MATERIALS LICENSE

Amendment No. 10

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 39, 40, and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

301630

Licensee	
1. General Dynamics Land Systems Division	In accordance with letter dated July 15, 1996 3. License Number 21-21068-01 is amended in its entirety to read as follows:
2. 38500 Mound Road Sterling Heights, MI 48310-3268	4. Expiration Date March 31, 2005
	5. Docket or Reference No. 030-19731

6. Byproduct, Source, and/or Special Nuclear Material	7. Chemical and/or Physical Form	8. Maximum Amount that Licensee May Possess at Any One Time Under This License
A. Hydrogen-3	A. Gas in glass ampoules as sealed sources (Self-Powered Lighting Corporation or mb-microtec, Inc.)	A. No single source to exceed 10.2 curies per assembly. Total not to exceed 8,000 curies
B. Nickel-63	B. Nickel-63 metal electroplated on a brass cylinder	B. No single source to exceed 15 mCi per source. Total not to exceed 1.5 curies
C. Americium-241	C. Sealed source (Amersham Corporation Foil Source Model AMM	C. No single source to exceed 250 microcuries. Total not to exceed 30 millicuries
D. Krypton-85	D. Krypton-85 gas Source Stick (MIL. SPEC.) No. MIL-R-51305 [MU])	D. No single source to exceed 5 millicuries per component. Total not to exceed 15 millicuries.

9. Authorized Use:

A. To be used in light source cell assembly Model P/N 12304725, to be installed as Muzzle Reference Sensor (MRS) devices on military equipment (Abrams Tank Weapon System) for distribution to the Department of Defense or contractors of the Department of Defense possessing a specific license issued by the U. S. Nuclear Regulatory Commission or an Agreement State.

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number
21-21068-01

Docket or Reference Number
030-19731

Amendment No. 10

B. and C. For receipt, storage, use, and transfer of CAM (nickel-63) and M43A1 (americium-241) chemical agent detectors.

D. For possession and use of source sticks incident to the testing of the AN/VDR2 Radiac meter to verify proper system integration of the Central Data Processing Unit (CDPU) for use on the FOX Nuclear Biological Chemical Reconnaissance System.

CONDITIONS

10. A. Licensed material shall be used only at the licensee's facilities located at:

Land Systems Division
Lima Army Tank Plant
1161 Buckeye
Lima, OH 45804

Land Systems Division
Detroit Arsenal Tank Plant
28251 Van Dyke
Warren, MI 48090

Land Systems Division
Central Office Complex
38500 Mound Road
Sterling Heights, MI 48310-3268

Land Systems, Inc.
General Motors Proving Grounds
1 General Motors Road
Military Building 12
Milford, MI 48380

Land Systems Division
Sterling Plant
6000 E. 17 Mile Road
Sterling Heights, MI 48078

Land Systems Division
Muskegon Operations
76 Getty Street
Muskegon, MI 49442

Land Systems Division
Muskegon Operations
Technical Center
640 Seminole Road
Muskegon, MI 49442

B. Licensed materials in devices which have been installed on military equipment may be used at temporary jobsites anywhere in the United States, for demonstration purposes as described in letter dated January 23, 1995.

11. A. Licensed material shall be used by, or under the supervision of, Dennis G. Stallsmith or B. H. Rose.

B. The Radiation Protection Officer for the activities authorized by this license is Dennis G. Stallsmith.

12. Sealed sources containing licensed material shall not be opened or removed from their respective source holders by the licensee.

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number
21-21068-01

Docket or Reference Number
030-19731

Amendment No. 10

13. The licensee shall conduct a physical inventory every six (6) months to account for all sealed sources received and possessed under the license. The records of the inventories shall be maintained for two (2) years from the date of the inventory for inspection by the Commission, and shall include the quantities and kinds of byproduct material, manufacturer's name and model numbers, location of the sealed sources and the date of the inventory.

14. The licensee may transport licensed material in accordance with the provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material".

15. Individuals who work in or whose duties may require them to work in restricted areas or in the vicinity of licensed materials, shall be instructed in the items specified in 10 CFR 19.12 at the time of initial employment and at least annually thereafter.

16. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The Nuclear Regulatory Commission's regulations shall govern unless the statements, representations, and procedures in the licensee's application and correspondence are more restrictive than the regulations.

    A. Application dated January 21, 1994; and

    B. Letters dated January 23, 1995, March 3, 1995, May 30, 1995, July 15, 1996, and October 3, 1996.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date October 3, 1996

By Loren J. Hunter
Nuclear Materials Licensing Branch, Region III

BETWEEN:

LICENSE FEE MANAGEMENT BRANCH, ARM
AND
REGIONAL LICENSING SECTIONS

(FOR LFMS USE)
INFORMATION FROM LTS

PROGRAM CODE: 03214
STATUS CODE: 0
FEE CATEGORY: 3B
EXP. DATE: 20050331
FEE COMMENTS:
DECOM FIN ASSUR REQD: N

R8

LICENSE FEE TRANSMITTAL

A. REGION

1. APPLICATION ATTACHED
APPLICANT/LICENSEE: GENERAL DYNAMICS LAND SYSTEMS, INC.
RECEIVED DATE: 960722
DOCKET NO: 3019731
CONTROL NO.: 301630
LICENSE NO.: 21-21068-01
ACTION TYPE: AMENDMENT

2. FEE ATTACHED
AMOUNT: 560
CHECK NO.: 472420

3. COMMENTS

SIGNED Janet Bell
DATE 7-25-96

B. LICENSE FEE MANAGEMENT BRANCH (CHECK WHEN MILESTONE 03 IS ENTERED / ✓ /)

1. FEE CATEGORY AND AMOUNT: 3B $580

2. CORRECT FEE PAID, APPLICATION MAY BE PROCESSED FOR:
AMENDMENT ✓
RENEWAL
LICENSE

3. OTHER

SIGNED SC
DATE 8/27/96

Log Jul 17 III
Remitter
Check No. 472420 | [redacted] 474877
Amount $560 | $20
Fee Category 3B
Type of Fee AMND
Date Check Rec'd 7/26/96
Date Completed 8/27/96
By: SC

SEP 03 1996

GENERAL DYNAMICS
Land Systems Division
P.O. Box 2072, Warren, Michigan 48090-2072

R&D/96-437

15 July 1996

United States Nuclear Regulatory Commission
Region III
Materials Licensing Section
801 Warrenville Road
Lisle, Illinois 60532-4351

Gentlemen:

Reference: 1. GDLS's Nuclear Regulatory Commission (NRC) Radioactive Materials License No. 21-21068-01, Amendment No. 9, Docket or Reference No. 030-19731.

Attachment: 1. GDLS Radiological Survey Report for Site Closure - Warren Logistics Center (WLC). June 1996.

The purpose of this letter is to request an amendment to General Dynamics Land Systems' NRC Radioactive Materials License (Reference 1). This amendment is necessary because of (1) facility consolidation, (2) facility acquisition, and (3) to expand the use of Nickel-63 for an additional chemical agent detector, the GID-3.

1. **It is requested that item 10A be amended to reflect the REMOVAL of the following facility:**

Land Systems Division
Warren Logistics Center
6700 East 14 Mile Road
Warren, Michigan 48092

This facility has been vacated by GDLS and all radioactive materials transferred to another "NRC-authorized" facility.

Prior to the release of this facility to unrestricted use and transfer of all radioactive commodities to another NRC-authorized facility, extensive radiological wipe testing was conducted to quantify any removable contamination present. Although several areas were identified as having very low levels of removable tritium contamination (478.7 dpm/100 cm^2, *maximum* vs. 1000 dpm/100 cm^2 *limit*), each was accordingly reduced to background. The attached report provides the information necessary to support this amendment request.

301630

PM: 7-17-96

2. **It is further requested that item 10A be amended to reflect the ADDITION of the following facilities:**

Land Systems Division
Muskegon Operations
Technical Center
640 Seminole Road
Muskegon, Michigan 49442

Land Systems Division
Muskegon Operations
76 Getty Street
Muskegon, Michigan 49442

These facilities and their operations were recently acquired from Teledyne Vehicle Systems (TVS) by GDLS. Future GDLS activities may include mobility testing of the Abrams Tank System at the Getty Street facility, and Engineering vehicle evaluations at the Seminole facility. It should be noted that prior to GDLS acquisition, a NRC Radioactive Materials License was not required of TVS for activities at these facilities. Radioactive materials were not utilized, nor contractually required.

A safety representative is based at the Muskegon site and in the event of a radiological emergency, the GDLS Radiation Safety Officer is within one (1) hour flight time (via corporate aircraft) to Muskegon.

3. **It is also requested that item "9B and C" be amended as follows to reflect the addition of the GID-3 Chemical Agent Detector.**

(9) B and C. For receipt, storage, use, and transfer of the CAM (Nickel-63), the GID-3 (Nickel-63), and the M43A1 (Americium-241) Chemical Agent Detectors.

It should be noted that an increase in the maximum quantity of Nickel-63 possessed at any one time does not change from that which has already been authorized by our license.

SUPPORTING INFORMATION.

Item Description.

The GID-3 (Figure 1) is a chemical agent detector which provides a warning to the soldier in the presence of chemical warfare agents. The GID-3 draws a sample of the surrounding air into the inlet and passes the sample to two (2) detection cells through a permeable membrane. Each detection cell contains no more than 15 mCi of Nickel-63. One cell detects the presence of nerve agent (G cell), and the other detects blister agent (H cell). Each cell is constantly cleaned by an internal pneumatic scrubbing system. The sample is then discharged to the surrounding air. Electrical signals are generated by gas ionization from the detection cells. The unique signals

generated by chemical agents are recognized by a microprocessor which is then capable of sending a signal to the display, indicating the type of agent detected and the hazardous level of agent vapor present. When preset levels are exceeded, a visible and audible alarm are activated.

