas, as necessary.
SW A 004398 10/02/2001 4 Pages PUBLIC	YES, ROUTINE	Ref: KH-00-900.UN	GUNDERSON, STEVE	LEGARE, JOSEPH A.	Colorado Department of Public Health and Environment (CDPHE) provides comments on the September 2000 Annual Update for the Historical Release Report (HRR). This report updates Individual Hazardous Substance Sites IHSSs and Potential Areas of Concern (PACs) with additional information including the results of characterization and remediation activities, and makes recommendations for No Further Action (NFA).

There are 19 records in this set and a total of 191 pages.

Doc. No. / Date	Routine	Internal Code	Title / Subject
IA A 000198 05/01/1999 22 Pages PUBLIC	YES, ROUTINE Author(s) NOT INDICATED	RF/RMRS-99-356 Recipient(s) DISTRIBUTION	Rocky Mountain Remediation Service (RMRS) Sampling and Analysis Plan (SAP) for the Installation of Three Geoprobe Boreholes at Building 984 (B984) in the Protected Area (PA), May, 1999 - This is a new 22 page SAP that describes the soil sampling and analysis of three Geoprobe boreholes to be drilled adjacent to B984 in support of modifications to the building.
IA A 000205 08/01/1999 112 Pages PUBLIC	YES, ROUTINE Author(s) NOT INDICATED	RF/RMRS-99-414.UN Recipient(s) DISTRIBUTION	Rocky Flats Rocky Mountain Remediation Services (RF/RMRS) Analysis Report on Geoprobe Boreholes for Building 984 (B984), August 1999 - The purpose of this investigation was to assess the impact of potential soil contamination in the area on activities associated with each modification at B984.
IA A 000207 08/13/1999 1 Pages PUBLIC	YES, ROUTINE Author(s) NOT INDICATED	ECG-014-99; RF/RMRS-99-414.UN Recipient(s) DISTRIBUTION	Transmits the Rocky Mountain Remediation Services (RMRS) Final Analysis Reports for Building 984 (B984) and Tenth Street Soils, August 13, 1999 - The attached are final analysis reports for soil sampling activities in B984 and on Tenth Street.
IA A 000935 04/17/2002 2 Pages PUBLIC	YES, ROUTINE Author(s) GUTHRIE, C. "VERN"	N/A Recipient(s) KRUCHEK, DAVID	Purpose of Contact: To present and discuss the proposed characterization actions for the Building 991 Complex. The facilities included are B991, 991 Tunnels, 984, 985, 989, 992, 993, 996, 997, 998 and 999.
IA A 001241 01/01/2003 12 Pages PUBLIC	YES, ROUTINE Author(s) NOT INDICATED	Ref: 03-RF-00034; JLB-005-03 Recipient(s) DISTRIBUTION	Environmental Restoration (ER) Rocky Flats Cleanup Agreement Standard Operating Protocol (RSOP) for Routine Soil Remediation FY02 Notification No. 03-05, Individual Hazardous Substance Site IHSS Group 900-1, January 2003. The 900-1 Group consists of Under Building Contaminant (UBC) 991, Weapons Assembly and R&D (including Vault Buildings 996, 997, 998 and 999, and assembly tunnels).

There are 19 records in this set and a total of 191 pages.

Doc. No. / Date	Routine	Internal Code	Author(s)	Recipient(s)	Title / Subject
IA A 001242 01/08/2003 1 Pages PUBLIC	YES, ROUTINE	03-RF-00024; JLB-004-03	BUTLER, J. LANE	DISALVO, RICHARD	Submits the attached [001241] Environmental Restoration (ER) Rocky Flats Cleanup Agreement Standard Operating Protocol (RSOP) for Routine Soil Remediation FY02 Notification No. 03-05, Individual Hazardous Substance Site IHSS Group 900-1 for review.
IA A 001267 01/30/2003 2 Pages PUBLIC	YES, ROUTINE	00093-RF-03	GUNDERSON, STEVE	DISALVO, RICHARD	The Colorado Department of Public Health and Environment (CDPHE) approves the Draft Industrial Area Sampling and Analysis Plan (IASAP) FY03 Addendum No. IA-03-03, Individual Hazardous Substance Site IHSS Group 900-1 and the Environmental Restoration (ER) Rocky Flats Cleanup Agreement Standard Operating Protocol (RSOP) FY02 Notification No. 03-05 IHSS Group 900-1.
IA A 001346 02/01/2003 15 Pages PUBLIC	YES, ROUTINE	N/A	NOT INDICATED	DISTRIBUTION	Environmental Restoration (ER) Rocky Flats Cleanup Agreement Standard Operating Protocol (RSOP) for Routine Soil Remediation FY03 Notification No. 03-05, Individual Hazardous Substance Site IHSS Group 900-1, February 2003. The 900-1 Group consists of Under Building Contaminant (UBC) 991, Weapons Assembly and R&D (including Vault Buildings 996, 997, 998 and 999, and assembly tunnels). Also in Group 900-1 are Radioactive Site Buildings 991, IHSS 900-173, Steam Cleaning Area 900-184, Enclosed Area PAC 900-1301 and Explosive Bonding Pit PAC 900-1307, Building 993.
IA A 001617 09/05/2003 17 Pages PUBLIC	YES, ROUTINE	03-RF-01344; FEG-026-03	GIBBS, FRANK E. TOWER, STEVE	LEGARE, JOSEPH A. KRUCHEK, DAVID	Submits the enclosed draft letter to the Colorado Department of Public Health and Environment (CDPHE) for the Rocky Flats Cleanup Agreement Standard Operating Protocol (RSOP) Notification of Component Removal, Size Reduction, and Decontamination Activities for Buildings 991 and 998, and RCRA Closure for Units 991.1 and 984.1.

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There are 19 records in this set and a total of 191 pages.

Doc. No. / Date	Routine	Internal Code	Author(s)	Recipient(s)	Title / Subject
IA A 001626 09/10/2003 1 Pages PUBLIC	YES, ROUTINE	03-DOE-01220; 00841-RF-03	LEGARE, JOSEPH A.	GUNDERSON, STEVE	Forwards the attached [001653, 001657, 001661] Reconnaissance Level Characterization Report (RLCR) for Buildings 223A, 302, 303, T303D, 308, 375 and 984, Revision 0 dated August 28, 2003. These Type 1 building reports are submitted for your concurrence.
IA A 001638 09/15/2003 1 Pages PUBLIC	YES, ROUTINE	00860-RF-03	GUNDERSON, STEVE	LEGARE, JOSEPH A.	The Colorado Department of Public Health and Environment (CDPHE) has reviewed the Reconnaissance Level Characterization Report (RLCR) for Building 984 Closure Project, Revision 0 dated August 28, 2003. Based on the information contained in the RLCR, the division concurs with the Type 1 facility designation with the condition that Building 984 RCRA Unit 984.1 must be properly closed.
IA A 001654 08/28/2003 1 Pages PUBLIC	YES, ROUTINE	03-RF-01299; DWF-064-03	FERRERA, DENNIS W.	TOWER, STEVE	Submits the attached [001657] Type 1 Reconnaissance Level Characterization Report (RLCR) for Building 984 Closure Project, Revision 0 dated August 28, 2003 for review and approval.
IA A 001700 10/17/2003 2 Pages PUBLIC	YES, ROUTINE	00977-RF-03	GUNDERSON, STEVE	LEGARE, JOSEPH A.	Notification by Rocky Flats Environmental Technology Site to invoke the Rocky Flats Cleanup Agreement Standard Operating Protocol (RSOP) for Facility Component Removal Sizes Reduction and Decontamination Activities for Buildings 984, 991, and 998, including Closure of Permitted Hazardous/ Mixed Waste container Storage

There are 19 records in this set and a total of 191 pages.

Doc. No. / Date	Routine	Internal Code	Author(s)	Recipient(s)	Title / Subject
IA A 001702 10/17/2003 2 Pages PUBLIC	YES, ROUTINE	N/A	GUNDERSON, STEVE	LEGARE, JOSEPH A.	Notification by Rocky Flats Environmental Technology Site (RFETS/Site) to invoke the Rocky Flats Cleanup Agreement Standard Operating Protocol (RSOP) for Facility Component Removal, Sizes Reduction, and Decontamination Activities for Buildings 984, 991, and 998, including Closure of Permitted Hazardous/Mixed Waste Container Storage Units 984.1 and 991.1-Concurrence. We formally agree that Units 984.1 and 991.1 are hereby administratively closed and that the component removal/size reduction and decontamination activities described in the notification may proceed utilizing the Component RSOP. The consultative process must continue to be utilized to keep us informed of the decommissioning strategy, planning, and activities for this project.
IA A INFO 02/04/2002 0 Pages PRELIM		N/A	DELLAGUARDIA, GARY	NOTE TO FILE	Note to File: Property Id. 984 - TRU Waste Storage Facility MS/RISS D&D 984, RISS Area: 2; Group-2, Cluster: 991 Facility Grouping No.: FGN-17, Facility Area: 1-3-5-9, Facility Type 1 and 2
IA A INFO 05/07/2002 0 Pages PUBLIC	YES, ROUTINE	Ref: 02-RF-01867; DWF-075-02; IA-A-001073	RISS, D&D GROUP	DISTRIBUTION	Information Only Entry: D&D RISS Facility Characterization Historical Site Assessment (HSA) Report, May 2002. The Building 991 Cluster is comprised of Type 1 facilities: 984, 985, 992, 993, and 989; and Type 2 facilities: 991, 991TUN, 996, 997, 998, and 999. This facility-specific HSA has been performed in accordance with: Decontamination and Decommissioning Characterization Protocol (DDCP), RFETS MAN-077-DDCP, latest version, and RFETS Facility Disposition Management Plan (FDMP), RFETS MAN-076-FDPM, latest version. This document is found under Attachment B of the August 20, 2002 Building 989, 992 and 993 Closure Project Reconnaissance Level Characterization

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ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
CERCLA ADMINISTRATIVE RECORD - GENERAL QUERY

There are 19 records in this set and a total of 191 pages.

Doc. No. / Date	Routine	Internal Code	Title / Subject
IA A INFO 05/07/2002 0 Pages PUBLIC	YES, ROUTINE Author(s) RISS, D&D GROUP	Ref: 02-RF-01867; DWF-075-02; IA-A-001073 Recipient(s) DISTRIBUTION	Information Only Entry: D&D RISS Facility Characterization Historical Site Assessment (HSA) Report, May 2002. Constructed in 1986, Building 984 is located directly south of Building 991. This building is, and has always been, a Shipping Container Storage Facility (RCRA Unit 984.1). It is currently in service as a TRU Waste Drum Storage Facility, a Hazardous Waste Drum Storage Facility, a Permitted Storage Facility, and a Receiving and Shipping Storage of all Waste Containers for the Rocky Flats Environmental Technology Site (RFETS/Site).
IA A INFO 05/07/2002 0 Pages PUBLIC	YES, ROUTINE Author(s) NOT INDICATED	IA-A-001657; Ref: 03-RF-01299 Recipient(s) DISTRIBUTION	Information Only Entry: Reconnaissance Level Characterization Report (RLCR) for the building 984 Closure Project, Historical Site Assessment (HSA) Report dated May 7, 2002. Building 984 is the Shipping Container Storage Facility, also known as the TRU Waste Storage Facility for RFETS, is located directly south of Building 991. Building 984, RCRA Unit 984.1, is currently in service as the TRU Waste Drum Storage Facility, a Hazardous Waste Drum Storage Facility, a Permitted Storage Facility and a Receiving and Shipping Storage of all Waste Containers for the RFETS.
IA A INFO 04/01/2003 0 Pages PUBLIC	YES, ROUTINE Author(s) NOT INDICATED	03-DOE-00449; 00397-RF-03 Recipient(s) DISTRIBUTION	Information Only Entry: Final Projects Closeout Report for the Building 993 Closure Project, April 2003; Historical Site Assessment (HSA) Report, May 7, 2003 - Constructed in 1986, Building 984 the Shipping Container Storage Facility (RCRA Unit 984.1), also known as the Transuranic Waste Storage Facility for RFETS, is located directly south of Building 991. Building 984 is currently is service as a TRU Waste Drum Storage Facility, a Hazardous Waste Drum Storage Facility, a Permitted Storage Facility, and a Receiving and Shipping Storage of all Waste Containers for the RFETS.

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COMPANY

Appendix 3

Article 1 **Pre-Demolition Survey Report (PDSR)**
Building 991, 991 East Tunnel and 998 Vault Closure Project

Article 2 **Pre-Demolition Survey Report (PDSR)**
Area 2 – Group 2a Closure Project (991 West Tunnel and Buildings 985, 996, 997, 999)

Revised 12/03
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ACTION

DIST.	LTR	ENC
BERARDINI, J.H.	X	
BOGNAR, E.S.	X	
BROOKS, L.	X	
BUTLER, L.	X	
CARPENTER, M.	X	
CROCKETT, G. A.		
DECK, C. A.	X	
DEGENHART, K. R.		
DIETER, T. J.		
DIETERLE, S. E.		
FERRERA, D. W.	X	
GIACOMINI, J. J.		
LINDSAY, D. C.	X	
LONG, J. W.		
LYLE, J. L.		
MARTINEZ, L. A.	X	
NAGEL, R. E.	X	
NESTA, S.	X	
NORTH, K.	X	
PARKER, A. M.	X	
RODGERS, A. D.		
SHELTON, D. C.	X	
SPEARS, M. S.		
RICE, K. D.		
OR, N. R.	X	
EMELT, K.	X	
WILLIAMS, J. L.		
ZAHM, C.	X	
Parsons, D.	X	

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ADMIN. RECORD	X	
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Reviewed for Addressee
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2/17/04 [illegible]
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Laboratory and Radiation Services Division
8100 Lowry Blvd.
Denver, Colorado 80230-6928
(303) 692-3090

Colorado Department of Public Health and Environment

February 12, 2004

Mr. Joe Legare
Assistant Manager for Environment and Stewardship
U.S. Department of Energy, Rocky Flats Field Office
10808 Highway 93, Unit A
Golden, CO 80403-8200

RE: Pre-Demolition Survey Report (PDSR) and Facility Disposition RSOP Notification for Building 991 - Approval

Dear Mr. Legare:

The Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division has reviewed the PDSR for Building 991, 991 East Tunnel and 998 Vault Closure Project, Revision 0 dated February 4, 2004, and the Notification of intent to utilize the Facility Disposition RSOP for demolition of B991. Based on the information contained in this PDSR (and as modified on February 12, 2004), we are hereby approving the PDSR for Building 991, 991 East Tunnel and 998 Vault.

We also agree that B991 may be demolished utilizing the Facility Disposition RSOP, even though asbestos containing tile and mastic remain on the floor/slab of B991. This deviation from the RSOP requirement to remove all ACM in this specific case has been agreed upon based on the tile and mastic being uncontaminated, the asbestos being non-friable in the tile and mastic, the limited amount of asbestos containing tile and mastic to remain, utilizing appropriate demolition and debris removal techniques to prevent the asbestos from becoming friable/airborne, placing at least three feet of soil over the remaining non-friable ACM, and placing restrictions on future excavation or construction for this site. In addition, it should be recognized that all areas with ACM remaining (as well as void space and all remaining infrastructure) must be identified and notated in the Closeout Report, as well as on future stewardship maps that may be generated.

If you have any questions regarding this correspondence please contact me at (303) 692-3367 or David Kruchek at (303) 692-3328.

Sincerely,

Steven H. Gunderson
RFCA Project Coordinator

cc: Gary Morgan, DOE
Mark Aguilar, EPA
Duane Parsons, KH
Administrative Records Building T130G
Karen Wiemelt, KH
Dave Shelton, KH
Steve Nesta, KH

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Rocky Flats Environmental Technology Site

PRE-DEMOLITION SURVEY REPORT (PDSR)

Building 991, 991 East Tunnel and 998 Vault Closure Project

REVISION 0

February 4, 2004

CLASSIFICATION REVIEW NOT REQUIRED PER EXEMPTION NUMBER CEX-005-02

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PRE-DEMOLITION SURVEY REPORT (PDSR)

Building 991, 991 East Tunnel and 998 Vault Closure Project

REVISION 0

February 4, 2004

Reviewed by: ______ Date: 2/5/04
Don Risoli, Quality Assurance

Reviewed by: ______ Date: 2/5/04
D.P. Snyder, RISS ESH&Q Manager

Approved by: ______ Date: 2/5/04
Karen Wiemelt, K-H Area 2 D&D Project Manager

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TABLE OF CONTENTS

ATTACHMENTS

ABBREVIATIONS/ACRONYMS

ACM	Asbestos containing material
Be	Beryllium
CDPHE	Colorado Department of Public Health and the Environment
$DCGL_{EMC}$	Derived Concentration Guideline Level – elevated measurement comparison
$DCGL_{W}$	Derived Concentration Guideline Level – Wilcoxon Rank Sum Test
D&D	Decontamination and Decommissioning
DDCP	Decontamination and Decommissioning Characterization Protocol
DOE	U.S. Department of Energy
DPP	Decommissioning Program Plan
DQA	Data quality assessment
DQOs	Data quality objectives
EPA	U.S. Environmental Protection Agency
FDPM	Facility Disposition Program Manual
HVAC	Heating, ventilation, air conditioning
HSAR	Historical Site Assessment Report
HEUN	Highly Enriched Uranyl Nitrate
IHSS	Individual Hazardous Substance Site
IWCP	Integrated Work Control Package
K-H	Kaiser-Hill
LBP	Lead-based paint
LLW	Low-level waste
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MDA	Minimum detectable activity
MDC	Minimum detectable concentration
NORM	Naturally occurring radioactive material
NRA	Non-Rad-Added Verification
OSHA	Occupational Safety and Health Administration
PARCC	Precision, accuracy, representativeness, comparability and completeness
PCBs	Polychlorinated Biphenyls
PDS	Pre-demolition survey
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RFFO	Rocky Flats Field Office
RLC	Reconnaissance Level Characterization
RLCR	Reconnaissance Level Characterization Report
RSA	Removable Surface Activity
RSP	Radiological Safety Practices
SVOCs	Semi-volatile organic compounds
TCLP	Toxicity Characteristic Leaching Procedure
TSA	Total surface activity
VOCs	Volatile organic compounds

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EXECUTIVE SUMMARY

A Pre-Demolition Survey (PDS) was performed to enable compliant disposition and waste management of Building 991, 991 East Tunnel and 998 Vault. Because these Type 2 facilities will be decommissioned, the characterization was performed in accordance with the Pre-Demolition Survey Plan (MAN-127-PDSP) to supplement the Reconnaissance Level Characterization of these Type 2 facilities. Building surfaces characterized as part of this PDS included the floors, walls, ceilings, and roofs. Environmental media beneath and surrounding the facilities were not within the scope of this PDS and will be addressed using the Soil Disturbance Permit process and in compliance with RFCA.

This PDS encompassed both radiological and chemical characterization to enable the compliant disposition and waste management pursuant to the D&D Characterization Protocol (MAN-077-DDCP). The characterization built upon physical, chemical and radiological hazards identified in the facility-specific Historical Site Assessment Report and Reconnaissance Level Characterization Report.

Results indicate that no radiological or chemical contamination exists in excess of the PDSP unrestricted release limits. Friable asbestos, leaking PCB ballasts (and those greater than 9 pounds), and hazardous waste items (e.g., mercury thermostats, fluorescent light bulbs, mercury vapor light bulbs, mercury-containing gauges, circuit boards, leaded glass, and lead-acid batteries) have been removed and disposed of in compliance with Environmental Protection Agency (EPA) and Colorado Department of Public Health and Environment (CDPHE) regulations. Based on the age of the building, paints are assumed to contain PCBs, and painted surfaces will be managed as PCB Bulk Product Waste. Non-friable asbestos floor tile and mastic remains in portions of the 991 building.

Based upon this PDSR, Building 991, 991 East Tunnel and 998 Vault can be decommissioned and the waste managed as PCB Bulk Product or sanitary waste. None of the demolition concrete rubble will be used for backfill on-site per the RFCA Recycling Concrete RSOP. Appropriate approvals have been obtained for leaving Room 402, Corridor B, 998 Vault, and portions of the 991 East Tunnel in-place underground. To ensure the facility remains free of contamination and PDS data remain valid, Level 2 Isolation Controls have been established and the area posted accordingly.

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1 INTRODUCTION

A Pre-Demolition Survey (PDS) was performed to enable compliant disposition and waste management of Building 991, 991 East Tunnel and 998 Vault. Because these Type 2 facilities will be decommissioned, the characterization was performed in accordance with the Pre-Demolition Survey Plan (MAN-127-PDSP) to supplement the Reconnaissance Level Characterization of these Type 2 facilities. Building surfaces characterized as a part of this PDS included floors, walls, ceilings and roofs. Environmental media beneath and surrounding the facilities were not within the scope of this PDS and will be addressed using the Soil Disturbance Permit process and in compliance with RFCA.

As part of the Rocky Flats Environmental Technology Site (RFETS) Closure Project, numerous facilities will be removed. Among these are Building 991, 991 East Tunnel and 998 Vault. The location of these facilities is shown in Attachment A, *Facility Location Map*. These facilities no longer support the RFETS mission and will be decommissioned to reduce Site infrastructure, risks and/or operating costs.

Before these Type 2 facilities can be decommissioned, the Data Quality Objectives (DQOs) for a Pre-Demolition Survey (PDS) must be satisfied; this document presents the PDS results for Building 991, 991 East Tunnel and 998 Vault. The PDS was conducted pursuant to the Decontamination and Decommissioning Characterization Protocol (MAN-077-DDCP) and the Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP). The PDS is built upon physical, chemical and radiological hazards identified in the facility-specific Historical Site Assessment Report and Reconnaissance Level Characterization Report.

1.1 Purpose

The purpose of this report is to communicate and document the results of Building 991, 991 East Tunnel and 998 Vault PDS effort. A PDS is performed prior to building demolition to define the final radiological and chemical conditions of a facility. Final conditions are compared with the release limits for radiological and non-radiological contaminants. PDS results will enable project personnel to make final disposition decisions, develop related worker health and safety controls, and estimate waste volumes by waste types.

1.2 Scope

This report presents the final radiological and chemical conditions of Building 991, 991 East Tunnel and 998 Vault. The PDS of the 991 West Tunnel, 996 Vault, 997 Vault and 999 Vault has already been performed, documented, and approved in a stand-alone PDSR (Area 2-Group 2a Closure Project PDSR, dated August 21, 2003, Revision 0). Environmental media beneath and surrounding the facilities are not within the scope of this PDSR and will be addressed using the Soil Disturbance Permit process and in compliance with RFCA.

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1.3 Data Quality Objectives

The Data Quality Objectives (DQOs) used in designing this PDS were the same DQOs identified in the Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP). Refer to section 2.0 of MAN-127-PDSP for these DQOs.

2 HISTORICAL SITE ASSESSMENT

A Facility-specific Historical Site Assessment (HSA) and a Reconnaissance Level Characterization (RLC) was conducted to understand the facility history and related hazards. The HSA consisted of facility walkdowns, interviews, and document review, including review of the Historical Release Report, and were used to design the RLC. Building 991, 991 East Tunnel and 998 Vault RLC was performed in FY 2002 as part of Area 2-Group 2 RLCR (Refer to *Reconnaissance Level Characterization Report for Area 2-Group 2 Facilities*, Dated January 14, 2003, Revision 1). Based on the RLC results, Building 991, 991 East Tunnel and 998 Vault were classified as Type 2 facilities, therefore, PDS characterization was required before decommissioning of the facilities. This report documents the results of that PDS. The HSA and RLC results were used to identify PDS data gaps and needs, and to develop radiological and chemical PDS characterization packages. HSA and RLC documentation are located in the RISS Characterization Project files.

3 RADIOLOGICAL CHARACTERIZATION AND HAZARDS

Building 991, 991 East Tunnel and 998 Vault were characterized for radiological hazards per the PDSP. Radiological characterization was performed to define the nature and extent of radioactive materials that may be present on the facility surfaces. Measurements were performed to evaluate the contaminants of concern. Based upon a review of historical and process knowledge, building walk-downs, and MARSSIM guidance, a Radiological Characterization Plan was developed during the planning phase that describes the minimum survey requirements (refer to the RISS Characterization Project files for Building 991, 991 East Tunnel and 998 Vault Radiological Characterization Plan). Building 991, 991 East Tunnel and 998 Vault exteriors were surveyed per PDS requirements as part of the Area 2-Group 2 RLCR, dated January 14, 2003, and met all PDS unrestricted release levels. Individual radiological survey unit packages are maintained in the RISS Characterization Project files.

Nine radiological survey unit packages were developed for Building 991, 991 East Tunnel and 998 Vault: 991-2-001, 991-2-002, 991-2-003, 991-2-004, 991-2-005, 991-2-006, 991-2-007, 991-2-008, and 991-2-EXH. The survey unit packages were developed in accordance with Radiological Safety Practices (RSP) 16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation and Closure*. Total surface activity (TSA), removable surface activity (RSA), and scan measurements were collected in accordance with RSP 16.02 *Radiological Surveys of Surfaces and Structures*. Radiological survey data were verified, validated and evaluated in accordance with RSP 16.04, *Radiological Survey/Sample Data Analysis*. Quality control measures were implemented relative to the survey process in accordance with RSP 16.05, *Radiological Survey/Sample Quality Control*.

Contamination identified during the RLC (i.e., the transuranic contamination in the Corridor B floor trench), as well contamination identified during the in-process stripout, was decontaminated prior to the PDS. The table below summarizes the PDS radiological survey data:

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PDS Radiological Summary Survey Table

Survey Unit	Description	MARSSIM Class	Number of TSA Surveys	Number of RSA Surveys	Percent Scanned (alpha)	Survey Results
991-2-001	B991 Interior North Rooms	2	26 – systematically grid, 2 – QC	26 - systematically grid	50% of floors (603 m^2 minimum), 25% of remaining surfaces (1066 m^2 minimum) at biased locations	All surveys and scans were less than the PDS unrestricted release levels.
991-2-002	B991 Interior Center Rooms	2	20 – systematically grid, 2 – QC	20 – systematically grid	50% of floors (485 m^2 minimum), 25% of remaining surfaces (652 m^2 minimum) at biased locations	All surveys and scans were less than the PDS unrestricted release levels.
991-2-003	B991 Interior South Rooms	2	15 – systematically grid, 2 – QC	15 – systematically grid	50% of floors (457 m^2 minimum), 25% of remaining surfaces (535 m^2 minimum) at biased locations	All surveys and scans were less than the PDS unrestricted release levels.
991-2-004	B991 East Tunnel and 998 Vault	2	16 – systematically grid, 2 – QC	16 – systematically grid	50% of floors (78 m^2 minimum), 25% of remaining surfaces (155 m^2 minimum) at biased locations	All surveys and scans were less than the PDS unrestricted release levels.
991-2-005	B991, Room 402 & 402A	2	21 – systematically grid, 2 – QC	21 – systematically grid	50% of floors (38 m^2 minimum), 10% of remaining surfaces (27 m^2 minimum) at biased locations	All surveys and scans were less than the PDS unrestricted release levels.
991-2-006	B991 Basement	2	26 – systematically grid, 2 – QC	26 – systematically grid	50% of floors (181 m^2 minimum), 25% of remaining surfaces (314 m^2 minimum) at biased locations	All surveys and scans were less than the PDS unrestricted release levels.
991-2-007	B991 Media Sample Area	2	40 –biased	40 - biased	1m^2 at each sample location	Paint samples were collected throughout the 991 building. All surveys, scans and media samples were less than the PDS unrestricted release levels.
991-2-EXH	B991 Exhaust Ventilation System	2	93 Biased (26 inside Plenum) (68 in the Ventilation) QC –5	93 Biased (25 inside Plenum) (68 in the Ventilation)	1m^2 at each sample location	All surveys and scans were less than the PDS unrestricted release levels.
991-2-008	B991 Corridor B	2	18 – systematically grid, 2 – QC	18 – systematically grid	50% of floors (111 m^2 minimum), 25% walls (54 m^2 minimum), 10% ceiling (28 m^2 minimum) at biased locations	All surveys and scans were less than the PDS unrestricted release levels.

Radiological survey data, statistical analysis results, survey locations and radiological scan maps are presented in Attachment B, Radiological Data Summary and Survey Maps.

4 CHEMICAL CHARACTERIZATION AND HAZARDS

Building 991, the 991 East Tunnel and 998 Vault were characterized for chemical hazards per the PDSP. Chemical characterization was performed to determine the nature and extent of chemical contamination that may be present on, or in the facility. Based upon a review of historical and process knowledge, visual inspections, and PDSP DQOs, additional sampling needs were determined. A Chemical Characterization Plan was developed during the planning phase that describes sampling requirements and the justification for the sample locations and estimated sample numbers. The contaminants of concern were asbestos, beryllium, and RCRA constituents. Refer to Attachment C, Chemical Summary Data and Sample Maps, for details on sample results and sample locations. Isolation control postings are displayed on affected structures to ensure no hazardous materials are introduced.

4.1 Asbestos

A survey of building materials suspected of containing asbestos was conducted during the RLC for the Area 2-Group 2 Facilities, dated January 14, 2003, Revision 1. A CDPHE-certified asbestos inspector conducted the inspections and sampling in accordance with the *Asbestos Characterization Protocol, PRO-563-ACPR, Revision 1.* Building materials suspected of containing asbestos were identified for sampling at the discretion of the inspector. Prior to the PDS, friable and non-friable asbestos abatement and satisfactory clearance sampling was conducted per CDPHE, Regulation No. 8, Part B, *Emission Standards for Asbestos*. Some non-friable asbestos floor tile and mastic remains in portions of the 991 building. On this basis, no additional asbestos sampling was required or performed as part of this PDS.

4.2 Beryllium (Be)

Random and biased beryllium samples were collected during the RLC of the Area 2-Group 2 Facilities and all results were less than the investigative limit of 0.1 $\mu g/100cm^2$, except for overhead areas of the 991 basement. Refer to the Area 2-Group 2 RLCR, dated January 14, 2003, Revision 1, for RLC beryllium laboratory sample data and location maps. During in-process electrical, mechanical and asbestos stripout, loose beryllium contamination was also discovered in portions of Room 150, the 991 north hallway, the return ventilation system ducting leading from Room 150 to the 991 roof plenum, and the 991 roof plenum. All of the areas and equipment that contained beryllium contamination, including the 991 basement, were either decontaminated or removed prior to the PDS. The final post-decontamination conditions of these areas as well as the rest of the building are reported in this PDSR. In-process beryllium sample results are included in Attachment C-2 *"In-Process Beryllium Sample Results."*

Additional random and biased beryllium samples were collected in Building 991, 991 East Tunnel and 998 Vault as part of this PDSR to supplement the RLCR and in-process data. Random and biased sampling was performed and all final PDS beryllium smear results were less than the investigative limit of 0.1 $\mu g/100cm^2$. Smear samples were collected on all facility surfaces, including on the inside and outside systems and equipment, in accordance with the PDSP and the *Beryllium Characterization Procedure,* PRO-536-BCPR, Revision 0, September 9, 1999. PDS beryllium sample results and location maps are contained in Attachment C-1, *"PDSR Beryllium Data Summaries and Sample Maps."*

4.3 RCRA/CERCLA Constituents [including metals and volatile organic compounds (VOCs)

Based on a review of the HSAR, RLCR, interviews, facility walkdowns, and a review of waste storage area inspection forms, there is no indication that Building 991, 991 East Tunnel and 998 Vault have been contaminated by RCRA/CERLCA constituents. Chemicals have been used within most of the facilities, and RCRA/CERCLA wastes have been stored or moved throughout, but there are no records or visible signs of chemical releases. However, there were stains on asbestos floor tile in two rooms (Room109 and Room140) that were sampled for RCRA metals. The stains were underneath roof leaks and appeared to be from rainwater, but a sample from each area was analyzed to ensure that contamination had not occurred. Results from both samples demonstrated that RCRA TCLP regulatory limits had not been exceeded. Both sample results were below regulatory limits and are presented in Attachment C-3, *RCRA/CERCLA (Metals) Chemical Data Summaries and Sample Maps.*

Sampling for lead in paint in Building 991, 991 East Tunnel and 998 Vault was not performed. Environmental Waste Compliance Guidance #27, *Lead-based Paint (LBP) and Lead-based paint Debris Disposal*, states that LBP debris generated outside of currently identified high contamination areas shall be managed as non-hazardous (solid) wastes, and additional analysis for characteristics of hazardous waste derived from LBP is not a requirement for disposal. There were no high contamination areas identified in Building 991, 991 East Tunnel or the 998 Vault.

The facilities contained some RCRA regulated items, such as mercury thermostats, fluorescent light bulbs, mercury vapor light bulbs, mercury containing gauges, circuit boards, and lead-acid batteries. However, these items have been removed and managed in accordance with the Colorado Hazardous Waste Act.

4.4 Polychlorinated Biphenyls (PCBs)

Based on the HSAR, RLCR, interviews, and facility walkdowns of Building 991, 991 East Tunnel and 998 Vault, no PCB-containing equipment was ever used or stored in the buildings, making the potential for PCB contamination resulting from spills highly unlikely. Therefore, PCB sampling was not performed as part of the PDS.

Based on the age of the facilities (constructed prior to 1980), paints used may contain PCBs, and painted surfaces will need to be disposed of as PCB Bulk Product Waste.

The facilities contained PCB fluorescent light ballasts, however, all ballasts have been checked and leaking PCB ballasts and those weighing more than 9 lbs, have been removed from the facility and managed in accordance with the Colorado Hazardous Waste Act. Non-leaking PCB ballasts of less than 9 lbs. may remain in the facility and will be disposed of as PCB Bulk Product Waste. None of the demolition concrete rubble will be used for backfill on-site per the RFCA Recycling Concrete RSOP.

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5 PHYSICAL HAZARDS

Physical hazards associated with Building 991, 991 East Tunnel and 998 Vault are those common to standard industrial environments, and include hazards associated with energized systems, utilities, and trips and falls. The 991 East Tunnel and the 998 Vault are underground. Building 991 has a horseshoe shape basement that heavy equipment operators should be aware for during demolition debris load-out. There are no other unique hazards associated with the facilities. The facilities have been relatively well maintained and are in good physical condition, and therefore, do not present hazards associated with building deterioration. Physical hazards are controlled by the Site Occupational Safety and Industrial Hygiene Program, which is based on OSHA regulations, DOE orders, and standard industry practices.

6 DATA QUALITY ASSESSMENT

Data used in making management decisions for the decommissioning of Building 991, 991 East Tunnel and 998 Vault, and consequent waste management, are of adequate quality to support the decisions documented in this report. The data presented in this report (Attachments B and C) were verified and validated relative to DOE quality requirements, applicable EPA guidance, and original project DQOs.

In summary, the Verification and Validation (V&V) process corroborates that the following elements of the characterization process are adequate:

- the *number* of samples and surveys;
- the *types* of samples and surveys;
- the sampling/survey process as implemented "in the field"; and
- the laboratory analytical process, relative to accuracy and precision considerations.

Details of the DQA are provided in Attachment D.

7 DECOMMISSIONING WASTE TYPES AND VOLUME ESTIMATES

The decommissioning of Building 991, 991 East Tunnel and 998 Vault will generate a variety of wastes. Estimated waste types and waste volumes are presented below. All wastes can be disposed of as sanitary waste, except PCB Bulk Product Waste. Leaking PCB ballasts (and those weighing more than 9 pounds), and hazardous waste items have been removed and managed pursuant to Site PCB and waste management procedures. None of the demolition concrete rubble will be used for backfill on-site per the RFCA Recycling Concrete RSOP. Some non-friable asbestos floor tile and mastic remains in portions of the 991 building. This non-friable asbestos floor tile and mastic will not be removed during demolition and will remain in place with the concrete slab and buried at least three feet deep under the final grade soil contour.

WASTE TYPES AND VOLUME ESTIMATES							
Facility	**Concrete (cu ft)**	**Wood (cu ft)**	**Metal (cu ft)**	**Corrugated Sheet Metal (cu ft)**	**Wall Board (cu ft)**	**ACM (cu ft)**	**Other Waste (cu ft)**
991	83,320	0	6,000	2,500	3,500	0	None
991 East Tunnel	12,333	0	833	0	0	0	None
998 Vault	31,200	0	20	0	0	0	None

8 FACILITY CLASSIFICATION AND CONCLUSIONS

Based on the analysis of radiological, chemical and physical hazards, Building 991, 991 East Tunnel and 998 Vault are classified as RFCA Type 2 facility pursuant to the RFETS Decommissioning Program Plan (DPP; K-H, 1999) and are ready for demolition. Appropriate approvals have been obtained for leaving Room 402, Corridor B, 998 Vault and portions of the 991 East Tunnel in-place underground. Building 991, 991 East Tunnel and 998 Vault possess no radiological or chemical contamination in excess of the PDSP unrestricted release limits. Friable asbestos, leaking PCB ballast (and those weighing more than 9 pounds), and hazardous waste items (e.g., mercury thermostats, fluorescent light bulbs, mercury vapor light bulbs, mercury-containing gauges, circuit boards, leaded glass, and lead-acid batteries) have been removed and disposed of in compliance with Environmental Protection Agency (EPA) and Colorado Department of Public Health and Environment (CDPHE) regulations. Some non-friable asbestos floor tile and mastic remains in portions of the 991 building.

The PDS for Building 991, 991 East Tunnel and 998 Vault was performed in accordance with the DDCP and PDSP, all PDSP DQOs were met, and all data satisfied the PDSP DQA criteria. Environmental media beneath and surrounding the facilities will be addressed at a future date using the Soil Disturbance Permit process and in compliance with RFCA. To ensure that Building 991, 991 East Tunnel and 998 Vault remain free of contamination and that PDS data remain valid, Level 2 Isolation Controls have been established and the facilities posted accordingly.

9 REFERENCES

DOE/RFFO, CDPHE, EPA, 1996. *Rocky Flats Cleanup Agreement (RFCA),* July 19, 1996.

DOE Order 5400.5, *"Radiation Protection of the Public and the Environment."*

DOE Order 414.1A, *"Quality Assurance."*

EPA, 1994. *"The Data Quality Objective Process,"* EPA QA/G-4.

K-H, 1999. *Decommissioning Program Plan*, June 21, 1999.

MAN-131-QAPM, *Kaiser-Hill Team Quality Assurance Program*, Rev. 1, November 1, 2001.

MAN-076-FDPM, *Facility Disposition Program Manual*, Rev. 3, January 1, 2002.

MAN-077-DDCP, *Decontamination and Decommissioning Characterization Protocol*, Rev. 4, July 15, 2002.

MAN-127-PDSP, *Pre-Demolition Survey Plan for D&D Facilities*, Rev. 1, July 15, 2002.

MARSSIM - *Multi-Agency Radiation Survey and Site Investigation Manual* (NUREG-1575, EPA 402-R-97-016).

PRO-475-RSP-16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation, and Closure,* Rev. 1, May 22, 2001.

PRO-476-RSP-16.02, *Pre-Demolition (Final Status) Radiological Surveys of Surfaces and Structures*, Rev. 1, May 22, 2001.

PRO-477-RSP-16.03, *Radiological Samples of Building Media*, Rev. 1, May 22, 2001.

PRO-478-RSP-16.04, *Radiological Survey/Sample Data Analysis for Final Status Survey*, Rev. 1, May 22, 2001.

PRO-479-RSP-16.05, *Radiological Survey/Sample Quality Control for Final Status Survey*, Rev. 1, May 22, 2001.

PRO-563-ACPR, *Asbestos Characterization Procedure,* Revision 0, August 24, 1999.

PRO-536-BCPR, *Beryllium Characterization Procedure*, Revision 0, August 24, 1999.

RFETS, *Environmental Waste Compliance Guidance #25, Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition.*

RFETS, *Environmental Waste Compliance* Guidance #27, Lead-Based Paint (LBP) and Lead-Based Paint Debris Disposal.

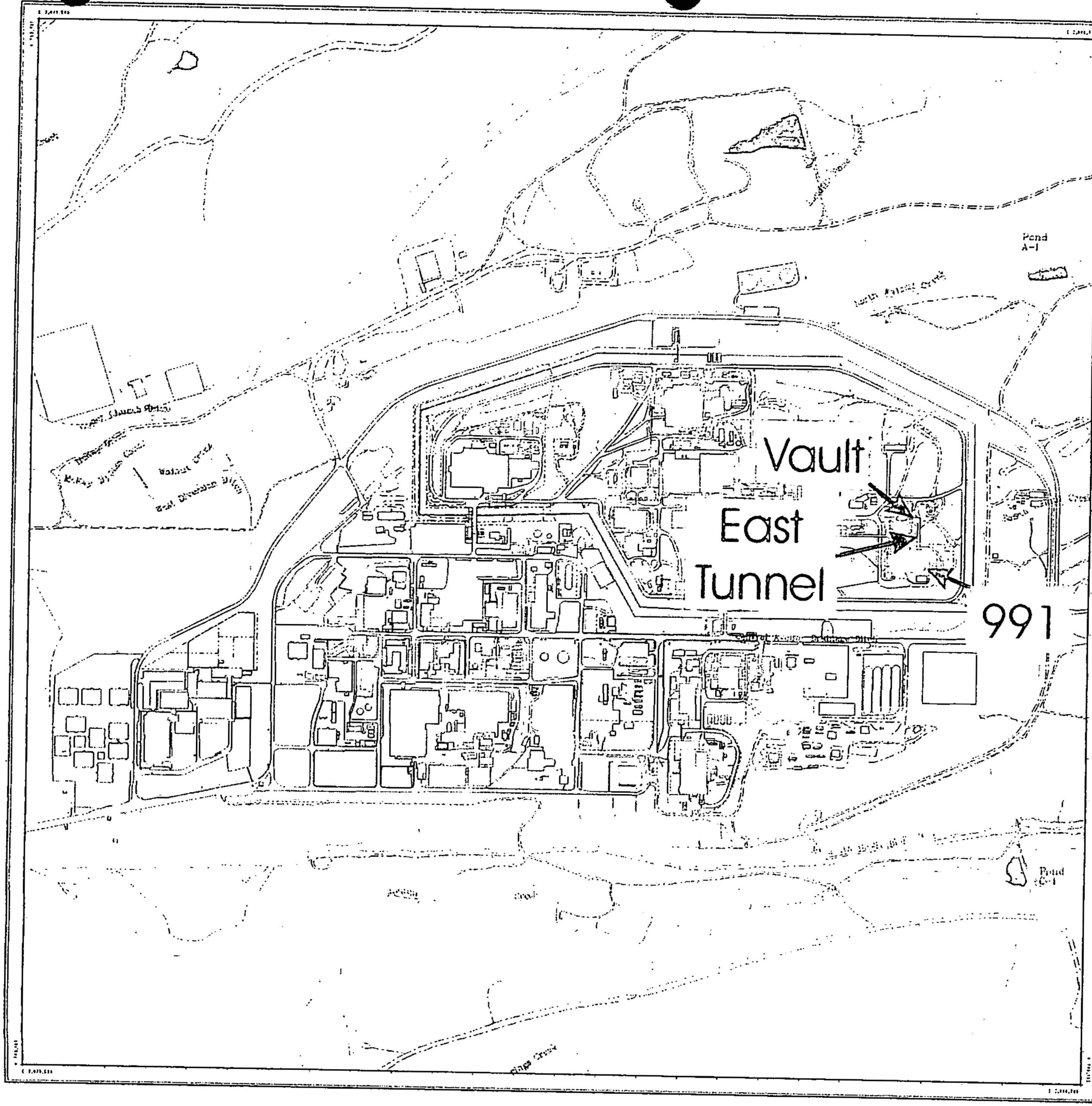
RFETS, *RFCA RSOP for Recycling Concrete*, September 28, 1999

Reconnaissance Level Characterization Report for the Area 2-Group 2 Facilities, Dated January 14, 2003, Revision 1

ATTACHMENT A

Facility Location Map

100



Area 2, Group 2
Building 991,
Vault & East Tunnel

Standard Map Features

Buildings and other structures

Demolished buildings and other structures

Lakes and ponds

Streams, ditches, or other drainage features

- - - - Fences and other barriers

═══ Paved roads

=== Dirt roads

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas.
Digitized from the orthophotographs. 1/95

Scale = 1 : 12450
1 inch represents approximately 1038 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

GIS Dept. 303-966-7707

Prepared by:
CH2MHILL

Prepared for:
KAISER-HILL
COMPANY

MAP ID: FY 2003

Feb. 2, 2004

NT_Srv w/projects/JS/A2G2/991-overe.cdr

ATTACHMENT B

Radiological Data Summaries and Survey Maps

SURVEY UNIT 991-2-001
RADIOLOGICAL DATA SUMMARY - PDS

Survey Unit Description: B991 Interior North Rooms

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PDS Data Summary

Total Surface Activity Measurements

19	26
Number Required	Number Obtained

MIN	-19.4	dpm/100 cm^2
MAX	52.4	dpm/100 cm^2
MEAN	13.6	dpm/100 cm^2
STD DEV	20.3	dpm/100 cm^2
TRANSURANIC $DCGL_W$	100	dpm/100 cm^2

Removable Activity Measurements

19	26
Number Required	Number Obtained

MIN	-1.8	dpm/100 cm^2
MAX	3.6	dpm/100 cm^2
MEAN	0.0	dpm/100 cm^2
STD DEV	1.2	dpm/100 cm^2
TRANSURANIC $DCGL_W$	20	dpm/100 cm^2

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SURVEY UNIT 991-2-001
TSA - DATA SUMMARY

Manufacturer:	NE Tech	NE Tech	NE Tech	NE Tech
Model:	DP-6	DP-6	AP-6	AP-6
Instrument ID#:	10	11	13	26
Serial #:	665	1260	665	3125
Cal Due Date:	3/16/04	6/2/04	3/16/04	3/24/04
Analysis Date:	1/13/04	1/13/04	1/14/04	1/26/04
Alpha Eff. (c/d):	0.213	0.223	0.213	0.221
Alpha Bkgd (cpm)	2.0	4.0	2.0	2.0
Sample Time (min)	1.5	1.5	1.5	1.5
LAB Time (min)	1.5	1.5	1.5	1.5
MDC (dpm/100cm^2)	48.0	48.0	48.0	48.0

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)[1]
1	11	12.7	57.0	6.7	30.0	34.3
2	11	12.0	53.8	8.0	35.9	31.1
3	10	16.0	75.1	4.7	22.1	52.4
4	11	12.0	53.8	6.7	30.0	31.1
5	10	8.0	37.6	6.0	28.2	14.9
6	10	4.0	18.8	0.7	3.3	-3.9
7	10	6.7	31.5	3.3	15.5	8.8
8	10	12.7	59.6	7.3	34.3	36.9
9	10	8.0	37.6	5.3	24.9	14.9
10	11	12.0	53.8	8.0	35.9	31.1
11	10	2.7	12.7	4.7	22.1	-10.0
12	11	13.7	61.4	2.7	12.1	38.8
13	10	12.7	59.6	2.7	12.7	36.9
14	10	6.7	31.5	3.3	15.5	8.8
15	10	5.3	24.9	8.0	37.6	2.2
16	26	8.7	39.4	6.0	27.1	16.7
17	26	8.0	36.2	6.7	30.3	13.5
18	13	3.3	15.5	3.3	15.5	-7.2
19	13	4.7	22.1	5.3	24.9	-0.6
20	13	2.7	12.7	6.7	31.5	-10.0
21	13	2.7	12.7	5.3	24.9	-10.0
22	13	4.7	22.1	0.7	3.3	-0.6
23	13	4.7	22.1	4.7	22.1	-0.6
24	13	0.7	3.3	3.3	15.5	-19.4
25	13	4.0	18.8	4.7	22.1	-3.9
26	13	14.7	69.0	2.7	12.7	46.3

22.7	Sample LAB Average
MIN	-19.4
MAX	52.4
MEAN	13.6
SD	20.3
Transuranic DCGL$_W$	100

1 - Average LAB used to subtract from Gross Sample Activity

2 -The initial Sample Net Activity for location 26 was 318.8 dpm/100cm2. This was detected during scan surveys.
The area was deconned and resurveyed. Re-survey values are reported.
All survey results are less than the applicable DCGLs, therefore no further investigation is required.

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SURVEY UNIT 991-2-001
TSA - DATA SUMMARY

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)[1]
QC Measurements						
3 QC	13	4.0	18.8	4.7	22.1	-8.0
7 QC	13	10.0	46.9	6.7	31.5	20.2
					26.8	QC LAB Average
					MIN	-8.0
					MAX	20.2
					MEAN	6.1
					Transuranic DCGL$_W$	100

1 - Average QC LAB used to subtract from Gross Sample Activity

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SURVEY UNIT 991-2-001
RSC - DATA SUMMARY

Manufacturer:	Eberline	Eberline	Eberline	Eberline
Model:	SAC-4	SAC-4	SAC-4	SAC-4
Instrument ID#:	2	3	4	5
Serial #:	1158	1164	984	845
Cal Due Date:	1/1/04	11/30/03	1/1/04	1/15/04
Analysis Date:	11/19/03	11/19/03	11/19/03	11/19/03
Alpha Eff. (c/d):	0.33	0.33	0.33	0.33
Alpha Bkgd (cpm)	0.3	0.6	0.2	0.1
Sample Time (min)	2	2	2	2
Bkgd Time (min)	10	10	10	10
MDC (dpm/100cm^2)	9.0	9.0	9.0	9.0

Sample Location Number	Instrument ID#	Gross Counts (cpm)	Net Activity (dpm/100 cm^2)
1	2	0	-0.9
2	3	1	-0.3
3	4	1	0.9
4	5	0	-0.3
5	2	3	3.6
6	3	1	-0.3
7	4	2	2.4
8	14	0	0.0
9	5	0	-0.3
10	14	0	0.0
11	2	0	-0.9
12	3	0	-1.8
13	4	0	-0.6
14	5	1	1.2
15	2	0	-0.9
16	3	1	-0.3
17	4	1	0.9
18	5	0	-0.3
19	2	0	-0.9
20	3	1	-0.3
21	4	0	-0.6
22	5	0	-0.3
23	2	1	0.6
24	3	0	-1.8
25	4	1	0.9
26	14	1	1.5
		MIN	-1.8
		MAX	3.6
		MEAN	0.0
		SD	1.2
		Transuranic $DCGL_W$	20

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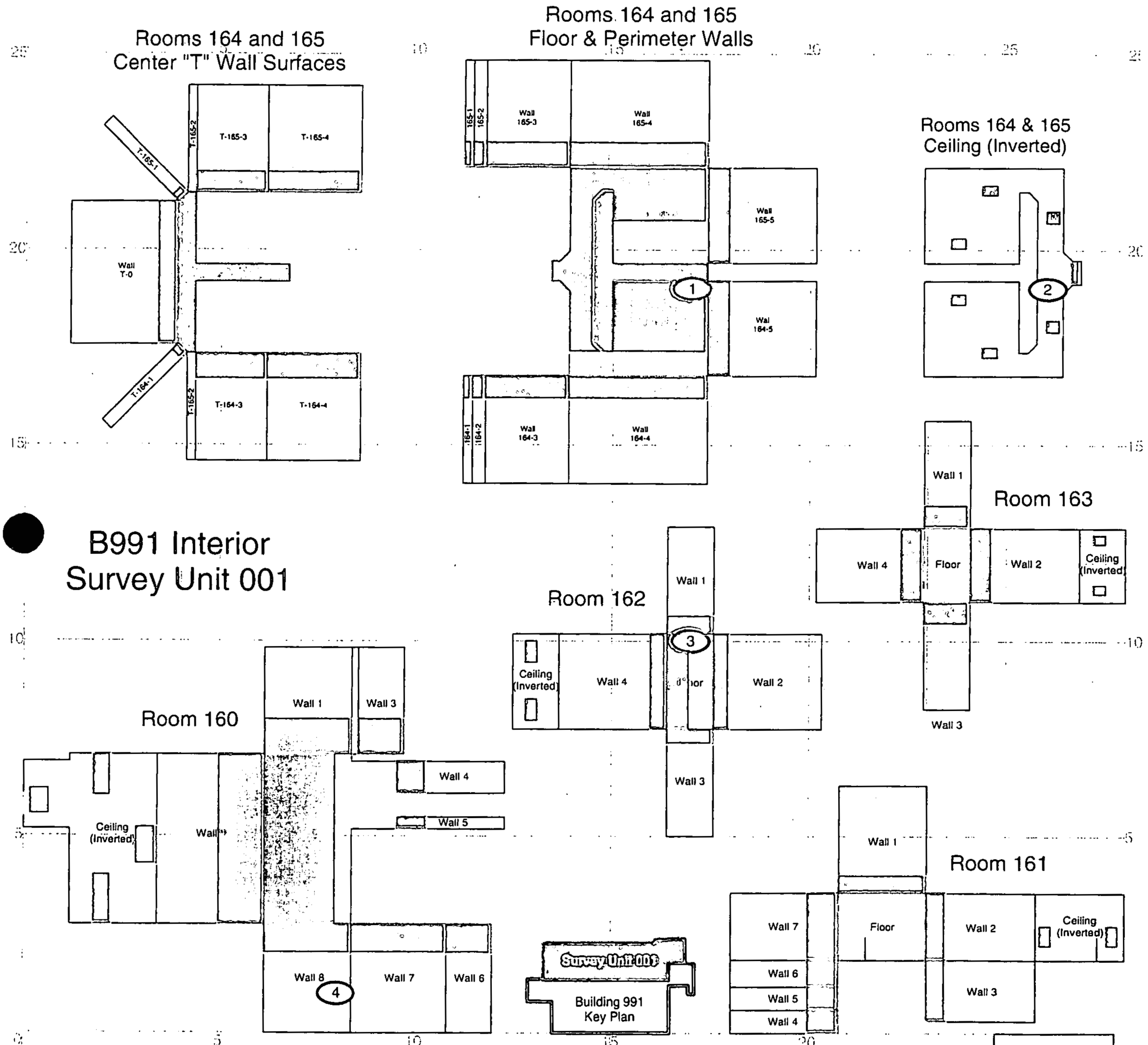
PRE-DEMOLITION SURVEY FOR AREA 2, GROUP 2

Survey Area: 2 Survey Unit: 991-2-001 Classification: 2
Building: 991
Survey Unit Description: Building 991 Interior, North Rooms
Total Area: 5,466 sq. m. Floor Area: 1,205 sq. m.
Grid Spacing for Survey Points: 18m x 18m



SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area

N

0 FEET 30

0 METERS 10

1 inch = 24 feet 1 grid sq. = 4 sq. m.

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s)
1, 7, 8, 9, 15 - 25, 27 - 30

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707
Prepared for:

CH2MHILL
Communications Group

KAISER-HILL COMPANY

MAP ID: 03-JS-SU1-SC Jan. 29, 2004

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PRE-DEMOLITION SURVEY FOR AREA 2, GROUP 2

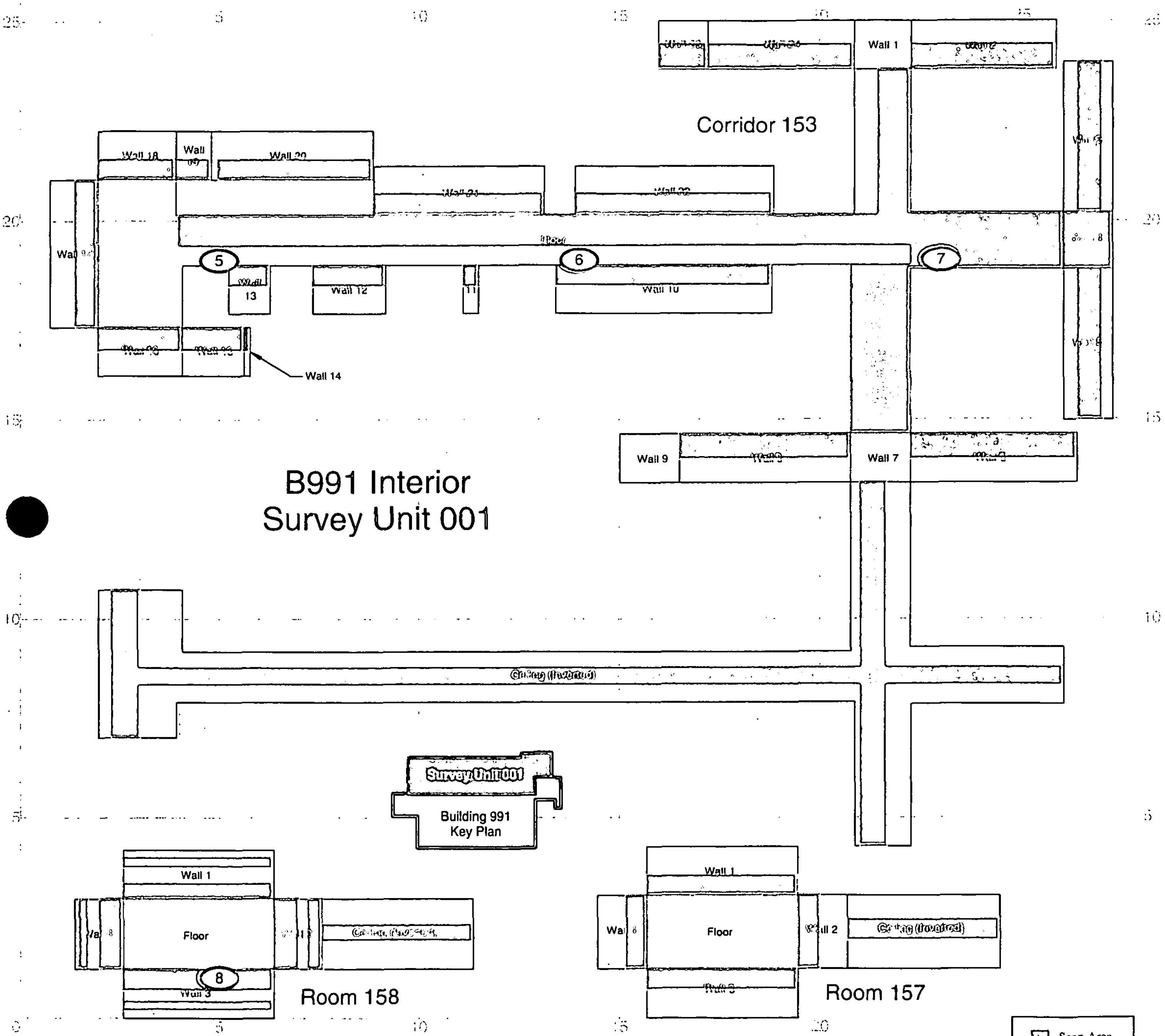
Survey Area: 2 | Survey Unit: 991-2-001 | Classification: 2

Building: 991

Survey Unit Description: Building 991 Interior, North Rooms

Total Area: 5,466 sq. m. | Floor Area: 1,205 sq. m.

Grid Spacing for Survey Points: 18m x 18m



SURVEY MAP LEGEND

(#) Smear & TSA Location

Smear, TSA & Sample Location

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N

0 FEET 30

0 METERS 10

1 inch = 24 feet | 1 grid sq. = 4 sq. m.

Scan Survey Information

Survey Instrument ID #(s) & RCT ID #(s)

1, 7, 8, 9, 15 - 25, 27 - 30

U.S. Department of Energy

Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

Prepared for:

CH2MHILL Communications Group

KAISER-HILL COMPANY

MAP ID: 03-JS-SU1-2-SC

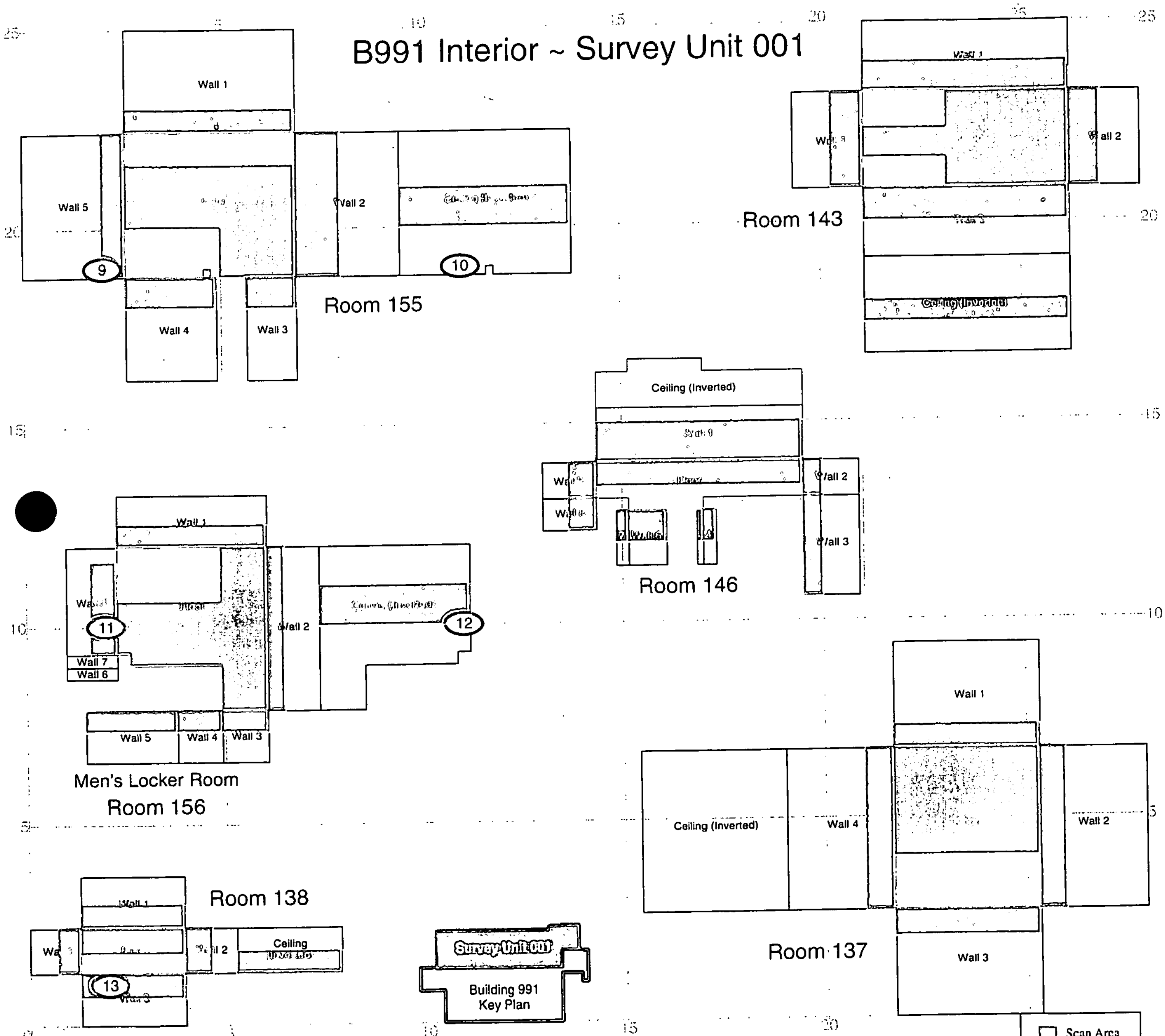
Jan 29, 2004

108

PRE-DEMOLITION SURVEY FOR AREA 2, GROUP 2

Survey Area: 2 Survey Unit: 991-2-001 Classification: 2
Building: 991
Survey Unit Description: Building 991 Interior, North Rooms
Total Area: 5,466 sq. m. Floor Area: 1,205 sq. m.
Grid Spacing for Survey Points: 18m x 18m

B991 Interior ~ Survey Unit 001



SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location

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N

FEET 0 30
METERS 0 10

1 inch = 24 feet 1 grid sq. = 4 sq. m.

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s)
1, 7, 8, 9, 15 - 25, 27 - 30

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707
Prepared for:

CH2MHILL
Communications Group

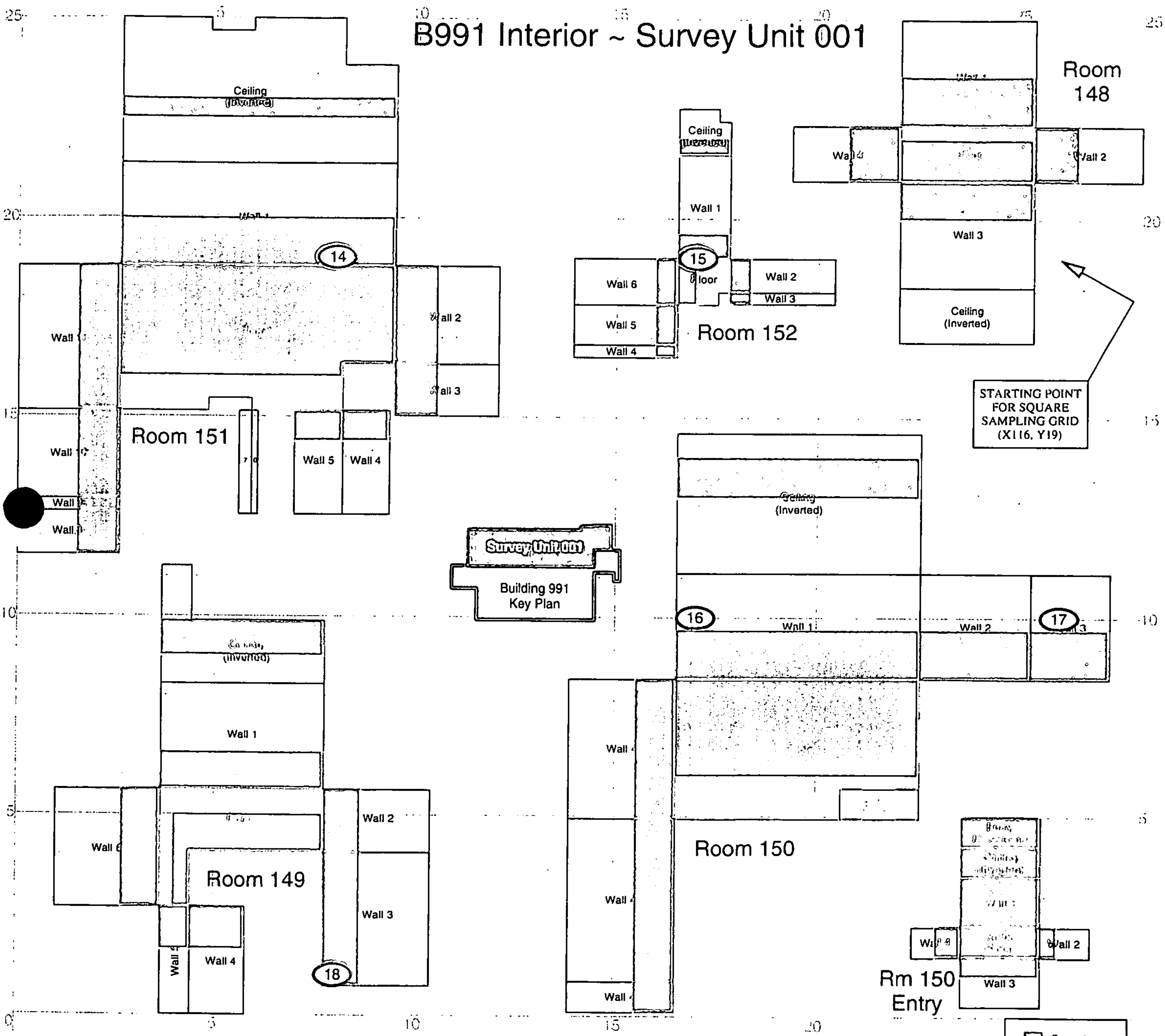
KAISER-HILL

MAP ID: 03-JS-SU1-3-SC
Jan 29, 2004

109

PRE-DEMOLITION SURVEY FOR AREA 2, GROUP 2

Survey Area: 2 **Survey Unit:** 991-2-001 **Classification:** 2
Building: 991
Survey Unit Description: Building 991 Interior, North Rooms
Total Area: 5,466 sq. m. **Floor Area:** 1,205 sq. m.
Grid Spacing for Survey Points: 18m x 18m



Scan Area

SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 30
0 METERS 10

1 inch = 24 feet 1 grid sq. = 4 sq. m.

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s)
1, 7, 8, 9, 15 - 25, 27 - 30

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707
Prepared for:

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Communications Group

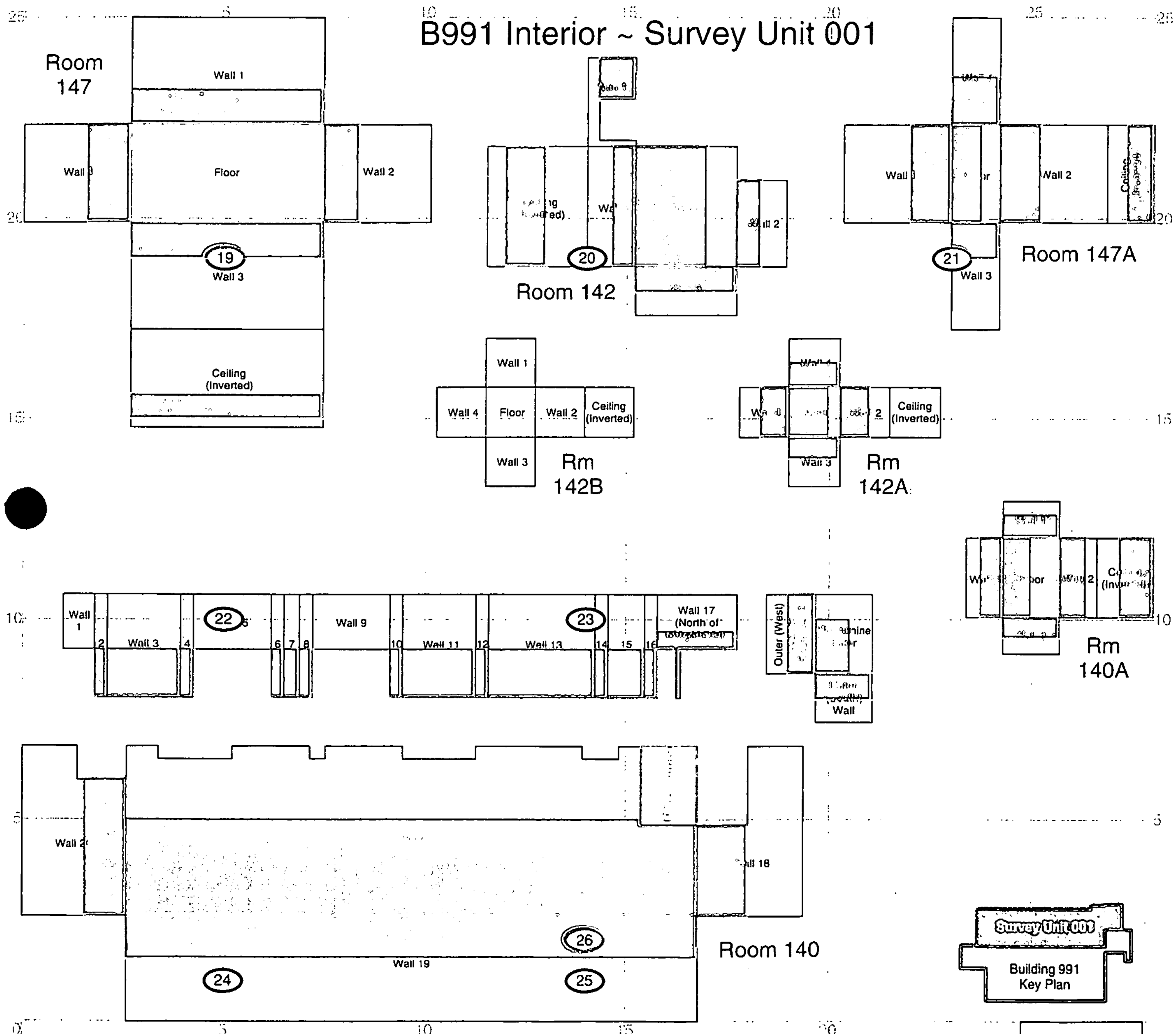
KAISER-HILL

MAP ID: 03-JS-SU1-4-SC
Jan 29, 2004

PRE-DEMOLITION SURVEY FOR AREA 2, GROUP 2

Survey Area: 2 **Survey Unit:** 991-2-001 **Classification:** 2
Building: 991
Survey Unit Description: Building 991 Interior, North Rooms
Total Area: 5,466 sq. m. **Floor Area:** 1,205 sq. m.
Grid Spacing for Survey Points: 18m x 18m

B991 Interior ~ Survey Unit 001



Scan Area

SURVEY MAP LEGEND			
Smear & TSA Location Smear, TSA & Sample Location Open/Inaccessible Area Area in Another Survey Unit	Neither the United States Government, nor Kaiser Hill Co., nor CH2M Hill, nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights.	N	0 FEET 30 0 METERS 10

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s)
1, 7, 8, 9, 15 - 25, 27 - 30

1 inch = 24 feet 1 grid sq. = 4 sq. m.

