



RESPONSE TO FREEDOM OF INFORMATION ACT (FOIA) / PRIVACY ACT (PA) REQUEST

2000-0165

1

RESPONSE TYPE FINAL PARTIAL

REQUESTER

Mr. Arthur Clark

DATE

JUN 21 2000

PART I. - INFORMATION RELEASED

- No additional agency records subject to the request have been located.
- Requested records are available through another public distribution program. See Comments section.
- APPENDICES Agency records subject to the request that are identified in the listed appendices are already available for public inspection and copying at the NRC Public Document Room.
- APPENDICES Agency records subject to the request that are identified in the listed appendices are being made available for public inspection and copying at the NRC Public Document Room.
- Enclosed is information on how you may obtain access to and the charges for copying records located at the NRC Public Document Room, 2120 L Street, NW, Washington, DC.
- APPENDICES Agency records subject to the request are enclosed.
- Records subject to the request that contain information originated by or of interest to another Federal agency have been referred to that agency (see comments section) for a disclosure determination and direct response to you.
- We are continuing to process your request.
- See Comments.

PART I.A - FEES

AMOUNT *

\$ 137.20

* See comments for details

- You will be billed by NRC for the amount listed. None. Minimum fee threshold not met.
- You will receive a refund for the amount listed. Fees waived.

PART I.B - INFORMATION NOT LOCATED OR WITHHELD FROM DISCLOSURE

- No agency records subject to the request have been located.
- Certain information in the requested records is being withheld from disclosure pursuant to the exemptions described in and for the reasons stated in Part II.
- This determination may be appealed within 30 days by writing to the FOIA/PA Officer, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Clearly state on the envelope and in the letter that it is a "FOIA/PA Appeal."

PART I.C COMMENTS (Use attached Comments continuation page if required)

The records identified on Appendices A and B are responsive to your request and are enclosed. In our statement of estimated fees, dated May 23, 2000, amounted to \$458.50. We are in receipt of your check for this amount. In a telephone conversation also on May 23, 2000, you stated your agreement to pay up to \$1,500. The actual fee for duplication amounts to an additional \$137.20, which is for 686 pages provided to you that were not included in our estimate. You will be billed by NRC for this additional amount. This completes NRC's action on your request.

SIGNATURE - FREEDOM OF INFORMATION ACT AND PRIVACY ACT OFFICER

Carol Ann Reed

(6-1999)

RESPONSE TO FREEDOM OF INFORMATION ACT (FOIA) / PRIVACY ACT (PA) REQUEST

2000-0165

JUN 21 2000

PART II.A - APPLICABLE EXEMPTIONS

APPENDICES B

Records subject to the request that are described in the enclosed Appendices are being withheld in their entirety or in part under the Exemption No.(s) of the PA and/or the FOIA as indicated below (5 U.S.C. 552a and/or 5 U.S.C. 552(b)).

- Exemption 1: The withheld information is properly classified pursuant to Executive Order 12958.
- Exemption 2: The withheld information relates solely to the internal personnel rules and procedures of NRC.
- Exemption 3: The withheld information is specifically exempted from public disclosure by statute indicated.
 - Sections 141-145 of the Atomic Energy Act, which prohibits the disclosure of Restricted Data or Formerly Restricted Data (42 U.S.C. 2161-2165).
 - Section 147 of the Atomic Energy Act, which prohibits the disclosure of Unclassified Safeguards Information (42 U.S.C. 2167).
 - 41 U.S.C., Section 253(b), subsection (m)(1), prohibits the disclosure of contractor proposals in the possession and control of an executive agency to any person under section 552 of Title 5, U.S.C. (the FOIA), except when incorporated into the contract between the agency and the submitter of the proposal.
- Exemption 4: The withheld information is a trade secret or commercial or financial information that is being withheld for the reason(s) indicated.
 - The information is considered to be confidential business (proprietary) information.
 - The information is considered to be proprietary because it concerns a licensee's or applicant's physical protection or material control and accounting program for special nuclear material pursuant to 10 CFR 2.790(d)(1).
 - The information was submitted by a foreign source and received in confidence pursuant to 10 CFR 2.790(d)(2).
- Exemption 5: The withheld information consists of interagency or intraagency records that are not available through discovery during litigation. Applicable privileges:
 - Deliberative process: Disclosure of predecisional information would tend to inhibit the open and frank exchange of ideas essential to the deliberative process. Where records are withheld in their entirety, the facts are inextricably intertwined with the predecisional information. There also are no reasonably segregable factual portions because the release of the facts would permit an indirect inquiry into the predecisional process of the agency.
 - Attorney work-product privilege. (Documents prepared by an attorney in contemplation of litigation)
 - Attorney-client privilege. (Confidential communications between an attorney and his/her client)
- Exemption 6: The withheld information is exempted from public disclosure because its disclosure would result in a clearly unwarranted invasion of personal privacy.
- Exemption 7: The withheld information consists of records compiled for law enforcement purposes and is being withheld for the reason(s) indicated.
 - (A) Disclosure could reasonably be expected to interfere with an enforcement proceeding (e.g., it would reveal the scope, direction, and focus of enforcement efforts, and thus could possibly allow recipients to take action to shield potential wrongdoing or a violation of NRC requirements from investigators).
 - (C) Disclosure would constitute an unwarranted invasion of personal privacy.
 - (D) The information consists of names of individuals and other information the disclosure of which could reasonably be expected to reveal identities of confidential sources.
 - (E) Disclosure would reveal techniques and procedures for law enforcement investigations or prosecutions, or guidelines that could reasonably be expected to risk circumvention of the law.
 - (F) Disclosure could reasonably be expected to endanger the life or physical safety of an individual.
- OTHER (Specify)

PART II.B - DENYING OFFICIALS

Pursuant to 10 CFR 9.25(g), 9.25(h), and/or 9.65(b) of the U.S. Nuclear Regulatory Commission regulations, it has been determined that the information withheld is exempt from production or disclosure, and that its production or disclosure is contrary to the public interest. The person responsible for the denial are those officials identified below as denying officials and the FOIA/PA Officer for any denials that may be appealed to the Executive Director for Operations (EDO).