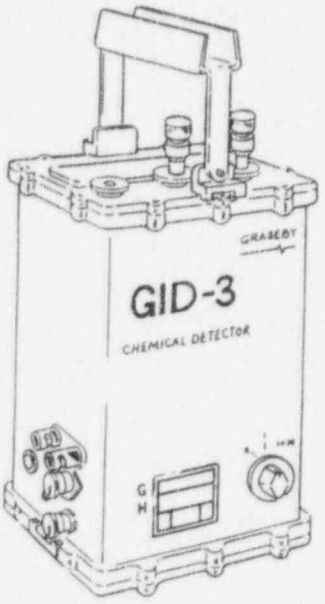

Figure 1. GID-3 Chemical Agent Detector

Purpose for which Licensed Material will be Used.

The Nickel-63 sources that are used for gas ionization in the GID-3 Chemical Agent Detector are the exact same source and construction that is currently utilized in the Chemical Agent Monitor (CAM), and authorized in GDLS's NRC License (Reference 1). The Nickel-63 Ring Source is manufactured by New England Nuclear Corporation. General Dynamics Land Systems intends on procuring the detector directly from the detector manufacturer, Graseby. The detector will be used for system integration design activities related to the Kuwait M1A2 Abrams Tank System. This primarily includes electrical interface and mounting hardware design.

Radiological Hazard.

As indicated in our renewal application for the CAM, Nickel-63 has a half-life of 92 years and emits only low energy beta particles with an average energy of 0.017 MeV. The GID-3's ring assembly is a brass ring electroplated with Nickel-63. The ring is held in a Teflon housing which is installed in a large aluminum alloy cylinder. The beta particles emitted by Nickel-63 are readily stopped by approximately 0.0016 inches (0.04 mm) of aluminum. Hence, these emissions are too weak to penetrate the housing of the GID-3 unit whose minimum thickness is 0.071 inches (1.8 mm) of aluminum. The radioactive source is totally enclosed and protected by the GID-3's case and poses no hazard when intact. Therefore, there is no external hazard or time limit for personnel handling or using this detector.

GID-3 units may be potentially hazardous if broken. The beta particles of Nickel-63 have an approximate range in dry air of 2.7 inches (68 mm). However, the internal hazard potential is small since beta particles can produce internal injury only if they are deposited inside the body, through either ingestion or inhalation. Since Nickel-63 is electroplated onto a brass ring, internal injury could only be caused by ingestion of any flaked off fragments of the radioactive plating, or by ingestion of the radioactive ring assembly itself.

The top of the GID-3 unit is labeled to show the presence of radioactive material (Figure 2).

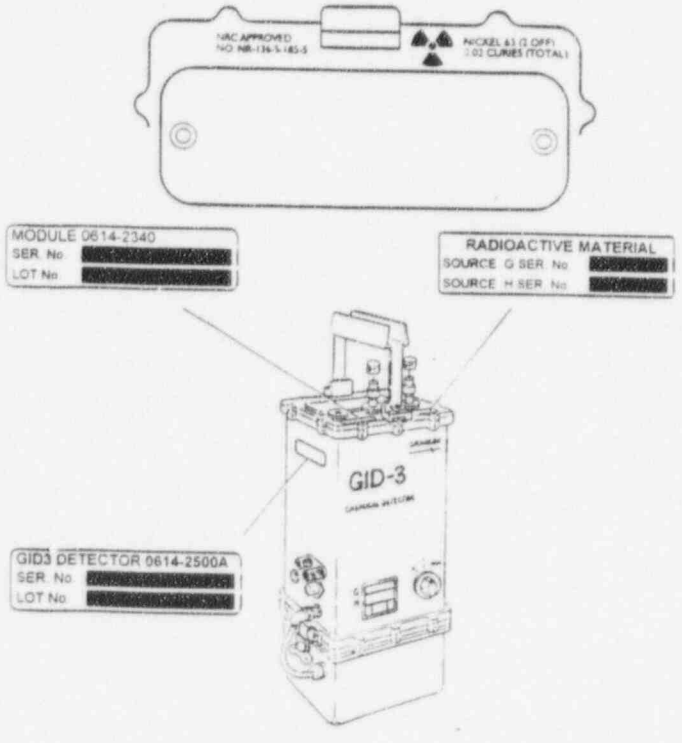

Figure 2. GID-3 Radioactive Material Warning Label

Maintenance, repair, or opening of the GID-3 source assemblies will be strictly prohibited. At no time will the sources be removed from the detector.

The unit will be wipe tested for leakage by trained personnel prior to transfer to another authorized person unless they have been leak tested within six (6) months prior to the date of use or transfer. Test samples will be taken from the detector's exterior surface and the exhaust port. If any test reveals the presence of 0.005 microcuries (μCi) or more of removable contamination, the unit will be withdrawn from use and decontaminated accordingly.

Emergency instructions will be provided to the applicable employees in the event of an accidental breakage of a GID-3 detector. Film badges and dosimeters are not required.

The area where the detector will be secured from unauthorized access will be labeled in accordance with current license provisions.

Disposal

Disposal of a damaged or unwanted GID-3 detector is to be accomplished by sending the unit back to the manufacturer or by using a commercial waste disposal service.

4. Radiation safety representation and overall radiation safety philosophy remains unchanged.

5. Check No. 472420 in the amount of $560.00 has been enclosed to cover the processing cost associated with a Category 3B license amendment.

6. Our Radiation Safety Officer, Dennis G. Stallsmith, may be contacted for any specific questions regarding this amendment request. His telephone number is (810) 825-5767.

Sincerely,
GENERAL DYNAMICS LAND SYSTEMS, INC.

T.J. O'Neill
Manager, Contracts
Research and Development

xc: w/o Attachment
D.G. Stallsmith
RW. Trempler, Jr.
J. Yost, Jr.
J. Schmuker (Muskegon)
N.S. Sridharan (Muskegon)

w/ Attachment
NRC - Washington
Division of Industrial and Medical Nuclear Safety
Washington, D.C. 20555

NRC FORM 577 (1-95)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSE FEE REQUIREMENTS

LICENSE FEE AND DEBT COLLECTION BRANCH
DIVISION OF ACCOUNTING AND FINANCE
OFFICE OF THE CONTROLLER
U.S. NUCLEAR REGULATORY COMMISSION
WASHINGTON, DC 20555-0001

GENERAL DYNAMICS
ATTN: T. J. O'NEILL
P. O. BOX 2072
WARREN, MICHIGAN 48090-2072

TYPE OF ACTION

- ☐ NEW LICENSE
- ☐ RENEWAL OF LICENSE
- ☒ AMENDMENT TO LICENSE

REQUESTED DATE: 7-15-96

LICENSE NUMBER: 21-21068-01

CONTROL NUMBER: 301630

I. APPLICATION FEE DUE

Your request for a licensing action is subject to the fee(s) in the category(ies) noted below in accordance with Section 170.31 of the enclosed Federal Register notice. Payment of the fee is required prior to the issuance of the license, renewal, or amendment.

FEE CATEGORY	APPLICATION	RENEWAL	AMENDMENT
3B	$	$	$ 580.00
	$	$	$
	$	$	$
	$	$	$
	$	$	$
	$	$	$
	$	$	$
	$	$	$
	$	$	$

FEE(s) DUE	$ 580.00
PAYMENT RECEIVED	$ 560.00
AMOUNT DUE	$ 20.00

☐ Your request was received without the prescribed application fee.

☒ We received your Check No. 472420 in the amount of $ 560.00. Payment of the additional fee noted above is required.

☐ Your request will increase the scope of your license program. Therefore, your request is subject to the application fee(s) noted above. Refer to Section 170.31 and Footnote 1(d)(2).

☐ Your license expired prior to the receipt of your application for renewal. Therefore, your request is subject to the application fee(s) noted above. Refer to Section 170.31 and Footnote 1(a).

MAKE PAYMENT OF THE FEE(S) TO THE U.S. NUCLEAR REGULATORY COMMISSION AND MAIL THE PAYMENT TO THE ADDRESS LISTED AT THE TOP OF THIS FORM. IF WE DO NOT RECEIVE A REPLY FROM YOU WITHIN 30 CALENDAR DAYS FROM THE DATE LISTED BELOW, WE SHALL ASSUME THAT YOU DO NOT WISH TO PURSUE YOUR APPLICATION AND WILL VOID THIS ACTION.

II. FEE NOT REQUIRED

☐ Enclosed is Check No. _____ which accompanied your request. The fee is not required because:

- ☐ We received your Check No. _____ in payment of the fee.
- ☐ The Licensing staff has informed us that your request is to be considered as a continuation of your request dated _____, Control No. _____.
- ☐ Your request was combined, prior to review, with your _____ request, Control No. _____.

III. CHECK RETURNED

☐ Enclosed is Check No. _____ which was returned to us by the bank for:

- ☐ INSUFFICIENT FUNDS
- ☐ ACCOUNT CLOSED
- ☐ OTHER

MAIL THE REPLACEMENT CHECK TO THE ADDRESS LISTED AT THE TOP OF THIS FORM AND REFERENCE THE ABOVE CONTROL NUMBER.

IV. LICENSE ISSUED WITHOUT THE REQUIRED FEE

☐ License No. _____, Amendment No. _____, issued on _____ was issued without the required fee being collected. The fee required is noted in Section I of this form.

☐ The scope of your licensed program was increased. Therefore, your request is subject to the application fee(s) noted in Section 1 of this form. Refer to Section 170.31 and Footnote 1(d)(2).

☐ Because of the urgency of your request, the license was issued without remittance of the prescribed fee noted in Section 1 of this form.

SIGNATURE -- LICENSE FEE ANALYST	LFDCB	LFDCB
Shirley Crutchfield SHIRLEY CRUTCHFIELD	SC 7/29/96	

Distribution:
Pending Fee File OC/DAF/SF(LF-3 2 7)
LFARB R/F (2) Region 3

DATE: July 30, 1996

NRC FORM 577 (1-95)

This form was electronically produced by Elite Federal Forms, Inc.

