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7. Abstract

This report describes the results of the Environmental Radiological Surveys conducted during the months of October, November, and December 1989.



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QUARTERLY
ENVIRONMENTAL RADIOLOGICAL SURVEY

4th QUARTER 1989

A. R. JOHNSON
C. R. HUCKFELDT

ENVIRONMENTAL DIVISION
ENVIRONMENTAL ASSURANCE
ENVIRONMENTAL PROTECTION
200/600 AREAS ENVIRONMENTAL PROTECTION

Executive Summary

This report provides the status of radiological conditions in the environment near facilities located in the 200 and 600 areas. The Fourth Quarter 1989 survey results and the status of actions required in past reports are summarized below:

- There were 67 radiological surveys completed during October, November, December 1989.
- Four Surveillance and Compliance Inspection Reports (SCIR) were issued for sites found out of compliance with standards identified in WHC-CM-7-5. They are summarized in section 5.1 of this report.
- Five Surveillance and Compliance Inspection Reports were closed as a result of corrective actions taken during the fourth quarter of 1989 and are summarized in section 5.2 of this report.
- Forty-two Surveillance and Compliance Inspection Reports, summarized in Table 5.4, had not been resolved. Landlord responsibilities for the unresolved SCIR's are as follows:

| <u>LANDLORD</u> | <u>OPEN INSPECTION REPORTS</u> |
|--------------------------------------|--------------------------------|
| Hanford Restoration Operations (HRO) | 35 |
| B Plant | 2 |
| PUREX | 1 |
| Tank Farm Operations (TFO) | 4 |

PRIORITIZATION RANKING

- Prioritization ranking for all open SCIR's are listed in Table 5.4. The ten sites with the highest priority for clean-up include:

| | <u>SITE</u> | <u>CUSTODIAN</u> |
|-----|-------------------------------------|------------------|
| 1. | UN-216-E-17 Contamination Migration | HRO |
| 2. | 241-B Tank Farm Perimeters | TFO |
| 3. | UN-216-E-16 (TC-4 Spur) | PUREX |
| 4. | 216-S-6 CRIB | HRO |
| 5. | UN-216-E-31 Contamination Migration | HRO |
| 6. | 216-T-14-17 Trenches | HRO |
| 7. | UN-216-W-31 Contamination Migration | HRO |
| 8. | 216-A-40 Basin | TFO |
| 9. | UN-216-E-36 Ant Intrusion | B-PLANT |
| 10. | UN-216-W-31 Pipeline | HRO |

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INTRODUCTION

Routine surveys to monitor radiological conditions are performed by Westinghouse Hanford Company's Health Physics Department. Areas surveyed include the road surfaces, firebreaks, radioactive waste sites, radioactively contaminated areas resulting from spills or releases, areas near buildings, tank farms and facilities located in the 200/600 areas. (see figures 1-3)

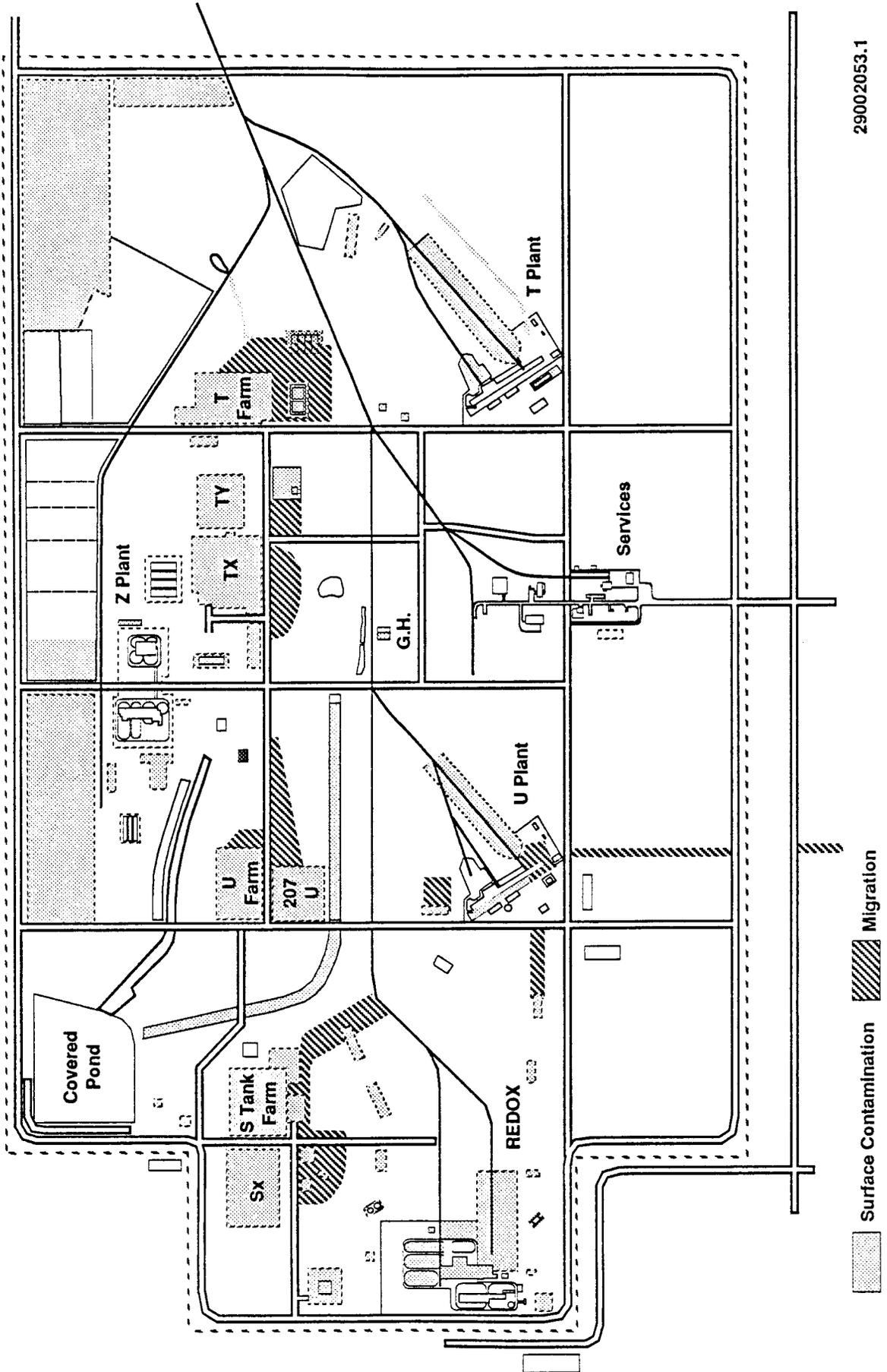
The survey frequencies for particular sites may vary, based on site history, radiological status, use, and general conditions. Special surveys may be requested at irregular frequencies if conditions warrant. Radiological surveys are conducted on sites to detect surface contamination that may result from biological intrusion, erosion, or windblown contamination from other sources. Survey data is compared with standards identified in WHC-CM-7-5, Environmental Compliance Manual, as well as previous surveys to recognize possible trends, assess environmental impacts, and help determine where corrective actions are needed.