DENYING OFFICIAL	TITLE/OFFICE	RECORDS DENIED	APPELLATE OFFICIAL		
			EDO	SECY	IG
Ellis W. Merschoff	Regional Administrator, RIV	App. B	✓		

Appeal must be made in writing within 30 days of receipt of this response. Appeals should be mailed to the FOIA/Privacy Act Officer, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, for action by the appropriate appellate official(s). You should clearly state on the envelope and letter that it is a "FOIA/PA Appeal."

**APPENDIX A
RECORDS BEING RELEASED IN THEIR ENTIRETY
(If copyrighted Identify with *)**

<u>NO.</u>	<u>DATE</u>	<u>DESCRIPTION/(PAGE COUNT)</u>
1.	09/10/99	License Application and Attachments Package, Subject: MKM Engineers, 105 pages.
2.	1999	Radiation Safety Procedures Book 1 relative to MKM Engineers, 198 pages.
3.	1999	Radiation Safety Procedures Book 2, 378 pages.
4.	12/03/99	U.S. Nuclear Regulatory Commission Materials License, Subject: MKM Engineers, Inc., 5 pages.

**APPENDIX B
RECORDS BEING WITHHELD IN PART**

<u>NO.</u>	<u>DATE</u>	<u>DESCRIPTION/(PAGE COUNT)/EXEMPTIONS</u>
1.	1999	License Application Page No. 28, Subject: MKM Engineers, Inc., 1 page, EXEMPTION 6.
2.	1999	Page 5 of Radiation Safety Procedures, Subject: MKM Engineers, Inc., 1 page, EXEMPTION 6.
3.	1999	MKM Engineers, Inc., 1 page, EXEMPTION 6.
4.	1999	MKM Engineers, Inc., 1 page, EXEMPTION 6.



MKM ENGINEERS

License Application and Attachments

**"SAFETY IS THE FIRST & MOST IMPORTANT
ASPECT OF ANY JOB"**

MKM ENGINEERS - 1999

7/14/99

All

LICENSE APPLICATION

Estimated burden per response to comply with this information collection request: 7 hours. Submittal of the application is necessary to determine that the applicant is qualified and that adequate procedures exist to protect the public health and safety. Forward comments regarding burden estimate to the Information and records management branch (T-8 F33), U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0120), Office of Management and Budget, Washington, DC 20503. NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

APPLICATION FOR MATERIAL LICENSE

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

APPLICATION FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH

DIVISION OF INDUSTRIAL AND MEDICAL NUCLEAR SAFETY
OFFICE OF NUCLEAR MATERIALS SAFETY AND SAFEGUARDS
U.S. NUCLEAR REGULATORY COMMISSION
WASHINGTON, DC 20555-0001

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS:

IF YOU ARE LOCATED IN:

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND, MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:

LICENSING ASSISTANT SECTION
NUCLEAR MATERIALS SAFETY BRANCH
U.S. NUCLEAR REGULATORY COMMISSION REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PA 19406-1415

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, PUERTO RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:

NUCLEAR MATERIALS LICENSING SECTION
U.S. NUCLEAR REGULATORY COMMISSION, REGION II
101 MARIETTA STREET, NW, SUITE 2900
ATLANTA, GA 30323-0199

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:

MATERIALS LICENSING SECTION
U.S. NUCLEAR REGULATORY COMMISSION, REGION III
801 WARRENVILLE RD.
LISLE, IL 60532-4351

ALASKA, ARIZONA, ARKANSAS, CALIFORNIA, COLORADO, HAWAII, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEVADA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, OREGON, PACIFIC TRUST TERRITORIES, SOUTH DAKOTA, TEXAS, UTAH, WASHINGTON, OR WYOMING, SEND APPLICATIONS TO:

NUCLEAR MATERIALS LICENSING SECTION
U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TX 76011-8064

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTIONS.

1. THIS IS AN APPLICATION FOR (Check appropriate item)

A. NEW LICENSE

B. AMENDMENT TO LICENSE NUMBER _____

C. RENEWAL OF LICENSE NUMBER _____

2 NAME AND MAILING ADDRESS OF APPLICANT (Include Zip code)

MKM Engineers, Inc.
6461 Plumcrest Rd. Ste 100
Las Vegas Nevada 89108-5309

3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED

At individual customer/client-generator facility.

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Ms. Dixie J. Wells,
Radiation Safety Officer

TELEPHONE NUMBER

(702) 395-9328

SUBMIT ITEMS 5 THROUGH 11 ON 8-1/2 X 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE

5. RADIOACTIVE MATERIAL a. Element and mass number, b. chemical and/or physical form, and c. Maximum amount Which will be possessed at any one time.	6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED
7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING EXPERIENCE	8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.
9. FACILITIES AND EQUIPMENT	10. RADIATION SAFETY PROGRAM
11. WASTE MANAGEMENT	12. LICENSE FEES / See 10 CFR 170 and Section 170.31) FEES CATEGORY 1D, 2C, 3N, 4B AMOUNT \$9,180.00

13. CERTIFICATION. (Must be completed by applicant). THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30,32,33,34,35,36,39 AND 40, AND THAT ALL INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948 62 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

CERTIFYING OFFICER - TYPED/PRINTED NAME AND TITLE: **Khodi G. Irani President, MKM Engineers, Inc.**

SIGNATURE: *Khodi G. Irani*

DATE: *Sept 10 '99*

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	AMOUNT RECEIVED	CHECK NUMBER	COMMENTS
			\$		
APPROVED BY				DATE	16 107508

LETTER & DISCUSSION



September 17, 1999

Nuclear Materials Licensing Branch
U. S. Nuclear Regulatory Commission, Region IV
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-8064

Subject: Application for an NRC Specific License of Broad Scope for Byproduct Material

This letter forwards MKM's request for review of the enclosed application for a "Type A Broad Scope" Radioactive Materials license. The primary document is the completed Application for Material License (Form 313). This letter and the written response to Items 5 through 11, as instructed in Section 2 of Draft Regulatory Guide DG-0005 (Second Proposed Revision 2 to Regulatory Guide 10.5) serve as attachments to Form 313. I have consulted *NUREG-1556, Consolidated Guidance About Materials Licenses*, for any additional or changed requirements.

