BOEING

Engineering Product Document

GO Number	S/A Number	Page 1 of	Total Pages	Rev. Ltr/Chg. No. See Summary of Chg.	Number
00054	13333	103	103	NEW	RS-00019

Program Title
Radiation Safety

Document Title
Radiation Survey of the Downey Facility

Document Type
Engineering Product Document

Related Documents

Original Issue Date
3/1/01

Release Date
RELEASE 05/07/2001 TV

Approvals

	Date
P. Rutherford	5/4/01
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IR&D Program? Yes ☐ No ☒
If Yes, Enter Authorization No.

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*	Engineering Data Mgmt	AB18
*	Facility Release Files	T057
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Abstract

This document describes a radiation survey of a portion of the Downey Facility. This survey is designed to verify that the Downey Facility has not been impacted by radiological operations associated with the Water Boiler Neutron Source (WBNS) reactor. Measurements taken demonstrated that clean-up standards promulgated by the Department of Energy, Nuclear Regulatory Commission, and Department of Health Services were met, and that there was no indication of any residual contamination in the facility. Accordingly, the area is suitable for release for unrestricted use.

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TABLE OF CONTENTS

TABLES

FIGURES

EXECUTIVE SUMMARY

A radiation survey was performed of the northeastern portion of Building 001of the Downey facility that once housed a 4-watt nuclear reactor. The areas surveyed comprised all the rooms, offices, and laboratories used by the Atomic Energy Research Department of North American Aviation during 1948 to 1955. Industry accepted protocols and approved cleanup criteria were used in the design and implementation of the survey.

The survey included 464 total alpha and beta surface contamination instrument measurements, and 460 removable alpha and beta surface contamination wipe samples. All measurements and wipe samples demonstrated compliance with appropriate regulatory cleanup standards (DCGLs). Appendices provide the detailed field measurements and analyses for each location where surface contamination measurements were taken. Not only do none of the net values exceed DCGLs, but the majority also do not even exceed the minimum detectable activity (MDA) of the instrument or counter. Not only do none of the net (background subtracted) values exceed DCGLs, but none of the gross values exceed the DCGLs also.

The survey also included 464 surface gamma exposure rate measurements, all of which are shown to be within the measured background range.

The survey also included gamma spectrometry of soil, paint, concrete and water samples that were taken. No evidence of man-made contamination was found in any sample.

Detailed analyses and/or computer printouts from laboratory counters (gamma spectroscopy and alpha/beta Tennelec) are given in the report for every sample and wipe taken.

No evidence of radioactive contamination was found in the facility and regulatory clean-up standards promulgated by the DOE, NRC, and California DHS were met. The area is therefore suitable for release for "unrestricted use" with no radiological restrictions.

1.0 INTRODUCTION

During the last 25 years, Boeing has successfully decommissioned, decontaminated, and surveyed 25 facilities at the Santa Susana Field Laboratory. These facilities have undergone independent verification surveys by Oak Ridge Associated Universities (ORAU), Oak Ridge Institute of Science and Education (ORISE), the Nuclear Regulatory Commission (NRC) and/or the State of California Department of Health Services (DHS) Radiological Health Branch (RHB). Of these, 20 have been released for unrestricted use by the appropriate agencies and five are pending DOE and DHS release, all Boeing responsibilities having been completed. The majority of these facility releases (13) have been accomplished within the last six years.

In September 2000, the Safety, Health and Environmental Affairs (SHEA) Department of Boeing Huntington Beach contacted Rocketdyne, requesting information on the nuclear research activities conducted at the Downey facility in the 1950s. This work had been conducted for the Atomic Energy Commission (AEC) by the Atomic Energy Research Department (AERD) of North American Aviation (NAA) from 1948 to 1955. In December 1955 all work was moved to Canoga Park and a new Division of NAA was formed, named Atomics International (AI). AI later merged in 1984 with Rocketdyne.

As available records of these early activities were sketchy, it was agreed that a radiological survey be conducted of those portions of the Downey facility occupied by AERD. The Downey facility is now owned by the National Aeronautics and Space Administration (NASA).

Radiological surveys are typically performed by the Rocketdyne Radiation Safety Department under established protocols to demonstrate that residual radioactivity does not exceed the Department of Energy (DOE), Nuclear Regulatory Commission (NRC), or State of California (DHS) regulatory cleanup standards (see Reference 1, 2, and 3).

The Downey facility radiation survey was designed to demonstrate compliance with the above mentioned regulatory release criteria. The scope of the radiation survey included investigation of areas for potential, residual radioactivity from radiological operations conducted at the facility from 1948 to 1955.

Section 2 provides a historical background of the facility. Section 3 describes the survey design and survey protocols. Section 4 summarizes and interprets the results and compares the results to regulatory cleanup standards. Appendix A gives detailed results of every field instrument measurement taken. Appendix B gives detailed results of every wipe test taken. Appendix C gives maps of each survey unit and the locations of every instrument measurement, wipe and sample taken. Finally, Appendix D provides gamma spectroscopic analysis of all soil and building debris samples taken.

2.0 BACKGROUND

2.1 Location and Structure

The Downey facility is located on Lakewood Blvd. in the City of Downey, California, and is shown in Figure 1 below.

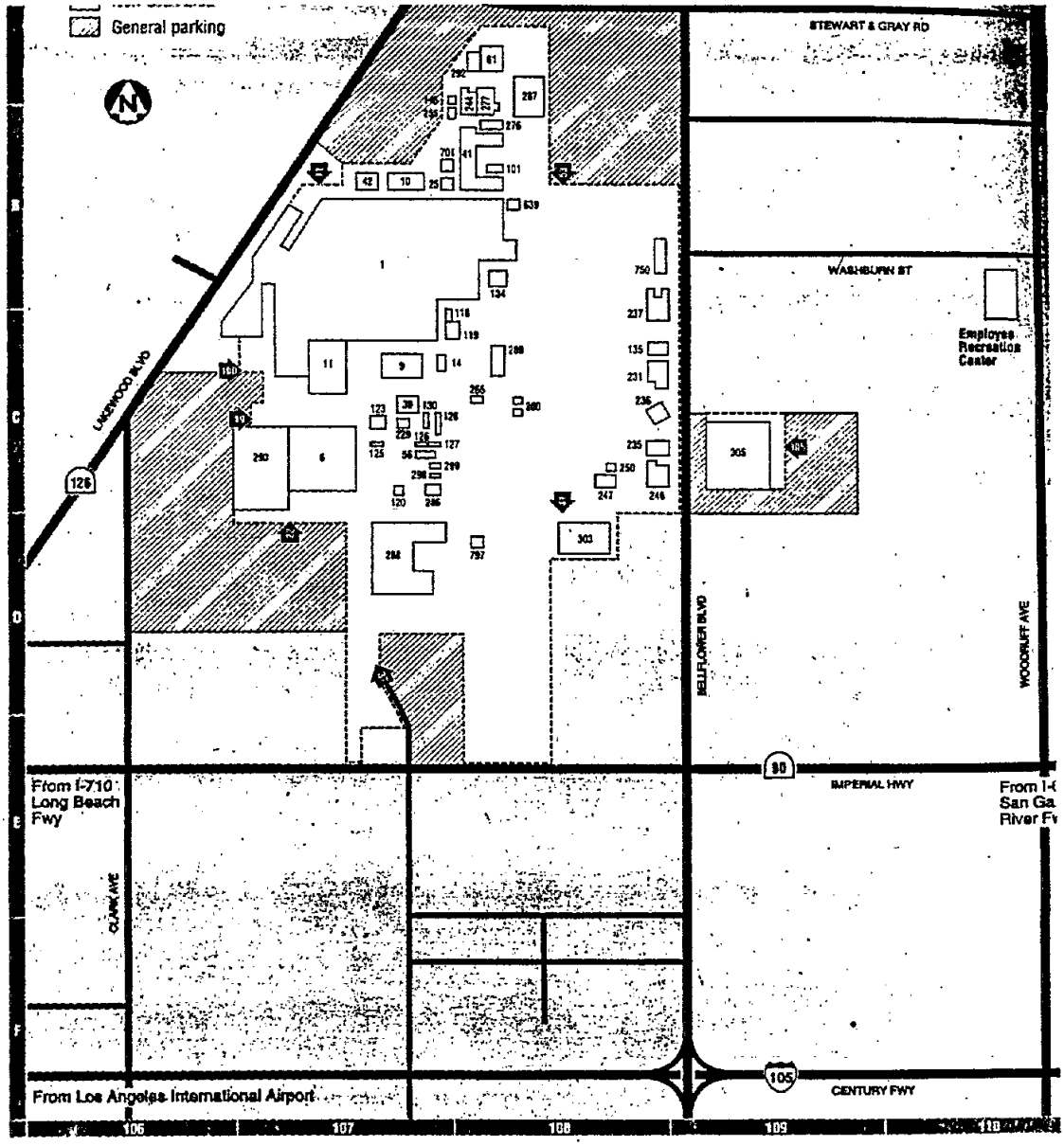


FIGURE 1: LOCATION OF THE DOWNEY FACILITY

The AERD occupied the northwest portion of Building 001 including the "finger" building and Building 108. This portion of Building 001 was subdivided into individual survey areas as shown in Figure 2, based on historical usage and potential for residual contamination (see section 3.1 for further details).

Building 001 and the loading dock are made of corrugated, galvanized steel panels. The buildings are positioned on a concrete foundation. The vault (Building 108) is made of concrete walls with a cinder block exterior, and the basement has concrete walls, floor, and ceiling.

2.2 Operating History (1948 - 1955)

The following account of the early years of atomic energy development at Downey is extracted from " Thirty-five Years in Power for America " (Reference 4).

> "Some 35 years ago in a secluded area in the Downey plant of North American Aviation, Inc. (NAA), a group of engineers and scientists was exploring a new technology that was a result of the discovery of nuclear fission in 1939. This epochal event opened up the prospect of an entirely new source of energy that had first been manifested in the bombs used near the end of World War II. In the early 1950s, the Atomic Energy Research Department of NAA was engaged in research and development for controlled release of energy from the atom for the production of electric power. This research and development was then sponsored by the Atomic Energy Commission (AEC), which was formed in 1946 to continue the development of nuclear power for both military and civilian applications. These were initiated in the Manhattan Project by the urgency of the war effort. Among new interests was a desire to investigate the feasibility of nuclear technology in propulsion scenarios.
>
> "One of the projects that resulted was the design, construction and operation of the first nuclear reactor in California. A source of neutrons was needed for one of the reactor physics projects, so a small aqueous, homogeneous reactor called the Water Boiler Neutron Source (WBNS) was built and put into operation on April 21, 1952. The reactor was operated at power levels up to 4 watts and served as an excellent neutron source for a number of reactor physics programs. It didn't really boil water, as one might guess from the 4-watt power level, but a small amount of hydrogen and oxygen from decomposition of the water was released from the solution into a tank during operation - hence the designation "water boiler."
>
> "The WBNS was operated at Downey until December 1955. In 1956 it was dismantled and moved to a facility at the Santa Susana Field Laboratory (SSFL). A number of design changes were made to increase the power level to 3 kilowatts to provide a significant increase in the available neutrons and offer greater flexibility in the use of the reactor.

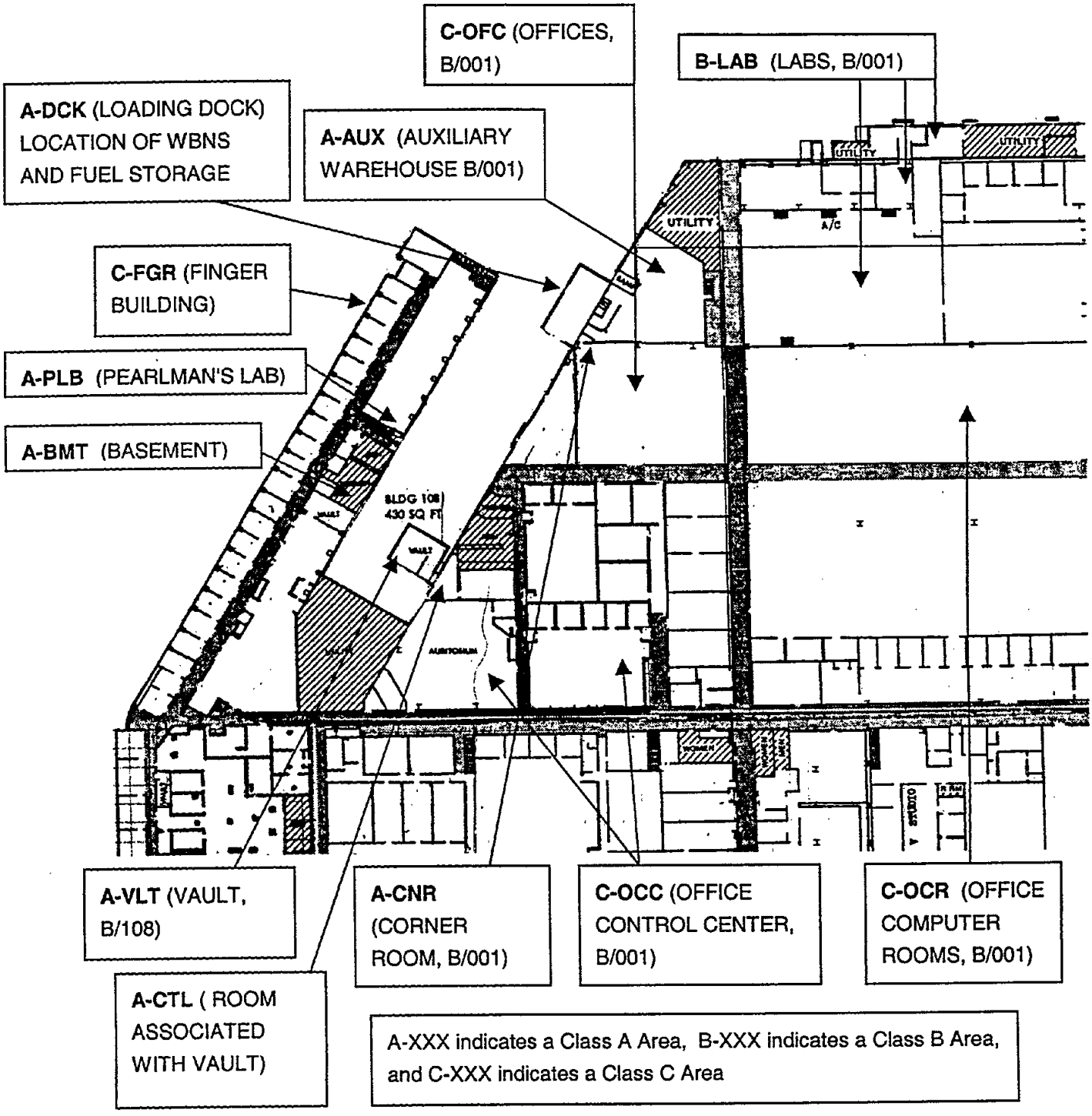


FIGURE 2: SURVEY AREAS

Operation of the reactor continued until February 29, 1980, when it was no longer cost-effective to continue its operation. It has since been completely dismantled and decontaminated, and the facility was released for unrestricted use."

The WBNS reactor and its associated exponential pile were located at what is now the loading dock adjacent to building 001 (see Figure 2, 3 and 4). The WBNS was 93% enriched uranyl sulfate solution. Normal and depleted uranium metal, graphite and heavy water was used for exponential pile experiments using the WBNS as a thermal neutron source as shown in Figure 4.

Information on specific operations is sketchy, anecdotal and/or non-existent. The major quantity of radioactive material utilized at Downey was canned normal and depleted uranium metal used in the exponential pile. The exponential pile was a system designed to model different fuel/moderator lattice configurations. The behavior of neutron flux in these lattices was measured. The 4-watt WBNS was used as a neutron source for the exponential pile. The radioactive material was obtained from a variety of AEC and government contractors. After use, it was returned to the source and/or transferred to the Santa Susana Field Laboratory (SSFL). The WBNS itself was also transferred to the SSFL in early 1956.

The most probable storage locations for radioactive materials were established by interviews and tours with retirees assigned to the buildings (Reference 7). Boeing accompanied these individuals to the site, and had them do a walk-through of the facility and identify various locations and describe the activities that occurred in them. According to these individuals, the fuel was stored in the Loading Dock area (where the WBNS reactor was located). These individuals have also stated that fuel was *not* stored in the vault (Building 008). It is suspected that this vault may have actually been a records storage vault. Boeing has concluded, therefore, that the loading dock was the only place where the fuel was stored. Notwithstanding this belief, the vault was also classified as a Class A area, and subjected to the same level of survey as the loading dock and other Class A areas (see Section 3. Survey Design).

It was also established through interviews and tours with retirees that smaller quantities of radioactive materials were used and/or stored in the Pearlman's laboratory and in the basement in the "finger building" (See Figure 2). These locations were also classified as Class A areas (See Section 3. Survey Design).

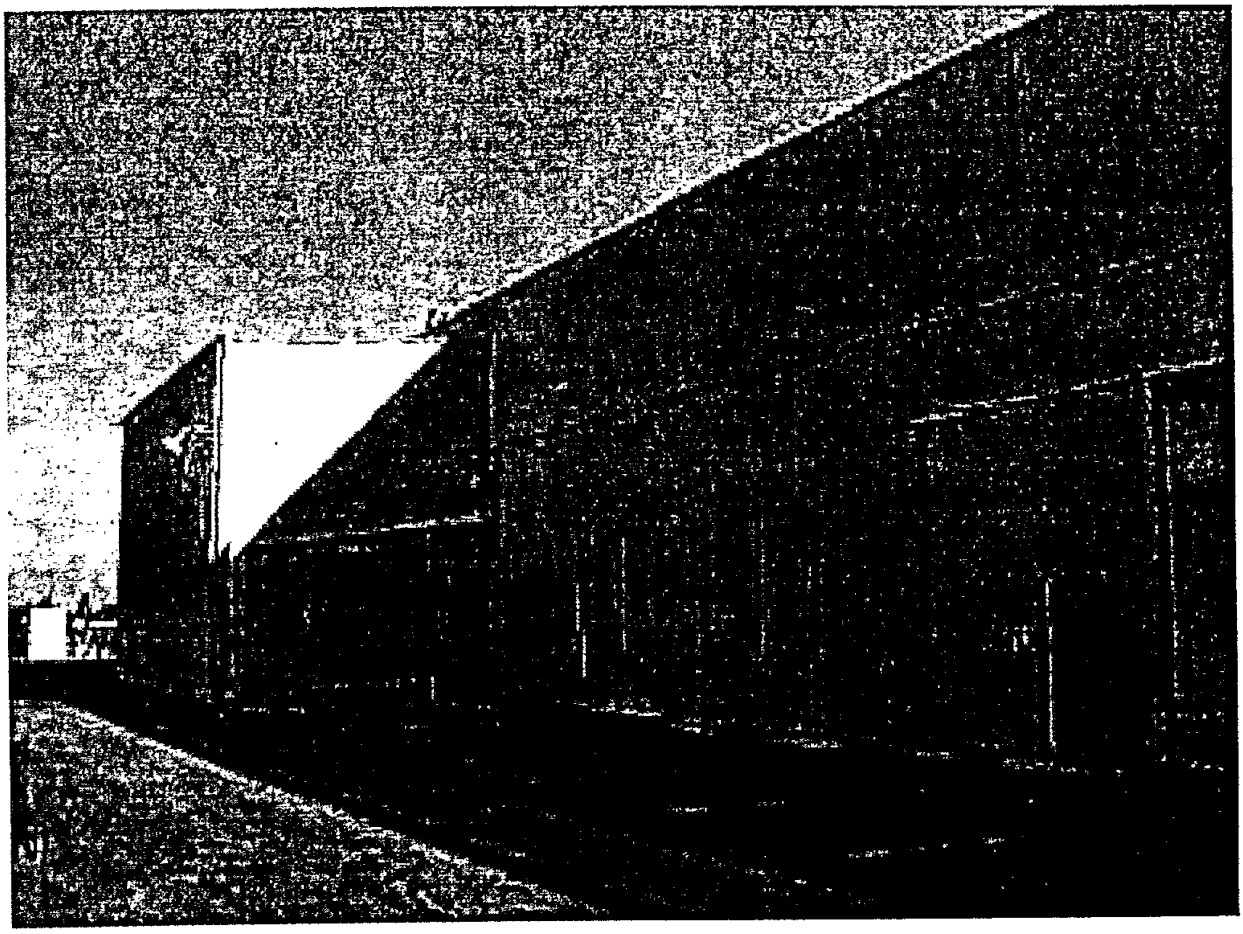


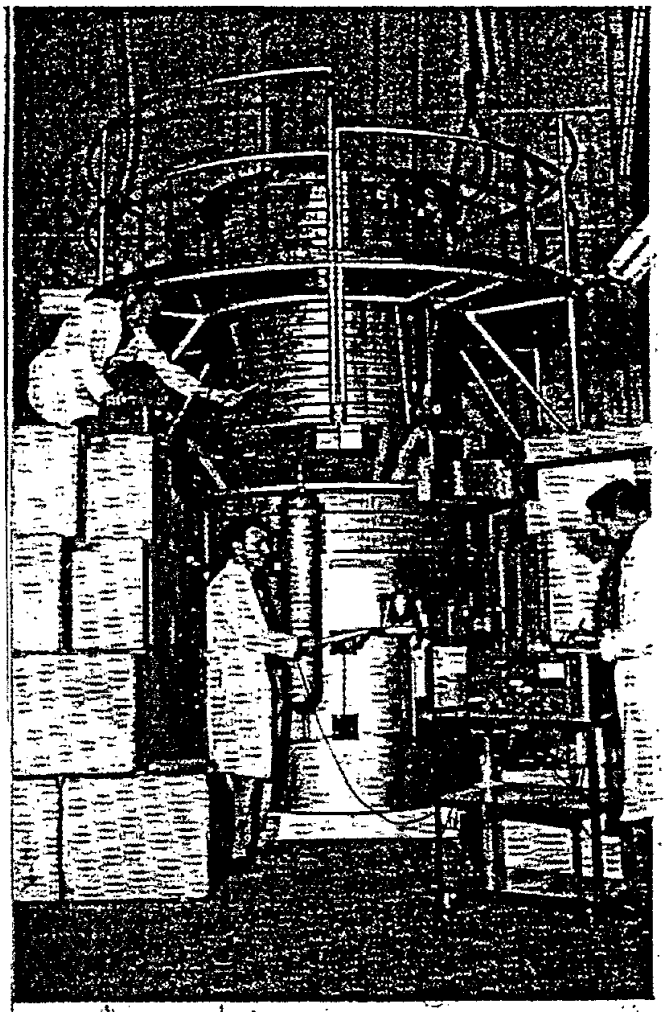
FIGURE 3: Loading Dock. Historic Location of WBNS

Although it is likely that spills occurred during the 1948-1955 time period when AERD occupied portions of the Downey facility, no incident records can be located. The fact that no detectable contamination has been detected in the current survey indicates that any spills that may have occurred were appropriately decontaminated at the time.

2.3 Operating History (1956 - 2000)

Specific information on operations performed in the subject northwest portion of Building 001, after AERD moved out in 1956 is unknown.

It is known that since the mid-1970s to the current date, the subject areas were used as administrative offices, housing the NASA, DCM, HR, and some executives. The main corrugated portion of the building was used as a small machine shop for R&D activities, for example, building an Ultralight wing. Later it was used as a storage area (Reference 5).



The Water Boiler Neutron Source (WBNS) in operation in early 1950s.

FIGURE 4: Water Boiler Neutron Source

All isotopes, subsequently used at Downey by NAA, and later Rockwell, were used for industrial radiography, and were located at building 004, on Clark Avenue. All isotopes were disposed of in the early 1990s (Reference 5).

Non-nuclear government contracts performed at the Downey site since 1955 are described below (Reference 6).

North American Aviation initiated its divisional buildup in 1955, the space elements of the company and the Automatics division remained in Downey. The Rocketdyne and Atomics International divisions moved to Canoga Park, in the San Fernando Valley area of Los Angeles. By 1957, the Downey facility (USAF Plant #16) had grown to 1,453,137 square feet. In 1957, there was a temporary down period for North American and it's defense contract posture. The

Navaho missile program was canceled in July 1957 but some elements of the program continued through the end of the year.

While there was an immediate cut-back in personnel because of the Navaho cancellation, North American received a contractual award from the USAF for another missile program - the Hound Dog. As everyone knows, in October of 1957, the Russians launched their Sputnik satellite. North American Aviation had developed the propulsion systems, guidance systems and aerodynamic structures over the past twelve years at Downey and had the capability of placing a satellite. The Mercury Program was on the Downey drawing boards in 1958 when the Space Act of 1958 was passed which created the National Space Council and the National Aeronautics and Space Administration.

North American received contracts to develop the Little Joe booster at the Downey facility which would be used to test the Mercury capsule, and the division also received contracts to develop hardware for the Saturn I launch vehicle. In 1961, the division received contracts to build the 2nd stage of the Saturn V launch vehicle and the Apollo Command and Service modules.

Increasing personnel requirements on both the Saturn and Apollo program required expansion of facilities at the Downey plant. Some 250,000 square feet of manufacturing and test facilities were added in 1962, and more than 500,000 square feet of office and laboratory areas was added in 1963.

In 1964, the USAF Plant #16 was transferred to the NASA as NASA Plant #1 and North American Aviation received a facility contract from the NASA to maintain the facility. In the early 1970s the government facilities encompassed some 1.7 million square feet of enclosed area while the North American Rockwell (NAA merged with Rockwell Standard in 1967) property housed 450,000 square feet. Overall acreage of the Downey facility was in excess of 200 acres which remained essentially the same to 1998.

In 1972, the Downey Space Division was awarded a NASA contact to design, develop, test and evaluate the Space Transportation Systems program, more commonly called the Space Shuttle. Rockwell constructed five Shuttle spacecraft. The fist spacecraft was used in approach and landing tests only and was not designed to fly in space. This program and associated R&D continued to plant closure. The Downey plant secured DOD contracts in pursuance of the Space Defense Initiatives and also worked on the National Space plane and advanced launch systems.

Employment of the Downey facility in 1957 (the Navaho program) was around 10,000 employees. Peak employment was reached in 1965 (the Apollo Program) when headcount was slightly in excess of 24,000. To cope with the steadily increasing engineering population required on both the Apollo and Saturn programs, the company leased many buildings in the Downey area and during 1972-73, dozens of large trailers were located at the Downey facility housing offices for approximately 1000 engineers.

The history of this industrial plant and a number of its extant buildings and structures precedes the NASA ownership. Originally constructed on privately owned farmland the earliest buildings were constructed in 1929 to support the emerging aircraft industry. Since that time the plant has

expanded physically several times, modernized to accommodate the changing needs of developing aircraft and aerospace programs, and expanded and contracted its workforce as a result of defense-related research and development and various military conflicts. Although the plant experienced periods of very little activity, it never completely closed its doors since 1929.

In 1992, NASA's Program Operational Plan contained budget directives to reduce real estate holdings, and as a result, in 1993, the Downey Industrial Plant (through a baseline facility review) was declared excess to NASA's needs. At that time the plant encompassed 166.1 acres. For ease of transfer, the site was divided into six parcels, with Parcels III, IV, V and VI (68.4 acres) being offered for immediate excess. Authority for excess of these four parcels was confirmed by the 104th Congress through the passage of legislation (Public Law 104-204) in September 1996, (the same year the Rockwell Aerospace merged with the Boeing Company) and these parcels were legally transferred to the City of Downey.

Initially Parcels I and II (97.7 acres) were retained for continued use by Boeing for the Space Shuttle program. However, as a result of restructuring of the Boeing Company in 1998, which led to a redistribution and consolidation of their holdings, the Downey Industrial Plant was no longer needed for Shuttle operations. As a result, the NASA declared Parcels I and II excess to their needs as well and the property was completed vacated in April 2001.

2.4 Radiological Assessment

Historical records of the 1952 through 1955 era indicate that routine, radiological surveys were performed of the areas occupied by the AERD and indicated that no residual contamination remained. However, these records are qualitative and anecdotal at best. Therefore, the current survey was planned and implemented to verify that the facility was indeed free of radioactive contamination.

During the period 1956 to 2000, these areas were no longer posted as radiologically controlled areas and therefore did not require any form of access control.

All available information from the 1950s indicated that the facility was not left in a contaminated condition. This was confirmed by the 2000 survey. No D&D or remediation was required and no evidence of any residual contamination was observed. All health physics technicians performing the 2000 survey were ANSI/ANS 3.1-1993 qualified and were fully trained radiation workers with training records on file at Rocketdyne.

3.0 SURVEY DESIGN

Guidance on radiological survey protocols and radiological release criteria are provided in numerous Federal and State documents. Some of the more pertinent are listed in Section 6 and include References 1 through 3, 8 through 24 and 27 through 28.

One of the most recent guidance documents on radiation surveys is the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) (Reference 8). Many of the key requirements of MARSSIM were implemented in this survey, including site investigation, data quality objectives, and data quality assessment. Some of these key requirements are outlined below with reference to the relevant section in this report that addresses the requirement.

- The **site investigation process** involved,
  - Review of available historical records on the Downey AERD operations including health physics surveys (Referenced in sections 2.2 and 2.4)
  - Contact and discussions with four retired personnel who worked for AERD in the early 1950s (Referenced in Sections 2.2 and 3.1).
  - A site tour of the facility with three of these retired personnel to identify the locations of various rooms and areas used by AERD (Referenced in Sections 2.2 and 3.1)
- **Characterization survey.** Historical survey information from the early 1950s was used to provide "qualitative" knowledge of the likely radiological status of the facility (Section 2.4).
- **Data Quality Objectives.** The principal DQOs were met in the survey design. These were,
  - **Survey areas were classified** according to their potential for contamination. (Discussed in Section 3.1)
  - All areas used by AERD were surveyed and sampled to ensure **completeness** (Discussed in Section 3.2).
  - **Contaminants of concern** were identified as alpha emitting uranium fuel isotopes (U-238, U-235, and U-234) and fission products (beta-gamma emitting Cs-137 and beta emitting Sr-90).
  - Diverse and complimentary **measurement techniques** were used in the survey. These included total alpha and beta surface contamination, removable alpha and beta surface contamination (including sink traps), and gamma exposure levels, plus gamma spectroscopic analysis of a variety of media including original ceiling paint,

sub-building soil, floor and wall material. This ensured **completeness** and **representativeness** of data (Discussed in sections 3.2, 3.3 and Table 1).