Landlords of sites found out of compliance are issued a Radiological Problem Report (RPR) from the Health Physics Department. Should the landlord fail to respond to the identified problem in a timely manner, Environmental Protection will issue a Surveillance and Compliance Inspection Report (SCIR). Open SCIR's are listed in section 5.4 of this report.

It should be noted that the surveys scheduled for this program consist of environmentally impacted areas only and do not include active facilities (e.g. inside active tank farms). Also, a survey to determine surface radiologic conditions does not equate to a release survey. Therefore, a radiological survey that detects no contamination within a radiation control area does not release the site from control, but may result in a posting status change.

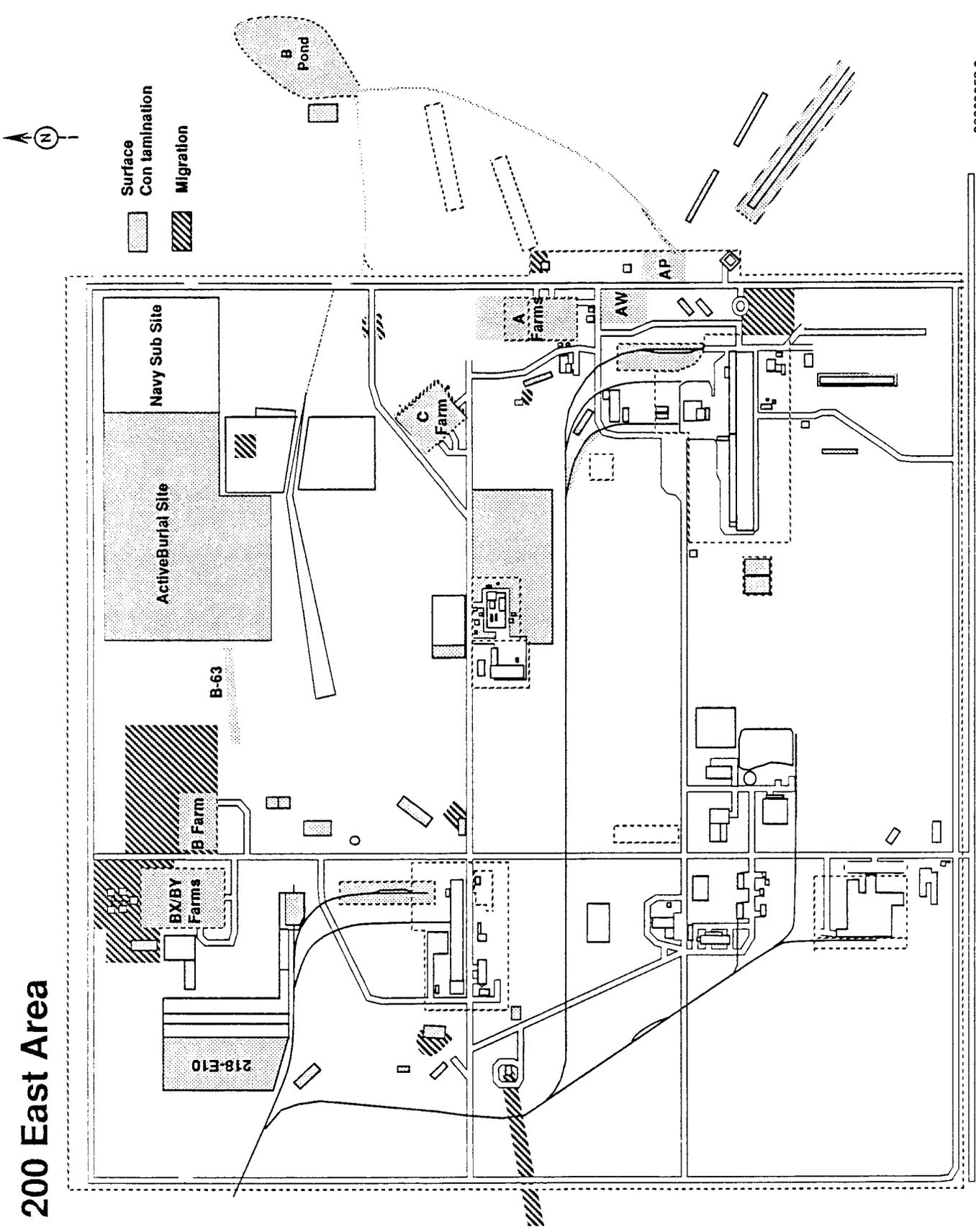
A ranking system is used for prioritizing surface contamination clean-up. A numerical value is assigned for level of contamination, site accessibility, and contamination mobility. The ranking with a maximum of 15 points are noted on Table 5.4.