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707 Prepared for:

CH2MHILL Communications Group

KAISER HILL

MAP ID: 03-JS-SU1-5 Jan 29, 2004

SURVEY UNIT 991-2-002
RADIOLOGICAL DATA SUMMARY - PDS

Survey Unit Description: B991 Interior Center Rooms

112

Total Surface Activity Measurements

15	20
Number Required	Number Obtained

MIN	-13.2	dpm/100 cm^2
MAX	82.8	dpm/100 cm^2
MEAN	7.7	dpm/100 cm^2
STD DEV	20.1	dpm/100 cm^2
TRANSURANIC $DCGL_W$	100	dpm/100 cm^2

Removable Activity Measurements

15	20
Number Required	Number Obtained

MIN	-1.5	dpm/100 cm^2
MAX	3.0	dpm/100 cm^2
MEAN	0.2	dpm/100 cm^2
STD DEV	1.1	dpm/100 cm^2
TRANSURANIC $DCGL_W$	20	dpm/100 cm^2

SURVEY UNIT 991-2-002
TSA DATA SUMMARY

Manufacturer:	NE Tech	NE Tech	NE Tech	NE Tech	NE Tech
Model:	DP-6	DP-6	DP-6	DP-6	DP-6
Instrument ID#:	1	3	9	12	13
Serial #:	2352	1589	2352	1249	2391
Cal Due Date:	5/11/04	7/19/04	5/11/04	4/2/04	7/26/04
Analysis Date:	1/27/04	1.27/04	1/28/04	1/29/04	1/29/04
Alpha Eff. (c/d):	0.222	0.215	0.222	0.203	0.219
Alpha Bkgd (cpm)	0.7	2.0	1.0	1.0	1.0
Sample Time (min)	1.5	1.5	1.5	1.5	1.5
LAB Time (min)	1.5	1.5	1.5	1.5	1.5
MDC (dpm/100cm^2)	48.0	48.0	48.0	48.0	48.0

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)[1]
1	1	7.3	32.9	2.0	9.0	16.6
2	1	2.7	12.2	5.3	23.9	-4.2
3	12	6.7	33.0	1.0	4.9	16.7
4	12	3.3	16.3	3.3	16.3	-0.1
5	1	22.0	99.1	4.7	21.2	82.8
6	1	7.3	32.9	2.0	9.0	16.6
7	1	4.7	21.2	6.0	27.0	4.9
8	1	2.0	9.0	5.0	22.5	-7.3
9	3	3.0	14.0	7.3	34.0	-2.4
10	12	4.0	19.7	4.0	19.7	3.4
11	12	4.7	23.2	2.0	9.9	6.8
12	3	4.0	18.6	2.0	9.3	2.3
13	1	2.0	9.0	7.0	31.5	-7.3
14	3	3.3	15.3	6.7	31.2	-1.0
15	12	4.0	19.7	3.3	16.3	3.4
16	1	9.7	43.7	4.3	19.4	27.4
17	9	5.3	23.9	0.7	3.2	7.6
18	9	0.7	3.2	2.0	9.0	-13.2
19	9	3.3	14.9	1.3	5.9	-1.5
20	12	4.0	19.7	0.7	3.4	3.4

16.3	Sample LAB Average
MIN	-13.2
MAX	82.8
MEAN	7.7
SD	20.1
Transuranic $DCGL_W$	100

1 - Average LAB used to subtract from Gross Sample Activity

2 -The initial sample net activity for location 21 was 18,287.7 dpm/100cm2. This was detected during scan surveys. A coupon sample was collected from location 21 and analyzed using the OASIS system. No transuranic isotopes were detected above the transuranic DCGLs. Therefore, the area was decontaminated and resurveyed to the uranium DCGLs. All follow up post-decon survey results were less than the uranium DCGLs. Refer to TSA location results 22-30 below for post-decon survey results of location 21.

SURVEY UNIT 991-2-002
TSA DATA SUMMARY

Location 21 Post-Decon TSA Survey Results

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)[1]
22	13	15.3	69.9	6.7	30.6	53.5
23	13	18.0	82.2	3.3	15.1	65.9
24	13	20.0	91.3	4.7	21.5	75.0
25	13	175.3	800.5	6.7	30.6	784.1
26	13	37.3	170.3	4.7	21.5	154.0
27	13	55.3	252.5	6.7	30.6	236.2
28	13	33.6	153.4	4.7	21.5	137.1
29	13	23.0	105.0	6.7	30.6	88.7
30	13	25.6	116.9	1.7	7.8	100.6

23.3	Sample LAB Average
MIN	53.5
MAX	784.1
MEAN	188.3
SD	230.4
Uranium $DCGL_W$	**5000**

QC Measurements

16 QC	12	7.3	36.0	3.3	16.3	22.9
5 QC	12	16.7	82.3	2.0	9.9	69.2

1 - Average QC LAB used to subtract from Gross Sample Activity

13.1	QC LAB Average
MIN	22.9
MAX	69.2
MEAN	46.1
Transuranic $DCGL_W$	**100**

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SURVEY UNIT 991-2-002
RSC - DATA SUMMARY

Manufacturer:	Eberline	Eberline	Eberline	Eberline
Model:	SAC-4	SAC-4	SAC-4	SAC-4
Instrument ID#:	2	6	7	11
Serial #:	924	966	770	924
Cal Due Date:	4/27/04	4/23/04	3/17/04	4/27/04
Analysis Date:	1/27/04	1/27/04	1/27/04	1/28/04
Alpha Eff. (c/d):	0.33	0.33	0.33	0.33
Alpha Bkgd (cpm)	0.0	0.3	0.5	0.0
Sample Time (min)	2	2	2	2
Bkgd Time (min)	10	10	10	10
MDC (dpm/100cm^2)	9.0	9.0	9.0	9.0

Sample Location Number	Instrument ID#	Gross Counts (cpm)	Net Activity (dpm/100 cm^2)
1	2	1	1.5
2	2	0	0.0
3	14	0	0.0
4	15	0	-0.3
5	2	1	1.5
6	2	0	0.0
7	2	0	0.0
8	7	3	3.0
9	6	2	2.1
10	14	0	0.0
11	15	1	1.2
12	6	0	-0.9
13	2	0	0.0
14	8	0	0.0
15	14	0	0.0
16	7	0	-1.5
17	11	0	-0.9
18	11	0	-0.9
19	11	0	-0.9
20	15	0	-0.3
		MIN	-1.5
		MAX	3.0
		MEAN	0.2
		SD	1.1
		Transuranic $DCGL_W$	20

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****
***** RFETS B903 ALPHA SPECTROMETER ANALYSIS RESULTS *****
****

Sample ID: 10 MIN SMEAR Type: BLDG 991 RM 170 N. WALL

Batch Id: 0401270e
Acquisition Start: 1/27/04 4:13:45 PM
Analysis Date: 1/27/2004 4:24:28 PM
Detector Name: A 1 1A
Spectrum File: C:\AANALYST\USEDBIFS\0401270e\0.CNF
Acquisition Live Time: 600.0 seconds
Calibrations:
Energy = 2468.593 keV + 1.6055E+000*ch
FWHM = 4.4951E+001 keV
Low Tail = 1.3097E+001 keV
Sample Size: 1.000 100 Cm2

991-2-002
Oasis Results
Location #21

----- ROI DATA -----

Peak No.	Associated Nuclide	ROI Start	End	Energy (keV)	FWHM (keV)
1	Pu+Am	19-	1887	3849.500	2.007
2	Bi-212	1923-	2263	5828.990	0.000
3	PO-214	2566-	3368	7498.752	1.606
4	PO-212	3689-	3911	8569.648	0.000

----- ROI ANALYSIS RESULTS -----

Nuclide	Net Counts +/- %1s	BKG counts	CPM
Pu+Am	180.389 +/- 7.458	0.611	18.039
Bi-212	-0.028 +/- 70.711	0.028	-0.003
PO-214	0.986 +/-101.418	0.014	0.099
PO-212	-0.014 +/-100.000	0.014	-0.001

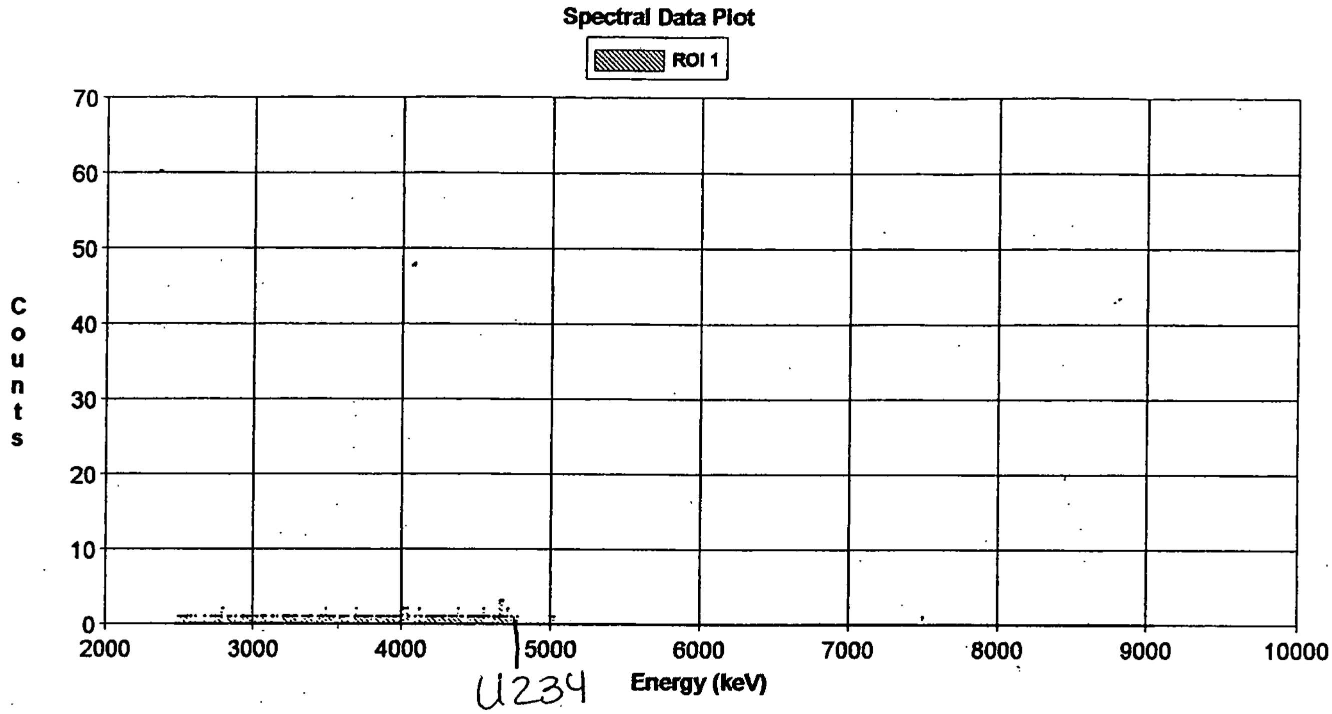
----- NUCLIDE ANALYSIS RESULTS -----

Nuclide Name	Id Conf.	ROI Midpt (keV)	Activity +/- 2s dpm/100 Cm	MDA dpm/100 Cm
Pu+Am	0.999	4000.00*	7.691E+001 +/- 1.387E+001	2.260E+000
Bi-212	1.000	5830.00*	-3.289E-002 +/- 4.663E-002	3.862E+000
PO-212	1.000	8572.00*	-5.922E-003 +/- 1.186E-002	1.322E+000
PO-214	0.997	7234.00*	4.205E-001 +/- 8.540E-001	1.322E+000

Analysis Reviewed by: [redacted]

Approved by: [redacted]

Spectral Data Plot

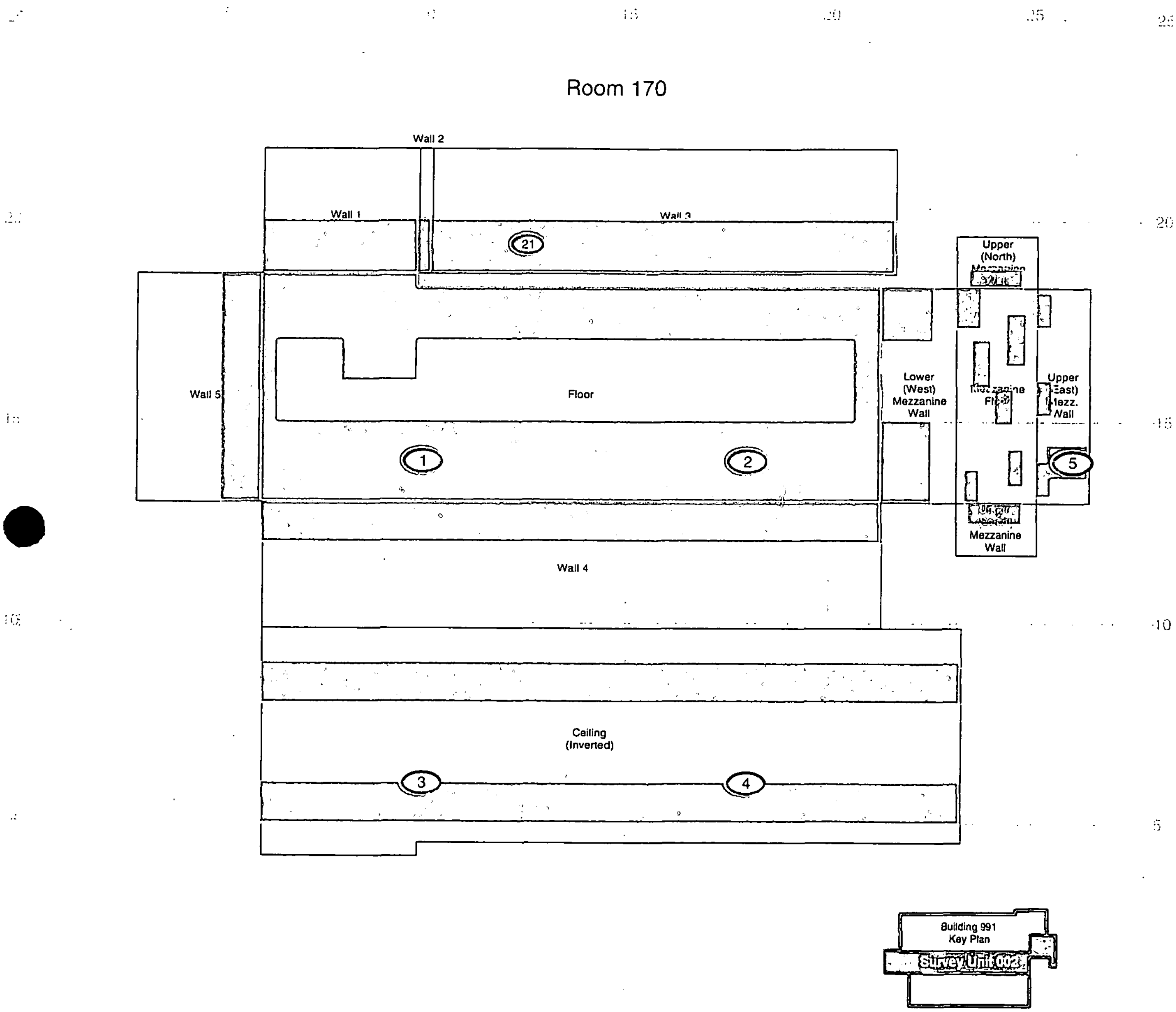


Datasource:	**0.CNF**		
Live Time:	**600 sec**		
Real Time:	**600 sec**		
Acq. Start:	**1/27/2004 4:13:45 PM**		
Start:	**1**	**:**	**2470.20 (keV)**
Stop:	**4096**	**:**	**9044.89 (keV)**

991-2-002
Oasis Results
Location #21

PRE-DEMOLITION SURVEY FOR AREA 2, GROUP 2

Survey Area: 2 Survey Unit: 991-2-002 Classification: 2
Building: 991
Survey Unit Description: Building 991 Interior, Center Rooms
Total Area: 3,578 sq. m. Floor Area: 970 sq. m.
Grid Spacing for Survey Points: 16m x 16m



Scan Area

SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
1, 3, 5, 9, 10

0 FEET 30
0 METERS 10

1 inch = 24 feet 1 grid sq. = 4 sq. m.

U.S. Department of Energy
Rocky Flats Environmental Technology Site

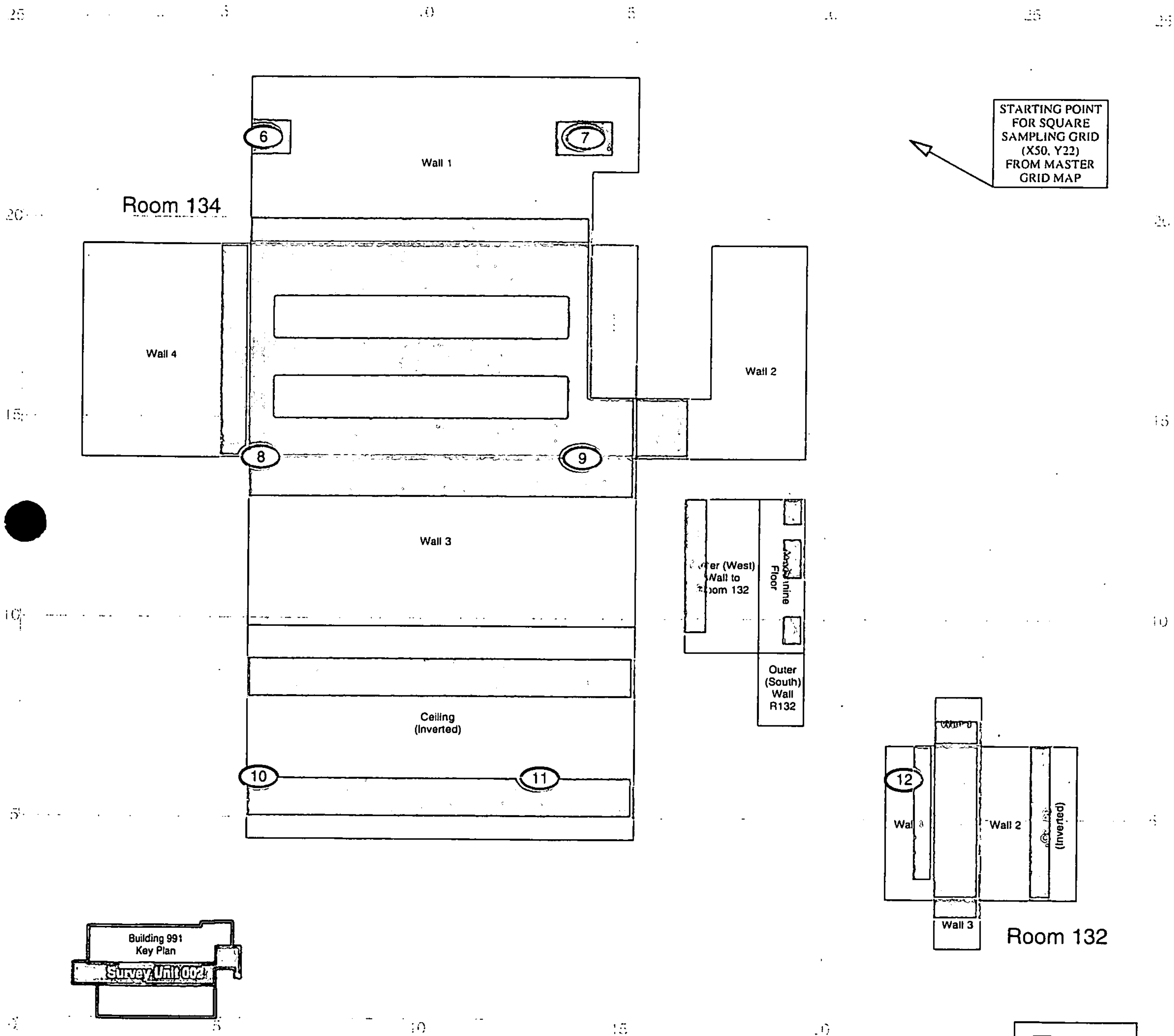
Prepared by: GIS Dept. 303-966-7707
Prepared for:

CH2MHILL
Communications Group

MAP ID: 03-JS/991-2-1-SC
Feb. 02, 2004

PRE-DEMOLITION SURVEY FOR AREA 2, GROUP 2

Survey Area: 2 Survey Unit: 991-2-002 Classification: 2
Building: 991
Survey Unit Description: Building 991 Interior, Center Rooms
Total Area: 3,578 sq. m. Floor Area: 970 sq. m.
Grid Spacing for Survey Points: 16m x 16m



Scan Area

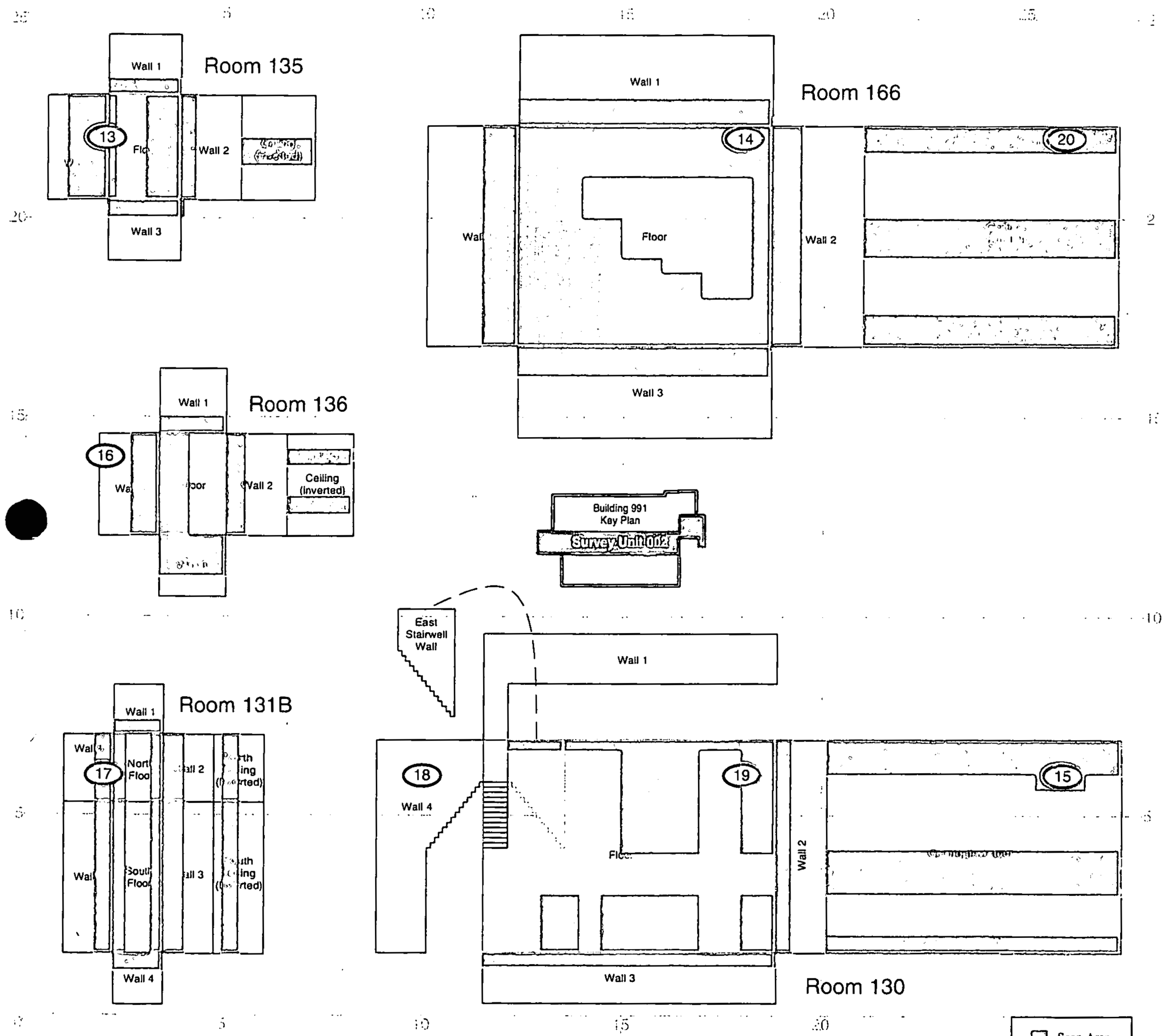
SURVEY MAP LEGEND				
Smear & TSA Location Smear, TSA & Sample Location Open/Inaccessible Area Area in Another Survey Unit	Neither the United States Government, nor Kaiser Hill Co., nor CH2M Hill, nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights.	N	0 FEET 30 0 METERS 10 1 inch = 24 feet 1 grid sq. = 4 sq. m.	U.S. Department of Energy Rocky Flats Environmental Technology Site Prepared by: GIS Dept. 303-966-7707 Prepared for: CH2MHILL Communications Group KAISER-HILL MAP ID: 03-JS/991-2-2-SC Feb. 02, 2004

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
1, 3, 5, 9, 10

120

PRE-DEMOLITION SURVEY FOR AREA 2, GROUP 2

Survey Area: 2 Survey Unit: 991-2-002 Classification: 2
Building: 991
Survey Unit Description: Building 991 Interior, Center Rooms
Total Area: 3,578 sq. m. Floor Area: 970 sq. m.
Grid Spacing for Survey Points: 16m x 16m



SURVEY MAP LEGEND
- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

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N

0 FEET 30
0 METERS 10

1 inch = 24 feet 1 grid sq. = 4 sq. m.

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
1, 3, 5, 9, 10

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707 Prepared for:

CH2MHILL
Communications Group

KAISER-HILL COMPANY

MAP ID: 03-JS/991-2-3-SC Feb. 02, 2004

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SURVEY UNIT 991-2-003
RADIOLOGICAL DATA SUMMARY - PDS

Survey Unit Description: B991 Interior South Rooms

Total Surface Activity Measurements

Number Required	Number Obtained
15	15

MIN	-12.4	dpm/100 cm^2
MAX	30.5	dpm/100 cm^2
MEAN	7.4	dpm/100 cm^2
STD DEV	12.4	dpm/100 cm^2
TRANSURANIC DCGL$_W$	100	dpm/100 cm^2

Removable Activity Measurements

Number Required	Number Obtained
15	15

MIN	-0.9	dpm/100 cm^2
MAX	2.1	dpm/100 cm^2
MEAN	-0.1	dpm/100 cm^2
STD DEV	1.1	dpm/100 cm^2
TRANSURANIC DCGL$_W$	20	dpm/100 cm^2

SURVEY UNIT 991-2-003
TSA - DATA SUMMARY

Manufacturer:	NE Tech	NE Tech	NE Tech	NE Tech
Model:	DP-6	DP-6	DP-6	DP-6
Instrument ID#:	1	2	3	4
Serial #:	3109	1379	1273	3125
Cal Due Date:	6/8/04	6/9/04	1/9/04	3/24/04
Analysis Date:	12/17/03	12/17/03	12/17/03	1/23/04
Alpha Eff. (c/d):	0.217	0.214	0.209	0.221
Alpha Bkgd (cpm)	1.0	0.0	4.0	3.0
Sample Time (min)	1.5	1.5	1.5	1.5
LAB Time (min)	1.5	1.5	1.5	1.5
MDC (dpm/100cm^2)	48.0	48.0	48.0	48.0

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)[1]
1	4	6.7	30.3	3.3	14.9	17.9
2	2	0.7	3.3	0.0	0.0	-9.1
3	4	6.0	27.1	5.3	24.0	14.8
4	1	2.0	9.2	1.3	6.0	-3.2
5	1	1.3	6.0	2.0	9.2	-6.4
6	1	3.3	15.2	1.3	6.0	2.8
7	1	4.0	18.4	1.3	6.0	6.0
8	1	9.3	42.9	4.0	18.4	30.5
9	1	6.7	30.9	2.7	12.4	18.5
10	1	2.7	12.4	3.3	15.2	0.0
11	1	4.7	21.7	2.7	12.4	9.3
12	4	8.0	36.2	6.0	27.1	23.8
13	2	5.3	24.8	3.3	15.4	12.4
14	2	4.0	18.7	2.0	9.3	6.3
15	2	0.0	0.0	2.0	9.3	-12.4

1 - Average LAB used to subtract from Gross Sample Activity

12.4	Sample LAB Average
MIN	-12.4
MAX	30.5
MEAN	7.4
SD	12.4
Transuranic DCGL$_W$	100

QC Measurements

8 QC	3	10.0	47.8	1.3	6.2	30.4
9 QC	3	6.0	28.7	6.0	28.7	11.2

1 - Average QC LAB used to subtract from Gross Sample Activity

17.5	QC LAB Average
MIN	11.2
MAX	30.4
MEAN	20.8
Transuranic DCGL$_W$	100

SURVEY UNIT 991-2-003
RSC - DATA SUMMARY

Manufacturer:	Eberline	Eberline
Model:	SAC-4	SAC-4
Instrument ID#:	10	11
Serial #:	924	966
Cal Due Date:	4/27/04	4/23/04
Analysis Date:	1/27/04	1/27/04
Alpha Eff. (c/d):	0.33	0.33
Alpha Bkgd (cpm)	0.3	0.3
Sample Time (min)	2	2
Bkgd Time (min)	10	10
MDC (dpm/100cm^2)	9.0	9.0

Sample Location Number	Instrument ID#	Gross Counts (cpm)	Net Activity (dpm/100 cm^2)
1	10	0	-0.9
2	11	1	0.6
3	10	1	0.6
4	11	0	-0.9
5	10	0	-0.9
6	11	0	-0.9
7	10	0	-0.9
8	11	0	-0.9
9	10	0	-0.9
10	11	2	2.1
11	10	2	2.1
12	11	1	0.6
13	10	1	0.6
14	11	0	-0.9
15	10	0	-0.9
		MIN	-0.9
		MAX	2.1
		MEAN	-0.1
		SD	1.1
		Transuranic DCGL$_W$	**20**

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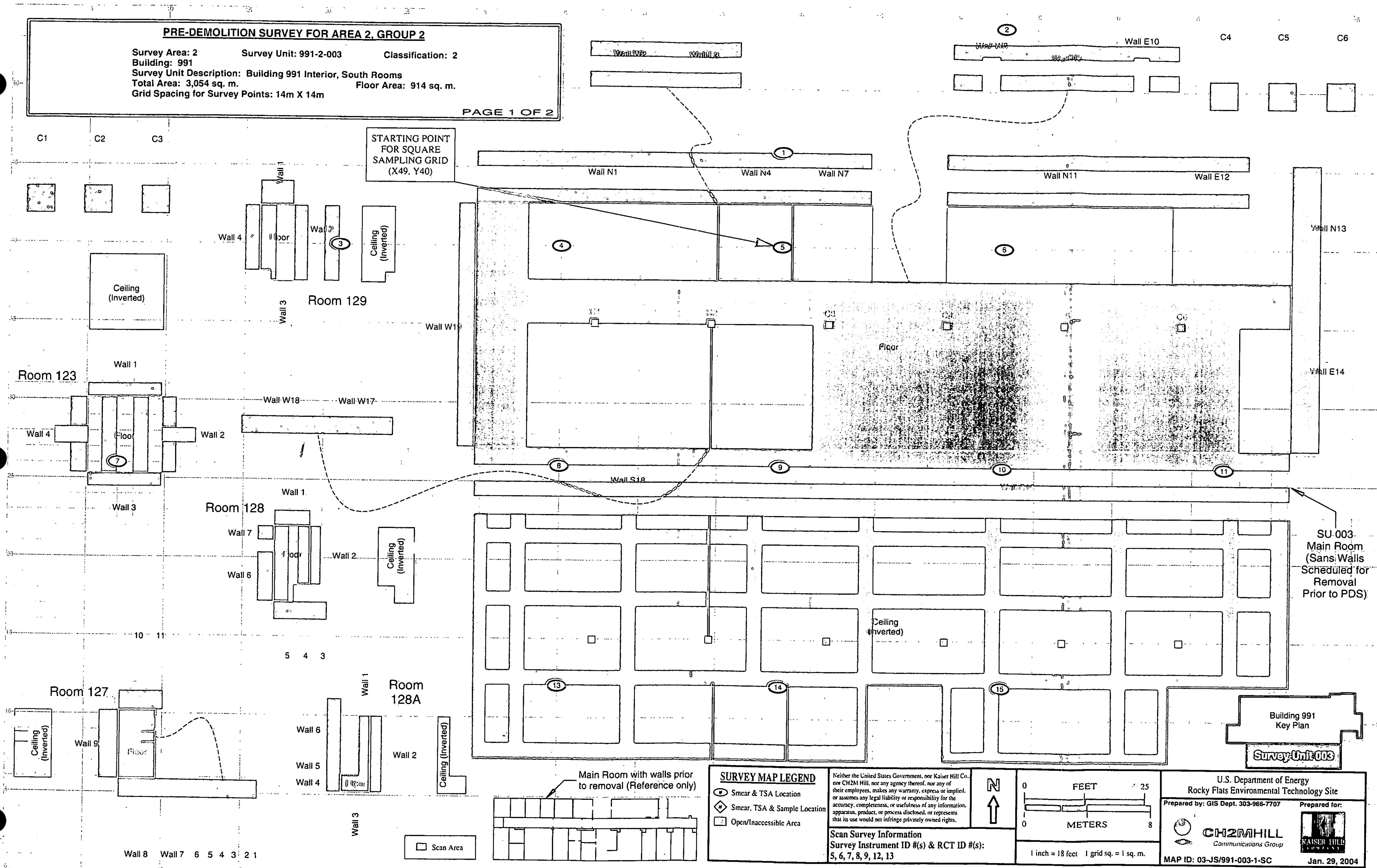
PRE-DEMOLITION SURVEY FOR AREA 2, GROUP 2
Survey Area: 2
Survey Unit: 991-2-003
Classification: 2
Building: 991
Survey Unit Description: Building 991 Interior, South Rooms
Total Area: 3,054 sq. m.
Floor Area: 914 sq. m.
Grid Spacing for Survey Points: 14m X 14m
PAGE 1 OF 2
STARTING POINT FOR SQUARE SAMPLING GRID (X49, Y40)
C1
C2
C3
C4
C5
C6
Wall N1
Wall N4
Wall N7
Wall N11
Wall E12
Wall E10
Wall N13
Wall E14
Wall W19
Wall W18
Wall W17
Wall S18
Floor
Ceiling (Inverted)
Room 129
Room 123
Room 128
Room 127
Room 128A
Wall 1
Wall 2
Wall 3
Wall 4
Wall 5
Wall 6
Wall 7
Wall 8
Wall 9
SU 003 Main Room (Sans Walls Scheduled for Removal Prior to PDS)
Building 991 Key Plan
Survey Unit 003
Main Room with walls prior to removal (Reference only)
Scan Area
SURVEY MAP LEGEND
Smear & TSA Location
Smear, TSA & Sample Location
Open/Inaccessible Area
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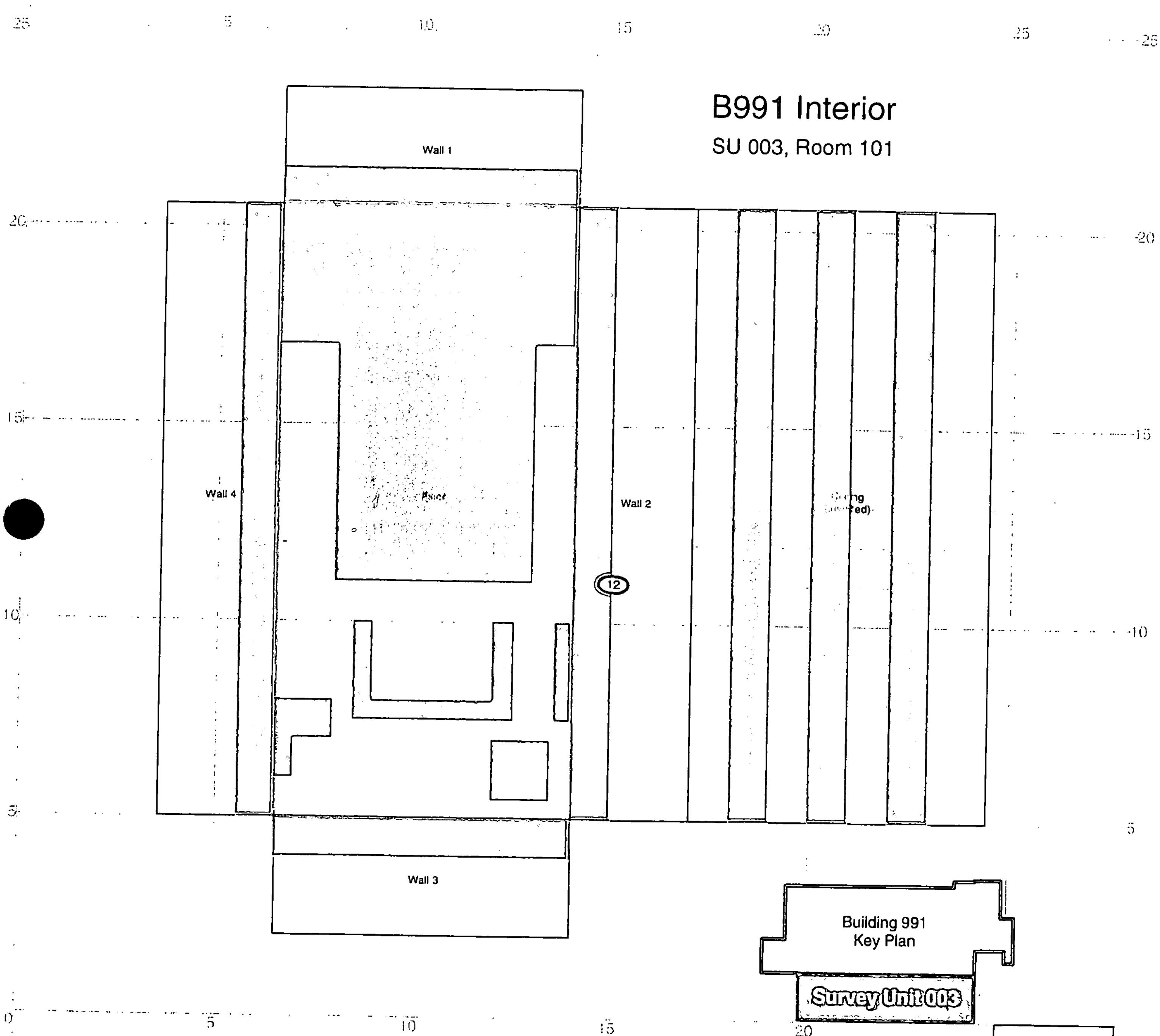
Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
5, 6, 7, 8, 9, 12, 13
N
FEET
METERS
1 inch = 18 feet
1 grid sq. = 1 sq. m.
U.S. Department of Energy
Rocky Flats Environmental Technology Site
Prepared by: GIS Dept. 303-966-7707
Prepared for:
CH2MHILL
Communications Group
KAISER HILL COMPANY
MAP ID: 03-JS/991-003-1-SC
Jan. 29, 2004

126

PRE-DEMOLITION SURVEY FOR AREA 2, GROUP 2

Survey Area: 2 Survey Unit: 991-2-003 Classification: 2
Building: 991
Survey Unit Description: Building 991 Interior, South Rooms
Total Area: 3,054 sq. m. Floor Area: 914 sq. m.
Grid Spacing for Survey Points:



Scan Area

SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

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N

FEET 0 15
METERS 0 5

1 inch = 12 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
5, 6, 7, 8, 9, 12, 13

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707
Prepared for:

CH2MHILL
Communications Group

KAISER-HILL

MAP ID: 03-JS/991-003-2-SC
Jan 29, 2004

SURVEY UNIT 991-2-004
RADIOLOGICAL DATA SUMMARY - PDS

Survey Unit Description: B991 East Tunnel and B998 Vault

128

PDS Data Summary

Total Surface Activity Measurements

15	16
Number Required	Number Obtained

MIN	-10.4	$dpm/100\ cm^2$
MAX	22.5	$dpm/100\ cm^2$
MEAN	5.2	$dpm/100\ cm^2$
STD DEV	9.7	$dpm/100\ cm^2$
TRANSURANIC $DCGL_W$	100	$dpm/100\ cm^2$

Removable Activity Measurements

15	16
Number Required	Number Obtained

MIN	-1.6	$dpm/100\ cm^2$
MAX	3.2	$dpm/100\ cm^2$
MEAN	-0.5	$dpm/100\ cm^2$
STD DEV	1.6	$dpm/100\ cm^2$
TRANSURANIC $DCGL_W$	20	$dpm/100\ cm^2$

TSA Data Summary

Manufacturer:	NE Tech	NE Tech	NE Tech	NE Tech
Model:	DP-6	DP-6	DP-6	DP-6
Instrument ID#:	1	2	3	4
Serial #:	3113	2352	1249	1420
Cal Due Date:	2/22/04	5/11/04	4/02.04	5/19/04
Analysis Date:	12/9/03	12/9/03	12/9/03	12/9/03
Alpha Eff. (c/d):	0.224	0.230	0.199	0.222
Alpha Bkgd (cpm)	0.0	1.0	3.0	0.0
Sample Time (min)	1.5	1.5	1.5	1.5
LAB Time (min)	1.5	1.5	1.5	1.5
MDC ($dpm/100cm^2$)	0.0	31.6	63.2	0.0

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)[1]
1	2	6.7	29.1	4.7	20.4	18.8
2	2	2.7	11.7	2.0	8.7	1.4
3	4	0.7	3.2	0.7	3.2	-7.2
4	4	7.3	32.9	1.3	5.9	22.5
5	4	2.7	12.2	1.3	5.9	1.8
6	2	3.3	14.3	2.0	8.7	4.0
7	2	5.3	23.0	3.3	14.3	12.7
8	2	3.3	14.3	3.3	14.3	4.0
9	4	3.3	14.9	1.3	5.9	4.5
10	4	5.3	23.9	3.3	14.9	13.5
11	4	0.7	3.2	2.0	9.0	-7.2
12	4	4.0	18.0	1.3	5.9	7.7
13	4	1.3	5.9	3.4	15.3	-4.5
14	4	6.0	27.0	2.7	12.2	16.7
15	4	3.3	14.9	0.7	3.2	4.5
16	4	0.0	0.0	4.0	18.0	-10.4

10.4	Sample LAB Average
MIN	-10.4
MAX	22.5
MEAN	5.2
SD	9.7
Transuranic $DCGL_W$	100

1 - Average LAB used to subtract from Gross Sample Activity

2 -The initial sample net activity for location 17 was 475.6 $dpm/100cm^2$. A coupon sample was collected from location 17 and analyzed using the Canberra ISOCS system. No transuranic isotopes were detected. The sample activity was determined to be from uranium and naturally occuring isotopes.
The sample net activity for location #17 (465.6 $dpm/100cm^2$) is below the uranium $DCGL_W$ limits (5000 $dpm/100cm^2$).
All survey results are less than the applicable DCGLs, therefore, no further investigation is required.
Sample 17 was taken because of high activity found during the scanning surveys, and is only reported on the survey package investigation form.

QC Measurements

14 QC	3	6.0	30.2	0.0	0.0	20.1
15 QC	3	4.0	20.1	4.0	20.1	10.1

1 - Average QC LAB used to subtract from Gross Sample Activity

10.1	QC LAB Average
MIN	10.1
MAX	20.1
MEAN	15.1
Transuranic $DCGL_W$	100

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SURVEY UNIT 991-2-004
RSC - DATA SUMMARY

Manufacturer:	Eberline	Eberline	Eberline
Model:	SAC-4	SAC-4	SAC-4
Instrument ID#:	5	6	7
Serial #:	952	966	952
Cal Due Date:	1/10/04	4/23/04	1/10/04
Analysis Date:	12/9/03	12/9/03	12/9/03
Alpha Eff. (c/d):	0.33	0.33	0.33
Alpha Bkgd (cpm)	0.4	0.2	0.4
Sample Time (min)	2	2	2
Bkgd Time (min)	10	10	10
MDC (dpm/100cm^2)	9.3	9.0	9.0

Sample Location Number	Instrument ID#	Gross Counts (cpm)	Net Activity (dpm/100 cm^2)
1	5	0.0	-1.6
2	6	0.0	-0.8
3	5	0.0	-1.6
4	6	0.0	-0.8
5	5	1.0	2.4
6	6	0.0	-0.8
7	5	0.0	-1.6
8	6	0.0	-0.8
9	5	1.0	2.4
10	6	0.0	-0.8
11	5	0.0	-1.6
12	6	1.0	3.2
13	5	0.0	-1.6
14	6	0.0	-0.8
15	5	0.0	-1.6
16	6	0.0	-0.8
		MIN	-1.6
		MAX	3.2
		MEAN	-0.5
		SD	1.6
		Transuranic DCGL$_W$	**20**

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991-2-004
Media Conversion Sheet

LOCATION DESCRIPTION	SAMPLE LOCATION NUMBER	SITE SAMPLE ID	NUCLIDE	pCi/g (2)	MDA (pCi/g)	WEIGHT (g)	SURFACE AREA (in^2)	INDIVIDUAL NUCLIDE ($dpm/100cm^2$) (3)	ESTIMATED MDA ($dpm/100cm^2$) (4)	URANIUM TOTAL ($dpm/100cm^2$)	TRANSURANIC TOTAL ($dpm/100cm^2$)
B998	17	03S0205-016.001	U-234	33.000	45.400	25.8	24.5	1196	1645		
			U-235	0.956	0.201			35	7		
			U-238	0.889	0.778			32	28	**1262.6**	
			Pu-239 Pu-240	0.000	1.296			0	47		
			Am-241	0.000	0.180			0	7		**0.0**

CANBERRA

Analysis Results Header 12/11/2003 11:39:29 AM Page 1

```
***************************************************************************
*****          G A M M A   S P E C T R U M   A N A L Y S I S         *****
** C a n b e r r a  M o b i l e  L a b o r a t o r y  S e r v i c e s **
***************************************************************************
```

991-2-004

B998 Vault

Location #17

Report Generated On : 12/11/2003 11:39:29 AM

RIN Number : 04S0097
Analytical Batch ID : 0312104606
Line Item Code : RC10C019

Filename: S:\GENIE2K\CAMFILES\LI014(G)\MOD\G1900116.CNF

Sample Number : 04S0097-003.001
Lab Sample Number : CMLS-4214
Sample Receipt Date : 12/10/2003
Sample Volume Received : 2.58E+001 GRAM

Result Identifier : NA

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 2.580E+001 GRAM
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 12/9/2003 2:30:00 PM
Acquisition Started : 12/11/2003 7:34:50 AM

Count Time : 7200.0 seconds
Real Time : 7231.1 seconds
Dead Time : 0.43 %

Energy Calibration Used Done On : 10/1/03
Energy = 0.263 + 0.250*ch + 2.24E-009*ch^2 + 0.00E+000*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 12/11/03
Efficiency Geometry ID : 04S0097-003.001

Analyzed By: Phil Sanderson Date: 12/11/03

Reviewed By: Marilyn Umbaugh Date: 12/11/03

CANBERRA


```
*************************************************************************
*****              Sample and QC Sample Results Summary            *****
*************************************************************************
```

Site Sample ID : 04S0097-003.001

Analytical Batch ID : 0312104606

Sample Type (Result Identifier): G19

Lab Sample Number : CMLS-4214

Geometry ID : 04S0097-003.001

Filename: S:\GENIE2K\CAMFILES\LI014(G)\MOD\G1900116.CNF

Detector Name: 4606

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

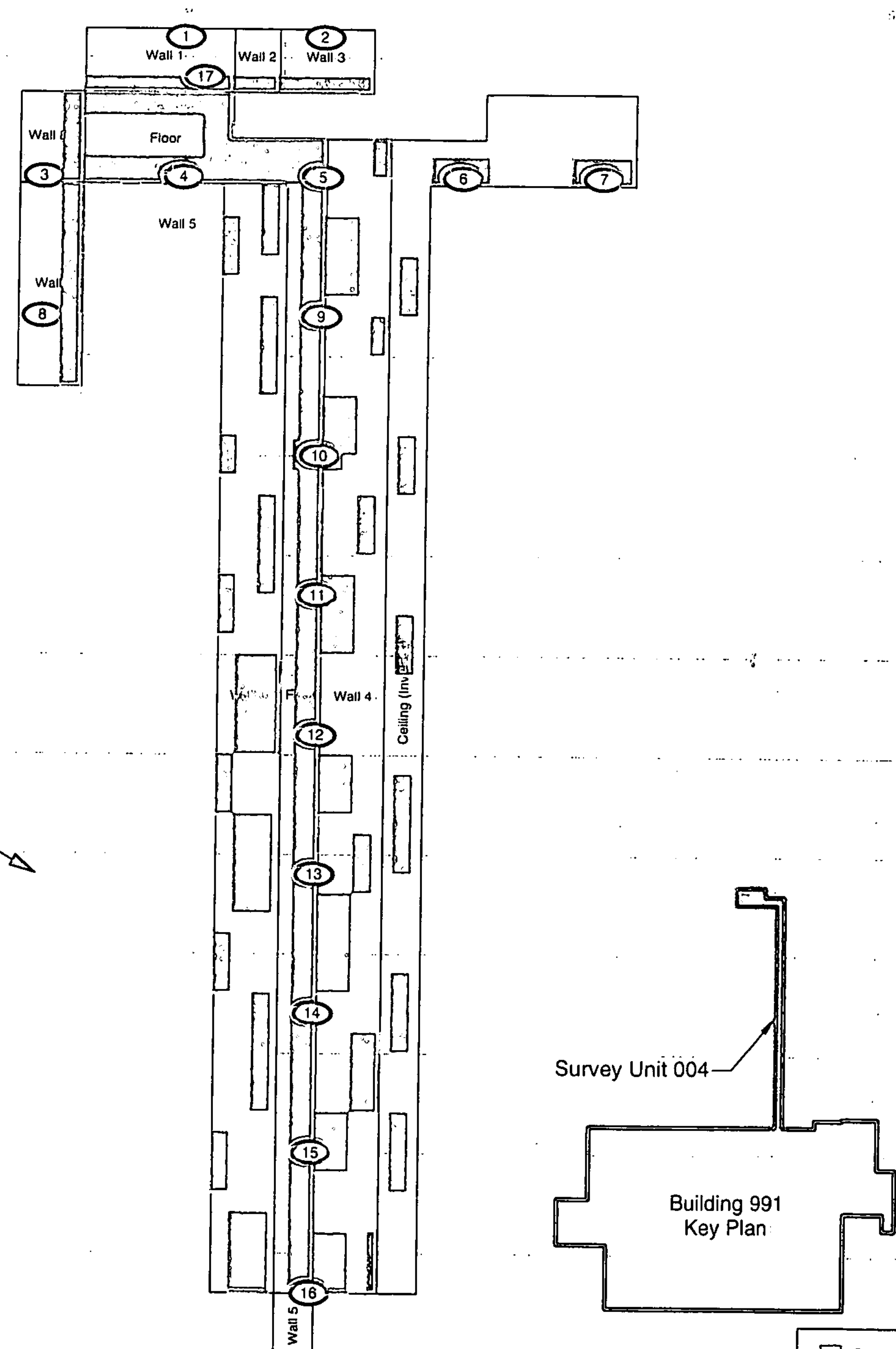
Analyte	Activity (pCi/GRAM)	2-Sigma Uncertainty (pCi/GRAM)	MDA (pCi/GRAM)
K-40n	1.14E+001	2.33E+000	2.74E+000
CS-137n	0.00E+000	0.00E+000	2.87E-001
TL-208n	2.09E-001	6.70E-002	1.38E-001
PO-210in	0.00E+000	0.00E+000	2.56E+004
BI-212n	0.00E+000	0.00E+000	3.82E+000
PB-212n	3.98E-001	9.49E-002	1.88E-001
BI-214n	8.78E-001	1.92E-001	3.55E-001
PB-214n	7.24E-001	1.87E-001	4.99E-001
RA-226n	0.00E+000	0.00E+000	3.24E+000
AC-228n	0.00E+000	0.00E+000	1.21E+000
TH-230n	0.00E+000	0.00E+000	1.78E+001
Th-231n	4.98E-001	3.90E-001	6.82E-001
PA-234Mn	0.00E+000	0.00E+000	3.42E+001
PA-234n	0.00E+000	0.00E+000	2.95E-001
U-234n	3.30E+001	1.54E+001	4.54E+001
U-235	9.56E-001	2.36E-001	2.01E-001
U238	8.89E-001	4.63E-001	7.78E-001
AM-241	0.00E+000	0.00E+000	1.80E-001

i - If Po-210 is detected in the spectrum, this peak may be the result of the interaction of Pb-206(n,n') which also produces a prompt gamma at 803 keV.

n - Non-contractual Nuclide

PRE-DEMOLITION SURVEY FOR AREA 2, GROUP 2

Survey Area: 2 Survey Unit: 991-2-004 Classification: 2
Building: 991
Survey Unit Description: B991 East Vault Tunnel
Total Area: 774 sq. m. Floor Area: 155 sq. m.
Grid Spacing for Survey Points: 7m X 7m



STARTING POINT FOR SQUARE SAMPLING GRID (X25, Y24)

B991 Interior
Survey Unit 004
East Vault Tunnel

Scan Area

SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 40
0 METERS 10

1 inch = 30 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
1, 2, 3 & 4

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707
Prepared for:

CH2MHILL
Communications Group

KAISER-HILL

MAP ID: 03-JS/991-004-SC
July 22, 2003

SURVEY UNIT 991-2-005
RADIOLOGICAL DATA SUMMARY - PDS

Survey Unit Description: B991 Interior Room 402 and 402A

136

PDS Data Summary

Total Surface Activity Measurements

15	21
Number Required	Number Obtained

MIN	-2.5	dpm/100 cm^2
MAX	53.7	dpm/100 cm^2
MEAN	22.8	dpm/100 cm^2
STD DEV	15.9	dpm/100 cm^2
TRANSURANIC $DCGL_W$	100	dpm/100 cm^2

Removable Activity Measurements

15	21
Number Required	Number Obtained

MIN	-0.9	dpm/100 cm^2
MAX	3.6	dpm/100 cm^2
MEAN	1.0	dpm/100 cm^2
STD DEV	1.4	dpm/100 cm^2
TRANSURANIC $DCGL_W$	20	dpm/100 cm^2

SURVEY UNIT 991-2-005
TSA - DATA SUMMARY

Manufacturer:	NE Tech	NE Tech	NE Tech	NE Tech	NE Tech
Model:	DP-6	DP-6	DP-6	DP-6	DP-6
Instrument ID#:	1	2	6	7	8
Serial #:	1273	2352	3110	1589	2352
Cal Due Date:	7/23/04	5/11/04	7/12/04	7/19/04	5/11/04
Analysis Date:	1/26/04	1/26/04	1/27/04	1/27/04	1/27/04
Alpha Eff. (c/d):	0.208	0.222	0.211	0.215	0.222
Alpha Bkgd (cpm)	5.0	2.0	0.0	2.0	0.7
Sample Time (min)	1.5	1.5	1.5	1.5	1.5
LAB Time (min)	1.5	1.5	1.5	1.5	1.5
MDC (dpm/100cm²)	48.0	48.0	48.0	48.0	48.0

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)[1]
1	1	3.3	15.9	1.3	6.3	-2.5
2	1	8.7	41.8	2.0	9.6	23.5
3	2	12.0	54.1	2.0	9.0	35.7
4	1	7.3	35.1	2.7	13.0	16.7
5	1	6.7	32.2	2.3	11.1	13.8
6	1	10.0	48.1	2.7	13.0	29.7
7	2	6.7	30.2	4.0	18.0	11.8
8	1	3.3	15.9	0.7	3.4	-2.5
9	1	6.0	28.8	2.7	13.0	10.5
10	1	6.0	28.8	2.7	13.0	10.5
11	2	4.7	21.2	2.3	10.4	2.8
12	2	15.3	68.9	0.7	3.2	50.5
13	2	10.7	48.2	1.3	5.9	29.8
14	2	8.7	39.2	8.0	36.0	20.8
15	2	8.0	36.0	5.3	23.9	17.7
16	2	10.0	45.0	6.0	27.0	26.7
17	8	13.3	59.9	6.7	30.2	41.5
18	8	16.0	72.1	8.0	36.0	53.7
19	7	12.0	55.8	7.3	34.0	37.4
20	7	7.0	32.6	8.0	37.2	14.2
21	8	12.0	54.1	7.3	32.9	35.7

1 - Average LAB used to subtract from Gross Sample Activity

18.4	Sample LAB Average
MIN	-2.5
MAX	53.7
MEAN	22.8
SD	15.9
Transuranic $DCGL_W$	100

QC Measurements

2 QC	6	8.7	41.2	5.3	25.1	12.8
6 QC	6	11.3	53.6	6.7	31.8	25.1

1 - Average QC LAB used to subtract from Gross Sample Activity

28.4	QC LAB Average
MIN	12.8
MAX	25.1
MEAN	19.0
Transuranic $DCGL_W$	100

138

SURVEY UNIT 991-2-005
RSC - DATA SUMMARY

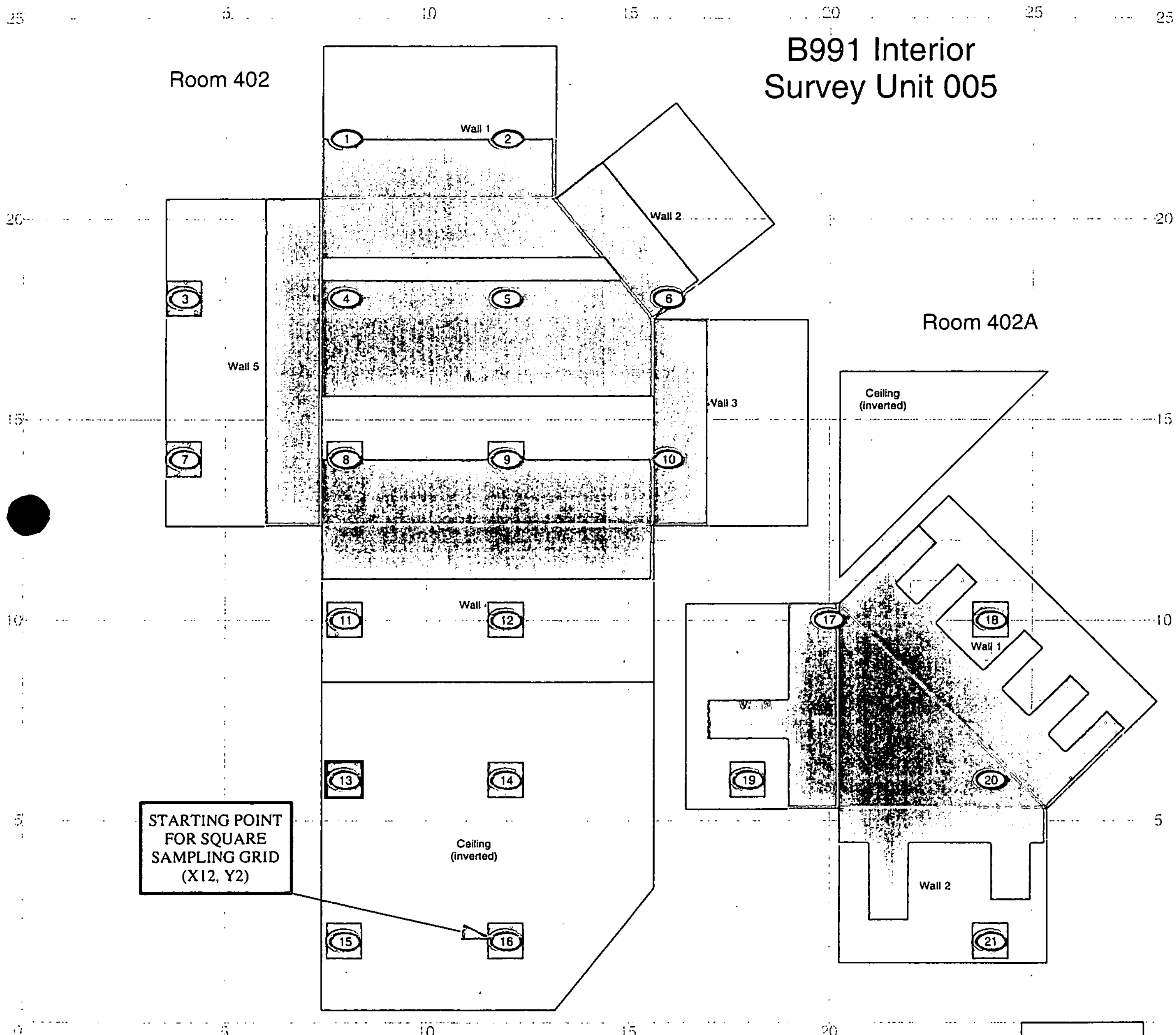
Manufacturer:	Eberline	Eberline	Eberline	Eberline
Model:	SAC-4	SAC-4	SAC-4	SAC-4
Instrument ID#:	3	4	9	10
Serial #:	830	770	924	966
Cal Due Date:	4/22/04	3/17/04	4/27/04	4/23/04
Analysis Date:	1/26/04	1/26/04	1/27/04	1/27/04
Alpha Eff. (c/d):	0.33	0.33	0.33	0.33
Alpha Bkgd (cpm)	0.0	0.3	0.3	0.3
Sample Time (min)	2	2	2	2
Bkgd Time (min)	10	10	10	10
MDC (dpm/100cm^2)	9.0	9.0	9.0	9.0

Sample Location Number	Instrument ID#	Gross Counts (cpm)	Net Activity (dpm/100 cm^2)
1	3	0	0.0
2	4	3	3.6
3	3	1	1.5
4	4	0	-0.9
5	3	0	0.0
6	4	0	-0.9
7	3	0	0.0
8	4	2	2.1
9	3	0	0.0
10	4	3	3.6
11	3	2	3.0
12	4	0	-0.9
13	3	0	0.0
14	4	1	0.6
15	3	1	1.5
16	4	1	0.6
17	9	1	0.6
18	10	2	2.1
19	9	2	2.1
20	10	1	0.6
21	9	2	2.1
		MIN	-0.9
		MAX	3.6
		MEAN	1.0
		SD	1.4
		Transuranic $DCGL_W$	20

L39

PRE-DEMOLITION SURVEY FOR Area2, Group2

Survey Area: 2 **Survey Unit:** 991-2-005 **Classification:** 2
Building: 991
Survey Unit Description: B991 Interior, Room 402 and 402A
Total Area: 340 sq. m. **Total Floor Area:** 76 sq. m.
Grid Spacing for Survey Points: 4m. X 4m.