- Measurement techniques with **minimum detectable activities (MDAs)** much less than 10% of the regulatory limit were used (demonstrated in Tables 4 and 5).
- **Calibrated instruments** were used to ensure **accuracy** (discussed in section 3.4).
- Participation in the DOE **Quality Assurance Program** (DOE QAP) ensures accuracy of sample analysis (Reference 25).
- Calibrated standards for laboratory gamma spectroscopic counters were used to ensure **accuracy** and **precision.**
- Performance of daily **instrument performance** checks ensures **precision** (Discussed in section 3.4)
- Appropriate **background** data sets were utilized (Discussed in section 3.4 and Table 2).
- **Regulatory limits or "derived concentration guidelines limits (DCGL)"** were specified. (Discussed in Section 3.5, Table 3 and referenced).

- **Data Quality Assessment** (See Section 4)
  - **Data was compared to Regulatory Limits or DCGLs.** All measured data not only met the DCGLs using net (background subtracted) data (see Table 4) but also met DCGLs when gross (non-background subtracted) data was used. (See Appendices A and B tables).
  - **Comparison with MDAs.** All surface removable measurements taken were below the laboratory counter statistical MDA (See Table 4). The majority of instrument measurements for total surface contamination were below the field instruments' MDAs (See Table 4 and Appendix A).
  - **Data validation.** All field data (100%) was checked and signed off by an independent reviewer (See Appendix B) and the final report data was reviewed in detail and signed off by management and Quality Assurance.

3.1 Identifying Survey Units

MARSSIM protocol requires survey areas for final status surveys to be classified according to their "a priori", pre-remedial level of contamination, as determined by "characterization surveys" and "remedial action support surveys". MARSSIM classifies areas as,

- Class I - Areas that have, or had prior to remediation, potential or known contamination, **in excess of the DCGLs.**
- Class II - Areas that have, or had prior to remediation, potential or known contamination, **not expected to exceed the DCGLs.**
- Class III - Areas that are not expected to contain any residual radioactivity, or expected to contain levels of residual radioactivity **at a small fraction of the DCGLs.**

The statistical framework of MARSSIM applies principally to Class I areas. There was no available historical evidence of any contamination exceeding even a small fraction of DCGLs, therefore Downey was considered a MARSSIM Class III area. This provided some flexibility in the choice of scanning percentages and fixed measurement densities (as permitted by MARSSIM)..

The Downey survey design further classified areas into Class A, B, and C categories to indicate the types of operations performed [and therefore potential for contamination]. They should not be confused with the MARSSIM Class I, II and III definitions). The use of Class A, B and C areas, enabled a graded approach to sample densities to be implemented, using a qualitative potential for contamination.

Although the interior of Building 001 has been refurbished several times over the last 50 years, walk-through tours by several Rockwell and NAA retirees were used to identify those areas of the facility that had been utilized by AERD (Reference 7). In particular, the location of the WBNS and fuel storage was identified as the loading dock (see Figure 2). The basement was identified as the location of film dosimetry processing and calibration source storage. The first floor of the finger building was identified as the location of a radiochemistry lab (Pearlman's lab). Areas utilized by AERD were divided into three classifications based on their relative potential for contamination,

- Class A: These were areas having the highest potential for residual contamination. For example, the location of the WBNS and its control room, the location of fuel storage, and laboratories and basement where radioactive material was known to have been stored and/or used.
- Class B: These were areas having a medium potential for residual contamination, For example, other laboratory and workshop areas.
- Class C: These were areas having the lowest potential for residual contamination. For example, office areas.

Classification of these areas is shown in Figure 2, Table 1, and the area maps in Appendix C. Area classification is also indicated by the location code, e.g. the loading dock is designated A-DCK were A refers to Area A, and DCK refers to "dock."

TABLE 1: TYPE AND NUMBER OF MEASUREMENTS TAKEN IN EACH AREA*

AREA CLASS	LOCATION	LOCATION CODE	ALPHA/BETA QUALITATIVE SCAN	TOTAL ALPHA/BETA SURFACE CONTAMINATION (1 MINUTE COUNTS)	REMOVABLE ALPHA/BETA SURFACE CONTAMINATION (WIPES)	GAMMA SURFACE EXPOSURE RATE (1 MINUTE COUNTS)
A	BASEMENT	A-BMT	5%	30	30	30
	VAULT	A-VLT	5%	30	30	30
	AUXILIARY WAREHOUSE	A-AUX	5%	30	30	30
	LOADING DOCK	A-DCK	5%	30	30	30
	PEARLMAN'S LAB	A-PLB	5%	20	20	20
	CORNER ROOM	A-CNR	5%	20	20	20
	CONTROL ROOM	A-CTL	5%	12	10	12
B	FORMER LABS	B-LAB	5%	20	20	20
C	OFFICE AREA	C-OFC	5%	10	10	10
	OFFICE COMPUTER ROOMS	C-OCR	5%	10	10	10
	OFFICE CONTROL CENTER	C-OCC	5%	10	10	10
	FINGER BUILDING	C-FGR	5%	10	10	10

* Location of measurements is shown in the area maps in Appendix C.

3.2 Sampling Locations

For all areas, a direct, qualitative alpha and beta-gamma scan of the floors and walls (5 % of all surfaces) was conducted.

Random sampling points were identified in each area (refer to Appendix C). Direct, quantitative counts were conducted for alpha and beta-gamma contamination using stationary, cumulative 1-minute counts.

Removable alpha and beta wipe surveys were taken at the same locations.

The type and number of surveys conducted for each area is shown in Table 1. In general more measurement locations were chosen for Class A areas than for Class B areas. More measurement locations were chosen for Class B areas than for Class C areas. Thus, a higher measurment/sample density was used for areas with the higher potential for contamination.

Following completion of a majority of the survey, one retiree definitively identified areas labeled B-LAB and C-OCR as having belonged to the airplane manufacturing operations of NAA and not part of AERD. We have nevertheless included the survey results for these areas to confirm that residual contamination had not been inadvertently spread from AERD to non-AERD operations.

In addition to locations of total and removable surface contamination measurements, selected samples were taken of soil, wall & floor material, water and ceiling paint and counted with a laboratory Canberra gamma spectrometer. The locations of these samples are also indicated in the area maps in Appendix C.

3.2.1 Basement Sub-Floor Samples

Floor concrete had been removed from some locations in the basement floor by Huntington Beach SHEA personnel to perform chemical soil sampling. The current survey utilized the same locations and did not perform any additional through-floor sampling.

There was no indication that the floor had been shielded. The basement housed only calibration sources. Penetration of the floor or soil with gamma radiation would not result in any activation or residual activity. No neutron fields were present in the basement, thus neutron activation of concrete and sub-foundation soil was not of concern.

The soil, concrete and water samples (ENV00129 to ENV00134, and ENV00144) were taken at locations where the concrete had been removed. The basement (A-BMT) was one of the most extensively surveyed areas in the survey, and no indication of contamination was found in wipe, soil, debris sweeps, or water samples (See Figure C-1, and Appendix C). If soil under the slab had been contaminated by spills or leakage, it would have been indicated by the presence of

contamination on the concrete surface and/or in the soil. This was not found, thus additional soil sampling under the intact concrete was determined to be unnecessary.

This same line of reasoning would apply to the rooms, also. The same principles would apply to rooms that did not house the WBNS reactor, i.e. a neutron source.

The potential for neutron activation in the loading dock was addressed. High power reactors produce enough neutron activation of surrounding concrete and sub-foundation soil to create detectable levels of radioactivity in the concrete and soil. However, the low power of the WBNS reactor system (4 watts), did not generate sufficient neutron flux outside the reactor shield to create activation products in any significant quantity. Figure 4 shows the presence of reactor operators next the reactor during its operation, confirming that neutron flux was extremely low. No elevated exposure levels or surface radioactivity was found in the loading dock area, which provided further support for this position. Sub-floor sampling of the loading dock was therefore not performed.

3.2.2 Auxiliary Warehouse Ceiling Paint Chips

According to facility history, established from a limited number of documents and the recall of workers, drop ceilings had been replaced several times after the end of the radiological activities. The original ceilings were approximately 30-40 feet above the floor. Appendix D contains results from gamma spectroscopy of lead paint chips (ENV00125). The location of this sample in the auxiliary warehouse (A-AUX) was proximate to the WBNS reactor and is shown in Figure C-7. The lead paint chips represented a composite of lead paint that had peeled off from the original ceilings in the building. It was clear that this was original paint, as the surfaces under the paint were observed to be bare metal. The fact that these paint chips were found to be free of contamination demonstrates that ceiling contamination is not present.

3.2.3 Corner Room Floor and Wall Material

Wall and floor material (ENV00136) was taken from the corner room (A-CNR), proximate to the WBNS reactor (See Figure 2 and Figure C-4).

3.3 Survey Instrumentation and Techniques

Measurements of the total alpha surface activities were made with a Ludlum 43-1 (ZnS) alpha scintillation detector. Measurements of the total beta surface activities were made with a Ludlum 44-9 thin-window pancake Geiger-Mueller tube.

A Ludlum 2221 count rate meter with an audible indication was used for qualitative scans. For scanning, the detector was moved slowly, at a scan rate of less than 5 cm/sec, over the surface being surveyed. The face of the detector was located near the surface and not more than ½-inch distance away.

One minute, cumulative, stationary counts for both alpha and beta total surface activities were performed in various locations within each survey area. Table 1 gives the number of stationary, quantitative counts made in each area.

Standard 1.75 inch disks (1 3/4 Nuclear Power Operators, Inc., cloth) were used to obtain samples of removable surface alpha and beta activity by wiping approximately 100 cm^2 of the surface area. The activity was measured on the disks using a low background, gas-flow, Tennelec proportional counter calibrated using Th-230 and Tc-99 standard sources. Table 1 gives the number of wipe samples taken in each survey area. As well as wipes of wall and floor surfaces, wipes were also taken at locations such as sink traps and other locations of sediment build-up.

The ambient exposure rates were measured on surfaces using a Ludlum 44-2 1"x1" , NaI scintillation detector, a Ludlum 2221 scalar detector and a count time of one minute. A standard conversion factor of 215 cpm per µR/hr was used for conversion of counts per minute to µR/hr. Table 1 gives the number of surface exposure rate measurements in each survey area.

All survey data was recorded on Radiation Survey Data Sheets (Form 732-A).

3.4 Instrument Calibrations, Performance Checks and Background

Measurements of total alpha surface activity were made using an alpha scintillation detector, sensitive only to alpha particles with energies exceeding about 1.5 MeV. The detector was calibrated with a Th-230 alpha source standard traceable to the National Institute of Standards and Technology (NIST). Measurements of the average beta surface activities were made with a thin-window pancake Geiger-Mueller (G-M) tube. The G-M detector was calibrated with a Tc-99 beta source standard, traceable to NIST.

All portable survey instruments were serviced and calibrated with NIST traceable standards on a quarterly basis. In addition, daily source, background, and performance checks were done on all instrumentation, when in use, to determine acceptable performance and establish a background value for the instrument on that day. Calibration records for the survey instruments used are maintained in the Radiation Safety Department files.

The gas-flow proportional counters, used to measure removable contamination, were calibrated using Th-230 and Tc-99 standard sources, traceable to NIST.

The ambient exposure rates at contact from surfaces were measured using a one-inch by one-inch NaI scintillation detector. Daily performance checks were made using a Cs-137 source.

Daily checks and calibrations were performed on all instrumentation to determine acceptable performance. Daily checks and calibration data were entered on the appropriate Instrument Qualification Sheet (IQS).

Daily background measurements were taken for each instrument in Building 010 and used for data analysis, are shown in Table 2 below. Building 010 is a corrugated, steel walled structure with a concrete base, physically separated from Building 001 but with a similar construction. Background gamma measurements were also obtained in Building 125 (bunker storage area) of similar construction to the basement's concrete walls and Building 108's (vault) cinder block exterior. This was done for gamma measurement comparison, and to verify different background levels for different structures.

TABLE 2: DAILY BACKGROUND RANGE

	GROSS SURFACE ACTIVITY LEVEL		EXPOSURE RATE
RADIATION TYPE	**ALPHA** $dpm/100cm^2$	**BETA** $dpm/100cm^2$	**GAMMA** $\mu R/hr$
Building 010 Range	2 to 6	1229 to 1772	8 to 9
Building 125 Range	Not Taken	Not Taken	14 to 17

3.5 Regulatory Release Limits

Regulatory limits for total and removable surface contamination are provided in References 1, 2, 3 and 26. Demonstration that these limits have been met is required before a regulatory agency will release a facility for unrestricted use. These limits are summarized in Table 3. MARSSIM refers to these release limits as "derived concentration guideline limits" (DCGL).

Surface contamination criteria for equipment and structures were originally established by the AEC in Regulatory Guide 1.86, dated June 1974 (Reference 3). All subsequent NRC, DOE and State of California guidelines for surface contamination are identical to these original limits.

- **DOE.** The most recent revision of DOE Order 5400.5 is January 7, 1993 (Reference 1). A 2000 draft revision of DOE 5400.5 (Reference 10) keeps the original surface contamination criteria for structures to be released for unrestricted use, though seeks to introduce lower limits for recycled metal from DOE facilities. The draft version of 10CFR834 (the codified version of DOE Order 5400.5 - Reference 9) also still promulgates the same original surface contamination criteria.

TABLE 3: SURFACE CONTAMINATION GUIDELINES (dpm/100cm^2)

Radionuclides	Average	Maximum	Removable
Separated or enriched Sr-90, Th-natural, Th-232	<1,000	<3,000	<200
U-natural, U-235, U-238, and associated decay products	<5,000α	<15,000α	<1,000α
Beta-gamma emitters (radionuclides with decay modes other than alpha emission or spontaneous fission), including Sr-90 intrinsic to the mixture. [This category of radionuclides includes mixed fission products, including Cs-137 and Sr-90. It does not apply to Sr-90, which has been separated from the other fission products or mixtures where the Sr-90 has been enriched.]	<5,000β-γ	<15,000β-γ	<1,000β-γ

Note: Where surface contamination by both alpha- and beta-gamma-emitting radionuclides exists, the limits established for alpha- and beta-gamma-emitting radionuclides apply independently. Measurements of average contamination should not be averaged over an area of more than one square meter. For objects of less surface area, averages should be derived for each such object. The maximum and removable contamination level applies to an area of not more than 100 cm^2.

- **NRC.** 10CFR20 Subpart E, "Radiological Criteria for License Termination", Article 20.1402 (Reference 11), and NUREG 1727, "NMSS Standard review Plan", Chapter 14.1 (Reference 12) state, "A site will be considered acceptable for unrestricted use if the residual radioactivity that is distinguishable from background radiation results in a TEDE to an average member of the critical group that does not exceed 25 mrem (0.25 mSv) per year." ANSI/HPS N13.12-1999, "Surface and Volume Radioactivity Standards for Clearance" (Reference 13), effectively demonstrates that, for all isotopes, the original Regulatory Guide 1.86 surface contamination limits are equivalent to an annual dose of less than 1 mrem/year.

- **California DHS.** There is a recent internal DHS Policy Memorandum relating to license termination. This is RML-00-02, "Radiological Release Criteria for Facilities Undergoing Large-Scale Decommissioning," dated May 1, 2000 (Reference 14). This memorandum references internal Policy Memorandum IPM-88-2, "Clearance Inspection and Survey," dated December 1997 (Reference 15), which, in turn, implements the surface contamination criteria of DECON-1, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use," dated June 1977

(Reference 2). RML-00-02 states that these surface contamination criteria are identical to the NRC's "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source or Special Nuclear Material," dated August 1987 (Reference 16), which in turn implements the surface contamination criteria of Regulatory Guide 1.86, "Termination of Operating Licenses for Nuclear Reactors," dated June 1974 (Reference 3). California is an agreement state and implements 10CFR20, by reference, in California Code of Regulations Title 17, section 30256 (Reference 17).

Thus all major players in the radiological decommissioning arena, still, to this day, utilize the original 1974 Regulatory Guide 1.86 surface contamination criteria for release for unrestricted use of equipment and facilities.

In order to establish cleanup standards for volumetric contamination of soil, both DOE, NRC and DHS require the use of a pathways dose analysis software, for example RESRAD (Reference 27). Isotope specific cleanup standards can be established corresponding the NRC's 25 mrem/year TEDE from all pathways plus ALARA. Rocketdyne has established soil cleanup standards based on a lower dose of 15 mrem/y TEDE. These have been approved by the DOE and DHS for use at the Santa Susana Field Laboratory (Reference 26). These soil cleanup standards are based on exposure pathways including direct radiation exposure, radon, inhaled dust, ingested dirt, ingestion of fruit and vegetables irrigated with contaminated groundwater, and the use of groundwater as drinking water. A residential scenario is assumed.

4.0 RESULTS

Site investigation and planning for the Downey survey occurred during November 2000. The field measurement and sampling activities for the Downey survey occurred during the period from December 2, 2000 through December 7, 2000.

4.1 Qualitative Scan

No detectable activity was observed during the qualitative alpha and beta instrument scan.

4.2 Total Surface Contamination

All quantitative total surface activity alpha and beta measurements are provided in Appendix A. Gross 1-minute counts are provided, together with background counts, instrument efficiencies and probe area factors. Using this measured input data, gross and net surface contamination (in disintegrations per minute per 100 cm^2 (dpm/100cm^2)) are calculated for both alpha and beta radiation. Net values should be compared with the DCGLs of Table 3.

For each of the Class A, B and C areas, the range of net alpha and beta total surface contamination is summarized and compared with the appropriate regulatory limit (DCGL) in Table 4. Table 4 also allows comparison of the measured values with the minimum detectable activity (MDA).

The highest net total alpha activity observed was 32 dpm/100 cm^2 compared with a DCGL for Uranium isotopes of 15,000 dpm/100 cm^2 (for a 100 cm^2 area) and an MDA of 27 dpm/100 cm^2. No total alpha measurements exceeded the DCGL.

The highest net total beta activity observed was 1,386 dpm/100 cm^2 compared with a DCGL for cesium-137 or mixed fission products of 15,000 dpm/100 cm^2 (for a 100 cm^2 area) and an MDA of 832 dpm/100 cm^2. No total beta measurements exceeded the DCGL. Approximately 10% of beta measurements exceeded the MDA, slightly more than the expected 5% (based on the 95% basis for the MDA). However, the MDA is based solely on counting statistics of the instrument and does not include spatial or material variability in surfaces of different materials, e.g. concrete, drywall, press-board, or corrugated steel.

4.3 Removable Surface Contamination

All quantitative removable surface activity alpha and beta measurements are provided in Appendix B. Net 1-minute counts are provided, together with background counts and counter efficiencies. Using this measured input data, net removable surface contamination (in disintegrations per minute per 100 cm^2 (dpm/100cm^2)) are calculated for both alpha and beta radiation. Net values should be compared with the DCGLs of Table 3.

For each of the Class A, B and C areas the range of net removable alpha and beta surface contamination is summarized and compared with the appropriate regulatory limit (DCGL) in

Table 4. Table 4 also allows comparison of the measured values with the minimum detectable activity (MDA).

TABLE 4: SURVEY RESULTS

Category	Net Total (dpm/100 cm^2)		Net Removable (dpm/100 cm^2)		Gross Surface Gamma
	Alpha	Beta	Alpha	Beta	Exposure Rate (μR/h)
Class "A" Area Range	-6 to 32	-732 to 1386	-0.6 to 3	-5 to 19	4 to 16
Class "B" Area Range	-5 to 2	-157 to 1008	-0.3 to 3	-5 to 14	5 to 9
Class "C" Area Range	-16 to 27	-6 to 1354	-0.6 to 3	-2 to 17	6 to 13
Minimum Detectable Activity*	27	832	11 to 14	17 to 22	1
Regulatory Limit	15,000	15,000	1,000	1,000	N/A

* MDAs are calculated based on counting statistics only and do not include inherent variability of surfaces of different materials (e.g. concrete, drywall, press-board, corrugated steel, etc.)

The highest net removable alpha activity observed was 3 dpm/100 cm^2 compared with a DCGL for Uranium isotopes of 1,000 dpm/100 cm^2 (for a 100 cm^2 area) and an MDA of 11 to 14 dpm/100 cm^2. No removable alpha contamination measurements exceeded the DCGL or the MDA.

The highest net removable beta activity observed was 19 dpm/100 cm^2 compared with a DCGL for cesium-137 or mixed fission products of 1,000 dpm/100 cm^2 (for a 100 cm^2 area) and an MDA of 17 to 32 dpm/100 cm^2. No removable beta measurements exceeded the DCGL or MDA.

4.4 Gamma Exposure Measurements

Appendix A provides the gross gamma counts in a 1-minute period together with daily background count and instrument efficiency. Both gross and net gamma exposures (in microRoentgens per hour (μR/hr)) are calculated.

Since the Downey facilities are to be demolished, there is no relevant release limit (DCGL) for gamma exposure levels. Also MARSSIM does not require gamma exposure rate measurements for facilities.

The gross gamma exposure rates observed in the facility surveys ranged from 4 to 16 μR/hr. Typically, the higher exposures were observed in concrete structures such as the basement, vault and enclosed spaces. This is due the proximity of material with naturally occurring radionuclides. Typically lower exposures are observed in wooden or corrugated steel buildings. This difference is also demonstrated in Table 2 where higher background exposures are observed in Building 125 (concrete bunker) than in Building 010 (corrugated steel walled building). The range of sampled area, gross gamma exposure rates (4 - 16 μR/hr) was comparable to the range of background gamma exposure rates (8 - 17 μR/hr)

4.5 MARSSIM Statistical Tests

The power of the statistical framework of MARSSIM is apparent when there are still measurable levels of contamination at a site at levels approaching, and in some cases exceeding the DCGLs. It enables Wilcoxon Rank Sum non-parametric comparison of a sampled area distribution to a reference background area distribution plus DCGLs.

In the current survey, where all measurements are not only well below DCGLs but also, for the most part, below instrument and counter MDAs, does not require such sophisticated statistical tests. A simple comparison of measured data vs. DCGLs and MDAs is sufficient, as is done in Tables 4 and 5. Furthermore, inspection of the tables in Appendix A and B reveals that the **gross** dpm/100 cm^2 measurements, even prior to background subtraction, are also less than the DCGLs. For these reasons, MARSSIM Wilcoxon Rank Sum statistical tests were not performed for the Downey data.

4.6 Soil and Building Debris Sampling

This section summarizes the results of gamma spectroscopy performed on soil, concrete, water, and paint chip samples from the Downey facility basement floor, auxiliary warehouse ceiling and corner room of Building 001 (see Figure 2 and the area maps of Appendix C for sample locations). Each sample was analyzed in the counting laboratory using a Canberra high-purity GeLi gamma spectrometer. Appendix D shows detailed results of each sample. Table 5 summarizes the gross radionuclide concentrations.. No evidence of contamination from the 1950's atomic research operations was found in any of these samples.

Several items in Table 5 deserve some amplification.

MDA (minimum detectable activity) is a function of background count rate, time of count, instrument efficiency, sample weight, and other factors. Thus a different count time or different sample weight would result in different MDA values. The variances noted in MDA in the table are due primarily to different sample weights and count times.

TABLE 5: SUMMARY OF GAMMA SPECTROMETER ANALYSIS OF SAMPLES

SAMPLE NUMBER*	LOCATION/ TYPE	DATE	NUCLIDE	DETECTED pCi/gm	MDA pCi/gm	LIMIT* pCi/gm	Comments
ENV00125	WAREHOUSE PAINT CHIPS	11/21/00	None Detected	No Activity	No Activity	N/A	
ENV00129	BASEMENT SOIL	12/5/00	K-40	14.9	0.5	N/A	Non-regulated, Naturally Occurring
ENV00130	BASEMENT SOIL	12/5/00	K-40	15.0	0.08	N/A	Non-regulated, Naturally Occurring
ENV00131	BASEMENT SOIL	12/5/00	K-40	15.1	0.46	N/A	Non-regulated, Naturally Occurring
ENV00132	BASEMENT SOIL/ CONCRETE	12/6/00	K-40	13.9	0.49	N/A	Non-regulated, Naturally Occurring
ENV00133	BASEMENT WATER	12/6/00	None Detected	No Activity	No Activity	N/A	
ENV00134	BASEMENT CONCRETE	12/8/00	K-40	23.5	0.94	N/A	Non-regulated, Naturally Occurring
ENV00136	CORNER ROOM/FLOOR & WALL CONCRETE	12/7/00	K-40	17.8	0.14	N/A	Non-regulated, Naturally Occurring
ENV00136	CORNER ROOM/ FLOOR & WALL CONCRETE	12/7/00	Cs-137	0.0076	0.008	9.20	< MDA. Typical Soil Background
ENV00136	CORNER ROOM/ FLOOR & WALL CONCRETE	12/7/00	U-235	0.067	0.012	30	Typical Soil Background
ENV00144	BASEMENT PIPE SECTION	12/15/00	K-40	1.4	0.07	N/A	Non-regulated, Naturally Occurring

NOTES: * Soil DCGLs from Reference 26
MDA means minimum detectable activity

ENV00136 contains a trace quantity of cesium-137. Reference 28 provides typical US background for cesium-137 in rock and soil as 0.7 pCi/g with range of 0.1 to 3.5 pCi/g. Note also that the measured value of 0.0076 pCi/g for sample ENV00136 is less than the minimum detectable activity (MDA) and is therefore not a very credible number. Normally the gamma spectroscopic software would not report this level of cesium. In this case the software did report

it because the measured value was close to the MDA. Note also that the count time for this sample was 50,000 seconds, much more than the typical count time of 1,000 seconds.

ENV00136 contains trace levels of uranium-235. Reference 29 reports typical uranium-238 activity in rock and soil as 7 to 60 bequerels/kilogram. This translates into 0.19 to 1.62 pCi/g. The ratio of U-235 to U-238 in naturally occurring uranium is 0.7% by weight or 5% by activity. Therefore typical uranium-235 activity in soil or rock is 0.01 to 0.81 pCi/g. The measured activity for ENV00136 is within this range. Note also that the confidence level of U-235 in sample ENV00136 is very low at 0.726. This is because of interference of the U-235 185.7 keV energy gamma with the Ra-226 185.9 keV energy gamma. Note the Ra-226 result was indeed rejected due to this very interference. Hence the measured U-235 result is not a very credible number.

All samples contain varying levels of potassium-40 up to 23.5 pCi/g. Reference 30 discusses naturally occurring potassium-40. K-40 is 0.0118% of total potassium with a half-life of 1.3 x 10^9 years. It is the most prevalent of all naturally occurring radionuclides on earth, and is found in all soil and rock, all plants and animals, and all foods we eat. It is therefore the dominant radionuclide in the human body, at about 0.1 microcurie per person, accounting for approximately 10% of our exposure to natural background radiation.

5.0 SUMMARY

A radiation survey was performed of the northeastern portion of Building 001of the Downey facility that once housed a 4-watt nuclear reactor. The areas surveyed comprised all the rooms, offices, and laboratories used by the Atomic Energy Research Department of North American Aviation during 1948 to 1955. Industry accepted protocols and approved cleanup criteria were used in the design and implementation of the survey.

Table 4 summarizes 464 total alpha and beta surface contamination instrument measurements, and 460 removable alpha and beta surface contamination wipe samples that demonstrate compliance with appropriate regulatory cleanup standards (DCGLs). Appendices A and B provide the detailed field measurements and analyses for each location where surface contamination measurements were taken. Not only do none of the net values exceed DCGLs, but the majority also do not even exceed the minimum detectable activity (MDA) of the instrument or counter. Not only do none of the net (background subtracted) values exceed DCGLs, but none of the gross values exceed the DCGLs also.

Table 4 and Appendix A also provide a summary of 464 surface gamma exposure rate measurements, all of which are within the measured background range shown in Table 2.

Table 5 represents a summary of gamma spectrometry results of all nine soil, paint, concrete and water samples that were taken. No evidence of man made contamination was found in any sample.

Detailed computer printouts of all nine samples are provided in Appendix D. Analysis and/or computer printout from laboratory counters (gamma spectroscopy and alpha/beta Tennelec) are given in the report for every sample and wipe taken.

No evidence of radioactive contamination was found in the facility and regulatory cleanup standards promulgated by the DOE, NRC, and California DHS were met. The area is therefore suitable for release for "unrestricted use" with no radiological restrictions.

6.0 REFERENCES

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11. 10CFR20, "Standards for Protection Against Radiation." Subpart E, "Radiological Criteria for License Termination", Article 20.1402. 56 Federal Register 23391. May 21, 1991

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24. Nuclear Regulatory Commission (NRC). 1997. "Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions." NUREG-1507.

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29. "Environmental Radioactivity". Eisenbud & Gessell. Academic Press. 1997. Page 140. Table 6-6.