As instructed in Section 2 of DG-0005, each separate sheet or document submitted is identified and keyed to the item number by direct reference - (*Item 5, 7, etc*) and/or preceded by an annotated divider page (usually in an other than white color).

The MKM Controlled Procedures, Manuals, Work Plans, etc. have been sent to you in hardcover notebooks for your review. As instructed, you have been sent two (2) complete copies of our submittal; both sets of procedures have been assigned to NRC Region IV in accordance with ARP-30 - Document Control. Working with your former Region V associate, Ms. Beth Prange, I have written two (2) other materials licenses (27-29103-01 & 27-29119-01) of this type. As I very much enjoyed working with her in the past, I am looking forward to working with a new reviewer from the Arlington office.

Thank you for the support and guidance I have always received from the NRC in licensing efforts. MKM looks forward to a productive relationship with the Nuclear Regulatory Commission. As you review this application, please call me for immediate assistance with any questions, concerns, comments, or clarifications. I may be reached by phone at (702) 395-9238 or (702) 528-0564 or by fax at (702) 395-2824.

Sincerely,

Dixie J. Wells, RSO
Las Vegas Operations
MKM Engineers, Inc

cc: Khodi Irani, President -MKM Engineers, Inc.
Jal Guzder, Executive VP - MKM Engineers, Inc.
Michelle Burton, Admin Ops - MKM Engineers, Inc.
Thomas O'Dou, Program Manager - MKM Las Vegas



In accordance with the instructions given in DG-0005, each section of the discussion will be referenced to a particular part of the application. If a referenced portion of the application is answered by a specific section of a procedure or manual, the part or parts of the procedure will be noted.

In addition to the instructions given in DG-0005, we have submitted an application of this type previously. Please reference NRC License Number 27-29103-01, issued in December 1996 to Gutierrez-Palmenberg, Inc., and 27-29119-01, issued in April 1998 to Aguirre Engineers, Inc. Both of those licenses have been audited without problems.

One of the primary purposes of this license is to provide a complete radioactive materials license package that includes; possession limits, an approved MKM Radiation Protection Program, regulatory auditability, professional staff, and, of course, NRC review of activities. This complete service would be for clients and/or facilities that require radioactive materials work to be performed, but do not have either the resources of or access to an approved radioactive materials license.

An additional purpose of this license is to provide a legal basis for work involving radioactive material remediation services which will be performed at the generator or client/generator's site. These services may consist of site characterization for radioactive wastes, sampling, decontamination of buildings, equipment and the environment, and surveillance for release, per NUREG/CR-5849 or NUREG 1575, *Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)*. These services would be performed at the client's request by contract for the intention of releasing an area or areas to public use or simply to aid the client in recovering greater control of their work spaces. Our primary guidance document for our decontamination efforts is NUREG/CR-5849, *Manual for Conducting Radiological Surveys in Support of License Termination*, June 1992; as well as release levels as defined in other guidance documents such as, *Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material* and *Regulatory Guide 1.86, Termination of Operating Licenses for Nuclear Reactors*, or any future release requirements published by the USNRC.

This license will be entered into as a Type A Broad Scope in accordance with 10 CFR Parts 30 and 33. Our license will have a Radiation Safety Committee with Thomas J. O'Dou, CHP as Chairperson, as well as a Radiation Safety Officer, Dixie J. Wells, as listed on Form 313. The designated Alternate RSO for the purposes of this license will be Thomas J. O'Dou, CHP. The license is designed for use in all areas of NRC jurisdiction and Agreement States.

MKM has no laboratory facilities and has entered into verbal contracts with licensed qualified laboratories for these service needs. These contracts have been executed with General Engineering Laboratories (GEL) located in Charleston, South Carolina, Mountain States in Salt Lake City, Utah, and Duke Engineering in Westborough, Massachusetts. A summary sheet with these laboratories has been included for your review and files.



ITEM 3

Necessary explanations in this application need to begin before the expected norm of Items 5-11. This is due to the unusual nature of this license request. As discussed with Jack Whitten and Billie Krynski in the initial stages of the license preparation of license number 27-29103-01, and subsequently with Beth Prange in the completion of both that license and 27-29119-01, the design of this license is also:

- ◆ to extend help to 'facilities' whose existing license may not fully cover the expected scope of a project involving radioactive materials, or;
- ◆ to extend coverage (of a radioactive materials license) to 'facilities' that may be required to undertake a project involving radioactive materials and they would not normally have a license for handling radioactive materials, (i.e., scrap yards that have discovered Radium dials, gauges, etc. years after it was placed in the yard), or;
- ◆ to work, and share responsibility for radioactive materials controls, with an existing NRC or Agreement State licensee.

Therefore, in response to *ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED*, the answer/address will vary with the project or contract. In all cases, a Work Package consisting of a; 1) Detailed Work Plan, 2) Health and Safety Plan, and 3) Quality Assurance (QA) Plan will be presented for review/approval prior to beginning a project. In both licenses, *License Condition 13*, addressed this specifically. In this submittal, the Detailed Work Plan example is for a Characterization - it would be written in the same format for a remediation, decontamination, etc. Decommissioning documents are normally written to conform to the NRC Guidelines in RG 3.66 and 3.67.

ITEM 5

The byproduct material at any given facility with each contract will vary; therefore, the Item 5 requirements are requested to provide the widest possible latitude without provision of a Certified Emergency Plan. In the event that the Item 5 limits are invoked to cover contract work or a contract project, control of the possession limits will be maintained at *Unity* as discussed in several CFR references and which indicates that the total amount of activity present at any one time, when factored and summed, would add up to a number that would be less than 1. This will be implemented by including site wide inventory of contracted radioactive materials and an appropriate set of *Unity* Calculations. I understand that there is a standard format used to assign these amounts. This format was implemented in the Item 5 response in 27-29103-01 & 27-29119-01, and as has been explained to me, is the NRC preferred response. It is equally sufficient in this request, as well.