Scan Area

SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 15
0 METERS 5

1 inch = 12 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
2, 7, 8

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707
Prepared for:

CH2MHILL
Communications Group

KAISER HILL

MAP ID: 03-JS/A2G2/991-007A
Oct 8, 2003

SURVEY UNIT 991-2-006
RADIOLOGICAL DATA SUMMARY - PDS

Survey Unit Description: B991 Interior Basement Utility Tunnel

141

PDS Data Summary

Total Surface Activity Measurements

15	26
Number Required	Number Obtained

MIN	-7.0	dpm/100 cm^2
MAX	50.2	dpm/100 cm^2
MEAN	27.2	dpm/100 cm^2
STD DEV	15.2	dpm/100 cm^2
TRANSURANIC $DCGL_W$	100	dpm/100 cm^2

Removable Activity Measurements

15	26
Number Required	Number Obtained

MIN	-0.3	dpm/100 cm^2
MAX	6.1	dpm/100 cm^2
MEAN	0.9	dpm/100 cm^2
STD DEV	1.5	dpm/100 cm^2
TRANSURANIC $DCGL_W$	20	dpm/100 cm^2

SURVEY UNIT 991-2-006
TSA - DATA SUMMARY

Manufacturer:	NE Tech	NE Tech	NE Tech	NE Tech
Model:	DP-6	DP-6	AP-6	AP-6
Instrument ID#:	1	2	6	7
Serial #:	2352	1249	632	1241
Cal Due Date:	5/11/04	4/2/04	7/7/04	3/4/04
Analysis Date:	1/29/04	1/29/04	1/29/04	1/29/04
Alpha Eff. (c/d):	0.222	0.203	0.183	0.195
Alpha Bkgd (cpm)	3.0	1.0	1.0	8.0
Sample Time (min)	1.5	1.5	1.5	1.5
LAB Time (min)	1.5	1.5	1.5	1.5
MDC (dpm/100cm^2)	48.0	48.0	48.0	48.0

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)[1]
1	1	12.0	54.1	2.7	12.2	38.0
2	1	13.3	59.9	3.3	14.9	43.9
3	1	5.3	23.9	3.3	14.9	7.9
4	1	9.3	41.9	3.3	14.9	25.9
5	1	8.0	36.0	4.0	18.0	20.0
6	1	8.7	39.2	6.0	27.0	23.2
7	1	4.7	21.2	4.0	18.0	5.2
8	1	8.7	39.2	2.7	12.2	23.2
9	1	6.8	30.6	1.0	4.5	14.6
10	1	10.7	48.2	4.7	21.2	32.2
11	1	12.0	54.1	6.0	27.0	38.0
12	1	14.7	66.2	2.7	12.2	50.2
13	1	10.0	45.0	4.0	18.0	29.0
14	1	9.3	41.9	4.7	21.2	25.9
15	1	10.8	48.6	3.3	14.9	32.6
16	1	11.3	50.9	4.7	21.2	34.9
17	1	2.0	9.0	2.7	12.2	-7.0
18	1	4.0	18.0	2.7	12.2	2.0
19	1	13.3	59.9	5.3	23.9	43.9
20	1	4.7	21.2	2.7	12.2	5.2
21	1	14.0	63.1	2.7	12.2	47.1
22	1	9.3	41.9	3.3	14.9	25.9
23	1	11.3	50.9	3.3	14.9	34.9
24	1	13.3	59.9	2.7	12.2	43.9
25	1	9.3	41.9	3.3	14.9	25.9
26	1	12.7	57.2	3.3	14.9	41.2

1 - Average LAB used to subtract from Gross Sample Activity

16.0	Sample LAB Average
MIN	-7.0
MAX	50.2
MEAN	27.2
SD	15.2
Transuranic $DCGL_W$	100

QC Measurements

19 QC	2	14.7	72.4	3.3	16.3	51.2
26 QC	2	19.3	95.1	5.3	26.1	73.9

1 - Average QC LAB used to subtract from Gross Sample Activity

21.2	QC LAB Average
MIN	51.2
MAX	73.9
MEAN	62.6
Transuranic $DCGL_W$	100

SURVEY UNIT 991-2-006
RSC - DATA SUMMARY

Manufacturer:	Eberline	Eberline
Model:	SAC-4	SAC-4
Instrument ID#:	3	4
Serial #:	924	966
Cal Due Date:	4/27/04	4/23/04
Analysis Date:	1/29/04	1/29/04
Alpha Eff. (c/d):	0.33	0.33
Alpha Bkgd (cpm)	0.0	0.1
Sample Time (min)	2	2
Bkgd Time (min)	10	10
MDC (dpm/100cm^2)	9.0	9.0

Sample Location Number	Instrument ID#	Gross Counts (cpm)	Net Activity (dpm/100 cm^2)
1	3	1	1.5
2	4	0	-0.3
3	3	0	0.0
4	4	0	-0.3
5	3	1	1.5
6	4	0	-0.3
7	3	0	0.0
8	4	1	1.2
9	3	0	0.0
10	4	1	1.2
11	3	0	0.0
12	4	0	-0.3
13	3	0	0.0
14	4	0	-0.3
15	3	4	6.1
16	4	2	2.7
17	3	0	0.0
18	4	1	1.2
19	3	1	1.5
20	4	1	1.2
21	3	0	0.0
22	4	0	-0.3
23	3	1	1.5
24	4	3	4.2
25	3	0	0.0
26	4	1	1.2
		MIN	-0.3
		MAX	6.1
		MEAN	0.9
		SD	1.5
		Transuranic DCGL$_W$	20

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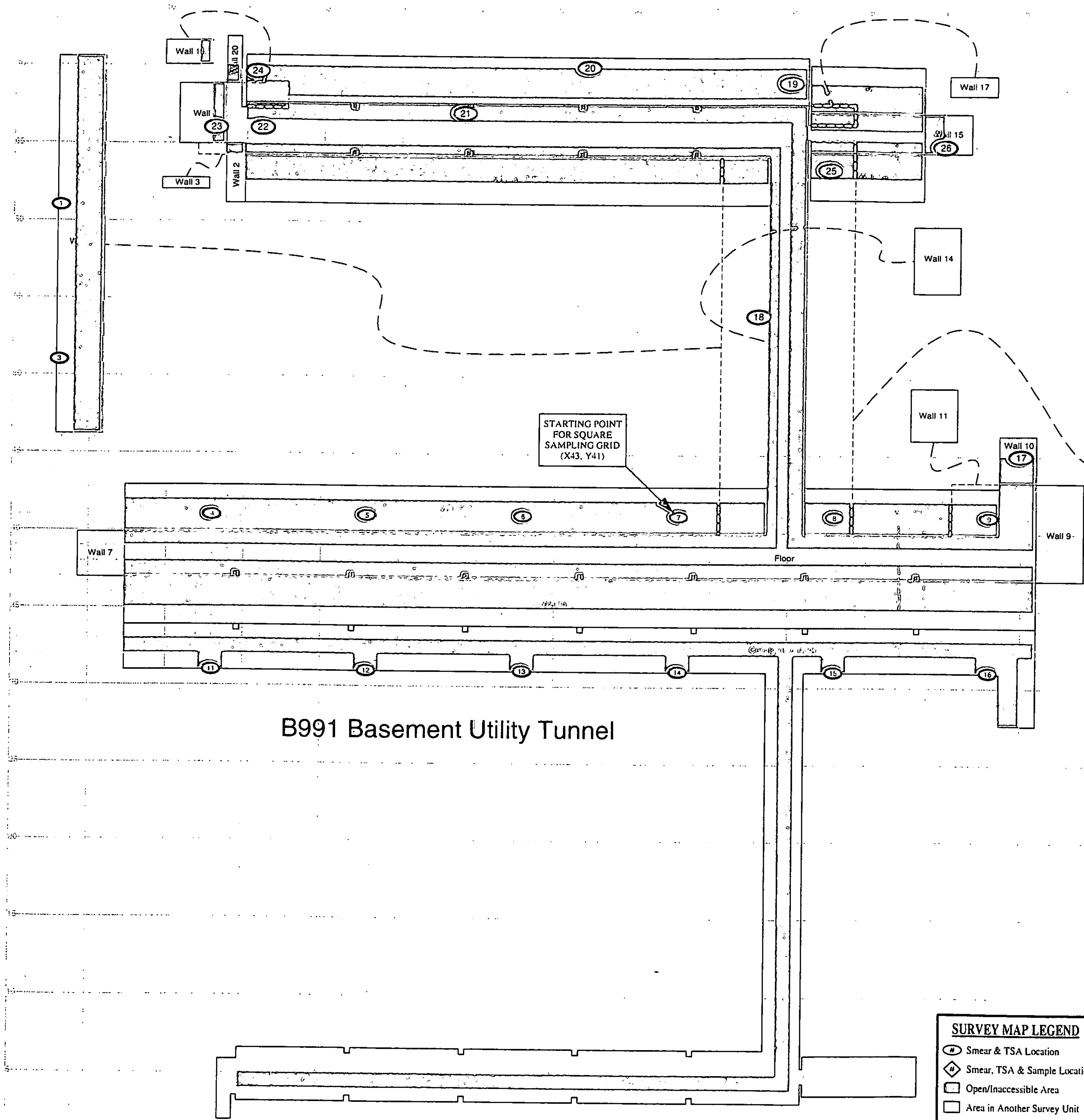
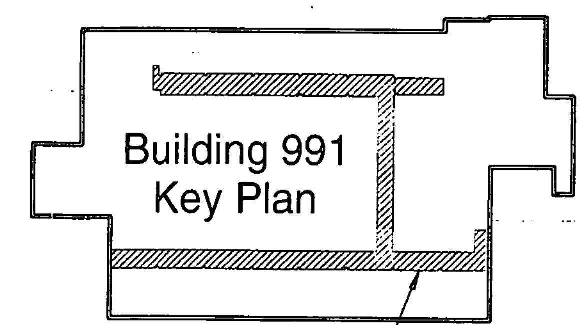
PRE-DEMOLITION SURVEY FOR AREA 2, GROUP 2

Survey Area: 2 Survey Unit: 991-2-006 Classification: 2
Building: 991
Survey Unit Description: B991 Utility Tunnel Floor, Walls, & Ceiling
Total Area: 1,646 sq. m. Floor Area: 392 sq. m.
Grid Spacing for Survey Points: 10m X 10m





Scan Area

SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 30
0 METERS 10

1 inch = 24 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
1, 2, 6, 7

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707
Prepared for:

CH2MHILL
Communications Group

KAISER HILL COMPANY

MAP ID: 03-JS/991-006-SC
Feb. 02, 2004

SURVEY UNIT 991-2-007
RADIOLOGICAL DATA SUMMARY - PDS

Survey Unit Description: B991 Paint Samples

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Media (Pre & Post)
Total Surface Activity Measurements

15	40
Number Required	Number Obtained

MIN	(7.33)	dpm/100 cm^2
MAX	60.24	dpm/100 cm^2
MEAN	12.97	dpm/100 cm^2
STD DEV	14.14	dpm/100 cm^2
TRANSURANIC $DCGL_W$	5,000.0	dpm/100 cm^2

Media (Pre & Post)
Removable Activity Measurements

15	40
Number Required	Number Obtained

MIN	(0.60)	dpm/100 cm^2
MAX	3.00	dpm/100 cm^2
MEAN	0.06	dpm/100 cm^2
STD DEV	0.66	dpm/100 cm^2
TRANSURANIC $DCGL_W$	1,000.0	dpm/100 cm^2

Media Samples

15	40
Number Required	Number Obtained

MIN	28.85	dpm/100 cm^2
MAX	1,806.32	dpm/100 cm^2
MEAN	358.92	dpm/100 cm^2
STD DEV	533.33	dpm/100 cm^2
URANIUM $DCGL_W$	5,000.0	dpm/100 cm^2

991-2-007
Media TSA Data Summary

Manufacturer:	N.E.Tech	N.E.Tech	N.E.Tech
Model:	Electra	Electra	Electra
Instrument ID#:	3	6	7
Serial #:	1379	1249	1379
Cal Due Date:	12/25/03	4/2/04	12/25/03
Analysis Date:	11/11/03	11/12/03	11/13/03
Alpha Bkgd (cpm)	2.0	4.0	2.0
Alpha Eff. (C/d)	0.222	0.199	0.222
Instrument β MDC (dpm/100cm^2)	48.0	48.0	48.0

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)[1]
Pre 1	6	2.0	10.1	0.7	3.5	2.7
Pre 2	6	1.3	6.5	1.3	6.5	(0.8)
Pre 3	7	6.0	27.0	2.0	9.0	19.7
Pre 4	7	3.0	13.5	4.0	18.0	6.2
Pre 6	6	6.0	30.2	1.0	5.0	22.8
Pre 7	6	2.0	10.1	1.0	5.0	2.7
Pre 8	6	1.0	5.0	3.0	15.1	(2.3)
Pre 9	7	4.0	18.0	1.0	4.5	10.7
Pre 10	7	3.0	13.5	0.0	0.00	6.2
Pre 11	3	4.7	21.2	0.7	3.2	13.8
Pre 12	6	1.0	5.0	0.0	0.00	(2.3)
Pre 13	6	2.0	10.1	1.3	6.5	2.7
Pre 14	6	2.0	10.1	2.0	10.1	2.7
Pre 16	6	4.0	20.1	1.3	6.5	12.8
Pre 17	6	1.3	6.5	1.3	6.5	(0.8)
Pre 18	7	3.0	13.5	0.0	0.00	6.2
Pre 19	7	2.0	9.0	1.0	4.5	1.7
Pre 20	6	4.0	20.1	2.0	10.1	12.8
Pre 21	6	3.3	16.6	0.7	3.5	9.3
Pre 22	3	2.0	9.0	2.0	9.0	1.7
Pre 23	7	4.0	18.0	0.0	0.00	10.7
Pre 24	7	8.0	36.0	0.7	3.2	28.7
Pre 25	6	4.7	23.6	0.7	3.5	16.3
Pre 26	6	2.0	10.1	1.3	6.5	2.7
Pre 27	3	3.3	14.9	1.3	5.9	7.5
Pre 28	3	2.0	9.0	2.8	12.6	1.7
Pre 29	7	2.0	9.0	0.0	0.00	1.7
Pre 30	3	3.4	15.3	2.0	9.0	8.0
Pre 31	3	3.3	14.9	3.3	14.9	7.5
Pre 32	7	1.0	4.5	3.0	13.5	(2.8)
Pre 33	7	4.0	18.0	1.0	4.5	10.7
Pre 34	3	2.7	12.2	2.0	9.0	4.8
Pre 35	3	8.0	36.0	2.0	9.0	28.7
Pre 36	3	2.7	12.2	2.0	9.0	4.8
Pre 37	3	0.7	3.2	0.7	3.2	(4.2)
Pre 38	3	2.0	9.0	4.0	18.0	1.7
Pre 39	3	2.0	9.0	1.3	5.9	1.7
Pre 40	7	2.0	9.0	4.0	18.0	1.7
Pre 41	7	6.0	27.0	0.0	0.00	19.7
Pre 42	7	10.0	45.0	7.0	31.5	37.7
Post 1	6	6.0	30.2	0.7	3.5	22.8
Post 2	6	8.7	43.7	1.3	6.5	36.4

991-2-007
Media TSA Data Summary

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)[1]
Post 3	7	1.0	4.5	4.0	18.0	(2.8)
Post 4	7	6.0	27.0	2.0	9.0	19.7
Post 6	6	5.0	25.1	1.0	5.0	17.8
Post 7	6	3.0	15.1	2.0	10.1	7.7
Post 8	6	5.0	25.1	1.0	5.0	17.8
Post 9	7	1.4	6.3	0.0	0.0	(1.0)
Post 10	7	0.0	0.0	0.0	0.0	(7.3)
Post 11	3	4.7	21.2	4.7	21.2	13.8
Post 12	6	4.0	20.1	2.0	10.1	12.8
Post 13	6	1.3	6.5	2.0	10.1	(0.8)
Post 14	6	9.0	45.2	2.0	10.1	37.9
Post 16	6	6.0	30.2	0.0	0.0	22.8
Post 17	6	9.3	46.7	0.7	3.5	39.4
Post 18	7	2.0	9.0	0.1	0.5	1.7
Post 19	7	5.0	22.5	4.0	18.0	15.2
Post 20	6	10.7	53.8	0.7	3.5	46.4
Post 21	6	5.0	25.1	0.5	2.5	17.8
Post 22	3	6.7	30.2	0.7	3.2	22.9
Post 23	7	3.0	13.5	0.0	0.0	6.2
Post 24	7	6.0	27.0	0.0	0.0	19.7
Post 25	6	8.7	43.7	0.7	3.5	36.4
Post 26	6	12.0	60.3	0.7	3.5	53.0
Post 27	3	2.8	12.6	0.0	0.0	5.3
Post 28	3	1.3	5.9	0.0	0.0	(1.5)
Post 29	7	7.0	31.5	0.0	0.0	24.2
Post 30	3	2.7	12.2	2.0	9.0	4.8
Post 31	3	6.7	30.2	2.0	9.0	22.9
Post 32	7	0.0	0.0	4.0	18.0	(7.3)
Post 33	7	5.0	22.5	1.0	4.5	15.2
Post 34	3	9.3	41.9	0.7	3.2	34.6
Post 35	3	2.7	12.2	2.7	12.2	4.8
Post 36	3	7.3	32.9	2.7	12.2	25.6
Post 37	3	8.0	36.0	0.7	3.2	28.7
Post 38	3	2.0	9.0	0.7	3.2	1.7
Post 39	3	4.7	21.2	1.6	7.2	13.8
Post 40	7	3.0	13.5	6.0	27.0	6.2
Post 41	7	15.0	67.6	5.0	22.5	60.2
Post 42	7	7.0	31.5	1.0	4.5	24.2

1 - Average LAB used to subtract from Gross Sample Activity

7.3	Sample LAB Average
MIN	(7.3)
MAX	60.2
MEAN	13.0
SD	14.1
Uranium $DCGL_W$	5,000

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Manufacturer:	Eberline	Eberline	Eberline	Eberline	Eberline
Model:	SAC-4	SAC-4	SAC-4	SAC-4	SAC-4
Instrument ID#:	1	2	4	5	8
Serial #:	1158	1164	1158	1164	1158
Cal Due Date:	1/1/04	11/30/03	1/1/04	11/30/03	1/1/04
Analysis Date:	11/10/03	11/10/03	11/12/03	11/12/03	11/13/03
Alphta Eff. (c/d):	33.3%	33.3%	33.3%	33.3%	33.3%
Alpha Bkgd (cpm)	0.2	0.2	0.5	0.2	0.1
Sample Time (min)	2.0	2.0	2.0	2.0	2.0
Bkgd Time (min)	10	10	10	10	10
MDC (dpm/100cm^2)	9	9	9	9	9

Manufacturer:	Eberline
Model:	SAC-4
Instrument ID#:	9
Serial #:	1164
Cal Due Date:	11/30/03
Analysis Date:	11/13/03
Alphta Eff. (c/d):	33.3%
Alpha Bkgd (cpm)	0.1
Sample Time (min)	2.0
Bkgd Time (min)	10
MDC (dpm/100cm^2)	9

Sample Location Number	Instrument ID#	Gross Counts (cpm)	Net Activity (dpm/100 cm^2)
Pre 1	8	0	0.0
Pre 2	9	3	3.0
Pre 3	8	1	1.0
Pre 4	9	0	0.0
Pre 6	1	1	0.8
Pre 7	2	1	0.8
Pre 8	1	0	-0.2
Pre 9	4	0	-0.6
Pre 10	5	0	-0.6
Pre 11	1	0	-0.2
Pre 12	2	1	0.8
Pre 13	1	0	-0.2
Pre 14	1	0	-0.2
Pre 16	2	0	-0.2
Pre 17	4	3	2.4
Pre 18	5	0	-0.6
Pre 19	4	0	-0.6
Pre 20	5	0	-0.6
Pre 21	1	0	-0.2
Pre 22	2	0	-0.2
Pre 23	2	1	0.8
Pre 24	1	0	-0.2
Pre 25	2	2	1.8
Pre 26	1	0	-0.2
Pre 27	2	0	-0.2
Pre 28	1	0	-0.2
Pre 29	2	1	0.8
Pre 30	2	0	-0.2
Pre 31	1	0	-0.2
Pre 32	2	0	-0.2
Pre 33	4	0	-0.6
Pre 34	1	1	0.8
Pre 35	2	0	-0.2

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Media RSA Data Summary

Sample Location Number	Instrument ID#	Gross Counts (cpm)	Net Activity (dpm/100 cm^2)
Pre 36	1	0	-0.2
Pre 37	2	0	-0.2
Pre 38	1	1	0.8
Pre 39	2	0	-0.2
Pre 40	1	0	-0.2
Pre 41	1	0	-0.2
Pre 42	2	0	-0.2
Post 1	8	0	0.0
Post 2	9	1	1.0
Post 3	8	0	0.0
Post 4	9	1	1.0
Post 6	2	0	-0.2
Post 7	1	0	-0.2
Post 8	4	0	-0.6
Post 9	5	0	-0.6
Post 10	1	0	-0.2
Post 11	2	0	-0.2
Post 12	1	0	-0.2
Post 13	1	0	-0.2
Post 14	2	0	-0.2
Post 16	5	0	-0.6
Post 17	4	0	-0.6
Post 18	5	0	-0.6
Post 19	1	0	-0.2
Post 20	2	1	0.8
Post 21	2	0	-0.2
Post 22	1	0	-0.2
Post 23	2	1	0.8
Post 24	1	1	0.8
Post 25	2	0	-0.2
Post 26	1	0	-0.2
Post 27	2	0	-0.2
Post 28	2	0	-0.2
Post 29	1	0	-0.2
Post 30	2	0	-0.2
Post 31	4	1	0.4
Post 32	1	0	-0.2
Post 33	2	0	-0.2
Post 34	1	1	0.8
Post 35	2	1	0.8
Post 36	1	0	-0.2
Post 37	2	0	-0.2
Post 38	1	0	-0.2
Post 39	1	0	-0.2
Post 40	2	0	-0.2
Post 41	4	1	0.4
Post 42	4	0	-0.6
		MIN	-0.6
		MAX	3.0
		MEAN	0.1
		SD	0.7
		Uranium $DCGL_W$	1,000

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Media Conversion Sheet

LOCATION DESCRIPTION	SAMPLE LOCATION NUMBER	SITE SAMPLE ID	NUCLIDE	pCi/g (2)	MDA (pCi/g)	WEIGHT (g)	SURFACE AREA (in²)	INDIVIDUAL NUCLIDE (dpm/100cm²) (3)	ESTIMATED MDA (dpm/100cm²) (4)	URANIUM TOTAL (dpm/100cm²)	TRANSURANIC TOTAL (dpm/100cm²)
B991	1	04S0072.028.001	U-234	0.657	0.888	20.6	24.5	19	26		
			U-235	0.077	0.113			2	3		
			U-238	0.657	0.887			19	26	40.2	
			Pu-239 Pu-240	0.000	0.878			0	25		
			Am-241	0.000	0.122			0	4		0.0
B991	2	04S0072.030.001	U-234	0.426	0.903	21.4	24.5	13	27		
			U-235	0.108	0.111			3	3		
			U-238	0.426	0.903			13	27	28.9	
			Pu-239 Pu-240	0.000	0.806			0	24		
			Am-241	0.000	0.112			0	3		0.0
B991	3, 4	04S0072.031.001	U-234	1.050	0.807	23.7	24.5	35	27		
			U-235	0.236	0.107			8	4		
			U-238	1.050	0.807			35	27	77.8	
			Pu-239 Pu-240	0.000	0.878			0	29		
			Am-241	0.000	0.122			0	4		0.0
B991	32	04S0072.032.001	U-234	1.750	0.866	23.4	24.5	58	28		
			U-235	0.202	0.140			7	5		
			U-238	1.750	0.866			58	28	121.7	
			Pu-239 Pu-240	0.000	0.907			0	30		
			Am-241	0.000	0.126			0	4		0.0
B991	6,7,8,9	04S0072.033.001	U-234	0.374	0.269	92.0	24.5	48	35		
			U-235	0.080	0.033			10	4		
			U-238	0.374	0.269			48	35	107.0	
			Pu-239 Pu-240	0.000	0.246			0	32		
			Am-241	0.000	0.034			0	4		0.0
B991	10	04S0072.034.001	U-234	0.741	0.982	20.4	24.5	21	28		
			U-235	0.344	0.174			10	5		
			U-238	0.741	0.982			21	28	52.3	
			Pu-239 Pu-240	0.000	1.001			0	29		
			Am-241	0.000	0.139			0	4		0.0
B991	33, 14	04S0072.035.001	U-234	9.370	9.300	93.0	24.5	1224	1215		
			U-235	0.093	0.039			12	5		
			U-238	1.030	0.266			135	35	1370.6	
			Pu-239 Pu-240	0.000	0.273			0	36		
			Am-241	0.000	0.038			0	5		0.0
B991	12, 13, 16	04S0072.036.001	U-234	0.880	0.267	85.3	24.5	105	32		
			U-235	0.026	0.035			3	4		
			U-238	0.880	0.267			105	32	214.0	
			Pu-239 Pu-240	0.177	0.250			21	30		
			Am-241	0.025	0.035			3	4		24.2
B991	17, 18, 19, 20	04S0072.037.001	U-234	12.300	9.800	96.1	24.5	1660	1323		
			U-235	0.181	0.038			24	5		
			U-238	0.902	0.247			122	33	1806.3	
			Pu-239 Pu-240	0.000	0.264			0	36		
			Am-241	0.000	0.037			0	5		0.0
B991	21, 41, 23	04S0072.038.001	U-234	0.869	0.250	88.1	24.5	108	31		
			U-235	0.132	0.028			16	3		
			U-238	0.869	0.250			108	31	231.4	
			Pu-239 Pu-240	0.467	0.307			58	38		
			Am-241	0.065	0.043			8	5		65.7

Media Conversion Sheet

LOCATION DESCRIPTION	SAMPLE LOCATION NUMBER	SITE SAMPLE ID	NUCLIDE	pCi/g (2)	MDA (pCi/g)	WEIGHT (g)	SURFACE AREA (in²)	INDIVIDUAL NUCLIDE (dpm/100cm²) (3)	ESTIMATED MDA (dpm/100cm²) (4)	URANIUM TOTAL (dpm/100cm²)	TRANSURANIC TOTAL (dpm/100cm²)
B991	24, 25	04S0072.039.001	U-234	0.345	0.172	85.1	24.5	41	21		
			U-235	0.046	0.044			6	5		
			U-238	0.345	0.172			41	21	88.0	
			Pu-239 Pu-240	0.000	0.199			0	24		
			Am-241	0.000	0.028			0	3		0.0
B991	26, 29, 42, 40	04S0072.040.001	U-234	0.389	0.220	81.6	24.5	45	25		
			U-235	0.095	0.034			11	4		
			U-238	0.389	0.220			45	25	100.0	
			Pu-239 Pu-240	0.000	0.225			0	26		
			Am-241	0.000	0.031			0	4		0.0
B991	22	04S0053.017.001	U-234	1.420	1.260	20.7	24.5	41	37		
			U-235	0.199	0.161			6	5		
			U-238 Pu-239	1.420	1.260			41	37	88.4	
			Pu-240	0.000	1.080			0	31		
			Am-241	0.000	0.150			0	4		0.0
B991	11, 35, 36	04S0053.013.001	U-234	1.180	0.256	91.5	24.5	152	33		
			U-235	0.072	0.041			9	5		
			U-238 Pu-239	1.180	0.256			152	33	312.6	
			Pu-240	0.000	0.282			0	36		
			Am-241	0.000	0.039			0	5		0.0
B991	27, 34	04S0053.014.001	U-234	0.670	0.241	93.0	24.5	88	31		
			U-235	0.124	0.037			16	5		
			U-238 Pu-239	0.670	0.241			88	31	191.2	
			Pu-240	0.000	0.248			0	32		
			Am-241	0.000	0.035			0	5		0.0
B991	28, 37	04S0053.015.001	U-234	6.050	5.190	140.0	24.5	1190	1021		
			U-235	0.073	0.020			14	4		
			U-238 Pu-239	0.403	0.135			79	27	1283.3	
			Pu-240	0.000	0.144			0	28		
			Am-241	0.000	0.020			0	4		0.0
B991	30, 38 39	04S0053.016.001	U-234	0.901	0.258	88.1	24.5	111	32		
			U-235	0.156	0.062			19	8		
			U-238 Pu-239	0.901	0.258			111	32	242.3	
			Pu-240	0.000	0.266			0	33		
			Am-241	0.000	0.037			0	5		0.0
B991	31	04S0053.018.001	U-234	1.460	0.933	24.4	24.5	50	32		
			U-235	0.138	0.158			5	5		
			U-238 Pu-239	1.460	0.933			50	32	104.8	
			Pu-240	0.000	1.166			0	40		
			Am-241	0.000	0.162			0	6		0.0
									MIN	28.9	0.0
									MAX	1806.3	65.7
									MEAN	358.9	5.0
									SD	533.3	16.2
									$DCGL_W$ =	5,000	100

(1) Paint samples collected in B991 were analyzed as grouped composites using the Canberra ISOCS Gamma Spectroscopy system.

(2) Critical Level test criterion were utilized in this analysis. If the net peak area was less than the L_C (critcal level), then a "not detected" or "zero" decision was made. The LC value is always less than the applicable MDA, but greater than zero.

(3) Individual nuclide dpm/100 cm² conversion is conservatively based on the <u>composite</u> sample weight. This assumption presumes that the total sample activity from composited samples is located at one, single sample location. This methodology ensures that no single sample location exceeds the applicable $DCGL_W$.

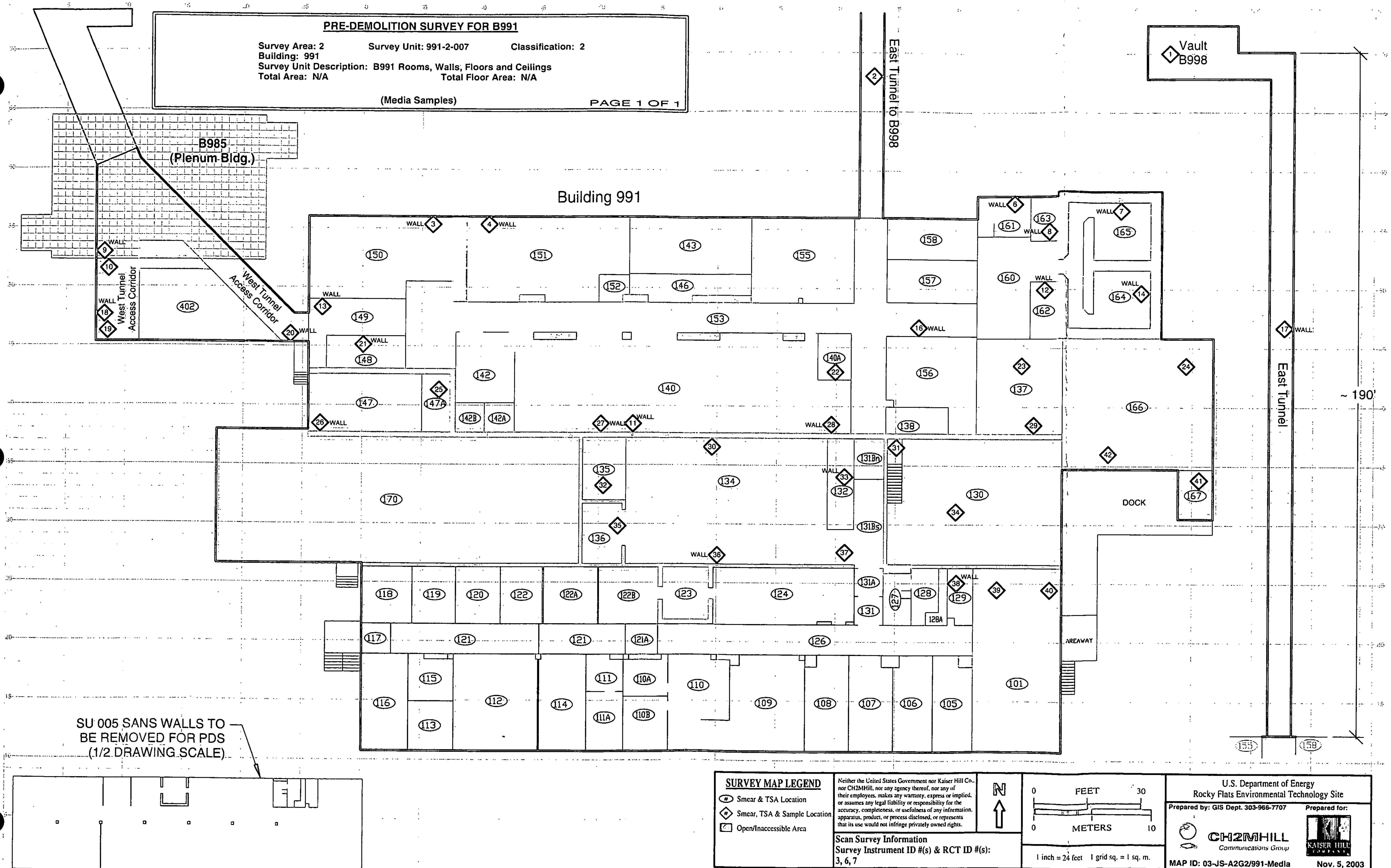
(4) Estimated MDA dpm/100 cm² conversion is conservatively based on the <u>composite</u> sample weight.

PRE-DEMOLITION SURVEY FOR B991

Survey Area: 2 Survey Unit: 991-2-007 Classification: 2
Building: 991
Survey Unit Description: B991 Rooms, Walls, Floors and Ceilings
Total Area: N/A Total Floor Area: N/A

(Media Samples)

PAGE 1 OF 1



SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area

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Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
3, 6, 7

N

FEET 0 30
METERS 0 10
1 inch = 24 feet 1 grid sq. = 1 sq. m.

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707
Prepared for:

CH2MHILL Communications Group
KAISER HILL COMPANY

MAP ID: 03-JS-A2G2/991-Media
Nov. 5, 2003

SURVEY UNIT 991-2-008
RADIOLOGICAL DATA SUMMARY - PDS

Survey Unit Description: B991 West Tunnel Access Corridor

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Total Surface Activity Measurements

Number Required	Number Obtained
17	18

MIN	-12.6	dpm/100 cm^2
MAX	23.3	dpm/100 cm^2
MEAN	4.6	dpm/100 cm^2
STD DEV	9.0	dpm/100 cm^2
TRANSURANIC $DCGL_W$	100	dpm/100 cm^2

Removable Activity Measurements

Number Required	Number Obtained
17	18

MIN	-1.8	dpm/100 cm^2
MAX	2.7	dpm/100 cm^2
MEAN	0.2	dpm/100 cm^2
STD DEV	1.3	dpm/100 cm^2
TRANSURANIC $DCGL_W$	20	dpm/100 cm^2

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SURVEY UNIT 991-2-008
TSA - DATA SUMMARY

Manufacturer:	NE Tech	NE Tech
Model:	DP-6	DP-6
Instrument ID#:	5	9
Serial #:	1260	3114
Cal Due Date:	6/2/04	4/29/04
Analysis Date:	1/9/04	1/9/04
Alpha Eff. (c/d):	0.223	0.228
Alpha Bkgd (cpm)	3.0	1.0
Sample Time (min)	1.5	1.5
LAB Time (min)	1.5	1.5
MDC (dpm/100cm^2)	48.0	48.0

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)[1]
1	5	0.0	0.0	3.0	13.5	-12.6
2	5	4.0	17.9	2.0	9.0	5.3
3	5	3.3	14.8	3.3	14.8	2.2
4	5	3.3	14.8	2.7	12.1	2.2
5	5	4.7	21.1	4.7	21.1	8.5
6	5	8.0	35.9	4.0	17.9	23.3
7	5	3.3	14.8	0.0	0.0	2.2
8	5	7.3	32.7	2.7	12.1	20.1
9	5	4.0	17.9	4.7	21.1	5.3
10	5	4.0	17.9	2.0	9.0	5.3
11	5	2.7	12.1	2.0	9.0	-0.5
12	5	1.3	5.8	4.0	17.9	-6.8
13	5	4.7	21.1	4.7	21.1	8.5
14	5	6.0	26.9	2.7	12.1	14.3
15	5	5.3	23.8	4.0	17.9	11.2
16	5	1.3	5.8	0.8	3.6	-6.8
17	5	2.7	12.1	0.0	0.0	-0.5
18	5	3.3	14.8	3.3	14.8	2.2

1 - Average LAB used to subtract from Gross Sample Activity

12.6	Sample LAB Average
MIN	-12.6
MAX	23.3
MEAN	4.6
SD	9.0
Transuranic DCGL$_W$	100

QC Measurements

8 QC	9	2.7	11.8	4.7	20.6	1.5
14 QC	9	3.3	14.5	0.0	0.0	4.2

1 - Average QC LAB used to subtract from Gross Sample Activity

10.3	QC LAB Average
MIN	1.5
MAX	4.2
MEAN	2.9
Transuranic DCGL$_W$	100

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SURVEY UNIT 991-2-008
RSC - DATA SUMMARY

Sample Location Number	Instrument ID#	Gross Counts (cpm)	Net Activity (dpm/100 cm^2)
1	4	2	2.7
2	2	1	-0.3
3	3	1	0.9
4	4	0	-0.3
5	4	0	-0.3
6	2	2	1.2
7	3	1	0.9
8	4	2	2.7
9	4	0	-0.3
10	2	2	1.2
11	3	0	-0.6
12	4	0	-0.3
13	4	0	-0.3
14	2	0	-1.8
15	3	0	-0.6
16	4	1	1.2
17	4	0	-0.3
18	2	0	-1.8
		MIN	-1.8
		MAX	2.7
		MEAN	0.2
		SD	1.3
		Transuranic $DCGL_W$	20

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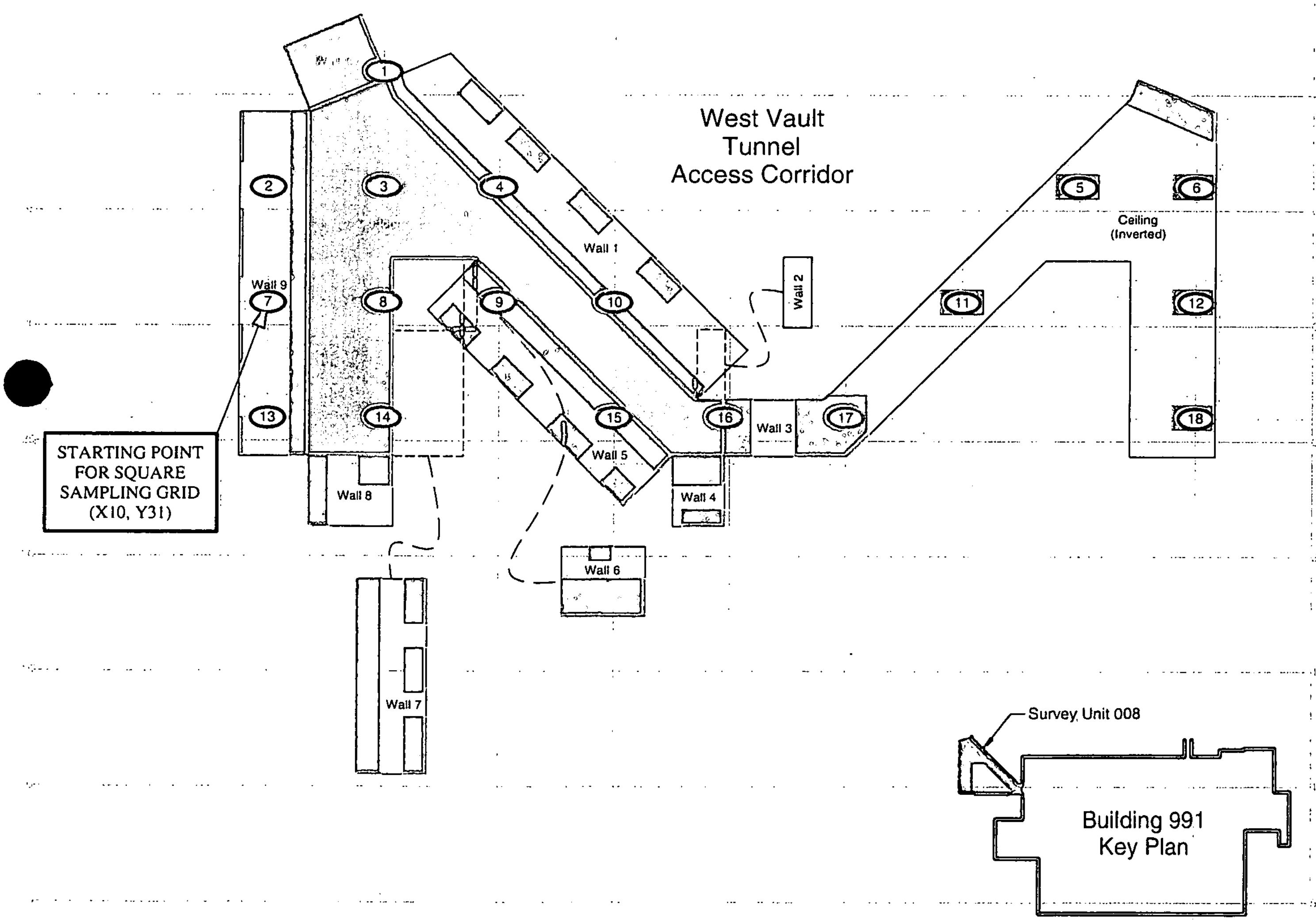
PRE-DEMOLITION SURVEY FOR AREA 2, GROUP 2

Survey Area: 2 **Survey Unit:** 991-2-008 **Classification:** 1
Building: 991
Survey Unit Description: B991 Interior, West Tunnel Access Corridor
Total Area: 440 sq. m. **Total Floor Area:** 112 sq. m.
Grid Spacing for Survey Points: 5m. X 5m.

B991 Interior
Survey Unit 008



Scan Area

SURVEY MAP LEGEND				
Smear & TSA Location Smear, TSA & Sample Location Open/Inaccessible Area Area in Another Survey Unit	Neither the United States Government nor Kaiser Hill Co., nor CH2MHill, nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights.	N	0 FEET 30 0 METERS 10	U.S. Department of Energy Rocky Flats Environmental Technology Site
	Scan Survey Information Survey Instrument ID #(s) & RCT ID #(s): 6, 7, 8, 9, 10		1 inch = 24 feet 1 grid sq. = 1 sq. m.	Prepared by: GIS Dept. 303-966-7707 Prepared for: KAISER-HILL COMPANY CH2MHILL Communications Group MAP ID: 03-JS/991-008-SC Jan. 13, 2004

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SURVEY UNIT 991-2-EXH
RADIOLOGICAL DATA SUMMARY - PDS

Survey Unit Description: B991 Exhaust Ventilation System

PDS Data Summary

Total Surface Activity Measurements

	60	93	
	Number Required	Number Obtained	
MIN	-16.1		dpm/100 cm^2
MAX	89.1		dpm/100 cm^2
MEAN	24.3		dpm/100 cm^2
STD DEV	24.7		dpm/100 cm^2
TRANSURANIC DCGL$_W$	100		dpm/100 cm^2

Removable Activity Measurements

	60	93	
	Number Required	Number Obtained	
MIN	-1.5		dpm/100 cm^2
MAX	10.9		dpm/100 cm^2
MEAN	0.8		dpm/100 cm^2
STD DEV	0.2		dpm/100 cm^2
TRANSURANIC DCGL$_W$	20		dpm/100 cm^2

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SURVEY UNIT 991-2-EXH
TSA - DATA SUMMARY

Manufacturer:	NE Tech	NE Tech	NE Tech	NE Tech	NE Tech	NE Tech	NE Tech
Model:	DP-6	DP-6	DP-6	DP-6	DP-6	DP-6	DP-6
Instrument ID#:	1	2	3	4	5	6	7
Serial #:	2352	3115	2352	1682	2352	2352	2352
Cal Due Date:	2/8/04	2/27/04	2/8/04	1/16/04	2/8/04	2/8/04	2/8/04
Analysis Date:	9/30/03	9/30/03	10/1/03	10/9/03	10/15/03	10/28/03	10/29/03
Alpha Eff. (c/d):	0.228	0.219	0.228	0.216	0.228	0.228	0.228
Alpha Bkgd (cpm)	0.0	0.0	0.0	4.0	3.0	4.0	1.0
Sample Time (min)	1.5	1.5	1.5	1.5	1.5	1.5	1.5
LAB Time (min)	1.5	1.5	1.5	1.5	1.5	1.5	1.5
MDC (dpm/100cm^2)	48.0	48.0	48.0	48.0	48.0	48.0	48.0

Manufacturer:	NE Tech	NE Tech	NE Tech
Model:	DP-6	DP-6	DP-6
Instrument ID#:	12	17	18
Serial #:	1379	3125	1271
Cal Due Date:	12/25/03	3/24/04	6/22/04
Analysis Date:	11/14/03	1/20/04	1/21/04
Alpha Eff. (c/d):	0.222	0.221	0.227
Alpha Bkgd (cpm)	1.0	1.0	2.0
Sample Time (min)	1.5	1.5	1.5
LAB Time (min)	1.5	1.5	1.5
MDC (dpm/100cm^2)	48.0	48.0	48.0

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)[1]
1	2	0.0	0.0	4.0	18.3	-16.1
2	2	4.0	18.3	3.0	13.7	2.1
3	2	5.0	22.8	4.0	18.3	6.7
4	2	9.0	41.1	0.0	0.0	25.0
5	2	14.0	63.9	0.0	0.0	47.8
6	2	6.0	27.4	1.0	4.6	11.3
7	2	3.0	13.7	1.0	4.6	-2.4
8	2	3.0	13.7	3.0	13.7	-2.4
9	2	7.0	32.0	1.0	4.6	15.8
10	2	4.0	18.3	1.3	5.9	2.1
11	2	3.3	15.1	2.0	9.1	-1.0
12	2	4.7	21.5	1.3	5.9	5.3
13	3	7.3	32.0	3.3	14.5	15.9
14	3	6.7	29.4	3.3	14.5	13.3
15	3	6.7	29.4	8.0	35.1	13.3
16	3	3.3	14.5	4.0	17.5	-1.6
17	3	5.3	23.2	2.7	11.8	7.1
18	3	7.3	32.0	3.3	14.5	15.9
19	3	5.3	23.2	2.0	8.8	7.1
20	3	3.3	14.5	2.0	8.8	-1.6
21	3	1.3	5.7	2.0	8.8	-10.4
22	3	9.3	40.8	0.7	3.1	24.7
23	3	6.0	26.3	4.0	17.5	10.2
24	3	2.0	8.8	4.0	17.5	-7.3
25	3	6.7	29.4	0.7	3.1	13.3
26	3	3.3	14.5	4.0	17.5	-1.6
27	4	12.0	55.6	2.0	9.3	39.4
28	4	22.7	105.1	5.3	24.5	89.0

SURVEY UNIT 991-2-EXH
TSA - DATA SUMMARY

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)[1]
29	4	16.7	77.3	4.7	21.8	61.2
30	4	18.0	83.3	5.3	24.5	67.2
31	5	4.0	17.5	3.0	13.2	1.4
32	5	4.0	17.5	2.7	11.8	1.4
33	5	6.7	29.4	1.3	5.7	13.3
34	5	4.7	20.6	1.3	5.7	4.5
35	5	5.3	23.2	0.7	3.1	7.1
36	5	4.7	20.6	4.7	20.6	4.5
37	5	14.0	61.4	2.0	8.8	45.3
38	5	20.0	87.7	2.0	8.8	71.6
39	5	8.0	35.1	5.0	21.9	19.0
40	5	24.0	105.3	6.0	26.3	89.1
41	17	9.3	42.1	6.7	30.3	26.0
42	18	4.7	20.6	7.3	32.0	4.5
43	5	9.0	39.5	5.0	21.9	23.4
44	5	16.0	70.2	8.0	35.1	54.1
45	5	6.0	26.3	6.0	26.3	10.2
46	5	5.0	21.9	4.0	17.5	5.8
47	5	9.0	39.5	6.0	26.3	23.4
48	5	9.0	39.5	9.0	39.5	23.4
49	6	16.7	73.2	8.0	35.1	57.1
50	6	22.7	99.6	2.7	11.8	83.4
51	6	15.3	67.1	4.0	17.5	51.0
52	6	6.7	29.4	2.0	8.8	13.3
53	6	4.7	20.6	1.3	5.7	4.5
54	6	8.0	35.1	4.7	20.6	19.0
55	6	8.7	38.2	8.0	35.1	22.0
56	6	12.0	52.6	2.7	11.8	36.5
57	6	12.7	55.7	2.7	11.8	39.6
58	6	10.7	46.9	4.7	20.6	30.8
59	6	8.7	38.2	2.7	11.8	22.0
60	7	14.7	64.5	0.0	0.0	48.4
61	7	12.7	55.7	2.0	8.8	39.6
62	7	10.0	43.9	5.3	23.2	27.7
63	7	7.3	32.0	5.3	23.2	15.9
64	7	8.0	35.1	7.3	32.0	19.0
65	7	16.0	70.2	7.3	32.0	54.1
66	7	16.7	73.2	5.3	23.2	57.1
67	7	18.7	82.0	5.3	23.2	65.9
68	7	10.0	43.9	4.7	20.6	27.7
69	12	8.7	39.2	4.0	18.0	23.1
70	12	3.0	13.5	4.0	18.0	-2.6
71	12	3.3	14.9	5.3	23.9	-1.3
72	12	4.0	18.0	1.3	5.9	1.9
73	12	4.0	18.0	1.0	4.5	1.9
74	12	5.3	23.9	4.0	18.0	7.8
75	12	5.0	22.5	2.0	9.0	6.4
76	12	5.3	23.9	4.7	21.2	7.8
77	12	6.0	27.0	0.0	0.0	10.9
78	12	5.3	23.9	2.0	9.0	7.8
79	12	12.0	54.1	3.3	14.9	37.9
80	12	4.0	18.0	0.7	3.2	1.9

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SURVEY UNIT 991-2-EXH
TSA - DATA SUMMARY

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)[1]
81	12	14.7	66.2	2.7	12.2	50.1
82	12	7.3	32.9	10.7	48.2	16.8
83	12	18.0	81.1	0.7	3.2	65.0
84	12	11.3	50.9	4.7	21.2	34.8
85	12	20.7	93.2	0.7	3.2	77.1
86	12	8.7	39.2	2.0	9.0	23.1
87	12	10.0	45.0	1.3	5.9	28.9
88	12	13.3	59.9	7.3	32.9	43.8
89	12	16.0	72.1	7.3	32.9	56.0
90	12	5.3	23.9	4.7	21.2	7.8
91	12	20.7	93.2	3.3	14.9	77.1
92	12	14.7	66.2	7.3	32.9	50.1
93	12	7.3	32.9	2.7	12.2	16.8

16.1	Sample LAB Average
MIN	-16.1
MAX	89.1
MEAN	24.3
SD	24.7
Transuranic $DCGL_W$	100

1 - Average LAB used to subtract from Gross Sample Activity

2 -The initial Sample Net Activity for location 41 was 106.7 dpm/100cm2, and location 42 was 111.1 dpm/100cm2. These locations were sealed and allowed to decay. Re-survey results were less than the transuranic DCGLW, and are reported. No further investigations are required.

QC Measurements

33 QC	17	6.7	30.3	4.0	18.1	7.6
37 QC	17	8.7	39.4	2.0	9.0	16.6
38 QC	17	3.3	14.9	4.7	21.3	-7.8
50 QC	17	25.7	116.3	6.7	30.3	93.5
39 QC	18	16.7	73.2	8.0	35.1	50.5

22.8	QC LAB Average
MIN	-7.8
MAX	93.5
MEAN	32.1
Transuranic $DCGL_W$	100

1 - Average QC LAB used to subtract from Gross Sample Activity

SURVEY UNIT 991-2-EXH
RSC - DATA SUMMARY

Manufacturer:	Eberline	Eberline	Eberline	Eberline
Model:	SAC-4	SAC-4	SAC-4	SAC-4
Instrument ID#:	8	9	10	11
Serial #:	1158	1164	984	845
Cal Due Date:	2/8/04	11/30/03	1/1/04	1/15/04
Analysis Date:	11/5/03	11/5/03	11/5/03	11/5/03
Alpha Eff. (c/d):	0.33	0.33	0.33	0.33
Alpha Bkgd (cpm)	0.4	0.2	0.0	0.0
Sample Time (min)	2	2	2	2
Bkgd Time (min)	10	10	10	10
MDC (dpm/100cm^2)	9.0	9.0	9.0	9.0

Manufacturer:	Eberline	Eberline	Eberline	Eberline
Model:	SAC-4	SAC-4	SAC-4	SAC-4
Instrument ID#:	13	14	15	16
Serial #:	1158	1164	984	845
Cal Due Date:	1/1/04	11/30/03	1/1/04	1/15/04
Analysis Date:	11/14/03	11/14/03	11/14/03	11/14/03
Alpha Eff. (c/d):	0.33	0.33	0.33	0.33
Alpha Bkgd (cpm)	0.3	0.4	0.5	0.0
Sample Time (min)	2	2	2	2
Bkgd Time (min)	10	10	10	10
MDC (dpm/100cm^2)	9.0	9.0	9.0	9.0

Sample Location Number	Instrument ID#	Gross Counts (cpm)	Net Activity (dpm/100 cm^2)
1	8	0	-1.2
2	9	0	-0.6
3	10	1	1.5
4	11	2	3.0
5	8	0	-1.2
6	9	0	-0.6
7	10	1	1.5
8	11	0	0.0
9	8	0	-1.2
10	9	1	0.9
11	10	1	1.5
12	11	0	0.0
13	8	1	0.3
14	9	3	3.9
15	10	2	3.0

SURVEY UNIT 991-2-EXH
RSC - DATA SUMMARY

Sample Location Number	Instrument ID#	Gross Counts (cpm)	Net Activity (dpm/100 cm^2)
16	11	0	0.0
17	8	0	-1.2
18	9	1	0.9
19	10	3	4.5
20	11	1	1.5
21	8	2	1.8
22	9	3	3.9
23	10	2	3.0
24	11	0	0.0
25	8	0	-1.2
26	9	0	-0.6
27	10	4	6.1
28	11	2	3.0
29	8	1	0.3
30	9	2	2.4
31	8	1	0.3
32	9	0	-0.6
33	10	1	1.5
34	11	0	0.0
35	8	2	1.8
36	9	0	-0.6
37	10	0	0.0
38	11	0	0.0
39	8	8	10.9
40	9	5	7.0
41	10	0	0.0
42	11	2	3.0
43	8	1	0.3
44	9	1	0.9
45	10	0	0.0
46	11	1	1.5
47	8	0	-1.2
48	9	0	-0.6
49	10	2	3.0
50	8	2	1.8
51	9	3	3.9
52	11	0	0.0
53	8	0	-1.2
54	9	0	-0.6
55	10	0	0.0
56	11	1	1.5
57	8	0	-1.2
58	9	0	-0.6
59	10	0	0.0
60	11	1	1.5

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SURVEY UNIT 991-2-EXH
RSC - DATA SUMMARY

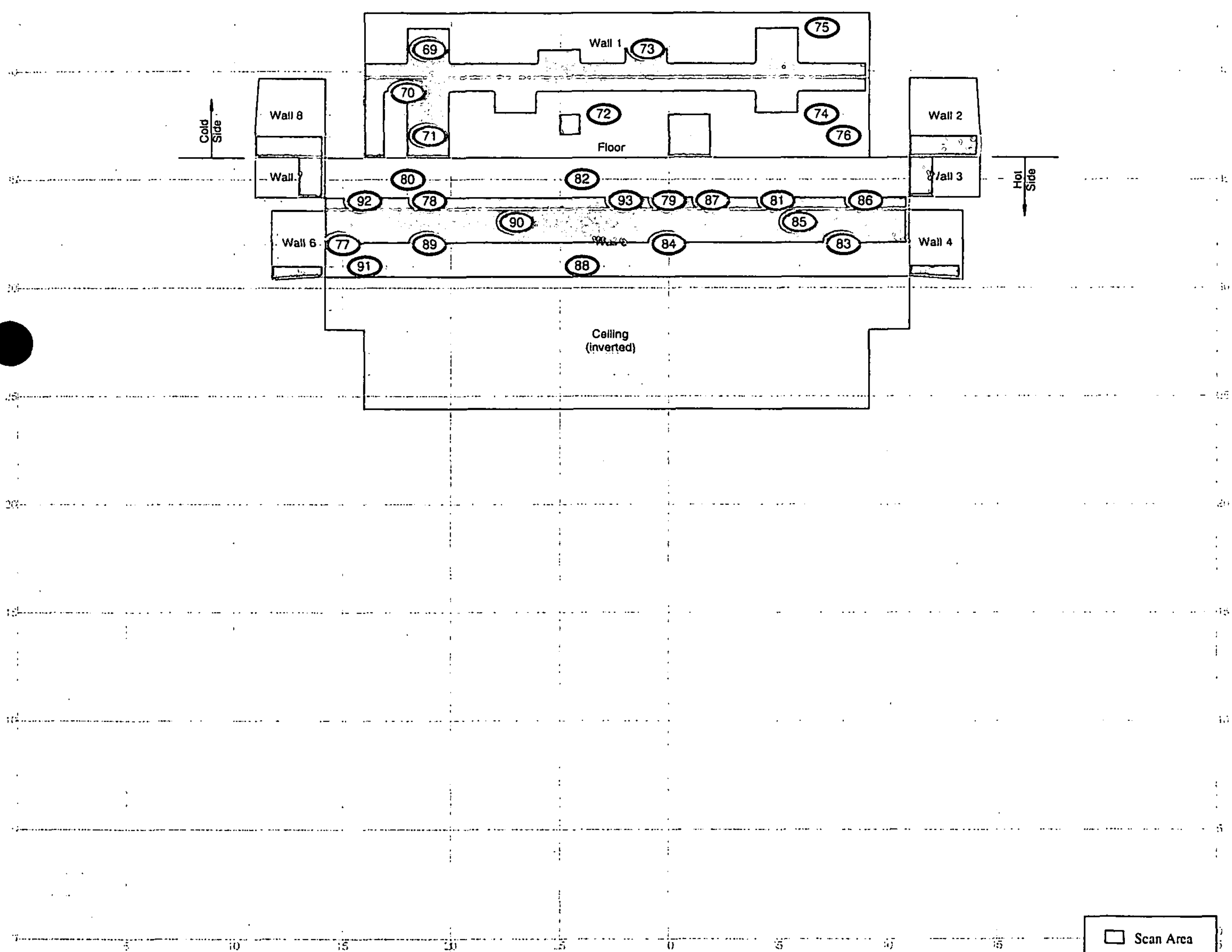
Sample Location Number	Instrument ID#	Gross Counts (cpm)	Net Activity (dpm/100 cm^2)
61	8	1	0.3
62	9	1	0.9
63	10	0	0.0
64	11	0	0.0
65	8	1	0.3
66	9	1	0.9
67	10	0	0.0
68	11	0	0.0
69	13	0	-0.9
70	14	0	-1.2
71	15	0	-1.5
72	16	0	0.0
73	13	1	0.6
74	14	0	-1.2
75	15	0	-1.5
76	16	0	0.0
77	13	0	-0.9
78	14	2	1.8
79	15	2	1.5
80	16	3	4.5
81	13	0	-0.9
82	14	0	-1.2
83	15	3	3.0
84	16	0	0.0
85	13	0	-0.9
86	14	0	-1.2
87	15	0	-1.5
88	16	1	1.5
89	13	1	0.6
90	14	0	-1.2
91	15	2	1.5
92	16	2	3.0
93	13	0	-0.9
		MIN	-1.5
		MAX	10.9
		MEAN	0.8
		SD	0.2
		Transuranic $DCGL_W$	**20**

PRE-DEMOLITION SURVEY FOR AREA 2, GROUP 2

Survey Area: 2 Survey Unit: 991-2-EXH Classification: 2
Building: 991
Survey Unit Description: 991 Exhaust Ventilation System
Total Area: N/A sq. m. Total Floor Area: N/A sq. m.

B991 Interior

Plenum



SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

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N

0 FEET 30

0 METERS 10

1 inch = 24 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
12

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707 Prepared for:

CH2MHILL Communications Group

KAISER-HILL COMPANY

MAP ID: 03-JS/991-Plen-Rad Jan. 29, 2004

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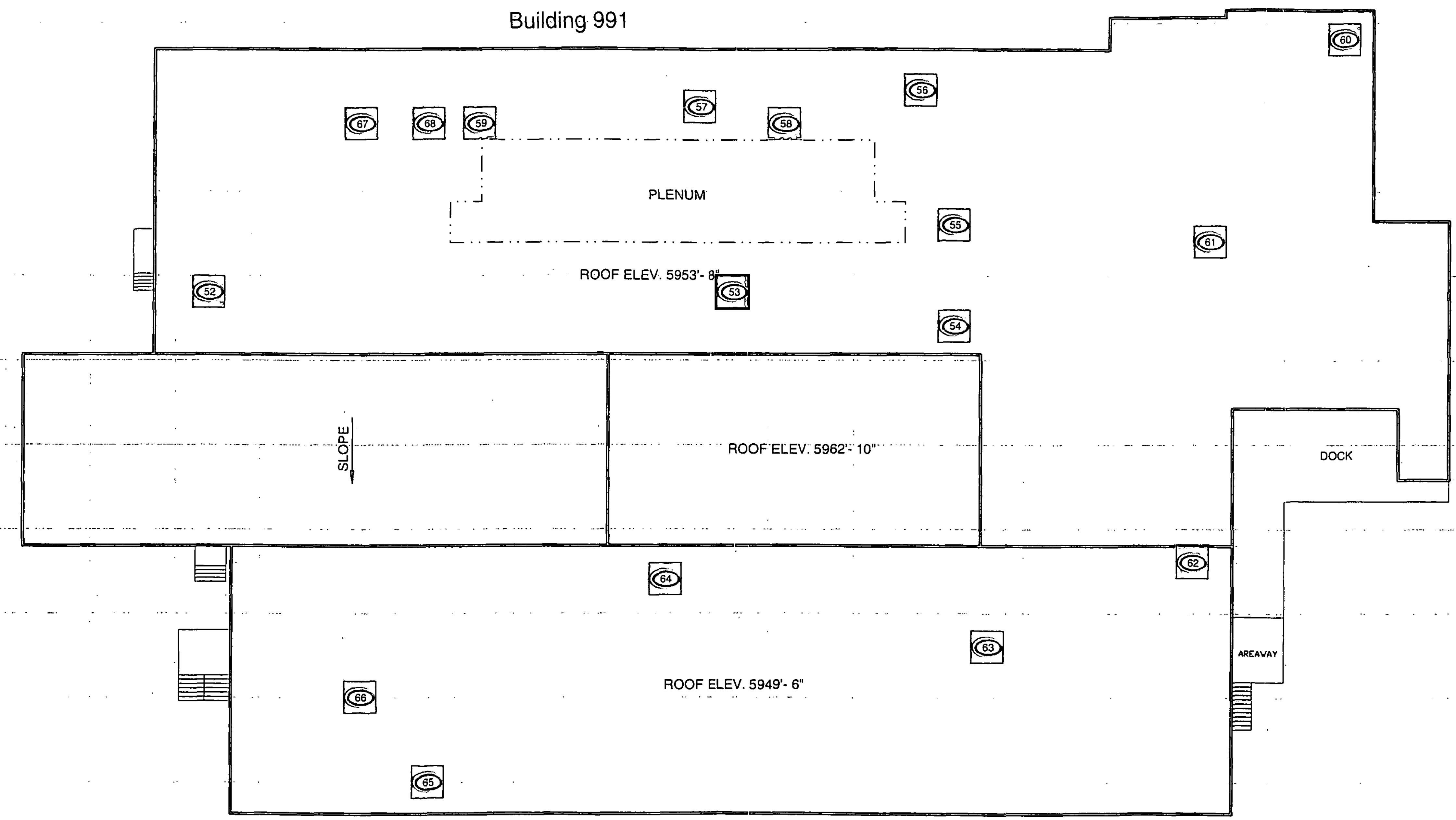
PRE-DEMOLITION SURVEY FOR AREA2, GROUP2

Survey Area: 2 Survey Unit: 991-2-EXH Classification: 2
Building: 991
Survey Unit Description: Building 991, Ventilation System
Total Area: N/A sq. m. Total Roof Area: N/A sq. m.



Scan Area

SURVEY MAP LEGEND
- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 30
0 METERS 10

1 inch = 24 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
1 - 7, 12

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707
Prepared for:

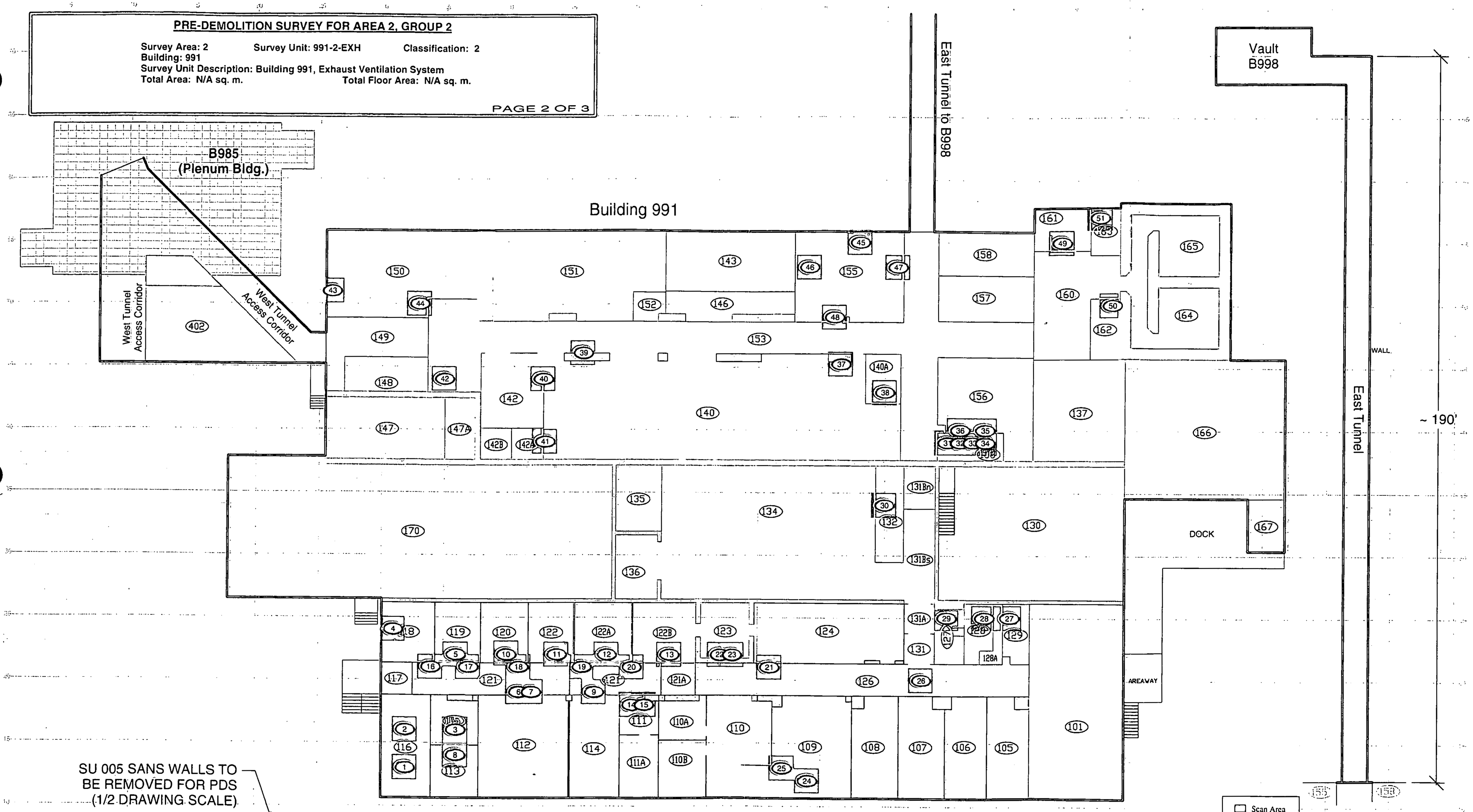
CH2MHILL
Communications Group

KAISER-HILL

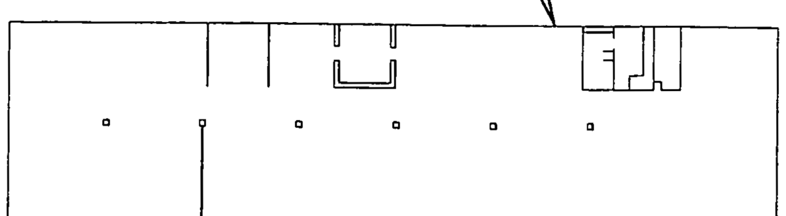
MAP ID: 03-JS-A2G2/991-Roof
Jan. 27, 2004

PRE-DEMOLITION SURVEY FOR AREA 2, GROUP 2

Survey Area: 2 Survey Unit: 991-2-EXH Classification: 2
Building: 991
Survey Unit Description: Building 991, Exhaust Ventilation System
Total Area: N/A sq. m. Total Floor Area: N/A sq. m.



SU 005 SANS WALLS TO BE REMOVED FOR PDS (1/2 DRAWING SCALE)



Scan Area

SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

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N

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
1 - 7, 12

FEET 0 30
METERS 0 10

1 inch = 24 feet 1 grid sq. = 1 sq. m.

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707 Prepared for:

CH2MHILL Communications Group

KAISER HILL COMPANY

MAP ID: 03-JS-A2G2/991-FlrPlan Jan. 27, 2004

ATTACHMENT C

Chemical Data Summaries and Sample Maps

ATTACHMENT C-1

PDSR Beryllium Data Summaries and Sample Maps

Beryllium Data Summary

Sample Number	Survey Map Location	Room	Sample Location	Result (ug/100 cm²)
Building 991				
991-01212004-23-001	1	150	Floor, random	< 0.1
991-01212004-23-002	2	148	Floor, random	< 0.1
991-01212004-23-003	3	158	Floor, random	< 0.1
991-01212004-23-004	4	150	Floor, random	< 0.1
991-01212004-23-005	5	402	Floor, random	< 0.1
991-01212004-23-006	6	Corridor B	Floor, random	< 0.1
991-01212004-23-007	7	140 Mezzanine	Floor, random	< 0.1
991-01212004-23-008	8	118	Floor, random	< 0.1
991-01212004-23-009	9	140	Floor, random	< 0.1
991-01212004-23-010	10	170	Floor, random	< 0.1
991-01212004-23-011	11	147	Floor, random	< 0.1
991-01212004-23-012	12	153	Floor, random	< 0.1
991-01212004-23-013	13	150	Floor, random	0.115 (1)
991-01212004-23-014	14	129	Floor, random	< 0.1
991-01212004-23-015	15	101	Floor, random	< 0.1
991-01212004-23-016	16	170	Floor, random	< 0.1
991-01212004-23-017	17	101	Floor, random	< 0.1
991-01212004-23-018	18	128A	Floor, random	< 0.1
991-01212004-23-019	19	163	Floor, random	< 0.1
991-01212004-23-020	20	138	Floor, random	< 0.1
991-01212004-23-021	21	170	Floor, random	< 0.1
991-01212004-23-022	22	140	Floor, random	< 0.1
991-01212004-23-023	23	153	Floor, random	< 0.1
991-01212004-23-024	24	105	Floor, random	< 0.1
991-01212004-23-025	25	121A	Floor, random	< 0.1
991-01212004-23-026	26	140A	Floor, random	< 0.1
991-01212004-23-027	27	149	Floor, random	< 0.1
991-01212004-23-028	28	170	Floor, random	< 0.1
991-01212004-23-029	29	143	Floor, random	< 0.1
991-01212004-23-030	30	142A	Floor, random	< 0.1
991-01212004-23-031	31	153	Floor, random	< 0.1
991-01212004-23-032	32	132	Floor, random	< 0.1
991-01212004-23-033	33	101	Floor, random	< 0.1
991-01212004-23-034	34	108	Floor, random	< 0.1
991-01212004-23-035	35	110A	Floor, random	< 0.1
991-01212004-23-036	36	124	Floor, random	< 0.1
991-01212004-23-037	37	Corridor B	Floor, random	< 0.1
991-01212004-23-038	38	130	Floor, random	< 0.1
991-01212004-23-039	39	123	Floor, random	< 0.1
991-01212004-23-040	40	146	Floor, random	< 0.1
991-01212004-23-041	41	155	Floor, random	< 0.1
991-01212004-23-042	42	142B	Floor, random	< 0.1
991-01212004-23-043	43	405	Floor, random	< 0.1
991-01212004-23-044	44	405	Floor, random	< 0.1
991-01212004-23-045	45	170	Floor, random	< 0.1
991-01212004-23-046	46	156	Floor, random	< 0.1
991-01292004-23-131	131	150	Floor, biased, next to #13	< 0.1 (1)
991-01292004-23-132	132	150	Floor, biased, next to #13	< 0.1 (1)
991-01292004-23-133	133	150	Floor, biased, next to #13	< 0.1 (1)
991-01292004-23-134	134	150	Floor, biased, next to #13	< 0.1 (1)
991-01102004-23-001	1	Basement	Floor, random	< 0.1
991-01102004-23-002	2	Basement	Floor, random	< 0.1
991-01102004-23-003	3	Basement	Floor, random	< 0.1
991-01102004-23-004	4	Basement	Floor, random	< 0.1
991-01102004-23-005	5	Basement	Floor, random	< 0.1
991-01102004-23-006	6	Basement	Floor, random	< 0.1
991-01102004-23-007	7	Basement	Floor, random	< 0.1
991-01102004-23-008	8	Basement	Floor, random	< 0.1
991-01102004-23-009	9	Basement	Floor, random	< 0.1

Sample Number	Survey Map Location	Room	Sample Location	Result ($ug/100 cm^2$)
991-01202004-23-004	29	991 Roof Plenum	Internal to Plenum, biased	< 0.1
991-01202004-23-005	30	991 Roof Plenum	Internal to Plenum, biased	< 0.1
991-01202004-23-006	31	991 Roof Plenum	Internal to Plenum, biased	0.391 (7)
991-01202004-23-007	32	991 Roof Plenum	Internal to Plenum, biased	0.162 (7)
991-01202004-23-008	33	991 Roof Plenum	Internal to Plenum, biased	< 0.1
991-01202004-23-009	34	991 Roof Plenum	Internal to Plenum, biased	0.183 (7)
991-01202004-23-010	35	991 Roof Plenum	Internal to Plenum, biased	< 0.1
991-01202004-23-011	36	991 Roof Plenum	Internal to Plenum, biased	< 0.1
991-01292004-23-601	601	991 Roof Plenum	Internal to Plenum, biased	< 0.1 (7)
991-01292004-23-602	602	991 Roof Plenum	Internal to Plenum, biased	< 0.1 (7)
991-01292004-23-603	603	991 Roof Plenum	Internal to Plenum, biased	< 0.1 (7)
991-01292004-23-604	604	991 Roof Plenum	Internal to Plenum, biased	< 0.1 (7)
991-01292004-23-701	701	991 Roof Plenum	Internal to Plenum, biased	< 0.1 (7)
991-01292004-23-702	702	991 Roof Plenum	Internal to Plenum, biased	< 0.1 (7)
991-01292004-23-703	703	991 Roof Plenum	Internal to Plenum, biased	< 0.1 (7)
991-01292004-23-704	704	991 Roof Plenum	Internal to Plenum, biased	< 0.1 (7)
991-01292004-23-901	901	991 Roof Plenum	Internal to Plenum, biased	< 0.1 (7)
991-01292004-23-902	902	991 Roof Plenum	Internal to Plenum, biased	< 0.1 (7)
991-01292004-23-903	903	991 Roof Plenum	Internal to Plenum, biased	< 0.1 (7)
991-01292004-23-904	904	991 Roof Plenum	Internal to Plenum, biased	< 0.1 (7)
Building 991 East Tunnel and 998 Vault				
991-12162003-23-001	1	991 East Tunnel	Floor, random	< 0.1
991-12162003-23-002	2	991 East Tunnel	Floor, random	< 0.1
991-12162003-23-003	3	991 East Tunnel	Floor, random	< 0.1
991-12162003-23-004	4	991 East Tunnel	Floor, random	< 0.1
991-12162003-23-005	5	998 Vault	Floor, random	< 0.1
991-12162003-23-006	6	991 East Tunnel	Floor, random	< 0.1
991-12162003-23-007	7	991 East Tunnel	Floor, random	< 0.1
991-12162003-23-008	8	991 East Tunnel	Floor, random	< 0.1
991-12162003-23-009	9	998 Vault	Floor, random	< 0.1
991-12162003-23-010	10	991 East Tunnel	Floor, random	< 0.1
991-12162003-23-011	11	991 East Tunnel	Floor, random	< 0.1
991-12162003-23-012	12	991 East Tunnel	Floor, random	< 0.1
991-12162003-23-013	13	991 East Tunnel	Floor, random	< 0.1
991-12162003-23-014	14	998 Vault	Floor, random	< 0.1

Footnotes:

(1) Beryllium smear result at map location #13 in Room 150 was 0.115 $ug/100cm^2$. The area was decontaminated and resurveyed. Four post-decontamination smears (#131, 132, 133 and 134) were all <0.1 $ug/100cm^2$. No further follow-up actions are required.

(2) Beryllium smear result at map location #11 in the 991 basement was 0.359 $ug/100cm^2$. The area was decontaminated and resurveyed. Four post-decontamination smears (#111, 112, 113 and 114) were all <0.1 $ug/100cm^2$. No further follow-up actions are required.

(3) Beryllium smear result at map location #14 in the 991 basement was 0.113 $ug/100cm^2$. The area was decontaminated and resurveyed. Four post-decontamination smears (#141, 142, 143 and 144) were all <0.1 $ug/100cm^2$. No further follow-up actions are required.

(4) Beryllium smear result at map location #18 in the 991 basement was 0.583 $ug/100cm^2$. The area was decontaminated and resurveyed. Four post-decontamination smears (#181, 182, 183 and 184) were all <0.1 $ug/100cm^2$. No further follow-up actions are required.

(5) Beryllium smear result at map location #24 in the 991 basement was 0.414 $ug/100cm^2$. The area was decontaminated and resurveyed. Four post-decontamination smears (#241, 242, 243 and 244) were all <0.1 $ug/100cm^2$. No further follow-up actions are required.

(6) Beryllium smear results at map location #39 and #67 of the 991 Ventilation System were 0.169 and 0.153 $ug/100cm^2$, respectively. These areas of the 991 Ventilation System were physically removed and disposed of as beryllium waste. No further follow-up actions are required.

(7) Beryllium smear results at map location #10, #11, and #21-25 in the 991 Roof Plenum were above the 0.1$ug/100cm^2$ PDSP investigation level. The area was decontaminated and resurveyed. Three post-decontamination smears (#31, #32 and #34) were still above the 0.1$ug/100cm^2$ PDSP investigation level, therefore additional decontamination and re-surveys were performed. Twelve additional post-decontamination smears were collected; #601-604 surrounding #31, #701-704 surrounding #32, and #901-904 surrounding #34, and all were <0.1 $ug/100cm^2$. Locations #601-604, 701-704 and 901-904 are not show on the map due to space restrictions. No further follow-up actions are required.