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APPENDICES

APPENDIX A

TOTAL SURFACE CONTAMINATION MEASUREMENTS (1 MINUTE COUNTS)

TABLE A1:
TOTAL SURFACE CONTAMINATION MEASUREMENTS
CLASS "A"

SAMPLE NAME	1 MIN ALPHA TOTAL	1 MIN ALPHA REM	1 MIN BETA TOTAL	1 MIN BETA REM	1 MIN GAM TOTAL	ALPHA INSTRUMENT BACKG	ALPHA INSTRUMENT EFACT	ALPHA INSTRUMENT AFACT	BETA INSTRUMENT BACKG	BETA INSTRUMENT EFACT	BETA INSTRUMENT AFACT	GAMMA BACKG	GAMMA EFACT
A-DCK-1: 12/3/00	2	*	36	*	1321	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-DCK-2: 12/3/00	3		34		1298	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-DCK-3: 12/3/00	0		36		1291	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-DCK-4: 12/3/00	0		40		1478	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-DCK-5: 12/3/00	1		42		1527	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-DCK-6: 12/3/00	3		51		1399	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-DCK-7: 12/3/00	2		36		1525	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-DCK-8: 12/3/00	1		41		1853	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-DCK-9: 12/3/00	1		36		1547	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-DCK-10: 12/3/00	3		45		1536	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-DCK-11: 12/3/00	1		43		1623	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-DCK-12: 12/3/00	1		36		1633	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-DCK-13: 12/3/00	3		47		1764	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-DCK-14: 12/3/00	2		45		1452	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-DCK-15: 12/3/00	1		30		1440	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-DCK-16: 12/3/00	0		50		1597	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-DCK-17: 12/3/00	0		32		1493	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-DCK-18: 12/3/00	0		33		1574	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-DCK-19: 12/3/00	1		36		1303	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-DCK-20: 12/3/00	0		37		1238	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-DCK-21: 12/3/00	8		67		1881	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-DCK-22: 12/3/00	0		56		1755	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-DCK-23: 12/3/00	1		75		1917	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-DCK-24: 12/3/00	1		90		1863	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-DCK-25: 12/3/00	1		40		1181	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-DCK-26: 12/3/00	1		75		1725	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-DCK-27: 12/3/00	3		66		2280	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-DCK-28: 12/3/00	1		66		1833	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-DCK-29: 12/3/00	2		71		1759	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-DCK-30: 12/3/00	0		63		1935	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-BMT-1: 12/2/00	0		47		3012	0.5	3.2	1.4	56.25	6.3	5	1952.8	0.0047
A-BMT-2: 12/2/00	0		63		3059	0.5	3.2	1.4	56.25	6.3	5	1952.8	0.0047
A-BMT-3: 12/2/00	0		55		3186	0.5	3.2	1.4	56.25	6.3	5	1952.8	0.0047
A-BMT-4: 12/2/00	1		56		3011	0.5	3.2	1.4	56.25	6.3	5	1952.8	0.0047
A-BMT-5: 12/2/00	3		42		2986	0.5	3.2	1.4	56.25	6.3	5	1952.8	0.0047
A-BMT-6: 12/2/00	1		50		3150	0.5	3.2	1.4	56.25	6.3	5	1952.8	0.0047
A-BMT-7: 12/2/00	1		64		2995	0.5	3.2	1.4	56.25	6.3	5	1952.8	0.0047
A-BMT-8: 12/2/00	0		54		2896	0.5	3.2	1.4	56.25	6.3	5	1952.8	0.0047
A-BMT-9: 12/2/00	0		53		2879	0.5	3.2	1.4	56.25	6.3	5	1952.8	0.0047
A-BMT-10: 12/2/00	0		47		3002	0.5	3.2	1.4	56.25	6.3	5	1952.8	0.0047
A-BMT-11: 12/2/00	1		45		2808	0.5	3.2	1.4	56.25	6.3	5	1952.8	0.0047

* Refer to Appendix B.

TABLE A1:
TOTAL SURFACE CONTAMINATION MEASUREMENTS
CLASS "A"

SAMPLE NAME	1 MIN ALPHA TOTAL	1 MIN ALPHA REM	1 MIN BETA TOTAL	1 MIN BETA REM	1 MIN GAM TOTAL	ALPHA INSTRUMENT BACKG	ALPHA INSTRUMENT EFACT	ALPHA INSTRUMENT AFACT	BETA INSTRUMENT BACKG	BETA INSTRUMENT EFACT	BETA INSTRUMENT AFACT	GAMMA BACKG	GAMMA EFACT
A-BMT-12: 12/2/00	1	*	66	*	2934	0.5	3.2	1.4	56.25	6.3	5	1952.8	0.0047
A-BMT-13: 12/2/00	0		57		2940	0.5	3.2	1.4	56.25	6.3	5	1952.8	0.0047
A-BMT-14: 12/2/00	0		33		2068	0.5	3.2	1.4	56.25	6.3	5	1952.8	0.0047
A-BMT-15: 12/2/00	3		54		2111	0.5	3.2	1.4	56.25	6.3	5	1952.8	0.0047
A-BMT-16: 12/2/00	4		67		2930	0.5	3.2	1.4	56.25	6.3	5	1952.8	0.0047
A-BMT-17: 12/2/00	0		51		3045	0.5	3.2	1.4	56.25	6.3	5	1952.8	0.0047
A-BMT-18: 12/2/00	0		64		3009	0.5	3.2	1.4	56.25	6.3	5	1952.8	0.0047
A-BMT-19: 12/2/00	1		62		3194	0.5	3.2	1.4	56.25	6.3	5	1952.8	0.0047
A-BMT-20: 12/2/00	0		49		2797	0.5	3.2	1.4	56.25	6.3	5	1952.8	0.0047
A-BMT-21: 12/2/00	3		72		3182	0.5	3.2	1.4	56.25	6.3	5	1952.8	0.0047
A-BMT-22: 12/2/00	0		72		3167	0.5	3.2	1.4	56.25	6.3	5	1952.8	0.0047
A-BMT-23: 12/2/00	0		82		3182	0.5	3.2	1.4	56.25	6.3	5	1952.8	0.0047
A-BMT-24: 12/2/00	1		84		3023	0.5	3.2	1.4	56.25	6.3	5	1952.8	0.0047
A-BMT-25: 12/2/00	2		57		2952	0.5	3.2	1.4	56.25	6.3	5	1952.8	0.0047
A-BMT-26: 12/2/00	2		41		2696	0.5	3.2	1.4	56.25	6.3	5	1952.8	0.0047
A-BMT-27: 12/2/00	0		62		2653	0.5	3.2	1.4	56.25	6.3	5	1952.8	0.0047
A-BMT-28: 12/2/00	2		57		3242	0.5	3.2	1.4	56.25	6.3	5	1952.8	0.0047
A-BMT-29: 12/2/00	2		58		3098	0.5	3.2	1.4	56.25	6.3	5	1952.8	0.0047
A-BMT-30: 12/2/00	2		96		3101	0.5	3.2	1.4	56.25	6.3	5	1952.8	0.0047

* Refer to Appendix B.

TABLE A1:
TOTAL SURFACE CONTAMINATION MEASUREMENTS
CLASS "A"

SAMPLE NAME	1 MIN ALPHA TOTAL	1 MIN ALPHA REM	1 MIN BETA TOTAL	1 MIN BETA REM	1 MIN GAM TOTAL	ALPHA INSTRUMENT BACKG	ALPHA INSTRUMENT EFACT	ALPHA INSTRUMENT AFACT	BETA INSTRUMENT BACKG	BETA INSTRUMENT EFACT	BETA INSTRUMENT AFACT	GAMMA BACKG	GAMMA EFACT
A-VLT-1: 12/3/00	1	*	68	*	3449	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-VLT-2: 12/3/00	2		70		3366	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-VLT-3: 12/3/00	0		58		3388	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-VLT-4: 12/3/00	1		78		3394	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-VLT-5: 12/3/00	2		69		3349	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-VLT-6: 12/3/00	1		74		3401	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-VLT-7: 12/3/00	0		70		3319	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-VLT-8: 12/3/00	1		83		3180	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-VLT-9: 12/3/00	1		68		3233	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-VLT-10: 12/3/00	0		69		3380	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-VLT-11: 12/3/00	0		59		3434	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-VLT-12: 12/3/00	1		56		3397	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-VLT-13: 12/3/00	1		77		3316	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-VLT-14: 12/3/00	0		80		3497	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-VLT-15: 12/3/00	0		73		3496	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-VLT-16: 12/3/00	1		55		3321	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-VLT-17: 12/3/00	0		71		3422	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-VLT-18: 12/3/00	2		62		3263	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-VLT-19: 12/3/00	0		69		3480	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-VLT-20: 12/3/00	1		71		3471	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-VLT-21: 12/3/00	1		76		3332	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-VLT-22: 12/3/00	2		68		3138	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-VLT-23: 12/3/00	1		71		3360	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-VLT-24: 12/3/00	0		66		3405	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-VLT-25: 12/3/00	0		52		3313	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-VLT-26: 12/3/00	2		57		3503	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-VLT-27: 12/3/00	0		70		3357	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-VLT-28: 12/3/00	0		58		3533	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-VLT-29: 12/3/00	0		54		3368	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-VLT-30: 12/3/00	0		57		3434	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-CTL-31A: 12/3/00	0		49		1904	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-CTL-32: 12/3/00	1		45		1686	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-CTL-33: 12/3/00	0		74		2201	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-CTL-34: 12/3/00	0		43		1813	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-CTL-35: 12/3/00	0		35		1847	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-CTL-36: 12/3/00	2		36		1742	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-CTL-37: 12/3/00	1		34		1743	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-CTL-38: 12/3/00	0		65		2517	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-CTL-39: 12/3/00	1		50		1939	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-CTL-40: 12/3/00	2		59		2262	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-CTL-41: 12/3/00	0		47		1664	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047
A-CTL-31B: 12/3/00	1		58		2785	0.75	3.2	1.4	46	6.3	5	1906.3	0.0047

*Refer to Appendix B

TABLE A1:
TOTAL SURFACE CONTAMINATION MEASUREMENTS
CLASS "A"

SAMPLE NAME	1 MIN ALPHA TOTAL	1 MIN ALPHA REM	1 MIN BETA TOTAL	1 MIN BETA REM	1 MIN GAM TOTAL	ALPHA INSTRUMENT BACKG	ALPHA INSTRUMENT EFACT	ALPHA INSTRUMENT AFACT	BETA INSTRUMENT BACKG	BETA INSTRUMENT EFACT	BETA INSTRUMENT AFACT	GAMMA BACKG	GAMMA EFACT
A-AUX-1: 12/4/00	2	*	37	*	1395	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.00465
A-AUX-2: 12/4/00	0		32		1193	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.00465
A-AUX-3: 12/4/00	0		34		1474	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.00465
A-AUX-4: 12/4/00	2		35		1261	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.00465
A-AUX-5: 12/4/00	0		31		1438	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.00465
A-AUX-6: 12/4/00	0		32		1588	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.00465
A-AUX-7: 12/4/00	1		40		1587	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.00465
A-AUX-8: 12/4/00	0		42		1214	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.00465
A-AUX-9: 12/4/00	0		44		1776	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.00465
A-AUX-10: 12/4/00	1		46		1644	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.00465
A-AUX-11: 12/4/00	1		42		1852	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.00465
A-AUX-12: 12/4/00	2		30		950	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.00465
A-AUX-13: 12/4/00	1		47		1449	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.00465
A-AUX-14: 12/4/00	0		45		1211	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.00465
A-AUX-15: 12/4/00	0		42		1511	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.00465
A-AUX-16: 12/4/00	1		37		1344	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.00465
A-AUX-17: 12/4/00	0		39		1475	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.00465
A-AUX-18: 12/4/00	1		36		1600	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.00465
A-AUX-19: 12/4/00	2		40		1760	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.00465
A-AUX-20: 12/4/00	2		32		1676	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.00465
A-AUX-21: 12/4/00	0		40		1609	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.00465
A-AUX-22: 12/4/00	0		36		1501	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.00465
A-AUX-23: 12/4/00	0		39		1567	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.00465
A-AUX-24: 12/4/00	3		34		1368	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.00465
A-AUX-25: 12/4/00	0		41		1631	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.00465
A-AUX-26: 12/4/00	1		66		1658	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.00465
A-AUX-27: 12/4/00	0		51		2367	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.00465
A-AUX-28: 12/4/00	2		62		1844	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.00465
A-AUX-29: 12/4/00	2		60		1839	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.00465
A-AUX-30: 12/4/00	0		66		1850	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.00465
A-PLB-1: 12/7/00	1		64		2285	1	3.2	1.4	42.25	6.3	5	1981	0.00465
A-PLB-2: 12/7/00	1		49		2782	1	3.2	1.4	42.25	6.3	5	1981	0.00465
A-PLB-3: 12/7/00	2		64		2750	1	3.2	1.4	42.25	6.3	5	1981	0.00465
A-PLB-4: 12/7/00	1		52		2869	1	3.2	1.4	42.25	6.3	5	1981	0.00465
A-PLB-5: 12/7/00	0		43		2858	1	3.2	1.4	42.25	6.3	5	1981	0.00465
A-PLB-6: 12/7/00	1		52		2762	1	3.2	1.4	42.25	6.3	5	1981	0.00465
A-PLB-7: 12/7/00	0		46		2767	1	3.2	1.4	42.25	6.3	5	1981	0.00465
A-PLB-8: 12/7/00	1		51		2753	1	3.2	1.4	42.25	6.3	5	1981	0.00465
A-PLB-9: 12/7/00	0		49		2811	1	3.2	1.4	42.25	6.3	5	1981	0.00465
A-PLB-10: 12/7/00	0		53		2870	1	3.2	1.4	42.25	6.3	5	1981	0.00465
A-PLB-11: 12/7/00	0		47		2724	1	3.2	1.4	42.25	6.3	5	1981	0.00465

* Refer to Appendix B

TABLE A1:
TOTAL SURFACE CONTAMINATION MEASUREMENTS
CLASS "A"

SAMPLE NAME	1 MIN ALPHA TOTAL	1 MIN ALPHA REM	1 MIN BETA TOTAL	1 MIN BETA REM	1 MIN GAM TOTAL	ALPHA INSTRUMENT BACKG	ALPHA INSTRUMENT EFACT	ALPHA INSTRUMENT AFACT	BETA INSTRUMENT BACKG	BETA INSTRUMENT EFACT	BETA INSTRUMENT AFACT	GAMMA BACKG	GAMMA EFACT
A-PLB-12: 12/7/00	2	*	56	*	2696	1	3.2	1.4	42.25	6.3	5	1981	0.00465
A-PLB-13: 12/7/00	0		47		2638	1	3.2	1.4	42.25	6.3	5	1981	0.00465
A-PLB-14: 12/7/00	0		54		2726	1	3.2	1.4	42.25	6.3	5	1981	0.00465
A-PLB-15: 12/7/00	0		52		2802	1	3.2	1.4	42.25	6.3	5	1981	0.00465
A-PLB-16: 12/7/00	0		51		2649	1	3.2	1.4	42.25	6.3	5	1981	0.00465
A-PLB-17: 12/7/00	0		46		2620	1	3.2	1.4	42.25	6.3	5	1981	0.00465
A-PLB-18: 12/7/00	2		67		2491	1	3.2	1.4	42.25	6.3	5	1981	0.00465
A-PLB-19: 12/7/00	2		57		2404	1	3.2	1.4	42.25	6.3	5	1981	0.00465
A-PLB-20: 12/7/00	0		56		2039	1	3.2	1.4	42.25	6.3	5	1981	0.00465

* Refer to Appendix B

TABLE A1:
TOTAL SURFACE CONTAMINATION MEASUREMENTS
CLASS "A"

SAMPLE NAME	1 MIN ALPHA TOTAL	1 MIN ALPHA REM	1 MIN BETA TOTAL	1 MIN BETA REM	1 MIN GAM TOTAL	ALPHA INSTRUMENT BACKG	ALPHA INSTRUMENT EFACT	ALPHA INSTRUMENT AFACT	BETA INSTRUMENT BACKG	BETA INSTRUMENT EFACT	BETA INSTRUMENT AFACT	GAMMA BACKG	GAMMA EFACT
A-CNR-1: 12/4/00	4	*	75	*	3022	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.0047
A-CNR-2: 12/4/00	0		67		2488	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.0047
A-CNR-3: 12/4/00	2		61		2128	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.0047
A-CNR-4: 12/4/00	1		63		2199	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.0047
A-CNR-5: 12/4/00	0		80		2662	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.0047
A-CNR-6: 12/4/00	3		72		2365	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.0047
A-CNR-7: 12/4/00	0		44		1800	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.0047
A-CNR-8: 12/4/00	1		61		2632	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.0047
A-CNR-9: 12/4/00	1		60		2797	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.0047
A-CNR-10: 12/4/00	1		50		2457	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.0047
A-CNR-11: 12/4/00	5		47		1912	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.0047
A-CNR-12: 12/4/00	2		32		1788	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.0047
A-CNR-13: 12/4/00	0		43		1833	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.0047
A-CNR-14: 12/4/00	1		67		2013	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.0047
A-CNR-15: 12/4/00	4		73		2588	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.0047
A-CNR-16: 12/4/00	2		71		2474	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.0047
A-CNR-17: 12/4/00	1		70		2413	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.0047
A-CNR-18: 12/4/00	4		75		2588	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.0047
A-CNR-19: 12/4/00	2		61		2091	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.0047
A-CNR-20: 12/4/00	1		52		2271	1.25	3.2	1.4	40.5	6.3	5	1859.8	0.0047

* Refer to Appendix B

TABLE A1:
TOTAL SURFACE CONTAMINATION MEASUREMENTS
CLASS "A"

SAMPLE NAME	ALPHA (DPM/100CM2)				BETA (DPM/100CM2)				GAMMA (uR/hr)		
	NET	STD DEV	GROSS	REM	NET	STD DEV	GROSS	REM	NET	GROSS	STD DEV
A-DCK-1: 12/3/00	5.60	10.74	8.96	*	-315.0	285.24	1134.00	*	-2.72	6.14	0.26
A-DCK-2: 12/3/00	10.08	2.33	13.44		-378.0	102.36	1071.00		-2.83	6.04	0.26
A-DCK-3: 12/3/00	-3.36	1.74	0.00		-315.0	102.75	1134.00		-2.86	6.00	0.26
A-DCK-4: 12/3/00	-3.36	1.74	0.00		-189.0	103.52	1260.00		-1.99	6.87	0.27
A-DCK-5: 12/3/00	1.12	1.95	4.48		-126.0	103.90	1323.00		-1.76	7.10	0.27
A-DCK-6: 12/3/00	10.08	2.33	13.44		157.5	105.61	1606.50		-2.36	6.51	0.27
A-DCK-7: 12/3/00	5.60	2.15	8.96		-315.0	102.75	1134.00		-1.77	7.09	0.27
A-DCK-8: 12/3/00	1.12	1.95	4.48		-157.5	103.71	1291.50		-1.18	7.69	0.28
A-DCK-9: 12/3/00	1.12	1.95	4.48		-315.0	102.75	1134.00		-1.67	7.20	0.27
A-DCK-10: 12/3/00	10.08	2.33	13.44		-31.5	104.47	1417.50		-1.72	7.14	0.27
A-DCK-11: 12/3/00	1.12	1.95	4.48		-94.5	104.09	1354.50		-1.32	7.55	0.28
A-DCK-12: 12/3/00	1.12	1.95	4.48		-315.0	102.75	1134.00		-1.27	7.60	0.28
A-DCK-13: 12/3/00	10.08	2.33	13.44		31.5	104.85	1480.50		-0.66	8.20	0.28
A-DCK-14: 12/3/00	5.60	2.15	8.96		-31.5	104.47	1417.50		-2.11	6.75	0.27
A-DCK-15: 12/3/00	1.12	1.95	4.48		-504.0	101.58	945.00		-2.17	6.70	0.27
A-DCK-16: 12/3/00	-3.36	1.74	0.00		126.0	105.42	1575.00		-1.44	7.43	0.28
A-DCK-17: 12/3/00	-3.36	1.74	0.00		-441.0	101.97	1008.00		-1.92	6.94	0.27
A-DCK-18: 12/3/00	-3.36	1.74	0.00		-409.5	102.17	1039.50		-1.55	7.32	0.27
A-DCK-19: 12/3/00	1.12	1.95	4.48		-315.0	102.75	1134.00		-2.81	6.06	0.26
A-DCK-20: 12/3/00	-3.36	1.74	0.00		-283.5	102.94	1165.50		-3.11	5.76	0.26
A-DCK-21: 12/3/00	32.48	3.07	35.84		661.5	108.57	2110.50		-0.12	8.75	0.29
A-DCK-22: 12/3/00	-3.36	1.74	0.00		315.0	106.54	1764.00		-0.70	8.16	0.28
A-DCK-23: 12/3/00	1.12	1.95	4.48		913.5	110.02	2362.50		0.05	8.92	0.29
A-DCK-24: 12/3/00	1.12	1.95	4.48		1386.0	112.70	2835.00		-0.20	8.67	0.29
A-DCK-25: 12/3/00	1.12	1.95	4.48		-189.0	103.52	1260.00		-3.37	5.49	0.26
A-DCK-26: 12/3/00	1.12	1.95	4.48		913.5	110.02	2362.50		-0.84	8.02	0.28
A-DCK-27: 12/3/00	10.08	2.33	13.44		630.0	108.39	2079.00		1.74	10.60	0.30
A-DCK-28: 12/3/00	1.12	1.95	4.48		630.0	108.39	2079.00		-0.34	8.53	0.28
A-DCK-29: 12/3/00	5.60	2.15	8.96		787.5	109.30	2236.50		-0.68	8.18	0.28
A-DCK-30: 12/3/00	-3.36	1.74	0.00		535.5	107.84	1984.50		0.13	9.00	0.29
A-BMT-1: 12/2/00	-2.24	1.42	0.00		-291.4	114.14	1480.50		4.93	14.01	0.33
A-BMT-2: 12/2/00	-2.24	1.42	0.00		212.6	116.89	1984.50		5.14	14.23	0.33
A-BMT-3: 12/2/00	-2.24	1.42	0.00		-39.4	115.52	1732.50		5.73	14.82	0.33
A-BMT-4: 12/2/00	2.24	1.68	4.48		-7.9	115.70	1764.00		4.92	14.00	0.33
A-BMT-5: 12/2/00	11.20	2.10	13.44		-448.9	113.27	1323.00		4.80	13.89	0.33
A-BMT-6: 12/2/00	2.24	1.68	4.48		-196.9	114.66	1575.00		5.57	14.65	0.33
A-BMT-7: 12/2/00	2.24	1.68	4.48		244.1	117.06	2016.00		4.85	13.93	0.33
A-BMT-8: 12/2/00	-2.24	1.42	0.00		-70.9	115.35	1701.00		4.39	13.47	0.32
A-BMT-9: 12/2/00	-2.24	1.42	0.00		-102.4	115.18	1669.50		4.31	13.39	0.32
A-BMT-10: 12/2/00	-2.24	1.42	0.00		-291.4	114.14	1480.50		4.88	13.96	0.33
A-BMT-11: 12/2/00	2.24	1.42	4.48		-354.4	113.79	1417.50		3.98	13.06	0.32

* Refer to Appendix B.

TABLE A1:
TOTAL SURFACE CONTAMINATION MEASUREMENTS
CLASS "A"

SAMPLE NAME	ALPHA (DPM/100CM2)				BETA (DPM/100CM2)				GAMMA (uR/hr)		
	NET	STD DEV	GROSS	REM	NET	STD DEV	GROSS	REM	NET	GROSS	STD DEV
A-BMT-12: 12/2/00	2.24	1.42	4.48	*	307.1	117.40	2079.00	*	4.56	13.65	0.33
A-BMT-13: 12/2/00	-2.24	1.42	0.00		23.6	115.87	1795.50		4.59	13.67	0.33
A-BMT-14: 12/2/00	-2.24	1.42	0.00		-732.4	111.68	1039.50		0.54	9.62	0.29
A-BMT-15: 12/2/00	11.20	2.10	13.44		-70.9	115.35	1701.00		0.74	9.82	0.30
A-BMT-16: 12/2/00	15.68	2.28	17.92		338.6	117.57	2110.50		4.54	13.63	0.32
A-BMT-17: 12/2/00	-2.24	1.42	0.00		-165.4	114.83	1606.50		5.08	14.16	0.33
A-BMT-18: 12/2/00	-2.24	1.42	0.00		244.1	117.06	2016.00		4.91	14.00	0.33
A-BMT-19: 12/2/00	2.24	1.68	4.48		181.1	116.72	1953.00		5.77	14.86	0.33
A-BMT-20: 12/2/00	-2.24	1.42	0.00		-228.4	114.49	1543.50		3.93	13.01	0.32
A-BMT-21: 12/2/00	11.20	2.10	13.44		496.1	118.41	2268.00		5.72	14.80	0.33
A-BMT-22: 12/2/00	-2.24	1.42	0.00		496.1	118.41	2268.00		5.65	14.73	0.33
A-BMT-23: 12/2/00	-2.24	1.42	0.00		811.1	120.07	2583.00		5.72	14.80	0.33
A-BMT-24: 12/2/00	2.24	1.68	4.48		874.1	120.40	2646.00		4.98	14.06	0.33
A-BMT-25: 12/2/00	6.72	1.90	8.96		23.6	115.87	1795.50		4.65	13.73	0.33
A-BMT-26: 12/2/00	6.72	1.90	8.96		-480.4	113.09	1291.50		3.46	12.54	0.32
A-BMT-27: 12/2/00	-2.24	1.42	0.00		181.1	116.72	1953.00		3.26	12.34	0.32
A-BMT-28: 12/2/00	6.72	1.90	8.96		23.6	115.87	1795.50		6.00	15.08	0.34
A-BMT-29: 12/2/00	6.72	1.90	8.96		55.1	116.04	1827.00		5.33	14.41	0.33
A-BMT-30: 12/2/00	6.72	1.90	8.96		1252.1	122.36	3024.00		5.34	14.42	0.33
MINIMUM	-3.36				-732.4				-3.37	5.49	
MAXIMUM	32.48		35.84		1386.0		3024.00		6.00	15.08	

* Refer to Appendix B.

TABLE A1:
TOTAL SURFACE CONTAMINATION MEASUREMENTS
CLASS "A"

SAMPLE NAME	ALPHA (DPM/100CM2)				BETA (DPM/100CM2)				GAMMA (uR/hr)		
	NET	STD DEV	GROSS	REM	NET	STD DEV	GROSS	REM	NET	GROSS	STD DEV
A-VLT-1: 12/3/00	1.12	9.76	4.48	*	693.0	336.33	2142.00	*	7.17	16.04	0.34
A-VLT-2: 12/3/00	5.60	2.15	8.96		756.0	109.12	2205.00		6.79	15.66	0.34
A-VLT-3: 12/3/00	-3.36	1.74	0.00		378.0	106.91	1827.00		6.89	15.76	0.34
A-VLT-4: 12/3/00	1.12	1.95	4.48		1008.0	110.56	2457.00		6.92	15.79	0.34
A-VLT-5: 12/3/00	5.60	2.15	8.96		724.5	108.94	2173.50		6.71	15.58	0.34
A-VLT-6: 12/3/00	1.12	1.95	4.48		882.0	109.84	2331.00		6.95	15.82	0.34
A-VLT-7: 12/3/00	-3.36	1.74	0.00		756.0	109.12	2205.00		6.57	15.44	0.34
A-VLT-8: 12/3/00	1.12	1.95	4.48		1165.5	111.46	2614.50		5.92	14.79	0.33
A-VLT-9: 12/3/00	1.12	1.95	4.48		693.0	108.75	2142.00		6.17	15.04	0.33
A-VLT-10: 12/3/00	-3.36	1.74	0.00		724.5	108.94	2173.50		6.85	15.72	0.34
A-VLT-11: 12/3/00	-3.36	1.74	0.00		409.5	107.10	1858.50		7.10	15.97	0.34
A-VLT-12: 12/3/00	1.12	1.95	4.48		315.0	106.54	1764.00		6.93	15.80	0.34
A-VLT-13: 12/3/00	1.12	1.95	4.48		976.5	110.38	2425.50		6.56	15.42	0.34
A-VLT-14: 12/3/00	-3.36	1.74	0.00		1071.0	110.92	2520.00		7.40	16.27	0.34
A-VLT-15: 12/3/00	-3.36	1.74	0.00		850.5	109.66	2299.50		7.39	16.26	0.34
A-VLT-16: 12/3/00	1.12	1.95	4.48		283.5	106.36	1732.50		6.58	15.45	0.34
A-VLT-17: 12/3/00	-3.36	1.74	0.00		787.5	109.30	2236.50		7.05	15.92	0.34
A-VLT-18: 12/3/00	5.60	2.15	8.96		504.0	107.65	1953.00		6.31	15.18	0.33
A-VLT-19: 12/3/00	-3.36	1.74	0.00		724.5	108.94	2173.50		7.32	16.19	0.34
A-VLT-20: 12/3/00	1.12	1.95	4.48		787.5	109.30	2236.50		7.28	16.14	0.34
A-VLT-21: 12/3/00	1.12	1.95	4.48		945.0	110.20	2394.00		6.63	15.50	0.34
A-VLT-22: 12/3/00	5.60	2.15	8.96		693.0	108.75	2142.00		5.73	14.60	0.33
A-VLT-23: 12/3/00	1.12	1.95	4.48		787.5	109.30	2236.50		6.76	15.63	0.34
A-VLT-24: 12/3/00	-3.36	1.74	0.00		630.0	108.39	2079.00		6.97	15.84	0.34
A-VLT-25: 12/3/00	-3.36	1.74	0.00		189.0	105.79	1638.00		6.54	15.41	0.34
A-VLT-26: 12/3/00	5.60	2.15	8.96		346.5	106.73	1795.50		7.42	16.29	0.34
A-VLT-27: 12/3/00	-3.36	1.74	0.00		756.0	109.12	2205.00		6.75	15.61	0.34
A-VLT-28: 12/3/00	-3.36	1.74	0.00		378.0	106.91	1827.00		7.56	16.43	0.34
A-VLT-29: 12/3/00	-3.36	1.74	0.00		252.0	106.17	1701.00		6.80	15.67	0.34
A-VLT-30: 12/3/00	-3.36	1.74	0.00		346.5	106.73	1795.50		7.10	15.97	0.34
A-CTL-31A: 12/3/00	-3.36	1.74	0.00		94.5	105.23	1543.50		-0.01	8.86	0.29
A-CTL-32: 12/3/00	1.12	1.95	4.48		-31.5	104.47	1417.50		-1.02	7.84	0.28
A-CTL-33: 12/3/00	-3.36	1.74	0.00		882.0	109.84	2331.00		1.37	10.24	0.30
A-CTL-34: 12/3/00	-3.36	1.74	0.00		-94.5	104.09	1354.50		-0.43	8.43	0.28
A-CTL-35: 12/3/00	-3.36	1.74	0.00		-346.5	102.56	1102.50		-0.28	8.59	0.28
A-CTL-36: 12/3/00	5.60	2.15	8.96		-315.0	102.75	1134.00		-0.76	8.10	0.28
A-CTL-37: 12/3/00	1.12	1.95	4.48		-378.0	102.36	1071.00		-0.76	8.11	0.28
A-CTL-38: 12/3/00	-3.36	1.74	0.00		598.5	108.21	2047.50		2.84	11.71	0.31
A-CTL-39: 12/3/00	1.12	1.95	4.48		126.0	105.42	1575.00		0.15	9.02	0.29
A-CTL-40: 12/3/00	5.60	1.74	8.96		409.5	107.10	1858.50		1.65	10.52	0.30
A-CTL-41: 12/3/00	-3.36	1.74	0.00		31.5	104.85	1480.50		-1.13	7.74	0.28
A-CTL-31B: 12/3/00	1.12	1.74	4.48		378.0	106.91	1827.00		4.09	12.95	0.32

*Refer to Appendix B

TABLE A1:
TOTAL SURFACE CONTAMINATION MEASUREMENTS
CLASS "A"