ITEM 6

As previously discussed, the byproduct material will be as a result of remediation services. These services may consist of site characterization for radioactive and hazardous wastes; sampling; decontamination of buildings; equipment and the environment; and surveillance for release. These services would be performed at the client's request by contract. Decontamination, onsite solidification, packaging and transportation of wastes, and other services of this nature will be performed in accordance with MKM procedures (which are provided for review in Section II, Volume II) and applicable client, state, and federal regulations. As you may note in *Authorized Use* portion of both licenses, it mentions receipt and storage, this is as it applies to work at the client's facility/site or for transport to an authorized storage or burial site.

ITEM 7

Certification and identification of these individuals, is submitted on the enclosed Training and Experience Forms. This format lists their training, where it occurred, whether it was *formal course* or *on-the-job*, and the length of time it lasted. In addition, the types and amounts of radioactive material handled, and a synopsis resume of each is included on the Training and Experience (T&E) Form.

Complete resumes for the Corporate Health Physicist, Thomas O'Dou, CHP, and the Radiation Safety Officer, Dixie Wells have been included. All T&Es and resumes are provided for your review.

Other aspects of this requirement are found in the MKM Radiation Safety Manual which introduces the management commitment to the radiation safety program, illustrates the line organization, and discusses the management roles. It also focuses on the Radiation Safety Officer responsibilities as the implementer of the license.

ITEM 8

Compliance with this item is included in the T&E specifications as noted in Item 7 for all initial personnel. For continuing qualification and for initial training and/or retraining of all additional radiation workers, the MKM Radiation Safety Training Manual will be implemented. This manual is provided for your review.

ITEM 9

MKM does not have an operational facility for waste handling or processing. All functions of this nature are contracted by the client/generator or by MKM for the client/generator.



MKM currently contracts with GTS Duratek and Environmental Restoration Group for counting instrumentation. An inventory of the type, counting range, model number, and other essential information regarding the instruments available to MKM is shown in Table 1 in Volume III of this application.

MKM's dosimetry provider and processor will be Landauer, Inc. As with the laboratories, there is a verbal contract with them. I have used them in the past, in conjunction with power plant operations.

MKM's bioassay sample analysis will be provided by Teledyne Midwest Laboratory, a division of TEL. As with the other vendor factions in this application, I have used them for several years, have confidence in their capabilities, and know them to be recognized and approved.

Specific and sample counting information requiring the use of laboratory facilities is provided by the laboratories previously listed.

ITEM 10

The most efficient method for addressing the objectives in Item 10 will be in narrative form, but may seem disjointed in the areas that do not apply to this license application specifically. Most of those areas will be with regard to facilities and procurement.

MKM has performed remediation work with regard to radioactive materials, hazardous waste, and unexploded ordnance, but these efforts were performed as a subcontractor to other companies and under their license(s). MKM has extensive experience in work in the areas mentioned and now seeks to expand their knowledge and capabilities through this NRC license.

MKM has a complete set of administrative and operational procedures for the work it performs. These documents have been provided in two (2) volumes for review. Book I contains procedures MKMP-001 through MKMP-010, the Radiation Safety Manual, the Radiation Safety Training Manual, and the Rad Worker Training Outline. Book II contains MKMP-011 through MKMP-042. Copies of laboratory QA have been indicated as unneeded and unnecessary in this submittal, but summaries are included. As instructed, there are two (2) complete sets of the application which includes the two (2) books of procedures.

Procurement of any radioactive materials will be done in accordance with procedure. Currently MKM has no plan to obtain licensed sources. MKM's radioactive sources will normally fall into the exempt category and will be used for checking radiation detection instrumentation. These sources will be ordered by the RSO; all original records maintained by the RSO, and all records will be in an auditable format.



The mechanism for verification of the Safety Evaluations is contained in the certification of the Corporate Health Physicist and the Radiation Safety Officer (resumes attached). One or both of these persons will evaluate and authorize any additions to the *Authorized Users* list. Auditable documentation, in accordance with MKM procedures, will be maintained. This records will normally be in the form of the submitted T&E Forms.

Contained within the Radiation Safety Manual are the provisions for management and radiation safety audits.

Compliance with item 10.6 will be provided in the form of a Work Package for each job or project. The Work Package, at a minimum, will consist of; *The Detailed Work Plan, The Health and Safety Plan, and The Quality Assurance Plan*. Since the content of the Work Package will vary with each project, you have been given the generic format for each of these documents for review.

ITEM 11

As with Section 10.6 of Item 10, the manner of waste management will vary from project to project and as such, will always be made a matter addressed in the Work Package.

Finally, as has been discussed with the Region IV office, was discussed with the Region I office in the preparation of such a license for Teledyne in early 1996, and as implemented with license numbers 27-29103-01 & 27-29119-01, this is a request for a normal Type A License of Broad Scope for Byproduct Material with a less than normal end use. We believe that the method in which this license will be applied provides for a greater than normal degree of control. The NRC has initial control in the approval of MKMs procedures and how they are implemented. It then is able to exercise additional control in the review of the Work Package associated with each project.