GENERAL DYNAMICS
Land Systems Division
P.O. Box 2072, Warren, Michigan 48090-2072

R&D/96-498

21 August 1996

United States Nuclear Regulatory Commission
License Fee & Debt Collection Branch
Division of Accounting & Finance
Office of the Controller
Washington, D.C. 20555-0001

Gentlemen:

References:
1. GDLS's Nuclear Regulatory Commission (NRC) Radioactive Materials License No. 21-21068-01, Amendment No. 9, Docket or Reference No. 030-19731.

2. R&D/96-437. "Request for Amendment" Correspondence from T.J. O'Neill (GDLS) to the U.S. NRC, dated 15 July 1996.

3. NRC Form 577. License Fee Requirements, from Shirley Crutchfield (U.S. NRC) to T.J. O'Neill (GDLS), dated 30 July 1996.

Enclosure:
1. General Dynamics Land Systems Check No. 474877 ($20.00).

Enclosed you will find a check (Enclosure 1) in the amount of $20.00 to cover the additional cost necessary to continue to process our Category 3B Request for Amendment (Reference 2). In the original request, GDLS submitted a check in the amount of $560.00. This amount was based on the fee schedule dated 01 January 1996. It was brought to our attention through Ms. Crutchfield's correspondence (Reference 3) that these fees were amended in April 1996, thus increasing the amendment fee to $580.00.

Please continue to process our request for amendment. Your prompt attention and processing is greatly appreciated.

Sincerely,
GENERAL DYNAMICS LAND SYSTEMS, INC.

T.J. O'Neill
Manager, Contracts
Research & Development

xc: D.G. Stallsmith, Radiation Safety Officer

OCT 0 4 1996

T. J. O'Neill, Manager
Contracts Research and
Development
General Dynamics
38500 Mound Road
Sterling Heights, MI 48310-3268

Dear Mr. O'Neill:

Enclosed is Amendment No. 10 to your NRC Material License No. 21-21068-01 in accordance with your request.

Please review the enclosed document carefully and be sure that you understand all conditions. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region III office at (630) 829-9887 so that we can provide appropriate corrections and answers.

Please note: we have added five years to the expiration date listed on your license. You should have recently received official notification from our headquarters office explaining the cause for the five-year extension. In the meantime, if you have any questions, please call me.

Please note that we can not add, as a location of use, your facility located in Imperial, California, as you requested in your letter dated August 9, 1996. As discussed with Mr. Dennis Stallsmith of your staff in a telecon on September 30, 1996, California is an "Agreement State" and as such you will need to pursue obtaining a license for that facility from the State of California.

Please note that this amendment authorizes you to release for unrestricted use your facility located at Warren Logistic Center, 6700 East 14 Mile Road, Warren, Michigan, by deleting it from Condition 10.A. of your license. This action was based on the close-out surveys and sealed source wipe test data you submitted in support of your request.

Also, please note that we have not added the GID-3 chemical agent detector to your license at this time in that it apparently has not been evaluated and registered with the Sealed Source & Device Registry. You stated that this is, or will be pursued in the near future. Once this is accomplished, you may provide us a copy of the Registry as additional information to Control No. 301630 and we will continue our review of that request at that time without an additional amendment fee.

301630

Please be advised that your license expires at the end of the day, in the month, and year stated in the license. Unless your license has been terminated, you must conduct your program involving byproduct materials in accordance with the conditions of your NRC license, representations made in your license application, and NRC regulations. In particular, note that you must:

1. Operate in accordance with NRC regulations 10 CFR Part 19, "Notices, Instructions and Reports to Workers; Inspections," 10 CFR Part 20, "Standards for Protection Against Radiation," and other applicable regulations.

2. Notify NRC, in writing, within 30 days:

   a. When the Radiation Safety Officer permanently discontinues performance of duties under the license or has a name change; or

   b. When the licensee's mailing address changes (no fee is required if the location of byproduct material remains the same).

3. In accordance with 10 CFR 30.36(b) and/or license condition, notify NRC, promptly, in writing, and request termination of the license when you decide to terminate all activities involving materials authorized under the license.

4. Request and obtain a license amendment before you:

   a. Change Radiation Safety Officers;

   b. Order byproduct material in excess of the amount, or radionuclide, or form different than authorized on the license;

   c. Add or change the areas of use or address or addresses of use identified in the license application or on the license; or

   d. Change ownership of your organization.

5. Submit a complete renewal application with proper fee or termination request at least 30 days before the expiration date of your license. You will receive a reminder notice approximately 90 days before the expiration date. Possession of byproduct material after your license expires is a violation of NRC regulations. A license will not normally be renewed, except on a case-by-case basis, in instances where licensed material has never been possessed or used.

In addition, please note that NRC Form 313 requires the applicant, by his/her signature, to verify that the applicant understands that all statements contained in the application are true and correct to the best of the applicant's knowledge. The signatory for the application should be the licensee or certifying official rather than a consultant.

You will be periodically inspected by NRC. Failure to conduct your program in accordance with NRC regulations, license conditions, and representations made in your license application and supplemental correspondence with NRC will result in enforcement action against you. This could include issuance of a notice of violation, or imposition of a civil penalty, or an order suspending, modifying or revoking your license as specified in the General Policy and Procedures for NRC Enforcement Actions. Since serious consequences to employees and the public can result from failure to comply with NRC requirements, prompt and vigorous enforcement action will be taken when dealing with licensees who do not achieve the necessary meticulous attention to detail and the high standard of compliance which NRC expects of its licensees.

Sincerely,

Loren J. Hueter
Nuclear Materials Licensing Branch

License No.: 21-21068-01
Docket No.: 030-19731

Enclosures:
1. Amendment No. 10
2. NRC Form 313
3. NRC Form 3

DOCUMENT NAME: M:\03019731.CL6
To receive a copy of this document, indicate in the box: "**C**" = Copy without attachment/enclosure "**E**" = Copy with attachment/enclosure "**N**" = No copy

OFFICE	DNMS/RIII	N							
NAME	LHUETER:sjd LJH								
DATE	10/3/96								

OFFICIAL RECORD COPY

CONVERSATION RECORD | TIME | DATE 10-3-96

O VISIT O CONFERENCE O TELEPHONE

O INCOMING
O OUTGOING

NAME OF PERSON(S) CONTACTED OR IN CONTACT: Bill Snell
ORGANIZATION (OFFICE, DEPT. ETC.): RIII Decom Group
TELEPHONE NO.:

SUBJECT: CH 301630 Re General Dynamics request for release for unrestricted use their Warren Logistic Center 6700 East 14 Mile Road, Warren, MI.

SUMMARY:

I reviewed, with Bill Snell, close-out surveys for Warren Logistic Center as submitted in letter dated Aug 9, 1996, and the additional data, including wipe tests results of the sealed sources on site that were transferred last Sept prior performing closout surveys. Bill concurred that since the licensee has only had non-leaking sealed sources at this facility as evidenced by wipe test data and close-out surveys, it meets Type I Decommissioning criteria and as such does not need to be forwarded to the Decommissioning Branch for review nor do any close-out inspection or confirmatory surveys required. Accordingly, I am issuing amendment No. 10 to License No. 21-21068-01 authorizing release of the Warren Logistic center for unrestricted use.

NAME OF PERSON DOCUMENTING CONVERSATION | SIGNATURE: Loren Plisco | DATE: 10-3-96

ACTION TAKEN

SIGNATURE | TITLE | DATE

GENERAL DYNAMICS
Land Systems Division
P.O. Box 2072, Warren, Michigan 48090-2072

R&D/96-636

03 October 1996

United States Nuclear Regulatory Commission
Region III
Materials Licensing Section
801 Warrenville Road
Lisle, Illinois 60532-4351
Attention : Loren Hueter

Post-it® Fax Note 7671	Date 10.03.96	# of pages ▶ 4
To LOREN HUETER	From DENNIS STALLSMITH	
Co./Dept. U.S. NRC	Co. GDLS	
Phone # (630) 829-9829	Phone # (810) 825-5767	
Fax # (630) 515-1259	Fax # (810) 825-4013	

436-20-55

Mr. Hueter:

Subject: Additional Information to Support NRC Radioactive Material License Amendment Request. Control No. 301630.

Reference: 1. GDLS's Nuclear Regulatory Commission (NRC) Radioactive Material License No. 21-21068-01, Amendment No. 9, Docket or Reference No. 030-19731.

2. GDLS "Request for Amendment" (R&D/96-437) from T.J. O'Neill (GDLS) to NRC Region III, dated 15 July 1996. License No. 21-21068-01.

3. Telephone Conversation between D.G. Stallsmith (GDLS) and L. Hueter (NRC) regarding additional amendment request information, 30 September 1996.

Attachment: 1. Leak Test Certificates affixed to Chemical Agent Detectors Analyzed at the Warren Logistics Center (WLC), 03 June 1996.

The purpose of this correspondence is to provide the Nuclear Regulatory Commission with additional, requested information to support our *Request for Amendment* (Reference 2).

1. **GID-3 Detector.** A *Sealed Source and Device Registry No.* for the GID-3 with its radioactive component has not been issued to date. Currently, the Department of Army's Edgewood Research, Development, and Engineering Center at the Aberdeen Proving Grounds in Maryland is evaluating a non-developmental prototype of the GID-3 detector under a Research & Development license. Mr. Jeff Havenner, U.S. Army Radiation Safety Officer at the Army's Rock Island facility, has indicated that the U.S. Army will be applying for the Registry No. once their evaluation of the detector has been completed.

2. **Muskegon Operations.** With respect to the addition of the Muskegon Operations facilities (Seminole Road and Getty Street), all procedures and commitments defined in our current license and referenced documentation will be implemented at these facilities.