SAMPLE NAME	ALPHA (DPM/100CM2)				BETA (DPM/100CM2)				GAMMA (uR/hr)		
	NET	STD DEV	GROSS dpm	REM	NET	STD DEV	GROSS dpm	REM	NET	GROSS	STD DEV
A-AUX-1: 12/4/00	3.36	12.87	8.96	*	-110.3	277.31	1165.50	*	-2.16	6.49	0.27
A-AUX-2: 12/4/00	-5.60	2.24	0.00		-267.8	96.47	1008.00		-3.10	5.55	0.26
A-AUX-3: 12/4/00	-5.60	2.24	0.00		-204.8	96.88	1071.00		-1.79	6.86	0.27
A-AUX-4: 12/4/00	3.36	2.57	8.96		-173.3	97.09	1102.50		-2.78	5.87	0.26
A-AUX-5: 12/4/00	-5.60	2.24	0.00		-299.3	96.27	976.50		-1.96	6.69	0.27
A-AUX-6: 12/4/00	-5.60	2.24	0.00		-267.8	96.47	1008.00		-1.26	7.39	0.27
A-AUX-7: 12/4/00	-1.12	2.41	4.48		-15.8	98.11	1260.00		-1.27	7.38	0.27
A-AUX-8: 12/4/00	-5.60	2.24	0.00		47.3	98.51	1323.00		-3.00	5.65	0.26
A-AUX-9: 12/4/00	-5.60	2.24	0.00		110.3	98.91	1386.00		-0.39	8.26	0.28
A-AUX-10: 12/4/00	-1.12	2.41	4.48		173.3	99.31	1449.00		-1.00	7.65	0.28
A-AUX-11: 12/4/00	-1.12	2.41	4.48		47.3	98.51	1323.00		-0.04	8.61	0.28
A-AUX-12: 12/4/00	3.36	2.57	8.96		-330.8	96.06	945.00		-4.23	4.42	0.25
A-AUX-13: 12/4/00	-1.12	2.41	4.48		204.8	99.51	1480.50		-1.91	6.74	0.27
A-AUX-14: 12/4/00	-5.60	2.24	0.00		141.8	99.11	1417.50		-3.02	5.63	0.26
A-AUX-15: 12/4/00	-5.60	2.24	0.00		47.3	98.51	1323.00		-1.62	7.03	0.27
A-AUX-16: 12/4/00	-1.12	2.41	4.48		-110.3	97.50	1165.50		-2.40	6.25	0.26
A-AUX-17: 12/4/00	-5.60	2.24	0.00		-47.3	97.90	1228.50		-1.79	6.86	0.27
A-AUX-18: 12/4/00	-1.12	2.41	4.48		-141.8	97.29	1134.00		-1.21	7.44	0.27
A-AUX-19: 12/4/00	3.36	2.57	8.96		-15.8	98.11	1260.00		-0.46	8.19	0.28
A-AUX-20: 12/4/00	3.36	2.57	8.96		-267.8	96.47	1008.00		-0.85	7.80	0.28
A-AUX-21: 12/4/00	-5.60	2.24	0.00		-15.8	98.11	1260.00		-1.17	7.48	0.27
A-AUX-22: 12/4/00	-5.60	2.24	0.00		-141.8	97.29	1134.00		-1.67	6.98	0.27
A-AUX-23: 12/4/00	-5.60	2.24	0.00		-47.3	97.90	1228.50		-1.36	7.29	0.27
A-AUX-24: 12/4/00	7.84	2.73	13.44		-204.8	96.88	1071.00		-2.29	6.36	0.26
A-AUX-25: 12/4/00	-5.60	2.24	0.00		15.8	98.31	1291.50		-1.06	7.59	0.27
A-AUX-26: 12/4/00	-1.12	2.41	4.48		803.3	103.23	2079.00		-0.94	7.71	0.28
A-AUX-27: 12/4/00	-5.60	2.24	0.00		330.8	100.31	1606.50		2.36	11.01	0.30
A-AUX-28: 12/4/00	3.36	2.57	8.96		677.3	102.46	1953.00		-0.07	8.58	0.28
A-AUX-29: 12/4/00	3.36	2.57	8.96		614.3	102.07	1890.00		-0.10	8.55	0.28
A-AUX-30: 12/4/00	-5.60	2.24	0.00		803.3	103.23	2079.00		-0.05	8.60	0.28
A-PLB-1: 12/7/00	0.00	2.19	4.48		685.1	104.52	2016.00		1.41	10.63	0.30
A-PLB-2: 12/7/00	0.00	2.19	4.48		212.6	101.63	1543.50		3.72	12.94	0.32
A-PLB-3: 12/7/00	4.48	2.37	8.96		685.1	104.52	2016.00		3.58	12.79	0.32
A-PLB-4: 12/7/00	0.00	2.19	4.48		307.1	102.22	1638.00		4.13	13.34	0.32
A-PLB-5: 12/7/00	-4.48	2.00	0.00		23.6	100.45	1354.50		4.08	13.29	0.32
A-PLB-6: 12/7/00	0.00	2.19	4.48		307.1	102.22	1638.00		3.63	12.85	0.32
A-PLB-7: 12/7/00	-4.48	2.00	0.00		118.1	101.05	1449.00		3.65	12.87	0.32
A-PLB-8: 12/7/00	0.00	2.19	4.48		275.6	102.02	1606.50		3.59	12.80	0.32
A-PLB-9: 12/7/00	-4.48	2.00	0.00		212.6	101.63	1543.50		3.86	13.07	0.32
A-PLB-10: 12/7/00	-4.48	2.00	0.00		338.6	102.41	1669.50		4.13	13.35	0.32
A-PLB-11: 12/7/00	-4.48	2.00	0.00		149.6	101.24	1480.50		3.45	12.67	0.32

* Refer to Appendix B

TABLE A1:
TOTAL SURFACE CONTAMINATION MEASUREMENTS
CLASS "A"

SAMPLE NAME	ALPHA (DPM/100CM2)				BETA (DPM/100CM2)				GAMMA (uR/hr)		
	NET	STD DEV	GROSS dpm	REM	NET	STD DEV	GROSS dpm	REM	NET	GROSS	STD DEV
A-PLB-12: 12/7/00	4.48	2.00	8.96	*	433.1	102.99	1764.00	*	3.32	12.54	0.32
A-PLB-13: 12/7/00	-4.48	2.00	0.00		149.6	101.24	1480.50		3.06	12.27	0.32
A-PLB-14: 12/7/00	-4.48	2.00	0.00		370.1	102.60	1701.00		3.46	12.68	0.32
A-PLB-15: 12/7/00	-4.48	2.00	0.00		307.1	102.22	1638.00		3.82	13.03	0.32
A-PLB-16: 12/7/00	-4.48	2.00	0.00		275.6	102.02	1606.50		3.11	12.32	0.32
A-PLB-17: 12/7/00	-4.48	2.00	0.00		118.1	101.05	1449.00		2.97	12.19	0.32
A-PLB-18: 12/7/00	4.48	2.37	8.96		779.6	105.09	2110.50		2.37	11.59	0.31
A-PLB-19: 12/7/00	4.48	2.37	8.96		464.6	103.18	1795.50		1.97	11.18	0.31
A-PLB-20: 12/7/00	-4.48	2.00	0.00		433.1	102.99	1764.00		0.27	9.48	0.29
MAXIMUM	7.84		13.44		803.3		2110.50		4.13	13.35	
MINIMUM	-5.60				-330.8					4.42	

* Refer to Appendix B

TABLE A1:
TOTAL SURFACE CONTAMINATION MEASUREMENTS
CLASS "A"

SAMPLE NAME	ALPHA (DPM/100CM2)				BETA (DPM/100CM2)				GAMMA (uR/hr)		
	NET	STD DEV	GROSS	REM	NET	STD DEV	GROSS	REM	NET	GROSS	STD DEV
A-CNR-1: 12/4/00	12.32	14.34	17.92	*	1086.8	338.53	2362.50	*	5.40	14.06	0.32
A-CNR-2: 12/4/00	-1.12	2.24	0.00		834.8	103.42	2110.50		2.92	11.57	0.31
A-CNR-3: 12/4/00	0.67	2.57	8.96		645.8	102.27	1921.50		1.25	9.90	0.29
A-CNR-4: 12/4/00	-0.22	2.41	4.48		708.8	102.65	1984.50		1.58	10.23	0.30
A-CNR-5: 12/4/00	-1.12	2.24	0.00		1244.3	105.89	2520.00		3.73	12.38	0.31
A-CNR-6: 12/4/00	1.57	2.73	13.44		992.3	104.38	2268.00		2.35	11.00	0.30
A-CNR-7: 12/4/00	-1.12	2.24	0.00		110.3	98.91	1386.00		-0.28	8.37	0.28
A-CNR-8: 12/4/00	-0.22	2.41	4.48		645.8	102.27	1921.50		3.59	12.24	0.31
A-CNR-9: 12/4/00	-0.22	2.41	4.48		614.3	102.07	1890.00		4.36	13.01	0.32
A-CNR-10: 12/4/00	-0.22	2.41	4.48		299.3	100.11	1575.00		2.78	11.43	0.31
A-CNR-11: 12/4/00	3.36	3.01	22.40		204.8	99.51	1480.50		0.24	8.89	0.29
A-CNR-12: 12/4/00	0.67	2.57	8.96		-267.8	96.47	1008.00		-0.33	8.32	0.28
A-CNR-13: 12/4/00	-1.12	2.24	0.00		78.8	98.71	1354.50		-0.12	8.53	0.28
A-CNR-14: 12/4/00	-0.22	2.41	4.48		834.8	103.42	2110.50		0.71	9.36	0.29
A-CNR-15: 12/4/00	2.46	2.87	17.92		1023.8	104.57	2299.50		3.39	12.04	0.31
A-CNR-16: 12/4/00	0.67	2.57	8.96		960.8	104.19	2236.50		2.86	11.51	0.31
A-CNR-17: 12/4/00	-0.22	2.41	4.48		929.3	104.00	2205.00		2.57	11.22	0.30
A-CNR-18: 12/4/00	2.46	2.87	17.92		1086.8	104.95	2362.50		3.39	12.04	0.31
A-CNR-19: 12/4/00	0.67	2.57	8.96		645.8	102.27	1921.50		1.08	9.73	0.29
A-CNR-20: 12/4/00	-0.22	2.41	4.48		362.3	100.50	1638.00		1.91	10.56	0.30
MAXIMUM	12.32		22.40		1244.3		2520.00		5.40	14.06	
MINIMUM	-1.12				-267.8					8.32	

* Refer to Appendix B

TABLE A2:
TOTAL SURFACE CONTAMINATION MEASUREMENTS
CLASS "B"

SAMPLE NAME	1 MIN ALPHA TOTAL	1 MIN ALPHA REM	1 MIN BETA TOTAL	1 MIN BETA REM	1 MIN GAM TOTAL	ALPHA INSTRUMENT BACKG	ALPHA INSTRUMENT EFACT	ALPHA INSTRUMENT AFACT	BETA INSTRUMENT BACKG	BETA INSTRUMENT EFACT	BETA INSTRUMENT AFACT	GAMMA BACKG	GAMMA EFACT
B-LAB-1: 12/6/00	0	*	36	*	1411	1	3.2	1.4	39	6.3	5	1988.5	0.0047
B-LAB-2: 12/6/00	0		36		1623	1	3.2	1.4	39	6.3	5	1988.5	0.0047
B-LAB-3: 12/6/00	0		40		1644	1	3.2	1.4	39	6.3	5	1988.5	0.0047
B-LAB-4: 12/6/00	1		41		1611	1	3.2	1.4	39	6.3	5	1988.5	0.0047
B-LAB-5: 12/6/00	0		41		1415	1	3.2	1.4	39	6.3	5	1988.5	0.0047
B-LAB-6: 12/6/00	2		49		1048	1	3.2	1.4	39	6.3	5	1988.5	0.0047
B-LAB-7: 12/6/00	2		63		1841	1	3.2	1.4	39	6.3	5	1988.5	0.0047
B-LAB-8: 12/6/00	3		34		1528	1	3.2	1.4	39	6.3	5	1988.5	0.0047
B-LAB-9: 12/6/00	2		43		1591	1	3.2	1.4	39	6.3	5	1988.5	0.0047
B-LAB-10: 12/6/00	0		43		1411	1	3.2	1.4	39	6.3	5	1988.5	0.0047
B-LAB-11: 12/6/00	1		40		1163	1	3.2	1.4	39	6.3	5	1988.5	0.0047
B-LAB-12: 12/6/00	2		39		1469	1	3.2	1.4	39	6.3	5	1988.5	0.0047
B-LAB-13: 12/6/00	1		39		1539	1	3.2	1.4	39	6.3	5	1988.5	0.0047
B-LAB-14: 12/6/00	1		40		1599	1	3.2	1.4	39	6.3	5	1988.5	0.0047
B-LAB-15: 12/6/00	1		50		2038	1	3.2	1.4	39	6.3	5	1988.5	0.0047
B-LAB-16: 12/6/00	1		35		1074	1	3.2	1.4	39	6.3	5	1988.5	0.0047
B-LAB-17: 12/6/00	0		71		1837	1	3.2	1.4	39	6.3	5	1988.5	0.0047
B-LAB-18: 12/6/00	0		41		1554	1	3.2	1.4	39	6.3	5	1988.5	0.0047
B-LAB-19: 12/6/00	2		35		1259	1	3.2	1.4	39	6.3	5	1988.5	0.0047
B-LAB-20: 12/6/00	2		63		1888	1	3.2	1.4	39	6.3	5	1988.5	0.0047

* Refer to Appendix B

TABLE A2:
TOTAL SURFACE CONTAMINATION MEASUREMENTS
CLASS "B"

SAMPLE NAME	ALPHA (DPM/100CM2)				BETA (DPM/100CM2)				GAMMA (uR/hr)		
	NET	STD DEV	GROSS	REM	NET	STD DEV	GROSS	REM	NET	GROSS	STD DEV
B-LAB-1: 12/6/00	-4.48	10.02	0.00	*	-94.5	272.80	1134.00	*	-2.69	6.56	0.27
B-LAB-2: 12/6/00	-0.90	2.00	0.00		-94.5	95.75	1134.00		-1.70	7.55	0.28
B-LAB-3: 12/6/00	-0.90	2.00	0.00		31.5	96.58	1260.00		-1.60	7.65	0.28
B-LAB-4: 12/6/00	0.00	2.19	4.48		63.0	96.78	1291.50		-1.76	7.49	0.28
B-LAB-5: 12/6/00	-0.90	2.00	0.00		63.0	96.78	1291.50		-2.67	6.58	0.27
B-LAB-6: 12/6/00	0.90	2.37	8.96		315.0	98.41	1543.50		-4.37	4.87	0.26
B-LAB-7: 12/6/00	0.90	2.37	8.96		756.0	101.19	1984.50		-0.69	8.56	0.29
B-LAB-8: 12/6/00	1.79	2.53	13.44		-157.5	95.34	1071.00		-2.14	7.11	0.28
B-LAB-9: 12/6/00	0.90	2.37	8.96		126.0	97.19	1354.50		-1.85	7.40	0.28
B-LAB-10: 12/6/00	-0.90	2.00	0.00		126.0	97.19	1354.50		-2.69	6.56	0.27
B-LAB-11: 12/6/00	0.00	2.19	4.48		31.5	96.58	1260.00		-3.84	5.41	0.26
B-LAB-12: 12/6/00	0.90	2.37	8.96		0.0	96.37	1228.50		-2.42	6.83	0.27
B-LAB-13: 12/6/00	0.00	2.19	4.48		0.0	96.37	1228.50		-2.09	7.16	0.28
B-LAB-14: 12/6/00	0.00	2.19	4.48		31.5	96.58	1260.00		-1.81	7.44	0.28
B-LAB-15: 12/6/00	0.00	2.19	4.48		346.5	98.61	1575.00		0.23	9.48	0.30
B-LAB-16: 12/6/00	0.00	2.19	4.48		-126.0	95.54	1102.50		-4.25	5.00	0.26
B-LAB-17: 12/6/00	-0.90	2.00	0.00		1008.0	102.75	2236.50		-0.70	8.54	0.29
B-LAB-18: 12/6/00	-0.90	2.00	0.00		63.0	96.78	1291.50		-2.02	7.23	0.28
B-LAB-19: 12/6/00	0.90	2.37	8.96		-126.0	95.54	1102.50		-3.39	5.86	0.26
B-LAB-20: 12/6/00	0.90	2.37	8.96		756.0	101.19	1984.50		-0.47	8.78	0.29
MAXIMUM	1.79		13.44		1008.0		2236.50		0.23	9.48	
MINIMUM	-4.48				-157.5					4.87	

* Refer to Appendix B

TABLE A3:
TOTAL SURFACE CONTAMINATION MEASUREMENTS
CLASS "C"

SAMPLE NAME	1 MIN ALPHA TOTAL	1 MIN ALPHA REM	1 MIN BETA TOTAL	1 MIN BETA REM	1 MIN GAM TOTAL	ALPHA INSTRUMENT BACKG	ALPHA INSTRUMENT EFACT	ALPHA INSTRUMENT AFACT	BETA INSTRUMENT BACKG	BETA INSTRUMENT EFACT	BETA INSTRUMENT AFACT	GAMMA BACKG	GAMMA EFACT
C-OCC-1: 12/5/00	1	*	56	*	1838	3.5	3.2	1.4	43	6.3	5	1794	0.0047
C-OCC-2: 12/5/00	1		26		1517	3.5	3.2	1.4	43	6.3	5	1794	0.0047
C-OCC-3: 12/5/00	1		28		1643	3.5	3.2	1.4	43	6.3	5	1794	0.0047
C-OCC-4: 12/5/00	1		40		1687	3.5	3.2	1.4	43	6.3	5	1794	0.0047
C-OCC-5: 12/5/00	2		50		1516	3.5	3.2	1.4	43	6.3	5	1794	0.0047
C-OCC-6: 12/5/00	0		39		1420	3.5	3.2	1.4	43	6.3	5	1794	0.0047
C-OCC-7: 12/5/00	3		39		1537	3.5	3.2	1.4	43	6.3	5	1794	0.0047
C-OCC-8: 12/5/00	0		36		1486	3.5	3.2	1.4	43	6.3	5	1794	0.0047
C-OCC-9: 12/5/00	0		37		1518	3.5	3.2	1.4	43	6.3	5	1794	0.0047
C-OCC-10: 12/5/00	0		27		1460	3.5	3.2	1.4	43	6.3	5	1794	0.0047
C-OFC-1: 12/5/00	3		86		2848	3.5	3.2	1.4	43	6.3	5	1794	0.0047
C-OFC-2: 12/5/00	1		36		1828	3.5	3.2	1.4	43	6.3	5	1794	0.0047
C-OFC-3: 12/5/00	0		39		1520	3.5	3.2	1.4	43	6.3	5	1794	0.0047
C-OFC-4: 12/5/00	2		36		1579	3.5	3.2	1.4	43	6.3	5	1794	0.0047
C-OFC-5: 12/5/00	1		50		1717	3.5	3.2	1.4	43	6.3	5	1794	0.0047
C-OFC-6: 12/5/00	0		45		1762	3.5	3.2	1.4	43	6.3	5	1794	0.0047
C-OFC-7: 12/5/00	0		48		1458	3.5	3.2	1.4	43	6.3	5	1794	0.0047
C-OFC-8: 12/5/00	6		37		1717	3.5	3.2	1.4	43	6.3	5	1794	0.0047
C-OFC-9: 12/5/00	2		41		1444	3.5	3.2	1.4	43	6.3	5	1794	0.0047
C-OFC-10: 12/5/00	1		37		1427	3.5	3.2	1.4	43	6.3	5	1794	0.0047
C-OCR-1: 12/6/00	1		38		1376	1	3.2	1.4	39	6.3	5	1988.5	0.0047
C-OCR-2: 12/6/00	2		44		1554	1	3.2	1.4	39	6.3	5	1988.5	0.0047
C-OCR-3: 12/6/00	0		39		1548	1	3.2	1.4	39	6.3	5	1988.5	0.0047
C-OCR-4: 12/6/00	2		50		1621	1	3.2	1.4	39	6.3	5	1988.5	0.0047
C-OCR-5: 12/6/00	0		48		1718	1	3.2	1.4	39	6.3	5	1988.5	0.0047
C-OCR-6: 12/6/00	1		29		1503	1	3.2	1.4	39	6.3	5	1988.5	0.0047
C-OCR-7: 12/6/00	7		33		1598	1	3.2	1.4	39	6.3	5	1988.5	0.0047
C-OCR-8: 12/6/00	0		42		1480	1	3.2	1.4	39	6.3	5	1988.5	0.0047
C-OCR-9: 12/6/00	2		35		1670	1	3.2	1.4	39	6.3	5	1988.5	0.0047
C-OCR-10: 12/6/00	0		40		1564	1	3.2	1.4	39	6.3	5	1988.5	0.0047
C-FGR-1: 12/6/00	1		62		2835	1	3.2	1.4	39	6.3	5	1988.5	0.0047
C-FGR-2: 12/6/00	1		50		2287	1	3.2	1.4	39	6.3	5	1988.5	0.0047
C-FGR-3: 12/6/00	0		61		2455	1	3.2	1.4	39	6.3	5	1988.5	0.0047
C-FGR-4: 12/6/00	0		50		2771	1	3.2	1.4	39	6.3	5	1988.5	0.0047
C-FGR-5: 12/6/00	0		51		2590	1	3.2	1.4	39	6.3	5	1988.5	0.0047
C-FGR-6: 12/6/00	1		31		2391	1	3.2	1.4	39	6.3	5	1988.5	0.0047
C-FGR-7: 12/6/00	0		46		2461	1	3.2	1.4	39	6.3	5	1988.5	0.0047
C-FGR-8: 12/6/00	1		43		2302	1	3.2	1.4	39	6.3	5	1988.5	0.0047
C-FGR-9: 12/6/00	2		66		2734	1	3.2	1.4	39	6.3	5	1988.5	0.0047
C-FGR-10: 12/6/00	3		56		2418	1	3.2	1.4	39	6.3	5	1988.5	0.0047

* Refer to Appendix B.

TABLE A3:
TOTAL SURFACE CONTAMINATION MEASUREMENTS
CLASS "C"

SAMPLE NAME	ALPHA (DPM/100CM2)				BETA (DPM/100CM2)				GAMMA (uR/hr)		
	NET	STD DEV	GROSS	REM	NET	STD DEV	GROSS	REM	NET	GROSS	STD DEV
C-OCC-1: 12/5/00	-11.20	19.27	4.48	*	409.5	313.42	1764.00	*	0.20	8.55	0.28
C-OCC-2: 12/5/00	-11.20	3.85	4.48		-535.5	97.80	819.00		-1.29	7.06	0.27
C-OCC-3: 12/5/00	-11.20	3.85	4.48		-472.5	98.21	882.00		-0.70	7.64	0.27
C-OCC-4: 12/5/00	-11.20	3.85	4.48		-94.5	100.60	1260.00		-0.50	7.85	0.27
C-OCC-5: 12/5/00	-6.72	3.96	8.96		220.5	102.56	1575.00		-1.29	7.05	0.27
C-OCC-6: 12/5/00	-15.68	3.75	0.00		-126.0	100.41	1228.50		-1.74	6.60	0.26
C-OCC-7: 12/5/00	-2.24	4.06	13.44		-126.0	100.41	1228.50		-1.20	7.15	0.27
C-OCC-8: 12/5/00	-15.68	3.75	0.00		-220.5	99.81	1134.00		-1.43	6.91	0.27
C-OCC-9: 12/5/00	-15.68	3.75	0.00		-189.0	100.01	1165.50		-1.28	7.06	0.27
C-OCC-10: 12/5/00	-15.68	3.75	0.00		-504.0	98.00	850.50		-1.55	6.79	0.27
C-OFC-1: 12/5/00	-2.24	4.06	13.44		1354.5	109.30	2709.00		4.90	13.25	0.32
C-OFC-2: 12/5/00	-11.20	3.85	4.48		-220.5	99.81	1134.00		0.16	8.50	0.28
C-OFC-3: 12/5/00	-15.68	3.75	0.00		-126.0	100.41	1228.50		-1.27	7.07	0.27
C-OFC-4: 12/5/00	-6.72	3.96	8.96		-220.5	99.81	1134.00		-1.00	7.34	0.27
C-OFC-5: 12/5/00	-11.20	3.85	4.48		220.5	102.56	1575.00		-0.36	7.99	0.28
C-OFC-6: 12/5/00	-15.68	3.75	0.00		63.0	101.58	1417.50		-0.15	8.20	0.28
C-OFC-7: 12/5/00	-15.68	3.75	0.00		157.5	102.17	1512.00		-1.56	6.78	0.27
C-OFC-8: 12/5/00	11.20	4.34	26.88		-189.0	100.01	1165.50		-0.36	7.99	0.28
C-OFC-9: 12/5/00	-6.72	3.96	8.96		-63.0	100.80	1291.50		-1.63	6.72	0.26
C-OFC-10: 12/5/00	-11.20	3.85	4.48		-189.0	100.01	1165.50		-1.71	6.64	0.26
C-OCR-1: 12/6/00	0.00	2.19	4.48		-31.5	96.17	1197.00		-2.85	6.40	0.27
C-OCR-2: 12/6/00	4.48	2.37	8.96		157.5	97.40	1386.00		-2.02	7.23	0.28
C-OCR-3: 12/6/00	-4.48	2.00	0.00		0.0	96.37	1228.50		-2.05	7.20	0.28
C-OCR-4: 12/6/00	4.48	2.37	8.96		346.5	98.61	1575.00		-1.71	7.54	0.28
C-OCR-5: 12/6/00	-4.48	2.00	0.00		283.5	98.21	1512.00		-1.26	7.99	0.28
C-OCR-6: 12/6/00	0.00	2.19	4.48		-315.0	94.29	913.50		-2.26	6.99	0.27
C-OCR-7: 12/6/00	26.88	3.10	31.36		-189.0	95.13	1039.50		-1.82	7.43	0.28
C-OCR-8: 12/6/00	-4.48	2.00	0.00		94.5	96.99	1323.00		-2.36	6.88	0.27
C-OCR-9: 12/6/00	4.48	2.37	8.96		-126.0	95.54	1102.50		-1.48	7.77	0.28
C-OCR-10: 12/6/00	-4.48	2.00	0.00		31.5	96.58	1260.00		-1.97	7.27	0.28
C-FGR-1: 12/6/00	0.00	2.19	4.48		724.5	101.00	1953.00		3.94	13.19	0.32
C-FGR-2: 12/6/00	0.00	2.19	4.48		346.5	98.61	1575.00		1.39	10.64	0.30
C-FGR-3: 12/6/00	-4.48	2.00	0.00		693.0	100.80	1921.50		2.17	11.42	0.31
C-FGR-4: 12/6/00	-4.48	2.00	0.00		346.5	98.61	1575.00		3.64	12.89	0.32
C-FGR-5: 12/6/00	-4.48	2.00	0.00		378.0	98.81	1606.50		2.80	12.05	0.31
C-FGR-6: 12/6/00	0.00	2.19	4.48		-252.0	94.71	976.50		1.87	11.12	0.31
C-FGR-7: 12/6/00	-4.48	2.00	0.00		220.5	97.80	1449.00		2.20	11.45	0.31
C-FGR-8: 12/6/00	0.00	2.19	4.48		126.0	97.19	1354.50		1.46	10.71	0.30
C-FGR-9: 12/6/00	4.48	2.37	8.96		850.5	101.78	2079.00		3.47	12.72	0.32
C-FGR-10: 12/6/00	8.96	2.53	13.44		535.5	99.81	1764.00		2.00	11.25	0.31
MAXIMUM	26.88		31.36		1354.5		2709.00		4.90	13.25	
MINIMUM	-15.68				-535.5					6.40	

* Refer to Appendix B.