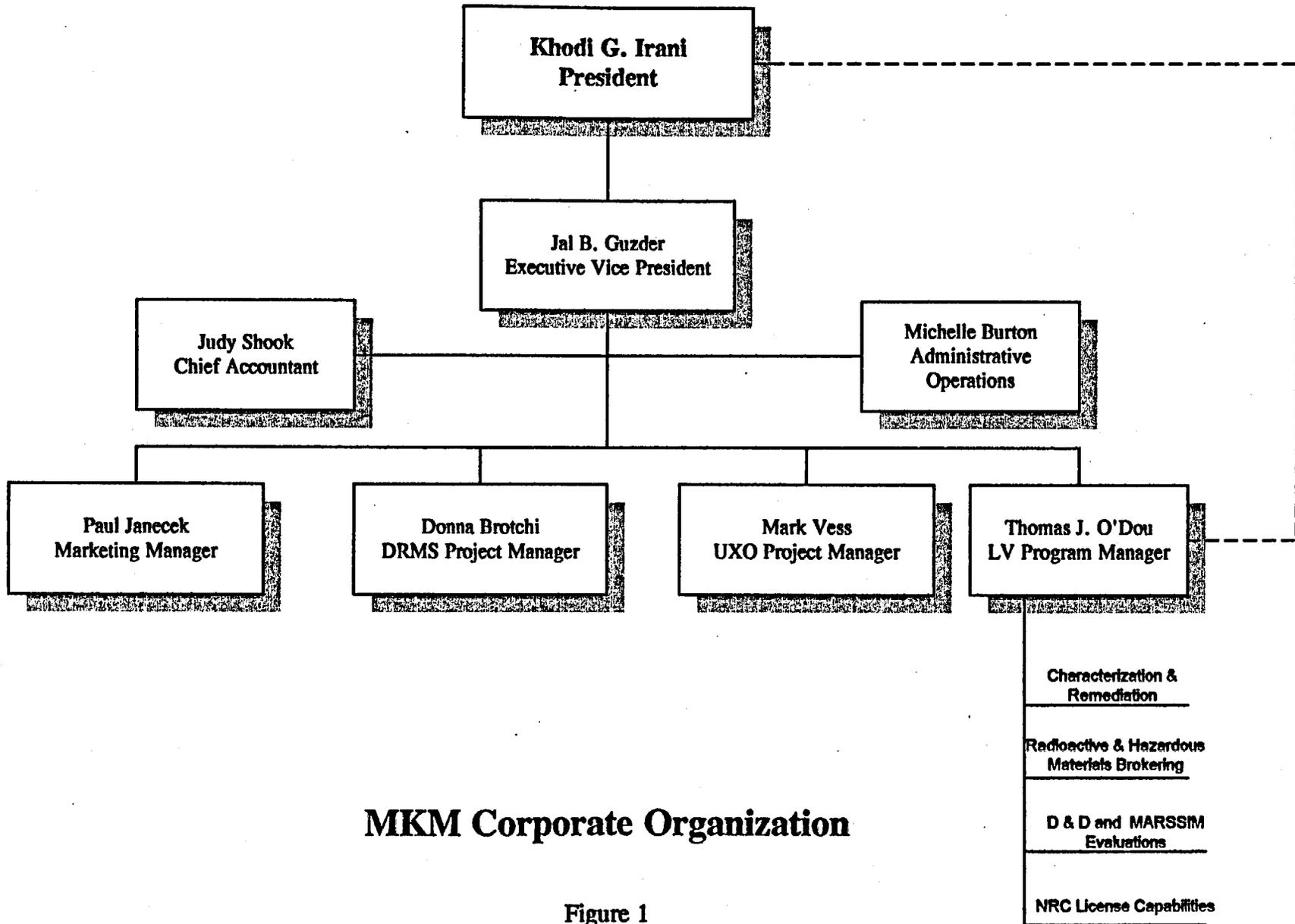
MKM and I would like to take this opportunity to express appreciation to the professionals in the various NRC offices that have helped in understanding of the requirements in the preparation of this license application. We look forward to continued operations with the NRC in the ongoing effort to help 'clean up' our environment.

Thank you.

ORGANIZATION CHARTS

MKM Enginee. s, Inc.

September 1, 1999



MKM Corporate Organization

Figure 1

Revision 0

Approved/Date:

Khodi G. Irani Sept 10 '99

See Figure 2 for
details of Las Vegas
Operations

MKM Engineers, Inc.