200 West Area



29002053.1

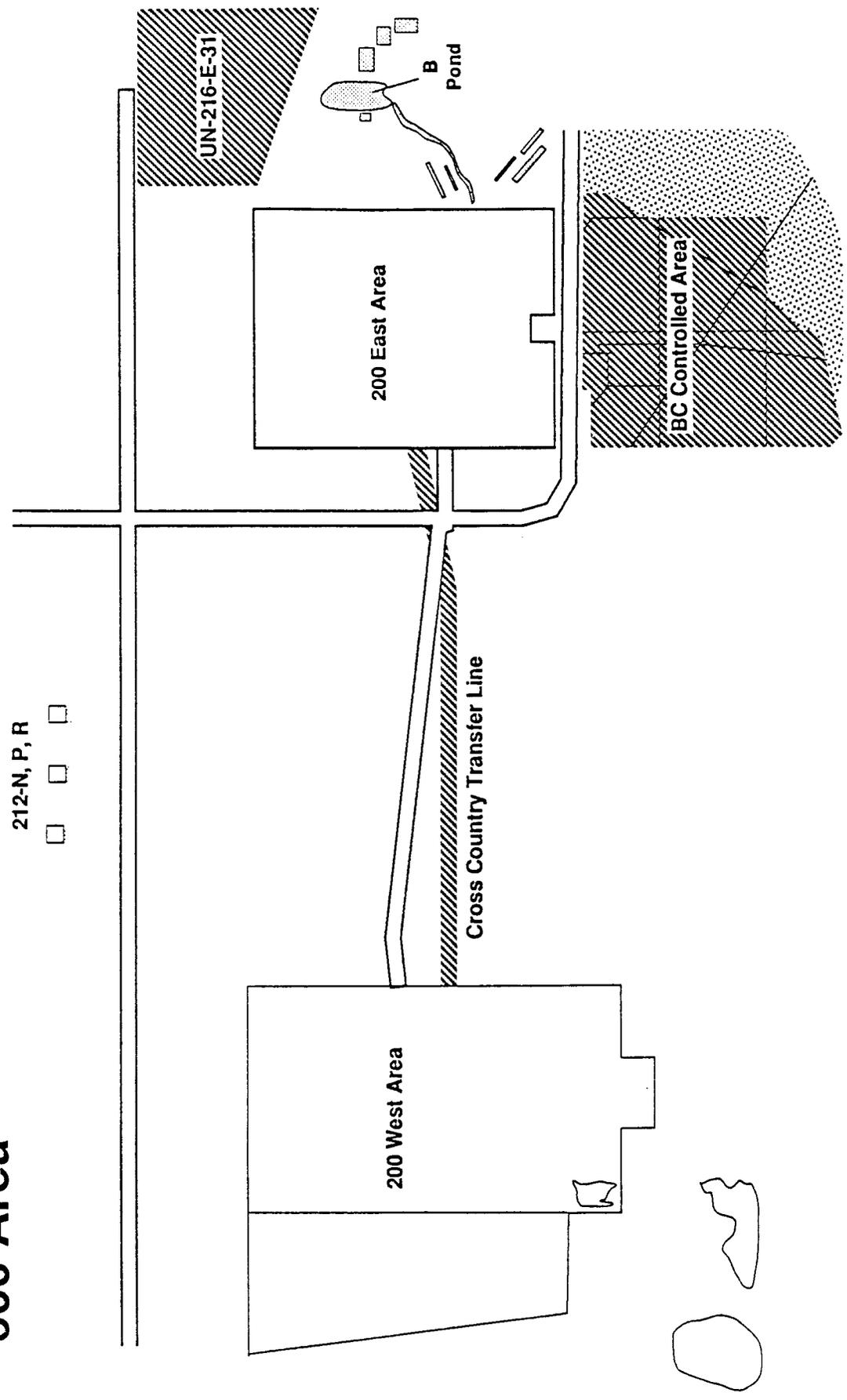
Figure 1



29002053.2

Figure 2

600 Area



212-N, P, R

UN-216-E-31

200 East Area

200 West Area

Cross Country Transfer Line



Surface Contamination Migration

29002053.3

Figure 3

1.0 OBJECTIVES

- Identify priorities for clean-up of surface contamination.
- Determine compliance with Department of Energy requirements and Westinghouse policy and standards regarding operational control, environmental and radiological protection.
- Identify trends in radiation levels and radioactive contaminants at waste sites and other radiation areas in the operations area environment.
- Assess the surface integrity of solid and liquid waste disposal sites.
- Detect contamination migration from radiologically controlled areas.
- Monitor for unplanned releases of radioactivity to the operations area environment.
- Determine the level of worker protection.
- Assure the general public of safety and environmental protection standards at the Hanford Site.

1.1 Survey Results Format

This report provides a summary of the 67 environmental radiological surveys conducted during October, November, and December of 1989. It includes brief descriptions of noteworthy survey results, cites where Surveillance and Compliance Inspection Reports (SCIR) were issued (section 5.1), SCIR's which were closed (section 5.2) and the status of previously issued SCIRs including priority ranking points (Table 5.4).