3. **Survey Dates - WLC.** During the close-out of the Warren Logistics Center (WLC), radiological wipe testing of the applicable facility areas was conducted on 03 June 1996 (preliminary) and also on 13 & 19 June 1996 (final).

4. **Detector Leak Testing.** On 03 June 1996, all chemical agent detectors that were presently being stored at the WLC facility (2 - M43A1's (Am-241), 1 - CAM (Ni-63)) were tested for leakage prior to their transfer. This was done in accordance with current license provisions. Analysis indicated 0.0 μCi of removable contamination. Enclosed (Attachment 1) is an enlarged copy of the three (3) leak test certificates that were affixed to the respective units.

5. **Krypton-85 Source Sticks.** To date, Krypton-85 source sticks have never been received or stored at any of the GDLS authorized facilities.

6. **Radiological Analysis of Test Samples.** Radiological wipe testing analysis is conducted for GDLS by Wayne State University Health Physics (NRC license # 21-00741-08). Per R.D. Cummings, WSU Radiation Safety Officer, the procedures and equipment utilized for the analysis of wipe samples are as follows:

"Americium-241 samples are initially analyzed using a Ludlum Model 2223 Scalar/Ratemeter. This meter is capable of detecting alpha, beta, and alpha + beta. It is calibrated in accordance with the applicable provisions outlined in WSU's NRC Radioactive Material License.

In evaluating by liquid scintillation technique, wipe samples are individually placed in 20 ml plastic vials, each of which contains 10 ml of RPI 3a20 Complete Scintillation Cocktail. The vials are then capped, shaken, wiped, and placed in a TM Analytic 5303 Mark V Liquid Scintillation Counter (LSC) where they are allowed to dark adapt for 5 - 8 hours.

The LSC has "set" window channels for sample analysis as follows:

Channel A	*0 - 19 keV*	*(tritium channel)*
Channel B	*20 - 70 keV*	*(Nickel-63 channel)*
Channel C	*71 - 2000 keV*	*(Americium-241 channel)*

Samples are counted for ten (10) minutes each with a one (1) minute Low Count Reject setting. Results for each channel are printed in counts per minute (cpm). The corresponding activity (disintegrations per minute) is then calculated by:

$$\text{Net dpm} = \frac{\text{Net cpm}}{\% \text{ eff.}}$$

2. **Muskegon Operations.** With respect to the addition of the Muskegon Operations facilities (Seminole Road and Getty Street), all procedures and commitments defined in our current license and referenced documentation will be implemented at these facilities.

3. **Survey Dates - WLC.** During the close-out of the Warren Logistics Center (WLC), radiological wipe testing of the applicable facility areas was conducted on 03 June 1996 (preliminary) and also on 13 & 19 June 1996 (final).

4. **Detector Leak Testing.** On 03 June 1996, all chemical agent detectors that were presently being stored at the WLC facility (2 - M43A1's (Am-241), 1 - CAM (Ni-63)) were tested for leakage prior to their transfer. This was done in accordance with current license provisions. Analysis indicated 0.0 µCi of removable contamination. Enclosed (Attachment 1) is an enlarged copy of the three (3) leak test certificates that were affixed to the respective units.

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$$\text{Net dpm} = \frac{\text{Net cpm}}{\% \text{ eff.}}$$

where Net cpm = sample cpm - background cpm, and
% eff. = percent detection efficiency for the respective isotope.

Aqueous quenched & unquenched standards have been obtained by WSU from Dupont - NEN and Amersham and are used for detection efficiency determination."

7. **Tritium Cell Integrity.** At no time during operations at the WLC had a tritium cell assembly been compromised or damaged. Henceforth, there was never a release of tritium gas within the facility.

Dennis G. Stallsmith, our Radiation Safety Officer, may be contacted for any specific questions regarding this additional information. His telephone number is (810) 825-5767.

Sincerely,
GENERAL DYNAMICS LAND SYSTEMS, INC.

T.J. O'Neill
Manager, Contracts
Research and Development

xc: D.G. Stallsmith, Radiation Safety Officer
J. Yost, Jr.

LEAK TEST CERTIFICATE
Chemical Agent Detector Z03-D-35675
Am-241 Source Cell Z03-C-36342
Date of Leak Test : 060396
Leak Test Results : 0.0 µCi
NRC # 21-00741-08

LEAK TEST CERTIFICATE
Chemical Agent Detector Z03-D-35442
Am-241 Source Cell Z03-C-28425
Date of Leak Test : 060396
Leak Test Results : 0.0 µCi
NRC # 21-00741-08

LEAK TEST CERTIFICATE
Chemical Agent Monitor sn 02153
Date of Leak Test : 060396
Leak Test Results : 0.0 µCi
NRC # 21-00741-08

R&D 96-473

GENERAL DYNAMICS
Land Systems Division
P.O. Box 2072, Warren, Michigan 48090-2072

09 August 1996

United States Nuclear Regulatory Commission
Region III
Materials Licensing Section
801 Warrenville Road
Lisle, Illinois 60532-4351

Attention: Loren Hueter

Mr. Hueter:

Subject: Additional Amendment Request/Additional Information.

Reference: 1. GDLS "Request for Amendment" (R&D/96-437) from T.J. O'Neill (GDLS) to NRC Region III, dated 15 July 1996. License No. 21-21068-01. Mail Control No. 301630.

2. Telephone conversation between D.G. Stallsmith (GDLS) and L. Hueter (NRC) regarding additional amendment request, 08 August 1996.

The purpose of this correspondence is to provide additional information to the referenced Request for Amendment (Reference 1) in order to add an additional facility to our list of NRC-authorized locations.

1. **It is requested that item 10A be amended to also include the ADDITION of the following facility:**

Land Systems Division
Imperial Valley Facility
450 Aten Road
Imperial, California 92251

This facility will be used to support the packaging and transfer of Muzzle Reference Sensors (MRS) (each containing 10 Curies of tritium gas) to Egypt under Government Contract No. DAAE07-95-C-0223. This contract will commence in October 1996, and be completed at the end of 1997/early 1998.

Pm: 8-13-96

Muzzle Reference Sensors will be shipped from our Lima Army Tank Plant (LATP) to the Imperial Valley Facility (IVF), repackaged into wooden shipping containers, and then transported to Egypt. The current contract schedule provides eight (8) units per month at this facility. It is anticipated that there will be no more than sixteen (16) units at this facility at any one time.

The area in which the MRS's will be stored prior to repackaging and shipment will be controlled and labeled in accordance with current license provisions.

Personnel who will be working with the MRS's will receive radiation safety training prior to commencement of radiation related activities. This training will include item description, radiological hazard and safety precautions, shipment, disposal, and safety procedures to follow in the event of an accidental source breakage. At no time will any of the tritium source cells be removed from their respective holder (beamsplitter assembly).

Inventories and applicable records will also be conducted and maintained in accordance with current license provisions.

The area in which radioactive material will be stored will be surveyed for tritium contamination every six months. Levels of removable contamination in excess of current license requirements will be reduced accordingly.

Routine bioassays and film badges are not required. Radiation Safety representation remains unchanged.

2. **Our Radiation Safety Officer, Dennis G. Stallsmith, may be contacted for any specific questions regarding this request. His telephone number is (810) 825-5767.**

Sincerely,
GENERAL DYNAMICS LAND SYSTEMS, INC.

T.J. O'Neill
Manager, Contracts
Research & Development

xc: D.G. Stallsmith
G.J. Tomaszewski
J. Yost, Jr.

CONVERSATION RECORD

TIME

DATE 9-30-96

O VISIT O CONFERENCE Ø TELEPHONE

O INCOMING
Ø OUTGOING

NAME OF PERSON(S) CONTACTED OR IN CONTACT	ORGANIZATION (OFFICE, DEPT. ETC.)	TELEPHONE NO.
Dennis Stallsmith, RSO	General Dynamics Land Systems	810-825-5767

SUBJECT CN 301630 Fax 810 403 3025

SUMMARY

1. Inform that we can not add proposed new use location in Imperial, Calif. as an agreement state. Dennis said no problem
2. Inform we can not add the GID-3 chemical agent detector to license unless they can provide inform. showing it is registered in Limited Source & Device Registry
3. Confirm that all procedures and commitments in their license and referenced documents will be implemented at the 2 proposed new locations at 640 Seminole Road and 76 Getty Street, both in Muskegon, MI.
4. Provide info that preliminary & final wipe surveys are conducted at Warren Logistic Center (WLC).
5. Provide latest wipe test results of the Ni-63 and AM-241 sealed sources that were used and/or stored at WLC.
6. Describe Wayne Stat U. system & procedures for liquid scintillation analysis of your wipe samples. H_3 - .018 Mev B, Ni_{63} - .065 Mev B AM-241 - 5.5 Mev α
7. Confirm there has been no incidents of breakage or catastrophic loss of gases from the sealed gas sources at WLC.
8. Respond in 30 days & ref. CN 301630. (will try to respond in 2 days)

NAME OF PERSON DOCUMENTING CONVERSATION

SIGNATURE Loren Hunter

DATE 9-30-96

ACTION TAKEN

SIGNATURE

TITLE

DATE

GENERAL DYNAMICS
Land Systems Division
P.O. Box 2072, Warren, Michigan 48090-2072

R&D/96-437

15 July 1996

United States Nuclear Regulatory Commission
Region III
Materials Licensing Section
801 Warrenville Road
Lisle, Illinois 60532-4351

030-19731

Gentlemen:

Reference: 1. GDLS's Nuclear Regulatory Commission (NRC) Radioactive Materials License No. 21-21068-01, Amendment No. 9, Docket or Reference No. 030-19731.

Attachment: 1. GDLS Radiological Survey Report for Site Closure - Warren Logistics Center (WLC). June 1996.

The purpose of this letter is to request an amendment to General Dynamics Land Systems' NRC Radioactive Materials License (Reference 1). This amendment is necessary because of (1) facility consolidation, (2) facility acquisition, and (3) to expand the use of Nickel-63 for an additional chemical agent detector, the GID-3.