Sample Number	Survey Map Location	Room	Sample Location	Result (ug/100 cm²)
991-10152003-23-032	32	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-033	33	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-034	34	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-035	35	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-036	36	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-037	37	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-038	38	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-039	39	991 Ventilation System	Internal System Ducting, biased	0.169 (6)
991-10152003-23-040	40	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-041	41	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-042	42	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-043	43	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-044	44	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-045	45	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-046	46	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-047	47	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-048	48	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-49	49	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-50	50	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-51	51	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-52	52	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-53	53	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-54	54	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-55	55	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-56	56	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-57	57	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-58	58	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-59	59	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-60	60	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-61	61	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-62	62	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-63	63	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-64	64	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-65	65	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-66	66	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-10152003-23-67	67	991 Ventilation System	Internal System Ducting, biased	0.153 (6)
991-10152003-23-68	68	991 Ventilation System	Internal System Ducting, biased	< 0.1
991-11142003-23-001	1	991 Roof Plenum	Internal to Plenum, random	< 0.1
991-11142003-23-002	2	991 Roof Plenum	Internal to Plenum, random	< 0.1
991-11142003-23-003	3	991 Roof Plenum	Internal to Plenum, random	< 0.1
991-11142003-23-004	4	991 Roof Plenum	Internal to Plenum, random	< 0.1
991-11142003-23-005	5	991 Roof Plenum	Internal to Plenum, random	< 0.1
991-11142003-23-006	6	991 Roof Plenum	Internal to Plenum, random	< 0.1
991-11142003-23-007	7	991 Roof Plenum	Internal to Plenum, random	< 0.1
991-11142003-23-008	8	991 Roof Plenum	Internal to Plenum, random	< 0.1
991-11142003-23-009	9	991 Roof Plenum	Internal to Plenum, random	< 0.1
991-11142003-23-010	10	991 Roof Plenum	Internal to Plenum, random	0.202 (7)
991-11142003-23-011	11	991 Roof Plenum	Internal to Plenum, random	0.228 (7)
991-11142003-23-012	12	991 Roof Plenum	Internal to Plenum, random	< 0.1
991-11142003-23-013	13	991 Roof Plenum	Internal to Plenum, random	< 0.1
991-11142003-23-014	14	991 Roof Plenum	Internal to Plenum, random	< 0.1
991-11142003-23-015	15	991 Roof Plenum	Internal to Plenum, random	< 0.1
991-11142003-23-016	16	991 Roof Plenum	Internal to Plenum, random	< 0.1
991-11142003-23-017	17	991 Roof Plenum	Internal to Plenum, random	< 0.1
991-11142003-23-018	18	991 Roof Plenum	Internal to Plenum, random	< 0.1
991-11142003-23-019	19	991 Roof Plenum	Internal to Plenum, random	< 0.1
991-11142003-23-020	20	991 Roof Plenum	Internal to Plenum, random	< 0.1
991-11142003-23-021	21	991 Roof Plenum	Internal to Plenum, random	0.278 (7)
991-11142003-23-022	22	991 Roof Plenum	Internal to Plenum, random	0.122 (7)
991-11142003-23-023	23	991 Roof Plenum	Internal to Plenum, random	0.147 (7)
991-11142003-23-024	24	991 Roof Plenum	Internal to Plenum, random	0.482 (7)
991-11142003-23-025	25	991 Roof Plenum	Internal to Plenum, random	0.445 (7)
991-01202004-23-001	26	991 Roof Plenum	Internal to Plenum, biased	< 0.1
991-01202004-23-002	27	991 Roof Plenum	Internal to Plenum, biased	< 0.1
991-01202004-23-003	28	991 Roof Plenum	Internal to Plenum, biased	< 0.1

Sample Number	Survey Map Location	Room	Sample Location	Result (ug/100 cm²)
991-01202004-23-004	29	991 Roof Plenum	Internal to Plenum, biased	< 0.1
991-01202004-23-005	30	991 Roof Plenum	Internal to Plenum, biased	< 0.1
991-01202004-23-006	31	991 Roof Plenum	Internal to Plenum, biased	0.391 (7)
991-01202004-23-007	32	991 Roof Plenum	Internal to Plenum, biased	0.162 (7)
991-01202004-23-008	33	991 Roof Plenum	Internal to Plenum, biased	< 0.1
991-01202004-23-009	34	991 Roof Plenum	Internal to Plenum, biased	0.183 (7)
991-01202004-23-010	35	991 Roof Plenum	Internal to Plenum, biased	< 0.1
991-01202004-23-011	36	991 Roof Plenum	Internal to Plenum, biased	< 0.1
991-01292004-23-601	601	991 Roof Plenum	Internal to Plenum, biased	< 0.1 (7)
991-01292004-23-602	602	991 Roof Plenum	Internal to Plenum, biased	< 0.1 (7)
991-01292004-23-603	603	991 Roof Plenum	Internal to Plenum, biased	< 0.1 (7)
991-01292004-23-604	604	991 Roof Plenum	Internal to Plenum, biased	< 0.1 (7)
991-01292004-23-701	701	991 Roof Plenum	Internal to Plenum, biased	< 0.1 (7)
991-01292004-23-702	702	991 Roof Plenum	Internal to Plenum, biased	< 0.1 (7)
991-01292004-23-703	703	991 Roof Plenum	Internal to Plenum, biased	< 0.1 (7)
991-01292004-23-704	704	991 Roof Plenum	Internal to Plenum, biased	< 0.1 (7)
991-01292004-23-901	901	991 Roof Plenum	Internal to Plenum, biased	< 0.1 (7)
991-01292004-23-902	902	991 Roof Plenum	Internal to Plenum, biased	< 0.1 (7)
991-01292004-23-903	903	991 Roof Plenum	Internal to Plenum, biased	< 0.1 (7)
991-01292004-23-904	904	991 Roof Plenum	Internal to Plenum, biased	< 0.1 (7)
Building 991 East Tunnel and 998 Vault				
991-12162003-23-001	1	991 East Tunnel	Floor, random	< 0.1
991-12162003-23-002	2	991 East Tunnel	Floor, random	< 0.1
991-12162003-23-003	3	991 East Tunnel	Floor, random	< 0.1
991-12162003-23-004	4	991 East Tunnel	Floor, random	< 0.1
991-12162003-23-005	5	998 Vault	Floor, random	< 0.1
991-12162003-23-006	6	991 East Tunnel	Floor, random	< 0.1
991-12162003-23-007	7	991 East Tunnel	Floor, random	< 0.1
991-12162003-23-008	8	991 East Tunnel	Floor, random	< 0.1
991-12162003-23-009	9	998 Vault	Floor, random	< 0.1
991-12162003-23-010	10	991 East Tunnel	Floor, random	< 0.1
991-12162003-23-011	11	991 East Tunnel	Floor, random	< 0.1
991-12162003-23-012	12	991 East Tunnel	Floor, random	< 0.1
991-12162003-23-013	13	991 East Tunnel	Floor, random	< 0.1
991-12162003-23-014	14	998 Vault	Floor, random	< 0.1

Footnotes:

(1) Beryllium smear result at map location #13 in Room 150 was 0.115 ug/100cm². The area was decontaminated and resurveyed. Four post-decontamination smears (#131, 132, 133 and 134) were all <0.1 ug/100cm². No further follow-up actions are required.

(2) Beryllium smear result at map location #11 in the 991 basement was 0.359 ug/100cm². The area was decontaminated and resurveyed. Four post-decontamination smears (#111, 112, 113 and 114) were all <0.1 ug/100cm². No further follow-up actions are required.

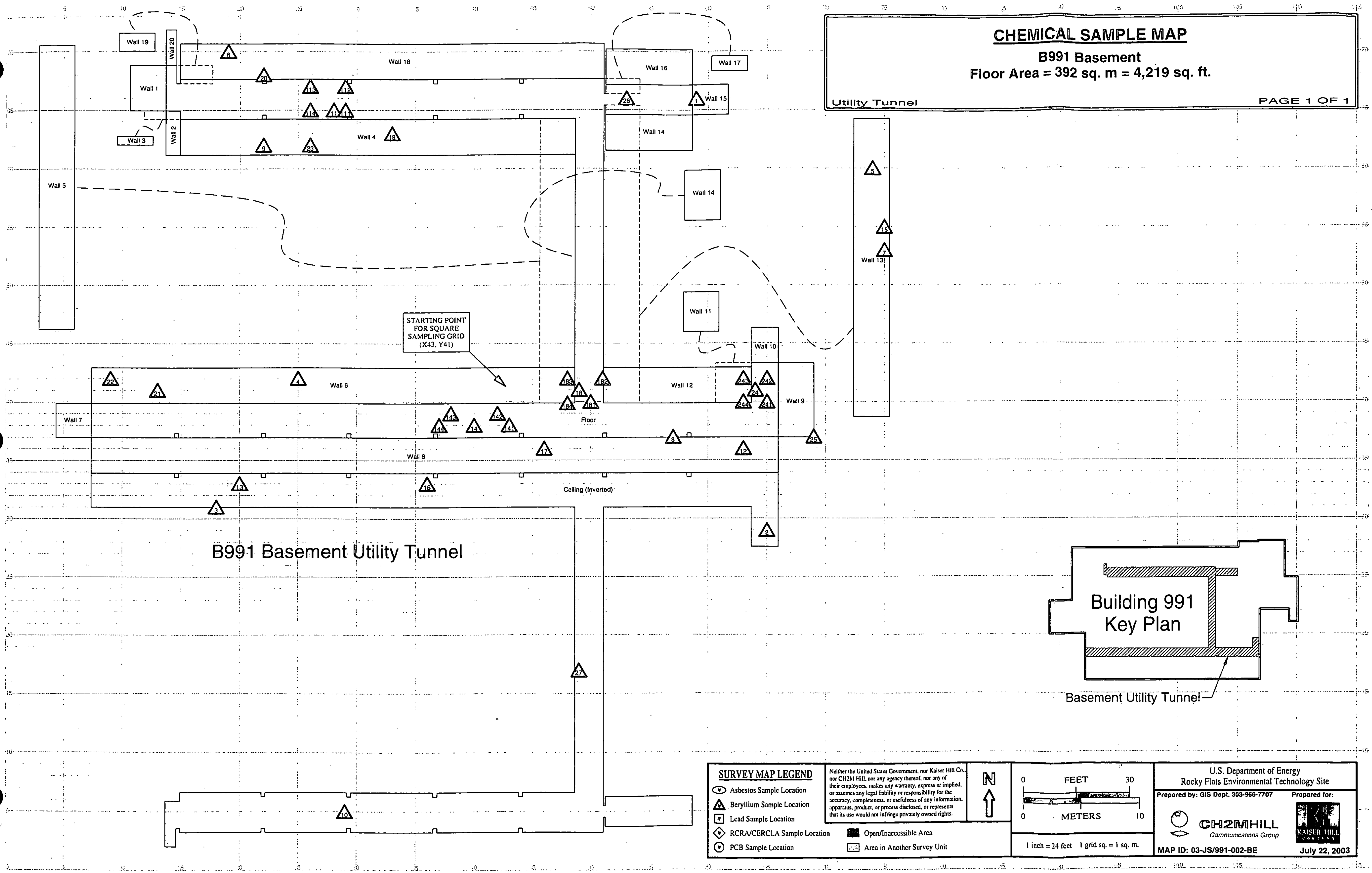
(3) Beryllium smear result at map location #14 in the 991 basement was 0.113 ug/100cm². The area was decontaminated and resurveyed. Four post-decontamination smears (#141, 142, 143 and 144) were all <0.1 ug/100cm². No further follow-up actions are required.

(4) Beryllium smear result at map location #18 in the 991 basement was 0.583 ug/100cm². The area was decontaminated and resurveyed. Four post-decontamination smears (#181, 182, 183 and 184) were all <0.1 ug/100cm². No further follow-up actions are required.

(5) Beryllium smear result at map location #24 in the 991 basement was 0.414 ug/100cm². The area was decontaminated and resurveyed. Four post-decontamination smears (#241, 242, 243 and 244) were all <0.1 ug/100cm². No further follow-up actions are required.

(6) Beryllium smear results at map location #39 and #67 of the 991 Ventilation System were 0.169 and 0.153 ug/100cm², respectively. These areas of the 991 Ventilation System were physically removed and disposed of as beryllium waste. No further follow-up actions are required.

(7) Beryllium smear results at map location #10, #11, and #21-25 in the 991 Roof Plenum were above the 0.1ug/100cm² PDSP investigation level. The area was decontaminated and resurveyed. Three post-decontamination smears (#31, #32 and #34) were still above the 0.1ug/100cm² PDSP investigation level, therefore additional decontamination and re-surveys were performed. Twelve additional post-decontamination smears were collected; #601-604 surrounding #31, #701-704 surrounding #32, and #901-904 surrounding #34, and all were <0.1 ug/100cm². Locations #601-604, 701-704 and 901-904 are not show on the map due to space restrictions. No further follow-up actions are required.


CHEMICAL SAMPLE MAP
B991 Basement
Floor Area = 392 sq. m = 4,219 sq. ft.
Utility Tunnel
PAGE 1 OF 1
Wall 1
Wall 2
Wall 3
Wall 4
Wall 5
Wall 6
Wall 7
Wall 8
Wall 9
Wall 10
Wall 11
Wall 12
Wall 13
Wall 14
Wall 15
Wall 16
Wall 17
Wall 18
Wall 19
Wall 20
Floor
Ceiling (Inverted)
STARTING POINT FOR SQUARE SAMPLING GRID (X43, Y41)
B991 Basement Utility Tunnel
Building 991 Key Plan
Basement Utility Tunnel
SURVEY MAP LEGEND
Asbestos Sample Location
Beryllium Sample Location
Lead Sample Location
RCRA/CERCLA Sample Location
PCB Sample Location
Open/Inaccessible Area
Area in Another Survey Unit
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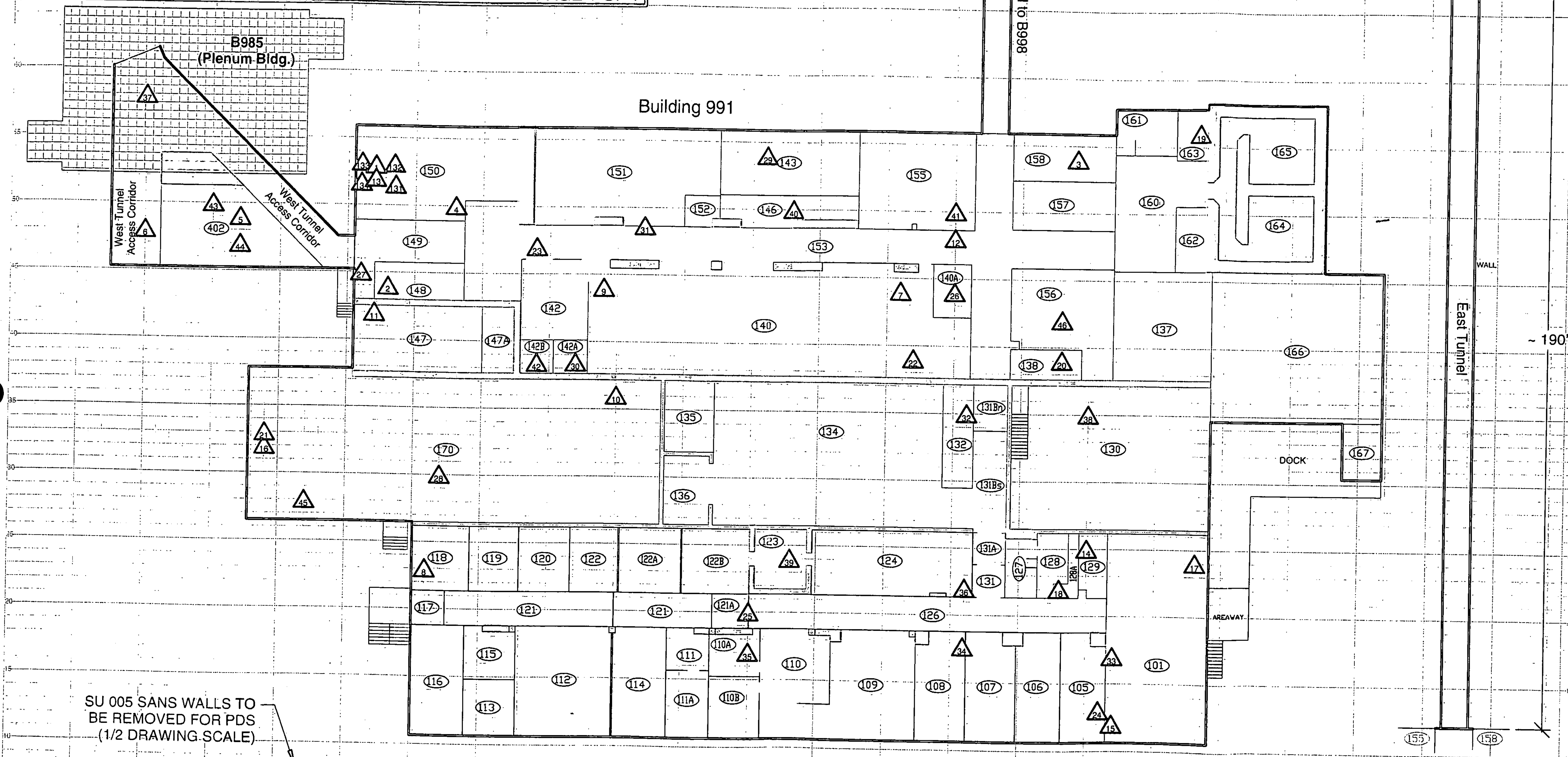
N
0 FEET 30
0 METERS 10
1 inch = 24 feet 1 grid sq. = 1 sq. m.
U.S. Department of Energy
Rocky Flats Environmental Technology Site
Prepared by: GIS Dept. 303-966-7707
Prepared for:
CH2MHILL Communications Group
KAISER HILL COMPANY
MAP ID: 03-JS/991-002-BE
July 22, 2003

CHEMICAL SAMPLE MAP for Building 991

Beryllium Interior Floor
Floor Area = 1,206 sq. m. = 12,970 sq. ft.
No. of Random Sample = 46

PAGE 1 OF 1



SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 30
0 METERS 10

1 inch = 24 feet   1 grid sq. = 1 sq. m.

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707
Prepared for:

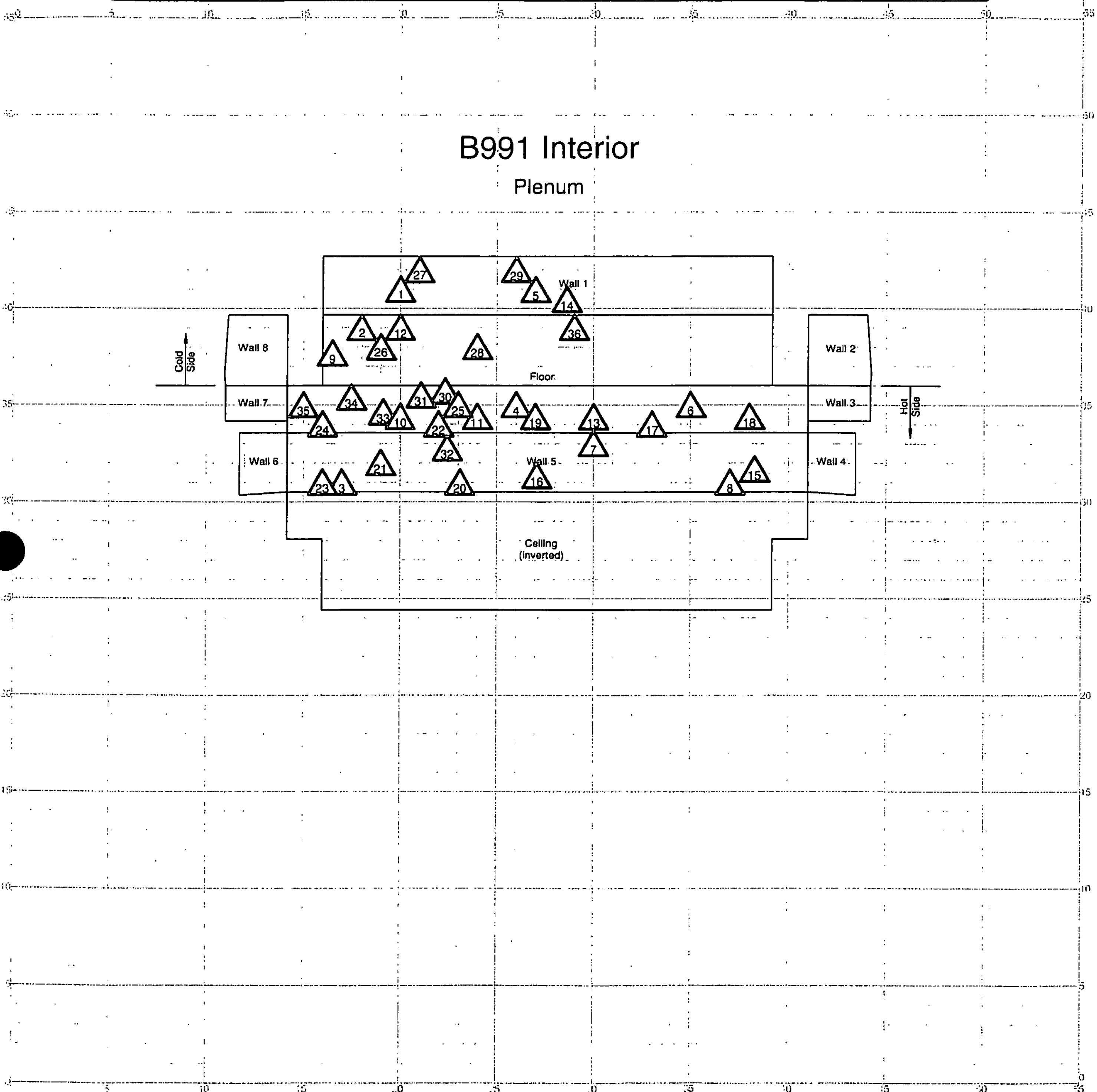
CH2MHILL
Communications Group

KAISER HILL

MAP ID: 03-JS/991BE
Feb. 4, 2004

CHEMICAL SAMPLE MAP

Building 991 Roof Plenum
Beryllium



SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 30
0 METERS 10

1 inch = 24 feet 1 grid sq. = 1 sq. m.

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707
Prepared for:

CH2MHILL
Communications Group

KAISER HILL

MAP ID: 03-JS/991-Plenum
Nov. 19, 2003

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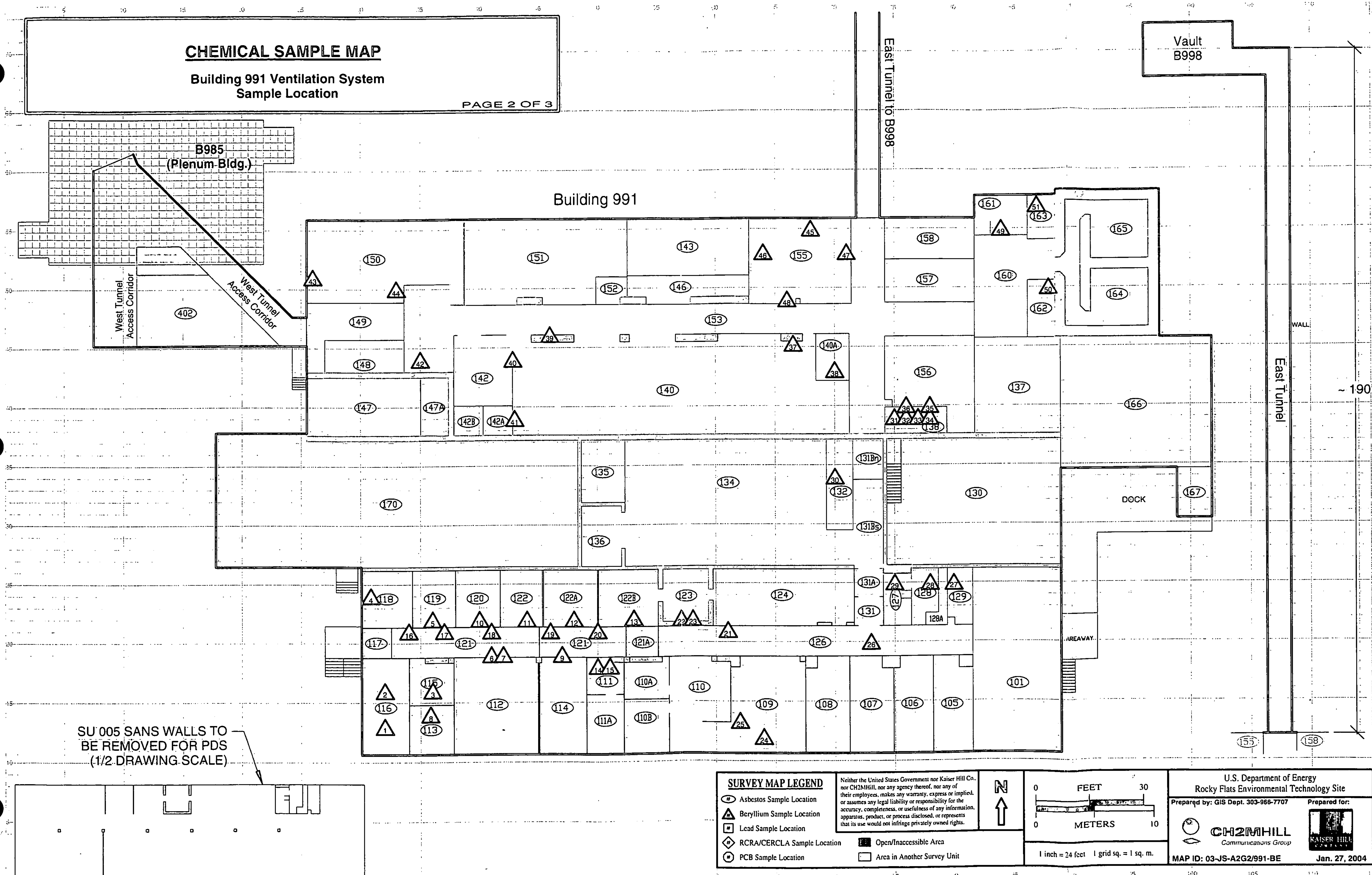
CHEMICAL SAMPLE MAP

Building 991 Ventilation System
Sample Location



SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

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N

0 FEET 30
0 METERS 10

1 inch = 24 feet 1 grid sq. = 1 sq. m.

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707
Prepared for:

CH2MHILL Communications Group

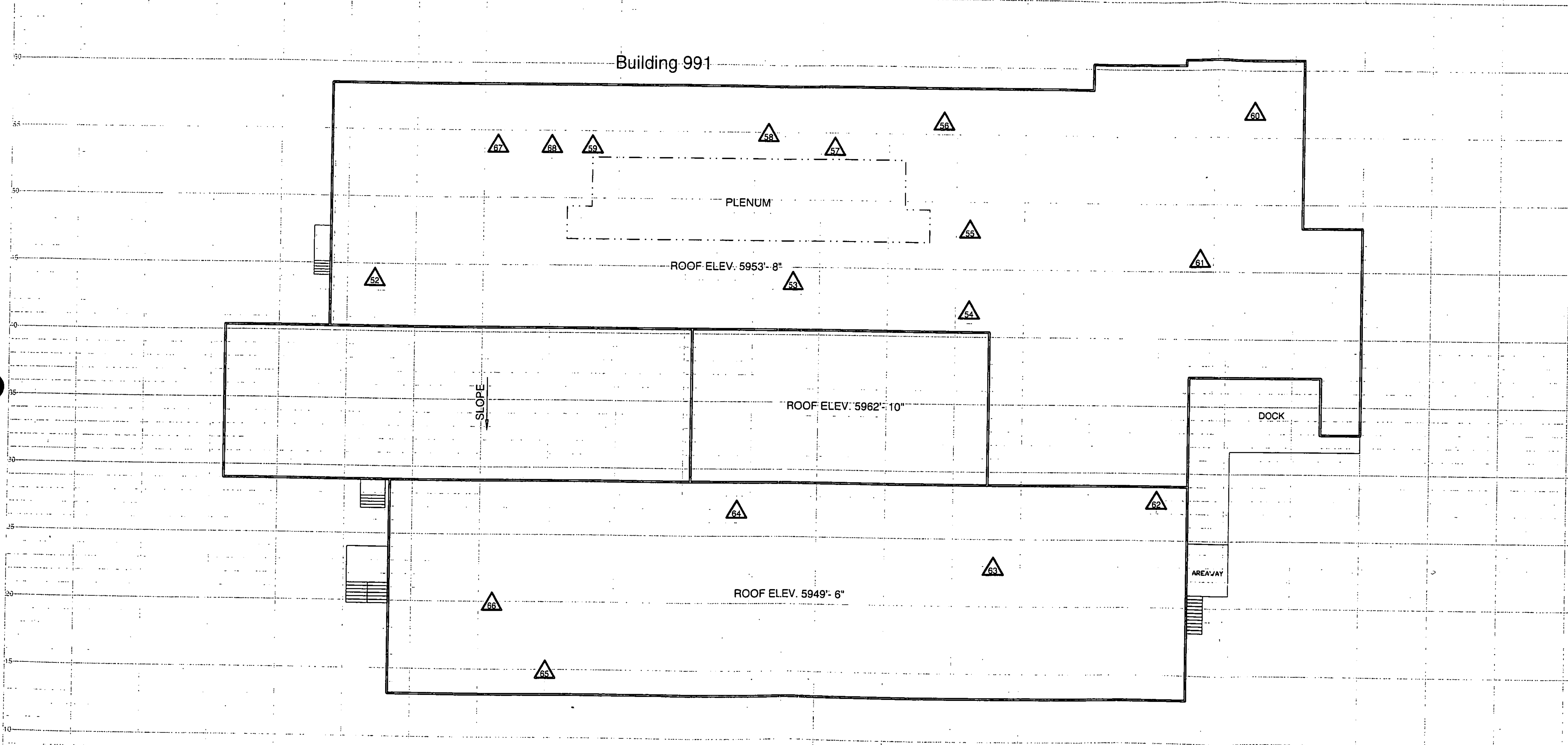
KAISER HILL COMPANY

MAP ID: 03-JS-A2G2/991-BE
Jan. 27, 2004

CHEMICAL SAMPLE MAP

Building 991 Ventilation System
Sample Locations

PAGE 3 OF 3



SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

FEET 0 30
METERS 0 10

1 inch = 24 feet 1 grid sq. = 1 sq. m.

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707
Prepared for:

CH2MHILL
Communications Group

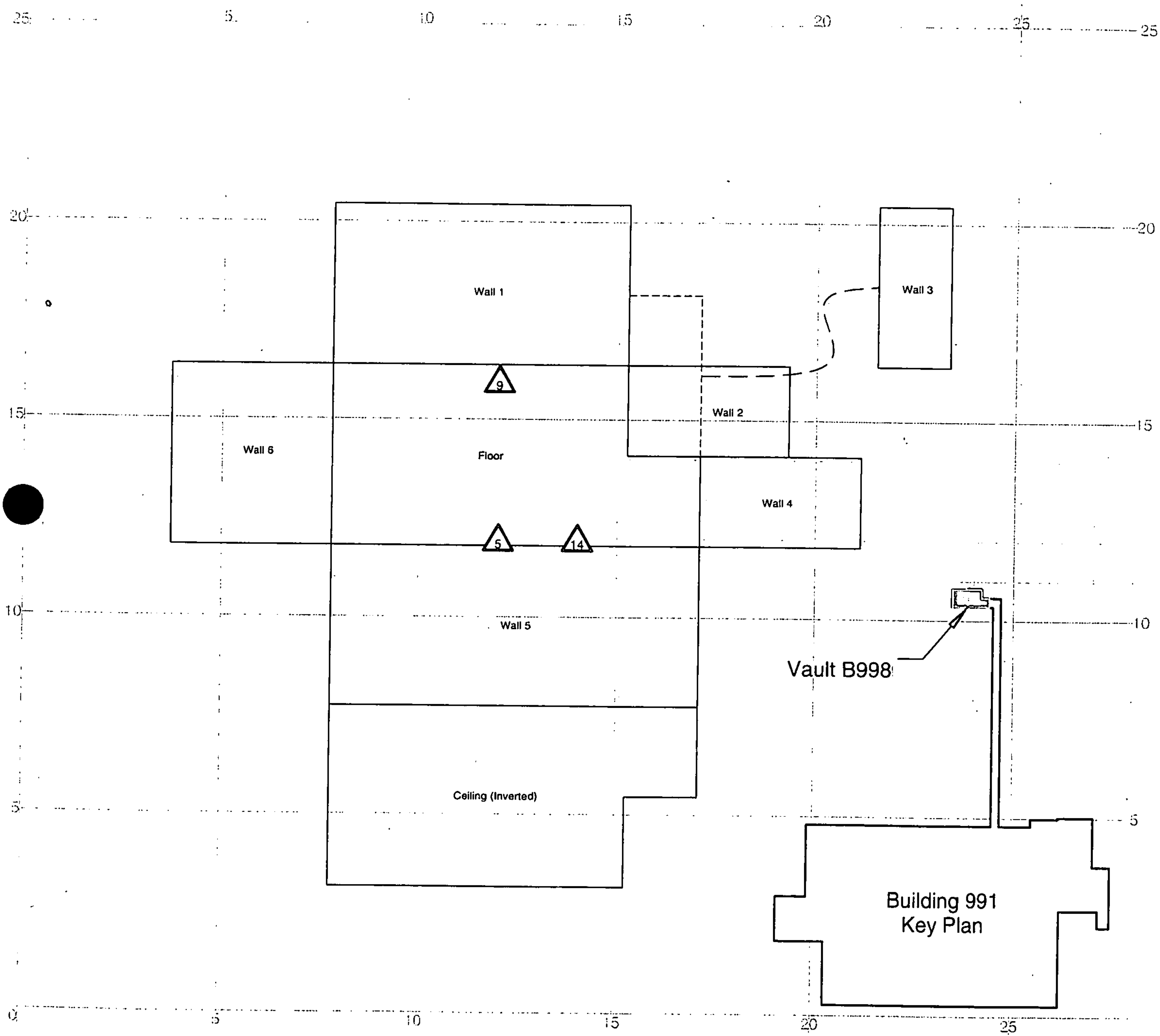
KAISER HILL

MAP ID: 03-JS-A2G2/991-Roof-BE Jan. 29, 2004

CHEMICAL SAMPLE MAP

B991 East Tunnel & Vault
Floor Area = 155 sq. m = 1,670 sq. ft.
No. of SU Random Samples = 14

Vault B998



SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location

B998 Interior
Survey Unit 991-003-Be

N

0 FEET 15
0 METERS 5

1 inch = 12 feet 1 grid sq. = 1 sq. m.

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707
Prepared for:

CH2MHILL
Communications Group

KAISER HILL

MAP ID: 03-JS/991004BE1
Jan 5, 2004

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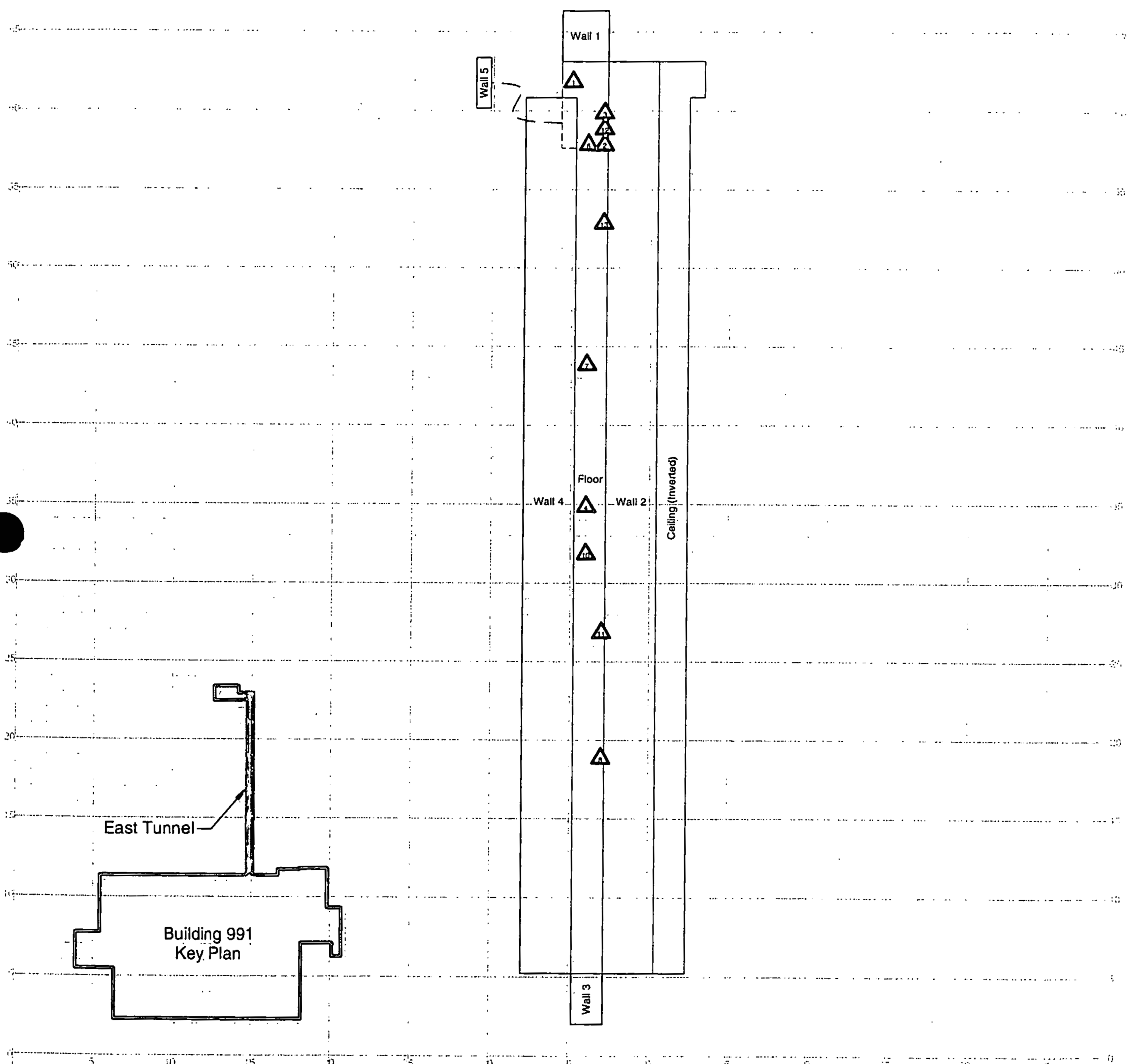
CHEMICAL SAMPLE MAP

B991 East Tunnel & 998 Vault
Floor Area = 155 sq. m = 1,670 sq. ft.
No. of SU Random Samples = 14

Bldg. 991 East Tunnel



SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 40

0 METERS 10

1 inch = 30 feet 1 grid sq. = 1 sq. m.

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

Prepared for:

CH2MHILL
Communications Group

KAISER HILL COMPANY

MAP ID: 03-JS/991004-BE2

Jan. 5, 2004

183

ATTACHMENT C-2

In-Process Beryllium Sample Results

Industrial Hygi[illegible]Information System
Sample [illegible]sults Report

SURFACE

Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration
RFCSS							
BOLEY, DICK C							
991-01212004-9-101		ROOF	INSIDE N-S DUCTWORK (PLENUM) SWIPE SAMPLE BOTTOM	WIPE	04Z0828	BERYLLIUM AND B	< 0.0000 _ UG/100CM2
991-01212004-9-102		ROOF	INSIDE N-S DUCTWORK (PLENUM) SAMPLE INSIDE OPENIN	WIPE	04Z0828	BERYLLIUM AND B	< 0.0000 _ UG/100CM2
991-01212004-9-103		ROOF	INSIDE FEEDER PIPE N-S DUCT BOTTOM	WIPE	04Z0828	BERYLLIUM AND B	< 0.0000 _ UG/100CM2
991-01212004-9-104		ROOF	INSIDE FEEDER PIPE N-S DUCT INSIDE OPENING	WIPE	04Z0828	BERYLLIUM AND B	< 0.0000 _ UG/100CM2
991-01212004-9-105		ROOF	INSIDE FEEDER PIPE FROM EAST_ DUCT BOTTOM	WIPE	04Z0828	BERYLLIUM AND B	< 0.0000 _ UG/100CM2
991-01212004-9-106		ROOF	INSIDE FEEDER PIPE FROM EAST DUCT INSIDE OPENING	WIPE	04Z0828	BERYLLIUM AND B	< 0.0000 _ UG/100CM2
991-01212004-9-107		ROOF	INSIDE FEEDER PIPE ON SOUTH DUCT-BOTTOM	WIPE	04Z0828	BERYLLIUM AND B	< 0.0000 _ UG/100CM2
991-01212004-9-108		ROOF	INSIDE FEEDER PIPE ON SOUTH DUCT-INSIDE OPENING	WIPE	04Z0828	BERYLLIUM AND B	< 0.0000 _ UG/100CM2
Building Subtotal: 8							
Hygienist Subtotal: 8							
MILLER, GREGG T							
991-12022003-607-001		150	LADDER #1	WIPE	04Z0507	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12022003-607-002		150	LADDER #1	WIPE	04Z0507	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12022003-607-003		150	LIGHT COVER #1	WIPE	04Z0507	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12022003-607-004		150	LIGHT COVER #2	WIPE	04Z0507	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12022003-607-005		150	LIGHT COVER #3	WIPE	04Z0507	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12022003-607-006		150	CAMERA #A	WIPE	04Z0507	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12022003-607-007		150	CAMERA #B	WIPE	04Z0507	BERYLLIUM AND B	< 0.1000 _ UG/100CM2

Footnotes:
(1) Equipment was either decontaminated or removed from building
(2) Area was decontaminated to $< 0.1\ ug/100cm^2$.

Industrial Hygi nformation System
Sample Results Report

SURFACE

Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration
RFCSS							
MILLER, GREGG T							
991-12022003-607-008		150	CAMERA #C	WIPE	04Z0507	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12022003-607-009		150	SPEAKER #D	WIPE	04Z0507	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12022003-607-010		150	WHITE BATTER BANK S/N 3202	WIPE	04Z0507	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12022003-607-011		150	TOOLS	WIPE	04Z0507	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12022003-607-012		150	TOOLS	WIPE	04Z0507	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12022003-607-013		150	TOOLS	WIPE	04Z0507	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12022003-607-014		150	LAMP SHADE 1	WIPE	04Z0507	BERYLLIUM AND B	0.6730 _ UG/100CM2 (1)
991-12022003-607-015		150	LAMP SHADE 2	WIPE	04Z0507	BERYLLIUM AND B	6.8700 _ UG/100CM2 (1)
991-12022003-607-016		150	LAMP SHADE 3	WIPE	04Z0507	BERYLLIUM AND B	0.4360 _ UG/100CM2 (1)
991-12022003-607-017		150	LAMP SHADE 4	WIPE	04Z0507	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12022003-607-018		150	LAMP SHADE 5	WIPE	04Z0507	BERYLLIUM AND B	0.2100 _ UG/100CM2 (1)
Building Subtotal: 18							
Hygienist Subtotal: 18							
Company Subtotal: 26							
SSOC							
SIMPSON, MARK W							
991-01082004-23-001		150	SEE ATTACHED MAP - ON TOP W. DUCT NW CORNER	WIPE	04Z0748	BERYLLIUM AND B	0.1500 _ UG/100CM2 (1)
991-01082004-23-002		150	SEE ATTACHED MAP - ON TOP W. DUCT CENTER	WIPE	04Z0748	BERYLLIUM AND B	0.3750 _ UG/100CM2 (1)
991-01082004-23-003		150	SEE ATTACHED MAP - ON TOP W. DUCT SW CORNER	WIPE	04Z0748	BERYLLIUM AND B	0.4030 _ UG/100CM2 (1)

Industrial Hyg[illegible] Information System
Sample Results Report

SURFACE

SSOC

SIMPSON, MARK W

Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration	
991-01082004-23-004		150	SEE ATTACHED MAP - ON TOP S. DUCT SW CORNER	WIPE	04Z0748	BERYLLIUM AND B	< 0.1000 _ UG/100CM2	
991-01082004-23-005		150	SEE ATTACHED MAP - ON TOP S. DUCT SW CORNER	WIPE	04Z0748	BERYLLIUM AND B	0.1110 _ UG/100CM2	(1)
991-01082004-23-006		150	SEE ATTACHED MAP - ON TOP MIDDLE DUCT W. END	WIPE	04Z0748	BERYLLIUM AND B	0.3380 _ UG/100CM2	(1)
991-01082004-23-007		150	SEE ATTACHED MAP - ON TOP MIDDLE DUCT CENTER	WIPE	04Z0748	BERYLLIUM AND B	< 0.1000 _ UG/100CM2	
991-01082004-23-008		150	SEE ATTACHED MAP - ON TOP MIDDLE DUCT E. END	WIPE	04Z0748	BERYLLIUM AND B	0.1180 _ UG/100CM2	(1)
991-01082004-23-009		150	SEE ATTACHED MAP - ON VENT COVER OF MIDDLE DUCT	WIPE	04Z0748	BERYLLIUM AND B	< 0.1000 _ UG/100CM2	
991-01082004-23-010		150	SEE ATTACHED MAP - FLOOR BELOW REMOVED BLACK DUST	WIPE	04Z0748	BERYLLIUM AND B	< 0.1000 _ UG/100CM2	
991-01092004-23-001		151	TOP OF VENT DUCT NE CORNER	WIPE	04Z0762	BERYLLIUM AND B	< 0.1000 _ UG/100CM2	
991-01092004-23-002		151	TOP OF VENT DUCT NORTH CENTERAL	WIPE	04Z0762	BERYLLIUM AND B	< 0.1000 _ UG/100CM2	
991-01092004-23-003		151	TOP OF MIDDLE VENT DUCT WEST END	WIPE	04Z0762	BERYLLIUM AND B	< 0.1000 _ UG/100CM2	
991-01092004-23-004		151	TOP OF NORTH SOUTH LONG VENT DUCT ON WEST END N	WIPE	04Z0762	BERYLLIUM AND B	< 0.1000 _ UG/100CM2	
991-01092004-23-005		151	TOP OF NORTH SOUTH LONG VENT DUCT ON WEST END S	WIPE	04Z0762	BERYLLIUM AND B	< 0.1000 _ UG/100CM2	
991-01092004-23-006		151	SHORT LEG RUNNING NORTH AND SOUTH WEST END OF ROOM	WIPE	04Z0762	BERYLLIUM AND B	< 0.1000 _ UG/100CM2	
991-01092004-23-007		151	LARGE CIRCULAR DUCT	WIPE	04Z0762	BERYLLIUM AND B	< 0.1000 _ UG/100CM2	
991-01092004-23-008		151	TOP OF MIDDLE VENT DUCT (MIDDLE)	WIPE	04Z0762	BERYLLIUM AND B	< 0.1000 _ UG/100CM2	
991-01092004-23-009		151	TOP OF 3" WHITE PIPE (SOUTH END OF ROOM)	WIPE	04Z0762	BERYLLIUM AND B	< 0.1000 _ UG/100CM2	
991-01092004-23-010		151	TOP OF MIDDLE DUCT (EAST END)	WIPE	04Z0762	BERYLLIUM AND B	< 0.1000 _ UG/100CM2	

Industrial Hygiene Information System
Sample Results Report

SURFACE

Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration
SSOC							
SIMPSON, MARK W							
991-01092004-23-011		151	TOP OF FAR EAST GRAY ALUMINUM DUCT NORTHEAST	WIPE	04Z0762	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01092004-23-012		151	FLOOR SAMPLE WEST CENTRAL AREA	WIPE	04Z0762	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01092004-23-013		151	OUTSIDE OF VACUUM CLEANER	WIPE	04Z0762	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01102004-23-001		BASEMENT	WALL - SEE ATTACHED MAP	WIPE	04Z0790	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01102004-23-002		BASEMENT	CEILING - SEE ATTACHED MAP	WIPE	04Z0790	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01102004-23-003		BASEMENT	CEILING - SEE ATTACHED MAP	WIPE	04Z0790	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01102004-23-004		BASEMENT	WALL - SEE ATTACHED MAP	WIPE	04Z0790	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01102004-23-005		BASEMENT	WALL - SEE ATTACHED MAP	WIPE	04Z0790	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01102004-23-006		BASEMENT	WALL - SEE ATTACHED MAP	WIPE	04Z0790	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01102004-23-007		BASEMENT	WALL - SEE ATTACHED MAP	WIPE	04Z0790	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01102004-23-008		BASEMENT	FLOOR - SEE ATTACHED MAP	WIPE	04Z0790	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01102004-23-009		BASEMENT	WALL - SEE ATTACHED MAP	WIPE	04Z0790	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01102004-23-010		BASEMENT	CEILING - SEE ATTACHED MAP	WIPE	04Z0790	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01102004-23-011		BASEMENT	FLOOR - SEE ATTACHED MAP	WIPE	04Z0790	BERYLLIUM AND B	0.3590 _ UG/100CM2 (2)
991-01102004-23-012		BASEMENT	WALL - SEE ATTACHED MAP	WIPE	04Z0790	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01102004-23-013		BASEMENT	WALL - SEE ATTACHED MAP	WIPE	04Z0790	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01102004-23-014		BASEMENT	FLOOR - SEE ATTACHED MAP	WIPE	04Z0790	BERYLLIUM AND B	0.1130 _ UG/100CM2 (2)
991-01102004-23-015		BASEMENT	WALL - SEE ATTACHED MAP	WIPE	04Z0790	BERYLLIUM AND B	< 0.1000 _ UG/100CM2

Industrial Hygiene Information System
Sample Results Report

SURFACE

85

Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration	
SSOC								
SIMPSON, MARK W								
991-01102004-23-016		BASEMENT	CEILING - SEE ATTACHED MAP	WIPE	04Z0790	BERYLLIUM AND B	< 0.1000 _ UG/100CM2	
991-01102004-23-017		BASEMENT	WALL - SEE ATTACHED MAP	WIPE	04Z0790	BERYLLIUM AND B	< 0.1000 _ UG/100CM2	
991-01102004-23-018		BASEMENT	FLOOR - SEE ATTACHED MAP	WIPE	04Z0790	BERYLLIUM AND B	0.5830 _ UG/100CM2	(2)
991-01102004-23-019		BASEMENT	WALL - SEE ATTACHED MAP	WIPE	04Z0790	BERYLLIUM AND B	< 0.1000 _ UG/100CM2	
991-01102004-23-020		BASEMENT	FLOOR/WALL - SEE ATTACHED MAP	WIPE	04Z0790	BERYLLIUM AND B	< 0.1000 _ UG/100CM2	
991-01102004-23-021		BASEMENT	WALL - SEE ATTACHED MAP	WIPE	04Z0790	BERYLLIUM AND B	< 0.1000 _ UG/100CM2	
991-01102004-23-022		BASEMENT	WALL - SEE ATTACHED MAP	WIPE	04Z0790	BERYLLIUM AND B	< 0.1000 _ UG/100CM2	
991-01102004-23-023		BASEMENT	WALL - SEE ATTACHED MAP	WIPE	04Z0790	BERYLLIUM AND B	< 0.1000 _ UG/100CM2	
991-01102004-23-024		BASEMENT	FLOOR - SEE ATTACHED MAP	WIPE	04Z0790	BERYLLIUM AND B	0.4140 _ UG/100CM2	(2)
991-01102004-23-025		BASEMENT	CORNER - SEE ATTACHED MAP	WIPE	04Z0790	BERYLLIUM AND B	< 0.1000 _ UG/100CM2	
991-01102004-23-026		BASEMENT	CEILING - SEE ATTACHED MAP	WIPE	04Z0790	BERYLLIUM AND B	< 0.1000 _ UG/100CM2	
991-01102004-23-027		BASEMENT	CEILING - SEE ATTACHED MAP	WIPE	04Z0790	BERYLLIUM AND B	< 0.1000 _ UG/100CM2	
991-01192004-23-001		150	FLOOR NW CORNER AREA	WIPE	04Z0842	BERYLLIUM AND B	< 0.1000 _ UG/100CM2	
991-01192004-23-002		150	WALL NW CORNER AREA	WIPE	04Z0842	BERYLLIUM AND B	< 0.1000 _ UG/100CM2	
991-01192004-23-003		150	FLOOR NW CORNER AREA	WIPE	04Z0842	BERYLLIUM AND B	0.1200 _ UG/100CM2	(2)
991-01192004-23-004		150	WALL NW CORNER AREA	WIPE	04Z0842	BERYLLIUM AND B	< 0.1000 _ UG/100CM2	
991-01192004-23-005		150	TIRES OF JLG 344185	WIPE	04Z0842	BERYLLIUM AND B	0.1170 _ UG/100CM2	(1)
991-01192004-23-006		150	TIRES OF JLG 344185	WIPE	04Z0842	BERYLLIUM AND B	< 0.1000 _ UG/100CM2	

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Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration
SSOC							
SIMPSON, MARK W							
991-01192004-23-007		150	TIRES OF JLG 344185	WIPE	04Z0842	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01192004-23-008		150	TIRES OF JLG 344185	WIPE	04Z0842	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01192004-23-009		150	WORKING PLATFORM OF JLG 344185	WIPE	04Z0842	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01192004-23-010		150	WORKING PLATFORM OF JLG 344185	WIPE	04Z0842	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01192004-23-011		150	SCISSOR SECTION OF JLG 344185 (L)	WIPE	04Z0842	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01192004-23-012		150	SCISSOR SECTION OF JLG 344185 (R)	WIPE	04Z0842	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01192004-23-013		N/A	ROLL OFF/RECTANGULAR DUCT (PINK)	WIPE	04Z0842	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01192004-23-014		N/A	ROLL OFF/INSIDE BLACK DUCT REMOVED FROM 150	WIPE	04Z0842	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01192004-23-015		N/A	ROLL OFF/INSIDE BLACK DUCT REMOVED FROM 150	WIPE	04Z0842	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01192004-23-016		N/A	ROLL OFF/RECTANGULAR PINK DUCT	WIPE	04Z0842	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01192004-23-017		N/A	ROLL OFF/RECTANGULAR PINK DUCT	WIPE	04Z0842	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01202004-23-001		991 PLENUM	FLOORNEAR WEST ENTRANCE	WIPE	04Z0859	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01202004-23-002		991 PLENUM	HEPA FILTER NEAR WEST ENTRANCE	WIPE	04Z0859	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01202004-23-003		991 PLENUM	FLOOR 20 FEET EAT OF WEST ENTRANCE	WIPE	04Z0859	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01202004-23-004		991 PLENUM	HEPA FILTER 20 FT FROM W ENTRANCE	WIPE	04Z0859	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01202004-23-005		991 PLENUM	FLOOR EAST END OF STRUCTURE	WIPE	04Z0859	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01202004-23-006		991 PLENUM	COURSE PRESCREEN	WIPE	04Z0859	BERYLLIUM AND B	0.3910 _ UG/100CM2 (1)
991-01202004-23-007		991 PLENUM	DEFLECTOR PLATE	WIPE	04Z0859	BERYLLIUM AND B	0.1620 _ UG/100CM2 (1)

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Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration
SSOC							
SIMPSON, MARK W							
991-01202004-23-008		991 PLENUM	FLOOR BELOW DEFLECTOR PLATE	WIPE	04Z0859	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01202004-23-009		991 PLENUM	COURSE PRESCREEN	WIPE	04Z0859	BERYLLIUM AND B	0.1830 _ UG/100CM2 (1)
991-01202004-23-010		991 PLENUM	FLOOR 10 FT W OF DUCT INTAKE	WIPE	04Z0859	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-01202004-23-011		991 PLENUM	LADDER	WIPE	04Z0859	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-09292003-23-001		109	VENT INTAKE OF MAGNETIC PHOTOCOPIER	WIPE	03Z2331	BERYLLIUM AND B	0.2090 _ UG/100CM2 (1)
991-09292003-23-002		109	INSIDE OF LEFT PANEL OF MAGNETIC PHOTOCOPIER	WIPE	03Z2331	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-09292003-23-003		109	TURN TABLE OF MAGNETIC PHOTOCOPIER	WIPE	03Z2331	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-001		ADMIN. HALLWAY	OVERHEAD LIGHT CONDIUT	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-002		ADMIN. HALLWAY	OVERHEAD LIGHT CONDIUT	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-003		ADMIN. HALLWAY	OVERHEAD LIGHT CONDIUT	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-004		ADMIN. HALLWAY	OVERHEAD LIGHT CONDIUT	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-005		ADMIN. HALLWAY	OVERHEAD LIGHT CONDIUT	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-006		ADMIN. HALLWAY	OVERHEAD LIGHT CONDIUT	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-007		ADMIN. HALLWAY	OVERHEAD LIGHT CONDIUT	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-008		ADMIN. HALLWAY	OVERHEAD LIGHT CONDIUT	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-009		ADMIN. HALLWAY	OVERHEAD LIGHT CONDIUT	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-010		ADMIN. HALLWAY	OVERHEAD LIGHT CONDIUT	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-011		ADMIN. HALLWAY	OVERHEAD LIGHT CONDIUT	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2

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Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration
SSOC							
SIMPSON, MARK W							
991-10062003-23-012		ADMIN. HALLWAY	OVERHEAD LIGHT CONDIUT	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-013		ADMIN. HALLWAY	OVERHEAD LIGHT CONDIUT	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-014		ADMIN. HALLWAY	OVERHEAD LIGHT CONDIUT	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-015		ADMIN. HALLWAY	OVERHEAD LIGHT CONDIUT	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-016		ADMIN. HALLWAY	OVERHEAD LIGHT CONDIUT	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-017		ADMIN. HALLWAY	OVERHEAD LIGHT CONDIUT	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-018		ADMIN. HALLWAY	OVERHEAD LIGHT CONDIUT	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-019		ADMIN. HALLWAY	OVERHEAD LIGHT CONDIUT	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-020		ADMIN. HALLWAY	OVERHEAD LIGHT CONDIUT	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-021		ADMIN. HALLWAY	OVERHEAD LIGHT CONDIUT	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-022		ADMIN. HALLWAY	OVERHEAD LIGHT CONDIUT	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-023		ADMIN. HALLWAY	OVERHEAD LIGHT CONDIUT	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-024		ADMIN. HALLWAY	OVERHEAD LIGHT CONDIUT	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-025		ADMIN. HALLWAY	OVERHEAD LIGHT CONDIUT	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-026		ADMIN. HALLWAY	OVERHEAD LIGHT CONDIUT	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-027		114	OVERHEAD LIGHT CONDIUT	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-028		110A	OVERHEAD	WIPE	04Z0005	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-029		110A	OVERHEAD	WIPE	04Z0005	BERYLLIUM AND B	~~RESULTS PENDING~~ <0.1 DAF 2/4/04

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Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration
SSOC							
SIMPSON, MARK W							
991-10062003-23-030		123	EAST BY WINDOW	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-031		132	COUNT ROOM	WIPE	04Z0050	BERYLLIUM AND B	~~RESULTS PENDING~~ <0.1 AP 2/2/04
991-10062003-23-032		120	WEST SIDE	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-033		122A	EAST SIDE	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-034		122	WEST SIDE	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-035		113	FLOOR	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-036		122B	OVERHEAD	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-037		109	HALLWAY	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-038		109	HALLWAY W DOOR	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-039		122A	OVERHEAD:LIGHT CONDIUT	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-040		110	FLOOR	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-041		109	ENTRANCE TO BACK AREA	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10062003-23-042		123	FLOOR	WIPE	04Z0050	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10092003-23-001		132	ROOM 132	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10092003-23-002		132	ROOM 132	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10092003-23-003		ADMIN. HALLWAY	HALLWAY BY NDT	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10092003-23-004		ADMIN. HALLWAY	HALLWAY BY 131B	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10092003-23-005		ADMIN. HALLWAY	HALLWAY BY 138	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2

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Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration

SSOC

SIMPSON, MARK W

Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration
991-10092003-23-006		ADMIN. HALLWAY	HALLWAY BY 137	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10092003-23-007		ADMIN. HALLWAY	HALLWAY BY 157	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10092003-23-008		ADMIN. HALLWAY	HALLWAY BY 160	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10092003-23-009		140	ROOM 140	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10092003-23-010		ADMIN. HALLWAY	HALLWAY 155	WIPE	04Z0115	BERYLLIUM AND B	0.3240 _ UG/100CM2 (2)
991-10092003-23-011		ADMIN. HALLWAY	HALLWAY 155	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10092003-23-012		ADMIN. HALLWAY	HALLWAY BY 141	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10092003-23-013		ADMIN. HALLWAY	HALLWAY BY 142	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10092003-23-014		ADMIN. HALLWAY	HALLWAY BY 150	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10092003-23-015		ADMIN. HALLWAY	HALLWAY BY 147	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10092003-23-016		149	ROOM 149	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10092003-23-017		148	ROOM 148	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10092003-23-018		147	ROOM 147A	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10092003-23-019		150	ROOM 150	WIPE	04Z0115	BERYLLIUM AND B	0.5490 _ UG/100CM2 (2)
991-10092003-23-020		165	ROOM 165	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10092003-23-021		165	ROOM 165	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10092003-23-022		164	ROOM 164	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10092003-23-023		162	ROOM 162	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2

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Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration
SSOC							
SIMPSON, MARK W							
991-10092003-23-024		161	ROOM 161	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10092003-23-025		140	ROOM 140	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10092003-23-026		141	ROOM 141	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10092003-23-027		151	ON TOP VENT DUCT - SW SECTION OF ROOM	WIPE	04Z0115	BERYLLIUM AND B	0.6120 _ UG/100CM2 (1)
991-10092003-23-028		142	ROOM 142	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10092003-23-029		170	ROOM 170	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10092003-23-030		134	ROOM 134	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10092003-23-031		156	ROOM 156	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10092003-23-032		157	ROOM 157	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10142003-23-001		BASEMENT	BASEMENT	WIPE	04Z0115	BERYLLIUM AND B	0.5550 _ UG/100CM2 (2)
991-10142003-23-002		BASEMENT	BASEMENT	WIPE	04Z0115	BERYLLIUM AND B	0.6230 _ UG/100CM2 (2)
991-10142003-23-003		BASEMENT	BASEMENT	WIPE	04Z0115	BERYLLIUM AND B	0.2900 _ UG/100CM2 (2)
991-10142003-23-004		BASEMENT	BASEMENT	WIPE	04Z0115	BERYLLIUM AND B	0.1960 _ UG/100CM2 (2)
991-10142003-23-005		BASEMENT	BASEMENT	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10142003-23-006		BASEMENT	BASEMENT	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10142003-23-007		BASEMENT	BASEMENT	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10142003-23-008		BASEMENT	BASEMENT	WIPE	04Z0115	BERYLLIUM AND B	0.2480 _ UG/100CM2 (2)
991-10142003-23-009		BASEMENT	BASEMENT	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2

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Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration
SSOC							
SIMPSON, MARK W							
991-10142003-23-010		BASEMENT	BASEMENT	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10142003-23-011		BASEMENT	BASEMENT	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10142003-23-012		BASEMENT	BASEMENT	WIPE	04Z0115	BERYLLIUM AND B	0.1870 _ UG/100CM2 (2)
991-10142003-23-013		BASEMENT	BASEMENT	WIPE	04Z0115	BERYLLIUM AND B	0.1400 _ UG/100CM2 (2)
991-10142003-23-014		BASEMENT	BASEMENT	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10142003-23-015		BASEMENT	BASEMENT	WIPE	04Z0115	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10152003-23-049		161	NORTH WALL	WIPE	04Z0294	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10152003-23-050		161	EAST WALL	WIPE	04Z0294	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10152003-23-051		161	NORTH WALL	WIPE	04Z0294	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10152003-23-052		161	E-14 SW CORNER ROOF 5953	WIPE	04Z0294	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10152003-23-053		161	E-16 BETWEEN ROOF 5962 AND PLENUM	WIPE	04Z0294	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10152003-23-054		161	SE CORNER MAIN PLENUM E-20	WIPE	04Z0294	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10152003-23-055		161	EAST END MAIN PLENUM	WIPE	04Z0294	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10152003-23-056		161	E-18 NE CORNER MAIN PLENUM	WIPE	04Z0294	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10152003-23-057		161	E-1 NE CORNER MAIN PLENUM	WIPE	04Z0294	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10152003-23-058		161	N SIDE MAIN PLENUM	WIPE	04Z0294	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10152003-23-059		161	N SIDE MAIN PLENUM	WIPE	04Z0294	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10152003-23-060		161	E ROOF RADIO EXHAUST FAN	WIPE	04Z0294	BERYLLIUM AND B	< 0.1000 _ UG/100CM2

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Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration
SSOC							
SIMPSON, MARK W							
991-10152003-23-061		161	E-2 E ROOF	WIPE	04Z0294	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10152003-23-062		161	E-8 E ROOF	WIPE	04Z0294	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10152003-23-063		161	E-22 S ROOF	WIPE	04Z0294	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10152003-23-064		161	E-12 CENTER OF S ROOF	WIPE	04Z0294	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10152003-23-065		161	E-11 SW CORNER OF ROOF	WIPE	04Z0294	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10152003-23-066		161	EXHAUST FAN RF-1	WIPE	04Z0294	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10152003-23-067		161	E-23 NW CORNER OF MAIN ROOF	WIPE	04Z0294	BERYLLIUM AND B	0.1530 _ UG/100CM2 (1)
991-10152003-23-068		161	E-25 NW CORNER OF MAIN ROOF	WIPE	04Z0294	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10172003-23-001		134	RUBBER BOOTS	WIPE	04Z0160	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10172003-23-002		134	RUBBER BOOTS	WIPE	04Z0160	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-001		OUTSIDE	DUCTING ON DOCK	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-002		CORRIDOR B	Y HALLWAY FLOOR S END	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-003		CORRIDOR B	TOP OF LAMPSHADE IN W TUNNEL	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-004		CORRIDOR B	ANGLE SECTION EAST TUNNEL	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-005		OUTSIDE	SLA-15 LIFT IN WEST TUNNEL	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-006		OUTSIDE	LAMPSHADE IN ROLL-OFF	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-007		OUTSIDE	LAMPSHADE IN ROLL-OFF	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-008		OUTSIDE	LAMPSHADE IN ROLL-OFF	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2

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Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration
SSOC							
SIMPSON, MARK W							
991-10202003-23-009		OUTSIDE	LAMPSHADE IN ROLL-OFF	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-010		OUTSIDE	LAMPSHADE IN ROLL-OFF	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-011		OUTSIDE	LAMPSHADE IN ROLL-OFF	WIPE	04Z0165	BERYLLIUM AND B	0.1640 _ UG/100CM2 (1)
991-10202003-23-012		170	REFRIGERATOR UNIT IN RM 170	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-013		170	REFRIGERATOR UNIT IN RM 170	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-019		140	LAB HOOD WEST SIDE WALL	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-020		140	LAB HOOD BACK SOUTH WALL	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-021		140	LAB HOOD EAST SIDE WALL	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-023		101	EAST EXIT	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-024		126	EAST END OF HALLWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-025		105	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-026		106	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-027		107	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-028		108	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-029		109	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-030		110	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-031		110A	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-032		110B	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2

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Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration
SSOC							
SIMPSON, MARK W							
991-10202003-23-033		111	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-034		111A	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-035		114	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-036		112	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-037		113	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-038		115	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-039		116	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-040		118	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-041		117	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-042		119	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-043		120	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-044		122	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-045		122A	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-046		122B	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-047		123	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-048		124	WEST DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-049		124	EAST DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-050		128	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2

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Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration
SSOC							
SIMPSON, MARK W							
991-10202003-23-051		128A	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-052		129	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-053		131	DOORWAY BETWEEN 131 AND 131A	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-054		131	DOORWAY BETWEEN 131 AND 131A	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-055		131	DOORWAY BETWEEN 131A AND 131B	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-056		130	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-057		130	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-058		130	BETWEEN 130 AND 137	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-059		130	BETWEEN 137 AND 166	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-060		130	166 AND THE DOCK	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-061		138	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-062		156	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-063		160	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-064		162	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-065		164	BETWEEN 164 AND 165	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-066		163	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-067		161	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-068		157	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2

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Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration
SSOC							
SIMPSON, MARK W							
991-10202003-23-069		158	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-070		ADMIN. HALLWAY	HALLWAY TO 998	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-071		155	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-072		151	EAST	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-073		151	WEST DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-074		150	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-075		149	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-076		148	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-077		147	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-078		142	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-079		140	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-080		140	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-081		140	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-082		140	DOORWAY	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-083		140	BETWEEN 140 AND 140A	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-084		131B	BETWEEN 131B AND 134	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-085		134	BETWEEN 134 AND 132	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-086		134	BETWEEN 134 AND 135	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2

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Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration
SSOC							
SIMPSON, MARK W							
991-10202003-23-087		134	BETWEEN 134 AND 136	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-088		136	BETWEEN 136 AND 170	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-089		170	170 AND OUTSIDE DOCK	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-090		153	HALLWAY 153	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-091		153	HALLWAY 153	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10202003-23-092		153	HALLWAY 153	WIPE	04Z0165	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-001		131	BETWEEN 131 AND 131A OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-002		131	CENTRAL OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-003		131	SOUTH OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-004		B998	HALLWAY TO 998 - SOUTH OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-005		B998	HALLWAY TO 998 - MID (S) OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-006		B998	HALLWAY TO 998 - MID (N) OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-007		B998	HALLWAY TO 998 - NORTH OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-008		B998	998 HALLWAY - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-009		158	NW CORNER - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-010		157	SE CORNER - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-011		B998	HALLWAY TO 998 - NORTH - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-012		160	SOUTH CENTRAL - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2

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Sample [illegible]esults Report

SURFACE

Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration

SSOC

SIMPSON, MARK W

Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration
991-10212003-23-013		161	SOUTH - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-014		162	NORTH CENTRAL - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-015		163	SOUTH - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-016		164	SW CORNER - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-017		165	NW CORNER - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-018		153	153 HALLWAY EAST - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-019		153	153 HALLWAY EAST - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-020		153	153 HALLWAY CENTER (E) - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-021		153	153 HALLWAY CENTER (W) - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-022		153	153 HALLWAY CENTER (W) - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-023		153	153 HALLWAY CENTER (W) - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-024		153	153 HALLWAY WEST - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-025		149	NORTH - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-026		148	SW CORNER - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-027		148	EAST CENTRAL - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-028		147A	NORTH - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-029		134	134/132 EAST - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-030		134	SOUTH - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2

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Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration
SSOC							
SIMPSON, MARK W							
991-10212003-23-031		134	NORTH - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-032		134	NORTH - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-033		170	EAST - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-034		170	CENTRAL - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-035		170	WEST - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-036		170	SOUTH - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-037		147	SE CORNER - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-038		142	SOUTH - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-039		142B	SOUTH - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-040		142A	SOUTH - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-041		150	SOUTH - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-042		150	SOUTH - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-043		150	SW CORNER - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-044		150	SW CORNER - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	0.4780 _ UG/100CM2 (2)
991-10212003-23-045		150	WEST - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-046		150	WEST - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	0.6770 _ UG/100CM2 (2)
991-10212003-23-047		150	NORTH - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-048		150	MID-ROOM - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2

Industrial Hygi[redacted]Information System
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Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration
SSOC							
SIMPSON, MARK W							
991-10212003-23-049		150	NORTH - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-050		150	NE CORNER - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-051		150	EAST - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-052		150	SE CORNER - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-053		150	EAST - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-054		150	MID-ROOM - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-055		151	WEST - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-056		151	NW CORNER - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	0.1790 _ UG/100CM2 (2)
991-10212003-23-057		151	MID-ROOM - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-058		151	MID-ROOM - OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-059		150	SOUTH - WALLS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-060		150	SOUTH - WALLS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-061		150	SW CORNER - WALLS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-062		150	WEST - WALLS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-063		150	NW CORNER - WALLS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-064		150	NORTH - WALLS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-065		150	NORTH - WALLS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-066		150	NE CORNER - WALLS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2

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SURFACE

Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration

SSOC

SIMPSON, MARK W

Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration
991-10212003-23-067		150	SE CORNER - WALLS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-068		150	SE CORNER - WALLS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-069		150	SOUTH - FLOORS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-070		150	SOUTH - FLOORS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-071		150	SW CORNER - FLOORS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-072		150	WEST - FLOORS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-073		150	NW CORNER - FLOORS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-074		150	NORTH - FLOORS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-075		150	NE CORNER - FLOORS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-076		150	NE CORNER - FLOORS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-077		150	EAST/MIDDLE - FLOORS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-078		150	WEST/MIDDLE - FLOORS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-079		151	SOUTH - WALLS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-080		151	SOUTH - WALLS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-081		151	SW CORNER - WALLS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-082		151	NW CORNER - WALLS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-083		151	NORTH - WALLS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-084		151	NORTH - WALLS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2

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Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration
SSOC							
SIMPSON, MARK W							
991-10212003-23-085		151	NORTH - WALLS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-086		151	EAST - WALLS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-087		151	SE CORNER - WALLS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-088		151	SE CORNER - WALLS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-089		151	SOUTH - FLOORS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-090		151	SW CORNER - FLOORS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-091		151	WEST - FLOORS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-092		151	NW CORNER - FLOORS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-093		151	NORTH - FLOORS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-094		151	NORTH - FLOORS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-095		151	NE CORNER - FLOORS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-096		151	SE CORNER - FLOORS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-097		151	SE CORNER - FLOORS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-098		151	MID-FLOOR - FLOORS	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-105		130	130Y - CIRCUIT BOARDS -01	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-106		166	OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-107		166	OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-108		166	OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2

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Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration
SSOC							
SIMPSON, MARK W							
991-10212003-23-109		166	OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-110		166	OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-111		137	OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-112		137	OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-113		137	OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-114		137	OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-115		137	OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-116		130	OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-117		130	OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-118		130	OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-119		130	OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-120		130	OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-121		151	OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-122		150	OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-123		146	OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-124		146	OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-125		146	OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-126		143	OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2

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Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration
SSOC							
SIMPSON, MARK W							
991-10212003-23-127		143	OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-128		140	OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-129		140	OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-130		140	OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-131		156	OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-132		156	OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-133		155	OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-134		155	OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-135		155	OVERHEAD	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-136		153	HALLWAY CEILING	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-137		153	HALLWAY	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-138		153	HALLWAY	WIPE	04Z0169	BERYLLIUM AND B	0.1340 _ UG/100CM2 (2)
991-10212003-23-139		153	HALLWAY	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-140		153	HALLWAY	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10212003-23-141		151	HALLWAY	WIPE	04Z0169	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10282003-23-002		167	FLAMMABLE CABINET SOUTH	WIPE	04Z0223	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10282003-23-003		167	FLAMMABLE CABINET NORTH	WIPE	04Z0223	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10282003-23-004		167	RED TOOL CABINET	WIPE	04Z0223	BERYLLIUM AND B	< 0.1000 _ UG/100CM2

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Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration
SSOC							
SIMPSON, MARK W							
991-10282003-23-005		167	PAINT HOOD	WIPE	04Z0223	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10282003-23-006		167	FLOOR	WIPE	04Z0223	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10282003-23-007		115	DUCT AIR CHASE	WIPE	04Z0223	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-10282003-23-008		OUTSIDE	Y TUNNEL	WIPE	04Z0223	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11032003-23-002		402	CONFINE SPACE	WIPE	04Z0269	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11032003-23-003		402	CONFINE SPACE	WIPE	04Z0269	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11052003-23-002		170	SHELF #1	WIPE	04Z0269	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11052003-23-003		170	SHELF #2	WIPE	04Z0269	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11052003-23-004		170	SHELF #3	WIPE	04Z0269	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11052003-23-005		170	SHELF SECTION 11	WIPE	04Z0269	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11052003-23-006		170	SHELF SECTION 28	WIPE	04Z0269	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11052003-23-007		170	SHELF SECTION 25	WIPE	04Z0269	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11052003-23-008		170	SHELF SECTION 8	WIPE	04Z0269	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11052003-23-009		170	SHELF SECTION 8	WIPE	04Z0269	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11052003-23-010		170	SHELF SECTION 13	WIPE	04Z0269	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11052003-23-011		170	SHELF SECTION 12	WIPE	04Z0269	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11052003-23-012		170	SHELF SECTION 2	WIPE	04Z0269	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11142003-23-001		991 PLENUM	INSIDE VENTILATION DUCT NW CORNER CLEAN SIDE	WIPE	04Z0379	BERYLLIUM AND B	< 0.1000 _ UG/100CM2