2.0 ENVIRONMENTAL PROTECTION STANDARDS

In this document, radiation survey data are used to determine compliance with the following WHC-CM-7-5, Environmental Compliance Manual, requirements:

Section L4.0 (a): Facility operations management shall provide a barrier over the contamination source which inhibits radionuclide transport to the surface. The barrier design shall be based on proven techniques which are appropriate for the type of disposal, and the adequacy of the barrier shall be verified by demonstrating through periodic monitoring that surface contamination levels do not exceed the limits established in Part K4.0.

Section L4.0 (c): Surface radiation levels shall be less than 1 mrem/hr (10 uSv/hr). The surface shall be uncontaminated; i.e., less than the limits in Part K (Part K4.0).

In this document, most radiation field measurements are reported in disintegrations per minute (dpm). In order to compare standards [as established in WHC-CM-7-5, Section L4.0 (c)] and field instrument values, a conversion factor is necessary. This conversion factor has been established where 20,000 dpm are approximately equivalent to one millirem per hour or 10 micro sieverts per hour for beta emitting radionuclides (Hankins, 1982). It must be understood that converting field instrument values, which included both beta and gamma energies, is approximate and does not allow for absolute precision.

These requirements apply to all inactive radioactive waste sites which include cribs, burial grounds, trenches, ditches, ponds, French drains, and other areas of concern such as tank farm perimeters and radioactive contamination due to spills or releases. Tank farms and radiation areas where operations are ongoing are not included.

3.0 SURVEILLANCE AND COMPLIANCE REPORTS

Whenever it is determined that conditions at a site are not in compliance with company policies or the standards established in WHC-CM-7-5, the appropriate area landlord will be notified. The Health Physics department will issue a Radiological Problem Report. If, after twenty working days, an acceptable response and compliance plan is not received, Environmental Protection will issue a Surveillance and Compliance Inspection Report. Resolution of a SCIR is considered initiated when a formal corrective action plan is provided to and accepted by Environmental Protection. However, for tracking purposes it will remain on file and appear in subsequent Environmental Radiological Survey Reports until satisfactory completion of the plan is demonstrated. A visual inspection by Environmental Protection and/or a post-corrective action radiation survey by Health Physics is required before closing a SCIR. If a compliance plan is not provided to Environmental Protection within one month, a second SCIR is issued. If a compliance plan is not provided to and accepted by Environmental Protection within two months of first issue, the SCIR is considered delinquent and will be placed on the Quality Safety Trending system (QST).

An SCIR may be issued for conditions which may pose a probable threat of radiological contamination, such as the presence of deep-rooted vegetation or animal intrusion, or obvious smearable or removable contamination. Once the condition of contamination is contained on or removed from a site for which a SCIR has been issued, the report may be closed after a follow-up radiation survey has indicated that no further environmental impact is evident. For example, nonsmearable contamination may remain and the site properly posted as a radiation area. The site will not be out of compliance, therefore, the SCIR can be closed.

4.0 SURVEY METHODS AND PRACTICES

4.1 ROAD SURVEYS

Road surveys are performed with a beta-gamma detector mounted approximately 20 inches above the ground on the underside of a vehicle with a readout in the cab. The vehicle is driven at less than seven miles per hour. When activity is detected, the vehicle is stopped and a thorough survey is made with an Eberline Model BNW-1 survey meter equipped with a P-11 mica window probe to identify the extent of contamination. Waste Management Health Physics and the appropriate operations management are notified when road contamination is found so that corrective action can be initiated. The road monitor is designed to detect contamination over 5,000 disintegrations per minute and within the effective range of the detector.

4.2 WASTE SITES AND OTHER RADIATION AREA SURVEYS

Surveys at waste sites and other radiation areas may be conducted with vehicles equipped with radiation detection instruments or with hand-held field instruments. Field instrument survey results are reported in disintegrations per minute as detected by a P-11 mica window probe attached to an Eberline Model BNW-1 count rate meter. Alpha survey results are reported in disintegrations per minute and are measured with a portable alpha meter (PAM) or a portable alpha counter (PAC-6). Surveys include the perimeter and portions of the ground surface of radiation areas. Wherever possible, smear surveys are made on the surface of exposed equipment within a radiation area. Vegetation, animal burrows, and animal feces are also monitored to detect biological transport. Detailed survey practices and procedures are described in WHC-CM-4-10, Radiation Protection Manual, WHC-CM-4-13, Operational Health Physics Procedures, and WHC-CM-7-4, Operational Environmental Monitoring.

5.0 SURVEY RESULTS

Sixty seven radiological surveys were completed during October, November and December of 1989. The surveys are routine surveillances of inactive waste facilities which include cribs, trenches, burial grounds, covered ponds and covered ditches. The survey schedule for environmental sites is outlined in WHC-CM-7-4, section 12. Areas found out of compliance with guidelines described in WHC-CM-7-5 are issued a Surveillance and Compliance Inspection Report.

5.1 SURVEILLANCE AND COMPLIANCE INSPECTION REPORTS ISSUED

During the fourth quarter of 1989 four Surveillance and Compliance Inspection Reports were issued. (see fig. 4-7)

| | | |
|---------------|--------------------------|----------------------|
| 8910EP200-042 | 241-ER-151-Catch Tank | Contamination Spread |
| 8910EP200-043 | 241-B-154-Diversion Box | Contamination Spread |
| 8910EP200-044 | 241-BX-155-Diversion Box | Contamination Spread |
| 8910EP200-045 | 216-A-37-1 Crib | Vegetation Growth |

5.2 SURVEILLANCE AND COMPLIANCE INSPECTION REPORTS CLOSED

Five Surveillance and Compliance Inspection Reports were closed during the fourth quarter of 1989.