September 1, 1999

Las Vegas Operations

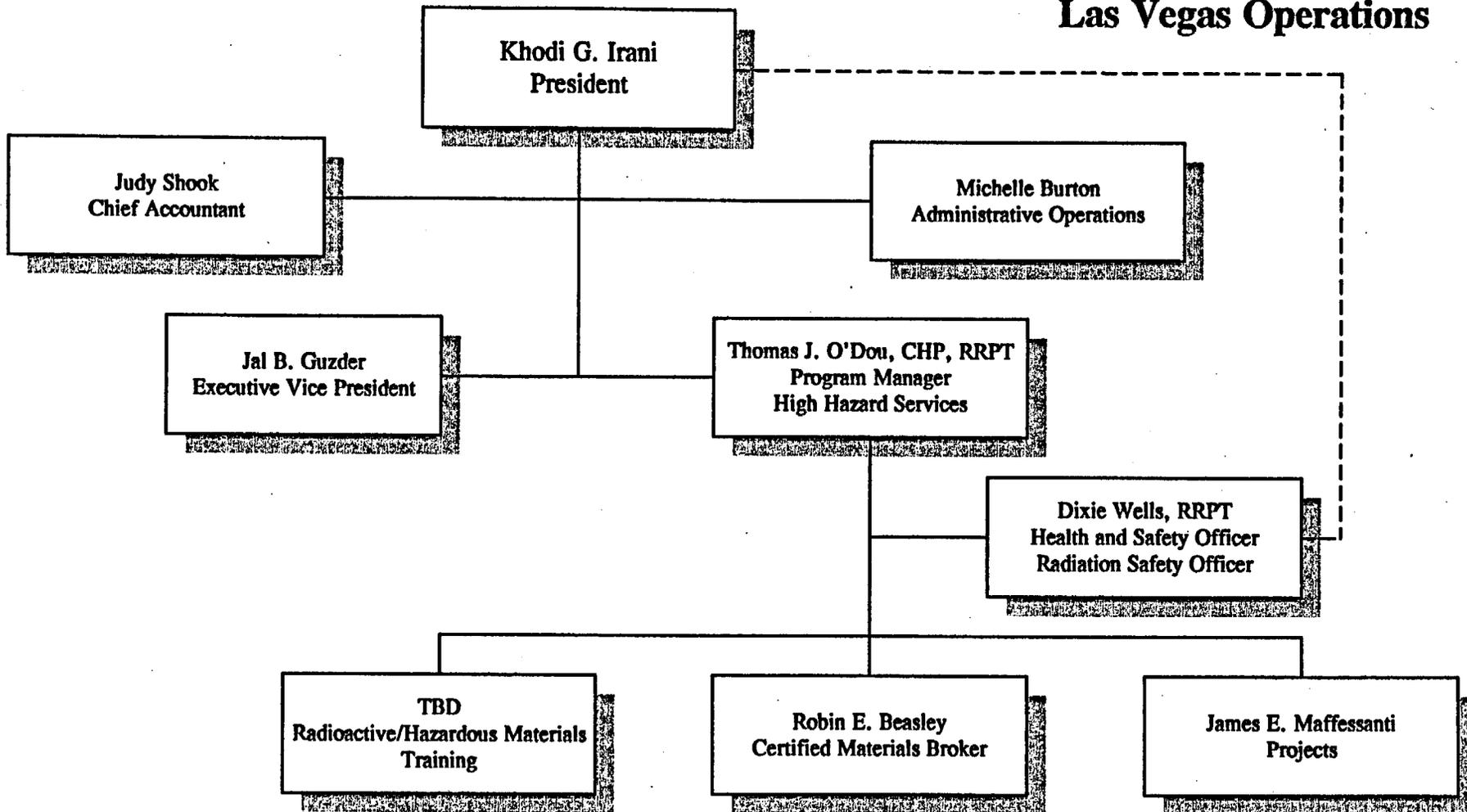


Figure 2

Revision 0

Approved/Date:

Sept 10 '99 *Khodi G. Irani*

T & E/RESUME
THOMAS O'DOU

TRAINING AND EXPERIENCE
AUTHORIZED USER OR RADIATION SAFETY OFFICER
(Use supplemental sheets if necessary)

1. **NAME OF APPLICANT:** Thomas J. O'Dou, CHP

2. **TRAINING RECEIVED IN BASIC RADIOISOTOPE HANDLING TECHNIQUES**

TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	FORMAL COURSE	ON THE JOB
a. Principles and practices of radiation protection	Lowell Technical Institute University of Lowell Portsmouth Naval Shipyard Davis-Besse Nuclear Power Station	4 Years 2 Years 10 Years 5 Years	B.S. RHP M.S. RSP	10 Years 5 Years
b. Radioactivity measurement standardization and monitoring techniques and instruments	Lowell Technical Institute University of Lowell Portsmouth Naval Shipyard Davis-Besse Nuclear Power Station	4 Years 2 Years 10 Years 5 Years	B.S. RHP M.S. RSP	10 Years 5 Years
c. Mathematics and calculations basic to the use and measurement of radioactivity	Lowell Technical Institute University of Lowell Portsmouth Naval Shipyard Davis-Besse Nuclear Power Station	4 Years 2 Years 10 Years 5 Years	B.S. RHP M.S. RSP	10 Years 5 Years
d. Biological effects of radiation	Lowell Technical Institute University of Lowell Portsmouth Naval Shipyard Davis-Besse Nuclear Power Station	4 Years 2 Years 10 Years 5 Years	B.S. RHP M.S. RSP	10 Years 5 Years

3. **EXPERIENCE WITH RADIATION (Actual use of radioisotopes)**

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
MFP	1500 Ci	Various Power Plants	15 Years	Radiation Protection
SNM	347 grams	ATG Richland & Yakima	3 Years	Corporate RSO
TRU	57 mCi	ATG Richland	1 Year	Corporate RSO
Tritium	200 Ci	Department of Defense	6 mo	Instructor/Consultant
⁶⁰ Co	150 Ci	Portsmouth Shipyard	10 Years	Radiation Protection
¹⁹² Ir	100 Ci	Portsmouth Shipyard	10 Years	Radiation Protection

4. **RESUME WITH RADIATION WORK EXPERIENCE**

DATES OF EMPLOYMENT	EMPLOYER / ADDRESS	JOB TITLE / DUTIES
August 1999 to Present	MKM Engineers, Inc, 6461 Plumcrest Rd. Las Vegas, NV 89108	Program Manager/Corporate Health Physicist

4. RESUME WITH RADIATION WORK EXPERIENCE

DATES OF EMPLOYMENT	EMPLOYER / ADDRESS	JOB TITLE / DUTIES
February 1998 to August 1999	Aguirre Engineering, Inc. 4820 Alpine Place C102 Las Vegas, NV 89107	Program Manager/Corporate Health Physicist
March 1996 to February 1998	Gutierrez-Palmenberg, Inc 333 North Rancho Drive Ste 580 Las Vegas, NV	Program Manager/Health Physicist/Corporate Radiation Safety Officer
October 1992 to March 1996	Allied Technology Group, Inc 99A Midway Lane Oak Ridge, TN	Health Physicist/Radiation Safety Officer for Field Operations
June 1987 to August 1992	Davis-Besse Nuclear Power Station 5501 N. State Route 2 Oak Harbor, OH	Health Physicist / Radiological Assessor
February 1977 to June 1987	Portsmouth Naval Shipyard Portsmouth, New Hampshire	Health Physicist
June 1975 to October 1975	Temple University Health Science Center	Assistant Health Physicist
October 1974	Cambridge Nuclear Radiopharmaceutical Billerica, MA	Assistant Manager of Health Physics
June 1974 to August 1974	Yankee Atomic Electric Company Yankee Rowe	Health Physics Technical Assistant
June 1973 to August 1973	Virginia Electric Power Company Surry Power Station	Health Physics Technical Assistant

TRAINING AND EXPERIENCE
AUTHORIZED USER OR RADIATION SAFETY OFFICER
(Use supplemental sheets if necessary)