1. **It is requested that item 10A be amended to reflect the REMOVAL of the following facility:**

Land Systems Division
Warren Logistics Center
6700 East 14 Mile Road
Warren, Michigan 48092

This facility has been vacated by GDLS and all radioactive materials transferred to another "NRC-authorized" facility.

Prior to the release of this facility to unrestricted use and transfer of all radioactive commodities to another NRC-authorized facility, extensive radiological wipe testing was conducted to quantify any removable contamination present. Although several areas were identified as having very low levels of removable tritium contamination (478.7 dpm/100 cm^2, *maximum* vs. 1000 dpm/100 cm^2 *limit*), each was accordingly reduced to background. The attached report provides the information necessary to support this amendment request.

RECEIVED
JUL 22 1996
REGION III

PM: 7-17-96 30630

JUL 22 1996

2. **It is further requested that item 10A be amended to reflect the ADDITION of the following facilities:**

Land Systems Division
Muskegon Operations
Technical Center
640 Seminole Road
Muskegon, Michigan 49442

Land Systems Division
Muskegon Operations
76 Getty Street
Muskegon, Michigan 49442

These facilities and their operations were recently acquired from Teledyne Vehicle Systems (TVS) by GDLS. Future GDLS activities may include mobility testing of the Abrams Tank System at the Getty Street facility, and Engineering vehicle evaluations at the Seminole facility. It should be noted that prior to GDLS acquisition, a NRC Radioactive Materials License was not required of TVS for activities at these facilities. Radioactive materials were not utilized, nor contractually required.

A safety representative is based at the Muskegon site and in the event of a radiological emergency, the GDLS Radiation Safety Officer is within one (1) hour flight time (via corporate aircraft) to Muskegon.

3. **It is also requested that item "9B and C" be amended as follows to reflect the addition of the GID-3 Chemical Agent Detector.**

(9) B and C. For receipt, storage, use, and transfer of the CAM (Nickel-63), the GID-3 (Nickel-63), and the M43A1 (Americium-241) Chemical Agent Detectors.

It should be noted that an increase in the maximum quantity of Nickel-63 possessed at any one time does not change from that which has already been authorized by our license.

SUPPORTING INFORMATION.

Item Description.

The GID-3 (Figure 1) is a chemical agent detector which provides a warning to the soldier in the presence of chemical warfare agents. The GID-3 draws a sample of the surrounding air into the inlet and passes the sample to two (2) detection cells through a permeable membrane. Each detection cell contains no more than 15 mCi of Nickel-63. One cell detects the presence of nerve agent (G cell), and the other detects blister agent (H cell). Each cell is constantly cleaned by an internal pneumatic scrubbing system. The sample is then discharged to the surrounding air. Electrical signals are generated by gas ionization from the detection cells. The unique signals

generated by chemical agents are recognized by a microprocessor which is then capable of sending a signal to the display, indicating the type of agent detected and the hazardous level of agent vapor present. When preset levels are exceeded, a visible and audible alarm are activated.

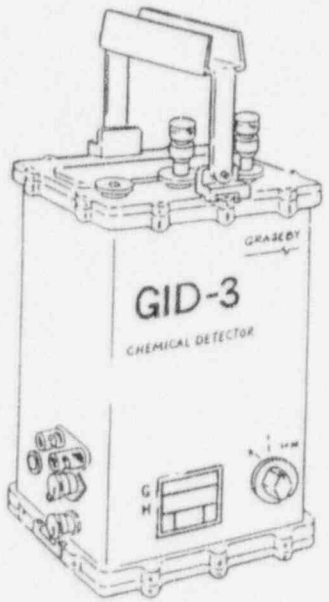

Figure 1. GID-3 Chemical Agent Detector

Purpose for which Licensed Material will be Used.

The Nickel-63 sources that are used for gas ionization in the GID-3 Chemical Agent Detector are the exact same source and construction that is currently utilized in the Chemical Agent Monitor (CAM), and authorized in GDLS's NRC License (Reference 1). The Nickel-63 Ring Source is manufactured by New England Nuclear Corporation. General Dynamics Land Systems intends on procuring the detector directly from the detector manufacturer, Graseby. The detector will be used for system integration design activities related to the Kuwait M1A2 Abrams Tank System. This primarily includes electrical interface and mounting hardware design.

Radiological Hazard.

As indicated in our renewal application for the CAM, Nickel-63 has a half-life of 92 years and emits only low energy beta particles with an average energy of 0.017 MeV. The GID-3's ring assembly is a brass ring electroplated with Nickel-63. The ring is held in a Teflon housing which is installed in a large aluminum alloy cylinder. The beta particles emitted by Nickel-63 are readily stopped by approximately 0.0016 inches (0.04 mm) of aluminum. Hence, these emissions are too weak to penetrate the housing of the GID-3 unit whose minimum thickness is 0.071 inches (1.8 mm) of aluminum. The radioactive source is totally enclosed and protected by the GID-3's case and poses no hazard when intact. Therefore, there is no external hazard or time limit for personnel handling or using this detector.

GID-3 units may be potentially hazardous if broken. The beta particles of Nickel-63 have an approximate range in dry air of 2.7 inches (68 mm). However, the internal hazard potential is small since beta particles can produce internal injury only if they are deposited inside the body, through either ingestion or inhalation. Since Nickel-63 is electroplated onto a brass ring, internal injury could only be caused by ingestion of any flaked off fragments of the radioactive plating, or by ingestion of the radioactive ring assembly itself.

The top of the GID-3 unit is labeled to show the presence of radioactive material (Figure 2).

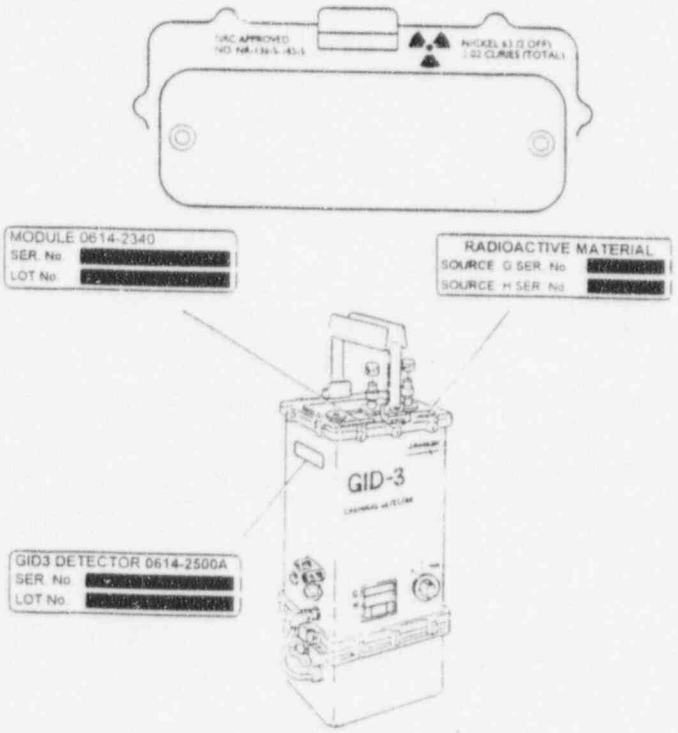

Figure 2. GID-3 Radioactive Material Warning Label

Maintenance, repair, or opening of the GID-3 source assemblies will be strictly prohibited. At no time will the sources be removed from the detector.

The unit will be wipe tested for leakage by trained personnel prior to transfer to another authorized person unless they have been leak tested within six (6) months prior to the date of use or transfer. Test samples will be taken from the detector's exterior surface and the exhaust port. If any test reveals the presence of 0.005 microcuries (μCi) or more of removable contamination, the unit will be withdrawn from use and decontaminated accordingly.

Emergency instructions will be provided to the applicable employees in the event of an accidental breakage of a GID-3 detector. Film badges and dosimeters are not required.

The area where the detector will be secured from unauthorized access will be labeled in accordance with current license provisions.

Disposal

Disposal of a damaged or unwanted GID-3 detector is to be accomplished by sending the unit back to the manufacturer or by using a commercial waste disposal service.

4. Radiation safety representation and overall radiation safety philosophy remains unchanged.

5. Check No. 472420 in the amount of $560.00 has been enclosed to cover the processing cost associated with a Category 3B license amendment.

6. Our Radiation Safety Officer, Dennis G. Stallsmith, may be contacted for any specific questions regarding this amendment request. His telephone number is (810) 825-5767.

Sincerely,
GENERAL DYNAMICS LAND SYSTEMS, INC.

T.J. O'Neill
Manager, Contracts
Research and Development

xc: w/o Attachment
D.G. Stallsmith
RW. Trempler, Jr.
J. Yost, Jr.
J. Schmuker (Muskegon)
N.S. Sridharan (Muskegon)

w/ Attachment
NRC - Washington
Division of Industrial and Medical Nuclear Safety
Washington, D.C. 20555

GENERAL DYNAMICS
Land Systems Division

RADIOLOGICAL SURVEY REPORT FOR SITE CLOSURE

WARREN LOGISTICS CENTER (WLC)
6700 EAST 14 MILE ROAD
WARREN, MICHIGAN 48092

REFERENCE :

U.S. NUCLEAR REGULATORY COMMISSION (NRC)
RADIOACTIVE MATERIALS LICENSE
No. 21-21068-01, Amendment No. 9
Docket No. 030-19731

EXECUTIVE SUMMARY

Due to consolidation of the General Dynamics Land Systems (GDLS) work force, the Warren Logistics Center (WLC), a NRC-authorized GDLS facility (reference NRC License No. 21-21068-01), has been vacated. Radiological surveys of the facility's radioactive material storage cabinet, Quality Inspection area, and the Validation/Verification area have indicated a level of removable tritium surface contamination much lower than (by at least a factor of two (2)) the NRC's unrestricted release limit for β emitters (1000 disintegrations per minute (dpm) per 100 cm^2). All areas typical of this have been decontaminated to background levels, and the facility released to unrestricted use.