| | | |
|---------------|---------------------------|--------------------------|
| 8908EP200-034 | 241-ER-152 Diversion Box | Contamination Removed |
| 8908EP200-035 | 241-U-Tank Farm Perimeter | Contamination Controlled |
| 8909EP200-037 | 244-A Lift station | Contamination Removed |
| 8910EP200-042 | 241-ER-151 Catch Tank | Contamination Removed |
| 8910EP200-044 | 241-BX-151 Diverson Box | Contamination Removed |

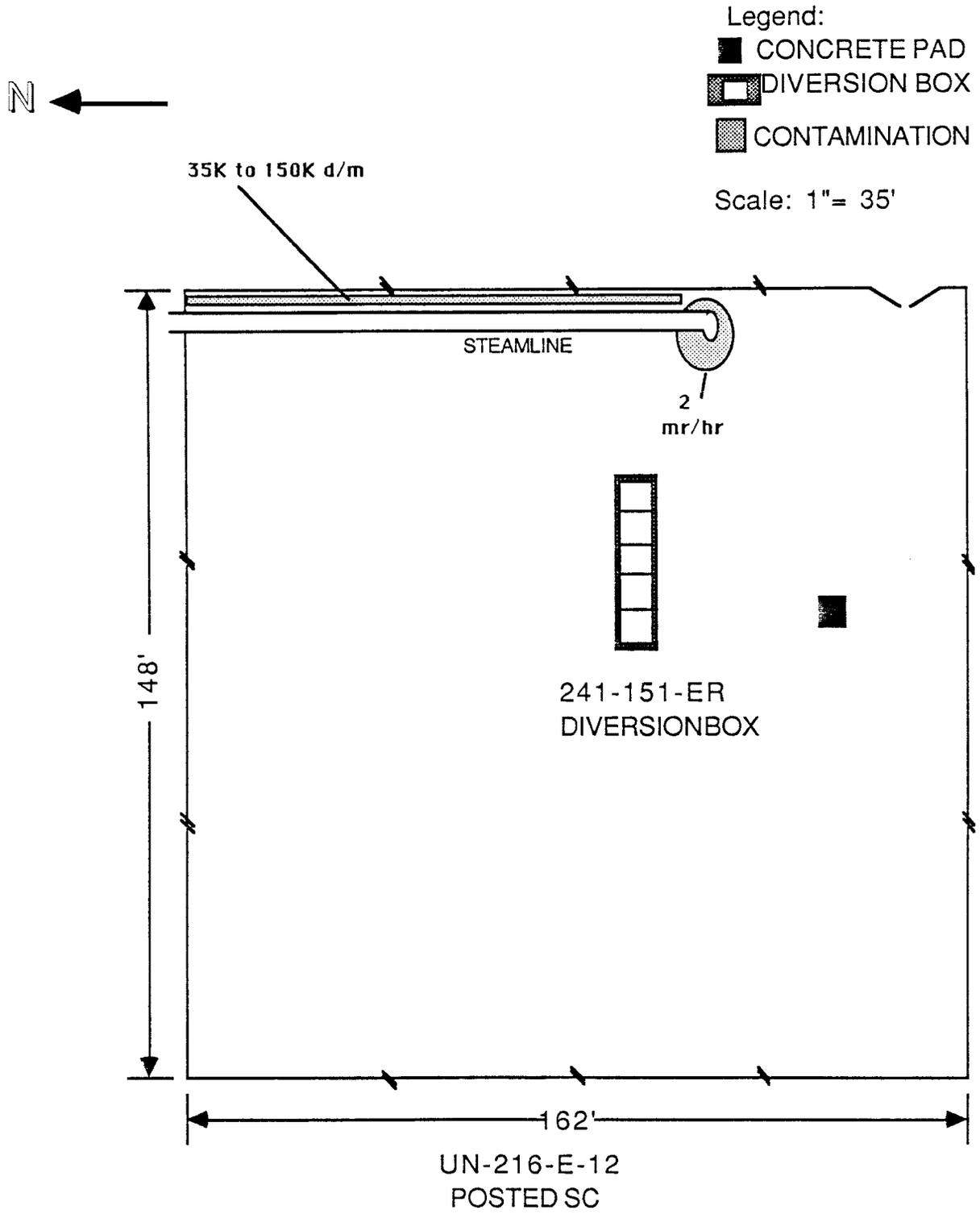
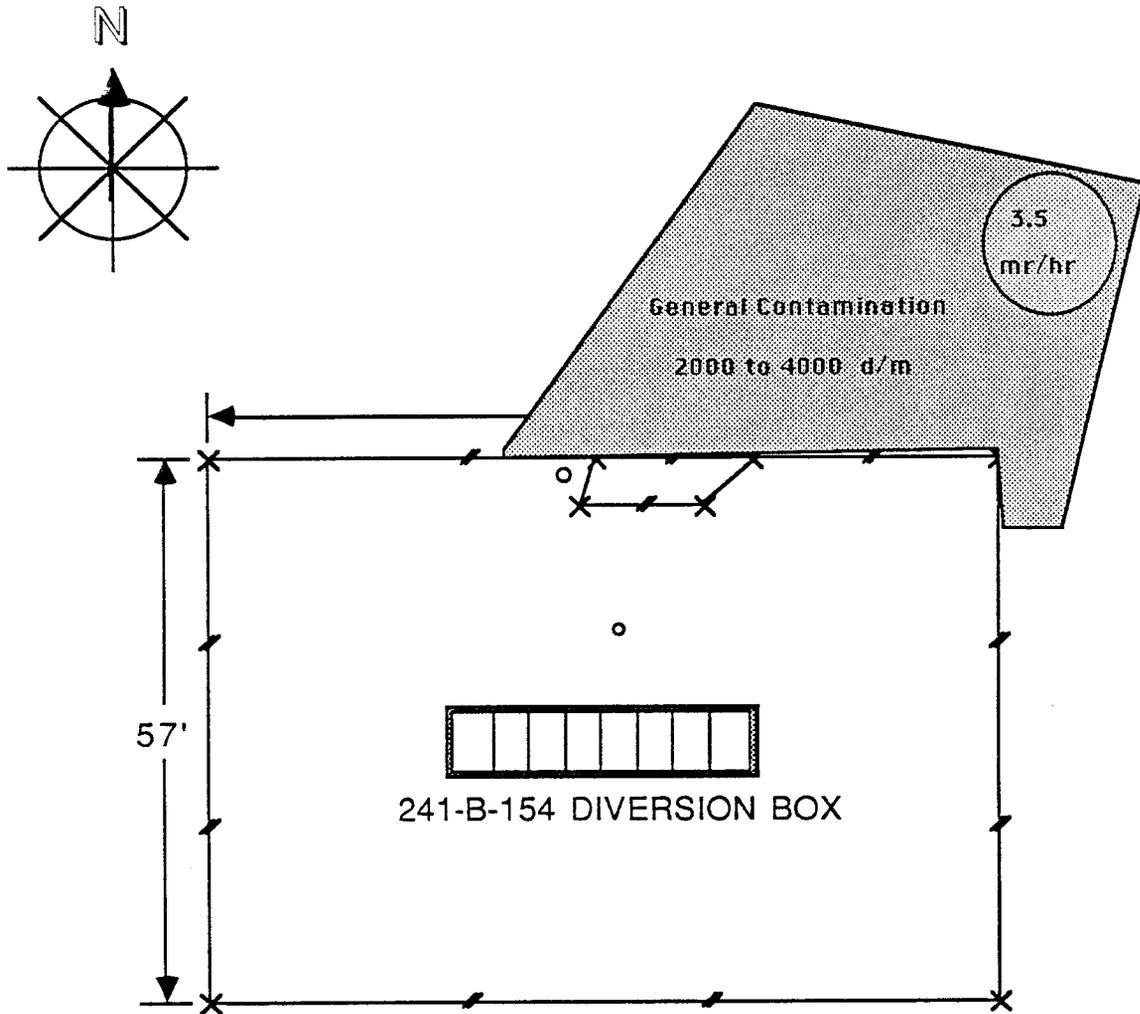