APPENDIX B

REMOVABLE SURFACE CONTAMINATION

OXFR ECLIPSE LB

Printing Date: 12/ 4/00
Print Time: 2:17:18PM

Version 1.10
Report Name: Gross Alpha Beta Basic CPM DPM

Count Date: 12/ 4/00

GROSS ALPHA / BETA BASIC ACTIVITY ANALYSIS

Procedure Name: Smear 1 Minute Count Stored Bkg. - 200012041340

System Information
Group: A
Unit ID: RMHF Tennelec
Serial No.: NO007137
Detector S/N: 6350

Sample Information
Sample Units:
Geometry: Smear

Detection Limit

	Alpha	Beta
Batch MDA:		
Batch LLD:		
Critical Level:		

Count Parameters
Count Mode: Simultaneous
Operating Voltage: 1,480.00
Count: Time: 1.00
Delay: 0.00
Sample Replicates: 1

	Alpha	Beta	Attenuation	Spillover
Efficiency (%):	34.84	39.85	Alpha	Disabeled
Spillover:	Disable		Beta	Disabeled
Spillover (%):				
Background Subtract:	Enable		Curve Model	
Background Type:	QC Data		Alpha	Constant
Background	0.05	1.30	Beta	Constant

Weak Sample Reject:
Time (min): 0.00
CPM: 0
Activity Correction: Enabled

Analysis Information
SDG:
Sample Matrix:
Chemistry Analyst ID:
Count Room Analyst ID:
Batch ID: 1,126

Sample ID	Sample Type	Lab ID	Carrier ID	Net Alpha CPM	Alpha DPM	2 Sigma DPM	Net Beta CPM	Beta DPM	2 Sigma DPM	Aliquot Amount	Residual Mass	Alpha MDA DPM/Unit	Beta MDA DPM/Unit
2000124134016-A1	Unknown	A-VLT-1	1	-0.05	-0.14	0.41	0.70	1.76	7.33	0.00	0.00		
2000124134142-A2	Unknown	A-VLT-2	2	-0.05	-0.14	0.41	0.70	1.76	7.33	0.00	0.00		
2000124134252-A3	Unknown	A-VLT-3	3	-0.05	-0.14	0.41	3.70	9.29	11.38	0.00	0.00		
200012413442-A4	Unknown	A-VLT-4	4	-0.05	-0.14	0.41	5.70	14.30	13.42	0.00	0.00		
2000124134512-A5	Unknown	A-VLT-5	5	-0.05	-0.14	0.41	1.70	4.27	8.88	0.00	0.00		
2000124134623-A6	Unknown	A-VLT-6	6	-0.05	-0.14	0.41	0.70	1.76	7.33	0.00	0.00		
2000124134733-A7	Unknown	A-VLT-7	7	-0.05	-0.14	0.41	4.70	11.79	12.44	0.00	0.00		
2000124134843-A8	Unknown	A-VLT-8	8	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		
2000124134953-A9	Unknown	A-VLT-9	9	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		
200012413513-A10	Unknown	A-VLT-10	10	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		
2000124135213-A11	Unknown	A-VLT-11	11	-0.05	-0.14	0.41	0.70	1.76	7.33	0.00	0.00		
2000124135323-A12	Unknown	A-VLT-12	12	-0.05	-0.14	0.41	4.70	11.79	12.44	0.00	0.00		

Analyst Review DLBood Date 12/4/00

Review PLibby Date 2/3/01

Count Date: 12/ 4/00

GROSS ALPHA / BETA
BASIC ACTIVITY ANALYSIS

Procedure Name: Smear 1 Minute Count Stored Bkg. - 200012041340

System Information
Group: A
Unit ID: RMHF Tennelec
Serial No.: NO007137
Detector S/N: 6350

Sample Information
Sample Units:
Geometry: Smear

Detection Limit

	Alpha	Beta
Batch MDA:		
Batch LLD:		
Critical Level:		

Count Parameters
Count Mode: Simultaneous
Operating Voltage: 1,460.00
Count: Time: 1.00
Delay: 0.00
Sample Replicates: 1

	Alpha	Beta	Attenuation	Spillover
Efficiency (%):	34.84	39.65	Alpha	Disabeled
Spillover:	Disable		Beta	Disabeled
Spillover (%):				
Background Subtract:	Enable		Curve Model	
Background Type:	QC Data		Alpha	Constant
Background	0.05	1.30	Beta	Constant

Weak Sample Reject:
Time (min): 0.00
CPM: 0
Activity Correction: Enabled

Analysis Information
SDG: _____
Sample Matrix: _____
Chemistry Analyst ID: _____
Count Room Analyst ID: _____
Batch ID: 1,126

Sample ID	Sample Type	Lab ID	Carrier ID	Net Alpha CPM	Alpha DPM	2 Sigma DPM	Net Beta CPM	Beta DPM	2 Sigma DPM	Aliquot Amount	Residual Mass	Alpha MDA DPM/Unit	Beta MDA DPM/Unit
2000124135433-A13	Unknown	A-VLT-13	13	-0.05	-0.14	0.41	0.70	1.76	7.33	0.00	0.00		
2000124135543-A14	Unknown	A-VLT-14	14	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		
2000124135653-A15	Unknown	A-VLT-15	15	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		
200012413583-A18	Unknown	A-VLT-16	16	-0.05	-0.14	0.41	3.70	9.29	11.38	0.00	0.00		
2000124135913-A17	Unknown	A-VLT-17	17	-0.05	-0.14	0.41	3.70	9.29	11.38	0.00	0.00		
200012414023-A18	Unknown	A-VLT-18	18	-0.05	-0.14	0.41	1.70	4.27	8.88	0.00	0.00		
200012414133-A19	Unknown	A-VLT-19	19	-0.05	-0.14	0.41	0.70	1.76	7.33	0.00	0.00		
200012414248-A20	Unknown	A-VLT-20	20	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		
200012414359-A21	Unknown	A-VLT-21	21	-0.05	-0.14	0.41	5.70	14.30	13.42	0.00	0.00		
2000124141459-A22	Unknown	A-VLT-22	22	0.95	2.73	5.76	7.70	19.32	15.20	0.00	0.00		
200012414619-A23	Unknown	A-VLT-23	23	-0.05	-0.14	0.41	5.70	14.30	13.42	0.00	0.00		
200012414729-A24	Unknown	A-VLT-24	24	-0.05	-0.14	0.41	4.70	11.79	12.44	0.00	0.00		
200012414839-A25	Unknown	A-VLT-25	25	-0.05	-0.14	0.41	1.70	4.27	8.88	0.00	0.00		
200012414949-A26	Unknown	A-VLT-26	26	-0.05	-0.14	0.41	4.70	11.79	12.44	0.00	0.00		
2000124141059-A27	Unknown	A-VLT-27	27	-0.05	-0.14	0.41	6.70	16.81	14.34	0.00	0.00		
200012414129-A28	Unknown	A-VLT-28	28	-0.05	-0.14	0.41	3.70	9.29	11.38	0.00	0.00		
2000124141319-A29	Unknown	A-VLT-29	29	-0.05	-0.14	0.41	3.70	9.29	11.38	0.00	0.00		

Analyst Review DL Bass Date 12/4/00

Review P Liddy Date 2/3/01

Count Date: 12/ 4/00

GROSS ALPHA / BETA
BASIC ACTIVITY ANALYSIS

Procedure Name: Smear 1 Minute Count Stored Bkg. - 200012041340

System Information
Group: A
Unit ID: RMHF Tennelec
Serial No.: NO007137
Detector S/N: 6350

Sample Information
Sample Units:
Geometry: Smear

Detection Limit

	Alpha	Beta
Batch MDA:		
Batch LLD:		
Critical Level:		

Count Parameters
Count Mode: Simultaneous
Operating Voltage: 1,480.00
Count: Time: 1.00
Delay: 0.00
Sample Replicates: 1

	Alpha	Beta
Efficiency (%):	34.84	39.85
Spillover:	Disable	
Spillover (%):		
Background Subtract:	Enable	
Background Type:	QC Data	
Background	0.05	1.30
Weak Sample Reject:		
Time (min):	0.00	
CPM:	0	

Attenuation: Alpha Disabeled, Beta Disabeled
Spillover
Curve Model: Alpha Constant, Beta Constant
Activity Correction: Enabled

Analysis Information
SDG: _____
Sample Matrix: _____
Chemistry Analyst ID: _____
Count Room Analyst ID: _____
Batch ID: 1,126

Sample ID	Sample Type	Lab ID	Carrier ID	Net Alpha CPM	Alpha DPM	2 Sigma DPM	Net Beta CPM	Beta DPM	2 Sigma DPM	Aliquot Amount	Residual Mass	Alpha MDA DPM/Unit	Beta MDA DPM/Unit
2000124141429-A30	Unknown	A-VLT-30	30	-0.05	-0.14	0.41	5.70	14.30	13.42	0.00	0.00		
2000124141539-A31	Unknown	A-VLT-31	31	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		

Analyst Review P L Rose Date 12/4/00

Review P Liddy Date 2/3/01

OXFR ECLIPSE LB

Version 1.10

Printing Date: 12/ 4/00

Report Name: Gross Alpha Beta Basic CPM DPM

Print Time: 12:17:31PM

Count Date: 12/ 4/00

GROSS ALPHA / BETA
BASIC ACTIVITY ANALYSIS

Page: 1 of 1

Procedure Name: Smear 1 Minute Count Stored Bkg. - 200012041205

System Information
Group: A
Unit ID: RMHF Tennelec
Serial No.: NO007137
Detector S/N: 6350

Sample Information
Sample Units:
Geometry: Smear

Detection Limit

	Alpha	Beta
Batch MDA:		
Batch LLD:		
Critical Level:		

Count Parameters
Count Mode: Simultaneous
Operating Voltage: 1,480.00
Count: Time: 1.00
Delay: 0.00
Sample Replicates: 1

	Alpha	Beta	Attenuation	Spillover
Efficiency (%):	34.84	39.85	Alpha	Disabeled
Spillover:	Disable		Beta	Disabeled
Spillover (%):				
Background Subtract:	Enable		Curve Model	
Background Type:	QC Data		Alpha	Constant
Background	0.05	1.30	Beta	Constant

Weak Sample Reject:
Time (min): 0.00
CPM: 0
Activity Correction: Enabled

Analysis Information
SDG: _____
Sample Matrix: _____
Chemistry Analyst ID: _____
Count Room Analyst ID: _____
Batch ID: 1,123

Sample ID	Sample Type	Lab ID	Carrier ID		Net Alpha CPM	Alpha DPM	2 Sigma DPM	Net Beta CPM	Beta DPM	2 Sigma DPM	Aliquot Amount	Residual Mass	Alpha MDA DPM/Unit	Beta MDA DPM/Unit
200012412539-A31	Unknown		A-CTL-1	31	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		
20001241270-A32	Unknown		A-CTL-2	32	-0.05	-0.14	0.41	0.70	1.76	7.33	0.00	0.00		
200012412815-A33	Unknown		A-CTL-3	33	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		
200012412926-A34	Unknown		A-CTL-4	34	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		
2000124121036-A35	Unknown		A-CTL-5	35	-0.05	-0.14	0.41	3.70	9.29	11.36	0.00	0.00		
2000124121146-A36	Unknown		A-CTL-6	36	-0.05	-0.14	0.41	1.70	4.27	8.88	0.00	0.00		
2000124121256-A37	Unknown		A-CTL-7	37	-0.05	-0.14	0.41	4.70	11.79	12.44	0.00	0.00		
200012412146-A38	Unknown		A-CTL-8	38	-0.05	-0.14	0.41	0.70	1.76	7.33	0.00	0.00		
2000124121516-A39	Unknown		A-CTL-9	39	-0.05	-0.14	0.41	1.70	4.27	8.88	0.00	0.00		
2000124121626-A40	Unknown		A-CTL-10	40	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		

Analyst Review DL Bass Date 12/4/00

Review P Libby Date 2/3/01

)XFR ECLIPSE LB
rinting Date: 12/ 4/00
'rint Time: 1:36:49PM

Version 1.10
Report Name: Gross Alpha Beta Basic CPM DPM

Count Date: 12/ 4/00

GROSS ALPHA / BETA
BASIC ACTIVITY ANALYSIS

Procedure Name: Smear 1 Minute Count Stored Bkg. -200012041259

System Information
Group: A
Unit ID: RMHF Tennelec
Serial No.: NO007137
Detector S/N: 6350

Sample Information
Sample Units:
Geometry: Smear

Detection Limit
Alpha Beta
Batch MDA:
Batch LLD:
Critical Level:

Count Parameters
Count Mode: Simultaneous
Operating Voltage: 1,480.00
Count: Time: 1.00
Delay: 0.00
Sample Replicates: 1

	Alpha	Beta	Attenuation	Spillover
Efficiency (%):	34.84	39.85	Alpha	Disabeled
Spillover:	Disable		Beta	Disabeled
Spillover (%):				
Background Subtract:	Enable		Curve Model	
Background Type:	QC Data		Alpha	Constant
Background	0.05	1.30	Beta	Constant
Weak Sample Reject:				
Time (min):	0.00		Activity Correction:	
CPM:	0		Enabled	

Analysis Information
SDG: _____
Sample Matrix: _____
Chemistry Analyst ID: _____
Count Room Analyst ID: _____
Batch ID: 1,125

Sample ID	Sample Type	Lab ID	Carrier ID	Net Alpha CPM	Alpha DPM	2 Sigma DPM	Net Beta CPM	Beta DPM	2 Sigma DPM	Aliquot Amount	Residual Mass	Alpha MDA DPM/Unit	Beta MDA DPM/Unit
2000124125926-A1	Unknown	A-DCK-1	1	-0.05	-0.14	0.41	1.70	4.27	8.88	0.00	0.00		
200012413052-A2	Unknown	A-DCK-2	2	-0.05	-0.14	0.41	-0.30	-0.75	5.34	0.00	0.00		
20001241322-A3	Unknown	A-DCK-3	3	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		
200012413312-A4	Unknown	A-DCK-4	4	-0.05	-0.14	0.41	4.70	11.79	12.44	0.00	0.00		
200012413422-A5	Unknown	A-DCK-5	5	-0.05	-0.14	0.41	5.70	14.30	13.42	0.00	0.00		
200012413532-A7	Unknown	A-DCK-7	7	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		
200012413642-A8	Unknown	A-DCK-8	8	-0.05	-0.14	0.41	3.70	9.29	11.38	0.00	0.00		
200012413752-A9	Unknown	A-DCK-9	9	-0.05	-0.14	0.41	-0.30	-0.75	5.34	0.00	0.00		
20001241392-A10	Unknown	A-DCK-10	10	-0.05	-0.14	0.41	1.70	4.27	8.88	0.00	0.00		
2000124131012-A11	Unknown	A-DCK-11	11	-0.05	-0.14	0.41	3.70	9.29	11.38	0.00	0.00		
2000124131122-A12	Unknown	A-DCK-12	12	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		
2000124131237-A13	Unknown	A-DCK-13	13	0.95	2.73	5.76	1.70	4.27	8.88	0.00	0.00		

Analyst Review K Bass Date 12/4/00

Review R Lidsky Date 2/3/01

Count Date: 12/ 4/00

GROSS ALPHA / BETA
BASIC ACTIVITY ANALYSIS

Procedure Name: **Smear 1 Minute Count Stored Bkg. - 200012041259**

System Information
Group: A
Unit ID: RMHF Tennelec
Serial No.: NO007137
Detector S/N: 6350

Sample Information
Sample Units:
Geometry: Smear

Detection Limit

	Alpha	Beta
Batch MDA:		
Batch LLD:		
Critical Level:		

Count Parameters
Count Mode: Simultaneous
Operating Voltage: 1,480.00
Count: Time: 1.00
Delay: 0.00
Sample Replicates: 1

	Alpha	Beta	Attenuation	Spillover
Efficiency (%):	34.64	39.65	Alpha	Disabeled
Spillover:	Disable		Beta	Disabeled
Spillover (%):				
Background Subtract:	Enable		Curve Model	
Background Type:	QC Data		Alpha	Constant
Background	0.05	1.30	Beta	Constant

Weak Sample Reject:
Time (min): 0.00
CPM: 0
Activity Correction: Enabled

Analysis Information
SDG: _____
Sample Matrix: _____
Chemistry Analyst ID: _____
Count Room Analyst ID: _____
Batch ID: 1,125

Sample ID	Sample Type	Lab ID	Carrier ID	Net Alpha CPM	Alpha DPM	2 Sigma DPM	Net Beta CPM	Beta DPM	2 Sigma DPM	Aliquot Amount	Residual Mass	Alpha MDA DPM/Unit	Beta MDA DPM/Unit
2000124131347-A14	Unknown	A-DCK-14	14	-0.05	-0.14	0.41	1.70	4.27	8.88	0.00	0.00		
2000124131457-A15	Unknown	A-DCK-15	15	-0.05	-0.14	0.41	0.70	1.76	7.33	0.00	0.00		
200012413168-A16	Unknown	A-DCK-16	~~16~~	-0.05	-0.14	0.41	3.70	9.29	11.38	0.00	0.00		
2000124131718-A17	Unknown	A-DCK-17	17	-0.05	-0.14	0.41	6.70	16.81	14.34	0.00	0.00		
2000124131828-A18	Unknown	A-DCK-18	18	-0.05	-0.14	0.41	0.70	1.76	7.33	0.00	0.00		
2000124131938-A19	Unknown	A-DCK-19	19	-0.05	-0.14	0.41	1.70	4.27	8.88	0.00	0.00		
2000124132048-A20	Unknown	A-DCK-20	20	-0.05	-0.14	0.41	0.70	1.76	7.33	0.00	0.00		
2000124132158-A21	Unknown	A-DCK-21	21	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		
200012413238-A22	Unknown	A-DCK-22	22	-0.05	-0.14	0.41	4.70	11.79	12.44	0.00	0.00		
2000124132418-A23	Unknown	A-DCK-23	23	-0.05	-0.14	0.41	4.70	11.79	12.44	0.00	0.00		
2000124132528-A24	Unknown	A-DCK-24	24	-0.05	-0.14	0.41	-0.30	-0.75	5.34	0.00	0.00		
2000124132638-A25	Unknown	A-DCK-25	25	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		
2000124132748-A26	Unknown	A-DCK-26	26	-0.05	-0.14	0.41	4.70	11.79	12.44	0.00	0.00		
2000124132858-A27	Unknown	A-DCK-27	27	-0.05	-0.14	0.41	3.70	9.29	11.38	0.00	0.00		
200012413308-A28	Unknown	A-DCK-28	28	0.95	2.73	5.76	1.70	4.27	8.88	0.00	0.00		
2000124133118-A29	Unknown	A-DCK-29	29	-0.05	-0.14	0.41	4.70	11.79	12.44	0.00	0.00		
2000124133228-A30	Unknown	A-DCK-30	30	-0.05	-0.14	0.41	3.70	9.29	11.38	0.00	0.00		

Analyst Review R Bass Date 12/4/00

Review B Liddy Date 2/3/01

OXFR ECLIPSE LB

Version 1.10

Printing Date: 12/ 4/00

Report Name: Gross Alpha Beta Basic CPM DPM

Print Time: 12:57:44PM

Count Date: 12/ 4/00

GROSS ALPHA / BETA
BASIC ACTIVITY ANALYSIS

Procedure Name: Smear 1 Minute Count Stored Bkg. - 200012041222

System Information
Group: A
Unit ID: RMHF Tennelec
Serial No.: NO007137
Detector S/N: 6350

Sample Information
Sample Units:
Geometry: Smear

Detection Limit

	Alpha	Beta
Batch MDA:		
Batch LLD:		
Critical Level:		

Count Parameters
Count Mode: Simultaneous
Operating Voltage: 1,480.00
Count: Time: 1.00
Delay: 0.00
Sample Replicates: 1

	Alpha	Beta	Attenuation	Spillover
Efficiency (%):	34.84	39.85	Alpha	Disabled
Spillover:	Disable		Beta	Disabled
Spillover (%):				
Background Subtract:	Enable		Curve Model	
Background Type:	QC Data		Alpha	Constant
Background	0.05	1.30	Beta	Constant

Weak Sample Reject:
Time (min): 0.00
CPM: 0
Activity Correction: Enabled

Analysis Information
SDG: _____
Sample Matrix: _____
Chemistry Analyst ID: _____
Count Room Analyst ID: _____
Batch ID: 1,124

Sample ID	Sample Type	Lab ID	Carrier ID	Net Alpha CPM	Alpha DPM	2 Sigma DPM	Net Beta CPM	Beta DPM	2 Sigma DPM	Aliquot Amount	Residual Mass	Alpha MDA DPM/Unit	Beta MDA DPM/Unit
2000124122224-A1	Unknown	A-AUX-1	1	-0.05	-0.14	0.41	-0.30	-0.75	5.34	0.00	0.00		
2000124122345-A2	Unknown	A-AUX-2	2	-0.05	-0.14	0.41	3.70	9.29	11.38	0.00	0.00		
200012412250-A3	Unknown	A-AUX-3	3	-0.05	-0.14	0.41	1.70	4.27	8.88	0.00	0.00		
2000124122610-A4	Unknown	A-AUX-4	4	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		
2000124122720-A5	Unknown	A-AUX-5	5	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		
2000124122830-A6	Unknown	A-AUX-6	6	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		
2000124122940-A7	Unknown	A-AUX-7	7	-0.05	-0.14	0.41	5.70	14.30	13.42	0.00	0.00		
2000124123050-A8	Unknown	A-AUX-8	8	-0.05	-0.14	0.41	0.70	1.76	7.33	0.00	0.00		
200012412320-A9	Unknown	A-AUX-9	9	-0.05	-0.14	0.41	-0.30	-0.75	5.34	0.00	0.00		
2000124123310-A10	Unknown	A-AUX-10	10	-0.05	-0.14	0.41	-0.30	-0.75	5.34	0.00	0.00		
2000124123420-A11	Unknown	A-AUX-11	11	0.95	2.73	5.76	3.70	9.29	11.38	0.00	0.00		
2000124123530-A12	Unknown	A-AUX-12	12	-0.05	-0.14	0.41	0.70	1.76	7.33	0.00	0.00		

Analyst Review DL Bass Date 12/4/00

Review B Lisby Date 2/3/01

Count Date: 12/ 4/00

GROSS ALPHA / BETA
BASIC ACTIVITY ANALYSIS

Procedure Name: Smear 1 Minute Count Stored Bkg. - 200012041222

System Information
Group: A
Unit ID: RMHF Tennelec
Serial No.: NO007137
Detector S/N: 6350

Sample Information
Sample Units:
Geometry: Smear

Detection Limit

	Alpha	Beta
Batch MDA:		
Batch LLD:		
Critical Level:		

Count Parameters
Count Mode: Simultaneous
Operating Voltage: 1,480.00
Count: Time: 1.00
Delay: 0.00
Sample Replicates: 1

	Alpha	Beta
Efficiency (%):	34.84	39.85
Spillover:	Disable	
Spillover (%):		
Background Subtract:	Enable	
Background Type:	QC Data	
Background	0.05	1.30
Weak Sample Reject:		
Time (min):	0.00	
CPM:	0	

Attenuation: Alpha Disabeled, Beta Disabeled
Spillover
Curve Model: Alpha Constant, Beta Constant
Activity Correction: Enabled

Analysis Information
SDG: _____
Sample Matrix: _____
Chemistry Analyst ID: _____
Count Room Analyst ID: _____
Batch ID: 1,124

Sample ID	Sample Type	Lab ID	Carrier ID	Net Alpha CPM	Alpha DPM	2 Sigma DPM	Net Beta CPM	Beta DPM	2 Sigma DPM	Aliquot Amount	Residual Mass	Alpha MDA DPM/Unit	Beta MDA DPM/Unit
2000124123640-A13	Unknown	A-AUX-13	13	-0.05	-0.14	0.41	1.70	4.27	8.88	0.00	0.00		
2000124123751-A14	Unknown	A-AUX-14	14	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		
200012412391-A15	Unknown	A-AUX-15	15	-0.05	-0.14	0.41	6.70	16.81	14.34	0.00	0.00		
2000124124011-A16	Unknown	A-AUX-16	16	-0.05	-0.14	0.41	4.70	11.79	12.44	0.00	0.00		
2000124124121-A17	Unknown	A-AUX-17	17	-0.05	-0.14	0.41	0.70	1.76	7.33	0.00	0.00		
2000124124236-A18	Unknown	A-AUX-18	18	-0.05	-0.14	0.41	-0.30	-0.75	5.34	0.00	0.00		
2000124124346-A19	Unknown	A-AUX-19	19	-0.05	-0.14	0.41	-0.30	-0.75	5.34	0.00	0.00		
2000124124456-A20	Unknown	A-AUX-20	20	0.95	2.73	5.76	-1.30	-3.28	1.82	0.00	0.00		
200012412466-A21	Unknown	A-AUX-21	21	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		
2000124124716-A22	Unknown	A-AUX-22	22	-0.05	-0.14	0.41	1.70	4.27	8.88	0.00	0.00		
2000124124826-A23	Unknown	A-AUX-23	23	0.95	2.73	5.76	2.70	6.78	10.21	0.00	0.00		
2000124124936-A24	Unknown	A-AUX-24	24	-0.05	-0.14	0.41	1.70	4.27	8.88	0.00	0.00		
2000124125046-A25	Unknown	A-AUX-25	25	-0.05	-0.14	0.41	0.70	1.76	7.33	0.00	0.00		
2000124125156-A26	Unknown	A-AUX-26	26	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		
200012412536-A27	Unknown	A-AUX-27	27	-0.05	-0.14	0.41	3.70	9.29	11.38	0.00	0.00		
2000124125416-A28	Unknown	A-AUX-28	28	-0.05	-0.14	0.41	1.70	4.27	8.88	0.00	0.00		
2000124125528-A29	Unknown	A-AUX-29	29	-0.05	-0.14	0.41	3.70	9.29	11.38	0.00	0.00		

Analyst Review DLBaan Date 12/4/00

Review PLiddy Date 2/3/01

Count Date: 12/ 4/00

GROSS ALPHA / BETA
BASIC ACTIVITY ANALYSIS

Procedure Name: **Smear 1 Minute Count Stored Bkg. - 200012041222**

System Information
Group: A
Unit ID: RMHF Tennelec
Serial No.: NO007137
Detector S/N: 6350

Sample Information
Sample Units:
Geometry: Smear

Detection Limit

	Alpha	Beta
Batch MDA:		
Batch LLD:		
Critical Level:		

Count Parameters
Count Mode: Simultaneous
Operating Voltage: 1,480.00
Count: Time: 1.00
Delay: 0.00
Sample Replicates: 1

	Alpha	Beta	Attenuation	Spillover
Efficiency (%):	34.64	39.65	Alpha	Disabeled
Spillover:	Disable		Beta	Disabeled
Spillover (%):				
Background Subtract:	Enable		Curve Model	
Background Type:	QC Data		Alpha	Constant
Background	0.05	1.30	Beta	Constant

Weak Sample Reject:
Time (min): 0.00
CPM: 0
Activity Correction: Enabled

Analysis Information
SDG: _____
Sample Matrix: _____
Chemistry Analyst ID: _____
Count Room Analyst ID: _____
Batch ID: 1,124

Sample ID	Sample Type	Lab ID	Carrier ID	Net Alpha CPM	Alpha DPM	2 Sigma DPM	Net Beta CPM	Beta DPM	2 Sigma DPM	Aliquot Amount	Residual Mass	Alpha MDA DPM/Unit	Beta MDA DPM/Unit
2000124125636-A30	Unknown	A-AUX-30	30	-0.05	-0.14	0.41	4.70	11.79	12.44	0.00	0.00		

Analyst Review D L Bass Date 12/4/00

Review P Liddy Date 2/3/01

OXFR ECLIPSE LB

Printing Date: 12/ 4/00
Print Time: 9:03:29AM

Version 1.10
Report Name: Gross Alpha Beta Basic CPM DPM

Count Date: 12/ 4/00

GROSS ALPHA / BETA BASIC ACTIVITY ANALYSIS

Page: 1 of 23

Procedure Name: Smear 1 Minute Count Stored Bkg. - 200012040840

System Information
Group: A
Unit ID: RMHF Tennelec
Serial No.: NO007137
Detector S/N: 6350

Sample Information
Sample Units:
Geometry: Smear

Detection Limit

	Alpha	Beta
Batch MDA:		
Batch LLD:		
Critical Level:		

Count Parameters
Count Mode: Simultaneous
Operating Voltage: 1,480.00
Count: Time: 1.00
Delay: 0.00
Sample Replicates: 1

	Alpha	Beta
Efficiency (%):	34.84	39.85
Spillover:	Disable	
Spillover (%):		
Background Subtract:	Enable	
Background Type:	QC Data	
Background	0.05	1.30

Attenuation: Alpha Disabeled, Beta Disabeled
Spillover
Curve Model: Alpha Constant, Beta Constant
Weak Sample Reject: Time (min): 0.00, CPM: 0
Activity Correction: Enabled

Analysis Information
SDG: _____
Sample Matrix: _____
Chemistry Analyst ID: _____
Count Room Analyst ID: _____
Batch ID: 1,115

Sample ID	Sample Type	Lab ID	Carrier ID	Net Alpha CPM	Alpha DPM	2 Sigma DPM	Net Beta CPM	Beta DPM	2 Sigma DPM	Aliquot Amount	Residual Mass	Alpha MDA DPM/Unit	Beta MDA DPM/Unit
200012484018-A1	Unknown	A-BMT-1	1	-0.05	-0.14	0.41	4.70	11.79	12.44	0.00	0.00		
200012484135-A2	Unknown	A-BMT-2	2	-0.05	-0.14	0.41	4.70	11.79	12.44	0.00	0.00		
200012484245-A3	Unknown	A-BMT-3	3	-0.05	-0.14	0.41	0.70	1.76	7.33	0.00	0.00		
200012484350-A4	Unknown	A-BMT-4	4	-0.05	-0.14	0.41	1.70	4.27	8.88	0.00	0.00		
20001248450-A5	Unknown	A-BMT-5	5	-0.05	-0.14	0.41	4.70	11.79	12.44	0.00	0.00		
20001248465-A6	Unknown	A-BMT-6	6	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		
200012484715-A7	Unknown	A-BMT-7	7	-0.05	-0.14	0.41	3.70	9.29	11.38	0.00	0.00		
200012484825-A8	Unknown	A-BMT-8	8	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		
200012484920-A9	Unknown	A-BMT-9	9	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		
200012485030-A10	Unknown	A-BMT-10	10	-0.05	-0.14	0.41	4.70	11.79	12.44	0.00	0.00		
200012485135-A11	Unknown	A-BMT-11	11	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		
200012485245-A12	Unknown	A-BMT-12	12	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		

Analyst Review D L Ross Date 12/4/00

Review D Liddy Date 2/3/01

Count Date: 12/ 4/00

GROSS ALPHA / BETA
BASIC ACTIVITY ANALYSIS

Procedure Name: Smear 1 Minute Count Stored Bkg. - 200012040840

System Information
Group: A
Unit ID: RMHF Tennelec
Serial No.: NO007137
Detector S/N: 6350

Sample Information
Sample Units:
Geometry: Smear

Detection Limit

	Alpha	Beta
Batch MDA:		
Batch LLD:		
Critical Level:		

Count Parameters
Count Mode: Simultaneous
Operating Voltage: 1,480.00
Count: Time: 1.00
Delay: 0.00
Sample Replicates: 1

	Alpha	Beta	Attenuation	Spillover
Efficiency (%):	34.84	39.85	Alpha	Disabeled
Spillover:	Disable		Beta	Disabeled
Spillover (%):				
Background Subtract:	Enable		Curve Model	
Background Type:	QC Data		Alpha	Constant
Background	0.05	1.30	Beta	Constant

Weak Sample Reject:
Time (min): 0.00
CPM: 0
Activity Correction: Enabled

Analysis Information
SDG: _____
Sample Matrix: _____
Chemistry Analyst ID: _____
Count Room Analyst ID: _____
Batch ID: 1,115

Sample ID	Sample Type	Lab ID	Carrier ID	Net Alpha CPM	Alpha DPM	2 Sigma DPM	Net Beta CPM	Beta DPM	2 Sigma DPM	Aliquot Amount	Residual Mass	Alpha MDA DPM/Unit	Beta MDA DPM/Unit
200012485345-A13	Unknown	A-BMT-13	13	-0.05	-0.14	0.41	1.70	4.27	8.88	0.00	0.00		
200012485455-A14	Unknown	A-BMT-14	14	-0.05	-0.14	0.41	3.70	9.29	11.38	0.00	0.00		
20001248560-A15	Unknown	A-BMT-15	15	-0.05	-0.14	0.41	0.70	1.76	7.33	0.00	0.00		
20001248575-A18	Unknown	A-BMT-16	18-16	-0.05	-0.14	0.41	3.70	9.29	11.38	0.00	0.00		
200012485815-A17	Unknown	A-BMT-17	17	-0.05	-0.14	0.41	0.70	1.76	7.33	0.00	0.00		
200012485920-A18	Unknown	A-BMT-18	18	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		
20001249030-A19	Unknown	A-BMT-19	19	-0.05	-0.14	0.41	3.70	9.29	11.38	0.00	0.00		
20001249131-A20	Unknown	A-BMT-20	20	-0.05	-0.14	0.41	1.70	4.27	8.88	0.00	0.00		
20001249241-A21	Unknown	A-BMT-21	21	-0.05	-0.14	0.41	2.65	6.64	11.59	0.00	0.00		