SURFACE

Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration

SSOC

SIMPSON, MARK W

Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration
991-11142003-23-002		991 PLENUM	INSIDE VENTILATION DUCT CENTRAL CLEAN SIDE	WIPE	04Z0379	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11142003-23-003		991 PLENUM	CLEAN SIDE FILTER LEDGE NW SIDE	WIPE	04Z0379	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11142003-23-004		991 PLENUM	NW CLEAN SIDE FLOOR	WIPE	04Z0379	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11142003-23-005		991 PLENUM	CLEAN SIDE INSIDE MIDDLE VENT DUCT	WIPE	04Z0379	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11142003-23-006		991 PLENUM	CLEAN SIDE FLOOR NEAR NORTH WALL EAST SIDE	WIPE	04Z0379	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11142003-23-007		991 PLENUM	CLEAN SIDE INSIDE NE VENT DUCT	WIPE	04Z0379	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11142003-23-008		991 PLENUM	CLEAN SIDE INSIDE NEFILTER BANK LEDGE	WIPE	04Z0379	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11142003-23-009		991 PLENUM	DIRTY SIDE INSIDE SUBMARINE DOOR	WIPE	04Z0379	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11142003-23-010		991 PLENUM	DIRTY SIDE ON FLOOR 10 FT IN FROM SUBMARINE DOOR	WIPE	04Z0379	BERYLLIUM AND B	0.2020 _ UG/100CM2 (2)
991-11142003-23-011		991 PLENUM	DIRTY SIDE ON FLOOR 15 FT IN FROM SUBMARINE DOOR	WIPE	04Z0379	BERYLLIUM AND B	< 0.2280 _ UG/100CM2 (2)
991-11142003-23-012		991 PLENUM	DIRTY SIDE UNDER FILTER BANK NORTH WALL	WIPE	04Z0379	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11142003-23-013		991 PLENUM	DIRTY SIDE FLLOR NEAR MIDDLE VENT DUCT	WIPE	04Z0379	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11142003-23-014		991 PLENUM	DIRTY SIDE MIDDLE OF PLENUM NORTH WALL 5 FT FROM F	WIPE	04Z0379	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11142003-23-015		991 PLENUM	DIRTY SIDE MIDDLE VENT DUCT SW CORNER	WIPE	04Z0379	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11142003-23-016		991 PLENUM	DIRTY SIDE MIDDLE VENT DUCT INSIDE	WIPE	04Z0379	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11142003-23-017		991 PLENUM	DIRTY SIDE MIDDLE AREA WALK THROUGH DOOR LEDGE	WIPE	04Z0379	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11142003-23-018		991 PLENUM	DIRTY SIDE SW VENT DUCT NEAR BOTTOM OF DEFL PLATE	WIPE	04Z0379	BERYLLIUM AND B	< 0.1000 _ UG/100CM2

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Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration
SSOC							
SIMPSON, MARK W							
991-11142003-23-019		991 PLENUM	DIRTY SIDE FLOOR BELOW DEFLECTOR PLATE	WIPE	04Z0379	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11142003-23-020		991 PLENUM	DIRTY SIDE S WALL 7 FT FROM FLOOR	WIPE	04Z0379	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11142003-23-021		991 PLENUM	DIRTY SIDE INSIDE SW VENT DUCT DEFLECTOR PLATE	WIPE	04Z0379	BERYLLIUM AND B	0.2780 _ UG/100CM2 (1)
991-11142003-23-022		991 PLENUM	DIRTY SIDE LEDGE OF PRESCREEN SW SIDE	WIPE	04Z0379	BERYLLIUM AND B	0.1220 _ UG/100CM2 (1)
991-11142003-23-023		991 PLENUM	DIRTY SIDE WALL 6 FT FROM FLOOR SW CORNER	WIPE	04Z0379	BERYLLIUM AND B	0.1470 _ UG/100CM2 (1)
991-11142003-23-024		991 PLENUM	DIRTY SIDE FLOOR BELOW SW VENT DUCT	WIPE	04Z0379	BERYLLIUM AND B	0.4820 _ UG/100CM2 (1)
991-11142003-23-025		991 PLENUM	DIRTY SIDE FLOOR 10 FOOT EAST OF SW VENT DUCT	WIPE	04Z0379	BERYLLIUM AND B	0.4450 _ UG/100CM2 (1)
991-11182003-23-003		131B	HEATING WATER RETURN LINE	WIPE	04Z0435	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11182003-23-004		131B	RED FIRE PIPE	WIPE	04Z0435	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11182003-23-005		131B	HANGER	WIPE	04Z0435	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11182003-23-006		131B	ELECTRICAL CONDUIT	WIPE	04Z0435	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11182003-23-007		131B	ELECTRICAL CONDUIT	WIPE	04Z0435	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11182003-23-008		153	TOP OF FIRE PIPE	WIPE	04Z0435	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11182003-23-009		153	TOP OF CONDUIT RACK	WIPE	04Z0435	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11182003-23-010		153	HEATING LINE SUPPLY	WIPE	04Z0435	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11182003-23-011		153	TOP OF LIGHT FIXTURE	WIPE	04Z0435	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11182003-23-012		153	TOP OF 3" FIRE LINE	WIPE	04Z0435	BERYLLIUM AND B	0.1550 _ UG/100CM2 (1)
991-11182003-23-013		153	TOP OF 1" CONDUIT	WIPE	04Z0435	BERYLLIUM AND B	< 0.1000 _ UG/100CM2

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Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration
SSOC							
SIMPSON, MARK W							
991-11182003-23-014		153	TOP OF LIGHT FIXTURE	WIPE	04Z0435	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11182003-23-015		153	TOP OF WIRE RUN	WIPE	04Z0435	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11182003-23-016		153	TOP OF 2" FIRE PIPE	WIPE	04Z0435	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11182003-23-017		153	TOP OF RACK	WIPE	04Z0435	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11182003-23-018		153	TOP OF TSI	WIPE	04Z0435	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11182003-23-019		153	TOP OF 3" CONDUIT	WIPE	04Z0435	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11182003-23-020		153	TOP OF J BOX	WIPE	04Z0435	BERYLLIUM AND B	0.1060 _ UG/100CM2 (1)
991-11182003-23-021		153	TOP OF 1" CONDUIT	WIPE	04Z0435	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11182003-23-022		153	TOP OF INSULATED VENT DUCT	WIPE	04Z0435	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-11192003-23-003		BASEMENT	STEP OFF PAD	WIPE	04Z0445	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12162003-23-001		998 TUNNEL	SEE MAP ATTACHED	WIPE	04Z0600	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12162003-23-002		998 TUNNEL	SEE MAP ATTACHED	WIPE	04Z0600	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12162003-23-003		998 TUNNEL	SEE MAP ATTACHED	WIPE	04Z0600	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12162003-23-004		998 TUNNEL	SEE MAP ATTACHED	WIPE	04Z0600	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12162003-23-005		998 TUNNEL	SEE MAP ATTACHED	WIPE	04Z0600	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12162003-23-006		998 TUNNEL	SEE MAP ATTACHED	WIPE	04Z0600	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12162003-23-007		998 TUNNEL	SEE MAP ATTACHED	WIPE	04Z0600	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12162003-23-008		998 TUNNEL	SEE MAP ATTACHED	WIPE	04Z0600	BERYLLIUM AND B	< 0.1000 _ UG/100CM2

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Sample Number	Work Pkg	Room	Location	Type	Rin No	Analyte	Concentration
SSOC							
SIMPSON, MARK W							
991-12162003-23-009		998 TUNNEL	SEE MAP ATTACHED	WIPE	04Z0600	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12162003-23-010		998 TUNNEL	SEE MAP ATTACHED	WIPE	04Z0600	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12162003-23-011		998 TUNNEL	SEE MAP ATTACHED	WIPE	04Z0600	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12162003-23-012		998 TUNNEL	SEE MAP ATTACHED	WIPE	04Z0600	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12162003-23-013		998 TUNNEL	SEE MAP ATTACHED	WIPE	04Z0600	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12162003-23-014		998 TUNNEL	SEE MAP ATTACHED	WIPE	04Z0600	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12292003-23-001		B998	DOORWAY OF 998 WEST DOOR	WIPE	04Z0695	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12292003-23-002		B998	DOORWAY OF 998 EAST DOOR	WIPE	04Z0695	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12292003-23-004		150	ROOM 105 DOORWAY EAST & WEST DOORS	WIPE	04Z0695	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12292003-23-005		N/A	HEPA VACUUM	WIPE	04Z0695	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12292003-23-006		BASEMENT	URS DRILL PIECE	WIPE	04Z0695	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12292003-23-007		N/A	URS CORE STEM	WIPE	04Z0695	BERYLLIUM AND B	< 0.1000 _ UG/100CM2
991-12292003-23-008		N/A	URS TOOLS/EXT. CORD AND MISC TOOLS	WIPE	04Z0695	BERYLLIUM AND B	< 0.1000 _ UG/100CM2

Building Subtotal: 500
Hygienist Subtotal: 500
Company Subtotal: 500
Grand Total 526

ATTACHMENT C-3

RCRA/CERCLA (TCLP Metals) Data Summaries and Sample Maps

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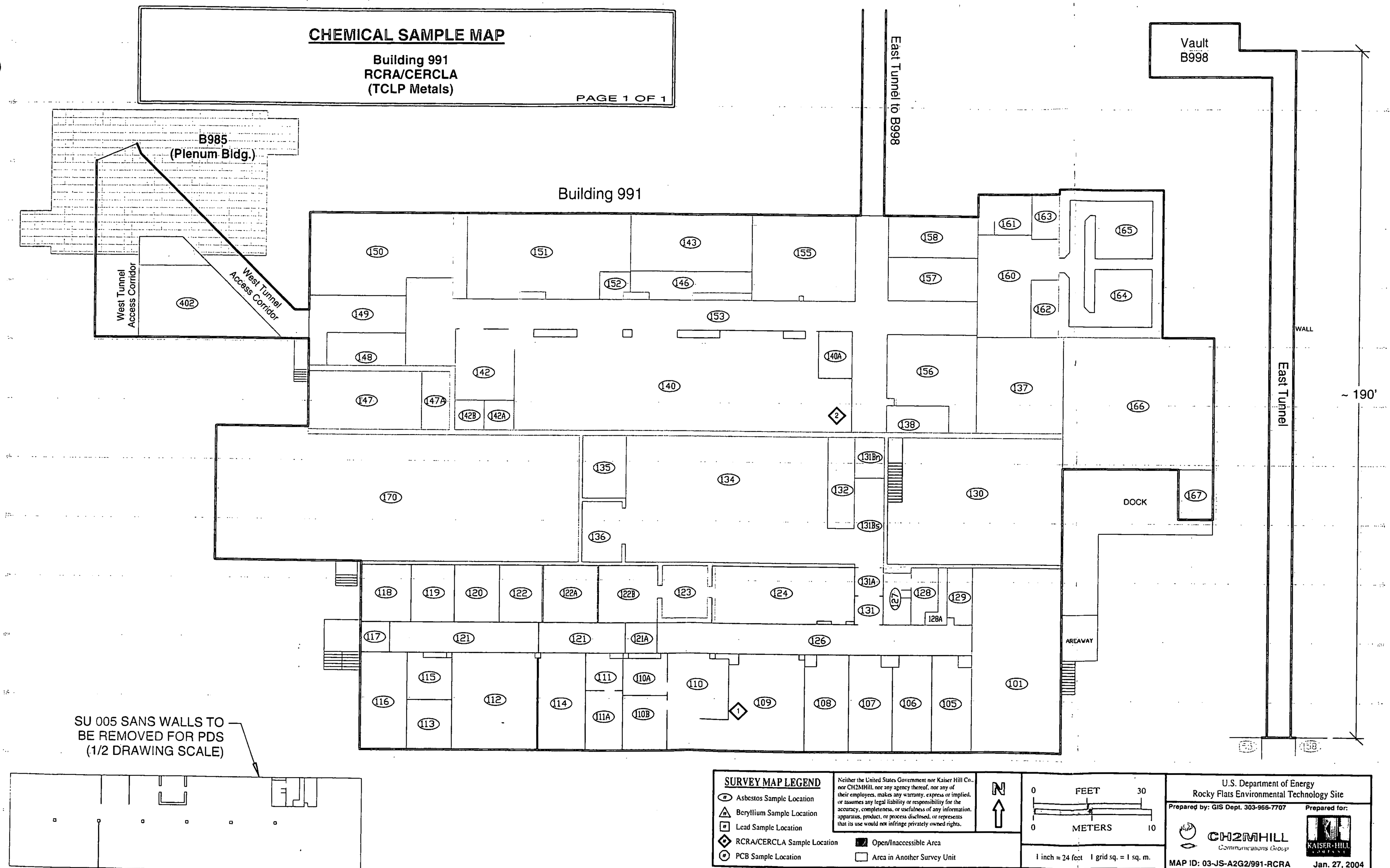
TABLE C-2: BUILDING 991 RCRA METALS DATA SUMMARY

Sample Location	Sample Number	Result (*mg/kg*)
B991 Rm#109	04D0188-001	Below Regulatory Limits
B991 Rm#140	04D0188-002	Below Regulatory Limits

RCRA Metals Toxicity Characteristic Limits

Analyte	Regulatory limit (mg/L)
Arsenic (D004)	5.0
Barium (D005)	100.0
Cadmium (D006)	1.0
Chromium (D007)	5.0
Lead (D008)	5.0
Mercury (D009)	0.2
Selenium (D010)	1.0
Silver (D011)	5.0

(a) Quantitation Limit is greater than the calculated regulatory level. The quantitation limit therefore becomes the regulatory level.
(b) If o-, m-, and p-Cresol concentrations cannot be differentiated, the total Cresol (D026) concentration (200mg/l) is used.



CHEMICAL SAMPLE MAP
Building 991
RCRA/CERCLA
(TCLP Metals)
PAGE 1 OF 1
B985
(Plenum Bldg.)
Building 991
East Tunnel to B998
Vault
B998
West Tunnel Access Corridor
West Tunnel Access Corridor
East Tunnel
WALL
~ 190'
DOCK
AREAWAY
150
151
143
155
158
161
163
165
152
146
157
160
162
164
402
149
153
148
142
140A
140
156
137
166
147
147A
142B
142A
138
135
134
131Bn
132
130
167
170
136
131Bs
118
119
120
122
122A
122B
123
124
131A
127
128
129
131
128A
117
121
121
121A
126
115
111
110A
110
116
112
114
109
108
107
106
105
101
113
111A
110B
SU 005 SANS WALLS TO
BE REMOVED FOR PDS
(1/2 DRAWING SCALE)
SURVEY MAP LEGEND
Asbestos Sample Location
Beryllium Sample Location
Lead Sample Location
RCRA/CERCLA Sample Location
PCB Sample Location
Open/Inaccessible Area
Area in Another Survey Unit
Neither the United States Government nor Kaiser Hill Co., nor CH2MHill, nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights.
N
FEET
0
30
METERS
0
10
1 inch = 24 feet
1 grid sq. = 1 sq. m.
U.S. Department of Energy
Rocky Flats Environmental Technology Site
Prepared by: GIS Dept. 303-966-7707
Prepared for:
CH2MHILL
Communications Group
KAISER-HILL
MAP ID: 03-JS-A2G2/991-RCRA
Jan. 27, 2004

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ATTACHMENT D

Data Quality Assessment (DQA) Detail

DATA QUALITY ASSESSMENT (DQA)

VERIFICATION & VALIDATION (V&V) OF RESULTS

V&V of the data confirm that appropriate quality controls are implemented throughout the sampling and analysis process, and that any substandard controls result in qualification or rejection of the data in question. The required quality controls and their implementation are summarized in a tabular, checklist format for each category of data – radiological surveys and chemical analyses (specifically beryllium and metals).

DQA criteria and results are provided in a tabular format for each suite of surveys or chemical analyses performed. The radiological survey assessment is provided in Table D-1, beryllium in Table D-2 and Metals in Table D-3. A data completeness summary for all results is given in Table D-4.

All relevant Quality records supporting this report are maintained in the RISS Characterization Project File. The report will be submitted to the CERCLA Administrative Record for permanent storage within 30 days of approval by the Regulators. All radiological data are organized into Survey Packages, which correlate to unique (MARSSIM) Survey Units. Chemical data are organized by RIN (Report Identification Number) and are traceable to the sample number and corresponding sample location.

Beta/gamma survey designs were not implemented for this PDS based on the conservatism of the transuranic limits used as DCGLs in the unrestricted release decision process. Survey designs were implemented for Building 991, 991 East Tunnel and 998 Vault based on the transuranic limits used as DCGLs in the unrestricted release decision process. All survey results were evaluated against, and were less than the Transuranic $DCGL_W$ (100 dpm/100cm^2) and the Uranium $DCGL_W$ (5,000 dpm/100cm^2) unrestricted release limits. Media samples were taken and analyzed by ISOCS Canberra gamma spectroscopy. Transuranic isotope activity and Uranium and/or other naturally occurring isotope activity were evaluated against, and were less than the Transuranic $DCGL_W$ (100 dpm/100cm^2) and the Uranium $DCGL_W$ (5,000 dpm/100cm^2) unrestricted release limits. Media results were converted to dpm/100cm^2 using the Media Conversion Table, evaluated against the transuranic and uranium DCGL limits, and are the values reported in the Radiological TSA Data Summary in support of the unrestricted release decision process. On this basis, all results were less than the PDSP unrestricted release limits.

Consistent with EPA's G-4 DQO process, the radiological survey design for each survey unit performed per PDS requirements was optimized by checking actual measurement results acquired during pre-demolition surveys against the model output with original estimates. Use of actual sample/survey (result) variances in the MARSSIM DQO model confirms that an adequate number of surveys were acquired.

DQA SUMMARY

In summary, the data presented in this report have been verified and validated relative to the quality requirements and project decisions as stated in the original DQOs. All data are useable based on qualifications stated herein and are considered satisfactory without qualification. All media surveyed and sampled yielded results less than their associated action levels and with acceptable certainties. However the following anomalous conditions were investigated and dispositioned as follows:

- During scanning of the 998 Vault, net activity (475.6 dpm/100cm^2) greater than the transuranic DCGL$_w$ of 100 dpm/100cm^2 was identified. This area was assigned sample location #17 and a coupon sample was taken and analyzed by gamma spectroscopy. No transuranic isotopes were detected. Activity was determined to be uranium and naturally occurring isotopes. The gamma spectroscopy results were converted to dpm/cm^2 using the Media Conversion Table. The resulting sample net activity was below the Uranium DCGL$_w$ (5,000 dpm/100cm^2), therefore, no further investigation was required.
- Initial net activity at locations #41 (106.7 dpm/100cm^2) and #42 (111.1 dpm/100cm^2) were identified in survey unit 991-2-EXH greater than the Transuranic DCGL$_w$ (100 dpm/100cm^2). The locations were sealed, allowed to decay and resurveyed. Re-survey results were below the Transuranic DCGL$_w$ and are the values reported in the PDS data summary. No further investigation required.
- Initial net activity was identified in survey unit 991-2-001 greater than the Transuranic DCGL$_w$ (100 dpm/100cm^2) at location #26 (318.8 dpm/100cm^2). The area was sealed, allowed to decay and re-surveyed. The re-survey result was less than the Transuranic DCGL and is the value reported in the TSA Data Summary. No further investigation required.
- Activity greater than the Transuranic DCGL$_W$ (100 dpm/100cm^2) was identified in survey unit 991-2-002 during scan surveys (18,287.8 dpm/100cm^2). A coupon sample was taken and assigned sample number #21. The coupon sample was analyzed by OASIS and results did not detect any transuranic activity greater than the Transuranic DCGL (100 dpm/100cm^2). Therefore, the area was decontaminated and resurveyed to the uranium unrestricted release limits. All results were less than the Uranium DCGL (5,000 dpm/100cm^2), therefore, no further investigation is required. Refer to the PDS Data Summary, sample numbers #22 through #30, for the sample results.
- There are no maps for the in-process Beryllium sampling locations. However, the in process Beryllium sampling results and sample location descriptions can be found in Attachment C-2, *In-Process Beryllium Sample Results.*

Based upon an independent review of the radiological data, it was determined that the original project DQOs satisfied MARSSIM guidance. All facility contamination levels were below applicable PDSP DCGL unrestricted release levels confirming the Type 2 facility classification. Minimum survey requirements were met, sampling/survey protocol was performed in accordance with applicable RSPs, survey units were properly designed and bounded, and instrument performance and calibration was within acceptable limits. All results meet the PDS unrestricted release criteria.

Chain of Custody was intact; documentation was complete, hold times were acceptable (where applicable,) and packaging integrity/custody seals were maintained throughout the sampling/analysis process. Level 2 Isolation Controls have been posted to prevent the inadvertent introduction of contamination into Building 991, 991 East Tunnel and 998 Vault. On this basis, Building 991, 991 East Tunnel and 998 Vault meet the PDSP unrestricted release criteria with the confidences stated herein.

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Table D-1 V&V of Radiological Results - Building 991, 991 East Tunnel and 998 Vault

V&V CRITERIA, RADIOLGICAL SURVEYS		K-H RSP 16.00 Series MARSSIM (NUREG-1575)		
QUALITY REQUIREMENTS				
	Parameters	Measure	Frequency	COMMENTS
ACCURACY	Initial calibrations	90%<x<110%	≥1	Multi-point calibration through the measurement range encountered in the field; programmatic records.
	Daily source checks	80%<x<120%	≥1/day	Performed daily/within range.
	Local area background: Field	Typically < 10 dpm	≥1/day	All local area backgrounds were within expected ranges (i.e., no elevated anomalies.)
PRECISION	Field duplicate measurements for TSA	≥5% of real survey points	≥10% of reals	N/A
REPRESENTATIVENESS	MARSSIM methodology: Survey Units 991-2-001, 991-2-002, 991-2-003, 991-2-004, 991-2-005, 991-2-006, 991-2-007 and 991-2-008 (interior).	Statistical and biased	NA	Random w/ statistical confidence.
	Survey Maps	NA	NA	Random and biased measurement locations controlled/mapped to ±1m.
	Controlling Documents (Characterization Pkg; RSPs)	qualitative	NA	Refer to the Characterization Package (planning document) for field/sampling procedures (located in Project files); thorough documentation of the planning, sampling/analysis process, and data reduction into formats.
COMPARABILITY	Units of measure	dpm/100cm^2	NA	Use of standardized engineering units in the reporting of measurement results.
COMPLETENESS	Plan vs. Actual surveys Usable results vs. unusable	>95% >95%	NA	See Table D-4 for details.
SENSITIVITY	Detection limits	TSA: ≤50 dpm/100cm^2 RA: ≤10 dpm/100cm^2	all measures	PDS MDAs ≤ 50% $DCGL_w$

Table D-2 V&V of Beryllium Results - Building 991, 991 East Tunnel and 998 Vault

V&V CRITERIA, CHEMICAL ANALYSES		DATA PACKAGE		
BERYLLIUM	**Prep: NMAM 7300** **METHOD: OSHA ID-125G**	**LAB --->**	Johns Manville, Littleton, Colorado	
		RIN ---->	Numerous RIN #'s – see Table D-4	
QUALITY REQUIREMENTS		**Measure**	**Frequency**	**COMMENTS**
ACCURACY	**Calibrations** Initial	Linear calibration	≥1	No qualifications significant enough to change project decisions, i.e. classification of Type 2 Facilities confirmed; all final PDS results were below associated action levels.
	Continuing	80%<%R<120%	≥1	
	LCS/MS	80%<%R<120%	≥1	
	Blanks – lab & field	<MDL	≥1	
	Interference check std (ICP)	NA	NA	
PRECISION	LCSD	80%<%R<120% (RPD<20%)	≥1	
	Field duplicate	All results < RL	≥1	
REPRESENTATIVENESS	COC	Qualitative	NA	
	Hold times/preservation	Qualitative	NA	
	Controlling Documents (Plans, Procedures, maps, etc.)	Qualitative	NA	
COMPARABILITY	Measurement units	Ug/100cm^2	NA	
COMPLETENESS	Plan vs. Actual samples Usable results vs. unusable	>95% >95%	NA	
SENSITIVITY	Detection limits	MDL of 0.012 ug/100cm^2	all measures	

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Table D-3 V&V of Metals – Building 991, 991 East Tunnel and 998 Vault

V&V CRITERIA, CHEMICAL ANALYSES			DATA PACKAGE		
Metals (total)	METHOD: SW6010/6020		LAB --->	Severn-Trent Services, Denver, Co.	
			RIN --->	RIN04D0188 (998 Vault & E. Tunnel)	
QUALITY REQUIREMENT					COMMENTS
			Measure	frequency	
ACCURACY	calibrations	Initial	Linear calibration	≥1/batch	No qualifications significant enough to change project decision, i.e., classification of Type 2 Facilities confirmed; TCLP results well below associated action levels.
		Continuing	80%<%R<120%	≥1/batch	
	LCS		80%<%R<120%	≥1/batch	
	MS		75%<%R<125%	≥1/batch	
	blanks	Lab	mg/kg	≥1/batch	
	serial dilutions		%D<10%	≥1/batch	
	interference check std (ICP)		80%<%R<120%	bracket batch	
PRECISION	MSD		RPD<30%	≥1/batch	
	field duplicate		All results < RL	≥1/batch	
REPRESENTATIVENESS	COC		Qualitative	NA	
	hold times/preservation		≤180 days	NA	
	Controlling Documents (Plans, Procedures, Maps, etc.)		Qualitative	NA	
COMPARABILITY			mg/kg	NA	
COMPLETENESS	Plan vs. Actual samples usable results vs. unusable		>95% >95%	NA	
SENSITIVITY	detection limits		Various	all analytes	

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Table D-4 Data Completeness Summary – Building 991, 991 East Tunnel and 998 Vault

ANALYTE	Building/Area/ Unit	Sample Number Planned (Real & QC)[A]	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
Beryllium	Building 991 Main Level (interior)	66 samples (46 random/20 biased) (interior)	50 samples (46 random/4 biased-interior)	Refer to footnotes in Attachment C-1	10CFR850; OSHA ID-125G RIN04Z0892 – (sample numbers 991-01212004-23-001 through 991-01212004-23-046) Numerous results identified greater than the investigative level (0.1 ug/100cm^2) and/or the action level (0.2 ug/100cm^2). Refer to footnotes in Attachment C-1 for discussion and disposition.
Beryllium	Building 991 Basement Level (interior)	37 samples (27 random/10 biased) (interior)	43 samples (27 random/16 biased) (interior)	Refer to footnotes in Attachment C-1	10CFR850; OSHA ID-125G RIN04Z0790 – (sample numbers 991-01102004-23-001 through 991-01102004-23-027). RIN04Z0969 - (sample numbers 991-01292004-23-111 through 991-01292004-23-114, 991-01292004-23-141 through 991-01292004-23-144, , 991-01292004-23-181 through 991-01292004-23-184 and 991-01292004-23-241 through 991-01292004-23-244). Numerous results identified greater than the investigative level (0.1 ug/100cm^2) and/or the action level (0.2 ug/100cm^2). Refer to footnotes in Attachment C-1 for discussion and disposition.
Beryllium	Building 998 Vault and 991 East Tunnel (interior)	19 samples (14 random/5 biased) (interior)	14 samples (14 random-interior)	No contamination found at any location	10CFR850; OSHA ID-125G RIN04Z0600 – 998 Vault and 991 East Tunnel (sample numbers 991-12162003-23-001 through 991-12162003-23-014). Final results were all below the PDSP investigative level (0.1 ug/100cm^2) and the action level (0.2 ug/100cm^2).

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Table D-4 Data Completeness Summary – Building 991, 991 East Tunnel and 998 Vault

ANALYTE	Building/Area/ Unit	Sample Number Planned (Real & QC)[A]	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
Beryllium	Building 991 Ventilation System, including Roof Plenum and Plenum Filter after vacuuming (interior)	0 samples Samples collected during in-process stripout	116 samples (68 biased in ducting/23 biased and 25 random in plenum)	Refer to footnotes in Attachment C-1	10CFR850; OSHA ID-125G RIN04Z0171 – Building 991 Ventilation System (sample numbers 991-10152003-23-001 through 991-10152003-23-048). RIN04Z0294 – Building 991 Ventilation System (sample numbers 991-10152003-23-49 through 991-10152003-23-68). RIN04Z0379 – Building 991 Roof Plenum (sample numbers 991-11142003-23-001 through 991-111462003-23-025). RIN04Z0589 – Building 991 Roof Filter Plenum after vacuuming (sample numbers 991-01202004-23-001 through 991-012062004-23-011). RIN04Z0969 – Building 991 Roof Plenum (sample numbers 991-01292004-23-601 through 991-01292004-23-604, 991-01292004-23-701 through 991-01292004-23-704 and 991-01292004-23-901 through 991-01292004-23-904). Numerous results identified greater than the investigative level (0.1 ug/100cm^2) and/or the action level (0.2 ug/100cm^2). Refer to the footnotes in Attachment C-1 for discussion and disposition. Sample map show approximate sample locations relative to ventilation duct access points.
Metals	Building 991	0 samples	4 biased (solids)	No metal contamination found, all results were below the regulatory limit	SW 6010/6020 – RIN04D0188

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Table D-4 Data Completeness Summary – Building 991, 991 East Tunnel and 998 Vault

ANALYTE	Building/Area/ Unit	Sample Number Planned (Real & QC)[A]	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
Radiological	Survey Area 2 Survey Unit: 991-2-EXH Bldg. 991 Exhaust Ventilation	1 α TSA at each access location (biased) 25 α TSA and 25 α RSA inside Plenum (60 estimated total - biased) 4 QC TSA 100% scan to 1 m^2 at each ventilation access point	1 α TSA and 1 α RSA at each access location (total of 68 locations-biased) 25 α TSA and 25 α RSA inside Plenum (25 total locations-biased) 5 QC TSA 100% scan to 1 m^2 at each ventilation access point	No contamination at any location; all values below unrestricted release levels	Uranium and/or Transuranic DCGL as applicable. Refer to Attachment D-DQA Summary for discussion regarding initial net activity identified at locations 41 (106.7 dpm/100cm^2) and 42 (111.1 dpm/100cm^2) that were greater than the Transuranic $DCGL_W$ (100 dpm/100cm^2). Sample map show approximate sample locations relative to ventilation duct access points.
Radiological	Survey Area 2 Survey Unit: 991-2-001 Bldg. 991 Interior North Rooms	19 α TSA and 19 α Smears (systematic) 2 QC TSA 50% scan of floor surfaces and 25% of remaining surfaces	26 α TSA and 26 α Smears (systematic) 2 QC TSA 50% scan of floor surfaces and 25% of remaining surfaces	No contamination at any location; all values below unrestricted release levels	Uranium and/or Transuranic DCGL as applicable. Refer to Attachment D-DQA Summary for discussion regarding initial net activity identified at location 26 (318.8 dpm/100cm^2) that was greater than the Transuranic $DCGL_W$ (100 dpm/100cm^2).
Radiological	Survey Area 2 Survey Unit: 991-2-002 Bldg. 991 Interior Center Rooms (interior)	15 α TSA and 15 α Smears (systematic) 2 QC TSA 50% scan of floor surfaces and 25% of remaining surfaces	20 α TSA and 20 α Smears (systematic) 2 QC TSA 50% scan of floor surfaces and 25% of remaining surfaces	No contamination at any location; all values below unrestricted release levels	Uranium and/or Transuranic DCGL as applicable. Refer to Attachment D-DQA Summary for discussion regarding activity identified greater than the Transuranic $DCGL_w$ (100.0 dpm/100cm^2) that was identified during scan surveys (18,287.8 dpm/100cm^2) and subsequently assigned sample number 21.

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Table D-4 Data Completeness Summary – Building 991, 991 East Tunnel and 998 Vault

ANALYTE	Building/Area/ Unit	Sample Number Planned (Real & QC)[A]	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
Radiological	Survey Area 2 Survey Unit: 991-2-003 Bldg. 991 Interior South Rooms (interior)	15 α TSA and 15 α Smears (systematic) 2 QC TSA 50% scan of floor surfaces and 25% of remaining surfaces	15 α TSA and 15 α Smears (systematic) 2 QC TSA 50% scan of floor surfaces and 25% of remaining surfaces	No contamination at any location; all values below unrestricted release levels	Uranium and/or Transuranic DCGL as applicable.
Radiological	Survey Area 2 Survey Unit: 991-2-004 Bldg. 991 East Vault Tunnel and Bldg. 998 Vault (interior)	15 α TSA and 15 α Smears (systematic) 2 QC TSA 50% scan of floor surfaces and 25% of remaining surfaces	16 α TSA and 16 α Smears (systematic) 2 QC TSA 50% scan of floor surfaces and 25% of remaining surfaces	No contamination at any location; all values below unrestricted release levels	Uranium and/or Transuranic DCGL as applicable. During scanning of the 998 vault area, net activity (475.6 dpm/100cm^2) greater than the transuranic DCGL$_w$ (100.0 dpm/100cm^2) was identified. This area was assigned sample location 17 and a coupon sample was taken and analyzed by gamma spectroscopy (RIN03S0205. Refer to Attachment D-DQA Summary regarding the elevated activity and subsequent investigation.
Radiological	Survey Area 2 Survey Unit: 991-2-005 Bldg. 991 – Room 402 and 402A (interior)	15 α TSA and 15 α Smears (systematic) 2 QC TSA 50% scan of floor surfaces and 10% of remaining surfaces	21 α TSA and 21 α Smears (systematic) 2 QC TSA 50% scan of floor surfaces and 10% of remaining surfaces	No contamination at any location; all values below unrestricted release levels	Uranium and/or Transuranic DCGL as applicable.

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Table D-4 Data Completeness Summary – Building 991, 991 East Tunnel and 998 Vault

ANALYTE	Building/Area/ Unit	Sample Number Planned (Real & QC)[A]	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
Radiological	Survey Area 2 Survey Unit: 991-2-006 Bldg. 991 Basement Utility Tunnel (interior)	15 α TSA and 15 α Smears (systematic) 2 QC TSA 50% scan of floor surfaces and 25% of remaining surfaces	16 α TSA and 16 α Smears (systematic) 10 α TSA and 10 α Smears (biased) 2 QC TSA 50% scan of floor surfaces and 25% of remaining surfaces	No contamination at any location; all values below unrestricted release levels	Uranium and/or Transuranic DCGL as applicable.
Radiological	Survey Area 2 Survey Unit: 991-2-007 Bldg. 991 Rooms, Walls, Floors and Ceilings (interior)	15 media samples (biased) 15 Pre and 15 Post TSA and Smear Media Samples	40 media samples (biased) 40 Pre and 40 Post TSA and Smear Media Samples	No contamination at any location; all values below unrestricted release levels	Uranium and/or Transuranic DCGL as applicable.
Radiological	Survey Area 2 Survey Unit: 991-2-008 Bldg. 991 West Tunnel Access Corridor B (interior)	17 α TSA and 17 α Smears (systematic) 2 QC TSA 100% scan of all accessible surfaces	18 α TSA and 18 α Smears (systematic) 2 QC TSA 100% scan of floors, 25% of walls and 10% ceilings	No contamination at any location; all values below unrestricted release levels	Uranium and/or Transuranic DCGL as applicable.

Rocky Flats Environmental Technology Site

PRE-DEMOLITION SURVEY REPORT (PDSR)

Area 2-Group 2a CLOSURE PROJECT (991 West Tunnel and Buildings 985, 996, 997, 999)

REVISION 0

August 21, 2003

CLASSIFICATION REVIEW NOT REQUIRED PER EXEMPTION NUMBER CEX-005-02

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PRE-DEMOLITION SURVEY REPORT (PDSR)

Area 2-Group 2a CLOSURE PROJECT (991 West Tunnel and Buildings 985, 996, 997, 999)

REVISION 0

August 21, 2003

Reviewed by: [signature] for Date: 8/25/03
Don Risoli, Quality Assurance

Reviewed by: D P Snyder Date: 8/25/03
D.P. Snyder, RISS ESH&Q Manager

Approved by: Karen K Wiemelt Date: 8/28/03
Karen Wiemelt, K-H Project Manager

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ATTACHMENTS

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ABBREVIATIONS/ACRONYMS

ACM	Asbestos containing material
Be	Beryllium
CDPHE	Colorado Department of Public Health and the Environment
$DCGL_{EMC}$	Derived Concentration Guideline Level – elevated measurement comparison
$DCGL_{W}$	Derived Concentration Guideline Level – Wilcoxon Rank Sum Test
D&D	Decontamination and Decommissioning
DDCP	Decontamination and Decommissioning Characterization Protocol
DOE	U.S. Department of Energy
DPP	Decommissioning Program Plan
DQA	Data quality assessment
DQOs	Data quality objectives
EPA	U.S. Environmental Protection Agency
FDPM	Facility Disposition Program Manual
HVAC	Heating, ventilation, air conditioning
HSAR	Historical Site Assessment Report
HEUN	Highly Enriched Uranyl Nitrate
IHSS	Individual Hazardous Substance Site
IWCP	Integrated Work Control Package
K-H	Kaiser-Hill
LBP	Lead-based paint
LLW	Low-level waste
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MDA	Minimum detectable activity
MDC	Minimum detectable concentration
NORM	Naturally occurring radioactive material
NRA	Non-Rad-Added Verification
OSHA	Occupational Safety and Health Administration
PARCC	Precision, accuracy, representativeness, comparability and completeness
PCBs	Polychlorinated Biphenyls
PDS	Pre-demolition survey
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RFFO	Rocky Flats Field Office
RLC	Reconnaissance Level Characterization
RLCR	Reconnaissance Level Characterization Report
RSA	Removable Surface Activity
RSP	Radiological Safety Practices
SVOCs	Semi-volatile organic compounds
TCLP	Toxicity Characteristic Leaching Procedure
TSA	Total surface activity
VOCs	Volatile organic compounds

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EXECUTIVE SUMMARY

A Pre-Demolition Survey (PDS) was performed to enable compliant disposition and waste management of the Area 2–Group 2a facilities (i.e., Building 991 West Tunnel, 985, 996, 997 and 999). Because these Type 2 facilities will be decommissioned, the characterization was performed in accordance with the Pre-Demolition Survey Plan (MAN-127-PDSP) to supplement the Reconnaissance Level Characterization of this Type 2 facility. Building surfaces characterized as part of this PDS included the floors, walls, ceilings, and roofs. Environmental media beneath and surrounding the facilities were not within the scope of this PDS and will be addressed using the Soil Disturbance Permit process and in compliance with RFCA.

This PDS encompassed both radiological and chemical characterization to enable compliant disposition and waste management pursuant to the D&D Characterization Protocol (MAN-077-DDCP). The characterization built upon physical, chemical and radiological hazards identified in the facility-specific Historical Site Assessment Report and Reconnaissance Level Characterization Report.

Results indicate that no radiological or chemical contamination exists in excess of the PDSP unrestricted release limits. Any potentially PCB-containing fluorescent light ballast and hazardous waste items (e.g., mercury thermostats, fluorescent light bulbs, mercury vapor light bulbs, mercury-containing gauges, circuit boards, leaded glass, and lead-acid batteries) were previously removed from the building and therefore, do not impact decontamination and decommissioning activities.

Based upon this PDSR, the Area 2-Group 2a facilities can be decommissioned and the waste managed as PCB Bulk Product or sanitary waste, and the concrete can be used for backfill on-site per the RFCA RSOP for Recycling Concrete. If appropriate approvals are obtained, the 991 West Tunnel and Vaults 996, 997 and 999 are also acceptable from a PDS standpoint to remain in-place underground. To ensure that the facility remains free of contamination and that PDS data remain valid, Level 2 Isolation Controls have been established, and the area has been posted accordingly.

1 INTRODUCTION

A Pre-Demolition Survey (PDS) was performed to enable compliant disposition and waste management of the Area 2–Group 2a facilities (i.e., 991 West Tunnel, 985, 996, 997 and 999). Because these Type 2 facilities will be decommissioned, the characterization was performed in accordance with the Pre-Demolition Survey Plan (MAN-127-PDSP) to supplement the Reconnaissance Level Characterization of these Type 2 facilities. Building surfaces characterized as a part of this PDS included floors, walls, ceilings and roofs. Environmental media beneath and surrounding the facilities were not within the scope of this PDS and will be addressed using the Soil Disturbance Permit process and in compliance with RFCA.

As part of the Rocky Flats Environmental Technology Site (RFETS) Closure Project, numerous facilities will be removed. Among these are the Area 2-Group 2a facilities. The location of this facility is shown in Attachment A, Facility Location Map. These facilities no longer support the RFETS mission and will be decommissioned to reduce Site infrastructure, risks and/or operating costs.

Before these Type 2 facilities can be decommissioned, the Data Quality Objectives (DQOs) for a Pre-Demolition Survey (PDS) must be satisfied; this document presents the PDS results for the Area 2-Group 2a facilities. The PDS was conducted pursuant to the Decontamination and Decommissioning Characterization Protocol (MAN-077-DDCP) and the Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP). The PDS is built upon physical, chemical and radiological hazards identified in the facility-specific Historical Site Assessment Report and Reconnaissance Level Characterization Report.

1.1 Purpose

The purpose of this report is to communicate and document the results of the Area 2 – Group 2a facilities PDS effort. A PDS is performed prior to building demolition to define the final radiological and chemical conditions of a facility. Final conditions are compared with the release limits for radiological and non-radiological contaminants. PDS results will enable project personnel to make final disposition decisions, develop related worker health and safety controls, and estimate waste volumes by waste types.

1.2 Scope

This report presents the final radiological and chemical conditions of the Area 2-Group 2a facilities. Environmental media beneath and surrounding the facilities are not within the scope of this PDSR and will be addressed using the Soil Disturbance Permit process and in compliance with RFCA.

1.3 Data Quality Objectives

The Data Quality Objectives (DQOs) used in designing this PDS were the same DQOs identified in the Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP). Refer to section 2.0 of MAN-127-PDSP for these DQOs.

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2 HISTORICAL SITE ASSESSMENT

A Facility-specific Historical Site Assessment (HSA) and a Reconnaissance Level Characterization (RLC) was conducted to understand the facility history and related hazards. The HSA consisted of facility walkdowns, interviews, and document review, including review of the Historical Release Report, and were used to design the RLC. The Area 2-Group 2a facility RLC was performed in FY 2002 as part of Area 2-Group 2 RLCR (Refer to *Reconnaissance Level Characterization Report for Area 2-Group 2 Facilities*, January 14, 2003, Revision 1). Based on the RLC results, the Area 2–Group 2a facilities were classified as Type 2 facilities, and therefore, PDS characterization was required before decommissioning of the facilities. This report documents the results of that PDS. The HSA and RLC results were used to identify PDS data gaps and needs, and to develop radiological and chemical PDS characterization packages. HSA and RLC documentation are located in the RISS Characterization Project files.

3 RADIOLOGICAL CHARACTERIZATION AND HAZARDS

The Area 2-Group 2a facilities were characterized for radiological hazards per the PDSP. Radiological characterization was performed to define the nature and extent of radioactive materials that may be present on the facility surfaces. Measurements were performed to evaluate the contaminants of concern. Based upon a review of historical and process knowledge, building walk-downs, and MARSSIM guidance, a Radiological Characterization Plan was developed during the planning phase that describes the minimum survey requirements (refer to the RISS Characterization Project files for the Area 2-Group 2a Radiological Characterization Plan). Five radiological survey unit packages were developed for the Area 2–Group 2a facilities: WTUN-2-001 (991 West Tunnel), 996-2-002 (996 interior), 999-2-003 (B999 interior), 997-2-004 (B997 interior) and 985-2-005 (B985 interior). Building 985 exterior was surveyed per PDS requirements as part of the Area 2-Group 2 RLCR, dated January 14, 2003, and met all PDSP DLCG values. Individual radiological survey unit packages are maintained in the RISS Characterization Project files.

The Area 2-Group 2a survey unit packages were developed in accordance with Radiological Safety Practices (RSP) 16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation and Closure*. Total surface activity (TSA), removable surface activity (RSA), and scan measurements were collected in accordance with RSP 16.02 *Radiological Surveys of Surfaces and Structures*. Radiological survey data were verified, validated and evaluated in accordance with RSP 16.04, *Radiological Survey/Sample Data Analysis*. Quality control measures were implemented relative to the survey process in accordance with RSP 16.05, *Radiological Survey/Sample Quality Control*. Radiological survey data, statistical analysis results, survey locations, and radiological scan maps are presented in Attachment B, Radiological Data Summary and Survey Maps.

B991 West Tunnel Interior (Survey Unit WTUN-2-001)
Building 991 West Tunnel interior was classified as a MARSSIM Class 2 Survey Unit. A total of 70 TSA measurements (16 systematically grid, 20 biased, 30 equipment and 4 QC) and 66 RSA measurements (16 systematically grid, 20 biased and 30 equipment) were taken and scan surveys performed. Alpha scan surveys of 25% of interior floor (124 m^2 minimum) and 10% of the walls and ceiling surfaces (164 m^2 minimum) at biased locations were performed. None of the measurements or scans indicated elevated activity above applicable DCGL values. Radiological survey data, statistical analysis results, survey locations and radiological scan maps are presented in Attachment B, Radiological Data Summary and Survey Maps.

B996 Interior (Survey Unit 996-2-002)
Building 996 interior was classified as a MARSSIM Class 2 Survey Unit. A total of 43 TSA measurements (19 systematically grid, 11 biased, 10 equipment and 3 QC) and 40 RSA measurements (19 systematically grid, 11 biased and 10 equipment) were taken and scan surveys performed. Alpha scan surveys of 25% of interior floor (37 m^2 minimum) and 10% of the walls and ceiling surfaces (50 m^2 minimum) at biased locations were performed. None of the measurements or scans indicated elevated activity above applicable DCGL values. Refer to Attachment B, Radiological Data Summary and Survey Maps for survey data, statistical analysis results, survey locations and radiological scan maps.

B999 Interior (Survey Unit 999-2-003)
Building 999 interior was classified as a MARSSIM Class 2 Survey Unit. A total of 46 TSA measurements (23 systematically grid, 10 biased, 10 equipment and 3 QC) and 43 RSA measurements (23 systematically grid, 10 biased and 10 equipment) were taken and scan surveys performed. Alpha scan surveys of 25% of interior floor (33 m^2 minimum) and 10% of the walls and ceiling surfaces (39 m^2 minimum) at biased locations were performed. None of the measurements or scans indicated elevated activity above applicable DCGL values. Refer to Attachment B, Radiological Data Summary and Survey Maps for survey data, statistical analysis results, survey locations and radiological scan maps.

B997 Interior (Survey Unit 997-2-004)
Building 997 interior was classified as a MARSSIM Class 2 Survey Unit. A total of 44 TSA measurements (21 systematically grid, 10 biased, 10 equipment and 3 QC) and 41 RSA measurements (21 systematically grid, 10 biased and 10 equipment) were taken and scan surveys performed. Alpha scan surveys of 25% of interior floor (33 m^2 minimum) and 10% of the walls and ceiling surfaces (47 m^2 minimum) at biased locations were performed. None of the measurements or scans indicated elevated activity above applicable DCGL values. Refer to Attachment B, Radiological Data Summary and Survey Maps for survey data, statistical analysis results, survey locations and radiological scan maps.

B985 Interior (Survey Unit 985-2-005)

Building 985 interior was classified as a MARSSIM Class 2 Survey Unit. A total of 82 TSA measurements (37 systematically grid, 10 biased, 30 equipment and 5 QC) and 77 RSA measurements (37 systematically grid, 10 biased and 30 equipment) were taken and scan surveys performed. Alpha scan surveys of 25% of interior floor (53 m^2 minimum) and 10% of the walls and ceiling surfaces (54 m^2 minimum) at biased locations were performed. None of the measurements or scans indicated elevated activity above applicable DCGL values. Refer to Attachment B, Radiological Data Summary and Survey Maps for survey data, statistical analysis results, survey locations and radiological scan maps.

4 CHEMICAL CHARACTERIZATION AND HAZARDS

The Area 2-Group 2a facilities were characterized for chemical hazards per the PDSP. Chemical characterization was performed to determine the nature and extent of chemical contamination that may be present on, or in the facility. Based upon a review of historical and process knowledge, visual inspections, and PDSP DQOs, additional sampling needs were determined. A Chemical Characterization Plan was developed during the planning phase that describes sampling requirements and the justification for the sample locations and estimated sample numbers. The contaminants of concern were asbestos and beryllium. Refer to Attachment C, Chemical Summary Data and Sample Maps, for details on sample results and sample locations. Isolation control postings are displayed on affected structures to ensure no hazardous materials are introduced.

4.1 Asbestos

A survey of building materials suspected of containing asbestos was conducted during the RLC for the Area 2–Group 2, dated January 14, 2003. A CDPHE-certified asbestos inspector conducted the inspections and sampling in accordance with the *Asbestos Characterization Protocol, PRO-563-ACPR, Revision 1.* Building materials suspected of containing asbestos were identified for sampling at the discretion of the inspector. Prior to decommissioning, asbestos abatement will be conducted per CDPHE, Regulation No. 8, Part B, *Emission Standards for Asbestos*. On this basis, no additional Asbestos sampling was performed as part of this PDS.

4.2 Beryllium (Be)

Eighty-eight (88) random and biased beryllium samples were collected during the RLC of the Area 2-Group 2 Facilities and all results were less than the investigative limit of 0.1 $\mu g/100cm^2$. Refer to the Area 2-Group 2 RLCR, dated January 14, 2003, Revision 1, for RLC beryllium laboratory sample data and location maps. RLC smear samples were collected on facility surfaces, including on the inside and outside systems and equipment, in accordance with the RLCP and the *Beryllium Characterization Procedure,* PRO-536-BCPR, Revision 0, September 9, 1999.

Seventy-six (76) additional biased beryllium samples were collected in the Area 2-Group 2a facilities as part of the Area 2-Group 2a PDSR in order to supplement the RLCR data. Biased sampling was performed and all PDS beryllium smear results were less than the investigative limit of 0.1 $\mu g/100cm^2$. Smear samples were collected on all facility surfaces, including on the inside and outside systems and equipment, in accordance with the PDSP and the *Beryllium Characterization Procedure,* PRO-536-BCPR, Revision 0, September 9, 1999. PDS supplementary beryllium laboratory sample data and location maps are contained in Attachment C, "Chemical Data Summaries and Sample Maps."

4.3 RCRA/CERCLA Constituents [including metals and volatile organic compounds (VOCs)]

Based on a review of the HSAR, RLCR, interviews, and facility walkdowns, there is no indication that the Area 2-Group 2a facilities have been contaminated by RCRA/CERLCA constituents. Chemicals have been used within most of the facilities, and non-RCRA/CERCLA wastes have been stored or moved throughout, but there are no records or visible signs of chemical releases. Therefore, sampling and analysis for RCRA/CERCLA constituents was not conducted as part of this PDS.

Sampling for lead in paint in the Area 2 - Group 2a facilities was not performed. Environmental Waste Compliance Guidance #27, *Lead-based Paint (LBP) and Lead-based paint Debris Disposal*, states that LBP debris generated outside of currently identified high contamination areas shall be managed as non-hazardous (solid) wastes, and additional analysis for characteristics of hazardous waste derived from LBP is not a requirement for disposal.

The facilities may have contained some RCRA regulated items, such as mercury thermostats, fluorescent light bulbs, mercury vapor light bulbs, mercury containing gauges, circuit boards, and lead-acid batteries. However, these items have been removed and managed in accordance with the Colorado Hazardous Waste Act.

4.4 Polychlorinated Biphenyls (PCBs)

Based on the HSAR, RLCR, interviews, and facility walkdowns of the Area 2 - Group 2a facilities, no PCB-containing equipment were ever used or stored in the buildings, making the potential for PCB contamination resulting from spills highly unlikely. Therefore, PCB sampling was not performed as part of the PDS.

Based on the age of the facilities (constructed prior to 1980), paints used may contain PCBs, and painted surfaces will need to be disposed of as PCB Bulk Product Waste. Painted concrete surfaces can be used as backfill on site in accordance with approval received from EPA in November 2001 (letter from K. Clough, US EPA Region 8, to J. Legare, DOE RFFO, 8EPR-F, Approval of the Risk-Based Approach for Polychlorinated Biphenyls (PCB)-Based Painted Concrete), provided the concrete meets the unrestricted-release criteria outlined in the Concrete Recycling RSOP.

The facilities may have contained PCB fluorescent light ballast, however, all ballasts have been checked and leaking PCB ballasts have been removed from the facility and managed in accordance with the Colorado Hazardous Waste Act.

5 PHYSICAL HAZARDS

Physical hazards associated with the Area 2 - Group 2a facilities consist of those common to standard industrial environments, and include hazards associated with energized systems, utilities, and trips and falls. The 991 West Tunnel and the storage vault buildings 996, 997 and 999 are underground. Building 985 has a pit approximately 16 by 16 feet wide and 12.5 feet deep that housed the plenum deluge tank. Building 985 also sits on a hillside just uphill from 991 building. There are no other unique hazards associated with the facilities. The facilities have been relatively well maintained and are in good physical condition, and therefore, do not present hazards associated with building deterioration. Physical hazards are controlled by the Site Occupational Safety and Industrial Hygiene Program, which is based on OSHA regulations, DOE orders, and standard industry practices.

6 DATA QUALITY ASSESSMENT

Data used in making management decisions for decommissioning of Area 2 - Group 2a facilities, and consequent waste management, are of adequate quality to support the decisions documented in this report. The data presented in this report (Attachments B and C) were verified and validated relative to DOE quality requirements, applicable EPA guidance, and original project DQOs.

In summary, the Verification and Validation (V&V) process corroborates that the following elements of the characterization process are adequate:

- the *numbe*r of samples and surveys;
- the *types* of samples and surveys;
- the sampling/survey process as implemented "in the field"; and
- the laboratory analytical process, relative to accuracy and precision considerations.

Details of the DQA are provided in Attachment D.

7 DECOMMISSIONING WASTE TYPES AND VOLUME ESTIMATES

The decommissioning of Area 2 - Group 2a facilities will generate a variety of wastes. Estimated waste types and waste volumes are presented below. All wastes can be disposed of as sanitary waste, except PCB Bulk Product Waste. PCB ballast and hazardous waste items have been removed and managed pursuant to Site PCB and waste management procedures. All concrete surfaces can be used as backfill onsite in accordance with the RFCA RSOP for Recycling Concrete.

WASTE TYPES AND VOLUME ESTIMATES							
Facility	**Concrete (cu ft)**	**Wood (cu ft)**	**Metal (cu ft)**	**Corrugated Sheet Metal (cu ft)**	**Wall Board (cu ft)**	**ACM (cu ft)**	**Other Waste (cu ft)**
985	18,000	None	980	None	None	None	900 – pipe insulation 400 – fiberglass insulation 600 – roofing material
991 West Tunnel	0[A]	0[A]	0[A]	None	None	None	None
996	0[A]	0[A]	None	None	None	None	None
997	0[A]	0[A]	None	None	None	None	None
999	0[A]	0[A]	None	None	None	None	None

[A]These buildings will be decommissioned in-place, therefore, disposal waste volumes are zero (0).

8 FACILITY CLASSIFICATION AND CONCLUSIONS

Based on the analysis of radiological, chemical and physical hazards, the Area 2 - Group 2a facilities are classified as RFCA Type 2 facility pursuant to the RFETS Decommissioning Program Plan (DPP; K-H, 1999) and are ready for demolition/decommissioning. If appropriate approvals are obtained, the 991 West Tunnel and Vaults 996, 997 and 999 are also acceptable from a PDS standpoint to remain in-place underground. The Area 2 -Group 2a facilities possess no radiological or chemical contamination in excess of the PDSP unrestricted release limits. PCB ballast and hazardous waste items have been removed and disposed of in compliance with Environmental Protection Agency (EPA) and Colorado Department of Public Health and Environment (CDPHE) regulations.

The PDS for the Area 2 - Group 2a facilities was performed in accordance with the DDCP and PDSP, all PDSP DQOs were met, and all data satisfied the PDSP DQA criteria. Environmental media beneath and surrounding the facilities will be addressed at a future date using the Soil Disturbance Permit process and in compliance with RFCA. To ensure that the Area 2 - Group 2a facilities remain free of contamination and that PDS data remain valid, Level 2 Isolation Controls have been established, and the facilities are posted accordingly.

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9 REFERENCES

DOE/RFFO, CDPHE, EPA, 1996. *Rocky Flats Cleanup Agreement (RFCA)*, July 19, 1996.

DOE Order 5400.5, *"Radiation Protection of the Public and the Environment."*

DOE Order 414.1A, *"Quality Assurance."*

EPA, 1994. *"The Data Quality Objective Process,"* EPA QA/G-4.

K-H, 1999. *Decommissioning Program Plan*, June 21, 1999.

MAN-131-QAPM, *Kaiser-Hill Team Quality Assurance Program*, Rev. 1, November 1, 2001.

MAN-076-FDPM, *Facility Disposition Program Manual*, Rev. 3, January 1, 2002.

MAN-077-DDCP, *Decontamination and Decommissioning Characterization Protocol*, Rev. 4, July 15, 2002.

MAN-127-PDSP, *Pre-Demolition Survey Plan for D&D Facilities*, Rev. 1, July 15, 2002.

MARSSIM - *Multi-Agency Radiation Survey and Site Investigation Manual* (NUREG-1575, EPA 402-R-97-016).

PRO-475-RSP-16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation, and Closure*, Rev. 1, May 22, 2001.

PRO-476-RSP-16.02, *Pre-Demolition (Final Status) Radiological Surveys of Surfaces and Structures*, Rev. 1, May 22, 2001.

PRO-477-RSP-16.03, *Radiological Samples of Building Media*, Rev. 1, May 22, 2001.

PRO-478-RSP-16.04, *Radiological Survey/Sample Data Analysis for Final Status Survey*, Rev. 1, May 22, 2001.

PRO-479-RSP-16.05, *Radiological Survey/Sample Quality Control for Final Status Survey*, Rev. 1, May 22, 2001.

PRO-563-ACPR, *Asbestos Characterization Procedure*, Revision 0, August 24, 1999.

PRO-536-BCPR, *Beryllium Characterization Procedure*, Revision 0, August 24, 1999.

RFETS, *Environmental Waste Compliance Guidance #25, Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition.*

RFETS, *Environmental Waste Compliance* Guidance #27, Lead-Based Paint (LBP) and Lead-Based Paint Debris Disposal.

RFETS, *RFCA RSOP for Recycling Concrete*, September 28, 1999

Reconnaissance Level Characterization Report for the Area 2-Group 2 Facilities, January 14, 2003, Revision 1

ATTACHMENT A

Facility Location Map

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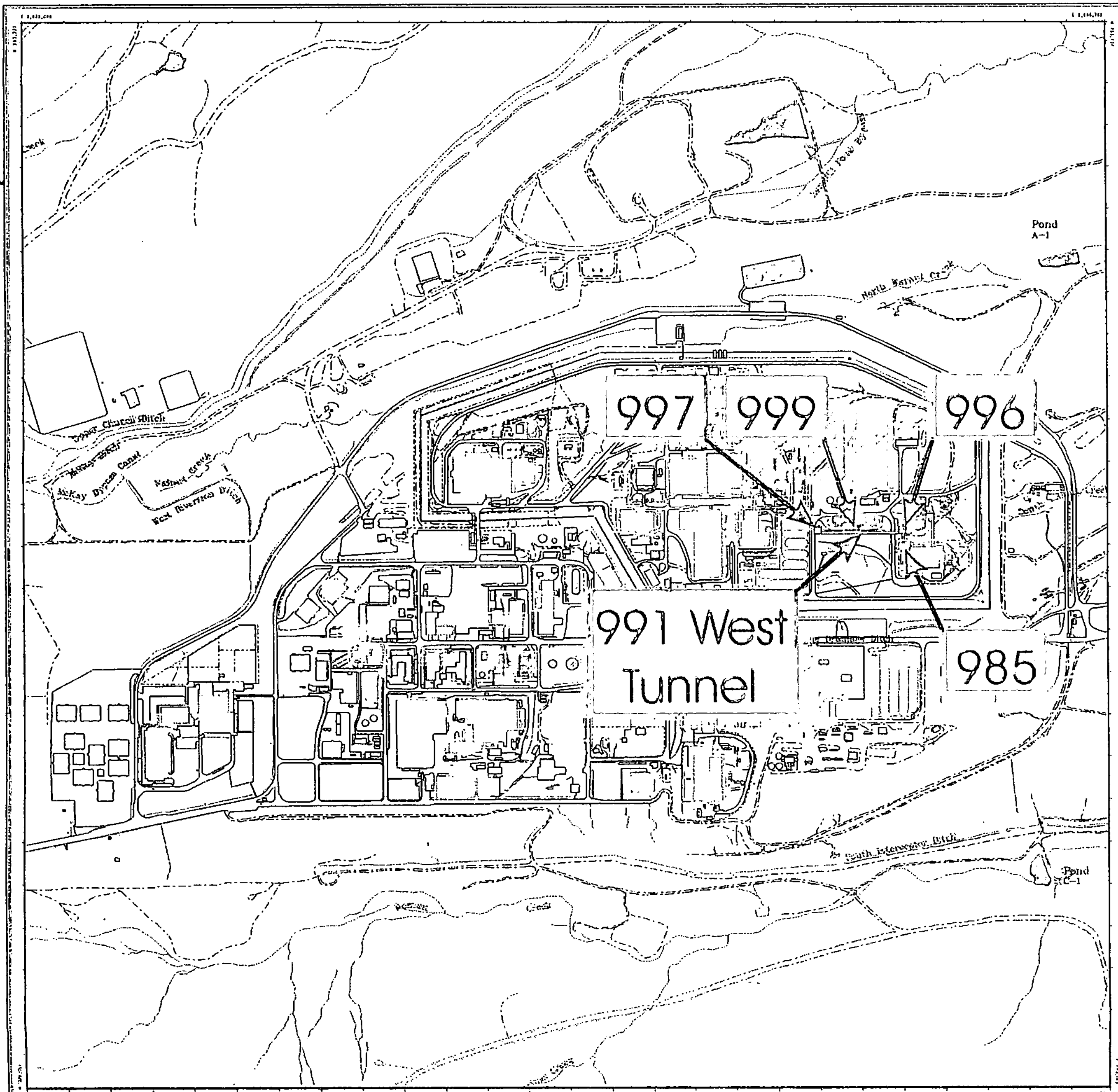

Area 2
Group 2 991West Tunnel, 996, 997, 999 & 985

Standard Map Features

- Buildings and other structures
- Demolished buildings and other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences and other barriers
- Paved roads
- Dirt roads

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas. Digitized from the orthophotographs. 1/95

Scale = 1 : 12450
1 inch represents approximately 1038 feet

250 0 500 1000 ft

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

GS Dept. 303-966-7707

Prepared by: CH2MHILL

Prepared for: KAISER-HILL COMPANY

MAP ID: FY2002

Aug. 5, 2003

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ATTACHMENT B

Radiological Data Summaries and Survey Maps

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SURVEY UNIT WTUN-2-001
RADIOLOGICAL DATA SUMMARY - PDS

Survey Unit Description: B991 West Tunnel Interior

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Total Surface Activity Measurements

65	66
Number Required	Number Obtained

MIN	-9.4	dpm/100 cm^2
MAX	73.9	dpm/100 cm^2
MEAN	24.6	dpm/100 cm^2
STD DEV	23.5	dpm/100 cm^2
TRANSURANIC $DCGL_W$	100	dpm/100 cm^2

Removable Activity Measurements

65	66
Number Required	Number Obtained

MIN	-1.5	dpm/100 cm^2
MAX	7.9	dpm/100 cm^2
MEAN	0.8	dpm/100 cm^2
STD DEV	1.8	dpm/100 cm^2
TRANSURANIC $DCGL_W$	20	dpm/100 cm^2

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SURVEY UNIT WTUN-2-001
TSA - DATA SUMMARY

Manufacturer:	NE Tech	NE Tech	NE Tech	NE Tech
Model:	DP-6	DP-6	DP-6	DP-6
Instrument ID#:	1	2	3	4
Serial #:	2404	1366	1681	1260
Cal Due Date:	10/9/03	11/27/03	10/18/03	7/10/03
Analysis Date:	6/23/03	6/23/03	6/23/03	6/23/03
Alpha Eff. (c/d):	0.222	0.210	0.218	0.223
Alpha Bkgd (cpm)	0.7	2.7	2.7	0.7
Sample Time (min)	1.5	1.5	1.5	1.5
LAB Time (min)	1.5	1.5	1.5	1.5
MDC (dpm/100cm^2)	48.0	48.0	48.0	48.0

Manufacturer:	NE Tech	NE Tech	NE Tech	NE Tech	NE Tech
Model:	DP-6	DP-6	DP-6	DP-6	DP-6
Instrument ID#:	13	14	15	20	21
Serial #:	1256	1589	1379	1379	3105
Cal Due Date:	12/18/03	12/30/03	12/25/03	12/25/03	1/15/04
Analysis Date:	7/8/03	7/8/03	7/8/03	7/23/03	7/23/03
Alpha Eff. (c/d):	0.230	0.220	0.216	0.216	0.201
Alpha Bkgd (cpm)	1.3	1.3	0.0	1.3	4.7
Sample Time (min)	1.5	1.5	1.5	1.5	1.5
LAB Time (min)	1.5	1.5	1.5	1.5	1.5
MDC (dpm/100cm^2)	48.0	48.0	48.0	48.0	48.0

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)[1]
1	3	7.3	33.5	0.7	3.2	12.4
2	13	11.3	49.1	6.7	29.1	28.0
3	13	9.3	40.4	1.3	5.7	19.3
4	13	4.0	17.4	2.7	11.7	-3.7
5	13	10.7	46.5	4.0	17.4	25.4
6	13	8.0	34.8	5.3	23.0	13.7
7	13	12.7	55.2	4.0	17.4	34.1
8	14	8.7	39.5	4.0	18.2	18.5
9	1	8.0	36.0	8.0	36.0	14.9
10	1	6.0	27.0	3.3	14.9	5.9
11	3	20.7	95.0	4.7	21.6	73.9
12	3	10.0	45.9	5.3	24.3	24.8
13	1	20.7	93.2	8.0	36.0	72.2
14	3	6.0	27.5	3.3	15.1	6.4
15	3	7.3	33.5	3.3	15.1	12.4
16	3	8.7	39.9	0.7	3.2	18.8
17	4	10.7	48.0	6.7	30.0	26.9
18	1	7.3	32.9	4.0	18.0	11.8
19	1	6.7	30.2	6.0	27.0	9.1
20	2	17.3	82.4	8.0	38.1	61.3
21	2	19.3	91.9	6.0	28.6	70.8
22	1	7.3	32.9	4.7	21.2	11.8
23	1	8.0	36.0	5.3	23.9	14.9
24	3	11.3	51.8	4.7	21.6	30.7
25	3	2.7	12.4	3.3	15.1	-8.7
26	3	8.7	39.9	2.0	9.2	18.8
27	4	6.0	26.9	4.0	17.9	5.8
28	20	16.0	74.1	4.7	21.8	53.0
29	13	2.7	11.7	6.0	26.1	-9.4
30	13	5.3	23.0	2.7	11.7	2.0
31	13	5.3	23.0	2.7	11.7	2.0

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SURVEY UNIT WTUN-2-001
TSA - DATA SUMMARY

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)[1]
32	20	18.3	84.7	6.7	31.0	63.6
33	13	6.7	29.1	6.0	26.1	8.0
34	20	12.6	58.3	4.0	18.5	37.2
35	14	7.3	33.2	6.7	30.5	12.1
36	15	4.0	18.5	8.0	37.0	-2.6
37	1	12.7	57.2	4.0	18.0	36.1
38	15	6.7	31.0	2.7	12.5	9.9
39	14	7.3	33.2	3.3	15.0	12.1
40	14	13.3	60.5	6.0	27.3	39.4
41	15	5.3	24.5	2.7	12.5	3.4
42	15	4.0	18.5	2.0	9.3	-2.6
43	15	8.0	37.0	8.0	37.0	15.9
44	15	6.0	27.8	4.0	18.5	6.7
45	20	12.7	58.8	6.0	27.8	37.7
46	20	8.0	37.0	8.0	37.0	15.9
47	13	4.0	17.4	1.3	5.7	-3.7
48	20	11.3	52.3	6.0	27.8	31.2
49	20	18.0	83.3	4.7	21.8	62.2
50	20	10.0	46.3	6.3	29.2	25.2
51	20	20.0	92.6	4.0	18.5	71.5
52	20	18.7	86.6	6.0	27.8	65.5
53	13	3.3	14.3	6.7	29.1	-6.7
54	20	20.0	92.6	8.0	37.0	71.5
55	13	6.0	26.1	6.7	29.1	5.0
56	4	9.3	41.7	0.0	0.0	20.6
57	4	7.3	32.7	3.7	16.6	11.6
58	4	5.4	24.2	4.0	17.9	3.1
59	3	9.3	42.7	4.0	18.3	21.6
60	4	8.0	35.9	0.7	3.1	14.8
61	1	7.3	32.9	6.0	27.0	11.8
62	4	20.7	92.8	8.0	35.9	71.7
63	3	10.7	49.1	6.0	27.5	28.0
64	1	18.7	84.2	2.0	9.0	63.1
65	1	14.0	63.1	5.3	23.9	42.0
66	1	14.0	63.1	3.3	14.9	42.0

1 - Average LAB used to subtract from Gross Sample Activity

21.1	Sample LAB Average
MIN	-9.4
MAX	73.9
MEAN	24.6
SD	23.5
Transuranic $DCGL_W$	100

QC Measurements

37 QC	21	6.0	29.9	4.7	23.4	9.3
39 QC	21	6.7	33.3	4.0	19.9	12.8
56 QC	20	7.3	33.8	2.7	12.5	13.3
47 QC	21	9.4	46.8	5.3	26.4	26.2

1 - Average QC LAB used to subtract from Gross Sample Activity

20.5	QC LAB Average
MIN	9.3
MAX	26.2
MEAN	15.4
Transuranic $DCGL_W$	100

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SURVEY UNIT WTUN-2-001
RSC - DATA SUMMARY

Manufacturer:	Eberline	Eberline	Eberline	Eberline
Model:	SAC-4	SAC-4	SAC-4	SAC-4
Instrument ID#:	5	6	7	8
Serial #:	959	952	971	924
Cal Due Date:	7/9/03	7/9/03	8/6/03	10/23/03
Analysis Date:	6/24/03	6/24/03	6/24/03	6/24/03
Alpha Eff. (c/d):	0.33	0.33	0.33	0.33
Alpha Bkgd (cpm)	0.0	0.4	0.1	0.5
Sample Time (min)	2	2	2	2
Bkgd Time (min)	10	10	10	10
MDC (dpm/100cm^2)	9.0	9.0	9.0	9.0

Manufacturer:	Eberline	Eberline	Eberline	Eberline
Model:	SAC-4	SAC-4	SAC-4	SAC-4
Instrument ID#:	16	17	18	19
Serial #:	770	830	971	924
Cal Due Date:	10/17/03	10/22/03	8/6/03	10/23/03
Analysis Date:	7/9/03	7/9/03	7/9/03	7/9/03
Alpha Eff. (c/d):	0.33	0.33	0.33	0.33
Alpha Bkgd (cpm)	0.2	0.4	0.2	0.2
Sample Time (min)	2	2	2	2
Bkgd Time (min)	10	10	10	10
MDC (dpm/100cm^2)	9.0	9.0	9.0	9.0

Sample Location Number	Instrument ID#	Gross Counts (cpm)	Net Activity (dpm/100 cm^2)
1	5	0	0.0
2	16	1	0.9
3	17	0	-1.2
4	18	2	2.4
5	19	0	-0.6
6	16	0	-0.6
7	17	1	0.3
8	18	1	0.9
9	6	1	0.3
10	7	0	-0.3
11	8	0	-1.5
12	5	0	0.0
13	6	1	0.3
14	7	1	1.2
15	8	0	-1.5
16	5	0	0.0
17	6	1	0.3
18	7	1	1.2
19	8	0	-1.5
20	5	0	0.0
21	6	1	0.3
22	7	0	-0.3
23	8	0	-1.5
24	5	0	0.0
25	6	0	-1.2
26	7	2	2.7
27	8	1	0.0
28	16	1	0.9
29	18	0	-0.6
30	19	0	-0.6
31	16	1	0.9