Figure 4

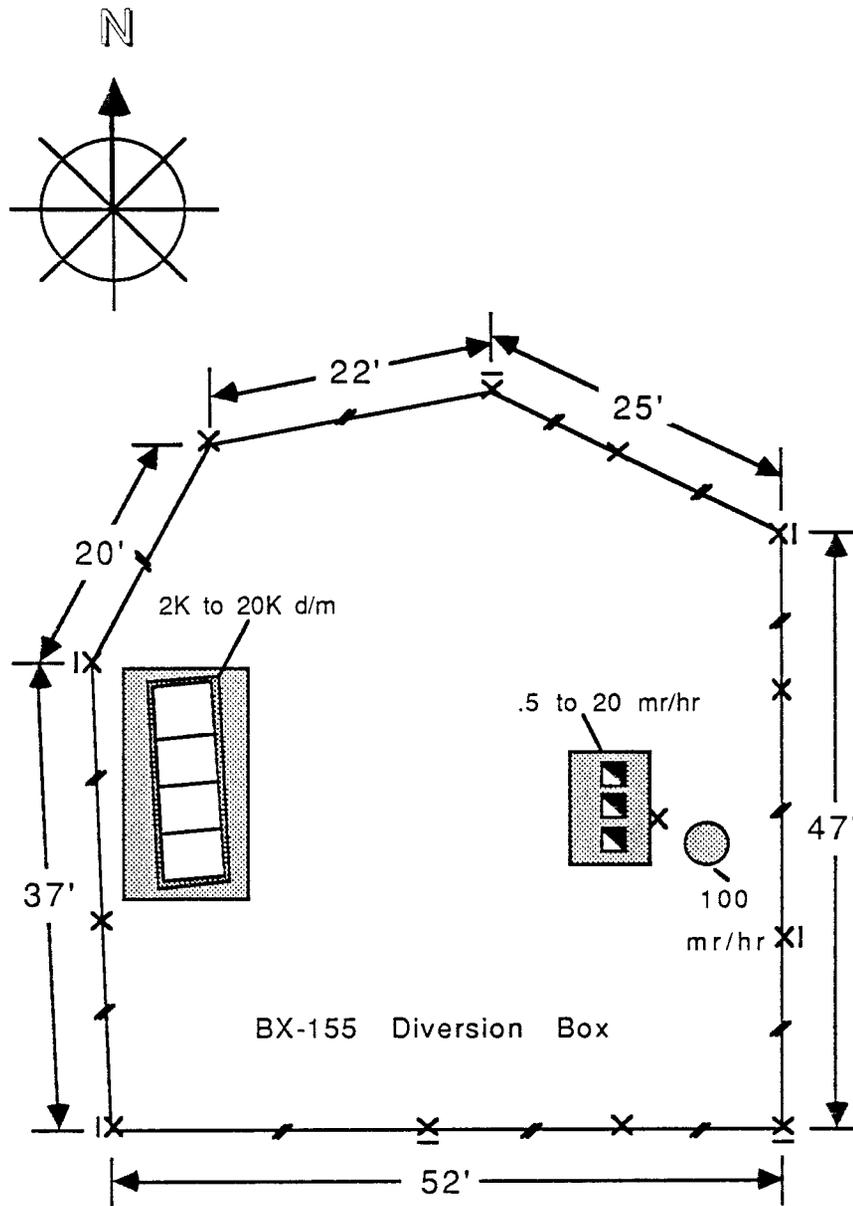


UN-216-E-5
POSTED SC

Legend:
X RAD. ZONE POST
[shaded box] CONTAMINATION

Scale: 1" = 20'