Analyst Review [signature] Date 12/4/00

Review [signature] Date 2/3/01

OXFR ECLIPSE LB

Printing Date: 12/ 4/00
Print Time: 12:01:33PM

Version 1.10
Report Name: Gross Alpha Beta Basic CPM DPM

Count Date: 12/ 4/00

GROSS ALPHA / BETA
BASIC ACTIVITY ANALYSIS

Procedure Name: Smear 1 Minute Count Stored Bkg. - 200012041132

System Information
Group: A
Unit ID: RMHF Tennelec
Serial No.: NO007137
Detector S/N: 6350

Sample Information
Sample Units:
Geometry: Smear

Detection Limit

	Alpha	Beta
Batch MDA:		
Batch LLD:		
Critical Level:		

Count Parameters
Count Mode: Simultaneous
Operating Voltage: 1,480.00
Count: Time: 1.00, Delay: 0.00
Sample Replicates: 1

	Alpha	Beta	Attenuation	Spillover
Efficiency (%):	34.84	39.85	Alpha	Disabeled
Spillover:	Disable		Beta	Disabeled
Spillover (%):				
Background Subtract:	Enable		Curve Model	
Background Type:	QC Data		Alpha	Constant
Background	0.05	1.30	Beta	Constant

Weak Sample Reject:
Time (min): 0.00
CPM: 0
Activity Correction: Enabled

Analysis Information
SDG: _____
Sample Matrix: _____
Chemistry Analyst ID: _____
Count Room Analyst ID: _____
Batch ID: 1,122

Sample ID	Sample Type	Lab ID	Carrier ID	Net Alpha CPM	Alpha DPM	2 Sigma DPM	Net Beta CPM	Beta DPM	2 Sigma DPM	Aliquot Amount	Residual Mass	Alpha MDA DPM/Unit	Beta MDA DPM/Unit
2000124113215-A22	Unknown	A-BMT-22	22	-0.05	-0.14	0.41	3.70	9.29	11.38	0.00	0.00		
2000124113336-A23	Unknown	A-BMT-23	23	-0.05	-0.14	0.41	3.70	9.29	11.38	0.00	0.00		
2000124113451-A24	Unknown	A-BMT-24	24	0.95	2.73	5.76	4.70	11.79	12.44	0.00	0.00		
200012411361-A25	Unknown	A-BMT-25	25	-0.05	-0.14	0.41	1.70	4.27	8.88	0.00	0.00		
2000124113711-A26	Unknown	A-BMT-26	26	-0.05	-0.14	0.41	4.70	11.79	12.44	0.00	0.00		
2000124113821-A27	Unknown	A-BMT-27	27	-0.05	-0.14	0.41	0.70	1.76	7.33	0.00	0.00		
2000124113931-A28	Unknown	A-BMT-28	28	-0.05	-0.14	0.41	0.70	1.76	7.33	0.00	0.00		
2000124114041-A29	Unknown	A-BMT-2	29	-0.05	-0.14	0.41	1.70	4.27	8.88	0.00	0.00		
2000124114151-A30	Unknown	A-BMT-30	30	-0.05	-0.14	0.41	7.70	19.32	15.20	0.00	0.00		

Analyst Review D Bass Date 12/4/00
Review P Liddy Date 2/3/01

OXFR ECLIPSE LB

Version 1.10

Printing Date: 12/ 4/00

Report Name: Gross Alpha Beta Basic CPM DPM

Print Time: 7:58:23AM

Count Date: 12/ 4/00

GROSS ALPHA / BETA BASIC ACTIVITY ANALYSIS

Procedure Name: Smear 1 Minute Count Stored Bkg. - 200012040650

System Information
Group: A
Unit ID: RMHF Tennelec
Serial No.: NO007137
Detector S/N: 6350

Sample Information
Sample Units:
Geometry: Smear

Detection Limit

	Alpha	Beta
Batch MDA:		
Batch LLD:		
Critical Level:		

Count Parameters
Count Mode: Simultaneous
Operating Voltage: 1,480.00
Count: Time: 1.00, Delay: 0.00
Sample Replicates: 1

	Alpha	Beta	Attenuation	Spillover
Efficiency (%):	34.84	39.85	Alpha	Disabeled
Spillover:	Disable		Beta	Disabeled
Spillover (%):				
Background Subtract:	Enable		Curve Model	
Background Type:	QC Data		Alpha	Constant
Background	0.05	1.30	Beta	Constant

Weak Sample Reject:
Time (min): 0.00
CPM: 0
Activity Correction: Enabled

Analysis Information
SDG: _____
Sample Matrix: _____
Chemistry Analyst ID: _____
Count Room Analyst ID: _____
Batch ID: 1,113

Sample ID	Sample Type	Lab ID	Carrier ID	Net Alpha CPM	Alpha DPM	2 Sigma DPM	Net Beta CPM	Beta DPM	2 Sigma DPM	Aliquot Amount	Residual Mass	Alpha MDA DPM/Unit	Beta MDA DPM/Unit
20001246503-A1	Unknown	C-OCC-1	1	-0.05	-0.14	0.41	1.70	4.27	8.88	0.00	0.00		
200012465120-A2	Unknown	C-OCC-2	2	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		
200012465229-A3	Unknown	C-OCC-3	3	-0.05	-0.14	0.41	-0.30	-0.75	5.34	0.00	0.00		
200012465334-A4	Unknown	C-OCC-4	4	-0.05	-0.14	0.41	0.70	1.76	7.33	0.00	0.00		
200012465444-A5	Unknown	C-OCC-5	5	-0.05	-0.14	0.41	4.70	11.79	12.44	0.00	0.00		
200012465544-A6	Unknown	C-OCC-6	6	-0.05	-0.14	0.41	3.70	9.29	11.38	0.00	0.00		
200012465654-A7	Unknown	C-OCC-7	7	-0.05	-0.14	0.41	5.70	14.30	13.42	0.00	0.00		
200012465759-A8	Unknown	C-OCC-8	8	-0.05	-0.14	0.41	6.70	16.81	14.34	0.00	0.00		
200012465859-A9	Unknown	C-OCC-9	9	-0.05	-0.14	0.41	0.70	1.76	7.33	0.00	0.00		
20001247010-A10	Unknown	C-OCC-10	10	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		

Analyst Review RL Boss Date 12/4/00

Review [signature] Date 2/3/01

OXFR ECLIPSE LB

Version 1.10

Printing Date: 12/ 4/00

Report Name: Gross Alpha Beta Basic CPM DPM

Print Time: 6:45:09AM

Count Date: 12/ 4/00

GROSS ALPHA / BETA
BASIC ACTIVITY ANALYSIS

Page: 1 of 1

Procedure Name: Smear 1 Minute Count Stored Bkg. - 200012040611

System Information
Group: A
Unit ID: RMHF Tennelec
Serial No.: NO007137
Detector S/N: 6350

Sample Information
Sample Units:
Geometry: Smear

Detection Limit

	Alpha	Beta
Batch MDA:		
Batch LLD:		
Critical Level:		

Count Parameters
Count Mode: Simultaneous
Operating Voltage: 1,480.00
Count: Time: 1.00
Delay: 0.00
Sample Replicates: 1

	Alpha	Beta	Attenuation	Spillover
Efficiency (%):	34.84	39.85	Alpha Disabeled	
Spillover:	Disable		Beta Disabeled	
Spillover (%):				
Background Subtract:	Enable		Curve Model	
Background Type:	QC Data		Alpha Constant	
Background	0.05	1.30	Beta Constant	

Weak Sample Reject:
Time (min): 0.00
CPM: 0
Activity Correction: Enabled

Analysis Information
SDG: _____
Sample Matrix: _____
Chemistry Analyst ID: _____
Count Room Analyst ID: _____
Batch ID: 1,112

Sample ID	Sample Type	Lab ID	Carrier ID	Net Alpha CPM	Alpha DPM	2 Sigma DPM	Net Beta CPM	Beta DPM	2 Sigma DPM	Aliquot Amount	Residual Mass	Alpha MDA DPM/Unit	Beta MDA DPM/Unit
200012461126-A1	Unknown	C-OFC-1	1	-0.05	-0.14	0.41	4.70	11.79	12.44	0.00	0.00		
200012461247-A2	Unknown	C-OFC-2	2	-0.05	-0.14	0.41	1.70	4.27	8.88	0.00	0.00		
200012461353-A3	Unknown	C-OFC-3	3	-0.05	-0.14	0.41	3.70	9.29	11.38	0.00	0.00		
200012461452-A4	Unknown	C-OFC-4	4	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		
20001246162-A5	Unknown	C-OFC-5	5	-0.05	-0.14	0.41	3.70	9.29	11.38	0.00	0.00		
20001246177-A6	Unknown	C-OFC-6	6	-0.05	-0.14	0.41	4.70	11.79	12.44	0.00	0.00		
200012461818-A7	Unknown	C-OFC-7	7	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		
200012461918-A8	Unknown	C-OFC-8	8	-0.05	-0.14	0.41	0.70	1.76	7.33	0.00	0.00		
200012462023-A9	Unknown	C-OFC-9	9	-0.05	-0.14	0.41	1.70	4.27	8.88	0.00	0.00		
200012462128-A10	Unknown	C-OFC-10	10	-0.05	-0.14	0.41	1.70	4.27	8.88	0.00	0.00		

Analyst Review D L Boss Date 12/4/00

Review D Liddy Date 2/3/01

OXFR ECLIPSE LB

Printing Date: 12/ 4/00
Print Time: 8:29:43AM

Version 1.10
Report Name: Gross Alpha Beta Basic CPM DPM

Count Date: 12/ 4/00

GROSS ALPHA / BETA
BASIC ACTIVITY ANALYSIS

Procedure Name: Smear 1 Minute Count Stored Bkg. - 200012040811

System Information
Group: A
Unit ID: RMHF Tennelec
Serial No.: NO007137
Detector S/N: 6350

Sample Information
Sample Units:
Geometry: Smear

Detection Limit

	Alpha	Beta
Batch MDA:		
Batch LLD:		
Critical Level:		

Count Parameters
Count Mode: Simultaneous
Operating Voltage: 1,480.00
Count: Time: 1.00
Delay: 0.00
Sample Replicates: 1

	Alpha	Beta	Attenuation	Spillover
Efficiency (%):	34.84	39.85	Alpha	Disabeled
Spillover:	Disable		Beta	Disabeled
Spillover (%):				
Background Subtract:	Enable		Curve Model	
Background Type:	QC Data		Alpha	Constant
Background	0.05	1.30	Beta	Constant

Weak Sample Reject:
Time (min): 0.00
CPM: 0
Activity Correction: Enabled

Analysis Information
SDG: _____
Sample Matrix: _____
Chemistry Analyst ID: _____
Count Room Analyst ID: _____
Batch ID: 1,114

Sample ID	Sample Type	Lab ID	Carrier ID	Net Alpha CPM	Alpha DPM	2 Sigma DPM	Net Beta CPM	Beta DPM	2 Sigma DPM	Aliquot Amount	Residual Mass	Alpha MDA DPM/Unit	Beta MDA DPM/Unit
200012481150-A1	Unknown	C-FGR-1	1	-0.05	-0.14	0.41	0.70	1.76	7.33	0.00	0.00		
20001248131-A2	Unknown	C-FGR-2	2	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		
200012481411-A3	Unknown	C-FGR-3	3	0.95	2.73	5.76	0.70	1.76	7.33	0.00	0.00		
200012481516-A4	Unknown	C-FGR-4	4	-0.05	-0.14	0.41	5.70	14.30	13.42	0.00	0.00		
200012481626-A5	Unknown	C-FGR-5	5	0.95	2.73	5.76	4.70	11.79	12.44	0.00	0.00		
200012481726-A6	Unknown	C-FGR-6	6	-0.05	-0.14	0.41	6.70	16.81	14.34	0.00	0.00		
200012481836-A7	Unknown	C-FGR-7	7	-0.05	-0.14	0.41	-0.30	-0.75	5.34	0.00	0.00		
200012481941-A8	Unknown	C-FGR-8	8	-0.05	-0.14	0.41	1.70	4.27	8.88	0.00	0.00		
200012482051-A9	Unknown	C-FGR-9	9	-0.05	-0.14	0.41	-0.30	-0.75	5.34	0.00	0.00		
200012482151-A10	Unknown	C-FGR-10	10	-0.05	-0.14	0.41	2.70	6.78	10.21	0.00	0.00		

Analyst Review R Rood Date 12/4/00

Review P Liddy Date 2/3/01

DOWNEY A-0001-PLB N29-E15

N DEC 11, 2000 1-20
OUP B SMEARS

SAMPLE SN	CODE	TIME (MIN.)	ALPHA COUNTS	BETA COUNTS	ALPHA CPM	BETA CPM	ALPHA CORRECTED	BETA CORRECTED	TOD CLOCK HR:MN:SEC
1		1.00	0	2	-0.10	0.20	-.29455081	.53518865	11:38:41
2		1.00	0	3	-0.10	1.20	-.29455081	3.2111319	11:39:53
3		1.00	0	4	-0.10	2.20	-.29455081	5.8870752	11:41:05
4		1.00	0	0	-0.10	-1.80	-.29455081	-4.8166779	11:42:16
5		1.00	0	4	-0.10	2.20	-.29455081	5.8870752	11:43:28
6		1.00	0	3	-0.10	1.20	-.29455081	3.2111319	11:44:40
7		1.00	0	4	-0.10	2.20	-.29455081	5.8870752	11:45:51
8		1.00	0	3	-0.10	1.20	-.29455081	3.2111319	11:47:03
9		1.00	0	3	-0.10	1.20	-.29455081	3.2111319	11:48:15
10		1.00	0	5	-0.10	3.20	-.29455081	8.5630185	11:49:26
11		1.00	0	0	-0.10	-1.80	-.29455081	-4.8166779	11:50:38
12		1.00	0	3	-0.10	1.20	-.29455081	3.2111319	11:51:50
13		1.00	0	5	-0.10	3.20	-.29455081	8.5630185	11:53:01
14		1.00	0	4	-0.10	2.20	-.29455081	5.8870752	11:54:13
15		1.00	0	4	-0.10	2.20	-.29455081	5.8870752	11:55:25
16		1.00	0	1	-0.10	-0.80	-.29455081	-2.1407546	11:56:37
17		1.00	0	2	-0.10	0.20	-.29455081	.53518865	11:57:48
18		1.00	0	6	-0.10	4.20	-.29455081	11.238962	11:59:00
19		1.00	0	2	-0.10	0.20	-.29455081	.53518865	12:00:12
20		1.00	0	3	-0.10	1.20	-.29455081	3.2111319	12:01:23

LOWNEY A-001-CNR
DEC 12, 2000
UP 8 SMEARS 1-20

SAMPLE SN	CODE	TIME (MIN.)	ALPHA COUNTS	BETA COUNTS	ALPHA CPM	BETA CPM	ALPHA CORRECTED	BETA CORRECTED	TOD CLOCK HR:MN:SEC
1		1.00	1	2	0.80	1.10	2.3738872	2.9681597	08:17:56
2		1.00	0	1	-0.20	0.10	-.59347181	0.2698327	08:19:08
3		1.00	0	4	-0.20	3.10	-.59347181	8.3648138	08:20:20
4		1.00	0	6	-0.20	5.10	-.59347181	13.761468	08:21:31
5		1.00	0	0	-0.20	-0.90	-.59347181	-2.4284943	08:22:43
6		1.00	0	4	-0.20	3.10	-.59347181	8.3648138	08:23:55
7		1.00	0	4	-0.20	3.10	-.59347181	8.3648138	08:25:06
8		1.00	0	1	-0.20	0.10	-.59347181	0.2698327	08:26:18
9		1.00	0	3	-0.20	2.10	-.59347181	5.6664868	08:27:30
0		1.00	0	1	-0.20	0.10	-.59347181	0.2698327	08:28:42
1		1.00	0	2	-0.20	1.10	-.59347181	2.9681597	08:29:53
2		1.00	0	2	-0.20	1.10	-.59347181	2.9681597	08:31:05
3		1.00	0	3	-0.20	2.10	-.59347181	5.6664868	08:32:17
4		1.00	0	3	-0.20	2.10	-.59347181	5.6664868	08:33:28
5		1.00	0	0	-0.20	-0.90	-.59347181	-2.4284943	08:34:40
6		1.00	1	0	0.80	-0.90	2.3738872	-2.4284943	08:35:52
7		1.00	0	1	-0.20	0.10	-.59347181	0.2698327	08:37:03
8		1.00	0	2	-0.20	1.10	-.59347181	2.9681597	08:38:15
9		1.00	0	4	-0.20	3.10	-.59347181	8.3648138	08:39:27
0		1.00	0	4	-0.20	3.10	-.59347181	8.3648138	08:40:39

downey Bool Lab

DEC 11, 2000

P B SMEARS 1-20

SAMPLE N	CODE	TIME (MIN.)	ALPHA COUNTS	BETA COUNTS	ALPHA CPM	BETA CPM	ALPHA CORRECTED	BETA CORRECTED	TOD CLOCK HR:MN:SEC
1		1.00	0	3	-0.10	1.20	-.29455081	3.2111319	15:30:27
2		1.00	0	3	-0.10	1.20	-.29455081	3.2111319	15:31:39
3		1.00	0	2	-0.10	0.20	-.29455081	.53518865	15:32:51
4		1.00	1	2	0.90	0.20	2.6509573	.53518865	15:34:02
5		1.00	0	1	-0.10	-0.80	-.29455081	-2.1407546	15:35:14
6		1.00	0	3	-0.10	1.20	-.29455081	3.2111319	15:36:25
7		1.00	0	0	-0.10	-1.80	-.29455081	-4.8166979	15:37:37
8		1.00	0	4	-0.10	4.20	-.29455081	11.238962	15:38:49
9		1.00	0	1	-0.10	-0.80	-.29455081	-2.1407546	15:40:00
10		1.00	1	0	0.90	-1.80	2.6509573	-4.8166979	15:41:12
11		1.00	1	2	0.90	0.20	2.6509573	.53518865	15:42:24
12		1.00	0	4	-0.10	2.20	-.29455081	5.8870752	15:43:35
13		1.00	1	3	0.90	1.20	2.6509573	3.2111319	15:44:47
14		1.00	1	2	0.90	0.20	2.6509573	.53518865	15:45:58
15		1.00	0	2	-0.10	0.20	-.29455081	.53518865	15:47:10
16		1.00	0	2	-0.10	0.20	-.29455081	.53518865	15:48:22
17		1.00	0	2	-0.10	0.20	-.29455081	.53518865	15:49:33
18		1.00	0	4	-0.10	2.20	-.29455081	5.8870752	15:50:45
19		1.00	0	2	-0.10	0.20	-.29455081	.53518865	15:51:57
20		1.00	1	7	0.90	5.20	2.6509573	13.914905	15:53:08

O'DONLEY C-001-OCR

DEC 12, 2000 1-10

JP B SMEARS

SAMPLE SN	CODE	TIME (MIN.)	ALPHA COUNTS	BETA COUNTS	ALPHA CPM	BETA CPM	ALPHA CORRECTED	BETA CORRECTED	TOD CLOCK HR:MN:SEC
1		1.00	0	1	-0.20	0.10	-.57347181	0.2698327	08:57:14
2		1.00	0	1	-0.20	0.10	-.57347181	0.2698327	08:58:26
3		1.00	0	4	-0.20	3.10	-.57347181	8.3648138	08:59:38
4		1.00	0	3	-0.20	2.10	-.57347181	5.6664868	09:00:49
5		1.00	0	0	-0.20	-0.90	-.57347181	-2.4284943	09:02:01
6		1.00	0	4	-0.20	3.10	-.57347181	8.3648138	09:03:13
7		1.00	0	1	-0.20	0.10	-.57347181	0.2698327	09:04:24
8		1.00	0	3	-0.20	2.10	-.57347181	5.6664868	09:05:36
9		1.00	0	2	-0.20	1.10	-.57347181	2.9681597	09:06:48
10		1.00	0	4	-0.20	3.10	-.57347181	8.3648138	09:07:59