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SURVEY UNIT WTUN-2-001
RSC - DATA SUMMARY

Sample Location Number	Instrument ID#	Gross Counts (cpm)	Net Activity (dpm/100 cm^2)
32	17	1	0.3
33	17	2	1.8
34	18	4	5.5
35	19	0	-0.6
36	16	0	-0.6
37	17	2	1.8
38	18	2	2.4
39	19	0	-0.6
40	17	2	1.8
41	16	2	2.4
42	18	2	2.4
43	19	3	3.9
44	16	0	-0.6
45	17	1	0.3
46	18	2	2.4
47	18	0	-0.6
48	19	1	0.9
49	16	2	2.4
50	17	2	1.8
51	18	2	2.4
52	19	2	2.4
53	19	1	0.9
54	16	2	2.4
55	16	0	-0.6
56	5	0	0.0
57	6	6	7.9
58	7	1	1.2
59	8	0	-1.5
60	5	1	1.5
61	6	1	0.3
62	7	0	-0.3
63	8	1	0.0
64	5	1	1.5
65	6	4	4.8
66	7	3	4.2
		MIN	-1.5
		MAX	7.9
		MEAN	0.8
		SD	1.8
		Transuranic $DCGL_W$	**20**

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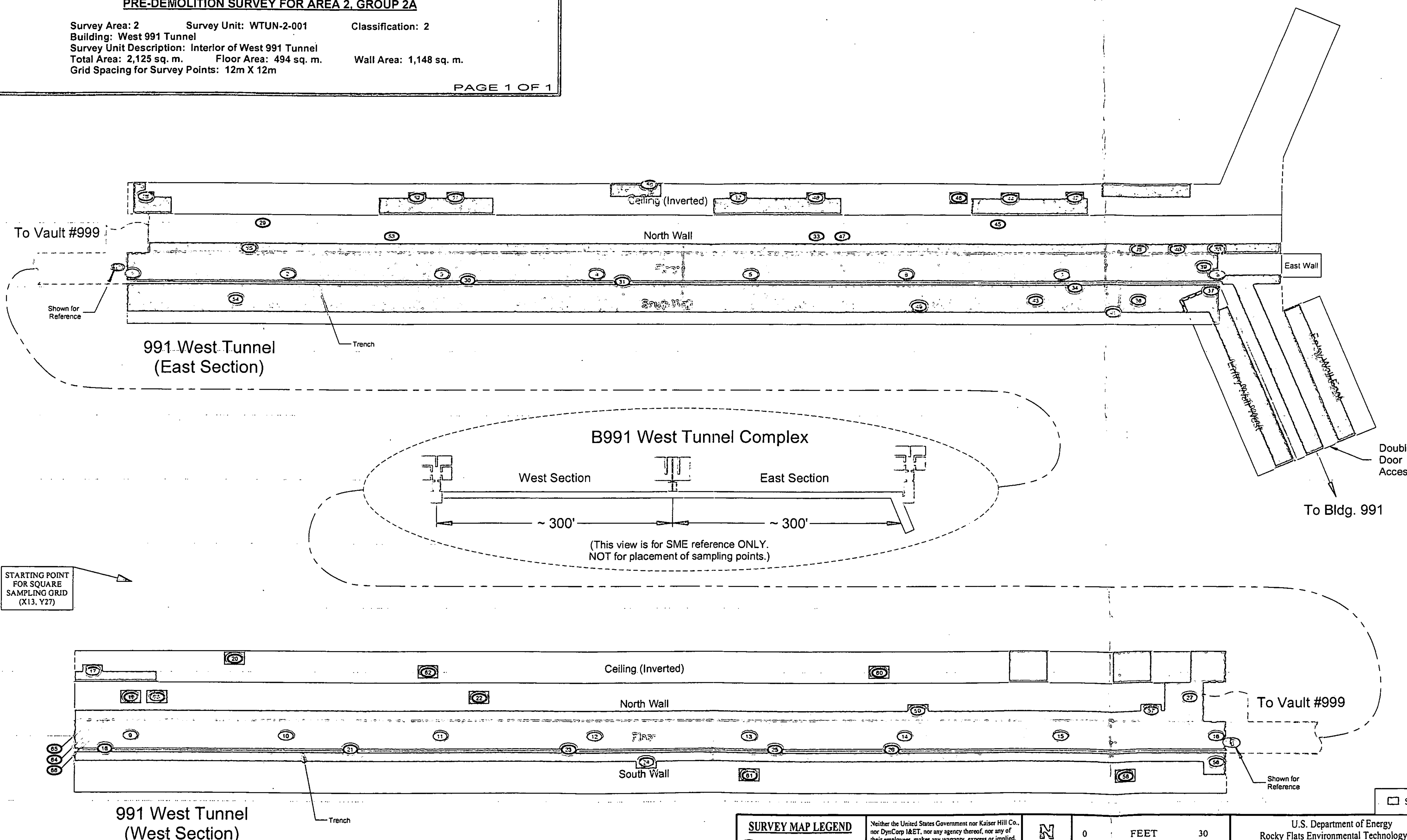
PRE-DEMOLITION SURVEY FOR AREA 2, GROUP 2A

Survey Area: 2 Survey Unit: WTUN-2-001 Classification: 2
Building: West 991 Tunnel
Survey Unit Description: Interior of West 991 Tunnel
Total Area: 2,125 sq. m. Floor Area: 494 sq. m. Wall Area: 1,148 sq. m.
Grid Spacing for Survey Points: 12m X 12m



Scan Area

SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

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N

0 FEET 30
0 METERS 10
1 inch = 24 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
1, 2, 3, 4, 9-15, 20, 21

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707 Prepared for:

CH2MHILL
Communications Group

KAISER-HILL

MAP ID: 02-0355/991-WTUN-SC AUG 7, 2003

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SURVEY UNIT 996-2-002
RADIOLOGICAL DATA SUMMARY - PDS

Survey Unit Description: B996 (Interior)

254

Total Surface Activity Measurements

39	40
Number Required	Number Obtained

MIN	-11.7	dpm/100 cm^2
MAX	70.9	dpm/100 cm^2
MEAN	13.6	dpm/100 cm^2
STD DEV	18.7	dpm/100 cm^2
TRANSURANIC $DCGL_W$	100	dpm/100 cm^2

Removable Activity Measurements

39	40
Number Required	Number Obtained

MIN	-1.2	dpm/100 cm^2
MAX	2.4	dpm/100 cm^2
MEAN	0.1	dpm/100 cm^2
STD DEV	1.0	dpm/100 cm^2
TRANSURANIC $DCGL_W$	20	dpm/100 cm^2

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SURVEY UNIT 996-2-002
TSA - DATA SUMMARY

Manufacturer:	NE Tech	NE Tech	NE Tech	NE Tech
Model:	DP-6	DP-6	DP-6	DP-6
Instrument ID#:	1	2	7	8
Serial #:	2391	3115	1681	1402
Cal Due Date:	7/10/03	9/24/03	10/18/03	9/12/03
Analysis Date:	4/29/03	4/29/03	6/30/03	6/30/03
Alpha Eff. (c/d):	0.220	0.218	0.218	0.216
Alpha Bkgd (cpm)	2.7	2.0	4.0	2.3
Sample Time (min)	1.5	1.5	1.5	1.5
LAB Time (min)	1.5	1.5	1.5	1.5
MDC (dpm/100cm^2)	48.0	48.0	48.0	48.0

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)[1]
1	2	7.3	33.5	4.7	21.6	18.6
2	1	5.3	24.1	4.0	18.2	9.2
3	1	2.0	9.1	2.0	9.1	-5.8
4	2	2.0	9.2	1.3	6.0	-5.7
5	2	4.0	18.3	0.7	3.2	3.5
6	1	4.7	21.4	4.7	21.4	6.5
7	2	12.7	58.3	1.3	6.0	43.4
8	2	4.0	18.3	4.0	18.3	3.5
9	1	2.3	10.5	3.3	15.0	-4.4
10	2	2.7	12.4	6.7	30.7	-2.5
11	2	7.3	33.5	3.3	15.1	18.6
12	1	6.0	27.3	2.0	9.1	12.4
13	2	3.3	15.1	5.3	24.3	0.3
14	2	8.7	39.9	0.7	3.2	25.1
15	2	9.3	42.7	5.3	24.3	27.8
16	8	6.0	27.8	4.7	21.8	12.9
17	2	7.3	33.5	1.3	6.0	18.6
18	2	6.7	30.7	4.0	18.3	15.9
19	1	1.4	6.4	5.3	24.1	-8.5
20	2	15.3	70.2	4.7	21.6	55.3
21	1	4.7	21.4	2.0	9.1	6.5
22	1	0.7	3.2	2.7	12.3	-11.7
23	1	6.0	27.3	2.0	9.1	12.4
24	1	10.0	45.5	2.7	12.3	30.6
25	1	14.7	66.8	3.3	15.0	52.0
26	1	4.0	18.2	2.0	9.1	3.3
27	2	7.3	33.5	1.3	6.0	18.6
28	2	18.7	85.8	5.3	24.3	70.9
29	1	4.7	21.4	4.0	18.2	6.5
30	2	6.7	30.7	3.3	15.1	15.9
31	1	3.3	15.0	2.0	9.1	0.1
32	1	3.3	15.0	4.0	18.2	0.1
33	1	6.0	27.3	2.0	9.1	12.4
34	1	6.7	30.5	0.7	3.2	15.6
35	2	7.3	33.5	3.3	15.1	18.6
36	2	0.7	3.2	2.7	12.4	-11.6

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SURVEY UNIT 996-2-002
TSA - DATA SUMMARY

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	*Sample Gross* Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)[1]
37	1	5.3	24.1	6.7	30.5	9.2
38	2	3.3	15.1	2.7	12.4	0.3
39	1	4.0	18.2	2.0	9.1	3.3
40	7	13.3	61.0	6.0	27.5	46.2

1 - Average LAB used to subtract from Gross Sample Activity

14.9	Sample LAB Average
MIN	-11.7
MAX	70.9
MEAN	13.6
SD	18.7
Transuranic $DCGL_W$	100

QC Measurements

7 QC	1	11.3	51.4	1.3	5.9	38.3
20 QC	1	14.0	63.6	3.3	15.0	50.6
28 QC	1	12.7	57.7	4.0	18.2	44.7

1 - Average QC LAB used to subtract from Gross Sample Activity

13.0	QC LAB Average
MIN	38.3
MAX	50.6
MEAN	44.5
Transuranic $DCGL_W$	100

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SURVEY UNIT 996-2-002
RSC - DATA SUMMARY

Manufacturer:	Eberline	Eberline	Eberline	Eberline	Eberline
Model:	SAC-4	SAC-4	SAC-4	SAC-4	SAC-4
Instrument ID#:	3	4	5	6	9
Serial #:	1164	952	971	924	959
Cal Due Date:	6/17/03	7/9/03	8/6/03	10/23/03	7/9/03
Analysis Date:	5/1/03	5/1/03	5/1/03	5/1/03	6/30/03
Alpha Eff. (c/d):	0.33	0.33	0.33	0.33	0.33
Alpha Bkgd (cpm)	0.2	0.4	0.2	0.0	0.2
Sample Time (min)	2	2	2	2	2
Bkgd Time (min)	10	10	10	10	10
MDC (dpm/100cm^2)	9.0	9.0	9.0	9.0	9.0

Sample Location Number	Instrument ID#	Gross Counts (cpm)	Net Activity (dpm/100 cm^2)
1	3	1	0.9
2	4	1	0.3
3	5	0	-0.6
4	6	1	1.5
5	3	1	0.9
6	4	1	0.3
7	5	0	-0.6
8	6	1	1.5
9	3	0	-0.6
10	4	1	0.3
11	5	0	-0.6
12	6	0	0.0
13	3	0	-0.6
14	4	0	-1.2
15	5	0	-0.6
16	9	1	0.9
17	3	0	-0.6
18	4	0	-1.2
19	5	0	-0.6
20	6	0	0.0
21	3	2	2.4
22	4	1	0.3
23	5	1	0.9
24	6	0	0.0
25	3	0	-0.6
26	4	0	-1.2
27	5	1	0.9
28	6	0	0.0
29	3	0	-0.6
30	4	1	0.3
31	5	2	2.4
32	6	0	0.0
33	3	1	0.9
34	4	0	-1.2
35	5	0	-0.6
36	6	0	0.0
37	3	0	-0.6
38	4	0	-1.2
39	5	2	2.4
40	9	0	-0.6
		MIN	-1.2
		MAX	2.4
		MEAN	0.1
		SD	1.0
		Transuranic $DCGL_W$	20

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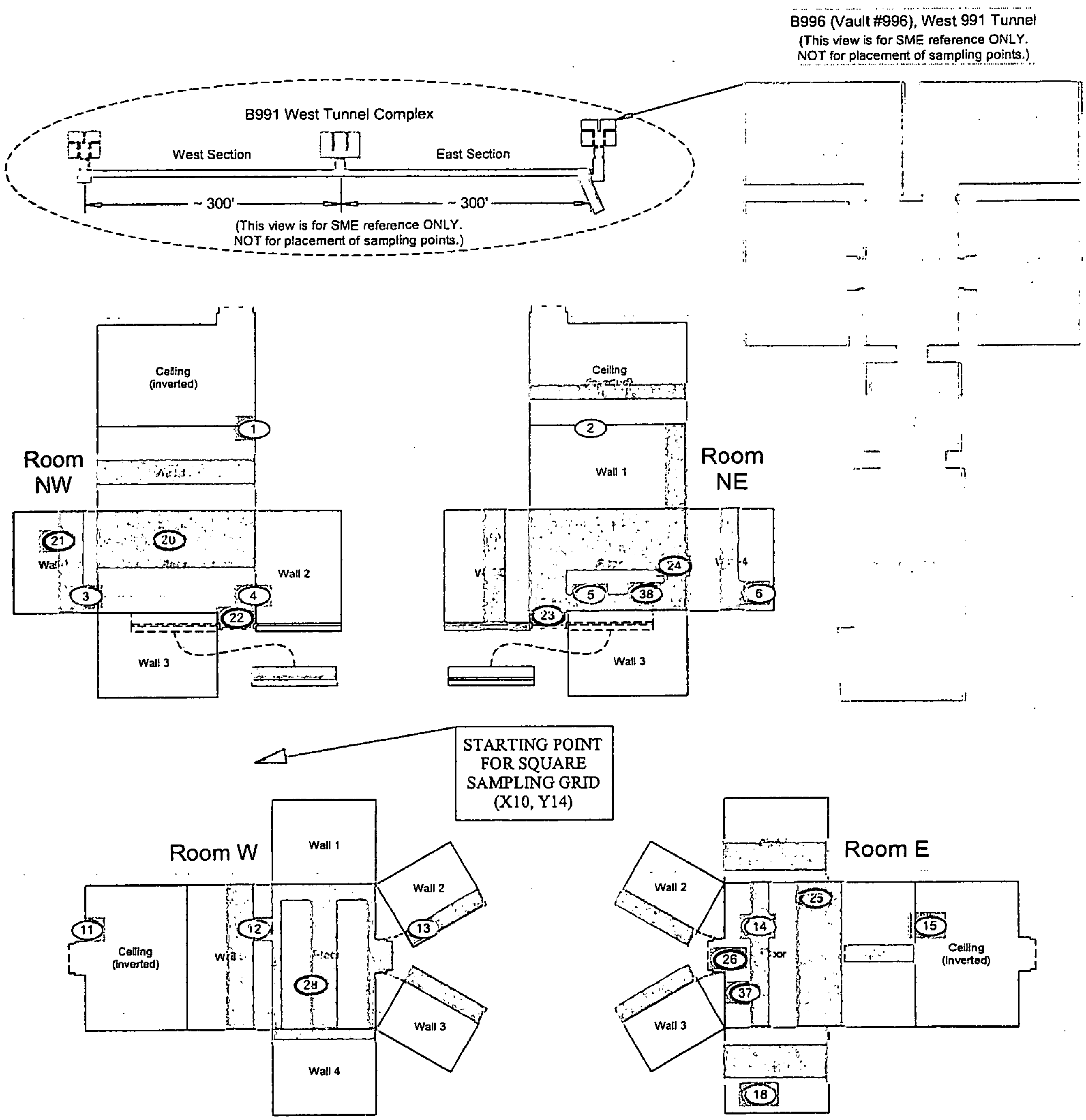
PRE-DEMOLITION SURVEY FOR AREA 2, GROUP 2A

Survey Area: 2 **Survey Unit: 996-2-002** **Classification: 2**
Building: 996
Survey Unit Description: Vault #996 (East end of the West 991 Tunnel) Interior
Total Area: 646 sq. m. **Floor Area: 147 sq. m.** **Wall Area: 353 sq. m.**
Grid Spacing for Survey Points: 6m X 6m



Scan Area

SURVEY MAP LEGEND				
Smear & TSA Location Smear, TSA & Sample Location Open/Inaccessible Area Area in Another Survey Unit	Neither the United States Government nor Kaiser Hill Co. nor DynCorp I&ET, nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights.	N	0 FEET 25 0 METERS 8	U.S. Department of Energy Rocky Flats Environmental Technology Site
	Scan Survey Information Survey Instrument ID #(s) & RCT ID #(s): 1, 2, 7 & 8		1 inch = 18 feet 1 grid sq. = 1 sq. m.	Prepared by: GIS Dept. 303-966-7707 Prepared for: CH2MHILL Communications Group MAP ID: 02-0335/B996 PG1-SC July 8, 2003

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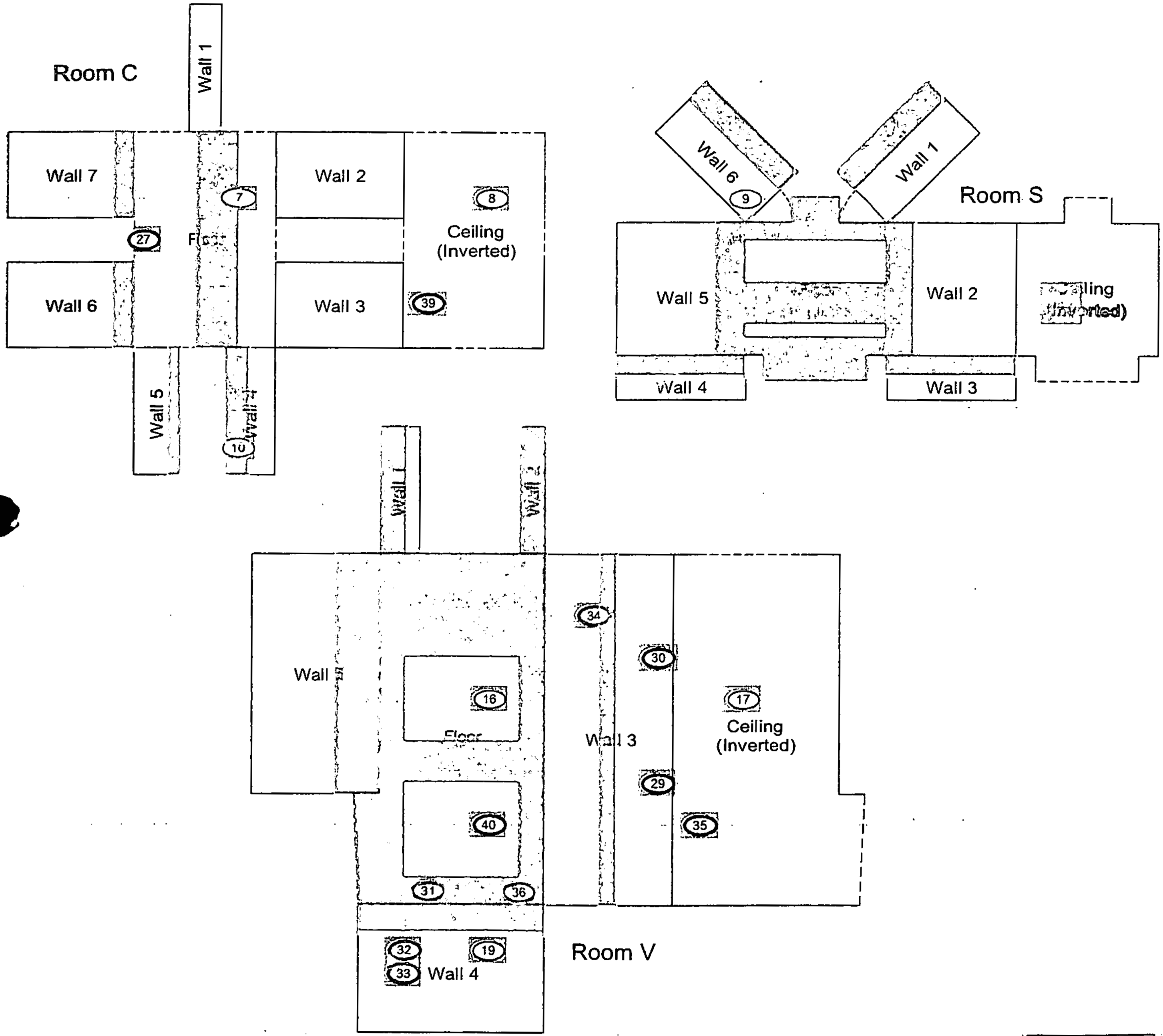
PRE-DEMOLITION SURVEY FOR AREA 2, GROUP 2A

Survey Area:2 Survey Unit: 996-2-002 Classification: 2
Building: 996
Survey Unit Description: Vault #996 (East end of the West 991 Tunnel) Interior
Total Area: 646 sq. m. Floor Area: 147 sq. m. Wall Area: 353 sq. m.
Grid Spacing for Survey Points: 6m X 6m



Scan Area

SURVEY MAP LEGEND				
Smear & TSA Location Smear, TSA & Sample Location Open/Inaccessible Area Area in Another Survey Unit	Neither the United States Government nor Kaiser Hill Co., nor DynCorp I&ET, nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights.	N	0 FEET 15 0 METERS 5	U.S. Department of Energy Rocky Flats Environmental Technology Site
	Scan Survey Information Survey Instrument ID #(s) & RCT ID #(s): 1, 2, 7 & 8		1 inch = 12 feet 1 grid sq. = 1 sq. m.	Prepared by: GIS Dept. 303-966-7707 CH2MHILL Communications Group Prepared for: KAISER-HILL MAP ID: 02-0355/B996 PG2-SC July 9, 2003

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SURVEY UNIT 997-2-004
RADIOLOGICAL DATA SUMMARY - PDS

Survey Unit Description: B997 (Interior)

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261

Total Surface Activity Measurements			
	41	41	
	Number Required	Number Obtained	
MIN	0.0	dpm/100 cm^2	
MAX	85.3	dpm/100 cm^2	
MEAN	26.1	dpm/100 cm^2	
STD DEV	18.6	dpm/100 cm^2	
TRANSURANIC $DCGL_W$	100	dpm/100 cm^2	

Removable Activity Measurements			
	41	41	
	Number Required	Number Obtained	
MIN	-1.2	dpm/100 cm^2	
MAX	4.8	dpm/100 cm^2	
MEAN	0.5	dpm/100 cm^2	
STD DEV	1.3	dpm/100 cm^2	
TRANSURANIC $DCGL_W$	20	dpm/100 cm^2	

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SURVEY UNIT 997-2-004
TSA - DATA SUMMARY

Manufacturer:	NE Tech	NE Tech	NE Tech	NE Tech
Model:	DP-6	DP-6	DP-6	DP-6
Instrument ID#:	1	2	3	8
Serial #:	1417	1366	3115	1417
Cal Due Date:	7/28/03	6/26/03	9/24/03	7/28/03
Analysis Date:	4/30/03	4/30/03	4/30/03	6/18/03
Alpha Eff. (c/d):	0.218	0.209	0.218	0.218
Alpha Bkgd (cpm)	2.7	6.0	1.3	0.7
Sample Time (min)	1.5	1.5	1.5	1.5
LAB Time (min)	1.5	1.5	1.5	1.5
MDC (dpm/100cm^2)	48.0	48.0	48.0	48.0

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)[1]
1	2	10.7	51.2	7.3	34.9	29.6
2	2	9.3	44.5	7.3	34.9	22.9
3	3	7.3	33.5	7.3	33.5	11.9
4	1	8.0	36.7	2.7	12.4	15.1
5	1	16.0	73.4	3.3	15.1	51.8
6	2	13.3	63.6	6.7	32.1	42.0
7	1	11.3	51.8	2.0	9.2	30.2
8	1	7.3	33.5	4.0	18.3	11.9
9	2	14.0	67.0	8.0	38.3	45.4
10	1	8.0	36.7	6.0	27.5	15.1
11	1	15.3	70.2	3.3	15.1	48.6
12	1	8.7	39.9	4.0	18.3	18.3
13	3	5.3	24.3	2.7	12.4	2.7
14	3	16.0	73.4	7.3	33.5	51.8
15	2	4.7	22.5	3.3	15.8	0.9
16	3	14.0	64.2	6.0	27.5	42.6
17	1	5.3	24.3	4.0	18.3	2.7
18	3	6.0	27.5	3.3	15.1	5.9
19	2	6.7	32.1	6.7	32.1	10.5
20	3	9.3	42.7	4.7	21.6	21.1
21	3	10.0	45.9	5.3	24.3	24.3
22	3	12.0	55.0	4.7	21.6	33.4
23	1	12.0	55.0	4.0	18.3	33.4
24	1	16.0	73.4	3.3	15.1	51.8
25	3	11.3	51.8	4.0	18.3	30.2
26	3	10.0	45.9	4.7	21.6	24.3
27	3	7.3	33.5	2.7	12.4	11.9
28	1	4.7	21.6	6.0	27.5	0.0
29	1	10.0	45.9	6.0	27.5	24.3
30	3	8.7	39.9	4.7	21.6	18.3
31	3	9.3	42.7	3.3	15.1	21.1
32	3	5.3	24.3	5.3	24.3	2.7
33	3	16.0	73.4	6.7	30.7	51.8
34	1	12.0	55.0	2.0	9.2	33.4
35	1	14.7	67.4	6.0	27.5	45.8
36	2	6.0	28.7	3.3	15.8	7.1

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SURVEY UNIT 997-2-004
TSA - DATA SUMMARY

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)[1]
37	3	23.3	106.9	2.7	12.4	85.3
38	1	10.0	45.9	2.0	9.2	24.3
39	1	14.0	64.2	3.3	15.1	42.6
40	1	6.0	27.5	5.3	24.3	5.9
41	3	8.7	39.9	6.0	27.5	18.3

1 - Average LAB used to subtract from Gross Sample Activity

21.6	Sample LAB Average
MIN	0.0
MAX	85.3
MEAN	26.1
SD	18.6
Transuranic $DCGL_W$	100

QC Measurements

37 QC	1	10.7	49.1	8.0	36.7	17.4
24 QC	3	14.7	67.4	6.7	30.7	35.8
5 QC	3	8.7	39.9	6.0	27.5	8.3

1 - Average QC LAB used to subtract from Gross Sample Activity

31.7	QC LAB Average
MIN	8.3
MAX	35.8
MEAN	20.5
Transuranic $DCGL_W$	100

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SURVEY UNIT 997-2-004
RSC - DATA SUMMARY

Manufacturer:	Eberline	Eberline	Eberline	Eberline
Model:	SAC-4	SAC-4	SAC-4	SAC-4
Instrument ID#:	4	5	6	7
Serial #:	1164	952	971	924
Cal Due Date:	6/17/03	7/9/03	8/6/03	10/23/03
Analysis Date:	5/1/03	5/1/03	5/1/03	5/1/03
Alpha Eff. (c/d):	0.33	0.33	0.33	0.33
Alpha Bkgd (cpm)	0.2	0.4	0.2	0.0
Sample Time (min)	2	2	2	2
Bkgd Time (min)	10	10	10	10
MDC ($dpm/100cm^2$)	9.0	9.0	9.0	9.0

Sample Location Number	Instrument ID#	Gross Counts (cpm)	Net Activity ($dpm/100\ cm^2$)
1	4	0	-0.6
2	5	4	4.8
3	6	1	0.9
4	7	0	0.0
5	4	0	-0.6
6	5	1	0.3
7	6	1	0.9
8	7	0	0.0
9	4	0	-0.6
10	5	3	3.3
11	6	0	-0.6
12	7	0	0.0
13	4	0	-0.6
14	5	1	0.3
15	6	0	-0.6
16	7	0	0.0
17	4	0	-0.6
18	5	0	-1.2
19	6	0	-0.6
20	7	0	0.0
21	4	1	0.9
22	5	1	0.3
23	6	1	0.9
24	7	1	1.5
25	4	1	0.9
26	5	2	1.8
27	6	0	-0.6
28	7	1	1.5
29	4	0	-0.6
30	5	0	-1.2
31	6	0	-0.6
32	7	1	1.5
33	4	1	0.9
34	5	3	3.3
35	6	1	0.9
36	7	0	0.0
37	4	1	0.9
38	5	2	1.8
39	6	0	-0.6
40	7	0	0.0
41	4	2	2.4
		MIN	-1.2
		MAX	4.8
		MEAN	0.5
		SD	1.3
		Transuranic $DCGL_W$	20

2 of 4
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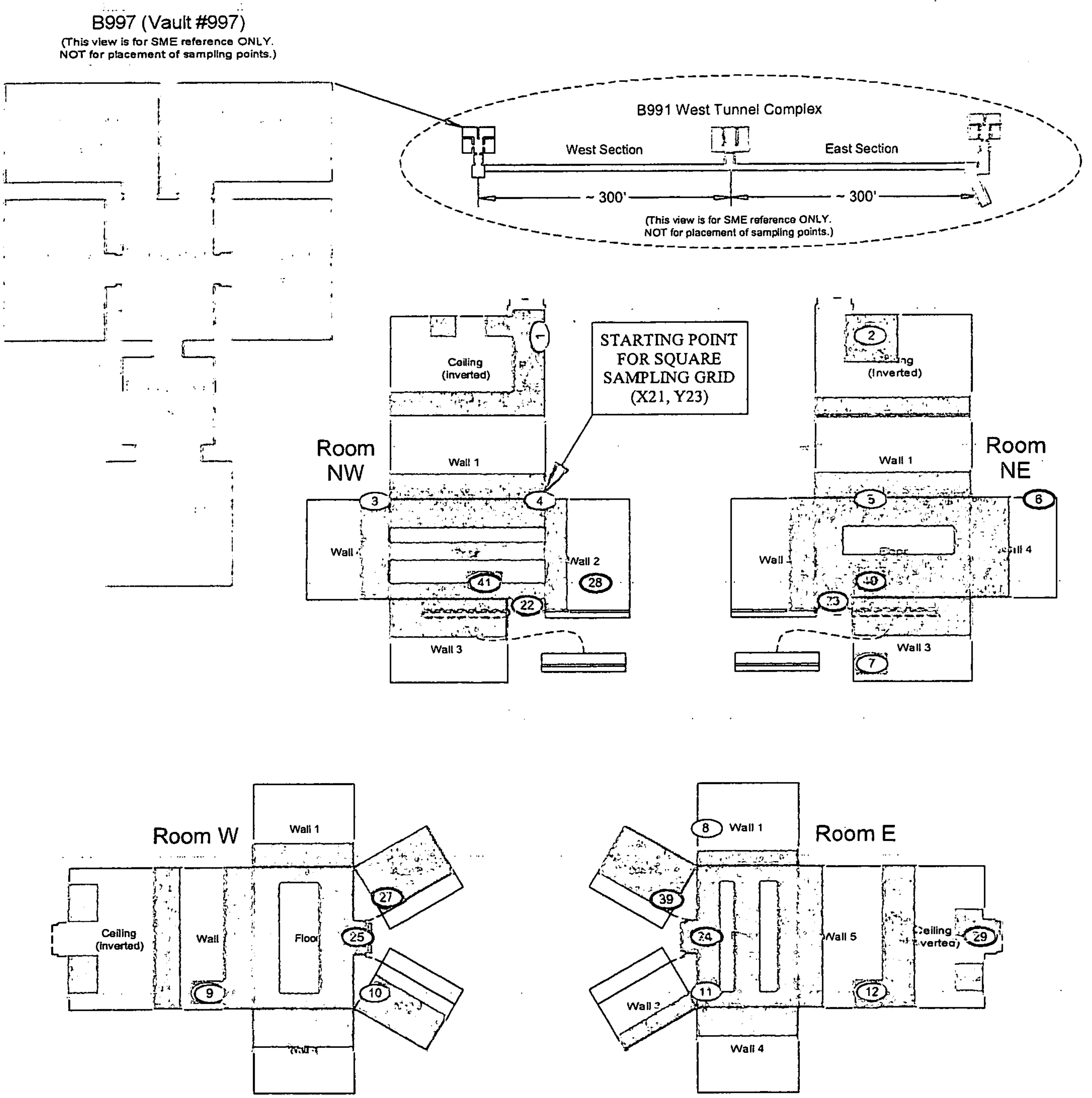
PRE-DEMOLITION SURVEY FOR AREA 2, GROUP 2A

Survey Area: 2 Survey Unit: 997-2-004 Classification: 2
Building: 997
Survey Unit Description: Vault #997 (West end of the West 991 Tunnel) Interior
Total Area: 607 sq. m. Floor Area: 133 sq. m. Wall Area: 340 sq. m.
Grid Spacing for Survey Points: 6m X 6m



Scan Area

SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

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N

0 FEET 25

0 METERS 8

1 inch = 18 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
8

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707
Prepared for:

CH2MHILL Communications Group

MAP ID: 02-0355/B997-PG1-SC July 8, 2003

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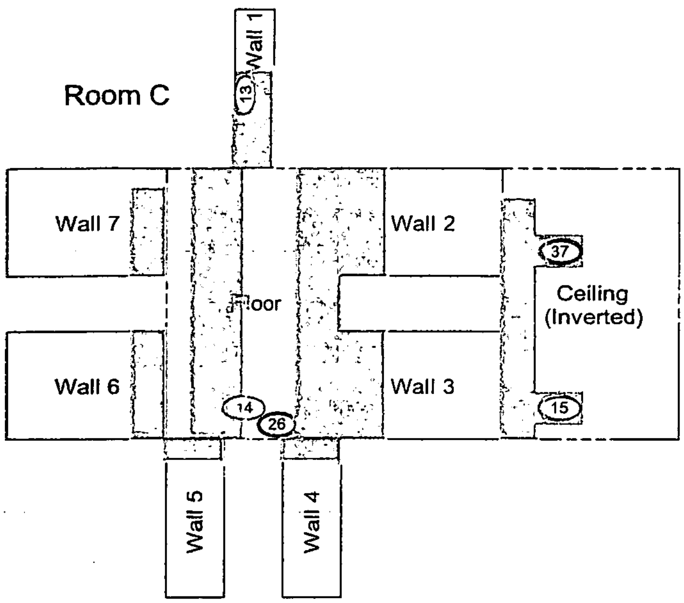
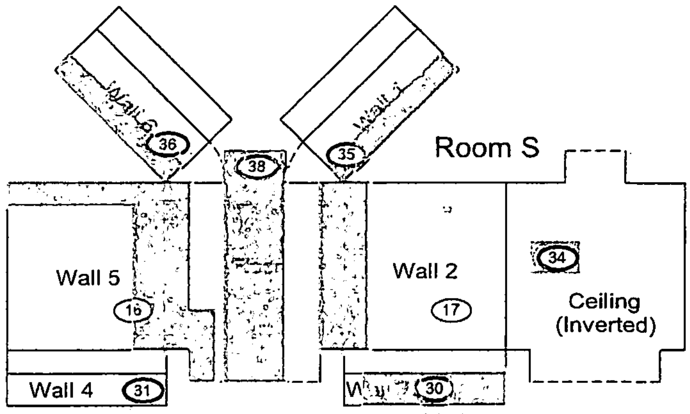
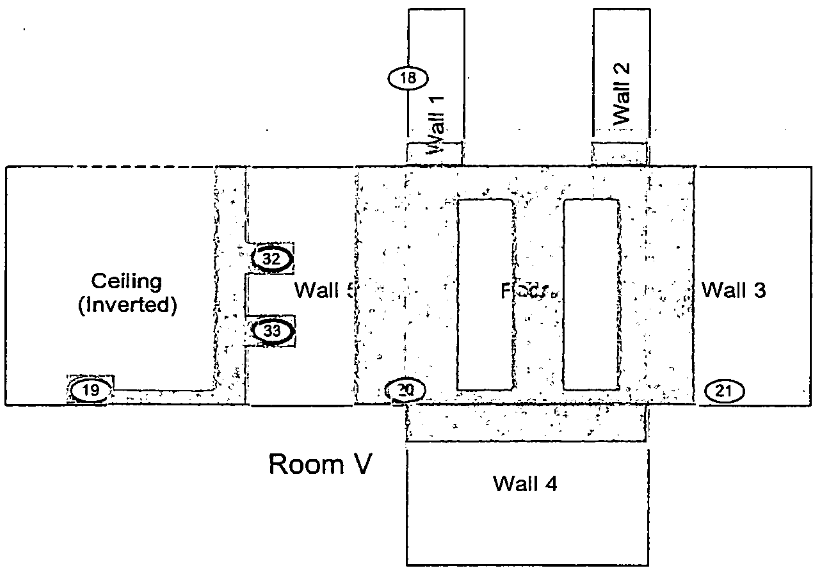
PRE-DEMOLITION SURVEY FOR AREA 2, GROUP 2A

Survey Area: 2 **Survey Unit:** 997-2-004 **Classification:** 2
Building: 997
Survey Unit Description: Vault #997 (West end of the West 991 Tunnel) Interior
Total Area: 607 sq. m. **Floor Area:** 133 sq. m. **Wall Area:** 340 sq. m.
Grid Spacing for Survey Points: 6m X 6m







Scan Area

SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 15
0 METERS 5

1 inch = 12 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
8

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707
Prepared for:

CH2MHILL
Communications Group

MAP ID: 02-0355/B997-PG2-SC
July 8, 2003

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SURVEY UNIT 999-2-003
RADIOLOGICAL DATA SUMMARY - PDS

Survey Unit Description: B999 (Interior)

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999-2-003
PDS Data Summary

Total Surface Activity Measurements

35	43
Number Required	Number Obtained

MIN	-0.8	dpm/100 cm^2
MAX	54.3	dpm/100 cm^2
MEAN	14.0	dpm/100 cm^2
STD DEV	12.6	dpm/100 cm^2
TRANSURANIC $DCGL_W$	100	dpm/100 cm^2

Removable Activity Measurements

35	43
Number Required	Number Obtained

MIN	-1.5	dpm/100 cm^2
MAX	4.2	dpm/100 cm^2
MEAN	0.5	dpm/100 cm^2
STD DEV	1.4	dpm/100 cm^2
TRANSURANIC $DCGL_W$	20	dpm/100 cm^2

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SURVEY UNIT 999-2-003
TSA - DATA SUMMARY

Manufacturer:	NE Tech	NE Tech
Model:	DP-6	DP-6
Instrument ID#:	1	2
Serial #:	3107	1417
Cal Due Date:	8/6/03	7/28/03
Analysis Date:	4/29/03	4/29/03
Alpha Eff. (c/d):	0.218	0.218
Alpha Bkgd (cpm)	1.3	0.7
Sample Time (min)	1.5	1.5
LAB Time (min)	1.5	1.5
MDC (dpm/100cm^2)	48.0	48.0

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)[1]
1	1	6.7	30.7	7.3	33.5	11.6
2	1	9.3	42.7	4.0	18.3	23.5
3	1	10.7	49.1	8.0	36.7	30.0
4	1	10.0	45.9	6.7	30.7	26.8
5	1	7.3	33.5	5.3	24.3	14.4
6	1	12.0	55.0	7.3	33.5	35.9
7	1	10.7	49.1	7.3	33.5	30.0
8	1	4.7	21.6	3.3	15.1	2.4
9	2	5.3	24.3	4.0	18.3	5.2
10	2	7.3	33.5	1.3	6.0	14.4
11	1	6.7	30.7	3.3	15.1	11.6
12	2	4.0	18.3	4.0	18.3	-0.8
13	2	6.0	27.5	4.7	21.6	8.4
14	2	12.7	58.3	3.3	15.1	39.1
15	2	4.0	18.3	4.7	21.6	-0.8
16	2	6.0	27.5	6.7	30.7	8.4
17	2	6.7	30.7	2.0	9.2	11.6
18	2	6.0	27.5	2.7	12.4	8.4
19	1	4.7	21.6	6.0	27.5	2.4
20	1	4.0	18.3	4.0	18.3	-0.8
21	2	4.7	21.6	1.3	6.0	2.4
22	2	8.7	39.9	1.3	6.0	20.8
23	1	4.7	21.6	4.0	18.3	2.4
24	1	4.0	18.3	0.7	3.2	-0.8
25	2	5.3	24.3	1.3	6.0	5.2
26	1	10.0	45.9	6.0	27.5	26.8
27	1	5.3	24.3	7.3	33.5	5.2
28	1	6.0	27.5	4.0	18.3	8.4
29	2	5.3	24.3	3.3	15.1	5.2
30	2	6.7	30.7	4.7	21.6	11.6
31	2	9.3	42.7	4.0	18.3	23.5
32	1	7.3	33.5	6.7	30.7	14.4
33	2	7.3	33.5	4.0	18.3	14.4
34	1	5.3	24.3	4.0	18.3	5.2
35	1	6.0	27.5	2.0	9.2	8.4
36	1	11.4	52.3	6.0	27.5	33.2

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SURVEY UNIT 999-2-003
TSA - DATA SUMMARY

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)[1]
37	2	16.0	73.4	1.3	6.0	54.3
38	1	6.7	30.7	4.0	18.3	11.6
39	1	4.7	21.6	2.7	12.4	2.4
40	2	6.0	27.5	6.0	27.5	8.4
41	2	6.0	27.5	0.7	3.2	8.4
42	2	8.0	36.7	2.7	12.4	17.6
43	1	11.3	51.8	5.3	24.3	32.7

1 - Average LAB used to subtract from Gross Sample Activity

19.1	Sample LAB Average
MIN	-0.8
MAX	54.3
MEAN	14.0
SD	12.6
Transuranic $DCGL_W$	100

QC Measurements

25 QC	1	8.0	36.7	6.0	27.5	15.3
10 QC	1	6.0	27.5	4.7	21.6	6.1
42 QC	1	5.0	22.9	3.3	15.1	1.5

1 - Average QC LAB used to subtract from Gross Sample Activity

21.4	QC LAB Average
MIN	1.5
MAX	15.3
MEAN	7.6
Transuranic $DCGL_W$	100

SURVEY UNIT 999-2-003
RSC - DATA SUMMARY

Manufacturer:	Eberline	Eberline	Eberline
Model:	SAC-4	SAC-4	SAC-4
Instrument ID#:	3	4	5
Serial #:	1164	952	971
Cal Due Date:	6/17/03	7/9/03	8/6/03
Analysis Date:	4/30/03	4/30/03	4/30/03
Alpha Eff. (c/d):	0.33	0.33	0.33
Alpha Bkgd (cpm)	0.1	0.5	0.3
Sample Time (min)	2	2	2
Bkgd Time (min)	10	10	10
MDC (dpm/100cm^2)	9.0	9.0	9.0

Sample Location Number	Instrument ID#	Gross Counts (cpm)	Net Activity (dpm/100 cm^2)
1	3	0	-0.3
2	4	2	1.5
3	5	1	0.6
4	3	3	4.2
5	4	2	1.5
6	5	1	0.6
7	3	0	-0.3
8	4	1	0.0
9	5	1	0.6
10	3	0	-0.3
11	4	2	1.5
12	5	0	-0.9
13	3	1	1.2
14	4	2	1.5
15	5	1	0.6
16	3	0	-0.3
17	4	3	3.0
18	5	0	-0.9
19	3	0	-0.3
20	4	0	-1.5
21	5	0	-0.9
22	3	0	-0.3
23	4	2	1.5
24	5	0	-0.9
25	3	1	1.2
26	4	2	1.5
27	5	3	3.6
28	3	0	-0.3
29	4	0	-1.5
30	5	1	0.6
31	3	0	-0.3
32	4	1	0.0
33	5	1	0.6
34	3	1	1.2
35	4	0	-1.5
36	5	1	0.6
37	3	1	1.2
38	4	0	-1.5
39	5	2	2.1
40	3	0	-0.3
41	4	3	3.0
42	5	0	-0.9
43	3	0	-0.3
		MIN	-1.5
		MAX	4.2
		MEAN	0.5
		SD	1.4
		Transuranic $DCGL_W$	20

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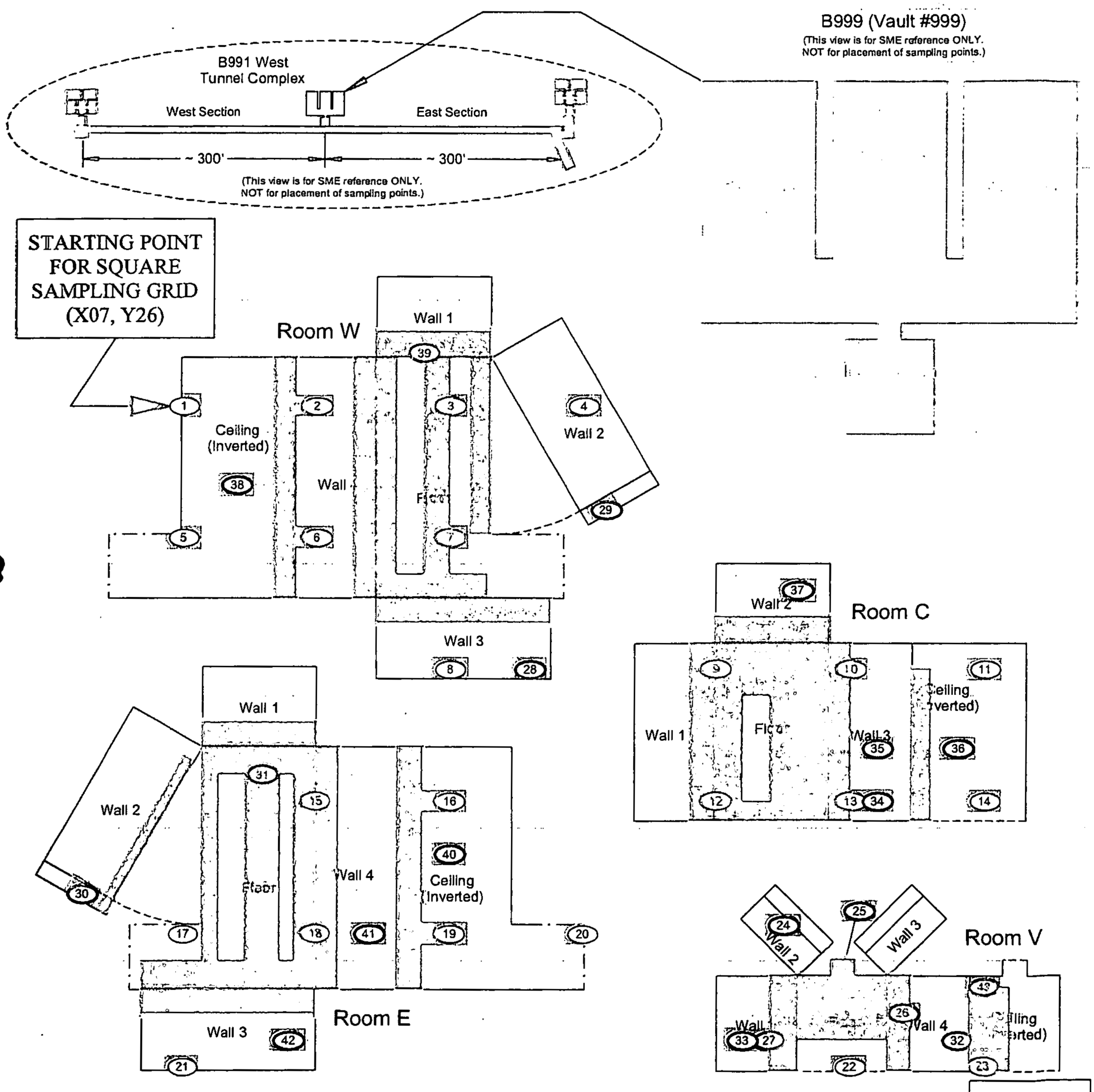
PRE-DEMOLITION SURVEY FOR AREA 2, GROUP 2A

Survey Area: 2 **Survey Unit:** 999-2-003 **Classification:** 2
Building: B999
Survey Unit Description: Vault #999 (Middle of the West 991 Tunnel) Interior
Total Area: 518 sq. m. **Floor Area:** 133 sq. m. **Wall Area:** 253 sq. m.
Grid Spacing for Survey Points: 5m X 5m



Scan Area

SURVEY MAP LEGEND	Disclaimer	N	Scale	
Smear & TSA Location Smear, TSA & Sample Location Open/Inaccessible Area Area in Another Survey Unit	Neither the United States Government nor Kaiser Hill Co., nor DynCorp I&ET, nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights.	N ↑	0 FEET 25 0 METERS 8	U.S. Department of Energy Rocky Flats Environmental Technology Site Prepared by: GIS Dept. 303-966-7707 Prepared for: CH2MHILL Communications Group
	Scan Survey Information **Survey Instrument ID #(s) & RCT ID #(s):** 6, 7, 8		1 inch = 18 feet 1 grid sq. = 1 sq. m.	MAP ID: 02-0355/B999 PG1-SC Aug. 19, 2003

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SURVEY UNIT 985-2-005
RADIOLOGICAL DATA SUMMARY - PDS

Survey Unit Description: B985 (Interior)

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PDS Data Summary

Total Surface Activity Measurements

55	77
Number Required	Number Obtained

MIN	-11.7	dpm/100 cm^2
MAX	89.4	dpm/100 cm^2
MEAN	16.4	dpm/100 cm^2
STD DEV	18.9	dpm/100 cm^2
TRANSURANIC $DCGL_W$	100	dpm/100 cm^2

Removable Activity Measurements

55	77
Number Required	Number Obtained

MIN	-1.2	dpm/100 cm^2
MAX	4.5	dpm/100 cm^2
MEAN	0.1	dpm/100 cm^2
STD DEV	1.3	dpm/100 cm^2
TRANSURANIC $DCGL_W$	20	dpm/100 cm^2

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SURVEY UNIT 985-2-005
TSA - DATA SUMMARY

Manufacturer:	NE Tech	NE Tech	NE Tech	NE Tech	NE Tech	NE Tech	NE Tech
Model:	DP-6	DP-6	DP-6	DP-6	DP-6	DP-6	DP-6
Instrument ID#:	1	2	3	4	5	6	7
Serial #:	2391	3115	1366	3115	3114	1681	1420
Cal Due Date:	7/10/03	9/24/03	6/26/03	9/24/03	9/3/03	10/18/03	6/4/03
Analysis Date:	4/30/03	4/30/03	4/30/03	5/1/03	5/1/03	5/1/03	5/1/03
Alpha Eff. (c/d):	0.220	0.218	0.209	0.218	0.219	0.218	0.221
Alpha Bkgd (cpm)	1.3	1.3	6.0	1.3	6.7	0.0	0.7
Sample Time (min)	1.5	1.5	1.5	1.5	1.5	1.5	1.5
LAB Time (min)	1.5	1.5	1.5	1.5	1.5	1.5	1.5
MDC (dpm/100cm^2)	48.0	48.0	48.0	48.0	48.0	48.0	48.0

Manufacturer:	NE Tech	NE Tech	NE Tech
Model:	DP-6	DP-6	DP-6
Instrument ID#:	15	16	21
Serial #:	1417	1425	1273
Cal Due Date:	1/21/04	1/24/04	1/9/04
Analysis Date:	8/12/03	8/12/03	8/13/03
Alpha Eff. (c/d):	0.218	0.225	0.212
Alpha Bkgd (cpm)	3.0	4.7	2.0
Sample Time (min)	1.5	1.5	1.5
LAB Time (min)	1.5	1.5	1.5
MDC (dpm/100cm^2)	48.0	48.0	48.0

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)[1]
1	2	12.7	58.3	8.0	36.7	37.5
2	1	5.3	24.1	4.0	18.2	3.4
3	3	9.3	44.5	7.3	34.9	23.8
4	3	9.3	44.5	6.0	28.7	23.8
5	2	8.7	39.9	8.0	36.7	19.2
6	1	12.0	54.5	7.3	33.2	33.8
7	1	8.7	39.5	4.7	21.4	18.8
8	3	15.3	73.2	4.0	19.1	52.5
9	3	7.3	34.9	8.0	38.3	14.2
10	2	7.3	33.5	5.3	24.3	12.8
11	3	12.0	57.4	8.0	38.3	36.7
12	3	16.0	76.6	6.0	28.7	55.8
13	1	9.3	42.3	4.0	18.2	21.6
14	1	4.0	18.2	6.0	27.3	-2.5
15	2	14.7	67.4	5.3	24.3	46.7
16	1	6.0	27.3	4.0	18.2	6.6
17	3	8.0	38.3	5.3	25.4	17.6
18	2	9.3	42.7	6.0	27.5	22.0
19	4	10.7	49.1	1.3	6.0	28.4
20	4	4.7	21.6	2.0	9.2	0.9
21	4	6.7	30.7	1.3	6.0	10.0
22	4	3.3	15.1	1.3	6.0	-5.6
23	4	4.0	18.3	3.3	15.1	-2.4
24	4	5.3	24.3	1.3	6.0	3.6
25	5	8.0	36.5	4.0	18.3	15.8
26	5	6.0	27.4	6.0	27.4	6.7
27	5	15.3	69.9	5.3	24.2	49.2
28	4	5.3	24.3	2.0	9.2	3.6
29	4	7.3	33.5	2.0	9.2	12.8
30	4	6.0	27.5	2.0	9.2	6.8
31	4	4.7	21.6	6.0	27.5	0.9
32	4	10.0	45.9	3.3	15.1	25.2
33	4	4.0	18.3	2.0	9.2	-2.4
34	4	2.0	9.2	4.7	21.6	-11.5
35	4	4.0	18.3	2.0	9.2	-2.4
36	4	8.0	36.7	1.3	6.0	16.0
37	4	5.3	24.3	2.0	9.2	3.6

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SURVEY UNIT 985-2-005
TSA - DATA SUMMARY

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)[1]
38	4	13.3	61.0	6.7	30.7	40.3
39	4	4.3	19.7	1.8	8.3	-1.0
40	4	5.3	24.3	2.7	12.4	3.6
41	4	4.0	18.3	3.3	15.1	-2.4
42	5	7.3	33.3	8.0	36.5	12.6
43	5	6.0	27.4	6.0	27.4	6.7
44	7	2.0	9.0	2.7	12.2	-11.7
45	7	6.7	30.3	4.0	18.1	9.6
46	7	5.3	24.0	2.0	9.0	3.3
47	7	6.0	27.1	1.3	5.9	6.4
48	7	2.7	12.2	2.0	9.0	-8.5
49	6	4.0	18.3	1.3	6.0	-2.4
50	7	6.7	30.3	2.0	9.0	9.6
51	5	10.0	45.7	4.7	21.5	25.0
52	5	8.0	36.5	6.0	27.4	15.8
53	5	9.3	42.5	6.7	30.6	21.8
54	5	7.3	33.3	4.7	21.5	12.6
55	5	12.7	58.0	7.3	33.3	37.3
56	5	10.7	48.9	4.0	18.3	28.2
57	5	9.3	42.5	2.7	12.3	21.8
58	15	5.8	26.6	5.3	24.3	5.9
59	16	10.0	44.4	8.0	35.6	23.7
60	21	22.0	103.8	2.8	13.2	83.1
61	15	24.0	110.1	6.0	27.5	89.4
62	16	8.0	35.6	6.0	26.7	14.8
63	16	7.3	32.4	2.0	8.9	11.7
64	15	14.0	64.2	4.7	21.6	43.5
65	15	5.3	24.3	7.6	34.9	3.6
66	15	10.7	49.1	4.5	20.6	28.4
67	15	5.3	24.3	5.3	24.3	3.6
68	15	7.3	33.5	6.0	27.5	12.8
69	16	9.3	41.3	7.3	32.4	20.6
70	15	9.3	42.7	8.0	36.7	22.0
71	15	6.7	30.7	4.6	21.1	10.0
72	15	8.0	36.7	5.3	24.3	16.0
73	16	8.7	38.7	4.7	20.9	18.0
74	16	8.7	38.7	5.3	23.6	18.0
75	15	7.3	33.5	3.8	17.4	12.8
76	15	4.0	18.3	5.3	24.3	-2.4
77	15	3.3	15.1	4.7	21.6	-5.6

1 - Average LAB used to subtract from Gross Sample Activity

2 - The initial Sample Net Activity for location 60 was 116.4 dpm/100cm2, and location 61 was 118.9 dpm/100cm2. These locations were sealed and allowed to decay. Re-survey results were less than the transuranic DCGLW, and are reported. No further investigations are required.

20.7	Sample LAB Average
MIN	-11.7
MAX	89.4
MEAN	16.4
SD	18.9
Transuranic $DCGL_W$	100

QC Measurements

27 QC	6	11.3	51.8	4.7	21.6	32.9
19 QC	5	13.3	60.7	2.7	12.3	41.8
55 QC	7	9.0	40.7	2.0	9.0	21.8
69 QC	15	7.3	33.5	7.3	33.5	14.5
63 QC	15	16.7	76.6	4.0	18.3	57.7

1 - Average QC LAB used to subtract from Gross Sample Activity

19.0	QC LAB Average
MIN	14.5
MAX	57.7
MEAN	33.7
Transuranic $DCGL_W$	100

~~276~~
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SURVEY UNIT 985-2-005
RSC - DATA SUMMARY

Manufacturer:	Eberline	Eberline	Eberline	Eberline
Model:	SAC-4	SAC-4	SAC-4	SAC-4
Instrument ID#:	8	9	10	11
Serial #:	1164	952	971	924
Cal Due Date:	6/17/03	7/9/03	8/6/03	10/23/03
Analysis Date:	5/1/03	5/1/03	5/1/03	5/1/03
Alpha Eff. (c/d):	0.33	0.33	0.33	0.33
Alpha Bkgd (cpm)	0.2	0.4	0.2	0.0
Sample Time (min)	2	2	2	2
Bkgd Time (min)	10	10	10	10
MDC (dpm/100cm^2)	9.0	9.0	9.0	9.0

Manufacturer:	Eberline	Eberline	Eberline	Eberline
Model:	SAC-4	SAC-4	SAC-4	SAC-4
Instrument ID#:	17	18	19	20
Serial #:	770	1164	924	959
Cal Due Date:	10/17/03	11/30/03	10/23/03	1/14/04
Analysis Date:	8/14/03	8/14/03	8/14/03	8/14/03
Alpha Eff. (c/d):	0.33	0.33	0.33	0.33
Alpha Bkgd (cpm)	0.4	0.1	0.3	0.1
Sample Time (min)	2	2	2	2
Bkgd Time (min)	10	10	10	10
MDC (dpm/100cm^2)	9.0	9.0	9.0	9.0

Sample Location Number	Instrument ID#	Gross Counts (cpm)	Net Activity (dpm/100 cm^2)
1	8	0	-0.6
2	9	1	0.3
3	10	0	-0.6
4	11	0	0.0
5	8	0	-0.6
6	9	0	-1.2
7	10	1	0.9
8	11	0	0.0
9	8	0	-0.6
10	9	0	-1.2
11	10	0	-0.6
12	11	0	0.0
13	8	0	-0.6
14	9	0	-1.2
15	10	0	-0.6
16	11	1	1.5
17	8	0	-0.6
18	9	0	-1.2
19	10	0	-0.6
20	11	0	0.0
21	8	0	-0.6
22	9	0	-1.2
23	10	0	-0.6
24	11	0	0.0
25	8	0	-0.6
26	9	0	-1.2
27	10	1	0.9
28	11	1	1.5

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SURVEY UNIT 985-2-005
RSC - DATA SUMMARY

Sample Location Number	Instrument ID#	Gross Counts (cpm)	Net Activity (dpm/100 cm^2)
29	8	1	0.9
30	9	0	-1.2
31	10	2	2.4
32	11	0	0.0
33	8	1	0.9
34	9	0	-1.2
35	10	0	-0.6
36	11	1	1.5
37	8	0	-0.6
38	9	0	-1.2
39	10	0	-0.6
40	11	3	4.5
41	8	0	-0.6
42	9	0	-1.2
43	10	2	2.4
44	11	3	4.5
45	8	0	-0.6
46	9	0	-1.2
47	10	0	-0.6
48	11	1	1.5
49	8	2	2.4
50	9	0	-1.2
51	10	1	0.9
52	11	0	0.0
53	8	0	-0.6
54	9	0	-1.2
55	10	0	-0.6
56	11	0	0.0
57	8	0	-0.6
58	17	2	1.8
59	18	0	-0.3
60	19	0	-0.9
61	20	0	-0.3
62	17	2	1.8
63	18	2	2.7
64	19	1	0.6
65	20	0	-0.3
66	17	0	-1.2
67	18	1	1.2
68	19	0	-0.9
69	20	1	1.2
70	17	3	3.3
71	18	1	1.2
72	19	1	0.6
73	20	0	-0.3
74	17	1	0.3
75	18	0	-0.3
76	19	0	-0.9
77	20	0	-0.3
		MIN	-1.2
		MAX	4.5
		MEAN	0.1
		SD	1.3
		Transuranic $DCGL_W$	20

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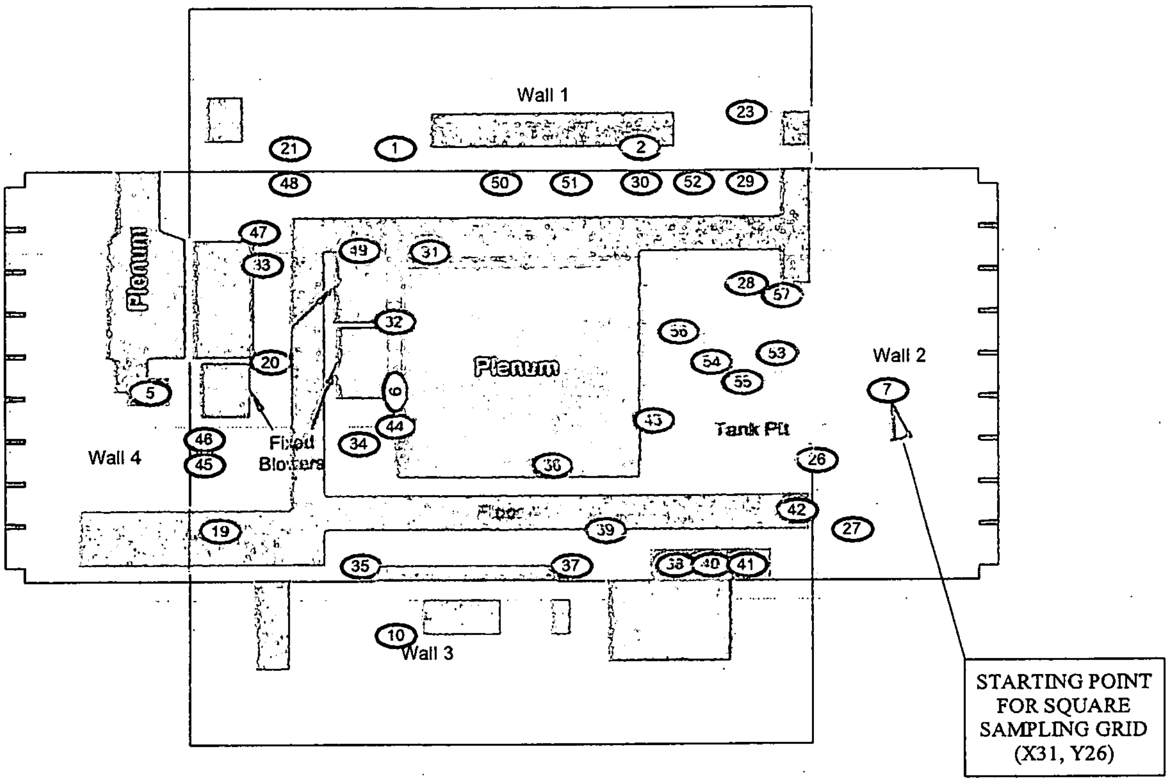
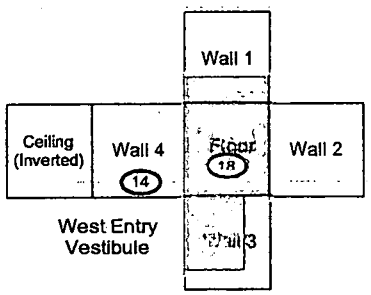
PRE-DEMOLITION SURVEY FOR AREA 2, GROUP 2A

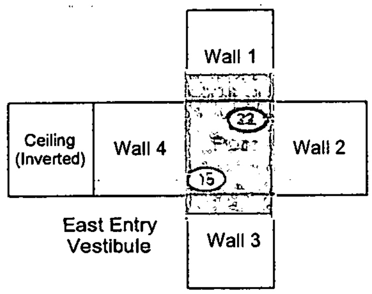
Survey Area: 2 **Survey Unit:** 985-2-005 **Classification:** 2
Building: 985
Survey Unit Description: Interior of Building
Total Area: 966 sq. m. **Floor Area:** 170 sq. m. **Wall Area:** 397 sq. m.
Grid Spacing for Survey Points: 7m X 7m

B985





West Entry Vestibule



East Entry Vestibule

Scan Area

SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

FEET 0 25
METERS 0 8

1 inch = 18 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
4, 5, 6, 7, 12, 13 & 14

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Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707 Prepared for:

CH2MHILL Communications Group

MAP ID: 02-0355/B985 PG1-SC Aug. 19, 2003

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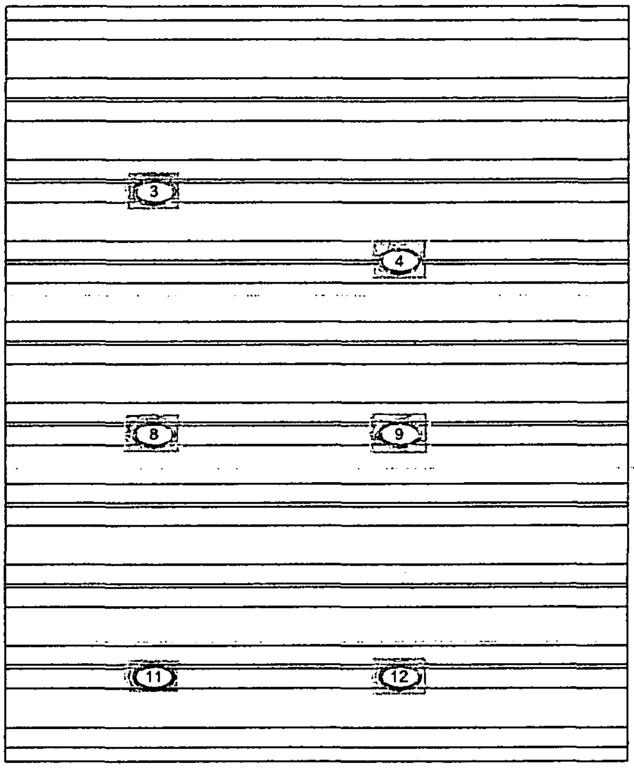
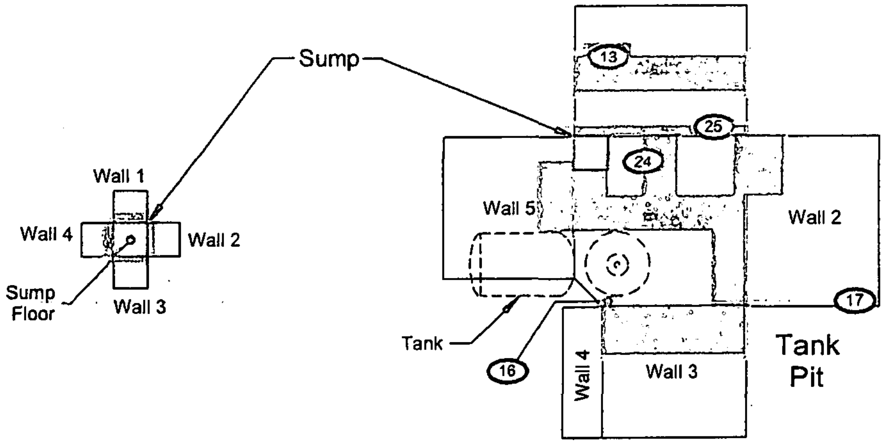
PRE-DEMOLITION SURVEY FOR AREA 2, GROUP 2A

Survey Area: 2 **Survey Unit:** 985-2-005 **Classification:** 2
Building: 985
Survey Unit Description: Interior of Filter Plenum Building
Total Area: 966 sq. m. **Floor Area:** 170 sq. m. **Wall Area:** 397 sq. m.
Grid Spacing for Survey Points: 7m X 7m



Inverted Ceiling
(Beams unfolded)



Scan Area

SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 25
0 METERS 8

1 inch = 18 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
4, 5, 6, 7, 12, 13 & 14

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CH2MHILL
Communications Group

MAP ID: 02-0355/B985 PG2-SC Aug. 19, 2003

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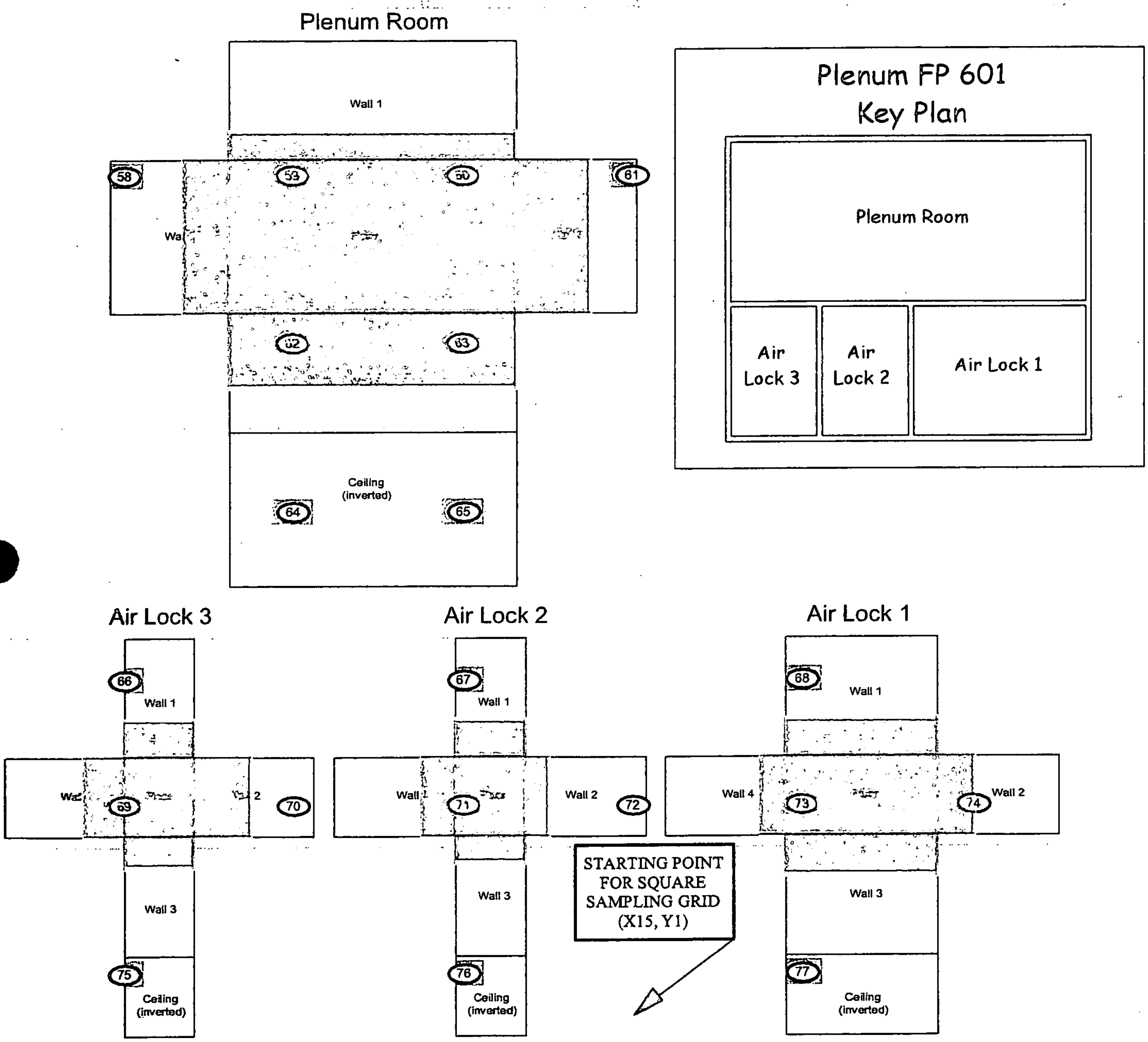
PRE-DEMOLITION SURVEY FOR B985

Survey Area: 2 **Survey Unit:** 985-2-005 **Classification:** 2
Building: 985
Survey Unit Description: Building 985 Plenum
Total Area: 205 sq. m. **Total Floor Area:** 38 sq. m.
Grid Spacing for Survey Points: 4m. X 4m.