Figure 5

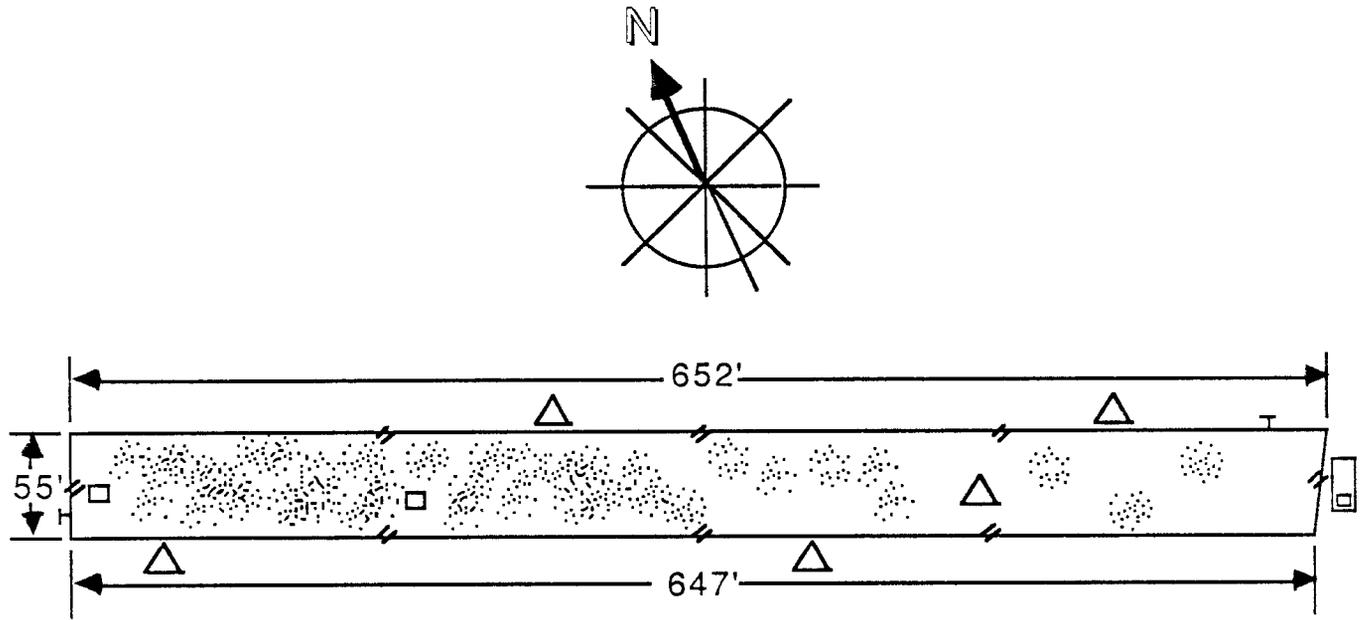


- Legend:
- RISER
 - CAPPED RISER
 - ✕ RAD. ZONE POST
 - ▨ CONTAMINATION

UN-216-E-6
POSTED SC

Scale: 1" = 15'

Figure 6



216-A-37-1
POSTEDSC

- Legend:
- RISER
 - △ GROUNDWATER WELL
 - ⊥ TLD
 - ☼ Weed growth

Scale: 1" = 100'

Figure 7

5.3 STATUS OF OPEN SURVEILLANCE AND COMPLIANCE REPORTS

Sites found to be out of compliance with the Environmental Compliance Manual, WHC-CM-7-5, were issued CIR's. Corrective actions are submitted to Environmental Protection by the responsible organization. Forty-two SCIRs remain open in the fourth quarter or 1989. These reports are summarized on Table 5.4 to include the referenced site number, prioritization ranking points (maximum of 15 pts), responsible custodian, SCIR report number, and estimated completion date.

Abbreviations used on this table include:

SCIR - Surveillance and Compliance Inspection Report

ECD - Estimated Completion Date

HRO - Hanford Restoration Operations

TFO - Tank Farm Operations

TABLE 5.4
OPEN SURVEILLANCE AND COMPLIANCE INSPECTION REPORTS
(maximum 15 pts.)

| <u>SITE</u> | <u>RANKING PTS</u> | <u>CUSTODIAN</u> | <u>SCIR NUMBER</u> | <u>ECD</u> |
|---------------------|--------------------|------------------|--------------------|------------|
| UN-216-E-17 | 13 | HRO | ESC-84-02-03 | 1990 |
| UN-216-E-31 | 11 | HRO | ESC-84-02-04 | 1991 |
| UN-216-E-23 | 9 | B-PLANT | ESC-85-019 | 1990 |
| 216-B-57 CRIB | 9 | HRO | ESC-85-016 | 1990 |
| UN-216-E-36 | 10 | B-PLANT | ECU-86-016 | 1992 |
| 207-S BASIN | 7 | HRO | ECU-86-022 | 1990 |
| 216-Z-5 CRIB | 7 | HRO | ECU-86-026 | 1993 |
| 216-Z-7 CRIB | 10 | HRO | ECU-86-028 | 1993 |
| 218-E-12B | 8 | HRO | ECU-86-036 | 1993 |
| UN-216-W-7 | 8 | HRO | ECU-86-045 | 1990 |
| UN-216-W-24 | 9 | HRO | ECU-86-046 | 1991 |
| UN-216-W-29 | 7 | HRO | ECU-86-047 | 1990 |
| UN-216-W-30 | 7 | HRO | ECU-86-048 | 1992 |
| UN-216-W-31 | 10 | HRO | ECU-86-049 | 1992 |
| 216-T-34 CRIB | 7 | HRO | ECU-86-053 | 1990 |
| 216-C-8 FR. DRAIN | 7 | HRO | ECU-87-10 | 1991 |
| 241-S-SX PERIMETERS | 9 | HRO | ECU-87-21 | 1993 |
| 216-A-6 CRIB | 7 | HRO | ECU-87-21 | 1992 |
| 216-A-7 CRIB | 8 | HRO | ECU-87-22 | 1992 |
| 204-S AREA | 8 | HRO | ECU-87-28 | TBD |
| 218-W-9 VAULT | 7 | HRO | EP-87-34 | 1992 |
| 216-S-6 CRIB | 10 | HRO | EP-87-35 | 1991 |
| UN-216-W-26 | 8 | HRO | EP-87-38 | 1991 |
| UN-216-E-32 | 6 | HRO | EP-87-44 | 1995 |