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TABLE OF APPENDICES

1.0 BACKGROUND

On 21 March 1995, General Dynamics Land Systems Division, 38500 Mound Road, Sterling Heights, Michigan 48310-3268, was issued a renewal to their U.S. Nuclear Regulatory Commission (NRC) Radioactive Materials License No. 21-21068-01, Amendment No. 07. This license renewal authorizes GDLS to continue to receive, possess, install, and transfer a variety of military commodities which contain radioactive by-product material. These commodities are identified below.

The Muzzle Reference Sensor (MRS) which is installed on the main weapon of the Abrams Tank System (contains 10 Curies of Hydrogen-3).

The Chemical Agent Monitor (CAM) which is installed on the FOX Nuclear Biological Chemical Reconnaissance System (NBCRS), used for chemical agent detection (contains 15 millicuries of Nickel-63).

The M43A1 Chemical Agent Detector which is also installed on the FOX NBCRS and is used for chemical agent detection (contains 250 microcuries of Americium-241).

By NRC license 21-21068-01, GDLS is authorized to conduct licensed activities at several of its facilities. The facility in which the contents of this report addresses is:

Land Systems Division
Warren Logistics Center (WLC)
6700 East 14 Mile Road
Warren, Michigan 48092

2.0 WARREN LOGISTICS CENTER (WLC) CONSOLIDATION

Due to defense budget reductions over the past several years, General Dynamics Land Systems (GDLS) has consolidated it's work force and facilities to remain competitive with other defense contractors. In one of many efforts to achieve this , GDLS is currently in the process of vacating the Warren Logistics Center (WLC), and consolidating respective personnel to the Land Systems Sterling Defense Plant (also an NRC authorized GDLS facility). Completion of the consolidation was 15 June 1996. Lease expiration for the WLC facility is 15 July 1996.

3.0 STORAGE OF RADIOACTIVE MATERIAL AT WLC

During occupancy of the WLC facility, radioactive commodities in their final configuration (as referenced in Section 1.0) would routinely be received in a "loose" (not installed) or vehicle installed configuration. Loose commodities were received, processed through Quality Inspection, and then secured in the radioactive material storage cabinet from unauthorized personnel. Inventory records have been maintained by the GDLS Radiation Safety Office in accordance with license conditions and the applicable regulatory requirements.

3.1 Commodity Storage

The storage cabinet utilized for securing radioactive material at WLC is a metal, lockable, fireproof cabinet which was located in the area directly behind the Shipping & Receiving offices (reference WLC Facility Layout - Appendix I). At the time the storage cabinet was transferred, it contained thirty-three (33) Muzzle Reference Sensors (MRS), one (1) Chemical Agent Monitor (CAM), and two (2) M43A1 Chemical Agent Detectors. Currently, the MRS's, along with the radioactive material storage cabinet, have been transferred to the Sterling Defense Plant. The three (3) Chemical agent detectors/monitor were transferred to the Anniston Army Depot. It should be noted that the facilities in which these commodities were transferred are all "NRC authorized".

3.2 Vehicle Systems

All vehicle systems (Abrams Tank Systems and FOX NBCRS's) containing radioactive commodities that were received at WLC had undergone a comprehensive inspection, and then were released to the Validation/Verification Group. The primary purpose of these systems was to support Test Set/Logistics personnel in verifying diagnostic procedures and the respective technical maintenance manuals of each vehicle. At no time were any of the radioactive sources removed from their respective commodity. Currently, all Abrams Tank Systems have been transferred from WLC to the U.S. Army's Detroit Arsenal Tank Plant (DATP), while the FOX NBCRS's were transferred to the Anniston Army Depot. Again, the facilities in which these vehicle systems were transferred are "NRC authorized".

4.0 RADIOLOGICAL ANALYSIS

Prior to the release of the WLC facility to unrestricted use, and transfer of the radioactive commodities to another NRC authorized facility, radiological wipe testing was conducted to quantify any removable contamination present at that site. Illumination of the tritium light sources was verified by the GDLS Radiation Safety Officer (Dennis G. Stallsmith) prior to their transfer. In addition, all of the chemical agent monitor/detectors were individually analyzed for removable contamination. Liquid scintillation analysis was performed on the wipe samples by

GDLS subcontractor, Wayne State University - Health Physics, Detroit, Michigan, under NRC Radioactive Material License No. 21-00741-08.

The areas tested and the results obtained (preliminary and final) are presented in Appendix II and III, respectively. The U.S. NRC's "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of License for Byproduct, Source, or Special Nuclear Material (August 1987)" was used as a reference. Per these guidelines, the acceptable surface contamination limit for β contamination is <1000 disintegrations per minute (dpm) per 100 cm^2. Although detected levels of removable contamination were lower than this requirement by at least a factor of two (2), all areas exhibiting any level of tritium contamination were reduced to background level (i.e. no detectable activity).

4.1 Preliminary Survey Results

Preliminary results indicated that residual Nickel-63 and Americium-241 contamination was not present at the WLC facility. All test samples revealed no detectable activity (NDA). No further sampling was conducted for these isotopes.

Initial sampling of the radioactive material storage cabinet, particularly Shelf #3 (top - down), revealed an approximate quantity of removable tritium contamination of 478.7 disintegrations per minute (dpm)/100 cm^2. The three (3) remaining shelves, along with the surrounding floor areas (including the Quality Inspection area), did not indicate the presence of tritium contamination in excess of 5.0 dpm/100 cm^2.

Minor levels of tritium contamination were also detected in the VAL/VER area. The maximum quantity detected was 21.6 dpm/ 100 cm^2.

Note: All levels of detected removable tritium contamination were below the acceptable surface contamination limit as indicated in the aforementioned guidelines.

4.2 Final Survey Results

At the recommendation of NRC - Region III Inspector, Mr. Jamnes L. Cameron (during his inspection of the GDLS Central Office Complex (COC) and WLC, 06 June 1996), the shelves of the radioactive material storage cabinet were all decontaminated. Rad-Con Surface Decontaminant was utilized for this activity. In addition, floor areas showing minor contamination in the Quality Inspection area and in the VAL/VER area were also decontaminated to background levels. Final radiological swipes of these areas were taken and the results are presented in Appendix III. All waste generated from decontamination activities is currently being maintained as low-level radioactive waste (llrw) by Wayne State University - Health Physics.

4.3 Residual Contamination vs. Normal Leakage

In accordance with American National Standard N540 ("Classification of Radioactive Self-Luminous Light Sources") , the maximum leakage rate for a gaseous tritium light source is 0.05 μCi per 24 hours (111,000 dpm per 24 hours). This requirement has been incorporated into the GDLS Quality Assurance Requirements (QAR) for the tritium light source (QAR 12304729) and is verified 100% by the cell manufacturer. Considering the length of time that many of the tritium cells have been in continuous storage at the WLC facility, one can reasonably conclude that the minor contamination levels that were detected could very well be the result of normal leakage of the tritium gas through its borosilicate capsule.

5.0 CONCLUSION

Radiological survey results obtained during the decommissioning of the Warren Logistics Center (WLC) showed that although detectable levels of removable tritium contamination were identified, they were below that which is allowed for unrestricted use of the facility by a factor of at least two (2). However, the decision was made to further reduce these low levels to background. Therefore, at the time of lease expiration (15 July 1996), the WLC facility will be released for unrestricted use to the lessor identified below:

Lenakona Development Ltd.
P.O. Box 31003
Honolulu, Hawaii 96820

6.0 RECORD MAINTENANCE

All applicable records for this effort will be maintained by the GDLS Radiation Safety Office and made available for review (upon request) during future NRC inspections.

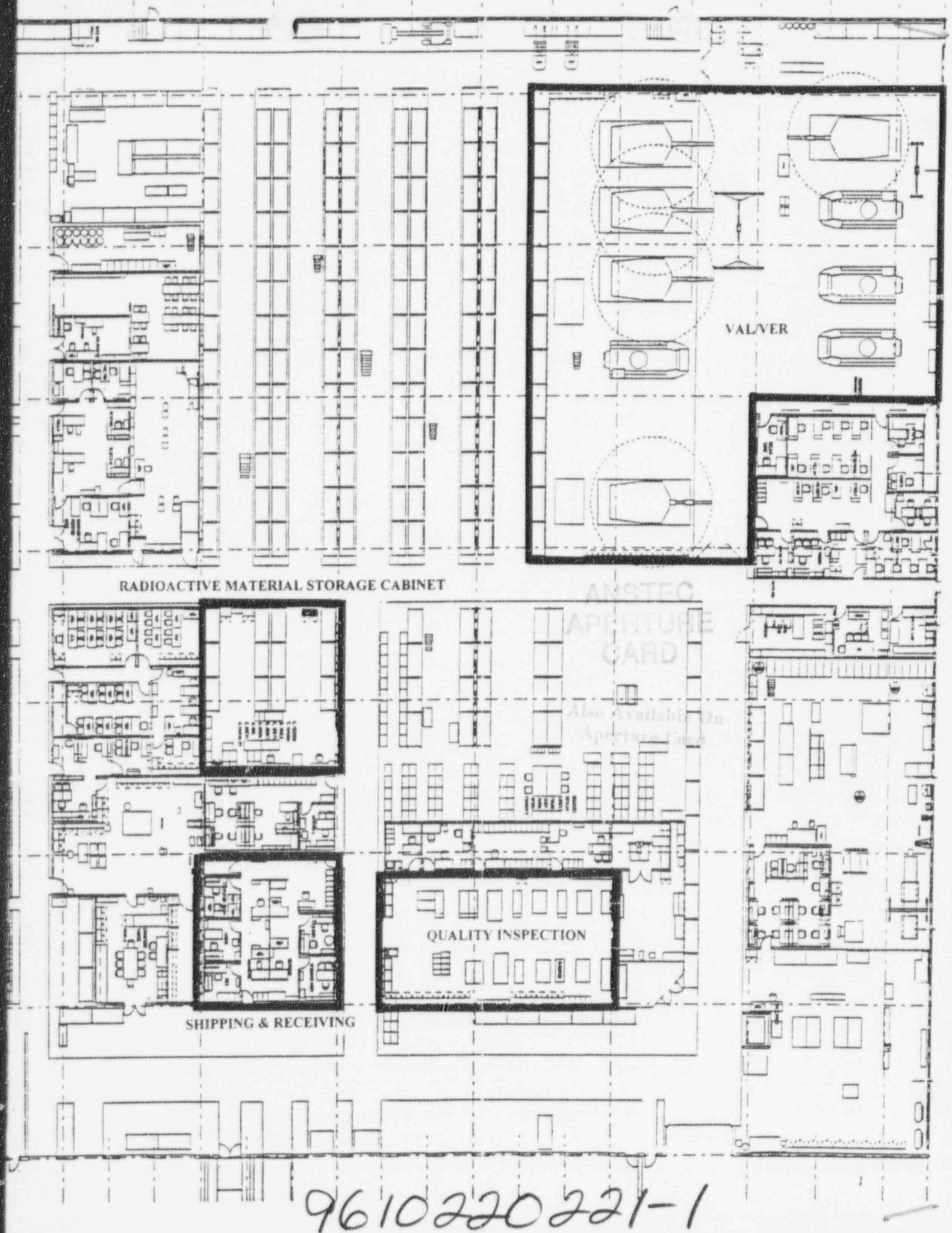
In accordance with U.S. Nuclear Regulatory Commission (NRC) regulations, the GDLS Radiation Safety Office will officially request through a "Request for Amendment" that the Warren Logistics Center (WLC) be removed from the list of NRC-authorized GDLS facilities (within 60 days) referenced in the aforementioned license. A copy of this report will accompany that request.