985 Plenum FP-601



Scan Area

SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 15
0 METERS 5

1 inch = 12 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
4, 5, 6, 7, 12, 13 & 14

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Prepared for:

CH2MHILL
Communications Group

KAISER-HILL

MAP ID: 02-0355/B986-Plen-SC
Aug 19, 2003

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ATTACHMENT C

Chemical Data Summaries and Sample Maps

Beryllium Data Summary

Sample Number	Map Survey Point Location	Room	Sample Location	Result ($\mu g/100\ cm^2$)
Building 991				
991-04162003-315-101	1	402	Inside supply duct	< 0.1
991-04162003-315-102	2	Corridor B	Supply duct for Room 402 by garage	< 0.1
991-04162003-315-103	3	Corridor B	Exhaust duct by Y in the room	< 0.1
991-04162003-315-104	4	996	Right hood	< 0.1
991-04162003-315-105	5	996	Left hood	< 0.1
991-04162003-315-106	6	996 Room 400	Exhaust fan	< 0.1
991-04162003-315-107	7	996 Room 401D	Vent	< 0.1
991-04162003-315-108	8	996 Room 401C	Right vent	< 0.1
991-04162003-315-109	9	996 Room 401C	Left vent	< 0.1
991-04162003-315-110	10	996 Room 401A	Right vent	< 0.1
991-04162003-315-111	11	996 Room 401A	Left vent	< 0.1
991-04162003-315-112	12	Tunnel	Right upper vent	< 0.1
991-04162003-315-113	13	Tunnel	Left upper vent	< 0.1
991-04162003-315-114	14	Tunnel	Right upper vent	< 0.1
991-04162003-315-115	15	Tunnel	Left upper vent	< 0.1
991-04162003-315-116	16	Tunnel	Right upper vent	< 0.1
991-04162003-315-117	17	Tunnel	Left upper vent	< 0.1
991-04162003-315-118	18	Tunnel	Right upper vent	< 0.1
991-04162003-315-119	19	Tunnel	Right upper vent	< 0.1
991-04162003-315-120	20	Tunnel	Left upper vent	< 0.1
991-04162003-315-121	21	Tunnel	Left upper vent	< 0.1
991-04162003-315-122	22	Tunnel	Left upper vent	< 0.1
991-04162003-315-123	23	Tunnel	Right upper vent	< 0.1
991-04162003-315-124	24	Tunnel	Left upper vent	< 0.1
991-04162003-315-125	25	Tunnel	Right upper vent	< 0.1
991-04162003-315-126	26	601D	Vent	< 0.1
991-04162003-315-127	27	601C	Exhaust vent	< 0.1
991-04162003-315-128	28	601B	Exhaust vent	< 0.1
991-04162003-315-129	29	500C	Supply vent	< 0.1
991-04162003-315-130	30	500A	Supply vent	< 0.1
Building 985				
985-04162003-315-101	31	Main	Vent. Biased	< 0.1
985-04162003-315-102	32	Main	Vent. Biased	< 0.1
985-04162003-315-103	33	Main	HP pipe, biased	< 0.1
985-04162003-315-104	34	Main	HP pipe, biased	< 0.1
985-04162003-315-105	35	Main	Hood, biased	< 0.1
985-04162003-315-106	36	Main	Sample line under hood, biased	< 0.1
985-08062003-00-100	37	Main	Plenum Demister Floor, biased	< 0.1
985-08062003-00-101	38	Main	Plenum Demister Floor, biased	< 0.1

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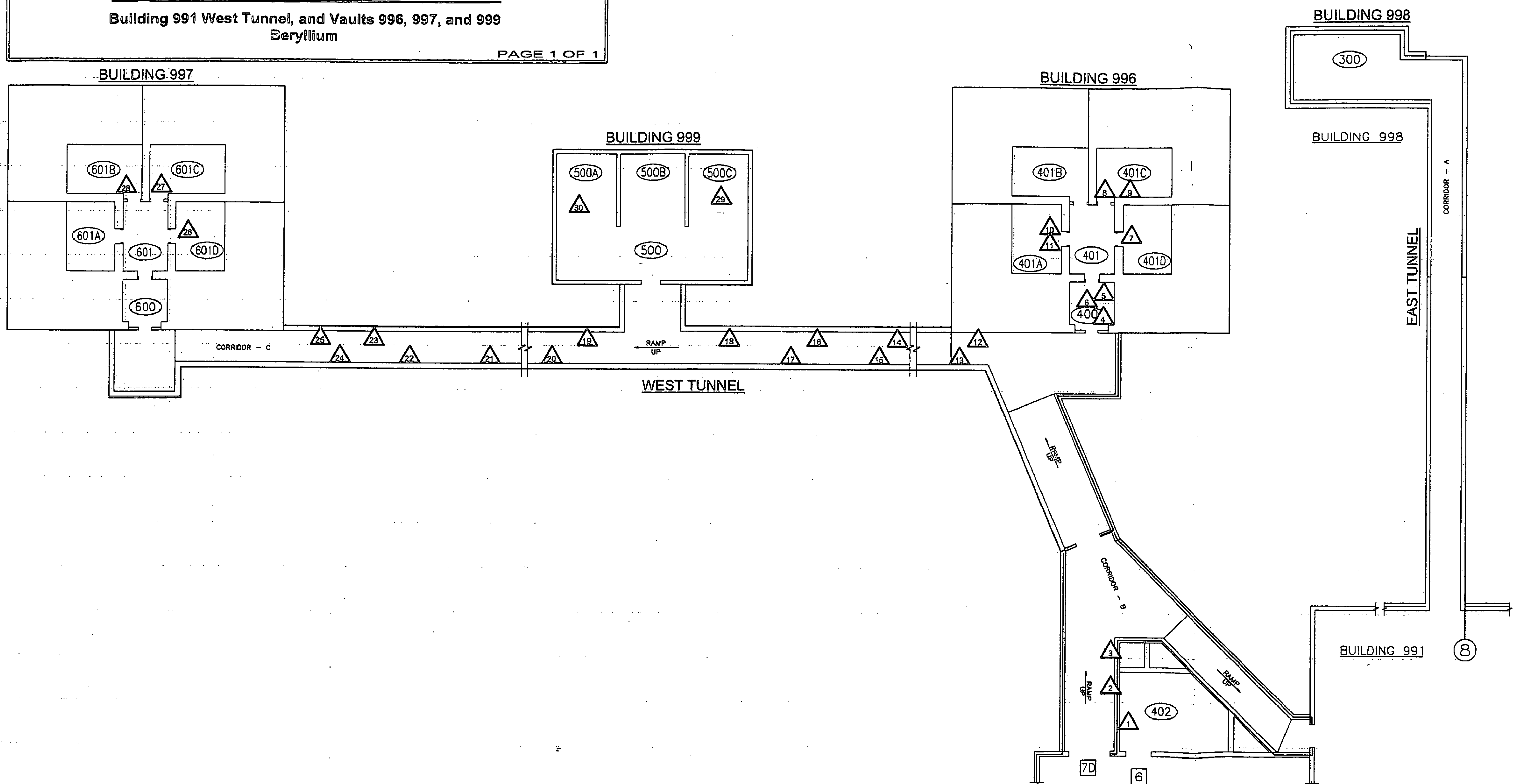
Sample Number	Map Survey Point Location	Room	Sample Location	Result ($ug/100\ cm^2$)
985-08062003-00-102	39	Main	Plenum Demister Floor, biased	< 0.1
985-08062003-00-103	40	Main	Plenum Demister Wall, biased	< 0.1
985-08062003-00-104	41	Main	Plenum Demister Floor, biased	< 0.1
985-08062003-00-105	42	Main	Plenum Demister Floor, biased	< 0.1
985-08062003-00-106	43	Main	Plenum Demister Filter rack, biased	< 0.1
985-08062003-00-107	44	Main	Plenum 1st Stage Floor, biased	< 0.1
985-08062003-00-108	45	Main	Plenum 1st Stage Floor, biased	< 0.1
985-08062003-00-109	46	Main	Plenum 1st Stage Filter Rack, biased	< 0.1
985-08062003-00-110	47	Main	Plenum 1st Stage Filter Rack, biased	< 0.1
985-08062003-00-111	48	Main	Plenum 2nd Stage Fan Inlet, biased	< 0.1
985-08062003-00-112	49	Main	Plenum 2nd Stage Floor, biased	< 0.1
985-08062003-00-113	50	Main	Plenum 2nd Stage Filter Rack, biased	< 0.1
985-08062003-00-114	51	Main	Deluge Tank flange internal, biased	< 0.1
985-08062003-00-115	52	Main	Deluge Tank internal, biased	< 0.1
985-08062003-00-116	53	Main	Deluge Tank internal, biased	< 0.1
985-08062003-00-117	54	Main	Deluge Tank internal, biased	< 0.1
985-08062003-00-118	55	Main	Process piping internal, biased	< 0.1
985-08062003-00-119	56	Main	Exhaust Vent louver	< 0.1
985-08062003-00-120	57	Main	Main floor, biased	< 0.1
985-08062003-00-121	58	Main	Top of Junction box, biased	< 0.1
985-08062003-00-122	59	Main	Main floor, biased	< 0.1
985-08062003-00-123	60	Main	Main floor, biased	< 0.1
985-08062003-00-124	61	Main	Main floor, biased	< 0.1
985-08062003-00-125	62	Main	Main floor, biased	< 0.1
985-0522003-315-101	63	Main	Top of fire phone	< 0.1
985-0522003-315-102	64	Main	Top of control panel	< 0.1
985-0522003-315-103	65	Main	Top of wall receptacle	< 0.1
985-0522003-315-104	66	Main	Main floor	< 0.1
985-0522003-315-105	67	Main	Top of electrical conduit	< 0.1
985-0522003-315-106	68	Main	Top of HVAC ductwork	< 0.1
985-0522003-315-107	69	Main	Top of FP-035 Deluge system	< 0.1
985-0522003-315-108	70	Main	Top of fire phone	< 0.1
985-0522003-315-109	71	Main	Top of LCB 602 panel	< 0.1
985-0522003-315-110	72	Main	Top of PB1A-05 alarm panel	< 0.1
985-0522003-315-111	73	Main	Top of LPIC-5A electrical panel	< 0.1
985-0522003-315-112	74	Main	Top of PB1D-05 electrical panel	< 0.1
985-0522003-315-113	75	Main	Top of 6' step ladder	< 0.1
985-0522003-315-114	76	Main	Top of second rung of 6' step ladder	< 0.1

CHEMICAL SAMPLE MAP FOR 991 CLUSTER

Building 991 West Tunnel, and Vaults 996, 997, and 999
Beryllium

PAGE 1 OF 1



SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

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N

0 FEET 0

0 METERS 0

DRAWING NOT TO SCALE

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

Prepared for:

CH2MHILL
Communications Group

MAP ID: 02-0366/991T-W-BE

May 14, 2003

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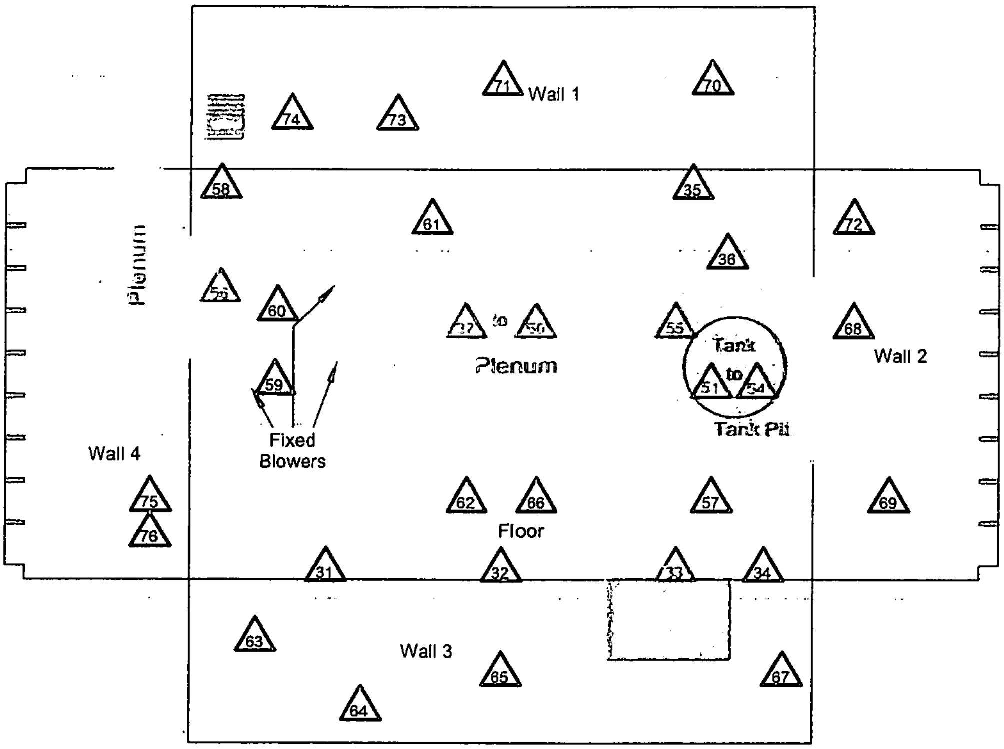
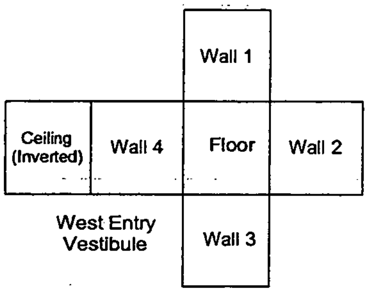
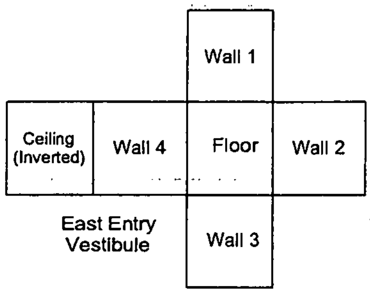
CHEMICAL SAMPLE MAP

Building 985
Beryllium







SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 25
0 METERS 8

1 inch = 18 feet 1 grid sq. = 1 sq. m.

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

CH2MHILL
Communications Group

Prepared for:

KAISER-HILL

MAP ID: 02-0355/B985 PG1-BE

Aug. 19, 2003

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ATTACHMENT D

Data Quality Assessment (DQA) Detail

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DATA QUALITY ASSESSMENT (DQA)

VERIFICATION & VALIDATION (V&V) OF RESULTS

V&V of the data confirm that appropriate quality controls are implemented throughout the sampling and analysis process, and that any substandard controls result in qualification or rejection of the data in question. The required quality controls and their implementation are summarized in a tabular, checklist format for each category of data – radiological surveys and chemical analyses (specifically beryllium).

DQA criteria and results are provided in a tabular format for each suite of surveys or chemical analyses performed. The radiological survey assessment is provided in Table D-1 and beryllium in Table D-2. A data completeness summary for all results is given in Table D-3.

All relevant Quality records supporting this report are maintained in the RISS Characterization Project File. The report will be submitted to the CERCLA Administrative Record for permanent storage within 30 days of approval by the Regulators. All radiological data are organized into Survey Packages, which correlate to unique (MARSSIM) Survey Units. Chemical data are organized by RIN (Report Identification Number) and are traceable to the sample number and corresponding sample location.

Beta/gamma survey designs were not implemented for the Area 2 - Group 2a facilities based on the conservatism of the transuranic limits used as DCGLs in the unrestricted release decision process. Survey designs were implemented for the Area 2 – Group 2a facilities based on the transuranic limits used as DCGLs in the unrestricted release decision process. All survey results were evaluated against, and were less than the Transuranic $DCGL_w$ (100 dpm/100cm^2) and the Uranium $DCGL_w$ (5,000 dpm/100cm^2) unrestricted release limits.

Consistent with EPA's G-4 DQO process, the radiological survey design for each survey unit performed per PDS requirements was optimized by checking actual measurement results acquired during pre-demolition surveys against the model output with original estimates. Use of actual sample/survey (result) variances in the MARSSIM DQO model confirms that an adequate number of surveys were acquired.

DQA SUMMARY

In summary, the data presented in this report have been verified and validated relative to the quality requirements and project decisions as stated in the original DQOs. All data are useable based on qualifications stated herein and are considered satisfactory without qualification. All media surveyed and sampled yielded results less than their associated action levels and with acceptable certainties.

Based upon an independent review of the radiological data, it was determined that the original project DQOs satisfied MARSSIM guidance. All facility contamination levels were below applicable DCGL unrestricted release levels confirming the Type 2 facility classification. Minimum survey requirements were met, sampling/survey protocol was performed in accordance with applicable RSPs, survey units were properly designed and bounded, and instrument performance and calibration was within acceptable limits. All results meet the PDS unrestricted release criteria.

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Chain of Custody was intact; documentation was complete, hold times were acceptable (where applicable,) and packaging integrity/custody seals were maintained throughout the sampling/analysis process. Level 2 Isolation Controls have been posted to prevent the inadvertent introduction of contamination into the Area 2- Group 2a facilities. On this basis, the Area 2 – Group 2 facilities met the unrestricted release criteria with the confidences stated herein.

Table D-1 V&V of Radiological Results, Area 2-Group 2a Facilities

V&V CRITERIA, RADIOLGICAL SURVEYS		K-H RSP 16.00 Series MARSSIM (NUREG-1575)		
QUALITY REQUIREMENTS				
	Parameters	**Measure**	**Frequency**	**COMMENTS**
ACCURACY	Initial calibrations	$90\% < x < 110\%$	≥ 1	Multi-point calibration through the measurement range encountered in the field; programmatic records.
	Daily source checks	$80\% < x < 120\%$	≥ 1/day	Performed daily/within range.
	Local area background: Field	typically < 10 dpm	≥ 1/day	All local area backgrounds were within expected ranges (i.e., no elevated anomalies.)
PRECISION	Field duplicate measurements for TSA	$\geq 5\%$ of real survey points	$\geq 10\%$ of reals	N/A
REPRESENTATIVENESS	MARSSIM methodology: Survey Units WTUN-2-001, B985-2-005, B996-2-002, B997-2-004 and B999-2-003.	statistical and biased	NA	Random w/ statistical confidence.
	Survey Maps	NA	NA	Random and biased measurement locations controlled/mapped to ± 1m.
	Controlling Documents (Characterization Pkg; RSPs)	qualitative	NA	Refer to the Characterization Package (planning document) for field/sampling procedures (located in Project files); thorough documentation of the planning, sampling/analysis process, and data reduction into formats.
COMPARABILITY	Units of measure	dpm/100cm^2	NA	Use of standardized engineering units in the reporting of measurement results.
COMPLETENESS	Plan vs. Actual surveys Usable results vs. unusable	>95% >95%	NA	See Table D-3 for details.
SENSITIVITY	Detection limits	TSA: ≤ 50 dpm/100cm^2 RA: ≤ 10 dpm/100cm^2	all measures	PDS MDAs $\leq$ 50% DCGL$_w$

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Table D-2 V&V of Beryllium Results, Area 2-Group 2a Facilities

V&V CRITERIA, CHEMICAL ANALYSES		DATA PACKAGE		
BERYLLIUM	**Prep: NMAM 7300** **METHOD: OSHA ID-125G**	**LAB ---->**	Johns Manville and Reservoirs Environmental, Inc.	
		RIN ---->	RIN03Z1750 RIN03Z2088 RIN03D0855	
				COMMENTS
QUALITY REQUIREMENTS		**Measure**	**Frequency**	No qualifications significant enough to change project decisions, i.e. classification of a Type 2 Facility confirmed; all results were below associated action levels.
ACCURACY	**Calibrations** Initial	linear calibration	≥1	
	Continuing	80%<%R<120%	≥1	
	LCS/MS	80%<%R<120%	≥1	
	Blanks – lab & field	<MDL	≥1	
	Interference check std (ICP)	NA	NA	
PRECISION	LCSD	80%<%R<120% (RPD<20%)	≥1	
	Field duplicate	all results < RL	≥1	
REPRESENTATIVENESS	COC	Qualitative	NA	
	Hold times/preservation	Qualitative	NA	
	Controlling Documents (Plans, Procedures, maps, etc.)	Qualitative	NA	
COMPARABILITY	Measurement units	$ug/100cm^2$	NA	
COMPLETENESS	Plan vs. Actual samples Usable results vs. unusable	>95% >95%	NA	
SENSITIVITY	Detection limits	MDL of $0.012\ ug/100cm^2$	all measures	

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Table D-3 Data Completeness Summary For The Area 2-Group 2a Facilities					
ANALYTE	**Building/Area/ Unit**	**Sample Number Planned (Real & QC)[A]**	**Sample Number Taken (Real & QC)**	**Project Decisions (Conclusions) & Uncertainty**	**Comments (RIN, Analytical Method, Qualifications, etc.)**
Beryllium	Building 991 West Tunnel, 996, 997 & 999 (interior)	30 biased (interior)	30 biased (interior)	No contamination found at any location	10CFR850; OSHA ID-125G RIN03D0855 – map locations 1 through 30 No results above the action level (0.2 ug/100cm^2) or investigative level (0.1 ug/100cm^2.)
Beryllium	Building 985 (interior)	32 biased (interior)	46 biased (interior)	No contamination found at any location	10CFR850; OSHA ID-125G RIN03Z2088 – map locations 37 through 62 RIN03D0855 – map locations 31 through 36 RIN03Z1750 – map locations 62 through 76 No results above the action level (0.2 ug/100cm^2) or investigative level (0.1 ug/100cm^2.)
Radiological	Survey Area 2 Survey Unit: WTUN-2-001 West 991 Tunnel (interior)	15α TSA and 15α Smears (systematic) 20α TSA and 20α Smears (biased) 30α TSA and 30α Smears (equipment) 4 QC TSA 25% scan of interior floors, 10% scan of walls and ceiling	16α TSA and 16α Smears (systematic) 20α TSA and 20α Smears (biased) 30α TSA and 30α Smears (equipment) 4 QC TSA 25% scan of interior floors, 10% scan of walls and ceiling	No contamination at any location; all values below unrestricted release levels	Uranium and/or Transuranic DCGL as applicable.

Table D-3 Data Completeness Summary For The Area 2-Group 2a Facilities

ANALYTE	Building/Area/ Unit	Sample Number Planned (Real & QC)[A]	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
Radiological	Survey Area 2 Survey Unit: B985-2-005 Bldg. 985 (interior)	15α TSA and 15α Smears (systematic) 10α TSA and 10α Smears (biased) 30 α TSA and 30 α Smears (equipment) 3 QC TSA 25% scan of interior floors, 10% scan of walls and ceiling	37α TSA and 37α Smears (systematic) 10α TSA and 10α Smears (biased) 30 α TSA and 30 α Smears (equipment) 5 QC TSA 25% scan of interior floors, 10% scan of walls and ceiling	No contamination at any location; all values below unrestricted release levels	Uranium and/or Transuranic DCGL as applicable. Initial net activity at locations 60 (116.4 dpm/100cm^2) and 61 (118.9 dpm/100cm^2) greater than the Transuranic DCGL$_w$ (100.0 dpm/100cm^2). The locations were sealed, allowed to decay and resurveyed. Resurvey results were below the transuranic DCGL$_w$ and are the values reported in the PDS data summary. No further investigation required.
Radiological	Survey Area 2 Survey Unit: B996-2-002 Bldg. 996-Vault (interior)	15α TSA and 15α Smears (systematic) 10α TSA and 10α Smears (biased) 10α TSA and 10α Smears (equipment) 3 QC TSA 25% scan of interior floors, 10% scan of walls and ceiling	19ά TSA and 19ά Smears (systematic) 11ά TSA and 10α Smears (biased) 10ά TSA and 10α Smears (equipment) 3 QC TSA 25% scan of interior floors, 10% scan of walls and ceiling	No contamination at any location; all values below unrestricted release levels	Uranium and/or Transuranic DCGL as applicable.

Table D-3 Data Completeness Summary For The Area 2-Group 2a Facilities

ANALYTE	Building/Area/ Unit	Sample Number Planned (Real & QC)[A]	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
Radiological	Survey Area 2 Survey Unit: B997-2-004 Bldg. 997-Vault (interior)	15α TSA and 15α Smears (systematic) 10α TSA and 10α Smears (biased) 10α TSA and 10α Smears (equipment) 3 QC TSA 25% scan of interior floors, 10% scan of walls and ceiling	15α TSA and 15α Smears (systematic) 10α TSA and 10α Smears (biased) 10α TSA and 10α Smears (equipment) 3 QC TSA 25% scan of interior floors, 10% scan of walls and ceiling	No contamination at any location; all values below unrestricted release levels	Uranium and/or Transuranic DCGL as applicable.
Radiological	Survey Area 2 Survey Unit: B999-2-003 Bldg. 999-Vault (interior)	15α TSA and 15α Smears (systematic) 10α TSA and 10α Smears (biased) 10α TSA and 10α Smears (equipment) 3 QC TSA 25% scan of interior floors, 10% scan of walls and ceiling	23α TSA and 23α Smears (systematic) 10α TSA and 10α Smears (biased) 10α TSA and 10α Smears (equipment) 3 QC TSA 25% scan of interior floors, 10% scan of walls and ceiling	No contamination at any location; all values below unrestricted release levels	Uranium and/or Transuranic DCGL as applicable.

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Appendix 4

Article 1 **Asbestos Air Sampling Results (3 pages)**
March 9 through March 22, 2004

Article 2 **Under Building and Soil Sampling Results**
Figure 2 – Existing Samples Above Background Mean Plus Two Standard Deviations or Detection Limit
Figure 3 – Accelerated Action Sampling Locations and Results at IHSS Group 900-1 Surface Soil and Sediments
Figure 4 – Accelerated Action Sampling Locations and Results at IHSS Group 900-1 Subsurface Soil

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Marschall, JR

From:	Hiebert, Doug G.
Sent:	Monday, March 22, 2004 8:32 AM
To:	Marschall, JR; Flannery, Mike; Wiemelt, Karen; Freiboth, Cameron; Snyder, Duke; Rukavina, Frank; Simpson, Mark; Rosco, Douglas
Cc:	Hiebert, Doug G.
Subject:	991 Asbestos Air Sampling

Asbestos samples were collected during the demolition of B991. Samples were collected as close to the demolition work as possible to ensure that hazardous levels of asbestos are not being released. Samples were analyzed by Phase Contrast Microscopy (PCM) for total fibers per filter and air concentrations were calculated. All asbestos sample results showed levels of asbestos equal to or less than 0.01 fibers per cubic centimeter. These levels are **well below** all occupational exposure standards.

The one sample that was equal to 0.01 fibers per cubic centimeter was subsequently analyzed by Transition Electron Microscopy (TEM) methods to determine the exact composition of the fibers on the filter (asbestos or non-asbestos). The TEM analysis showed no asbestos fibers on the filter.

Summary of Asbestos Results:

Bldg - Date - Sample Number	Location	Result
991-03092004-00-001	South Corner of Building	0.011* Fibers/CC
991-03092004-00-002	South West	0.003 Fibers/CC
991-03092004-00-003	South	<0.01 Fibers/CC
991-03092004-00-004	South	<0.01 Fibers/CC
991-03092004-00-005	Blank	<0.01 Fibers/CC
991-03102004-00-001	South	0.006 Fibers/CC
991-03102004-00-002	East	<0.01 Fibers/CC
991-03112004-00-001	West	<0.01 Fibers/CC
991-03112004-00-002	East	0.008 Fibers/CC
991-03112004-00-003	Blank	<0.01 Fibers/CC

*TEM results are None Detected for asbestos.

If you have any questions, let me know.

Thanks,

Doug Hiebert, CIH, CSP
Sr. Industrial Hygienist
Rocky Flats Environmental Technology Site
Golden, CO 80403
303-966-3647

Marschall, JR

From:	Simpson, Mark
Sent:	Monday, March 22, 2004 9:30 AM
To:	Flannery, Mike; Marschall, JR; Rukavina, Frank; Snyder, Duke; Nesta, Stephen; Hiebert, Doug G.
Subject:	Asbestos Area Samples from 991 Demo

Asbestos samples were collected during the demolition of B991. Samples were collected as close to the demolition work as possible to ensure that hazardous levels of asbestos are not being released. The samples were analyzed by Transition Electron Microscopy (TEM) method to determine the exact composition of the fibers (asbestos or non-asbestos). The TEM analysis showed no asbestos fibers.

Summary of Asbestos Results:

Bldg. - Date - Sample number	Location	Results
991-03162004-23-301	West	Non-detect
991-03162004-23-302	East	Non-detect
991-03172004-23-301	West	Non-detect
991-03172004-23-302	East	Non-detect

If you have any questions, feel free to contact me.

Thanks
Mark Simpson

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Marschall, JR

From: Simpson, Mark
Sent: Tuesday, April 13, 2004 6:45 AM
To: Wiemelt, Karen; Snyder, Duke; Rukavina, Frank; Flannery, Mike; Marschall, JR; Hiebert, Doug G.
Subject: 991 Asbestos Area air Sample Results

Asbestos area air samples were collected during the demolition of B991. Samples were collected as close to the demolition work as possible to ensure that hazardous levels of asbestos were not being released into the environment. The samples were analyzed by Transition Electron Microscopy (TEM) method to determine the exact composition of the fibers (asbestos or non asbestos). See results below:

Sample Number	***Location***	***Results***
991003182004-23-301	West side	Non Detect
991003182004-23-302	East side	Non Detect
991003192004-23-301	West side	Non Detect
991003192004-23-302	East side	0.005 F/cc
991003222004-23-301	West side	Non Detect
991003222004-23-302	East side	Non Detect

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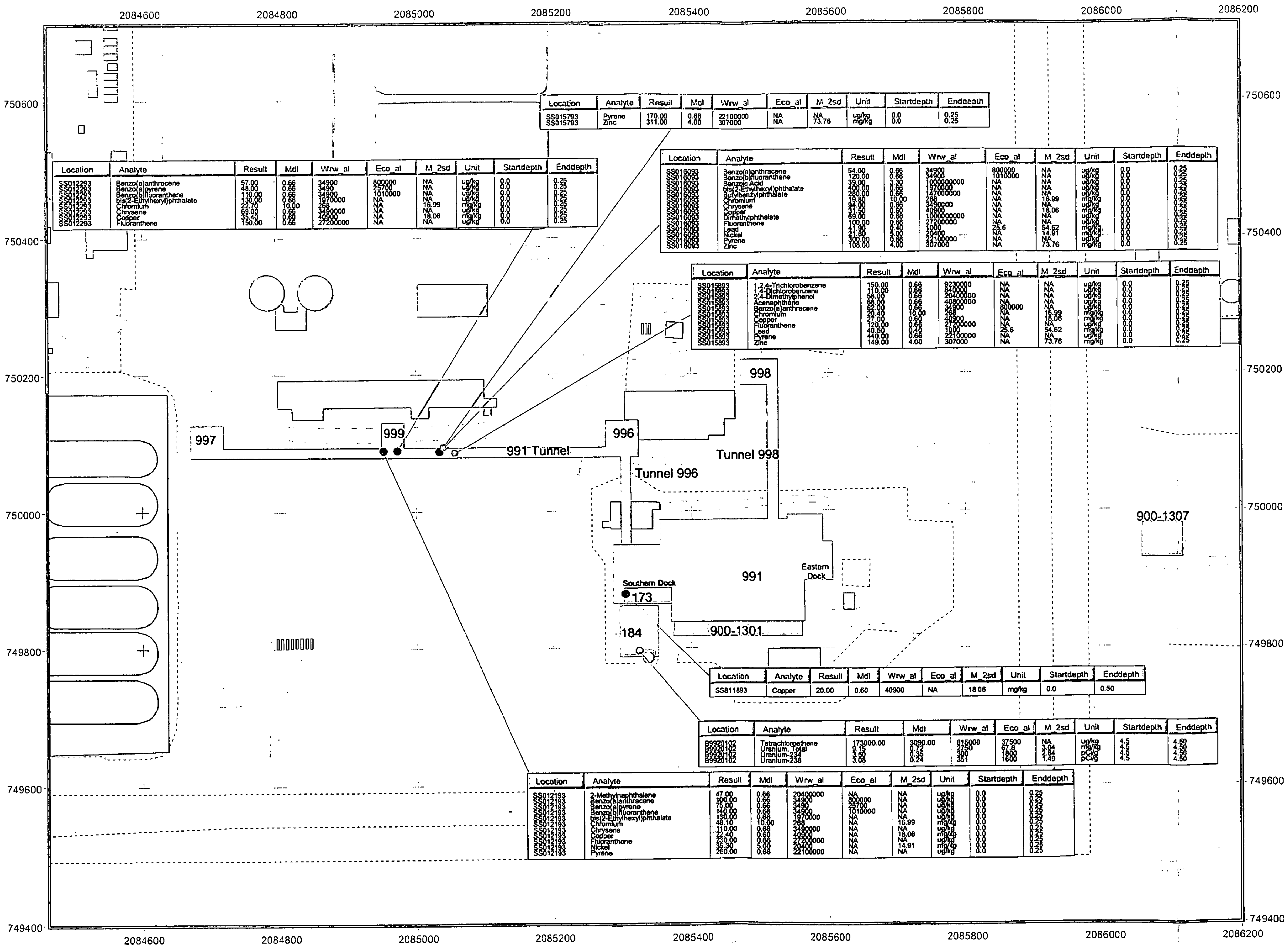
Figure 2
Existing Samples Above Background Mean Plus Two Standard Deviations or Detection Limit



Location	Analyte	Result	Mdl	Wrw_al	Eco_al	M_2sd	Unit	Startdepth	Enddepth
SS015793	Pyrene	170.00	0.66	22100000	NA	NA	ug/kg	0.0	0.25
SS015793	Zinc	311.00	4.00	307000	NA	73.76	mg/kg	0.0	0.25

Location	Analyte	Result	Mdl	Wrw_al	Eco_al	M_2sd	Unit	Startdepth	Enddepth
SS012293	Benzo(a)anthracene	57.00	0.66	34900	800000	NA	ug/kg	0.0	0.25
SS012293	Benzo(a)pyrene	48.00	0.66	3490	25700	NA	ug/kg	0.0	0.25
SS012293	Benzo(b)fluoranthene	110.00	0.66	34900	1010000	NA	ug/kg	0.0	0.25
SS012293	bis(2-Ethylhexyl)phthalate	130.00	0.66	1970000	NA	NA	ug/kg	0.0	0.25
SS012293	Chromium	22.70	10.00	268	NA	16.99	mg/kg	0.0	0.25
SS012293	Chrysene	69.00	0.66	3490000	NA	NA	ug/kg	0.0	0.25
SS012293	Copper	35.40	0.60	40900	NA	18.06	mg/kg	0.0	0.25
SS012293	Fluoranthene	150.00	0.66	27200000	NA	NA	ug/kg	0.0	0.25

Location	Analyte	Result	Mdl	Wrw_al	Eco_al	M_2sd	Unit	Startdepth	Enddepth
SS016093	Benzo(a)anthracene	54.00	0.66	34900	800000	NA	ug/kg	0.0	0.25
SS016093	Benzo(b)fluoranthene	120.00	0.66	34900	1010000	NA	ug/kg	0.0	0.25
SS016093	Benzoic Acid	39.00	3.30	1000000000	NA	NA	ug/kg	0.0	0.25
SS016093	bis(2-Ethylhexyl)phthalate	400.00	0.66	1970000	NA	NA	ug/kg	0.0	0.25
SS016093	Butylbenzylphthalate	280.00	0.66	147000000	NA	NA	ug/kg	0.0	0.25
SS016093	Chromium	19.80	10.00	268	NA	16.99	mg/kg	0.0	0.25
SS016093	Chrysene	94.00	0.66	3490000	NA	NA	ug/kg	0.0	0.25
SS016093	Copper	31.50	0.60	40900	NA	18.06	mg/kg	0.0	0.25
SS016093	Dimethylphthalate	69.00	0.66	1000000000	NA	NA	ug/kg	0.0	0.25
SS016093	Fluoranthene	100.00	0.66	27200000	NA	NA	ug/kg	0.0	0.25
SS016093	Lead	41.90	0.40	1000	25.6	54.62	mg/kg	0.0	0.25
SS016093	Nickel	21.80	5.00	20400	NA	14.91	mg/kg	0.0	0.25
SS016093	Pyrene	300.00	0.66	22100000	NA	NA	ug/kg	0.0	0.25
SS016093	Zinc	108.00	4.00	307000	NA	73.76	mg/kg	0.0	0.25

Location	Analyte	Result	Mdl	Wrw_al	Eco_al	M_2sd	Unit	Startdepth	Enddepth
SS015893	1,2,4-Trichlorobenzene	150.00	0.66	9230000	NA	NA	ug/kg	0.0	0.25
SS015893	1,4-Dichlorobenzene	110.00	0.66	840000	NA	NA	ug/kg	0.0	0.25
SS015893	2,4-Dimethylphenol	58.00	0.66	20400000	NA	NA	ug/kg	0.0	0.25
SS015893	Acenaphthene	68.00	0.66	40800000	NA	NA	ug/kg	0.0	0.25
SS015893	Benzo(a)anthracene	62.00	0.66	34900	800000	NA	ug/kg	0.0	0.25
SS015893	Chromium	20.40	10.00	268	NA	16.99	mg/kg	0.0	0.25
SS015893	Copper	27.00	0.60	40900	NA	18.06	mg/kg	0.0	0.25
SS015893	Fluoranthene	120.00	0.66	27200000	NA	NA	ug/kg	0.0	0.25
SS015893	Lead	40.50	0.40	1000	25.6	54.62	mg/kg	0.0	0.25
SS015893	Pyrene	440.00	0.66	22100000	NA	NA	ug/kg	0.0	0.25
SS015893	Zinc	149.00	4.00	307000	NA	73.76	mg/kg	0.0	0.25

Location	Analyte	Result	Mdl	Wrw_al	Eco_al	M_2sd	Unit	Startdepth	Enddepth
SS811893	Copper	20.00	0.60	40900	NA	18.06	mg/kg	0.0	0.50

Location	Analyte	Result	Mdl	Wrw_al	Eco_al	M_2sd	Unit	Startdepth	Enddepth
B9920102	Tetrachloroethene	173000.00	3090.00	615000	37500	NA	ug/kg	4.5	4.50
B9920102	Uranium, Total	9.15	0.72	2750	67.8	3.04	mg/kg	4.5	4.50
B9920102	Uranium-234	3.50	0.35	300	1800	2.64	pCi/g	4.5	4.50
B9920102	Uranium-238	3.08	0.24	351	1600	1.49	pCi/g	4.5	4.50

Location	Analyte	Result	Mdl	Wrw_al	Eco_al	M_2sd	Unit	Startdepth	Enddepth
SS012193	2-Methylnaphthalene	47.00	0.66	20400000	NA	NA	ug/kg	0.0	0.25
SS012193	Benzo(a)anthracene	100.00	0.66	34900	800000	NA	ug/kg	0.0	0.25
SS012193	Benzo(a)pyrene	75.00	0.66	3490	25700	NA	ug/kg	0.0	0.25
SS012193	Benzo(b)fluoranthene	140.00	0.66	34900	1010000	NA	ug/kg	0.0	0.25
SS012193	bis(2-Ethylhexyl)phthalate	130.00	0.66	1970000	NA	NA	ug/kg	0.0	0.25
SS012193	Chromium	48.10	10.00	268	NA	16.99	mg/kg	0.0	0.25
SS012193	Chrysene	110.00	0.66	3490000	NA	NA	ug/kg	0.0	0.25
SS012193	Copper	22.40	0.60	40900	NA	18.06	mg/kg	0.0	0.25
SS012193	Fluoranthene	230.00	0.66	27200000	NA	NA	ug/kg	0.0	0.25
SS012193	Nickel	35.30	5.00	20400	NA	14.91	mg/kg	0.0	0.25
SS012193	Pyrene	260.00	0.66	22100000	NA	NA	ug/kg	0.0	0.25

KEY

- Eco AL Exceedance
- Detection below AL
- Paved Roads
- IHSS
- Under Building Contamination
- Potential Area of Concern
- Building
- Dirt Roads
- Fence

Wrw_al = Wildlife refuge worker action level
Eco_al = Ecological receptor action level
M_2SD = Background mean plus two standard deviations
Mdl = Method detection limit

N
W E
S

100 0 100 Feet

Scale = 1: 1750

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: Date: 02.09.04

RADMS

Prepared for:

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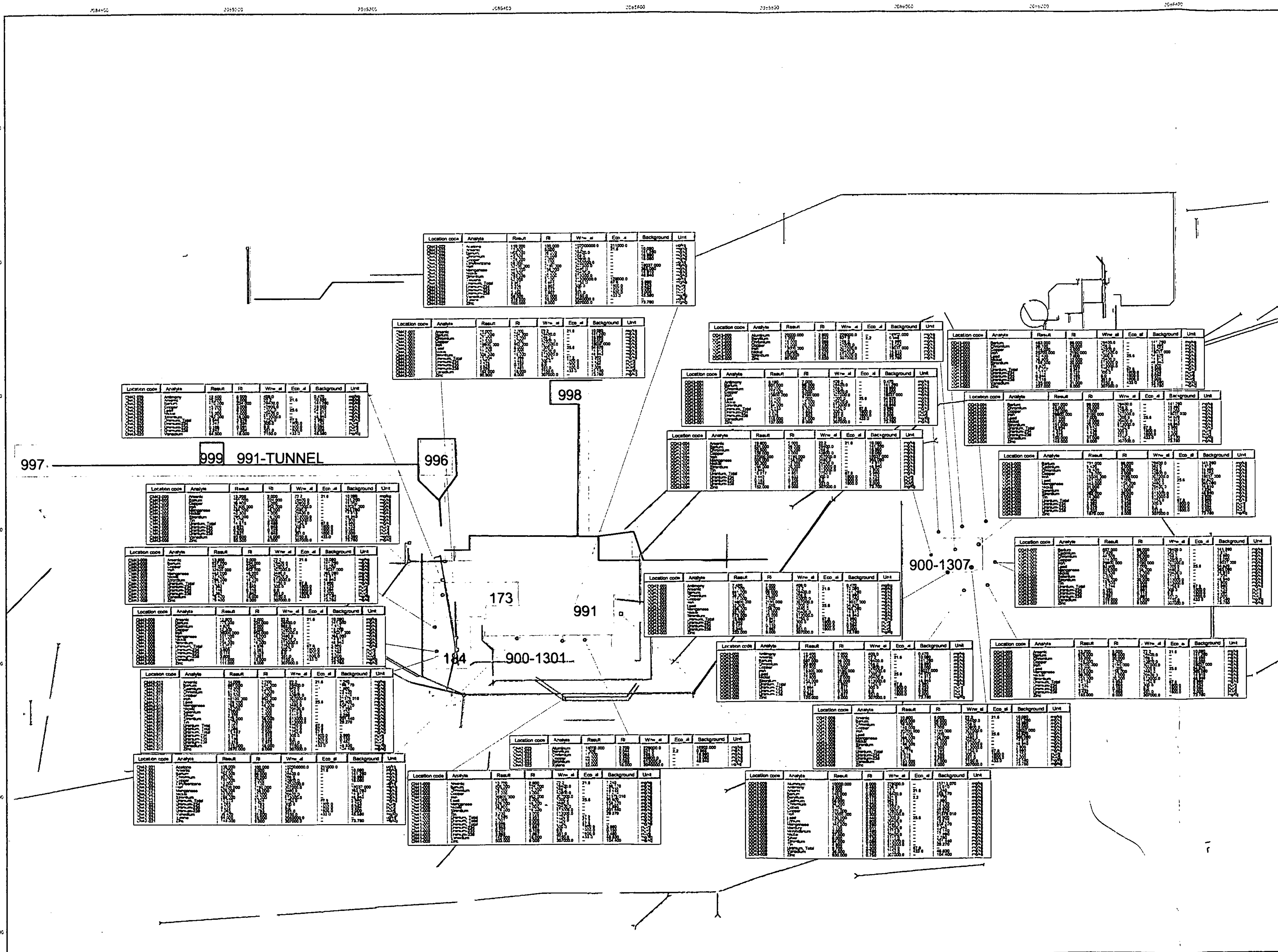

Figure 3
Accelerated Action Sampling Locations and Results at IHSS Group 900-1 Surface Soil and Sediments

KEY

- Soil WRW AL Exceedance
- Soil Eco AL Exceedance
- Soil Detection below AL
- Sediment Eco AL Exceedance
- UBC
- IHSS
- PAC
- Paved road
- Storm drains
- Foundation drains

RL = Reporting limit
Background = Background mean plus two standard deviations
Wrw al = Wildlife refuge worker action level
Eco al = Ecological receptor action level

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N

Scale = 1: 850
100 0 100 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: Date: 02.26.04
RADMS

Prepared for:
KAISER-HILL COMPANY

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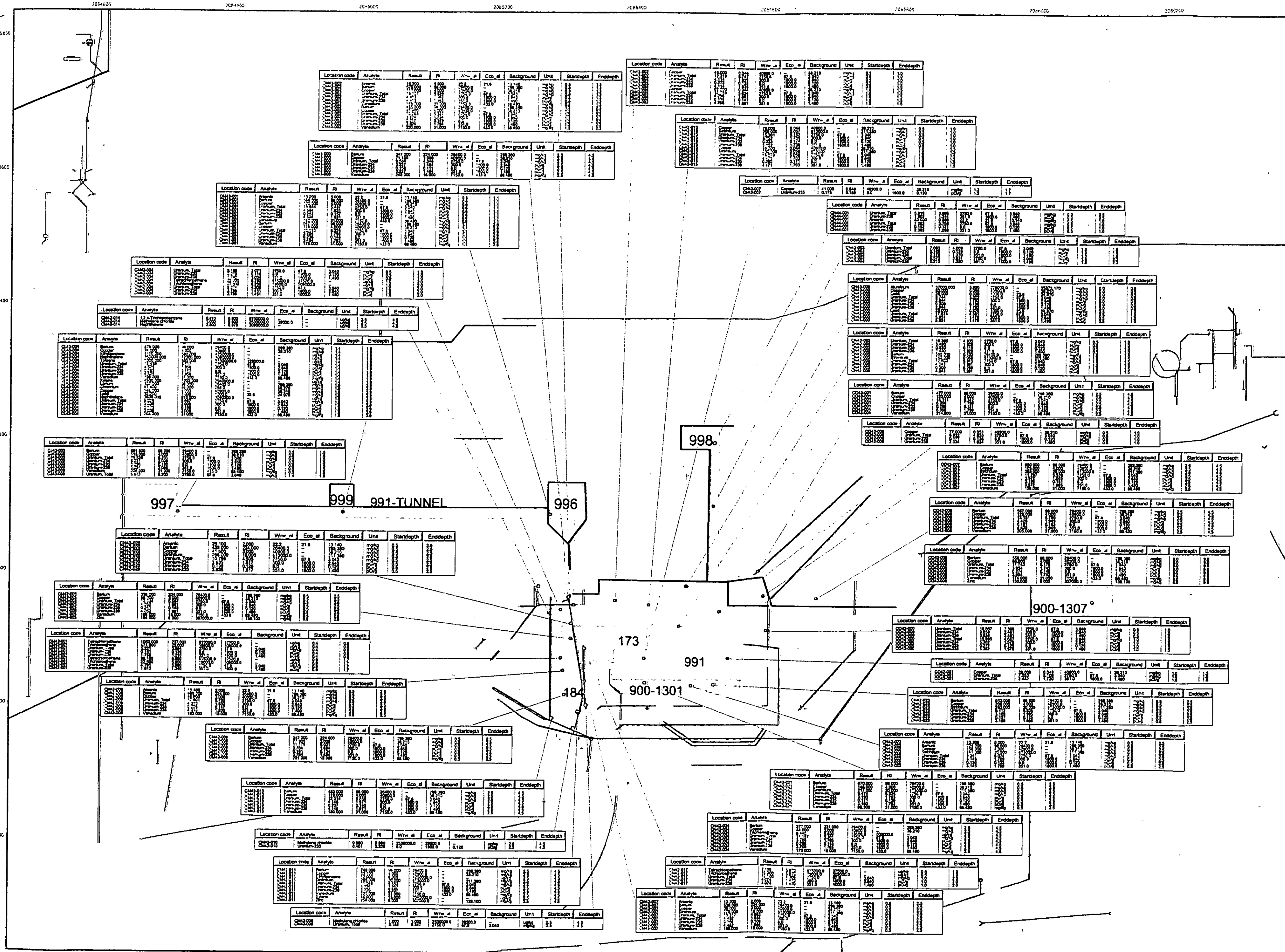

Figure 4
Accelerated Action Sampling Locations and Results at IHSS Group 900-1 Subsurface Soil

KEY

WRW AL Exceedance

Eco AL Exceedance

Detection below AL

UBC

IHSS

PAC

Paved road

Storm drains

Foundation drains

RL = Reporting limit
Background = Background mean plus two standard deviations
Wrw al = Wildlife refuge worker action level
Eco al = Ecological receptor action level

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Scale = 1: 850

100 0 100 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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Rocky Flats Environmental Technology Site

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RADMS

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KAISER-HILL COMPANY

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Appendix 5

Article 1	Portions of Building 991 Structure Left in Place (drawing)
Article 2	Remaining Structure of Corridor “B” and Room 402 (photograph)
Article 3	Remaining Structure of West Corridor “B” (photograph)
Article 4	Remaining Structure of East Corridor “B” (photograph)
Article 5	Remaining Structure of South 60” of Corridor “A” (photograph)
Article 6	991 Underground Utilities
Article 7	Photographs of 991 Hillside

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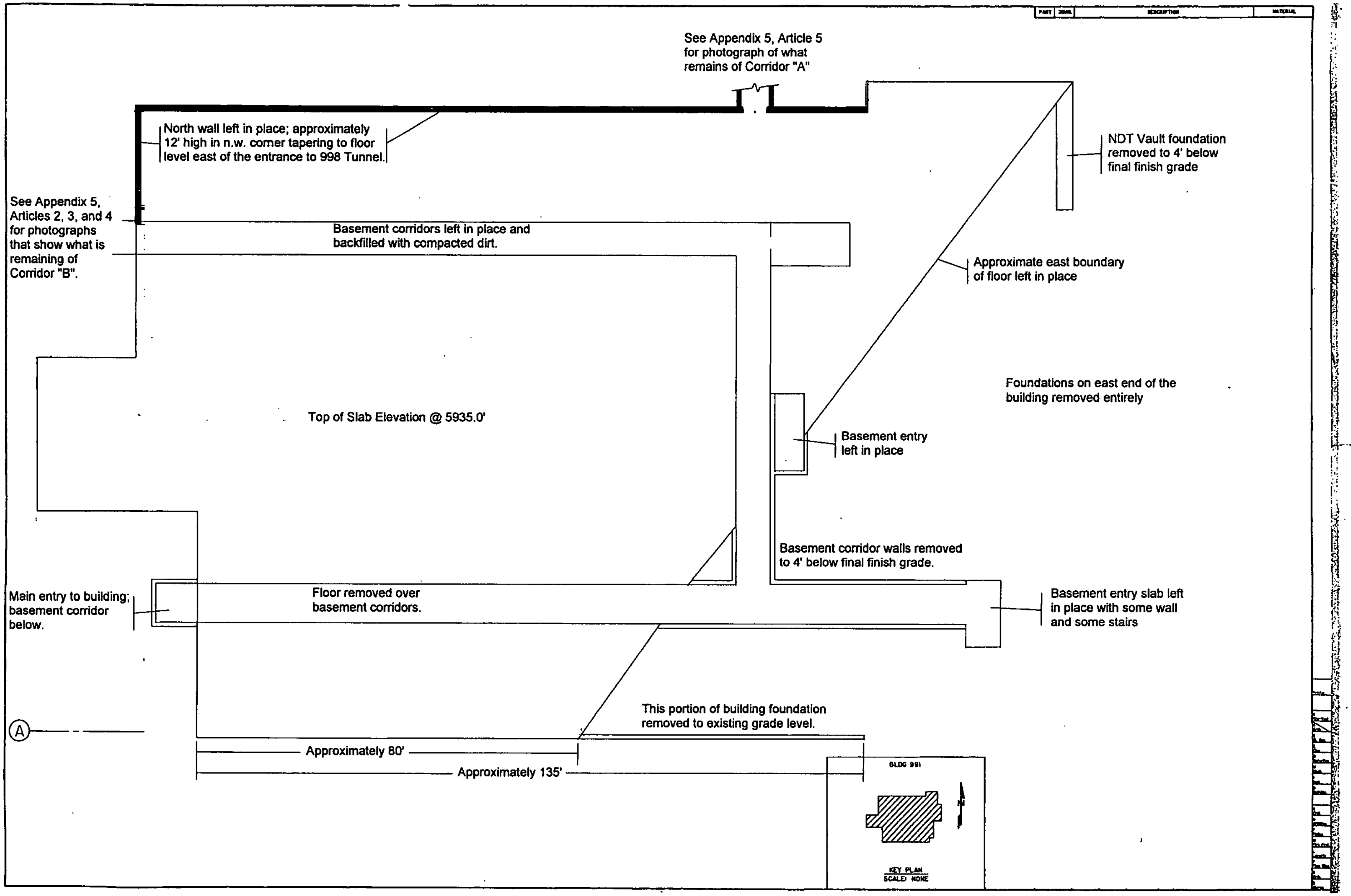

Portions of Building 991 Structure Left in Place

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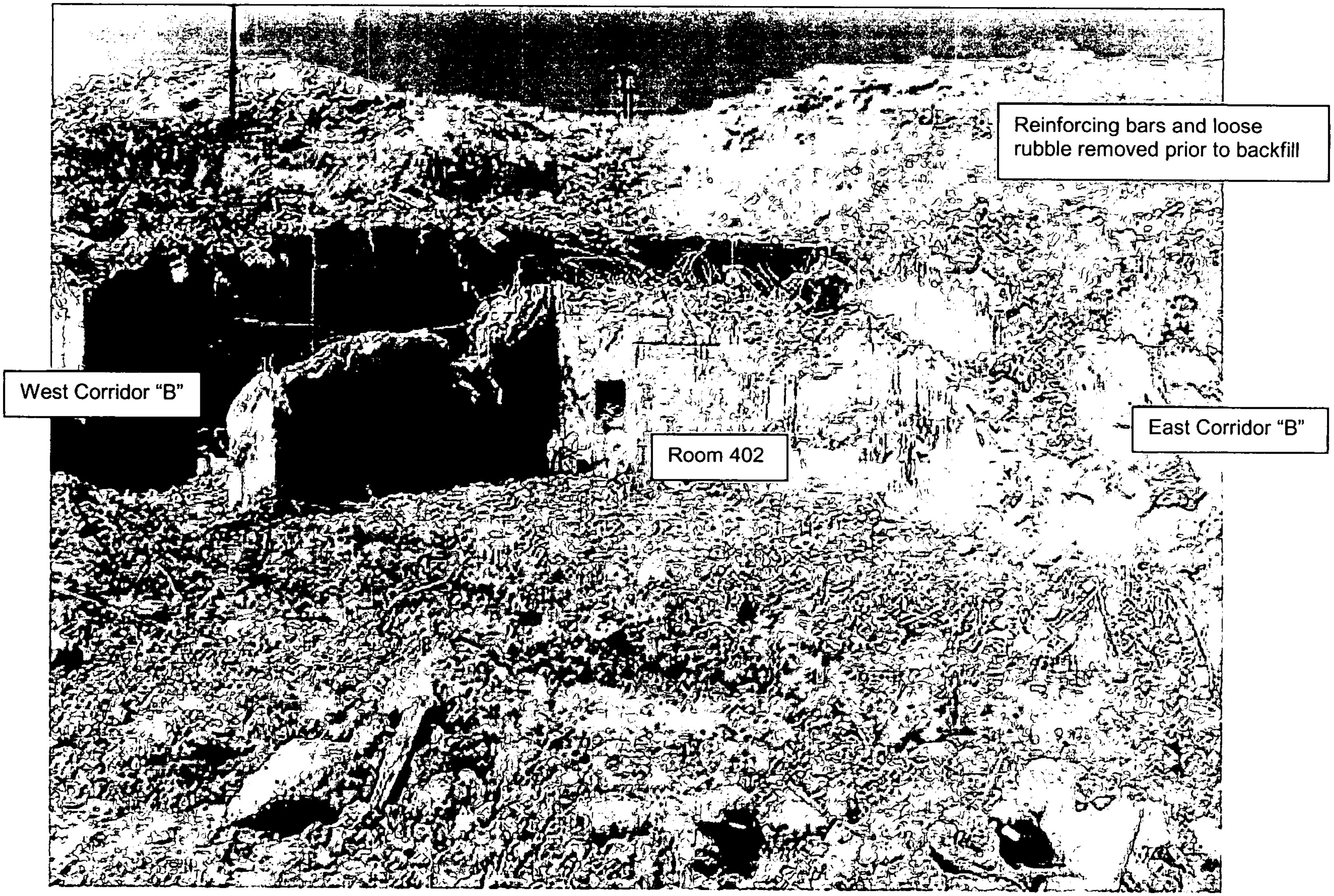

Remaining Structure of Corridor B and Room 402

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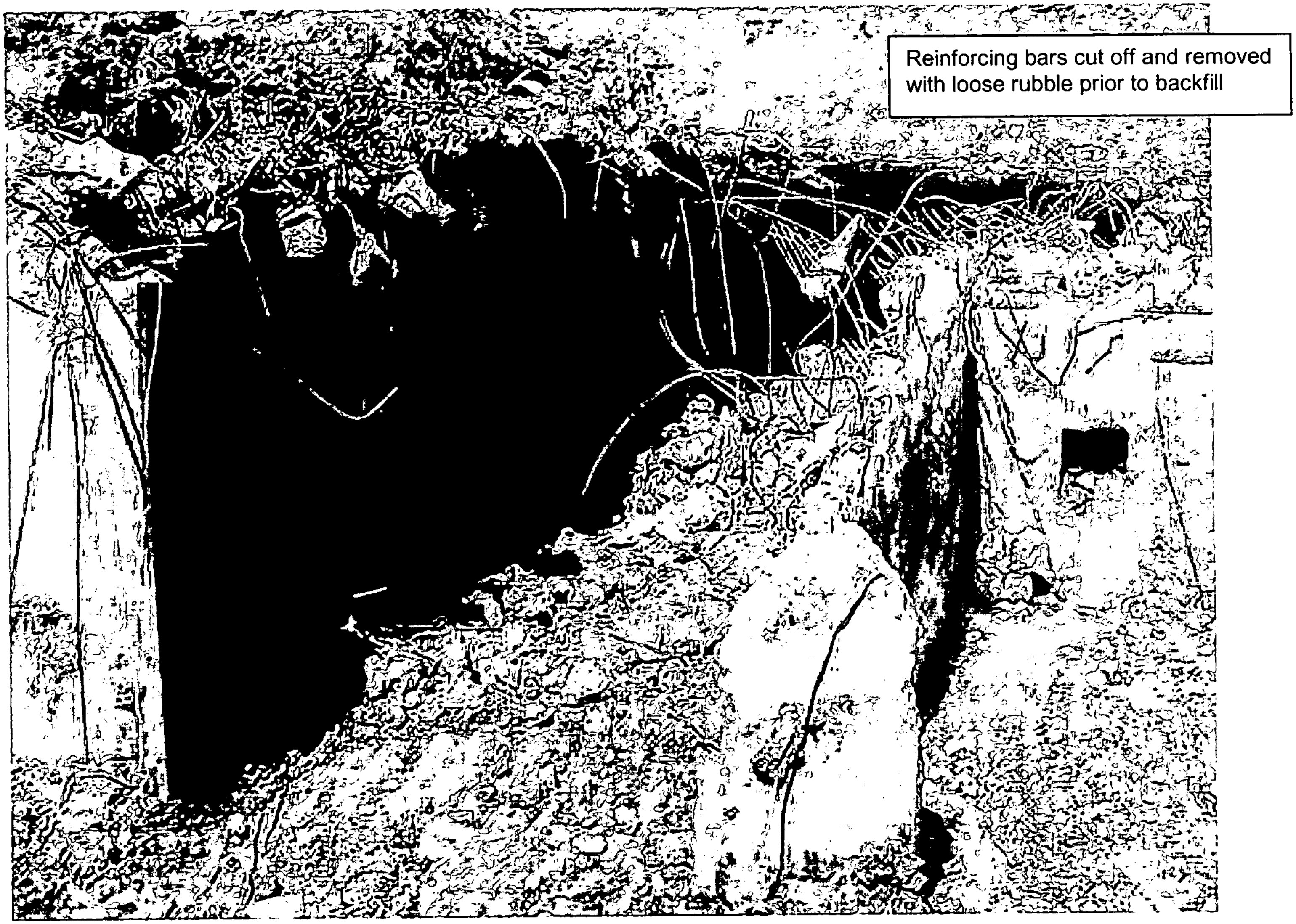

Remaining Structure of West Corridor "B"

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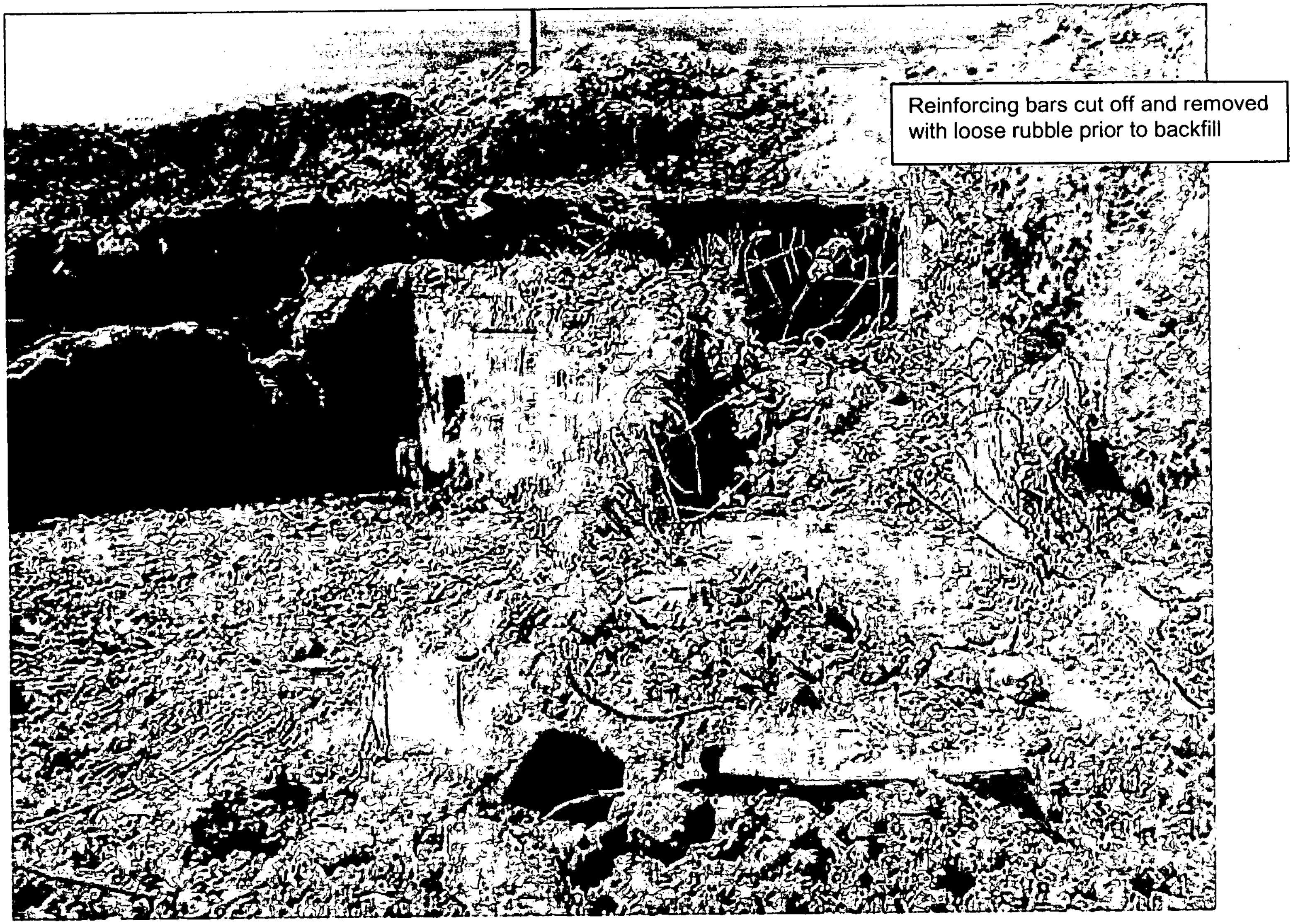

Remaining Structure of East Corridor "B"

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Remaining Structure of South 60' of Corridor "A"

Appendix 4 Article 6

991 Underground Utilities Disconnect

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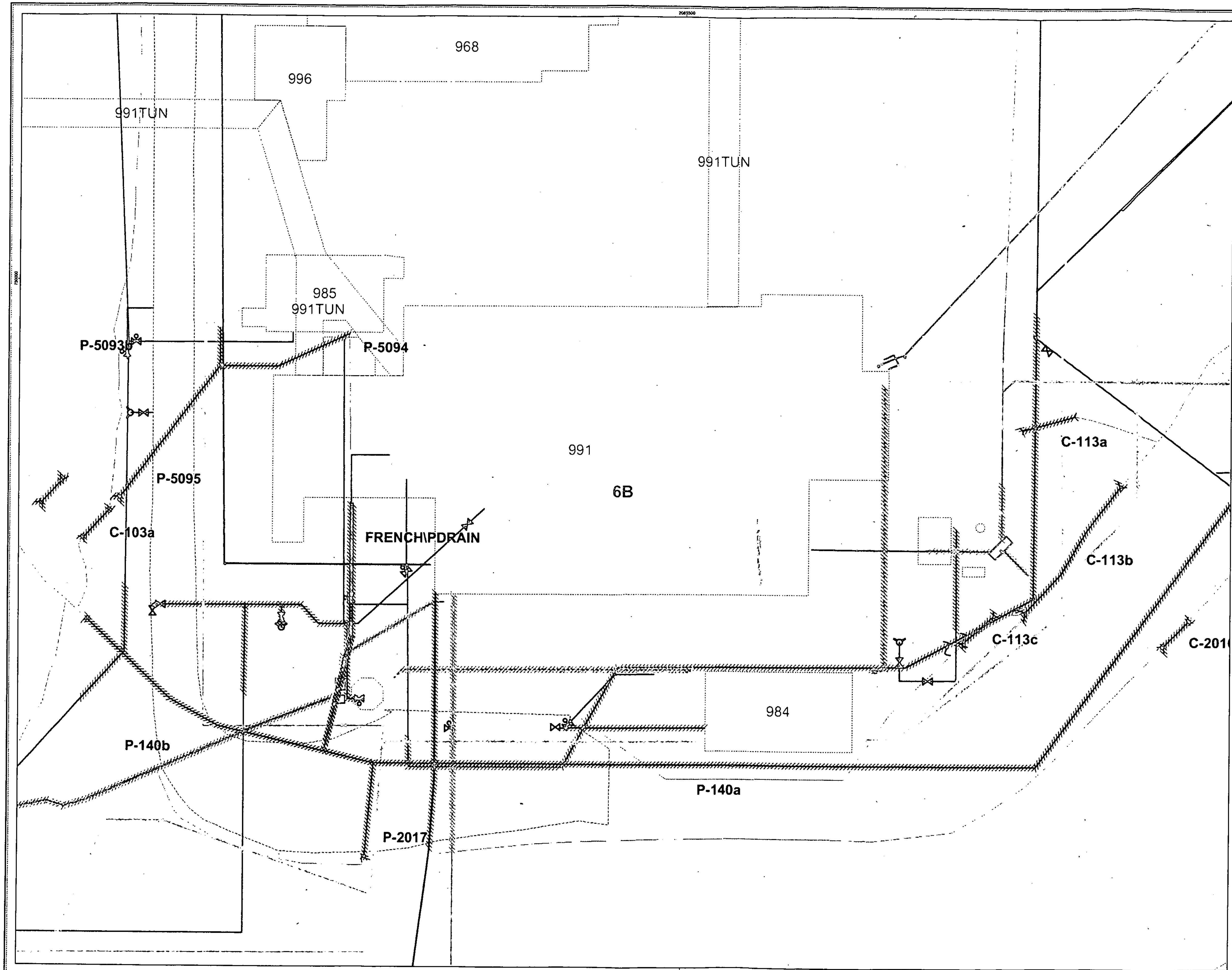

Building 991 Underground Utilities

EXPLANATION

Manholes *
Alarm
2nd Alarm
Classified Data
Classified LAN
Original Alarm
Telephone
Active Telephone
Alarm (PIDAS)
Nitrogen Lines
Natural Gas
Fuel Line
Steam
DCWF
Active DCWF
Raw Water
Sectors

Sewer Blocks
Sewer Abandoned
Sewer

Power Lines
Power
Culverts & Drains

Original Process Waste Lines
Left in Place
Between 3 and 4 Feet
Removed
Does Not Exist

New Process Waste Lines
Removed or Closed
Not Remove

Valve Vaults
Removed
Not Removed

NOTE: Hatched line symbols represent removed features.
* Color indicates utility type.

Standard Map Features

Demolished Facility
Remaining Facility
Lake and Pond
Demolished Road
Paved Road
Railroad Removed
Railroad Remaining
Fence Remaining
Stream or Ditch

N

20 0 20 40 60 80
Feet

State Plane Coordinate Projection
Colorado Central Zone (3476)
Datum: NAD27

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Rocky Flats Environmental Technology Site

Prepared By:
CH2MHILL
GIS DEPT. (303) 966-7707

Prepared For:
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COMPANY

DATE: 5/26/2005

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Appendix 5 **Article 7**
Photographs of 991 Hillside

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Appendix 6

Independent Investigation of the Building 991 Fire
February 12, 2004

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INDEPENDENT INVESTIGATION

OF THE BUILDING 991 FIRE

FEBRUARY 12, 2004

APPROVED BY: Art Geis, Team Lead / J. A. Geis / 3-18-04

Print Name Date

Kaiser-Hill Company, LLC

Rocky Flats Environmental Technology Site

U.S. Department of Energy

Reviewed for Classification/UCNI

By: J. A. Geis (uwu)

Date: 3/18/04

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Table of Contents

Acronyms/Abbreviations

AFFF	Aqueous Fire Fighting Foam
B444	Building 444
B460	Building 460
B881	Building 881
B883	Building 883
B991	Building 991
CDPHE	Colorado Department of Public Health and the Environment
CSS	Crisis Support Staff
D&D	Decontamination and Demolition
DOE	U.S. Department of Energy
DOT	Department of Transportation
EOC	Emergency Operations Center
ESH&Q	Environmental Safety Health and Environment
FD	Fire Department
FF	Fire Fighters
FDC	Fire Dispatch Center
FF&I	Foaming Fixative and InstaCote
FPE	Fire Protection Engineer
FWC	Functional Work Center
HAC	Hazard Assessment Center
HAI	Hughes Associates, Inc.
HCN	Hydrogen Cyanide
HCFC	Hydro-Chlorinated Fluorocarbons
HRT	Hazard Reduction Technician
HEPA	High Efficiency Particulate Air
IC	Incident Command
IH	Industrial Hygiene
IWCP	Integrated Work Control Program
JHA	Job Hazard Analysis
K-H	Kaiser-Hill Company, LLC
LCO	Limiting Condition for Operation
LLW	Low Level Waste

LOQI	List of Qualified Individuals
MDI	Methyl Diphenyl Diisocyanate
MSDS	Material Safety Data Sheet
NFPA	National Fire Protection Association
OE	Operational Emergency
OJT	On the Job Training
OOS	Out of Service
OMD	Occupational Medicine Department
OPWL	Old Process Waste Lines
PM	Project Manager
PATS	Plant Action Tracking System
PPE	Personal Protective Equipment
PPM	Parts Per Million
QA	Quality Assurance
RF	Rocky Flats
RAD	Radiological
RCT	Radiological Control Technician
RFP	Rocky Flats Plant
RPT	Radiological Protection Technician
RFCSS	Rocky Flats Closure Site Services
RFETS	Rocky Flats Environmental Technology Site
RISS	Remediation, Industrial & Site Services
RFPO	Rocky Flats Project Office
RWP	Radiological Work Permit
SCBA	Self-Contained Breathing Apparatus
SCO	Service Contaminated Object
Site	Rocky Flats Environmental Technology Site
SME	Subject Matter Expert
STP	Sewage Treatment Plan
SWP	Standard Work Package
SE&QP	Safety Engineering and Quality Programs
USQD	Unreviewed Safety Question Determination

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Independent Investigation
of the
Building 991 Fire

Executive Summary

PURPOSE

The President and Chief Executive Officer of the Kaiser-Hill Company, LLC (K-H) commissioned an independent investigation of the circumstances surrounding the fire in the tunnel in Building 991 at the Rocky Flats Environmental Technology Site (RFETS), which occurred on February 12, 2004. The intent of this investigation was to provide a comprehensive review of: 1) the event, 2) the subsequent event investigations, and 3) the corrective actions being implemented to preclude a recurrence of this event.