TABLE 5.4 (continued)
OPEN SURVEILLANCE AND COMPLIANCE INSPECTION REPORTS

| <u>SITE</u> | <u>RANKING PTS</u> | <u>CUSTODIAN</u> | <u>SCIR NUMBER</u> | <u>ECD</u> |
|---------------------------|--------------------|------------------|--------------------|------------|
| 261-B-7A&B CRIBS | 10 | HRO | EP-87-45 | 1992 |
| 216-B-9 CRIB | 10 | HRO | EP-87-46 | 1992 |
| 216-B-43-50 CRIBS | 9 | HRO | EP-87-47 | 1992 |
| UN-216-E-37 | 11 | HRO | EP-87-50 | 1989 |
| TANK UNLOADING T-PLANT | 7 | HRO | EP-87-51 | 1990 |
| 276-U-BASIN | 8 | HRO | EP-88-7 | 1990 |
| 216-A-40 BASIN | 10 | TFO | EP-88-9 | 1989 |
| WR VAULT | 8 | HRO | EP-88-10 | 1995 |
| 216-U-1&2 CRIBS | 9 | HRO | EP-88-15 | 1994 |
| 216-U-10 POND | 7 | HRO | 8810EP200-009 | 1989 |
| 216-U-11 OVERFLOW | 7 | HRO | 8810EP200-009 | 1989 |
| UN-216-W-33 | 9 | TFO | 8810EP200-012 | TBD |
| 216-B-11A&B WELLS | 9 | HRO | 8810EP200-025 | TBD |
| 216-T-18 CRIB | 6 | HRO | 8811EP200-027 | TBD |
| 216-T-26-28 CRIBS | 8 | HRO | 8811EP200-028 | 1990 |
| UN-216-E-16 (TC-4 SPUR) | 11 | PUREX | 8901EP200-001 | 1990 |
| 216-T-14-17 TRENCHES | 10 | HRO | 8907EP200-032 | 1992 |
| 241-B PERIMETERS | 13 | TFO | 8909EP200-036 | TBD |
| UN-216-E-5 | 10 | TFO | 8910EP200-043 | TBD |

6.0 SUMMARY

Sixty-seven sites were surveyed in October, November and December 1989

Four SCIR's were issued (Table 5.2) during October, November and December 1989.

Five SCIR's were closed (Table 5.3) during October, November and December 1989.

Forty-two SCIRs remain open (Table 5.4). Open reports will be addressed and clean-up plans with completion dates are being developed or have already been provided to Environmental Protection.

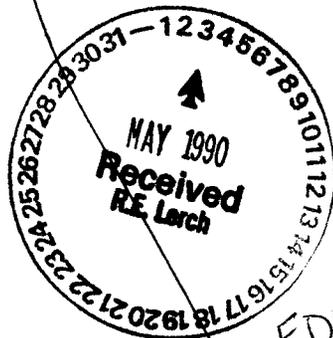
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| M. I. Armatis | T3-21 | X |
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| T. D. Blankenship | S5-04 | X |
| J. W. Bloom | S6-05 | X |
| J. A. Brockman | S4-39 | X |
| G. D. Carpenter | H4-15 | X |
| H. F. Daugherty | R2-53 | X |
| B. R. Dickey | S5-66 | X |
| L. P. Diediker | T1-30 | X |
| J. J. Dorian | H4-15 | X |
| G. T. Dukelow | R1-81 | X |
| J. A. Eacker | R1-51 | X |
| R. E. Elder | R3-20 | X |
| D. B. Erb | R1-51 | X |
| Z. D. Farris | H4-52 | X |
| B. G. Faulk | T5-56 | X |
| K. A. Gano | X0-21 | X |
| J. M. Garcia | X0-04 | X |
| L. A. Garner | H4-50 | X |
| E. M. Greager | L6-60 | X |
| R. H. Griffin | X0-21 | X |
| M. L. Grygiel | S6-65 | X |
| K. A. Hadley | R2-42 | X |
| V. W. Hall | H4-53 | X |
| G. S. Hauger | T3-06 | X |
| W. F. Heine | R1-15 | X |
| R. E. Heineman | R3-12 | X |
| M. E. Hevland | R3-12 | X |
| C. R. Huckfeldt (2) | T1-30 | X |
| M. C. Hughes | R1-15 | X |
| G. W. Jackson | R2-29 | X |
| A. R. Johnson | T1-30 | X |
| S. R. Johnson | R3-12 | X |
| R. E. Lerch | H4-51 B2-35 | X |
| J. B. Levine | X3-50 | X |
| D. E. Mahagin | H4-21 | X |
| W. C. Mallory | S5-51 | X |
| D. J. McCain | S0-08 | X |
| R. M. Mitchell | H4-55 | X |
| L. A. Nelson | T1-25 | X |
| W. L. Osborne | R2-77 | X |
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| L. W. Roberts | R2-80 | X |
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