Dennis G. Stallsmith
GDLS Radiation Safety Officer

Concurrence: J. Yost, Jr.
Manager, Systems Engineering

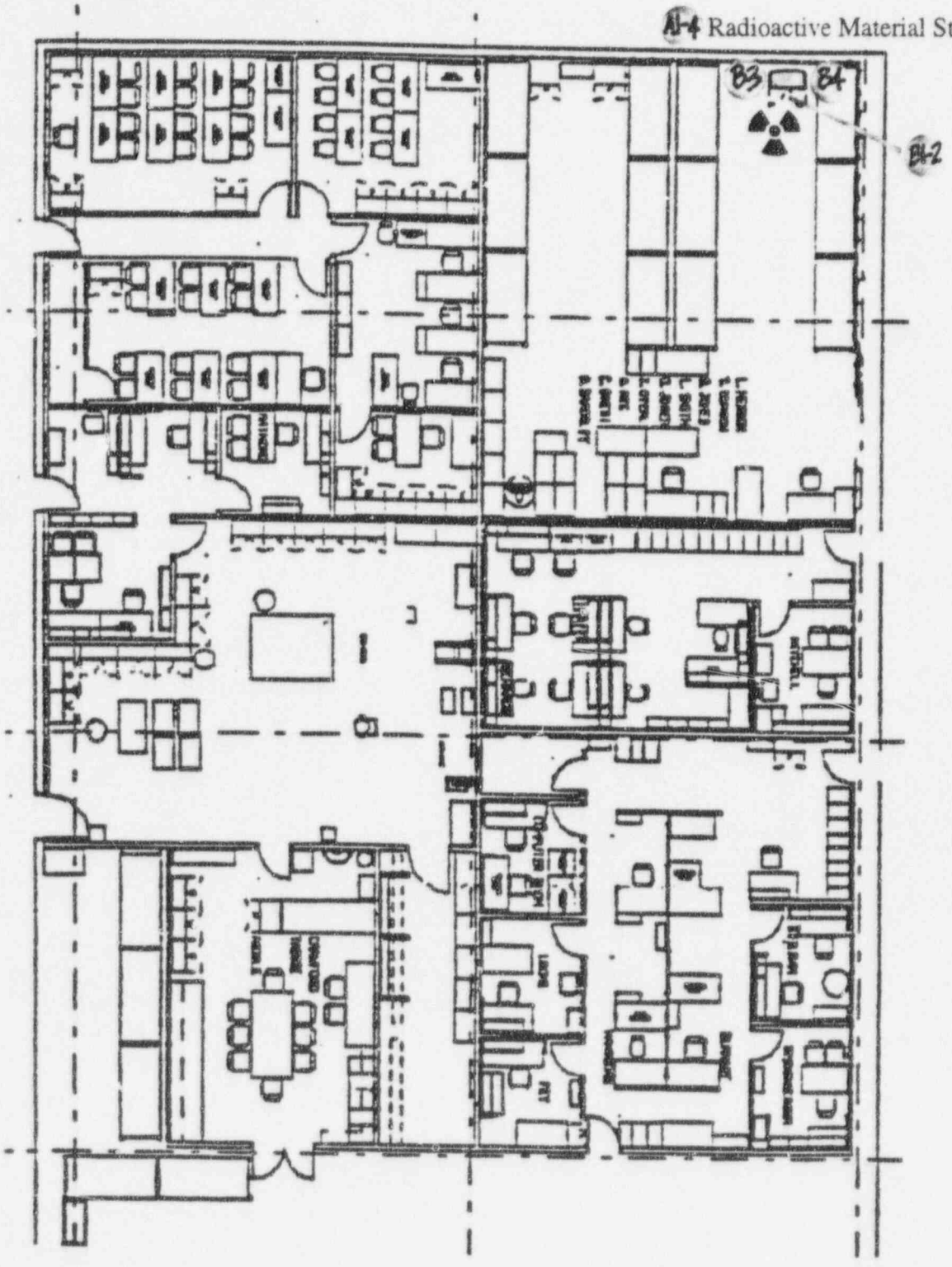
APPENDIX I
WARREN LOGISTICS CENTER (WLC) FACILITY LAYOUT

8,700 sf @ 130 sf/person
= 67 capacity



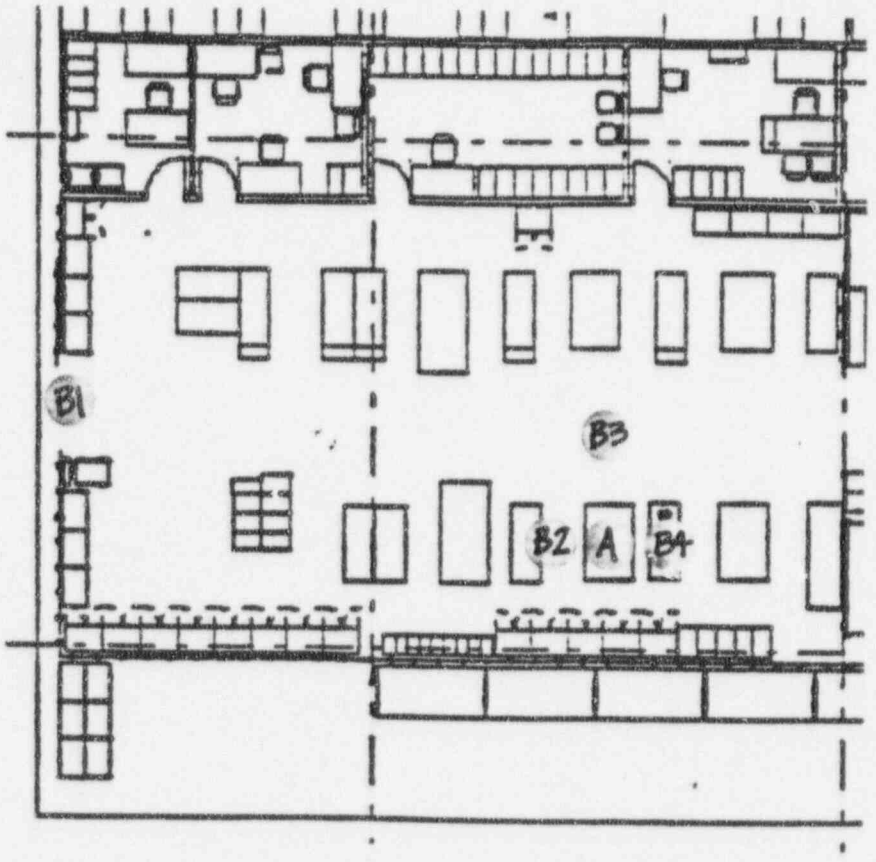
9610220221-1

Radiological Swipe Locations

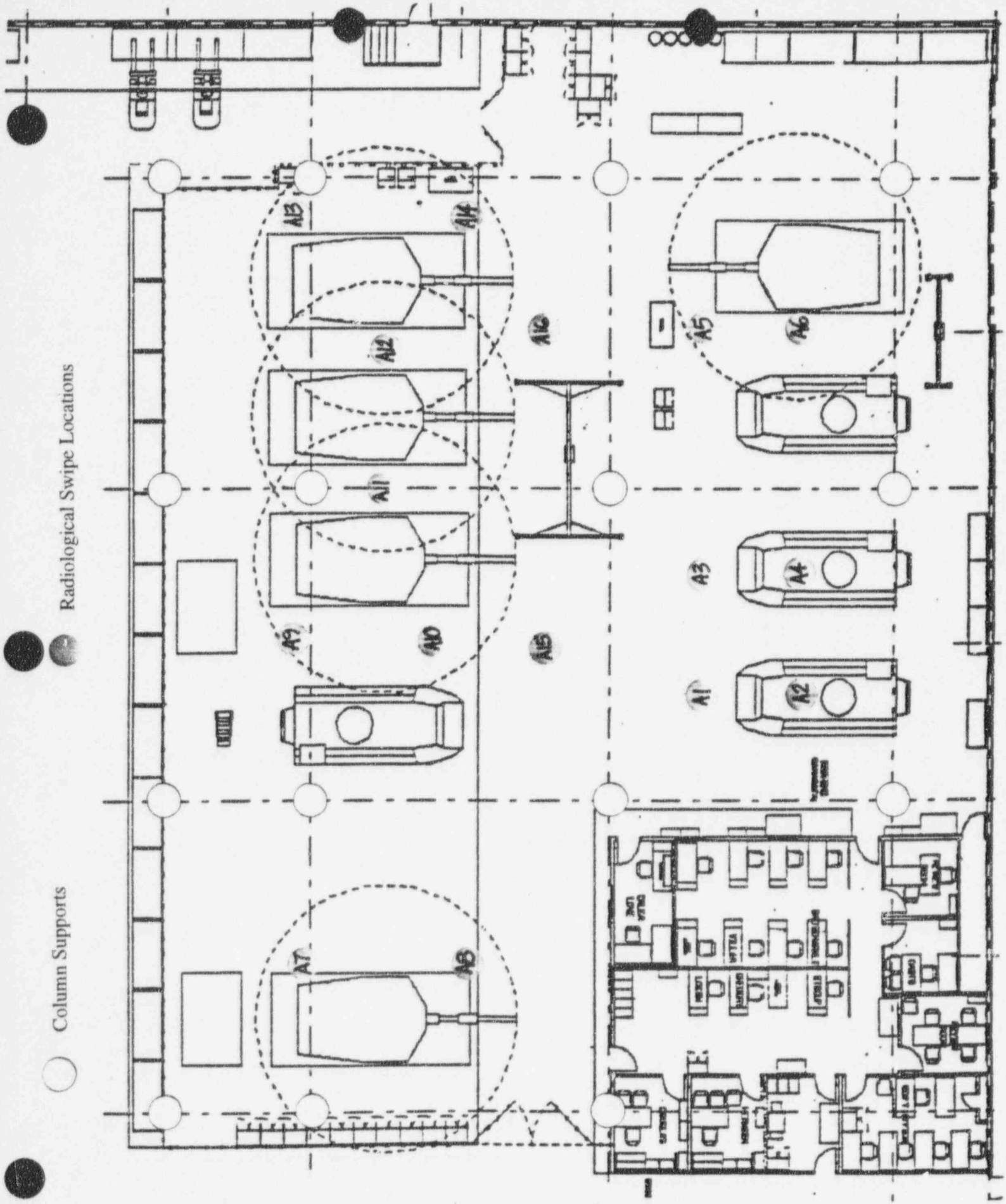


Warren Logistics Center (WLC) - Radioactive Material Storage Area
Final Radiological Surveys for Site Closure - June 1996

Radiological Swipe Locations



Warren Logistics Center (WLC) - Quality Inspection
Final Radiological Surveys for Site Closure - June 1996



Warren Logistics Center (WLC) - Validation/Verification (VAL/VER)
Final Radiological Surveys for Site Closure - June 1996

APPENDIX II
PRELIMINARY RADIOLOGICAL SURVEY FOR SITE CLOSURE

Warren Logistics Center (WLC)
Preliminary Radiological Survey for Site Closure

SAMPLE LOCATION	REF. NO.	SAMPLE AREA (cm^2)	H - 3 (net dpm)	H - 3 (dpm/100 cm^2)	Ni - 63 (net dpm)	Ni - 63 (dpm/100 cm^2)	Am - 241 (net dpm)	Am - 241 (dpm/100 cm^2)
Radioactive Material Storage Area								
Cabinet Shelf 1	IA1	258	12	4.7	NDA	NDA	NDA	NDA
Cabinet Shelf 2	IA2	258	0	NDA *	NDA	NDA	NDA	NDA
Cabinet Shelf 3	IA3	258	8	3.1	NDA	NDA	NDA	NDA
Cabinet Shelf 4	IA4	258	1235	478.7	NDA	NDA	NDA	NDA
Floor - Front Left	IB1	258	3	1.2	NDA	NDA	NDA	NDA
Floor - Front Right	IB2	258	0	NDA	NDA	NDA	NDA	NDA
Floor - Side Left	IB3	258	0	NDA	NDA	NDA	NDA	NDA
Floor - Side Right	IB4	258	0	NDA	NDA	NDA	NDA	NDA
Quality Inspection								
Inspection Table	IIA	929	0	NDA	NDA	NDA	NDA	NDA
Floor - Entrance	IIB1	929	0	NDA	NDA	NDA	NDA	NDA
Floor - Table Front	IIB2	929	20	2.2	NDA	NDA	NDA	NDA
Floor - Table Aisle	IIB3	929	0	NDA	NDA	NDA	NDA	NDA
Floor - Table Rear	IIB4	929	23	2.5	NDA	NDA	NDA	NDA
Validation/Verification (VAL/VER)								
Floor	IIIA1	929	0	NDA	NDA	NDA	NDA	NDA
Floor	IIIA2	929	25	2.7	NDA	NDA	NDA	NDA
Floor	IIIA3	929	0	NDA	NDA	NDA	NDA	NDA
Floor	IIIA4	929	201	21.6	NDA	NDA	NDA	NDA
Floor	IIIA5	929	0	NDA	NDA	NDA	NDA	NDA
Floor	IIIA6	929	15	1.6	NDA	NDA	NDA	NDA
Floor	IIIA7	929	10	1.1	NDA	NDA	NDA	NDA
Floor	IIIA8	929	18	1.9	NDA	NDA	NDA	NDA
Floor	IIIA9	929	7	0.8	NDA	NDA	NDA	NDA
Floor	IIIA10	929	10	1.1	NDA	NDA	NDA	NDA
Floor	IIIA11	929	7	0.8	NDA	NDA	NDA	NDA
Floor	IIIA12	929	32	3.4	NDA	NDA	NDA	NDA
Floor	IIIA13	929	0	NDA	NDA	NDA	NDA	NDA
Floor	IIIA14	929	7	0.8	NDA	NDA	NDA	NDA
Floor	IIIA15	929	0	NDA	NDA	NDA	NDA	NDA
Floor	IIIA16	929	0	NDA	NDA	NDA	NDA	NDA

* NDA : No Detectable Activity

APPENDIX III
FINAL RADIOLOGICAL SURVEY FOR SITE CLOSURE

SAMPLE LOCATION	REF. NO.	SAMPLE AREA (cm^2)	Preliminary Survey (H-3 dpm/100 cm^2)	Decontamination Completed	Final Survey (H-3 dpm/100 cm^2)	Release Status
Radioactive Material Storage Area						
Cabinet Shelf 1	IA1	258	4.7	Rad-Con	NDA*	unrestricted use
Cabinet Shelf 3	IA3	258	3.1	Rad-Con	NDA	unrestricted use