APPENDIX C

SURVEY MAPS

FIGURE C-1: BASEMENT SURVEY LOCATIONS

AREA "A"
A-BMT-1 TO 30
F= FLOOR

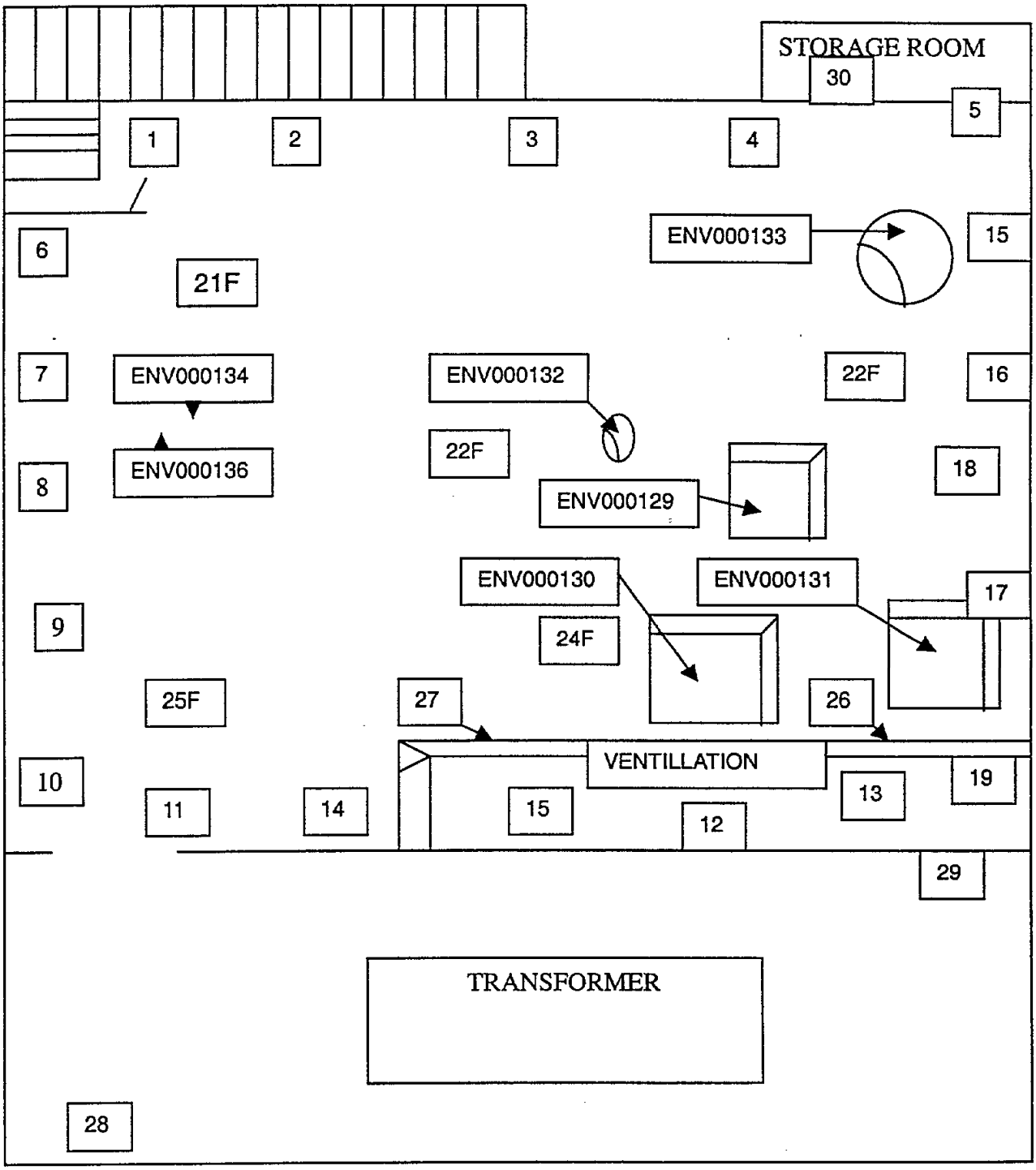


FIGURE C-2: VAULT SURVEY LOCATIONS

AREA "A"
A-VLT-1 TO 30
F = FLOOR

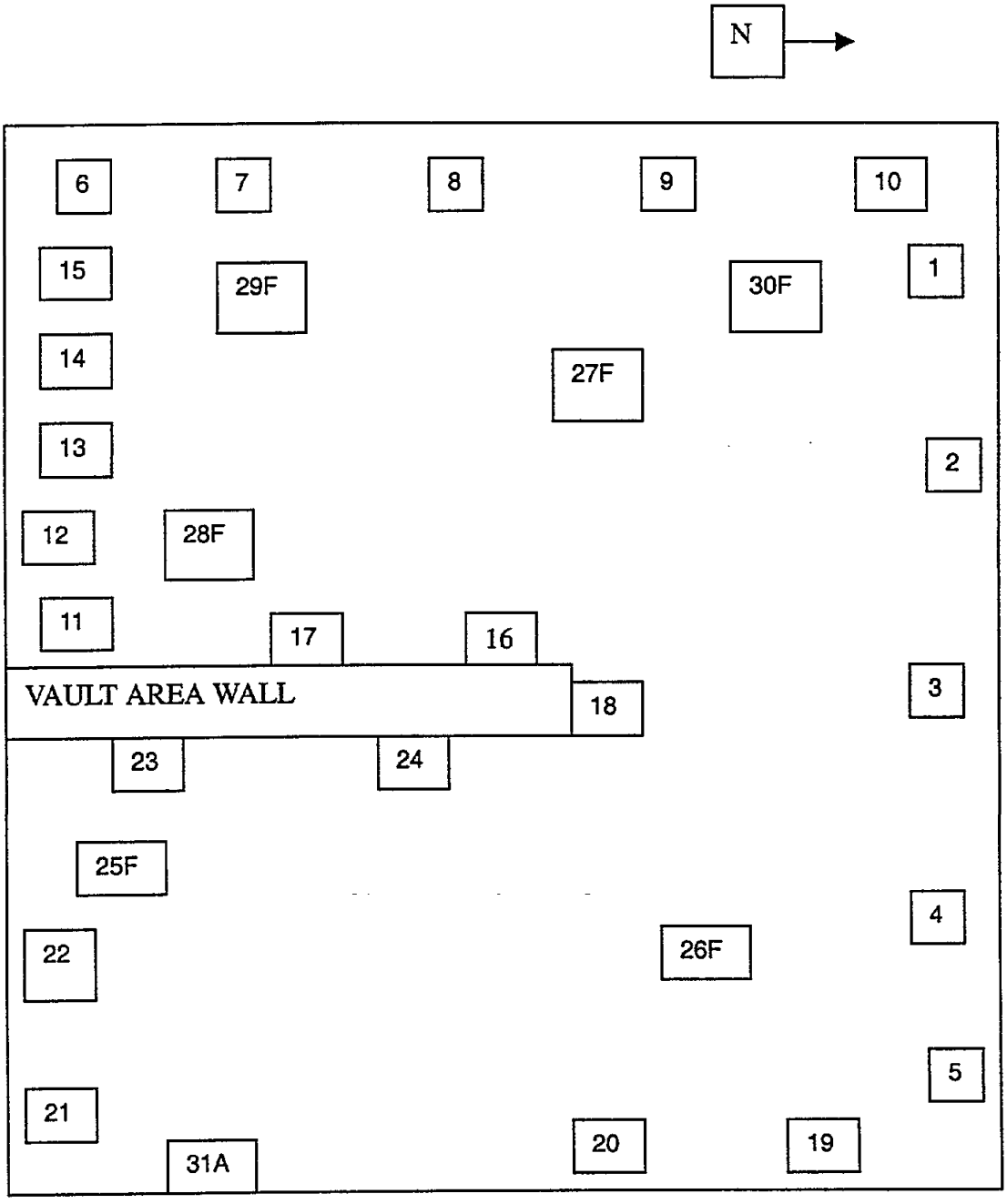


FIGURE C-3: CONTROL ROOM SURVEY LOCATIONS

AREA "A"
A-CTL-31B TO 40

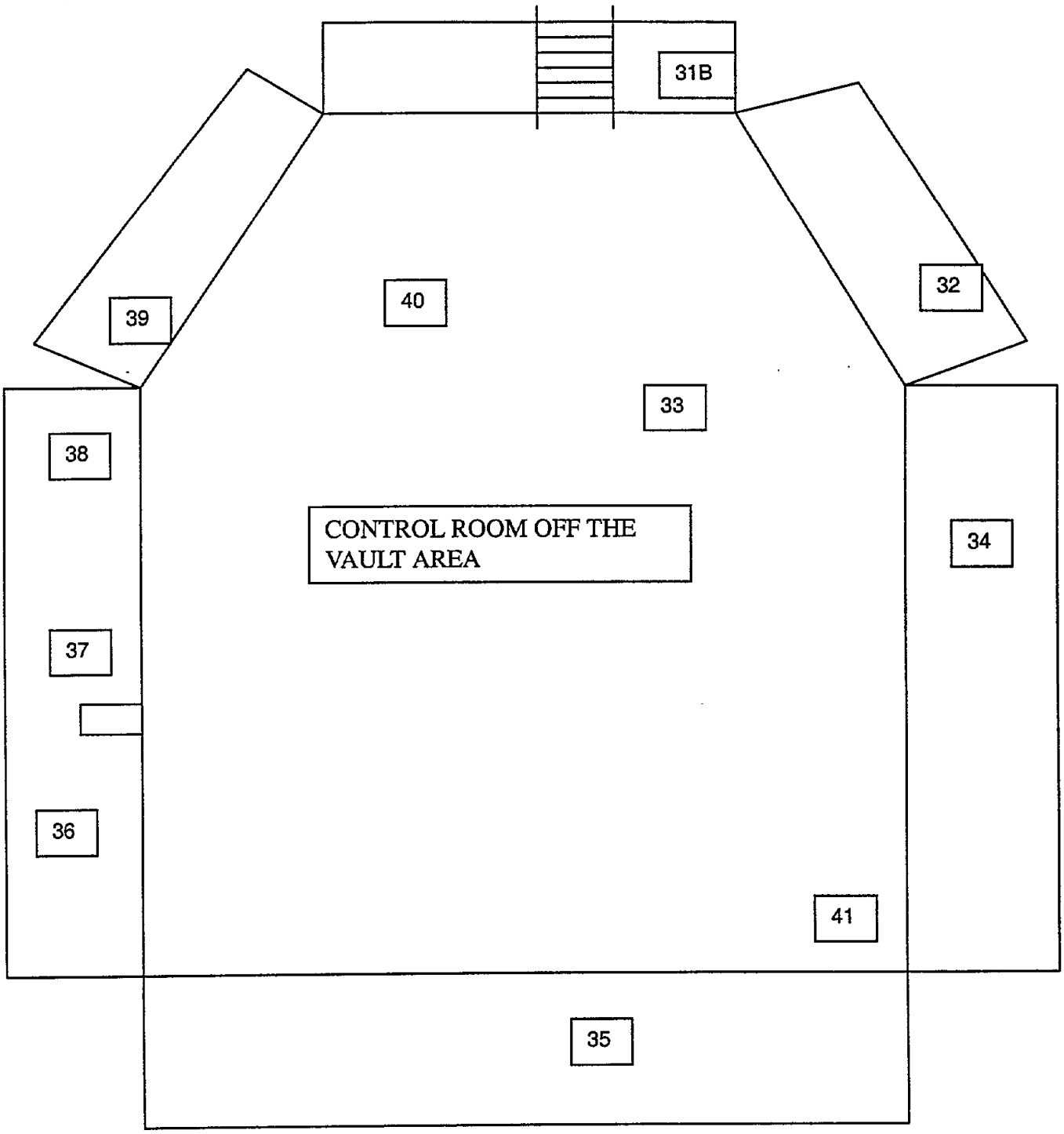


FIGURE C-4: CORNER ROOM OFF AUXILIARY WAREHOUSE SURVEY LOCATIONS

AREA "A"
A-CNR-1 TO 20

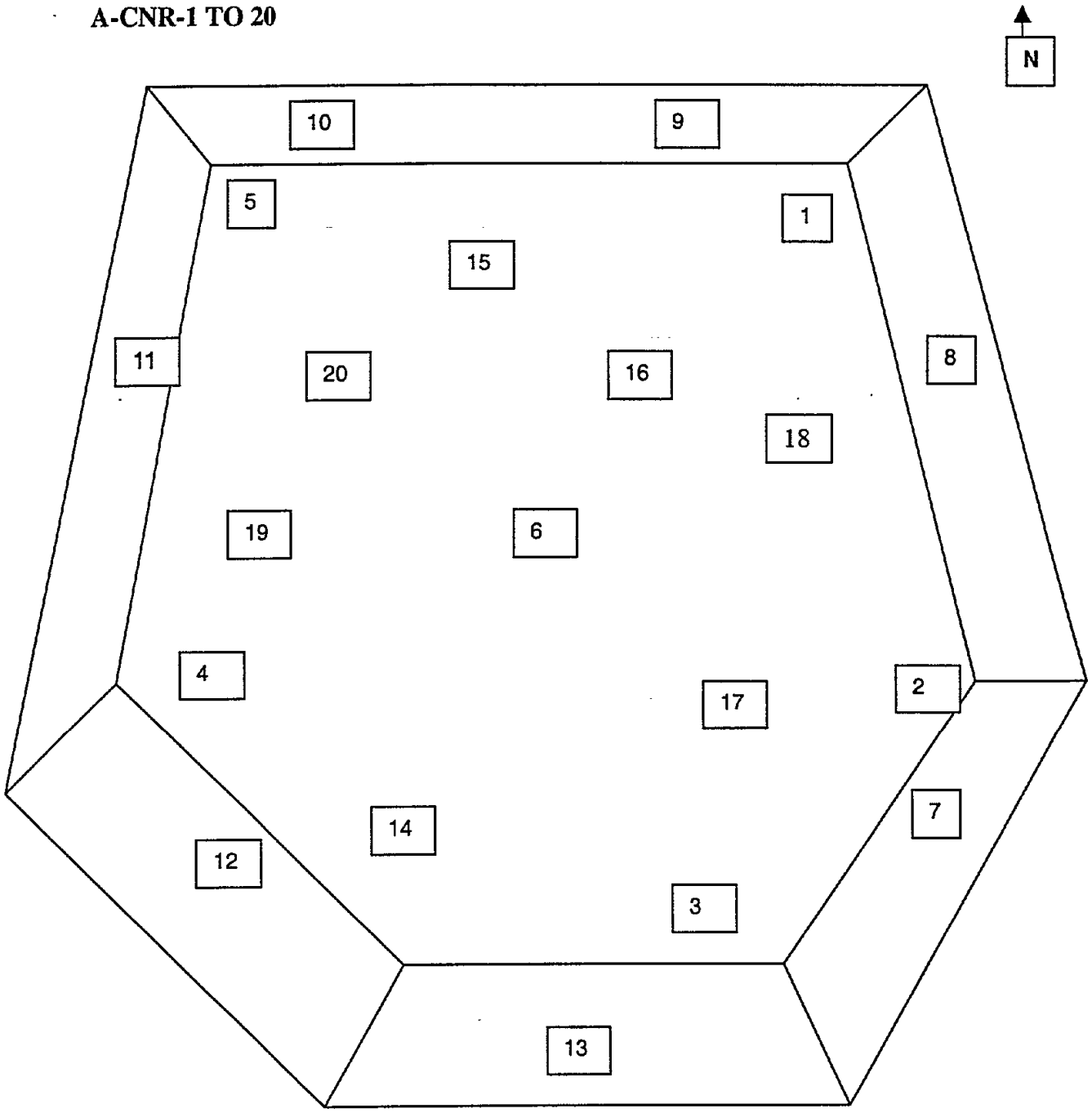


FIGURE C-5: DOCKING AREA SURVEY LOCATIONS

AREA "A"
A-DCK-1 TO 30

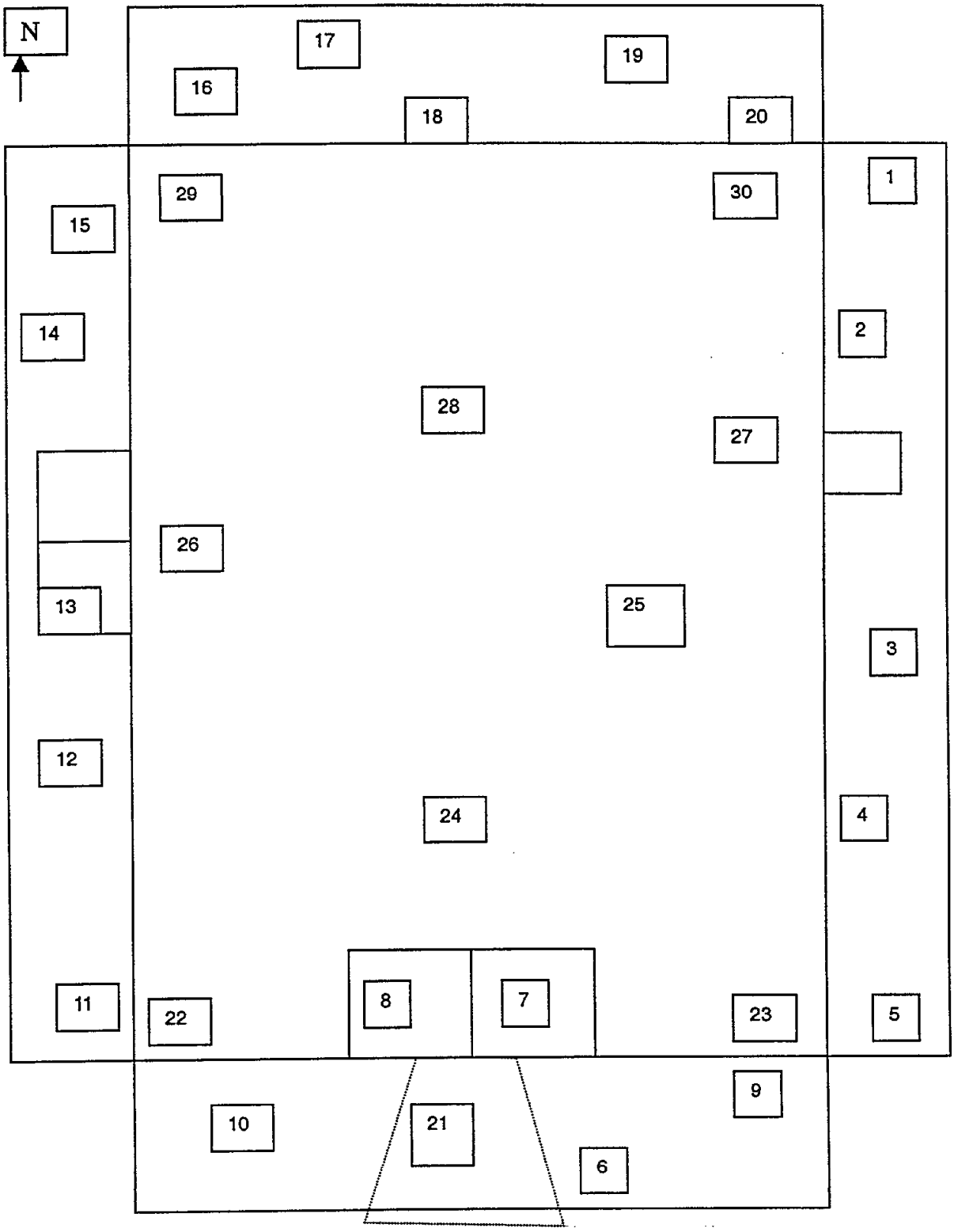


FIGURE C-6: PEARLMAN'S FORMER LAB, SURVEY LOCATIONS
AREA "A"
A-PLB-1 TO 20
W = WALL

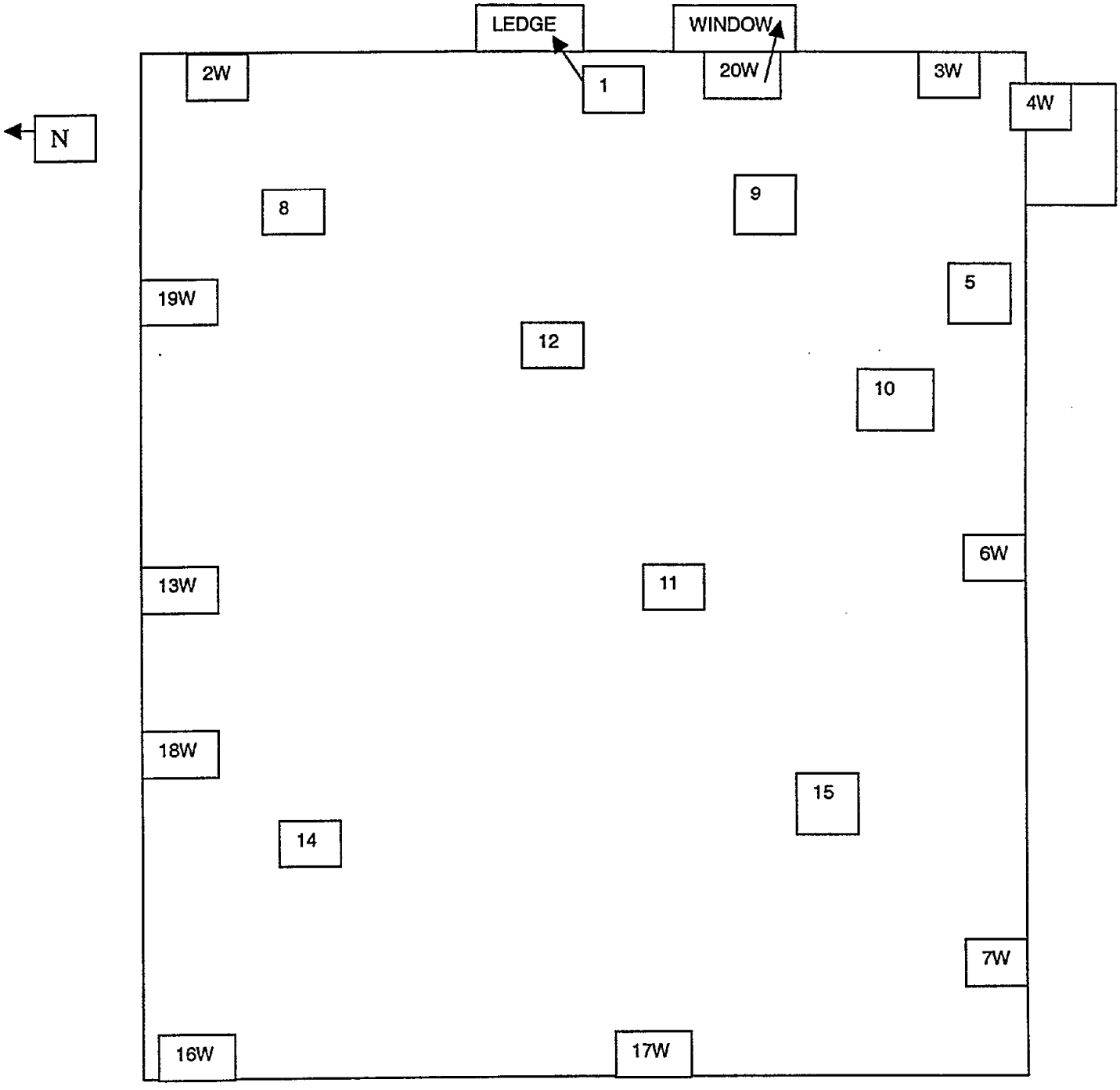


FIGURE C-7: AUXILIARY WAREHOUSE, SURVEY LOCATIONS

A-AUX-1 TO 30

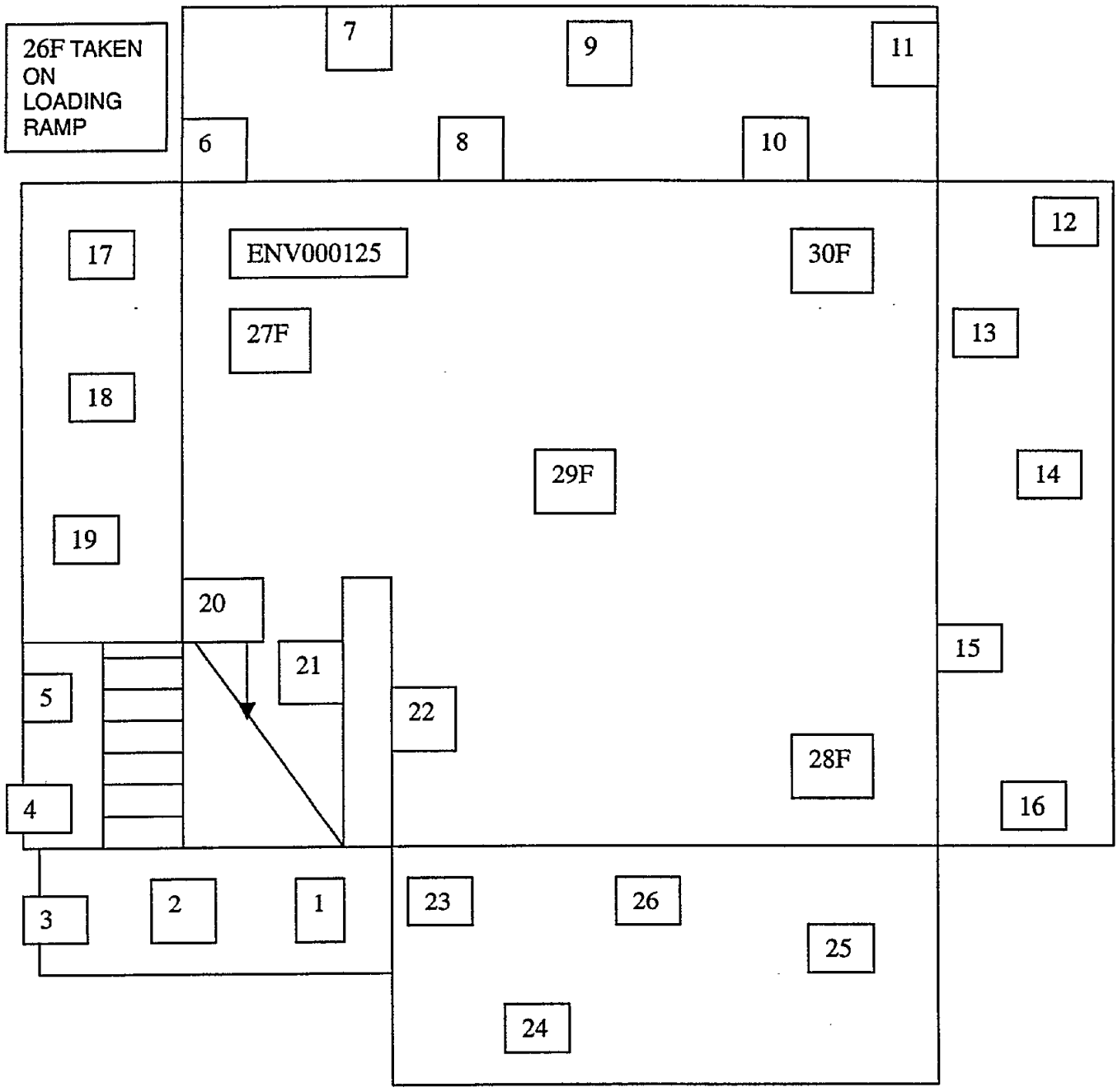


FIGURE C-8: FORMER NORTH LABORATORY SURVEY LOCATIONS
AREA "B"
B-LAB-1 TO 7
F = FLOOR

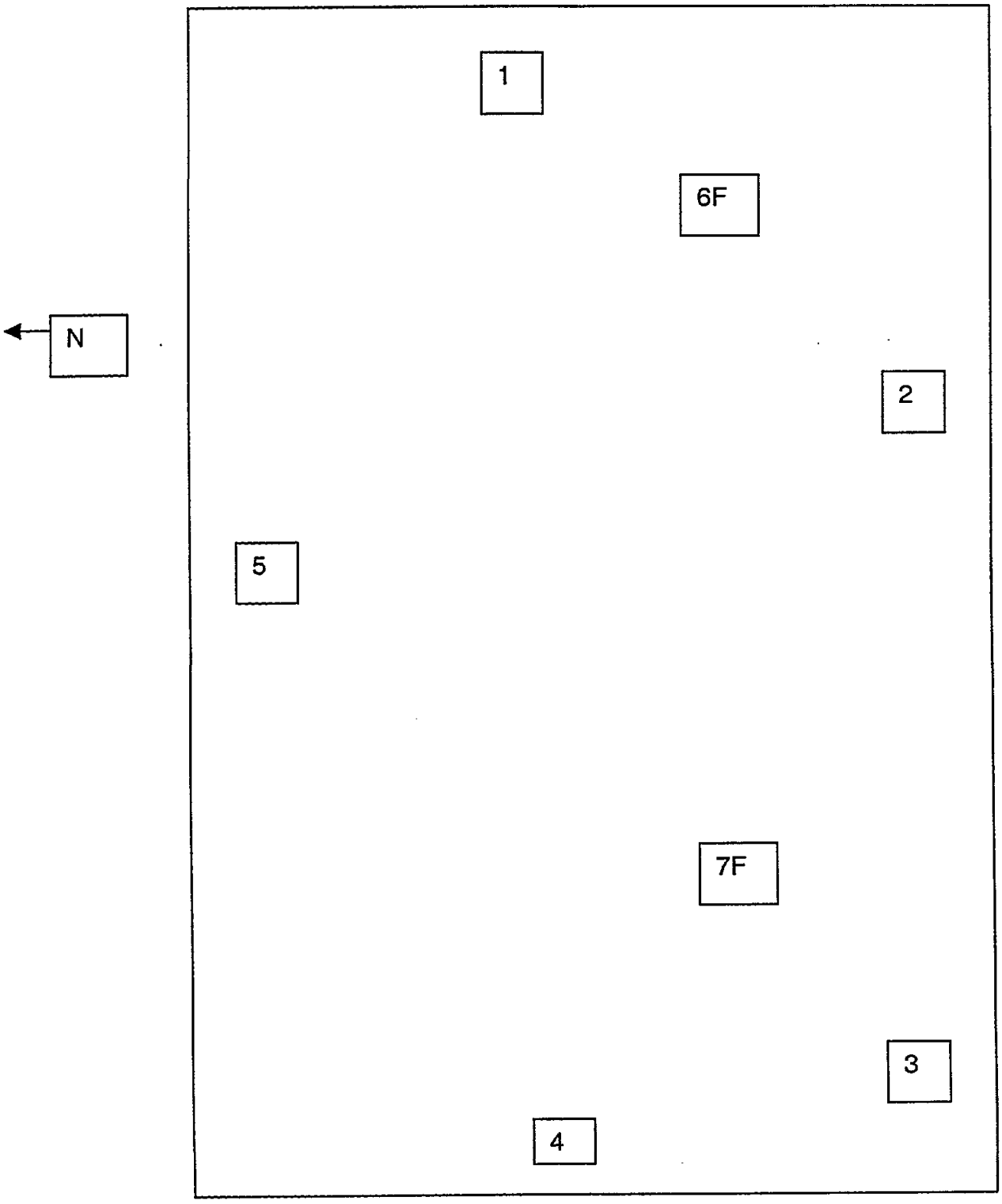


FIGURE C-9: FORMER SOUTH LABORATORY SURVEY LOCATIONS
AREA "B"
B-LAB-8 TO 13 F = FLOOR

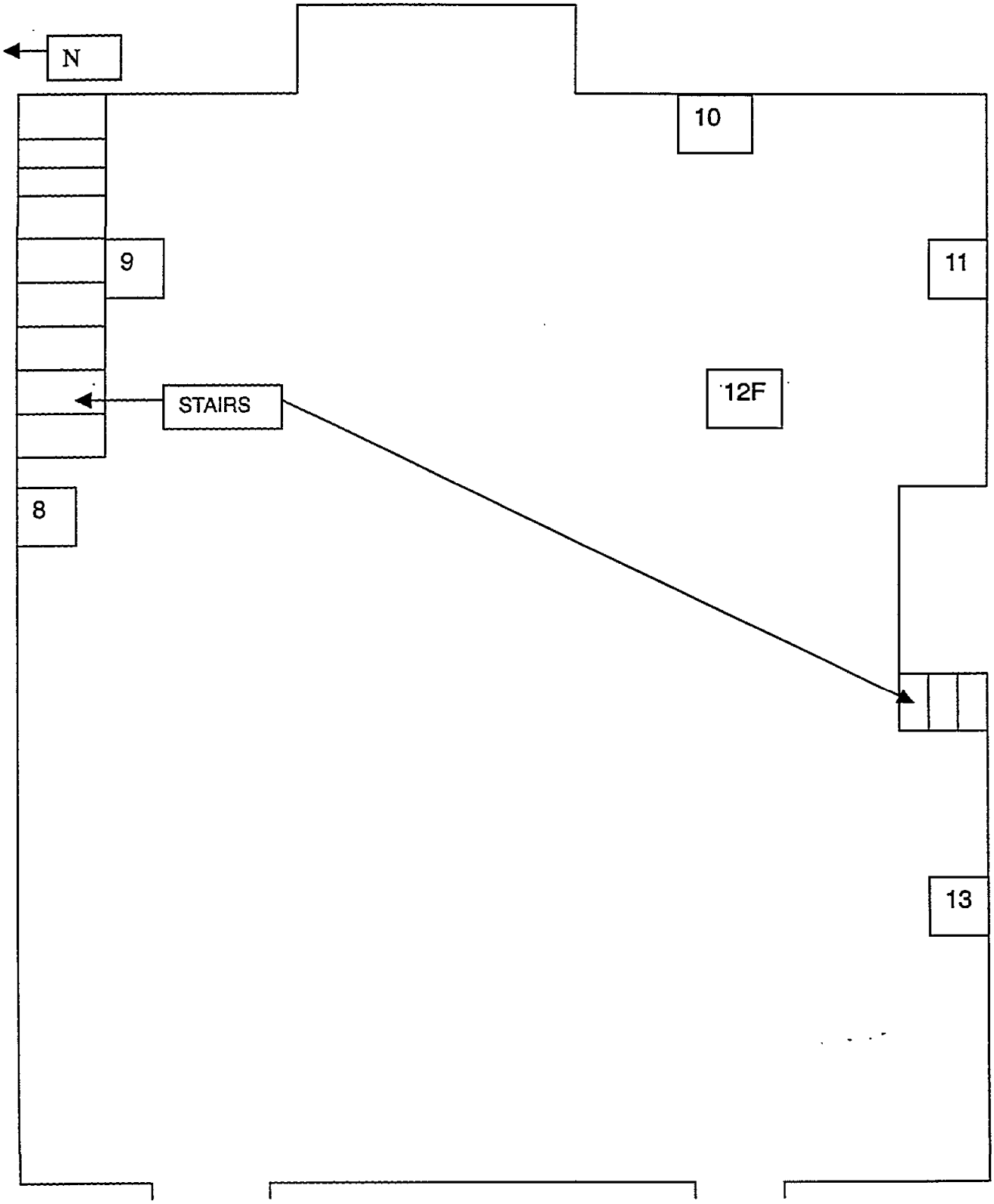


FIGURE C-10: FORMER NORTHWEST LAB SURVEY LOCATIONS
AREA "B"
B-LAB-14 TO 20
ALL WALL LOCATIONS

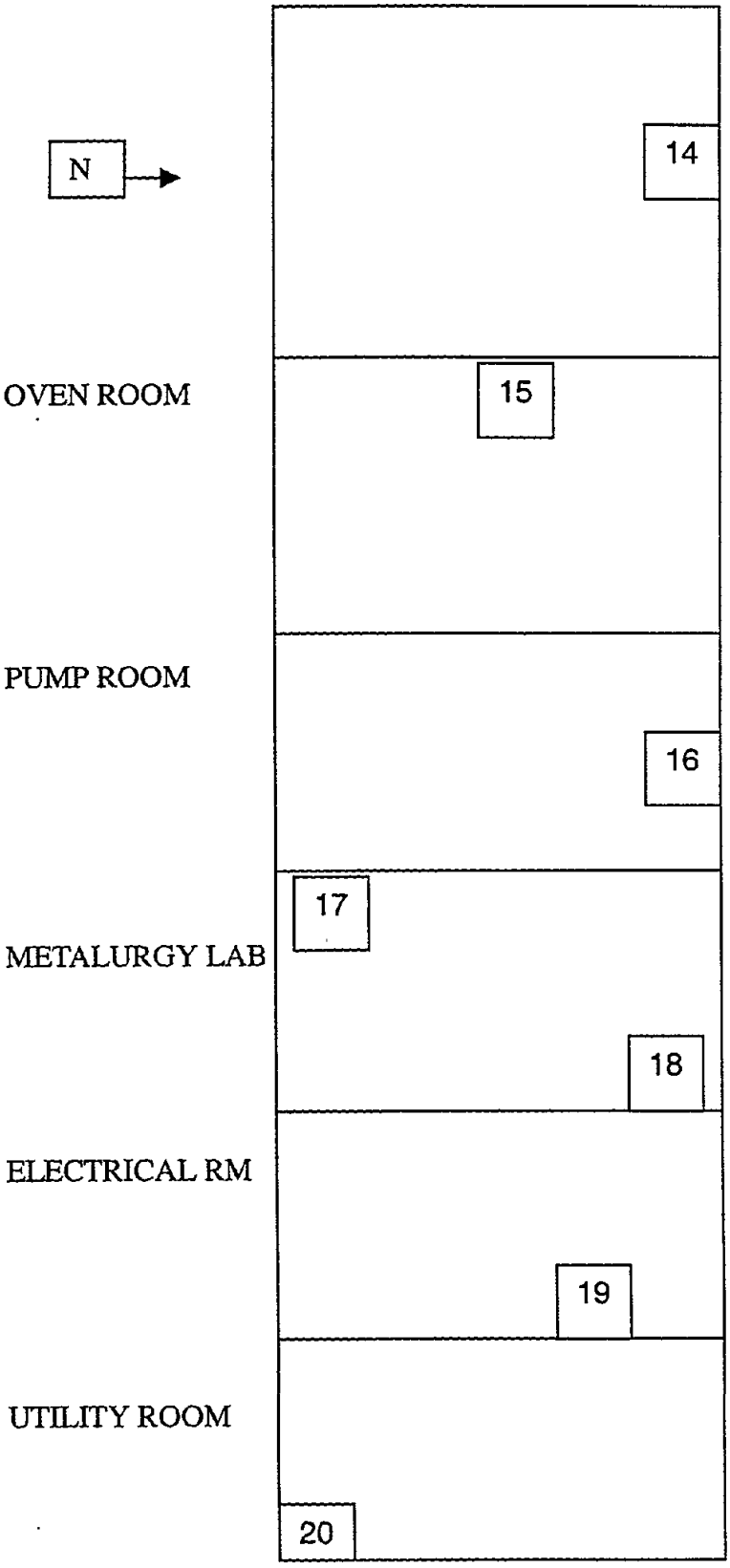


FIGURE C-11: FINGER BUILDING SURVEY LOCATIONS

AREA "C"
C-FGR-1 TO 10 W=WALL

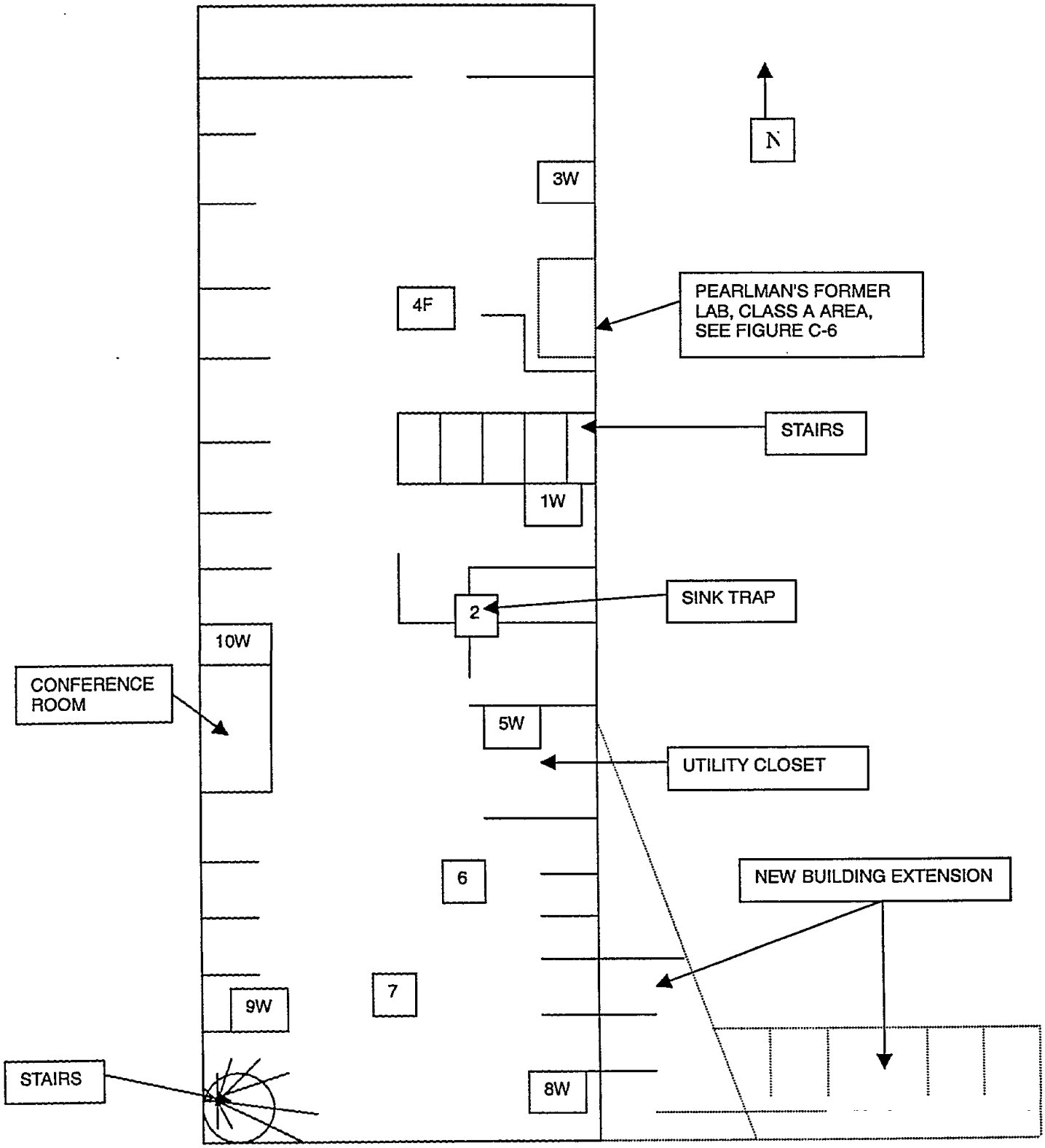


FIGURE C-12: AUDITORIUM AND OFFICE AREAS SURROUNDING VAULT SURVEY LOCATIONS

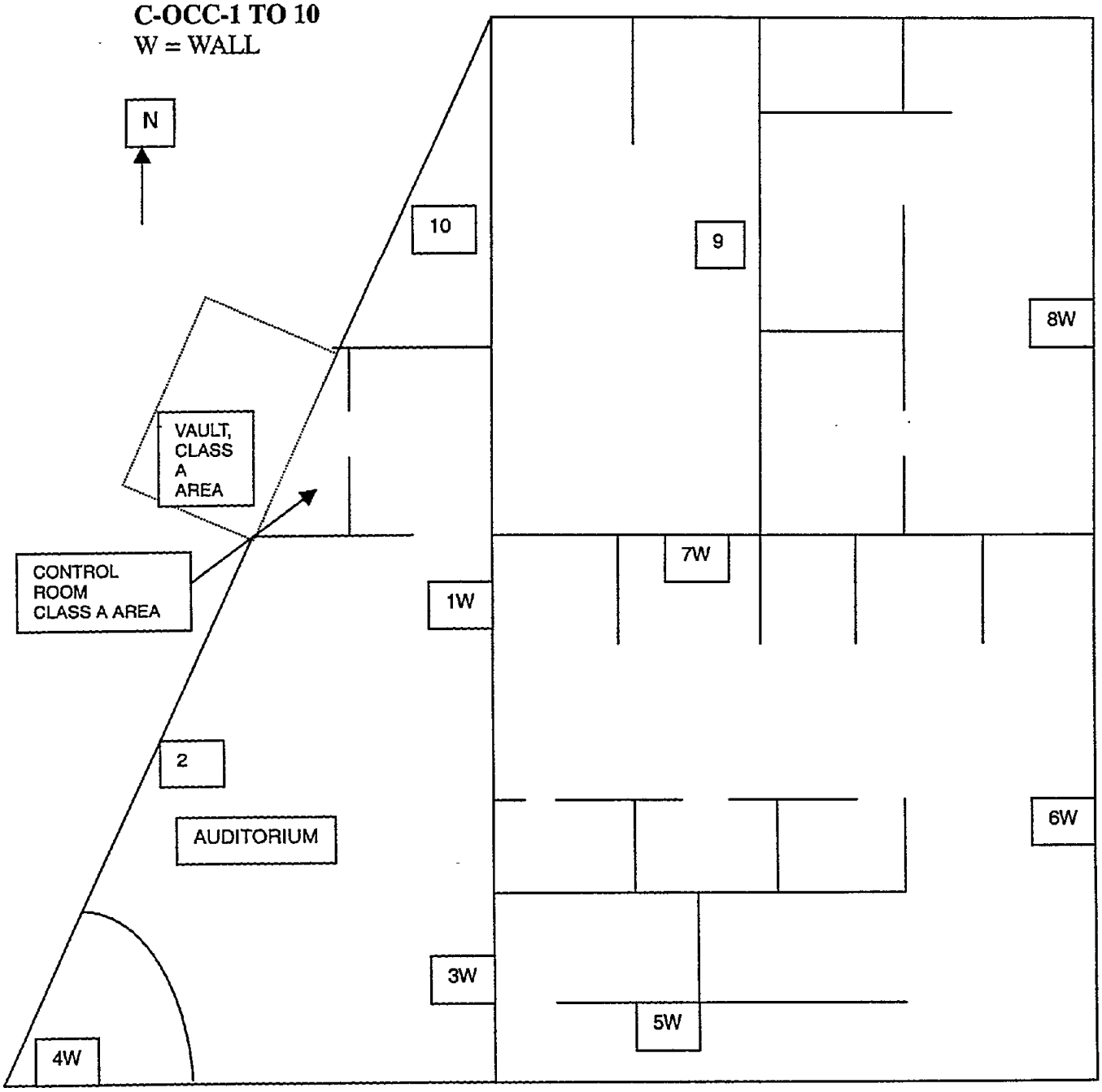


FIGURE C-13: OFFICE AREA SOUTH OF WAREHOUSE IN BUILDING 001, SURVEY LOCATIONS

AREA "C"
C-OFC-1 TO 10 ALL WALL LOCATIONS

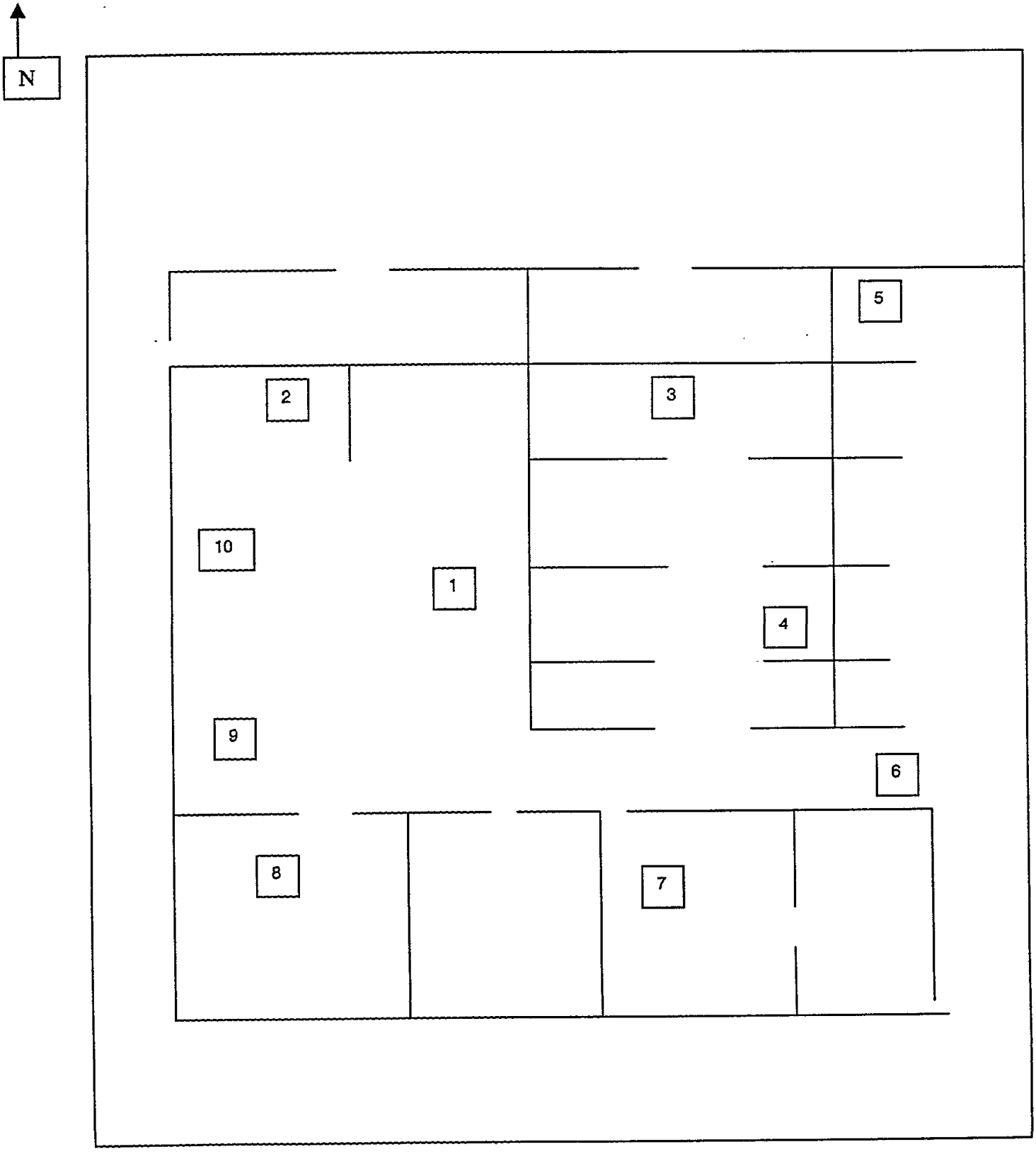
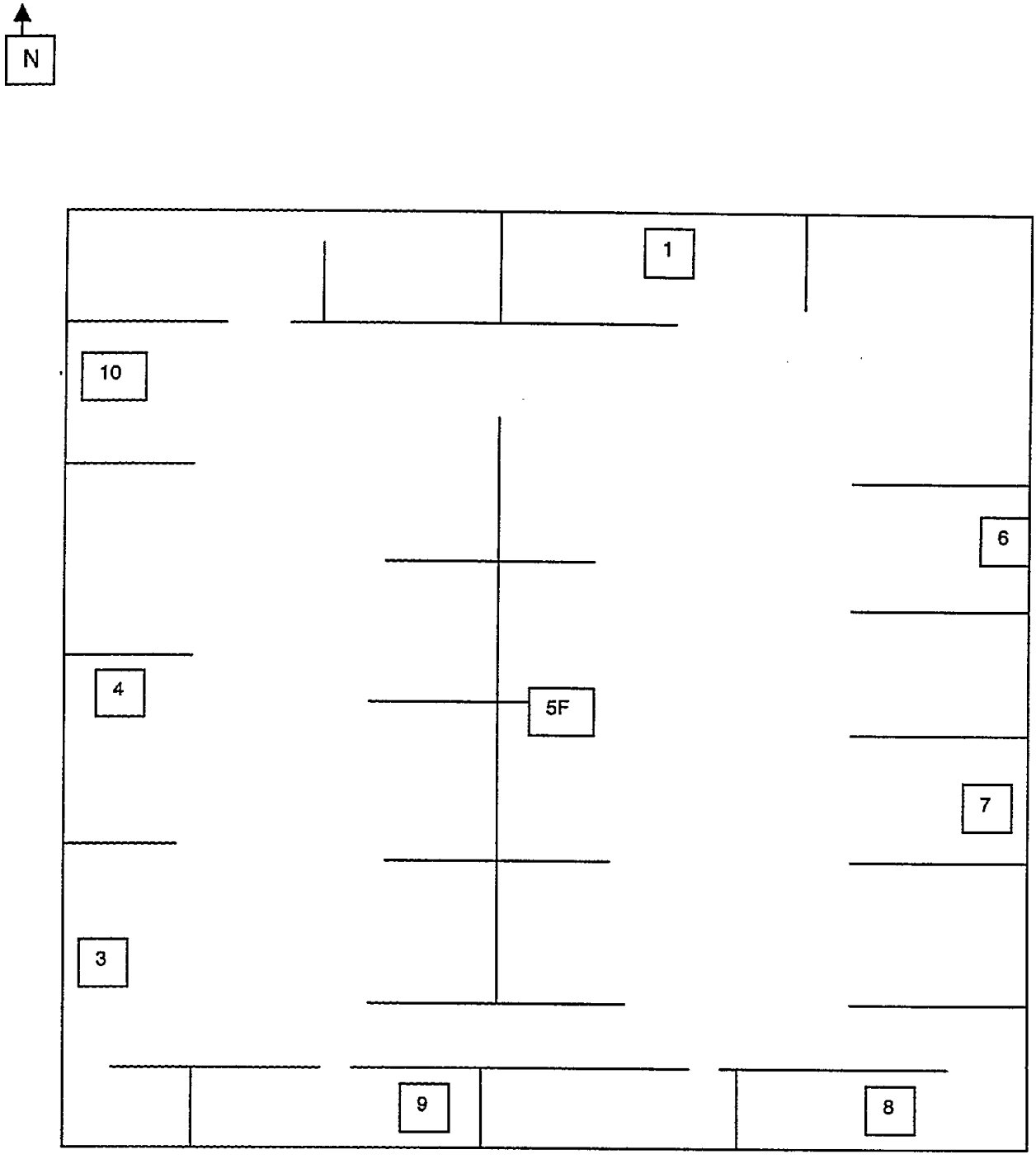


FIGURE C-14: OFFICE COMPUTER ROOMS SOUTH OF LABS, SURVEY LOCATIONS

AREA "C"
C-OCR-1 TO 10
F = FLOOR



APPENDIX D

ISOTOPIC ANALYSES

****
***** BOEING CANOGA PARK *****
***** SHEA - RADIATION SAFETY LAB *****
***** *****
***** GAMMA SPECTRUM ANALYSIS REPORT *****
****

Report Generated On : 11/21/00 1:11:31 PM

Sample Identification : ENV00125
Spectrum Description : Downey Lead Paint Chips
MCA Number : System # 1
Sample Type : Paint
Sample Geometry : 2

Peak Locate Threshold : 4.00
Peak Locate Range (in channels) : 200 - 16384
Peak Area Range (in channels) : 1 - 16384
Identification Energy Tolerance : 1.000 keV

Sample Size : 2.480E+002 Gram

Sample Taken On : 11/20/00 10:00:00 AM
Acquisition Started : 11/21/00 10:53:21 AM

Live Time : 3000.0 seconds
Real Time : 3000.2 seconds

Energy Calibration Used Done On : 10/10/00
Efficiency Calibration Used Done On : 10/10/00

Report Reviewed and
Conforms to N0010P000028 By: [signature] Date: 11-21-00

Radiation Safety

****
***** I N T E R F E R E N C E C O R R E C T E D R E P O R T 1 *****
****

Sample Identification : ENV00125

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/Gram)	Wt mean Activity Uncertainty	Percent Total Act.	Nuclide MDA (pCi/Gram)

Total Sample Activity... 0.0000E+000 pCi/Gram

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000 sigma

No peak search results available for nuclide analysis.

****
***** BOEING CANOGA PARK *****
***** SHEA - RADIATION SAFETY LAB *****
***** *****
***** GAMMA SPECTRUM ANALYSIS REPORT *****
****

Report Generated On : 12/05/00 2:32:00 PM

Sample Identification : ENV00129
Spectrum Description : Downy Soil Under Basement Floor # 1
MCA Number : System # 1
Sample Type : Soil
Sample Geometry : 1

Peak Locate Threshold : 4.00
Peak Locate Range (in channels) : 200 - 16384
Peak Area Range (in channels) : 1 - 16384
Identification Energy Tolerance : 1.000 keV

Sample Size : 8.320E+002 Gram

Sample Taken On : 12/02/00 9:00:00 AM
Acquisition Started : 12/05/00 1:32:26 PM

Live Time : 1000.0 seconds
Real Time : 1024.2 seconds

Energy Calibration Used Done On : 11/29/00
Efficiency Calibration Used Done On : 11/29/00

Report Reviewed and
Conforms to N001OP000028 By: ER MacDonald Date: 12-5-00

Radiation Safety

NOTE:COPY1

****
***** INTERFERENCE CORRECTED REPORT 2 *****
****

Sample Identification : ENV00129

Nuclide Name		Nuclide Id Confidence	Wt mean Activity (pCi/Gram)	Wt mean Activity Uncertainty	Percent Total Act.	Nuclide MDA (pCi/Gram)
K-40		0.999	1.489E+001	1.801E+000	92.44%	5.062E-001
Tl-208		0.672	1.939E-001	4.880E-002	1.20%	4.749E-002
PB-212	@	0.577	6.166E-001	9.339E-002	3.83%	8.263E-002
PB-214	@	0.553	4.072E-001	6.798E-002	2.53%	7.987E-002

Total Sample Activity... 1.6108E+001 pCi/Gram

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000 sigma

****
***** BOEING CANOGA PARK *****
***** SHEA - RADIATION SAFETY LAB *****
***** *****
***** GAMMA SPECTRUM ANALYSIS REPORT *****
****

Report Generated On : 12/05/00 3:17:30 PM

Sample Identification : ENV00130
Spectrum Description : Downy Soil Under Basement Floor # 2
MCA Number : System # 1
Sample Type : Soil
Sample Geometry : 1

Peak Locate Threshold : 4.00
Peak Locate Range (in channels) : 200 - 16384
Peak Area Range (in channels) : 1 - 16384
Identification Energy Tolerance : 1.000 keV

Sample Size : 9.300E+002 Gram

Sample Taken On : 12/02/00 9:00:00 AM
Acquisition Started : 12/05/00 2:28:40 PM

Live Time : 1000.0 seconds
Real Time : 1000.2 seconds

Energy Calibration Used Done On : 11/29/00
Efficiency Calibration Used Done On : 11/29/00

Report Reviewed and
Conforms to N001OP000028 By: EP McBrinn Date: 12-5-00

Radiation Safety

NOTE:COPY1

****
***** I N T E R F E R E N C E C O R R E C T E D R E P O R T 2 *****
****

Sample Identification : ENV00130

Nuclide Name		Nuclide Id Confidence	Wt mean Activity (pCi/Gram)	Wt mean Activity Uncertainty	Percent Total Act.	Nuclide MDA (pCi/Gram)
K-40		1.000	1.495E+001	1.725E+000	90.29%	7.748E-002
Tl-208		0.635	2.188E-001	4.552E-002	1.32%	4.329E-002
BI-212		0.507	4.328E-001	1.903E-001	2.61%	2.759E-001
PB-212	@	0.577	5.729E-001	8.942E-002	3.46%	8.649E-002
PB-214	@	0.559	3.839E-001	6.344E-002	2.32%	8.153E-002

Total Sample Activity... 1.6561E+001 pCi/Gram

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000 sigma

BOEING CANOGA PARK
SHEA - RADIATION SAFETY LAB
GAMMA SPECTRUM ANALYSIS REPORT

Report Generated On : 12/05/00 3:38:13 PM

Sample Identification : ENV00131
Spectrum Description : Downy Soil Under Basement Floor # 3
MCA Number : System # 1
Sample Type : Soil
Sample Geometry : 1

Peak Locate Threshold : 4.00
Peak Locate Range (in channels) : 200 - 16384
Peak Area Range (in channels) : 1 - 16384
Identification Energy Tolerance : 1.000 keV

Sample Size : 8.470E+002 Gram

Sample Taken On : 12/02/00 9:00:00 AM
Acquisition Started : 12/05/00 3:15:55 PM

Live Time : 1000.0 seconds
Real Time : 1000.2 seconds

Energy Calibration Used Done On : 11/29/00
Efficiency Calibration Used Done On : 11/29/00

Report Reviewed and
Conforms to N001OP000028 By: ER McDunn Date: 12-5-00

Radiation Safety

NOTE:COPY1

****
***** I N T E R F E R E N C E C O R R E C T E D R E P O R T 2 *****
****

Sample Identification : ENV00131

Nuclide Name		Nuclide Id Confidence	Wt mean Activity (pCi/Gram)	Wt mean Activity Uncertainty	Percent Total Act.	Nuclide MDA (pCi/Gram)
K-40		1.000	1.514E+001	1.807E+000	92.85%	4.565E-001
Tl-208		0.662	1.993E-001	5.098E-002	1.22%	5.287E-002
PB-212	@	0.760	5.995E-001	9.218E-002	3.68%	8.378E-002
PB-214	@	0.684	3.665E-001	6.702E-002	2.25%	9.680E-002

Total Sample Activity... 1.6307E+001 pCi/Gram

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000 sigma

****
***** BOEING CANOGA PARK *****
***** SHEA - RADIATION SAFETY LAB *****
***** *****
***** GAMMA SPECTRUM ANALYSIS REPORT *****
****

Report Generated On : 12/06/00 9:07:02 AM