1. NAME OF APPLICANT: Dixie J. Wells

2. TRAINING RECEIVED IN BASIC RADIOISOTOPE HANDLING TECHNIQUES

TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	FORMAL COURSE	ON THE JOB
a. Principles and practices of radiation protection	Ingalls Shipbuilding (Naval Nuclear)	2 Years	Yes	Yes
	Detroit Edison Company (Fermi 1 & 2)	11 Years	Yes	Yes
b. Radioactivity measurement standardization and monitoring techniques and instruments	Ingalls Shipbuilding (Naval Nuclear)	2 Years	Yes	Yes
	Detroit Edison Company (Fermi 1 & 2)	11 Years	Yes	Yes
c. Mathematics and calculations basic to the use and measurement of radioactivity	Ingalls Shipbuilding (Naval Nuclear)	2 Years	Yes	Yes
	Detroit Edison Company (Fermi 1 & 2)	11 Years	Yes	Yes
d. Biological effects of radiation	Ingalls Shipbuilding (Naval Nuclear)	2 Years	Yes	Yes
	Detroit Edison Company (Fermi 1 & 2)	11 Years	Yes	Yes

3. EXPERIENCE WITH RADIATION (Actual use of radioisotopes)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
MFP	2,000 Ci	Naval Rx's/Var. Power Plants	7 Years	Radiation Protection
SNM	347 grams	Fermi 1 & 2	2 Years	Rad Protection/RSO
TRU	57 mCi	ATG Richland & Yakima	1 Year	Rad Protection/RSO
¹⁹² Ir	75 Ci	ATG Richland	6 Months	Radiation Protection
⁹⁰ Sr	189,000 Ci	Duane Arnold Energy Ctr ATG Richland - RCF	1 Year	Rad Protection/RSO

4. RESUME OF RADIATION WORK EXPERIENCE

DATES OF EMPLOYMENT	EMPLOYER / ADDRESS	JOB TITLE / DUTIES
August 1999 to Present	MKM Engineering, Inc. 6461 Plumcrest Rd. Las Vegas, NV 89108	Radiation Safety Officer

4. RESUME OF RADIATION WORK EXPERIENCE

DATES OF EMPLOYMENT	EMPLOYER / ADDRESS	JOB TITLE / DUTIES
February 1998 to August 1999	Aguirre Engineering 4820 Alpine Place C102 Las Vegas, NV 89107	Radiation Safety Officer
March 1996 to February 1998	Gutierrez-Palmenberg, Inc 333 North Rancho Drive Ste 580 Las Vegas, NV 89106	Radiation Safety Officer
April 1994 to March 1996	Allied Technology Group, Inc. Richland, WA 99352	Radiation Safety Officer
April 1982 to September 1993	Detroit Edison Co. 6400 N. Dixie Highway Newport, MI	Radiological Assessor Internal Dosimetry Specialist Radiological Engineer
March 1980 to April 1982	NSSI Hershey, PA	Senior Technician Assistant Site Coordinator RP Instructor
January 1980 to March 1980	ARC @ DAEC Atlanta, GA	Senior Rad Pro Technician
72 to January 1980	Ingalls Shipbuilding	Rad Con Monitor

DISCUSSION
ITEMS 9 & 11

ITEMS 9 AND 11

INSTRUMENTATION DISCUSSION

A. INSTRUMENTATION/MAINTENANCE INFORMATION

Instrumentation used on projects for measurement of radiation and characterization of radioactive material and other hazardous materials is rented or leased from GTS or Teledyne Brown Engineering Services. These companies have been evaluated by MKM and provide instruments for which MKM has procedures.

The instruments are maintained with calibration traceable to the National Institute of Standards and Technology, and they are well maintained by the manufacturer and the lessor.

A list of the instruments which MKM has leased or may be provided to MKM for use on projects is provided as Table 1. These instruments may be used in any of the four categories, Decommissioning, Transportation /Brokering, and/or Processing and Disposal.

TABLE 1					
Instrumentation for the Measurement/Characterization of Radioactive and Mixed Materials					
Instrument	Model Number	Serial Number	Date Calibrated	Manufacturer	Owner/ Lessor
Rate Meter	3	92104	2-15-96	Ludlum	GTS
GM Probe	44-9	094811	2-15-96	Ludlum	GTS
uR Meter	19	115870	2-15-96	Ludlum	GTS
Ion Chamber	RO-2	3729	3-19-96	Eberline	GTS
Ion Chamber	9	127138	5-17-96	Ludlum	GTS
Gas Proportional Counter	This is a portable gas flow counter rental instrument NIST calibrated prior to rental.				Teledyne Brown
External NaI Crystal	This is a portable sodium iodide detector with ratemeter NIST calibrated prior to rental.				Teledyne Brown
Pressurized Ion Chamber	This is a self contained PIC with calibration traceable to NIST for low dose rate measurement				Teledyne Brown
Portable MCA with NaI	This is a portable MCA with sodium iodide detector NIST calibrated prior to use.				Teledyne Brown
Portable MCA with GeLi	This is a portable MCA with high resolution GeLi detector or intrinsic Ge detector calibrated prior to use.				Teledyne Brown

TABLE 1**Instrumentation for the Measurement/Characterization of Radioactive and Mixed Materials**

Instrument	Model Number	Serial Number	Date Calibrated	Manufacturer	Owner/Lessor
Micro-Rem	Micro Analyst	7751	**	Bicron	GTS
Alpha Detector	PAC-4G	1512	**	Eberline	GTS
Neutron Detector	PNR-4	4485	**	Eberline	GTS
GM Detector	E-520	155	**	Eberline	GTS
Multiple Detector	ESP-1	879	**	Eberline	GTS
NaI Detector	PRM-6	1542	**	Eberline	GTS
Rascal	RAS-1	0186	**	Eberline	GTS
Frisker	RM-14	7751	**	Eberline	GTS
Ion Chamber	RO-2	901	**	Eberline	GTS
GM Detector	3	37127	**	Ludlum	GTS
GM Detector	12	12287	**	Ludlum	GTS
NaI Analyzer	18	30717	**	Ludlum	GTS
Alarm Ratemeter	177	113645	**	Ludlum	GTS
Scaler SCA	2200	92416	**	Ludlum	GTS
Portable SCA	2221	94954	**	Ludlum	GTS
Alpha/Beta Scaler	2929	95575	**	Ludlum	GTS
Air Sampler	HV-1	1515	**	Ludlum	GTS
Air Sampler	TF-1A	17695N	**	Staplex	GTS

Table 1 Notes:

* = currently leased by MKM

** = calibrated when needed for lease

Other instruments with NIST calibration may be used as needed to support the contract specifications and scope.