Cabinet Shelf 4	IA4	258	478.7	Rad-Con	NDA	unrestricted use
Floor - Front Left	IB1	258	1.2	Rad-Con	NDA	unrestricted use
Quality Inspection						
Floor - Table Front	IIB2	929	2.2	Rad-Con	NDA	unrestricted use
Floor - Table Rear	IIB4	929	2.5	Rad-Con	NDA	unrestricted use
Validation/Verification (VAL/VER)						
Floor	IIIA2	929	2.7	Rad-Con	NDA	unrestricted use
Floor	IIIA4	929	21.6	Rad-Con	NDA	unrestricted use
Floor	IIIA6	929	1.6	Rad-Con	NDA	unrestricted use
Floor	IIIA7	929	1.1	Rad-Con	NDA	unrestricted use
Floor	IIIA8	929	1.9	Rad-Con	NDA	unrestricted use
Floor	IIIA9	929	0.8	Rad-Con	NDA	unrestricted use
Floor	IIIA10	929	1.1	Rad-Con	NDA	unrestricted use
Floor	IIIA11	929	0.8	Rad-Con	NDA	unrestricted use
Floor	IIIA12	929	3.4	Rad-Con	NDA	unrestricted use
Floor	IIIA14	929	0.8	Rad-Con	NDA	unrestricted use

* NDA : No Detectable Act

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
801 WARRENVILLE ROAD
LISLE, ILLINOIS 60532-4351

July 23, 1996

Dennis G. Stallsmith
Radiation Safety Officer
General Dynamics Land Systems, Inc.
Land Systems Division
38500 Mound Road
Sterling Heights, MI 48310-3268

SUBJECT: ACKNOWLEDGEMENT OF CORRESPONDENCE
(Letter Dated July 15, 1996)

Dear Licensee:

In response to your request, we have completed the initial processing, which is an administrative review of your application for a(n):

_ New License ✓ Amendment _ Renewal
_ Termination _ Auth User (Amendment not required) _ QMP Revision
_ Other _____.

No administrative deficiencies were identified during this initial review. However, it should be noted that a technical review may identify omissions in the submitted information, technical issues that require additional information, or policy/technical issues that require coordination with headquarters or other NRC regional offices.

It appears that your request is routine (see 1-3 below, as applicable) and complete.

1. New and amendment actions are normally processed within 90 days, unless we find major deficiencies, or policy issues requiring central program office assistance.

2. Renewal actions are normally processed within 180 days, however, under timely filing (before expiration), you may continue to operate under your existing license.

3. Termination actions are normally processed within 90 days, unless confirmatory surveys following decontamination/decommissioning activities are involved.

A copy of your correspondence has been forwarded to our Licensing Fee and Debt Collection Branch (301/415-6097) for approval of the fee category and amount.

If you have a compelling safety or business-related reason for requesting expedited review, please contact the Materials Licensing Branch at (708) 829-9887. We will try to complete your request as soon as practicable. Any correspondence about this request should reference the control number.

Nuclear Materials Support Branch

Mail Control No. 301630
License No. 21-21068-01