Sample Identification : ENV00132
Spectrum Description : Downy Basement Concrete Dust, Soil, Wat
MCA Number : System # 1
Sample Type : Wet Solid
Sample Geometry : 1

Peak Locate Threshold : 4.00
Peak Locate Range (in channels) : 200 - 16384
Peak Area Range (in channels) : 1 - 16384
Identification Energy Tolerance : 1.000 keV

Sample Size : 9.600E+002 Gram

Sample Taken On : 12/02/00 9:00:00 AM
Acquisition Started : 12/05/00 3:36:47 PM

Live Time : 1000.0 seconds
Real Time : 1000.2 seconds

Energy Calibration Used Done On : 11/29/00
Efficiency Calibration Used Done On : 11/29/00

Report Reviewed and
Conforms to N001OP000028 By: _____ Date: 12-6-00

Radiation Safety

NOTE:COPY1

****
***** I N T E R F E R E N C E C O R R E C T E D R E P O R T 2 *****
****

Sample Identification : ENV00132

Nuclide Name		Nuclide Id Confidence	Wt mean Activity (pCi/Gram)	Wt mean Activity Uncertainty	Percent Total Act.	Nuclide MDA (pCi/Gram)
K-40		0.998	1.394E+001	1.647E+000	93.10%	4.864E-001
Tl-208		0.653	1.632E-001	3.793E-002	1.09%	3.968E-002
PB-212	@	0.705	5.652E-001	8.431E-002	3.78%	7.513E-002
PB-214	@	0.631	3.052E-001	5.932E-002	2.04%	8.743E-002

Total Sample Activity... 1.4972E+001 pCi/Gram

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000 sigma

****
***** BOEING CANOGA PARK *****
***** SHEA - RADIATION SAFETY LAB *****
***** *****
***** GAMMA SPECTRUM ANALYSIS REPORT *****
****

Report Generated On : 12/06/00 3:40:44 PM

Sample Identification : ENV00133
Spectrum Description : Downy Basement Sump Water
MCA Number : System # 1
Sample Type : Water
Sample Geometry : 1

Peak Locate Threshold : 4.00
Peak Locate Range (in channels) : 200 - 16384
Peak Area Range (in channels) : 1 - 16384
Identification Energy Tolerance : 1.000 keV

Sample Size : 4.780E-001 Gram

Sample Taken On : 12/02/00 9:00:00 AM
Acquisition Started : 12/06/00 9:06:09 AM

Live Time : 1000.0 seconds
Real Time : 1000.1 seconds

Energy Calibration Used Done On : 11/29/00
Efficiency Calibration Used Done On : 11/29/00

Report Reviewed and
Conforms to N0010P000028 By: ER McBurnett Date: 12-6-00

Radiation Safety

NOTE:COPY1

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***** I N T E R F E R E N C E C O R R E C T E D R E P O R T 2 *****
****

Sample Identification : ENV00133

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/Gram)	Wt mean Activity Uncertainty	Percent Total Act.	Nuclide MDA (pCi/Gram)

Total Sample Activity... 0.0000E+000 pCi/Gram

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000 sigma

****
***** BOEING CANOGA PARK *****
***** SHEA - RADIATION SAFETY LAB *****
***** *****
***** GAMMA SPECTRUM ANALYSIS REPORT *****
****

Report Generated On : 12/08/00 9:55:23 AM

Sample Identification : ENV00134
Spectrum Description : Downy Basement Concrete Composite
MCA Number : System # 1
Sample Type : Concrete
Sample Geometry : 1

Peak Locate Threshold : 4.00
Peak Locate Range (in channels) : 200 - 16384
Peak Area Range (in channels) : 1 - 16384
Identification Energy Tolerance : 1.000 keV

Sample Size : 5.380E+002 Gram

Sample Taken On : 12/02/00 9:00:00 AM
Acquisition Started : 12/07/00 8:56:03 AM

Live Time : 1000.0 seconds
Real Time : 1000.2 seconds

Energy Calibration Used Done On : 11/29/00
Efficiency Calibration Used Done On : 11/29/00

Report Reviewed and
Conforms to N001OP000028 By: GR McDaniels Date: 12-8-00

Radiation Safety

NOTE:COPY1

Interference Corrected Activity Report 12/08/00 9:55:24 AM Page 15

****
***** INTERFERENCE CORRECTED REPORT 2 *****
****

Sample Identification : ENV00134

Nuclide Name		Nuclide Id Confidence	Wt mean Activity (pCi/Gram)	Wt mean Activity Uncertainty	Percent Total Act.	Nuclide MDA (pCi/Gram)
K-40		0.998	2.350E+001	2.839E+000	92.79%	9.440E-001
Tl-208		0.663	2.796E-001	6.534E-002	1.10%	5.606E-002
PB-212	@	0.886	8.026E-001	1.192E-001	3.17%	1.138E-001
PB-214	@	0.753	7.444E-001	1.189E-001	2.94%	1.306E-001

Total Sample Activity... 2.5323E+001 pCi/Gram

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000 sigma

****
***** BOEING CANOGA PARK *****
***** SHEA - RADIATION SAFETY LAB *****
***** *****
***** GAMMA SPECTRUM ANALYSIS REPORT *****
****

Report Generated On : 12/07/00 8:36:58 AM

Sample Identification : ENV00136
Spectrum Description : Downy Concrete Dust, Floor Elevated Rea
MCA Number : System # 1
Sample Type : Concrete
Sample Geometry : 1

Peak Locate Threshold : 4.00
Peak Locate Range (in channels) : 200 - 16384
Peak Area Range (in channels) : 1 - 16384
Identification Energy Tolerance : 1.000 keV

Sample Size : 4.190E+002 Gram

Sample Taken On : 12/06/00 9:00:00 AM
Acquisition Started : 12/06/00 3:43:01 PM

Live Time : 50000.0 seconds
Real Time : 50006.5 seconds

Energy Calibration Used Done On : 11/29/00
Efficiency Calibration Used Done On : 11/29/00

Report Reviewed and
Conforms to N001OP000028 By: EP Radiation Safety Date: 12-7-00

NOTE:COPY1

****
***** INTERFERENCE CORRECTED REPORT 2 *****
****

Sample Identification : ENV00136

	Nuclide Name		Nuclide Id Confidence	Wt mean Activity (pCi/Gram)	Wt mean Activity Uncertainty	Percent Total Act.	Nuclide MDA (pCi/Gram)
	K-40		0.998	1.782E+001	1.266E+000	75.04%	1.358E-001
X	MN-54		0.953				7.397E-009
	CS-137		0.961	7.572E-003	3.551E-003	0.03%	8.017E-003
	Tl-208		0.933	2.329E-001	1.733E-002	0.98%	1.066E-002
	PB-210		1.000	2.813E-001	1.137E-001	1.18%	2.568E-001
	BI-212		0.857	4.024E-001	6.185E-002	1.69%	9.967E-002
	PB-212	@	0.982	6.723E-001	4.421E-002	2.83%	1.299E-002
	BI-214		0.759	5.254E-001	3.088E-002	2.21%	2.470E-002
	PB-214	@	0.933	5.372E-001	2.982E-002	2.26%	2.116E-002
	RA-223	@	0.333	3.585E-002	2.594E-002	0.15%	3.015E-002
	RA-224		0.994	6.879E-001	1.159E-001	2.90%	1.405E-001
X	RA-226		0.935				1.995E-007
	AC-228	@	0.583	6.482E-001	3.712E-002	2.73%	5.162E-002
	TH-231	@	0.307	1.333E-001	8.814E-002	0.56%	0.000E+000
	PA-234M		0.980	1.170E+000	4.617E-001	4.93%	1.033E+000
	TH-234	@	0.886	5.263E-001	1.992E-001	2.22%	3.065E-001
	U-235	@	0.726	6.707E-002	2.662E-002	0.28%	1.212E-002

Total Sample Activity... 2.3743E+001 pCi/Gram

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000 sigma

****
***** BOEING CANOGA PARK *****
***** SHEA - RADIATION SAFETY LAB *****
***** *****
**** GAMMA SPECTRUM ANALYSIS REPORT *****
****

Report Generated On : 12/15/00 2:57:08 PM

Sample Identification : ENV00144
Spectrum Description : Downey Cross Sect. Bsemnt Srce Tube
MCA Number : System # 1
Sample Type : Steel & Conc.
Sample Geometry : 2

Peak Locate Threshold : 4.00
Peak Locate Range (in channels) : 200 - 16384
Peak Area Range (in channels) : 1 - 16384
Identification Energy Tolerance : 1.000 keV

Sample Size : 1.080E+004 Gram

Sample Taken On : 12/14/00 9:00:00 AM
Acquisition Started : 12/14/00 3:21:53 PM

Live Time : 1000.0 seconds
Real Time : 1000.3 seconds

Energy Calibration Used Done On : 11/27/00
Efficiency Calibration Used Done On : 11/27/00

Report Reviewed and
Conforms to N0010P000028 By: GR Wadsworth Date: 12-15-00

Radiation Safety

NOTE:COPY1

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**** I N T E R F E R E N C E C O R R E C T E D R E P O R T 2 *****
****

Sample Identification : ENV00144

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/Gram)	Wt mean Activity Uncertainty	Percent Total Act.	Nuclide MDA (pCi/Gram)
K-40	1.000	1.427E+000	1.953E-001	100.00%	6.682E-002

Total Sample Activity... 1.4272E+000 pCi/Gram

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000 sigma