BACKGROUND

Event Description

On the afternoon of February 12, 2004, an Alert-Star Operational Emergency was declared due to evidence of a fire in Room 402 of Building 991 at the RFETS. Plant personnel observed smoke escaping from Room 402 (through small conduit holes above the door); however, Room 402 was not accessible as it had been recently sealed and prepared for demolition. The RFETS Fire Department promptly responded to the event. The area was secured and placed under positive access control. The Emergency Operations Center (EOC) was activated at the Alert-Star level (Crisis Support Staff) and the actions required by the RFETS Emergency Plan were executed.

The Plan

A polyurethane foam agent (Autofroth® 9453), manufactured by BASF, was used in an effort to seal specific areas of Building 991, including Room 402 and associated tunnels. Foaming operations were undertaken to minimize any future slumping of the ground above the structure and to make areas of Building 991 inaccessible. This operation was completed on February 5, 2004.

Direct Cause

Polyurethane foams are created via an exothermic reaction that requires specific application controls. Combining this exothermic property with the scope of the application, i.e., the large

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mass, the excellent insulation properties of the foam, and the absence of compensatory controls, an excessive build-up of heat was created in the foam in the vicinity of Room 402 and the B West tunnel. This excessive heat build-up led to the fire, which, upon subsequent investigation, consumed a significant amount of the foam in the B West Tunnel.

SCOPE

This independent investigation focused on determining the following with respect to the circumstances surrounding the Building 991 fire:

- The adequacy of work planning and control as well as procedural adequacy and compliance.
- The cause of the excessive heat build-up in the foam, which resulted in the fire.
- The time-line of the foaming operations.
- The time-line of the fire event and response actions.
- The appropriateness of the event response by the work crew and supervisor.
- The appropriateness and timeliness of notifications and external response actions.
- The appropriateness of the actions of the building incident command and the EOC.
- The appropriateness of post-event action by Project Management including fact-finding, technical analysis, lessons learned, corrective actions, Price-Anderson screening, and work restart decisions.

INVESTIGATION METHODOLOGY

This investigation was performed in accordance with the procedures contained in the Site Quality Assurance Program Manual. The assessment was led by the Program Manager of Criticality Safety, Nuclear Safety & Licensing, and Quality Programs. The team was comprised of a diverse team of on-Site and off-Site experts. The following methods were used during the performance of this assessment:

- Personnel Interviews: RISS Management Building 991 Project Management, Foaming, Fixative and InstaCote (FF&I) Project Management, FF&I Subject Matter Experts (SMEs), FF&I workers associated with the foaming operations, foam product vendor, fire response and Incident Command personnel, and EOC personnel.

- Document Reviews: Work Package No. TO107232, other foaming work packages and procedures, product literature and training materials, vendor correspondence, event reports, Fire Department Response Log, EOC logs and closure planning correspondence.

- Observations: Tour of the area inspection of Authofroth® spray unit and tanks and observations of post event analysis.

Issues identified during this investigation will be categorized as one of the following:

- **Deficiency** – A generic term that denotes the characteristics of an item, activity, process, or document that depart from a specified requirement or render it unfit for its intended use, or render its compliance or safety status as indeterminate.

- **Opportunity for Improvement** – An item, activity, process, or document, which, if subjected to quality improvement actions, would make an increased contribution to factors such as safety, efficiency, effectiveness, or productivity.

- **Good Practices** – Observed policies, management approaches, work processes, or activities which clearly contribute to safety, efficiency, effectiveness, or productivity.

- **Causal Factors** – The sequence of events and its associated corrective actions of events, issues, or conditions.

- **Recommendations** – A generic term that denotes ideas proposed for management consideration that, upon implementation, may correct identified deficiencies, improve areas of weakness, and expand the use of good practices.

Deficiencies identified during the investigation will be documented on the Plant Action Tracking System (PATS) Deficiency Identification Form and forwarded to the appropriate Responsible Managers for processing. The Team was also tasked with providing recommendations for management consideration.

Deficiencies

- **Failure to understand the scope of foaming operations and the hazards associated with curing. The scope of the foaming operations, the significant increase in volume of Autofroth® 9453 to be applied in the Building 991 tunnels and rooms, and the application and curing requirements were not fully understood by the crew, foreman, or the SME.** Recent foaming operations involved mainly waste cargo containers, and as such, the cross-sectional volumes used during those operations were significantly less than the scope of the Building 991 effort. Further, the large metal objects in the cargo containers separated foam volumes and also provided heat sinks, and good mixing occurred due to the use of long nozzles. Failure to understand the impact of this increase in scope of the Building 991 effort, and its effects on the rigor of proper application techniques for appropriate curing, led to excessive heat build-up in the foam and a subsequent fire in some of the affected areas of Building 991. Some application techniques such as using a shortened tube (poor mixing) without mixing air turned on, near continuous pouring, and foaming on top of rising foam most likely contributed to the circumstances that led to the excessive heat build-up. (PATS 2004-000218)

- **Failure to comply with the Site Integrated Work Control Program (IWCP).**

  The work package contained obvious discrepancies between the BASF vendor requirements contained in the appendices and the body of the procedure. Subsequent engineering and management review failed to note these problems.

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The use of the standard foaming work package was inappropriate and out of scope for the tunnel work, and a new work package was required.

The work crew and foreman did not comply with the manufacturer's instructions with respect to the application of Autofroth® 9453 even though they were contained in Work Package No. TO107232. (PATS 2004-000219)

- **Failure of Incident Command communications. Communications were hampered at the scene since the Fire Department radios were not equipped with incident command channels.** In order to communicate, the EOC and incident command were forced to patch communications into the Fire Department dispatching system. (PATS 2004-000220)

- **Failure to adequately train and qualify FF&I personnel.** Section 7 of Work Package TO107232, List of Special Tool Requirements/Personal Protective Equipment (PPE)/Training, includes the following requirements: **"FOAMING OPERATIONS TRAINING** (BASF-Vendor Training) **NOTE:** Training will include formal classroom and in field training."

  The Team reviewed the training records and the List of Qualified Individuals for the six individuals on the foaming work crew, the foreman, and the two SMEs. The training records show that only one SME and one member of the work crew were fully trained and qualified to perform foaming operations. The other SME did not have the required classroom training. The other five members of the work crew did not have on the job training (OJT), and three of them also did not have the required classroom training. The foreman did not have either the required classroom training or OJT.

  The Training Program Manual, MAN-094-TPM, Section 6.1, General Requirements Outside DOE Order 5480.20A, states, in part, "All required training **SHALL** be completed before a worker is assigned duties requiring training or qualifications." Section 6.1.3, Qualification Process, states, in part, "All Site personnel **SHALL** be trained and qualified to perform their assigned duties. (PATS 2004-000221)

Opportunities for Improvement

- **Work package review.** The independent review of Work Package No. TO107232 failed to highlight, to RISS management, the issues associated with the increase in scope from standard foaming operations and subsequent hazards associated with the "curing" of the Autofroth® 9453 product. The primary reason for this failure was that the reviewer assumed that the crew worked in accordance with the vendor specifications. The work package was not reviewed against specific criteria that might have highlighted the problems.

- **Emergency Operations Center Response.** The EOC response exhibited a number of opportunities for improvement as some personnel were not completely familiar with communications protocols, actions, and procedures. The confusion at the EOC was further complicated as a number of non-designated personnel entered the EOC to observe.

Good Practices

- **Recovery Effort**. The RISS recovery efforts associated with the monitoring, control and subsequent investigation of the Building 991 fire were initiated in a timely manner, planned in detail in a logical sequence, fully focused on safety, and overall commendable.

- **Work Package Sign-off of Sections 8 and 9**. The work crew annotated sign offs for multiple applications of foam, even though the procedure only had a single space.

- **Initial Emergency Response**. The initial response provided by one of the Site Industrial Hygienists was commendable. In spite of communications difficulties, the Fire Department was notified of the discovery in a timely manner and incident boundaries were established quickly based on real time samples of hazardous gases. The EOC served a key role in notifications to external agencies, and provided timely communications with the appropriate Vendors, related to confirming hazards and fire-fighting techniques.

Causal Factors

- Failure of Expert Judgment in control of the work. The Job Hazard Analysis (JHA) for Work Package No. TO107232 required SME direction with respect to the fire/combustion hazard by limiting the lift heights of the applied foam and specifying wait time between lifts. Additionally, during the review of the work package by RISS management, the questions with respect to the increase in scope of this effort from "standard" foaming operations were answered incorrectly by the SME. Furthermore, during the actual application of the Autofroth® 9453 foam product, the SMEs did not ensure that the crew complied with the manufacturer's technical specifications even though they were present for much of the application.

- SME did not anticipate "issues" with the increased scope and subsequent curing of the product; SME did not make the FF&I crew adhere to vendor specifications.

- Project Manager, SME, and FF&I crew personnel evolved over time with little evidence of "adequate" turnover and ongoing training.

- Oversight of foaming operations diminished from initial application in nuclear buildings to routine sitewide projects.

- Original foaming procedures were revised into Standard Work Packages (SWP) and much of the rigor was lost.

- Innovative use of foam refrigerant insulation for bracing and stabilizing was extended beyond manufacturer'/vendor's previous efforts.

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Recommendations

- Review innovative applications when commercial products intended for another application are altered/modified to support site closure purposes. These applications should undergo a greater degree of scrutiny to ensure an understanding of:
  - Scope of the effort
  - Training and qualification requirements
  - Technical specifications, hazard controls, and product limits
  - Interfaces and impacts to other ongoing work
  - Quality assurance and oversight requirements
- Evaluate all outstanding FF&I work efforts and revise Work Packages/procedures to be compliant with vendor specifications and not SME dependent; revise procedure/package to specify key application parameters, such as:
  - Mixing tube length
  - Mixing tube configuration
  - Use of purge air during foaming applications
  - Foam lift heights and lay down pattern
  - Wait time between lifts
- Upgrade training and qualifications of FF&I crew and Project Manager.
- Upgrade technical oversight at the "point of attack" to aid project managers and supervisors in complying with site infrastructure. Consider establishing a contract for field technical support with appropriate vendors.
- Review event response capabilities as the Site infrastructure continues to contract; evaluate:
  - Site communications related to event response to assure that equipment provides reliable communications throughout the Site.
  - Field Sampling Team versus using Project resources.
  - The protocol for EOC staffing in support of external notifications and senior management role.
  - The process to maintain up-to-date information in the EOC, and Fire Dispatch, so that proper notifications, contact information, and position checklists are in place and effective.
  - The frequency and level of training for EOC and Incident Command personnel to achieve an appropriate level of preparedness.
- Correct the deficiency with alignment of radio channels.

1.0 PURPOSE

The President and the Chief Executive Officer of Kaiser-Hill Company, LLC (K-H) commissioned an independent investigation of the circumstances surrounding the fire in the tunnel in Building 991 at the Rocky Flats Environmental Technology Site (RFETS), which occurred on February 12, 2004. The intent of this investigation was to provide a comprehensive review of: 1) the event, 2) the subsequent event investigations, and 3) the corrective actions being implemented to preclude a recurrence of this event.

2.0 BACKGROUND AND EVENT DESCRIPTION

2.1 Background

Foaming activities were conducted in Building 991 on February 2 - February 5, 2004. The following timeline and sequence of events was created from interviews with individuals who performed, supervised, or were involved in those activities, and represents the best information available. All times are approximate.

Monday, 2/2/04

7:15 a.m. Pre-evolution briefing.

8:00 a.m. Arrived at 280 Cargoes. Load 2 foam tanks (approximately 3,000 lbs. each), rack of Nitrogen bottles, compressor, foam hoses, foam gun, and other equipment onto truck.

9:00 a.m. Arrived at Building 991. Unloaded equipment from truck onto dock. Moved equipment into Building 991 Corridor A area, near previously constructed wooden-framed and plastic-lined area to be foamed. Ran extension cords from temporary electrical power panels on southeast corner of building.

11:00 a.m Completed equipment movement and staging. Break for lunch.

12:30 p.m. Returned to Building 991 work area, commenced foaming preparation activities by checking ratio. Found Resin okay, but Isocyanate not. Cycled valves on tanks, opened and cleaned connections, checked gun and flow control valves. Shot two 55-gallon drum liners full of mostly resin during troubleshooting efforts.

1:30 p.m. Equipment working properly, performed ratio check and bag check. Installed a clear plastic window in the translucent plastic liner to enable observation of foaming activity.

2:00 p.m. Began foaming Corridor A plug. Ambient temperature was approximately 35°F. Foam tanks approximately 90 percent full at start. Performed bag check at approximately 5-minute intervals.

4:00 p.m. Completed foaming Corridor A plug. Purged and secured equipment. Left everything at the Corridor A location. Foam tanks at approximately 60 percent full.

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Tuesday, 2/3/04

7:15 a.m. Pre-evolution briefing.

8:00 a.m. Arrived at Building 991. Picked up the 2 foam tanks from Corridor A, moved them to the dock and then loaded onto truck.

8:30 a.m. Arrived at 280 Cargoes. Unloaded 2 foam tanks from truck and placed into heated storage. Loaded 2 warm foam tanks, approximately 90 percent full, from heated storage onto truck.

9:00 a.m. Arrived at Building 991. Unloaded 2 foam tanks and moved them into Corridor B area. Relocated all other equipment from Corridor A to Corridor B. Ran electrical extension cords into Corridor B.

10:45 a.m. Completed relocating and setting up equipment in Corridor B. Break for lunch.

12:30 p.m. Installed a clear plastic window in the previously constructed wooden-framed and plastic-lined area to be foamed at Corridor B West (roll-up door). Performed ratio check and bag check – satisfactory.

12:45 p.m. Commenced foaming at the bottom of the roll-up door, then down one side, then the other side, but not the back side (closest to the operator) of the enclosure. Expanding foam tended to roll towards the center from each of the 3 sides, eventually moving towards the back side. Performed bag checks at approximately 5-minute intervals. It took approximately 5 or 6 minutes to apply a layer of foam to each of the 3 sides of the enclosure. With the time to perform the bag checks, the first area foamed had approximately 15 to 20 minutes to set-up and cure before an additional layer of foam was applied. Successive applications of foam were conducted on these 3 sides of the enclosure to approximately 5 or 6 feet in height, at which point the area towards the back side and the center was filled to the same height. Operators observed the foam expanding against the plastic sheeting and felt the expected warmth from the expanding foam. Foaming was then continued on the 3 sides as before.

Shortly after foaming activities had begun, the gun operators found they were getting fumes into their supplied-air hoods. Foaming was stopped temporarily, and it was discovered that the air compressor had been located near the door to Room 402, and that fumes were exiting through that door and being taken into the compressor. The air compressor was relocated inside Building 991 and foaming operations were continued. Also, at some point that afternoon, a breaker on the building's temporary power supply tripped, and the foaming activity was interrupted until the power was restored.

3:30 p.m. Operator at foam tanks reported they were both at approximately 7 percent full. Stopped foaming operations, and left all equipment there. The Corridor B West area was filled to within approximately 3 feet of the ceiling at the roll-up door end of the enclosure and to approximately 6 feet of the ceiling at the wooden-framed end.

Wednesday, 2/4/04

7:15 a.m. Pre-evolution briefing.

8:00 a.m. Arrived at 280 Cargoes. Loaded the 60 percent full foam tanks used on Monday (now warmed to approximately 75°F) onto truck.

8:30 a.m. Arrived at Building 991. Foreman decided to return all equipment to the truck and work off the truck since the hose could reach from the truck to all areas to be worked that day. Relocated equipment. Cleaned equipment, performed ratio and bag checks – satisfactory.

9:30 a.m. Began foaming the remainder of the Corridor B West enclosure by standing on a scissors lift inside Room 402 and shooting through the ventilation ports between the west wall of Room 402 and Corridor B. Observed that the foam applied in that area the day before had expanded and crusted over as expected. Applied foam to the roll-up door end of the enclosure first, then the far (west) wall, then the wooden-framed wall, ending by shooting upward at the ceiling to completely fill the enclosure. The mixing tube/nozzle was approximately 5 or 6 feet long when it was installed on Tuesday, and was cut down to approximately 3 feet long as work proceeded on Wednesday.

11:00 a.m. Completed foaming the Corridor B west enclosure. Foam tanks at approximately 40 percent. Break for lunch.

12:30 p.m. Removed equipment from Room 402 and relocated it to the area to be foamed at the Corridor B east enclosure.

1:00 p.m. Began foaming the Corridor B east enclosure, shooting along all 4 sides of the enclosure and allowing the foam to flow towards the middle.

2:30 p.m. Completed foaming the Corridor B east enclosure. Foam tanks at approximately 30 percent full. Moved equipment to Room 402. Placed bags of foam from previous quality tests as well as halves of 55-gallon drum liners full of foam/resin into Room 402 before foaming. Cleaned screens and performed bag check – satisfactory.

3:00 p.m. Began foaming in Room 402 by standing at the wooden-framed area near the door and spraying along and against the east wall.

4:00 p.m. Foam tanks empty. Stopped work for the day. Foam height was approximately 4-1/2 to 5 feet on east wall, angled down to floor level approximately half way across Room 402.

Thursday, 2/5/04

7:15 a.m. Pre-evolution briefing.

8:00 a.m. No new foam tanks in 280 Cargoes. Trucking was unable to deliver on Wednesday due to snow. Went to warehouse and picked up 2 foam tanks. Temperature of tanks approximately 70°F.

8:30 a.m. Arrived at Building 991, Room 402. Connected tanks and equipment. Performed ratio check and bag check – satisfactory. Observed foam applied the previous day was cold and hard, but was separated approximately 2 inches from the east wall.

8:45 a.m. Began foaming in Room 402, with operator standing on ladder shooting over the 10-foot high wooden-framed and plastic-lined wall. Started in northwest

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area, then moved to east area, covering the foam from previous day, then back.

10:30 a.m. Room 402 filled to the desired 6-foot level in all areas except the door enclosure. Foam tanks at approximately 50 percent. Removed equipment from the door enclosure area, cleaned screens, performed bag check – satisfactory.

11:00 a.m. Began foaming the Room 402 door enclosure, starting at the concrete wall (west), then moving around the perimeter.

12:30 p.m. Completed foaming the Room 402 door enclosure area to a height of approximately 8 feet. Foam tanks at approximately 40 percent.

Afternoon Removed all foaming equipment from Building 991 and loaded on truck.

Friday, 2/6/04 through Sunday, 2/8/04
No work.

Monday, 2/9/04
One member of foaming work crew returned to Building 991 and walked down all areas worked the previous week to ensure all items had been removed. No abnormal conditions observed.

2.2 Event Description

On February 12, 2004, the Industrial Hygiene (IH) support person for RISS was working with a small crew of people in Building 991 to move a few waste drums from the building. He noticed an unusual odor (different from the normal curing of the foam), and observed a haze at the far west end of a corridor in Building 991. He went outside and approached the west end of Building 991, near the loading dock. At about 12:32 p.m., he observed wisps of light-green smoke coming out of small penetrations above the exterior of Room 402, Door 6.

The Fire Department was notified of the observation of smoke at Building 991 at 12:42 p.m. and responded to the scene at 12:47 p.m. The area was secured and placed under positive access control. The Fire Department staged equipment and Fire Fighters prepared to charge Room 402 with water through a conduit hole above Door 6. At 1:08 p.m., three Fire Fighters entered Building 991 wearing self-contained breathing apparatus (SCBAs), and staged a fan to remove accumulated smoke from the west end of the 153 hallway where the B-East foam plug is located.

As a result of the observed smoke and the inability to access the facility to identify and eliminate the source of the smoke, Facility Management determined that the conditions were met for entry into an Alert-Star Operational Emergency (OE). The Alert-Star designation represents degradation in the level of safety at a site/facility that requires response efforts from outside the site/facility. It falls below the protective action criteria for an Alert and does not require further classification as specified in DOE Order 151.1A.

An Alert-Star OE was declared at 1:32 p.m. due to evidence of combustion taking place in Room 402 of Building 991. As noted in Section 2.1, placing of polyurethane foam in Room 402 and adjacent tunnel areas had been completed on February 5, 2004, in preparation for building demolition. Room 402 had been sealed by the foam placement so confirmation of the nature or extent of the combustion was not possible. The EOC was activated at the Crisis Support Staff level and actions required by the RFETS Emergency Plan were executed. Technical Support organizations were deployed as necessary in accordance with Site procedures. Communications with the foam manufacturer, BASF, and distributor, InstaCote, were established to assist in developing response actions.

Water was introduced into Room 402 through the penetration above the door and was effective in controlling the amount of smoke observed. Air and water monitoring was instituted promptly following initiation of the event and continued as appropriate. Following these actions, the conditions prompting entry into the OE were exited, and the Alert-Star was terminated at 5:02 p.m. on February 12, 2004.

No injuries or chemical exposures occurred during the incident. As a precaution, Fire Fighters and other appropriate personnel underwent blood evaluations to determine if there had been any hazardous material exposures. The results of the blood work were negative for Hydrogen Cyanide.

3.0 INVESTIGATION METHODOLOGY

This investigation was performed in accordance with the procedures contained in the Site Quality Assurance Program Manual. The assessment was led by the Program Manager of Criticality Safety, Nuclear Safety & Licensing, and Quality Programs. The team was comprised of a diverse team of on-Site and off-Site experts. The following methods were used during the performance of this assessment:

- Personnel Interviews: RISS Project Management Building 991 Project Management, Foaming, Fixative and InstaCote (FF&I) Project Management, FF&I Subject SMEs, FF&I workers associated with the foaming operations, foam product vendor, fire response and Incident Command personnel, and EOC personnel.

- Document Reviews: Work Package No. TO107232, other foaming work packages and procedures, BASF produced literature and training materials, vent reports, Fire Department Response Log, and EOC logs.

- Observations: Tour of the area and review of post event analysis.

Issues identified during this investigation will be categorized as one of the following:

- **Deficiency** – A generic term that denotes the characteristics of an item, activity, process, or document that depart from a specified requirement or render it unfit for its intended use, or render its compliance or safety status as indeterminate.

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- **Opportunity for Improvement** – An item, activity, process, or document which, if subjected to quality improvement actions, would make an increased contribution to factors such as safety, efficiency, effectiveness, or productivity.
- **Good Practices** – Observed policies, management approaches, work processes, or activities which clearly contribute to safety, efficiency, effectiveness, or productivity.
- **Recommendations** – A generic term that denotes ideas proposed for management consideration that, upon implementation may correct identified deficiencies, improve areas of weakness, and expand the use of good practices.

Deficiencies identified during the investigation will be documented on the Plant Action Tracking System (PATS) Deficiency Identification Form and forwarded to the appropriate Responsible Managers for processing. The Team was also tasked with providing recommendations for management consideration.

4.0 RESULTS AND FINDINGS

4.1 Work Planning and Control

The work control documents used to perform foaming activities in Building 991 and other areas of the Site were reviewed to determine if they contained appropriate information and controls, and to determine if they met the requirements of the Integrated Work Control Program (IWCP). Listed below are the documents reviewed by the team and the results of those reviews, including identified deficiencies and recommendations.

4.1.1. Work Package TO107232, Rev. 3, Foaming Operations (i.e., Tanks, Cargos, Ductwork, Piping, Gloveboxes, etc.), June 25, 2003

This work package was the work control document used to perform foaming activities in Building 991 on February 2, 2004 – February 5, 2004. Subsequent to the February 12, 2004, event, the RISS Project identified several discrepancies in this work package (See Appendix G). The Team recognized the validity of those discrepancies and identified additional discrepancies during their review. The following is a listing of all discrepancies that were identified in this work package:

1. Work Package TO107232 is a Type 1 work package, but it does not meet the requirements in the IWCP Manual (MAN-071-IWCP) for either a Type 1 or a SWP. A Type 1 work package is used for activities that are performed one time, and includes a single Work Process Form. A Standard Work Package is used for activities that are repetitive in nature, utilizes a different cover sheet, and requires a new Work Process Form each time the work package is performed. Work Package TO107232 was drafted to cover a broad range of foaming activities in different facilities, but was not developed or performed as either a Type 1 or a Standard Work Package under the requirements of the IWCP Manual. This is considered a Deficiency. (PATS 2004-000219)

Previous foaming activities performed in Building 371 in 2002 and in Building 776 in 2001 utilized procedures written specifically for those activities (See 4.1.2, items 1 and 2 below). Additional foaming activities in Building 707/776/777 were performed under a Standard Work Package written specifically for inside or outside foaming activities (See 4.1.2, items 4 and 5 below). A review of those procedures and work packages found they contained greater details and controls regarding the application technique (specifically 24-inch lift height and 90-minute cure time limitations). Either a procedure, a Type 1 Work Package or a Standard Work Package could have been drafted and utilized to perform foaming activities in Building 991, as developed and performed, but Work Package TO107232 did not meet these requirements.

2. The applicability of Work Package TO107232 is identified in both the title and in the Purpose statement at the beginning of Section 8, Initial Conditions/Prerequisites as "cargo containers, tanks, waste crates, gloveboxes, piping ductwork, etc." The Purpose statement further amplifies the intended scope of this work package as "to block/brace and/or make machinery, ancillary piping or ductwork inaccessible."

   The foaming activities in Building 991 involved large-area plugs of foam in concrete hallways and rooms, which were unique when compared to other previous foaming activities on-Site. The Building 991 activities exceeded the anticipated scope and applicability of this work package.

3. Work Package TO107232 was not reviewed by Nuclear Safety. Though such a review was not required for performing work in Building 991 (since Building 991 had previously been declared free of radiological contamination), it was required for other foaming applications for which this work package was used. There was also no review of this work package by Quality Assurance or the Independent Safety Review Committee. Noteworthy is the fact that the procedures used for similar activities in Building 776 and Building 371 did receive Nuclear Safety reviews, which considered and documented the limits on foam lift height and cure time. See items 7 and 11, below, for a discussion of the importance of lift height and cure time.

4. Work Package TO107232 was not reviewed or approved by Fire Protection Engineering, though the JHA identifies "fire, smoke, heat generation" as a potential hazard. The JHA was reviewed and approved by Fire Protection on January 19, 2004, approximately seven months after the work package was issued. Discussions with the reviewer indicated that the scope of her review was for cargo containers and did not consider application of foam within a building area such as in Building 991.

5. Section 7 of the work package, List of Special Tool Requirements/PPE/Training, includes the following subsection:

   FOAMING OPERATIONS TRAINING (BASF-Vendor Training)
   NOTE: Training will include formal classroom and in field training.

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Section 8 of the work package, Initial Conditions/Prerequisites, includes the following requirement in Step 8.1.11, and has a block for the performer to initial indicating completion:

***JOB SUPERVISOR/SUBCONTRACTOR:* Review the training requirements for the hazards of the work associated with this package listed in Section 7.**

Only one of the six individuals performing foaming activities in Building 991 had received the requisite training. See additional discussion of this issue in Section 4.1.4, below.

6. Step 8.1.8 of the work package states, "Caution should be taken to ensure foaming is accomplished in lifts (as determined by engineering) with appropriate time (~90 minutes) between each lift to dissipate heat." The Required Controls listed in the JHA for potential fire, smoke and heat generation hazards are, "Apply/Stage foam in recommended lift heights per engineering direction. As directed by SME (then lists the two individual SME's names)." The SME did not provide guidance regarding lift height or cure time to the workers performing foaming activities in Building 991. In fact, contrary guidance was provided by the SMEs that neither the 90-minute cure time nor the lift height was important as long as "good foam" was produced. This is considered a Deficiency.

   In 2002, a glovebox in Building 707 was foamed using higher density foam and that work was performed under an approved procedure. The same workers who performed the glovebox high-density foaming in Building 707 also performed the Building 991 foaming. The workers, along with the SMEs, all recalled strict limitations on 24-inch lift height and 90-minute cure times associated with the Building 707 glovebox high-density foaming. However, the workers and SMEs incorrectly assumed that those controls did not apply to the regular (lower density) foam used in all other applications.

7. Section 8.1.17 of the work package states, "Steps of this package can be performed concurrently and in any order as long as those steps follow a logical sequence." The manufacturer's operating procedure, included as an attachment to the work package, begins with the following statement, "The following procedure <u>MUST</u> be carried out in the exact sequence outlined below by properly trained individuals."

   While there was no indication that steps were performed out of sequence, this statement provides misleading guidance to the operators. Section 8.1.17 is a "boilerplate" type of step, but it was inappropriate to include it in this work package. This provides another indication that the work package was not properly prepared or approved.

8. At the end of Section 8.1 of Work Package TO107232, a NOTE states, "COMPLETE A SECTION 8 FOR EACH FOAMING EVOLUTION. ENSURE COPIES OF THE COMPLETED SECTION 8'S ARE DOCUMENTED AND PLACED IN APPENDIX 3." A similar note appears in Section 9, just before Section 9.2, Prerequisites. A single set of Section 8 and 9 instructions were utilized for all foaming activities conducted in Building 991 on February 2, 2004 – February 5, 2004, with some steps signed off four times and others signed off once.

9. Section 9 of Work Package TO107232, Specific Task Instructions, Step 9.3.3, states the following and includes a line for a signature and date to indicate completion:

   ENGINEER: **Verify bulk material temperature of Isocyanate and Resin Tanks are between 70°-90° Fahrenheit.**

   The sequence of this step in relation to other steps in the work package anticipates performance of this temperature verification before beginning foaming activities, which is also consistent with the manufacturer's literature. The copy of the work package used for the Building 991 work has a single signature on this step that is dated February 5, 2004, which was the last day of foaming activities at Building 991.

10. Section 9 of Work Package TO107232, Specific Task Instructions, Step 9.3.10, states, "Perform foaming operations in cargo containers, waste crates and/or associated equipment in accordance with attached procedures in Appendix 6. (Foaming Operation procedure)." Appendix 6 of the work package contains the manufacturer's (BASF) operating manual for the Autofroth® dispensing unit and training material from a course given by the manufacturer's representative at the Site on October 28, 2002. The following discrepancies were identified between the manufacturer's operating manual, the training materials, and the process/techniques used to apply foam in Building 991:

    a. The training materials include a Foaming Operations Procedure, which begins with the following, "NOTE: Because heat is generated by the foam forming chemical reaction, filling large containers should be completed in lifts not thicker than 24", twenty four inches. Allow 90 minutes between lifts for heat to dissipate." The application techniques used in Building 991 did not conform to either the lift height or cure time requirements. The foam application crew was given guidance by the SMEs that neither the 90 minute cure time nor the lift height was important as long as "good foam" was produced.

    b. Step 4 of the manufacturer's operating procedure states, "Refer to chart to determine the **time** (in seconds) required to foam the estimated area to a thickness of 2 feet (24")." The referenced chart uses the length and width of the area to be foamed to determine the time required to pour rectangular volumes to a height of 24." The chart includes the statement, "**Due to heat generation, do not pour thicker than 24"**." The application of foam in Building 991 was made in essentially continuous pours, without adhering to time or height limitations.

    c. Step 5 of the manufacturer's operating procedure states, "Visually estimate the length of the mixing tube to be used, maximum length is 10 feet, minimum length is 3 feet." In interviews conducted with the workers on the foam application crew, they stated that the minimum mixing tube length was 18 inches, and were not aware of the required 3 feet minimum mixing tube length. While the manufacturer does make a special 18-inch mixing tube with stator vanes, such tubes have never been procured or used at the Site. The foam application crew indicated they likely cut the mixing tube shorter than 3 feet to complete foaming in some locations in Building 991.

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d. Step 8 of the manufacturer's operating procedure states, "Turn air valve to 'full Purge' position" prior to dispensing foam. Sections 4 and 5 of the SL-360/390 dispensing unit operation manual contain less clear directions that appear to provide contradictory instructions to turn the purge air off during pours. The addition of purge air was not utilized by the foam application crew in Building 991 or in other foaming activities performed under this work package.

   According to the SME, the addition of purge air is not necessary when using a 10-foot mixing tube because the length of the tube allows for sufficient mixing before the foam is dispensed. But with shorter mixing tubes, the addition of purge air is needed to ensure adequate mixing.

   During cargo foaming activities (when a 10-foot mixing tube was being used), the SME instructed the foam application crew that purge air was not needed. But the need to utilize purge air with shorter mixing tubes was not explained or instructed by the SME. These failures to follow procedural requirements constitute a Deficiency. (PATS 2004-000218)

11. Step 9.4.2 of Work Package TO107232 states, "Before the cargo doors are closed, place absorbent socks at the threshold of the door at each corner." While clearly inapplicable, this step was signed off as complete on the work package used to perform foaming activities in Building 991. This indicates a casual use of and compliance with work package instructions, which is also supported by the fact that all steps were performed numerous times in Building 991, but only three steps are initialed more than once. Also see items 8 and 9, above. The workers provided multiple signoffs for their steps. The SME signoffs did not demonstrate clear performance of his responsibilities.

12. The JHA performed for Work Package TO107232 was not adequately developed. The JHA lists a single Major Job Step, "Perform setup/foam operations and equipment disassembly. All foaming operations will be accomplished by trained and qualified individuals ONLY." The foaming activities would more appropriately be presented as six major job steps: 1) Equipment Assembly, 2) Startup and Ratio Check, 3) Foam Application, 4) Shutdown, 5) Tank Change-out, and 6) Preventive Maintenance.

4.1.2 Review of other work control documents for previous foaming activities at RFETS.

1. PRO-1516-AF-371, Procedure for Autofroth® Operations for Building 371/374, July 18, 2002

This procedure incorporates more limitations and precautions from the manufacturer's operating manual and training material, thus making the procedure steps specific and easier for operator use. The limitations and precautions (Section 4) state that caution shall be taken to maintain lifts that are approximately 24-inches thick, not to exceed 36-inches thick. An approximately 90 minute wait time shall be observed between each lift greater than 24-inches thick in order to dissipate heat. The foaming operation (Section 8.3) contains a Note stating that should the depth (lift) exceed 24 inches and 90 minutes should be allowed between lifts for heat to dissipate. The allowance for exceeding the 24-inch lift height is not consistent with the manufacturer's operating procedures, but is not considered significant in light of the other controls included in the procedure. Section 8.3 identifies the maximum length of mixing tube to be used as 20 feet, and the minimum length as 3 feet. The procedure also specifies that during foaming operation, the air valve should be in the full PURGE position.

The Nuclear Safety group's review of this procedure is documented in USQD-371-02.1938-SLA-R01, Evaluate Use of Autofroth® in Building 371/374. This Unreviewed Safety Question Determination (USQD) states, "The product foam partially expands in the mixing tube but expands an additional 2-3 times as it sets up and hardens when applied in lifts not exceeding two feet in depth. The mixing and hardening process releases some Freon-22 and is exothermic. The two-foot operational lift limit is an operational guideline that serves to prevent internal charring from the exothermic reaction as was reported to have been found when a cube six-feet on a side was formed and cut open after curing by the manufacturer." The USQD thus recognized the importance of the 24-inch lift height limit as well as the exothermic reaction and potential for charring.

The JHA performed for this procedure (Figure 3-2) does not include fire, smoke, and heat generation as a potential hazard. However, the Note in section 8.3 addresses the need to allow heat to dissipate in thick sections of foam.

This procedure included appropriate guidance on use of purge air, lift height, and cure times, all of which were reviewed and addressed prior to its issuance.

2. PRO-1277-AF-707/776, Procedure for Autofroth® for 707/776/777 Closure Project, November 12, 2001

Similar to PRO-1516-AF-371, this procedure incorporates more limitations and precautions from the vendor manual and training material, thus making the procedure steps specific and easier for operator use. The limitations and precautions (Section 4) state that caution shall be taken to ensure that foaming is accomplished in lifts that are no more than 24 inches thick, with appropriate time (about 90 minutes) between each lift to allow for dissipation of heat. The foaming operation (Section 8.3) contains a Note stating that if the length, width, and depth of a pre-expanded foam lift exceeds 24 inches, then 90 minutes should be allowed between lifts for heat to dissipate. The intent of the Note is that any lift height should not exceed 24 inches. The Note concludes that any dimension less than 24 inches is acceptable. This agrees with the vendor limit for height of foam application (lift) as 2 feet, followed by 90 minutes wait period. Section 8.3 of the procedure identifies the maximum length of mixing tube to be used as 20 feet, and the minimum length as 3 feet. Also specified is that during foaming operation, the air valve should be in the full PURGE position.

The Nuclear Safety group's review of this procedure is documented in USQD-RFP-02.0095-DSR, Autofroth® for 707/776/777 Closure Project. This USQD states, "Inline initial expansion is due to incorporated blowing agent. Impingement mixing of components and mixing in stator tube causes exothermic cross link reactions to occur. Heat of the reaction drives the close cell foam formation and heat will be concentrated at the center of foam mass. Closed cell foam are

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insulators and heat dissipation is slow. Caution should be taken to avoid over pouring. Temperatures have been shown to reach 400° F when pouring a 6 ft cube, resulting in interior charring."

The JHA performed for this procedure (Figure 3-1) does not include fire, smoke, and heat generation as a potential hazard. However, the Note in section 8.3 addresses the need to allow heat to dissipate in thick sections of foam. The USQD quoted above did recognize the exothermic reaction and potential for charring.

This procedure included appropriate guidance on use of purge air, lift height, and cure times, all of which were reviewed and addressed prior to its issuance, as with PRO-1516-AF-371.

3. Completed Work Package #T0108102 for the Contaminated Cargo Container on 779 Pad

The purpose of this work package was to seal a contaminated glovebox, which was breached and already in a cargo container and immobilize it for shipment. This work package was used outdoors with a plastic house erected around the cargo container door and positive ventilation established from the contaminated glovebox in the container through High Efficiency Particulate Air (HEPA) filters to outside.

A Note in the procedure (Section 9.2.7) states that the thickness of an expanded foam application shall not exceed 24". Due to heat generation, no additional thickness shall be applied on top of a just poured foam application for a period of at least 90 minutes.

The mixing tube length should be a minimum of 3 feet and the purge air valve was to be closed during foam application. The acceptable temperature of the product storage tanks was stated to be 70° to 85°F. The thermostat for the hose heater tape was to be set at 85° F. During a test shot on December 3, 2001, the data sheet record indicates that each product tank temperature was 70°F.

4. Standard Work Package #707/776/777-21011-01 for Autofroth®ing (Outside Only), May 3, 2002

This work package provides instructions for personnel to enter cargo containers (outside of a nuclear facility only) and foam void spaces for blocking and bracing to prevent contents from shifting during transport. It also provides instructions for foaming job evaluation in accordance with engineering analysis and set up, test, operate, maintain, troubleshoot, and secure Autofroth® foam equipment.

The work package contains clear and detailed step-by-step procedures for operating the Autofroth® foam equipment that were taken from the vendor's manual. It requires the Job Supervisor to identify each cargo container to be foamed and lay out a method to accomplish each foaming operation in accordance with the foam manufacturer's application guidance in Appendix 6 and the engineering analysis in Appendix 9. The method is to be documented in Appendix 2 of the SWP.

The foaming operation section contains a Note consistent with vendor guidance which states, "If all of the dimensions of an expanded foam application exceeds 24" then we must wait 90 minutes before continuing foaming operation. But if one dimension is less than 24' the foaming operation may continue."

The procedure defines the minimum length of the mixing tube as 3 feet and that the foam application is made with the purge air off. The work package requires that the foaming media tanks be at an acceptable temperature of 80° +/- 5°F (section 9.2.3), although in section 9.2.4.1, the system is up to temperature at 60° - 85°F, when the electric power is turned on to the hose bundle heat tape (thermostatically controlled).

5. Standard Work Package #707/776/777-22009-00 for Autofroth®ing (Inside Only), June 3, 2002

This work package provides instructions for personnel to foam gloveboxes with BASF Autofroth® 9453 Polyurethane Foam (inside of a nuclear facility only) and fill void spaces for blocking and bracing to prevent contents from shifting during transport. It also provides instructions for foaming job evaluation in accordance with engineering analysis and set up, test, operate, maintain, troubleshoot, and secure Autofroth® foam equipment.

Only the 1000-pound system (one 500-pound cylinder of resin and one 500-pound cylinder of isocyanate) is allowed inside the building to keep the amount of Freon in the resin (17 percent) below the reportable quantity. The foaming operations can only be used on enclosed systems that are kept under negative pressure so that curing gases are exhausted to the outside of the building. The volumes of foam material actually used shall be documented in Appendix 10 and reported to Environmental Compliance to support their annual reports (Section 8.3.19).

The work package contains clear and detailed step-by-step procedures for operating the Autofroth® foam equipment that were taken from the vendor's manual. It requires the Job Supervisor to complete a worksheet for each glovebox to be foamed to document the specific method used to accomplish each foaming operation lift in accordance with the manufacturer's application guidance in Appendix 6 and the engineering calculation in Appendix 9.

The foaming operation section contains a Note consistent with vendor guidance which states, "If all of the dimensions of an expanded foam application exceeds 24" then the operator must wait 90 minutes before continuing foaming operation. But if one dimension is less than 24' the foaming operation may continue."

The procedure defines the minimum length of the mixing tube as 3 feet and the foam application is made with the purge air off. The work package requires that the foaming media tanks be at an acceptable temperature of 80° +/- 5°F (section 9.2.3), although in section 9.2.4.1, the system may be in the temperature range of 60° to 85°F, when the electric power is turned on to the hose bundle heat tape (thermostatically controlled).

4.1.3. Tank Weights and Residual Material Volumes

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The Team noted a discrepancy in the weights of one of the three sets of tanks used for the Building 991 foaming activities (Set 3, see table below). With the assistance of the work crew and foreman, the Team was able to determine that Set 1 was used on February 3, 2004, to foam a majority of the B-West plug, and Set 2 was used on February 5, 2004, to complete foaming in Room 402. Set 3 was used on February 2, 2004, to foam the Corridor A plug, and on February 4, 2004, to foam the top portion of the B-West plug, all of the B-East plug, and part of Room 402.

Tank Number	Gross Weight Full (per label)	Tare Weight (stenciled on tank)	Net Weight Full (per label)	Gross Weight After Use	Net Weight After Use	Tank Gauge Reading (%)	Actual Percentage Remaining
SET 1							
07-6759 (A)	4522 lbs	1072	3450	1580	508	20	14.7
74-8622 (B)	missing	1155	3050	1600	445	7	14
SET 2							
07-6773 (A)	4520	1070	3450	2520	1450	42	42
74-1878 (B)	4655	1155	3500	2600	1445	34	41.3
SET 3							
74-7111 (A)	4515	1065	3450	2040	975	<5	28.2
74-1822 (B)	4655	1155	3500	1220	65	7	1.85

The discrepancy can partially be accounted for by the fact that two 55-gallon drum liners were filled almost entirely with resin (B-component) during troubleshooting activities on February 2, 2004, prior to the Corridor A plug foaming. If, however, the ratio of the foam applied was significantly different from the ratio checks recorded at the beginning of daily operations, significant quantities of unreacted chemicals could have been applied in the areas serviced by these tanks.

4.1.4 Training/LOQI

The Training Program Manual, MAN-094-TPM, Section 6.1, General Requirements Outside DOE Order 5480.20A, states, in part, "All required training **SHALL** be completed before a worker is assigned duties requiring training or qualification." Section 6.1.3, Qualification Process, states, in part, "All Site personnel **SHALL** be trained and qualified to perform their assigned duties."

Section 7 of Work Package TO107232, List of Special Tool Requirements/PPE/Training, includes the following requirement, "**FOAMING OPERATIONS TRAINING** (BASF-Vendor Training) **NOTE:** Training will include formal classroom and in field training."

The Team reviewed the training records and List of Qualified Individuals for the six individuals on the foaming work crew, the foreman, and the two SMEs. The training records show that only one SME and one member of the work crew were fully trained and qualified to perform foaming operations. The other SME did not have the required classroom training. The other five members of the work crew did not have OJT, and three of them also did not have the required classroom training. The foreman did not have either the required classroom training or OJT. Coincidentally, the recently assigned project manager for foaming recognized the training deficiencies and a classroom training session was in progress when the event occurred on February 12, 2004. Nonetheless, the foaming crew as a whole were not trained and qualified as required prior to or during the application of foam in Building 991. This is considered a Deficiency. (PATS 2004-000221)

4.1.5 Conclusions regarding Work Planning and Control

The overall conclusion drawn from these items is that Work Package TO107232 was not adequate for performing foaming activities in Building 991, and that it did not comply with the requirements of the Integrated Work Control Program Manual.

The root cause of the February 12, 2004, thermal event in Building 991 was inadequate and/or inappropriate direction from the SMEs to the foam application crew regarding application technique, lift height, and cure time.

A contributing cause was that Management allowed work to proceed under a process that relied on the SMEs to provide direction to the operators, with no additional verification of the accuracy or adequacy of the SMEs performance. This expert-based approach replaced a specification, training, and review system.

The potential effects of the inadequacy of the existing procedures on existing packages that utilized foam are clearly recognized. Based on these inadequacies, the team evaluated the effectiveness of past foaming operations on gloveboxes and cargo containers. Discussions with the vendor, BASF, indicated that the inadequacies of the work packages did not have a substantial impact on the efficacy of the existing packaging. This conclusion is based on the size of the lifts and the heat sinks provided by the internal contents of the cargo containers, as well as the heat sink from the cargo container itself. The integrity of the gloveboxes was maintained by the fact that lift height and curing time requirements were better defined and more closely followed.

4.1.6 Recommendations regarding Work Planning and Control

The active Site procedures for using foam should be reviewed and updated consistent with BASF application guidance. Based on a BASF telephone contact, (See Section 4.3) a smooth-bore mixing tube should have a length in excess of six feet. If a shorter mixing tube is desired, the internal bore should have baffles or a static mixer. In all cases the purge air should be turned on during foaming operations. Specific recommendations for individual procedures and work packages are:

1. Work Package for Foaming Operations (#TO107232)

The work package should clearly state the vendor foam lift limitations in the procedure, and the work plan for a specific application should identify exactly how the limits will be met by

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the laydown pattern for that specific application. Because the end use and application of this foam are generally well outside of those intended for Autofroth® 9453, the specific application should be reviewed with BASF and their recommendations incorporated in the work package as requirements. If this approach had been followed for the large placement of foam in Building 991, the resultant hazard would have been controlled and the incident avoided. The required controls should be documented in a work plan for each specific application as noted above so clear direction is provided to the operators and a well-documented record can be maintained.

The Autofroth® training material clearly states that the temperature of the product streams at the mixing point should be in the range of 75° F to 85° F to ensure proper foam quality. The work package (Section 9.3.3) only requires verification that the bulk material temperatures of the product tanks are between 70° F and 90° F. The product hoses are heat traced and there are individual temperature gauges for each product hose at the mixing nozzle. The work package should require that the foaming operator verify that the product temperatures are within the specified range during the entire foaming operation. Consideration should be given to the periodic calibration of these temperature gauges. The use of this material as a structural fill over a long period of time will require increased attention to achieving optimal foam characteristics.

The quality of the foam placement requires proper mixing of the two products in the mixing tube. The training material attached to work package specifies a minimum mixing tube length of 36 inches, and the use of purge air during foaming operations. During contacts with BASF by the team, BASF stated they really prefer a minimum tube length of 6 feet and purge air on during foaming operations. These should be specifically stated in the body of the work package. The procedures for foam operations in Building 371/374 and Building 707/776/777 included specific requirements, as well as providing step by step startup, operation, and shutdown procedures for the Autofroth® system. The work package clearly did not take advantage of these earlier procedures.

During interviews with the operators, they stated that the ratio check bags from the placing of the tunnel plugs were disposed on the floor of Room 402 prior to placing foam in that room. In this case, the plastic bags and off-ratio material potentially provided more fuel for combustion. The proper disposal of test shot bags needed to be identified in the work package. In addition to control of the foam lift height, the work plan needed to specify the laydown pattern for a large fill, to avoid the foam in foam effect, which could lead to splitting of the foam, allowing a pathway for oxygen to reach the hot foam and enabling combustion. Operators were often shooting through a cut in a plastic barrier and experienced difficulty in maintaining constant movement of the foam nozzle.

2. Procedure for Autofroth® Operations for Building 371/374 (PRO-1516-AF-371)

If this procedure were to be revised, the Job Hazard Analysis (JHA; Figure 3-2) should address the potential hazard of fire, smoke, and heat generation and identify appropriate controls. There is a Note in Section 8.3 concerning the need to allow heat to dissipate in thick sections of foam.

The instructions (Sections 6 and 8) address the storage and operational temperatures of the A and B products, indicating that a temperature range of 60° F to 80° F is acceptable. The vendor supplied training material specifies that the product temperature should be in the range of 75° F to 85° F to ensure proper foam quality. It is noted in USQD-371-02.1938-SLA-R01, "The vendor recommends application with the material in the temperature range 60°- 85 °F, with 80°F being optimal. Optimal foam characteristics are not needed for this waste application."

When used as a fixative and/or dunnage, conditions less than those designed to optimize foam physical properties may be acceptable, but some control of quality is still needed. This depends on adequate operator training and proper supervisory oversight.

3. Procedure for Autofroth® for 707/776/777 Closure Project (PRO-1277-AF-707/776)

If this procedure were to be revised, the Job Hazard Analysis (JHA; Figure 3-2) should address the potential hazard of fire, smoke, and heat generation and identify appropriate controls. There is a Note in Section 8.3 concerning the need to allow heat to dissipate in thick sections of foam.

4.2 Event Response

Mark Simpson is the IH support person for RISS. He was working with a small crew of people in 991 and noticed an odor. He observed a haze at the far, west end of a corridor in 991. He went outside and approached the West end of 991, near the dock. He observed wisps of light-green smoke.

His Nextel telephone had "no service" so he used the direct connect radio feature to contact JR Marschall, the 991 Decontamination and Demolition (D&D) Project Manager. JR immediately notified the Fire Department via 2911.

The Fire Department responded with Gene Quador, Operations Command, serving as the initial Incident Commander. He used the 1st Engine Unit as the exterior sector to establish perimeter control and set up a charged fire hose. The 2nd Engine Unit was assigned interior sector. This sector, supported by the Industrial Hygienist conducted air monitoring to define the boundary for SCBA-required areas. This boundary was established and marked with barrier tape.

Radiological Protection reported that the building met the "free release" criteria so there were no radiological concerns. To confirm this, radiological monitoring and surveying was initiated and performed throughout the event. There was never any indication of radiological contamination or airborne release from the event.

Industrial Hygiene provided air sampling that confirmed elevated readings of carbon monoxide and hydrogen cyanide in the wisps of smoke. These elevated readings were present only at the exhaust point (abandoned conduits above the door) from Room 402. Readings taken in the adjacent corridor in 991, within the canopy area outside Room 402, and in the surrounding area

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outside were all normal. Air samples were also taken up the hill toward the West to confirm that no contaminants were being carried to the 750 Pad area.

The RISS Duty Manager determined that the nature of the event was best managed by the Fire Department incident command function, so incident command remained with Gene Quador. The RISS Duty Manager and the balance of the incident command team focused on event classification and selection of an appropriate Material Safety Data Sheet, given the foam products. A call was made to the foam product manufacturer, BASF, to confirm the best medium for fire fighting. While water is effective at controlling the smoke, a foam agent (AFFF) is recommended for extinguishing a fire.

The incident command team determined that the event should be classified at the Alert-Star level and the EOC should be activated. Since the Nextel phones did not work adjacent to 991, a member of the incident command team ran up the hill to the West, and called Fire Dispatch to activate the EOC. Separately, one of the qualified Crisis Managers, Mark Spears, had concluded the Alert-Star classification, and directed activation of the EOC just prior to the incident command team's notification to Fire Dispatch.

The Fire Department incident command communicator immediately noted that Fire Department's radios aren't configured to the incident command/EOC channel. Contact was made via alternate means, and the EOC was able to re-configure the radio channels to achieve the required contact between incident command and EOC. This condition should have been corrected when the Shift Superintendent position was eliminated in July 2003. Absence of radios configured for incident command to EOC is a deficiency against the requirements of the Site Emergency Plan. (PATS 2004-000220, Responsible Manager, Bob Kopplin).

Mark Spears was involved in the recovery operation on Central Avenue near 750 Pad for a trailer, loaded with LLW cargo containers, that had slipped from its tractor. He observed the Fire Department response to 991. He was notified via Nextel telephone that there was a concern with Fire Department staffing for any subsequent response. Based on the information he received, he notified Jerry Lyle that he was activating the EOC, as a qualified Crisis Manager. Mark proceeded to classify the event as an Alert-Star, based on the guidance provided in the Event Classification Guide.

Gary Carnival reported as Emergency Director, the normal lead position in the EOC for Alert-Star events. Gary received a turnover briefing from Mark Spears and assumed his position as director. He then directed Echo1 to establish communications with incident command. Jerry Cable, Echo 1, got this communications link established by having Dick Burns, EOC manager implement a "patch" to align the Fire Department radio channel with the EOC channel. The Emergency director was responsible to evaluate information related to use of fire fighting agent and direct the decision to incident command. This process was judged to be slow, due to confusion between contacts made with the manufacturer by different personnel.

For an Alert-Star event, the EOC callout brings the Crisis Support Staff (CSS), which includes the Hazard Assessment Center (HAC) Manager, plus the assigned CSS positions. Dick Sexton, HAC Manager, was monitoring the fire department radio channel in the HAC. He notified Alan

Parker and Jerry Lyle that in consideration of the Fire Department response posture, Hot Work on the Site should be suspended. He made contact with the RISS Deputy Project Manager for Environmental, Safety, Health and Quality to discuss status. The HAC was working on release modeling, based on sampling information, and had trouble mobilizing the field sampling team. However, the incident command radiological protection member was able to separately mobilize radiological protection resources from adjacent projects in a timely manner. Note – review field sampling team function versus use of project resources. The HAC was also assisting in evaluation of sampling data from the incident command IH representative. The HAC coordinated efforts to determine the most effective fire fighting agent, including contact with the product manufacturer.

The EOC Manager, Dick Burns, provided excellent technical support (the radio channel patch) including on-the-spot refreshers on use of the EOC telephone system, logbooks, and position checklists. He noted that most personnel were "rusty", but that they settled into a routine pretty well. The Department of Energy (DOE), Rocky Flats Project Office (RFPO) positions had been consolidated, including job aides, and the assigned DOE personnel worked very well. Other than the significant radio channel problem described above, the EOC Manager noted that the Functional Work Centers (FWC) did not report-in as required, some FWC contact information had changed, and extra management personnel (not assigned to the EOC for an Alert-Star) sat in unassigned seats in the EOC.

The Crisis Manager elected to assume leadership from the Emergency Director when the number of senior managers began to impact EOC operations. This action reduced the level of confusion, and proved to be appropriate. Note – review how to assemble EOC when senior management personnel are available on Site.

The sitewide notification of Fire Department response capability was not well done. The first decision passed for announcement was overly conservative and not aligned with most of the nuclear facility Authorization Basis documents. The subsequent announcement corrected the error, but this area needs another review for improvement.

Other notifications to external agencies were hampered because the automated dialing system was inoperable. This requires manual dial up of 14 local agencies, plus DOE-HQ. Since this must be completed in 15 minutes, the lack of automated dialing created a significant burden. The EOC was very effective in supporting this effort because Fire Dispatch was busy with Fire Department communications. This issue needs to be reviewed as we evaluate event response with reduced resources.

Logistics, managed by Fran Roberts, effectively coordinated reporting FWC, the Vendor Technical Representative input to the HAC, and the diversion of runoff water to the holding ponds.

Radio communications between radiological protection, IH and their respective Functional Work Centers, and the HAC were as designed. Incident command decisions were made to stage the AFFF foam agent ready for use upon confirmation from the EOC; divert fire fighting runoff water to the B-1 Pond per protocol; and take a "wait and see" posture on the fire fight. Since

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Building 991 is concrete construction, no evidence of flames, no evidence of external releases, and smoke under control, the incident commander opted to monitor and wait rather than attack the fire.

Incident Command had the scene in a safe, controlled posture prior to the activation of the EOC. Support from the incident command team was excellent. Knowledge, experience, expertise, and timeliness of technical support were also excellent.

The incident command team comments included issues with: 1) radio channel configuration; 2) timeliness of EOC confirmation to use foaming agent; and 3) decisions made by EOC without notification of incident command (e.g., sitewide action related to Fire Department staffing question and assigning site resources such as radiological protection and fire protection engineering).

As the Site moves forward with closure, the incident command team believes the communications support for event response must be evaluated.

The general consensus was that EOC operations were effective, though not crisp. There were issues with up to date job aides and FWC information and communications both within the EOC and between the incident command post (though most communication was effective). Strengths include external notification, effective decision-making process, technical evaluation of sampling data, and appropriate command and control to minimize release, and conduct a safe, effective response.

The EOC members interviewed were in agreement that the ongoing event response posture, relative to resources, equipment, and organization must be evaluated.

Recommendations:

- Evaluate Site communications related to event response to assure that equipment provides reliable communications throughout the Site.
- Evaluate Field Sampling Team versus using Project resources.
- Evaluate the protocol for EOC staffing in support of external notifications and senior management role.
- Evaluate the process to maintain up-to-date information in the EOC, and Fire Dispatch, so that proper notifications, contact information, and position checklists are in place and effective.
- Evaluate the frequency and level of training for EOC and Incident Command personnel to achieve an appropriate level of preparedness.
- Correct the deficiency with alignment of radio channels.

4.3 Cause of Fire

The purpose of this section is to provide some preliminary comments regarding the preparation of the polyurethane plugs in the Building 991 tunnels and Room 402, and the fires that occurred. Based on the investigation thus far, the following is intended to discuss the causes of the excessive heat build-up in the foam during the application, the causes for the presence of oxygen in the vicinity of this heat build-up, and how this could have led to combustion of the foam.

Polyurethanes are formed from the reaction between alcohols with two or more reactive hydroxyl groups per molecule, i.e., diols or polyols, and isocyanates that have more than one reactive group per molecule, in this case 4,4'-diphenylmethanediisocyante (MDI). The type of polymerization is referred to as addition polymerization.

HO-R-OH + OCN-R'-NCO => $[\text{-CO-NH-R'-NH-CO-O-R-O-}]_n$

Polyol + Polyisocyanate => Polyurethane

The reactions are exothermic, and in the case of rigid foams such as the Autofroth® 9453, the heat generated is used to vaporize a blowing agent such that the reacting chemicals polymerize and expand to produce the foam.

[Polyol + HCFC + catalyst] + Polyisocyanate => Polyurethane Foam

The typical application for this BASF polyurethane foam system is insulation for walk-in coolers. Thus, foam is typically shot between two surfaces of known temperature, with the final thickness of the part being under a few inches. The RFETS interest in using Autofroth® 9453 and the SL-360 dispenser is for such uses as cargo containers (as cribbing) and glove boxes. In particular, adjustments were made to account for the larger volumes of foam needed to "fill" the cargo containers and glove boxes. Through testing at the BASF technical facility in Livonia, MI, both BASF and Instacote worked to develop a methodology to maximize the opportunity for proper dissipation of the heat generated during the exothermic reaction associated with polyurethane curing, and minimize the hazardous potential of smoking and charring of the foam. Their recommendation, as stated in their training materials, was to apply the foam in no greater than 24-inch lifts, followed by a minimum 90 minute wait time between each lift.

Discussion

In discussions with the crew following the fire, it was determined that they had not followed the lift height/wait time recommendations provided by the vendors. These large masses of foam were essentially formed by a near continuous pour. As mentioned, the reaction associated with the creation of rigid polyurethane foams is exothermic (heat generating). Further, these foams have excellent insulation properties (thermal conductivity ~ $0.027 J/m\text{-}sec\text{-}^0C$). Combining these two facts it is understandable that heat generated during the exothermic reaction is not easily nor readily dissipated through the foam. By employing a continuous pour rather than the recommended staging of 24-inches/90 minutes wait time, it is very likely that excessive heat build-up occurred in the foam plug. (During the investigation following the fire, hydrogen cyanide gas was detected in the vicinity of the fire. For Hydrogen Cyanide (HCN) to be liberated from the foam, temperatures would have needed to exceed 600^0C.)

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In addition to the excessive heat build-up, it is also likely that by using a continuous pour the crew was actually foaming on top of rising (and curing) foam. This can result in a pressure build-up as the newly applied foam may become trapped behind the previous layers of foam that have reached the curing point of the reaction and have solidified. This will cause splitting in the foam, providing a means for oxygen to reach the areas of the plug where the heat build-up is occurring. Ultimately, this can lead to scorching, charring, and significant smoke. Upon visual inspection of "intact" foam removed from the B West tunnel plug after the fire, fissures and large voids were observed throughout the space and samples.

One last item to consider is proper mixing of the resin and isocyanate during the foam application. BASF recommends no less than a 6 ft. tube length for spraying, unless a static mixer (i.e., internal spiral mixing baffles) and the addition of air at the nozzle are used. For the Building 991 plug, roughly a 3 ft., smooth bore tube was employed with no baffles or mixing air. Thus, it is likely that the resin and isocyanate were not well mixed, which would have led to hot spots in the plug and unreacted combustible materials (i.e., polyols). Upon visual inspection of "intact" foam removed from the B West tunnel plug after the fire, slugs of resin (material that is gold in color and sticky to the touch) were observed. Also Boroscope inspection of the A Tunnel plug saw small amounts of resin.

Combining the three aforementioned items, excessive heat build-up, a pathway for oxygen to reach the heat, and the presence of combustible materials, a link is clearly drawn between the application technique used to apply the foam plug, and the fires that occurred. Additionally, ratio check bags, which are only hand mixed and therefore probably contain unreacted isocyanate and resin, were disposed of by embedding them at the bottom of the foam plug in Room 402. While the ongoing forensic investigation will determine if they were involved in combustion, it is a poor work practice that should be eliminated.

4.4 Post-Event Actions & Analysis

The Recovery Manager, Duke Snyder, was assigned at the close of the Alert-Star event status, per procedure. The checklists were completed properly, and a Recovery Plan was developed. Resources were assigned and a major activities list was developed.

Recovery Plan Building 991 Fire, Major Activities, February 2004

1. Terminate Alert-Star EOC, assign Recovery Manager
2. Maintain Fire Department on scene coverage until a sample plan and monitoring protocol can be implemented
3. Develop and implement a sampling and analysis plan for Rad, IH, and water
4. Establishes barriers to prevent unauthorized personnel and vehicle access
5. Suspend all foaming operations sitewide until further notice
6. Divert fire water to B-1 Pond

7. Contract with BASF and Hughes Associates, Inc. (HAI) to assist in the recovery and causal determination
8. Obtain summa canister air analysis where odor indicates exposures to unprotected site personnel to allay employee concerns
9. OMD obtain blood draws for fire fighters who may have been exposed to HCN
10. Periodically review sample results and visual indicators and adjust observation posts and protocols accordingly. Validate site response appropriateness with BASF and HAI
11. Have water plant on standby to respond to Building 124 and the fire pump skid in the event the Fire Department needs to commence application of large amounts of water
12. Brief SPO force on event and conditions
13. Provide daily update status briefs at SAC
14. Develop Type 1 IWCP packages to take temperature, gas, and foam samples to verify when combustion is complete

Activity Summary – Recover from Building991 Burning Incident

Type 1 Work Package T0112315, "Surface Temperature, Atmosphere Readings, and Core Temperature for 991 Foam Plug Locations," was developed to control work activities associated with the recovery and investigation of the Building 991 foam fire. As new information was obtained, the package was revised to control subsequent steps necessary in the recovery. The following is a summary of the WP actions to date:

Revision 0	Determine surface temperature of metal Door 7 (Corridor B), Door 6D (Room 402), East Corridor B wooden foam barrier, and Corridor A (998 tunnel) foam plug. Analyze atmosphere in visible smoky areas and at the holes into Room 402 above Door 6D. Obtain radiological swipes. (Approved February 17, 2004)
Revision 1	Enter Building 991 and establish ventilation by opening accessible doors and windows. Isolate fire water flow to Room 402. Monitor atmospheres as necessary for IH purposes. (Approved February 18, 2004)
Revision 2	Measure foam core temperature in designated locations in foam plugs in Corridor A (998 tunnel) and East Corridor B to verify combustion is not occurring. Monitor atmospheres as necessary for IH purposes. (Approved February 19, 2004)
Revision 3	Measure foam core temperatures in designated locations in foam plugs in Room 402 and in Corridor B behind Door 7 to verify no combustion and that foam has cooled. Monitor atmospheres as necessary for IH purposes. (Approved February 20, 2004)
Revision 4	Sample atmospheres above the foam plugs in Room 402 and Corridor B (behind Door 7) to determine hazardous constituents and concentrations. (Approved February 24, 2004)

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Revision 5	Remove portion of Door 7 allowing access to Corridor B for observation, examination, foam sampling. Monitor atmospheres as necessary for IH purposes. (Approved February 25, 2004)
Revision 6	Excavate the damaged/burnt foam from Corridor B. Obtain material samples as directed by the Fire Investigative Team. Monitor atmospheres as necessary for IH purposes. (Approved February 26, 2004)

15. Evaluate long term options for disposition of foam and plan 991 demolition

16. Support independent investigation

The detailed activities to investigate the condition of the foam, determine the nature of the work environment, initiate the forensic fire investigation, remove the burned foam, and determine an acceptable path forward for 991 were all incorporated into a Type I - IWCP work package that was written for discrete steps and formally revised for each next step. The work package planning process utilized a full compliment of appropriate disciplines in a roundtable format to assure the most efficient, effective management of the work.

This process is supported by key technical members of the investigation team including Dr. Craig Beyler, Bruce Campbell, and Dr. Jo Ellen Deporter.

Progress to date has confirmed initial technical assessment of the "failure mode" within the foam. Pictures of this initial effort are shown in Attachment K.

Evaluation of the remaining foam plugs is ongoing, as well as the detailed testing and analysis to finalize the forensic cause of the fire.

The Recovery Plan and its management team have demonstrated excellence to date. Continuation of this recovery approach should provide safe, efficient, and effective recovery.

The other primary concern is evaluation of continued use of the FF&I processes, given the weaknesses identified.

Recommendations:

- Evaluate all FF&I work scopes, including work control documents, training, expertise, and quality control prior to restart of any such activities.
- Establish a contract for field technical support with appropriate vendors to provide improved technical capability for both planning and performance of these activities.
- Review activities where innovations are in use to determine appropriateness of work control, hazards analysis, training, technical support, and quality control.
- Develop "check and balance" people and/or process to enhance the safety and quality of planning and performance.

5. CAUSAL FACTORS

In order to close the RFETS in an accelerated manner, many management challenges must be overcome since a cleanup and closure project of this magnitude has never before been successfully undertaken in the federal sector. As such, the K-H Management Team must figure out how to accomplish the work safely and efficiently while downsizing the Site personnel and infrastructure. This leads to the K-H Management Team looking for "innovations" to overcome the safety, technical, fiscal, regulatory, and political challenges of the first ever closure of this magnitude.

Critical to this investigation is the analysis of foaming operations as an "innovation", to understand from a Site perspective, "How we got here". It is imperative that this independent investigation seek to uncover the ancillary elements and causal factors associated with innovating and undertaking work at the RFETS. The utilization of refrigerant foaming as stabilization and bracing agent was one such "innovation". The following outlines how this innovation ended up in an independent investigation.

- Use of refrigerant foam insulation (BASF Autofroth 9453 and others) to brace and stabilize D&D and waste components conceived as an "innovation" to aid in Site closure;
- Development of early "project specific" foaming work procedures per nuclear infrastructure for use in the nuclear buildings – required detailed procedures written by the building to the exact manufacturer's specifications and dedicated building oversight;
- Establishment of sitewide capability (dedicated Project Manager and FF&I Team) for foaming operations – SME supplied by vendor involved in much of the initial work planning and execution;
- Training of dedicated FF&I Team – vendor driven; followed by "OJT";
- Development of a Standard Work Package for foaming operations – scoped on foaming cargo containers and based on SME judgment for hazard evaluation;
- Assignment of the "trained" work crew in a "job shop" fashion led to "trained" members being utilized elsewhere and "untrained" members being used for foaming operations but only becoming comfortable with one specific operation (technical support, gun operations, truck operations, etc.);
- Experience of a bad cargo foaming job – Fact Finding undertaken resulting in direct SME supervision of operations;
- Direction and presence of SME (non-vendor) required for all foaming operations;
- Application of foam in narrow scope jobs (piping, ductwork, cargo containers, etc.) becomes routine – varied scopes not encountered;
- Re-assignment of FF&I Project Manager to other more challenging work resulted in a "gap" in turnover to new project manager;
- Contact with CDPHE required less than originally planned (Foaming of all the tunnels) but more extensive foaming for BLDG 991 demolition than common in other foaming jobs;
- Scoping and planning of the BLDG 991 foaming job with manufacturer's rep "teleconferenced in" results in a "one week" effort - time to complete the scope of work not consistent with manufacturer's specifications for application lift heights and wait times;

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- Review of Building 991 work package for foaming operations by RISS Project Manager raises questions about use of the Standard Work Package for "much larger" scope – SME assures project manager "not an issue" since the crew had already foamed one tunnel plug in Building 991 (Tunnel C);
- Work package review initiated by RISS management - scope of BLDG 991 foaming operations questioned but project manager/SME assures "not an issue"; reviewer also assumed that work package instructions would be complied with;
- Application of foam in BLDG 991 undertaken in "standard fashion" by a work crew with incomplete training under the supervision of the SME and not in accordance with the work package instructions – no external oversight present as was the case for foaming operations in nuclear buildings; and
- Discovery of fire event in BLDG 991 by site worker involved with another activity.

As it can be seen from the outline of events above, there were a number of opportunities to prevent this operation from ending up in an independent investigation. Many factors contributed to this event from the change out of the project manager, use of a subcontractor as an SME and not the product vendor, incomplete training of the work crew, failure to understand the increased scope of foaming operations, failure to follow the work package instructions, and the elimination of external oversight since the SME was present for all operations. All throughout this job, from early planning to execution, the misapplication of the foam that led to the fire was preventable.

While it is clear that the RFETS cannot be successfully closed without significant "innovation" by the K-H Team, it is imperative that in instances where an innovation is to be applied, a detailed review and analysis of risks and hazards must be undertaken to ensure the application is done in a safe and compliant manner. Failure to do so will result in unsafe conditions and an overall negative impact to project.

6.0 RECOMMENDATIONS

- Review innovative applications when commercial products intended for another application are altered/modified to support site closure purposes; these applications should undergo a greater degree to scrutiny to ensure and understanding of:

    - Scope of the effort
    - Training and qualification requirements
    - Technical specifications, hazard controls, and product limits
    - Interfaces and impacts to other ongoing work
    - Quality assurance and oversight requirements

- Evaluate all outstanding FF&I work efforts and revise work packages/procedures to be compliant with vendor specifications and not SME dependent; revise procedure/package to specify key parameters, such as:

    - Mixing tube length
    - Mixing tube configuration

- Use of purge air during foaming applications
- Foam lift height and lay down pattern
- Wait time between lifts

- Upgrade training and qualifications of FF&I crew and project manager. Consider establishing a contract for field technical support with appropriate vendors.

- Upgrade technical oversight at the "point of attack" to aid project managers and supervisors in complying with site infrastructure.

- Review event response capabilities as the Site infrastructure continues to contract; evaluate:

  - Site communications related to event response to assure that equipment provides reliable communications throughout the Site.
  - Field Sampling Team versus using Project resources.
  - The protocol for EOC staffing in support of external notifications and senior management role.
  - The process to maintain up-to-date information in the EOC and Fire Dispatch so that proper notifications, contact information, and position checklists are in place and effective.
  - The frequency and level of training for EOC and Incident Command personnel to achieve and appropriate level of preparedness.

- Correct the deficiency with alignment of radio channels.

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