B. LABORATORY FACILITIES DOCUMENTATION

Laboratory support for IOC projects is provided by a number of possible laboratories in order for MKM to provide the most accurate, expeditious, and cost effective analyses for our clients. A complete description of the services available through subcontractors is provided. Table 2 provides the name of each laboratory contractor which will be used to provide analytical services. These laboratories provide services and have certifications which could enable their services to be used for both Characterization/Verification and Decontamination/Decommissioning analysis work.

Table 2 Laboratory Analytical Services Companies which may be used on Decontamination and Decommissioning Projects			
Name	Location	Services	Contact
Duke Engineering Lab	Westborough MA	Analysis of Samples Including: Alpha and Beta Counting Specific Radium Analysis Specific Uranium Analysis I-125, I-131 in milk or other media Gamma Spectroscopy Alpha Spectroscopy H-3, P-32, Fe-55, Ni-63, Sr-89/90 C-14, Tc-99, Pu-241, Pb-210 Rn-222 in water Pu, Th, Am, or Cm by Alpha Spec	Contact: Ed Moreno 580 Main Street Bolton, MA 01740- 1398 Phone: 508-779-6711 Fax: 508-568-3700

Table 2
Laboratory Analytical Services Companies which may be used on
Decontamination and Decommissioning Projects

Name	Location	Services	Contact
General Engineering Labs	Charleston, SC	<p>Analysis of Samples Including: Low level radiochemical and mixed waste preparation and analysis. Types of analysis include: Alpha spectrometry Gas Proportional Counting Liquid Scintillation Counting Lucas Cell Analysis Laser Kinetic Phosphorescence Gamma Spectrometry Inorganic analysis including digestion, extraction and general preparation of inorganic samples. RCRA sample characterization, TCLP extraction, metals analysis by Atomic Absorption, mercury analyzer, and ICP/MS. Ion Chromatography and wet chemistry services.</p>	<p>Nancy A. Slater 2040 Savage Road Charleston, SC 29407 Phone: 803-556-8171 Fax: 803-766-1178</p>
Barringer Labs	Golden, CO	<p>Analysis of Samples including: Gross Alpha Counting Non-volatile Beta counting Total Radium (Gas Flow Prop) Radium Emanation - Gamma Spec Ra-228 gas flow prop/gamma spec C-14, H-3, Tc-99 liquid scintillation Alpha Spectroscopy Total Uranium TCLP, CCW, CCWE, RCRA, BTEX, GC/MS, D-list, GC Fingerprint, TPH by API/EPA Protocol, PAN</p>	<p>Steve Lazar 15000 W. 6th Ave. #300 Golden, CO 80401 84119 Phone: 800-654-0506 Fax: 303-277-1689</p>

C. TRANSPORTATION DOCUMENTATION

MKM does not own or lease transportation vehicles for movement of radioactive or hazardous materials. AEI relies solely on experienced subcontractors for radioactive and hazardous material transportation support. The subcontractors are evaluated in accordance with MKM's Quality Control Plan.

MKM relies on several qualified carriers for transportation of radioactive and hazardous materials. Each of the listed carriers has been in the business of transporting hazardous materials for many years and has a demonstrated excellent safety record.

Company	DOT ID	ICCMC	EPA ID
Tri-State Motor 800-568-1821	060396018005E/	MC-09397	MOD09503998
Thomas Gray & Assoc 800-318-7803	051496003011E/	MC-264886	CAD066151648
Environmental Transport 800-826-0047	061595005033D/	MC-172874	OKD981605363
R & R Trucking 800-625-6885	00150208/CR 382936	MC-182583	MOR000012948

The audited transportation support used is appropriate for Transportation/Brokering and Processing/Disposal of radioactive or hazardous materials.

WASTE MANAGEMENT

D. WASTE PROCESSING EQUIPMENT DOCUMENTATION

At the current time, MKM does not possess waste processing equipment for radioactive waste. Our own processing is limited to segregation and repackaging of the waste at a customer's facility or transfer to a subcontractor facility for further processing such as decontamination, drum crushing, cutting of metals, metal melting, or incineration of combustible materials. MKM contracts with such companies as Allied Technology Group, Scientific Ecology Group, Waste Control Specialist, or Envirocare, etc. as needed for processing services.

ALARA Program

MKM Engineers, Inc.

September 1, 1999

1. Management Commitment

- a. We, the management of MKM Engineers, Inc. (MKM), are committed to the program described herein for keeping individual and collective doses as low as reasonably achievable (ALARA). In accord with this commitment, we hereby describe an administrative organization for radiation safety and will develop the necessary written policy, procedures, and instructions to foster the ALARA concept within our organization. The organization will include a Radiation Safety Committee (RSC) and a Radiation Safety Officer (RSO).
- b. We will perform a formal annual review of the radiation safety program, including ALARA considerations. This will include reviews of operating procedures and past dose records, inspections, etc., and consultations with the radiation safety staff or outside consultants.
- c. Modifications to operating and maintenance procedures and to equipment will be made if they will reduce exposures unless the cost, in our judgement, is considered to be unjustified. We will be able to demonstrate, if necessary, that improvements have been sought, that modifications have been considered, and that they have been implemented when reasonable. If modifications have been recommended but not implemented, we will be prepared to describe the reasons for not implementing them.
- d. In addition to maintaining doses to individuals as far below the limits as is reasonably achievable, the sum of the doses received by all exposed individuals will also be maintained at the lowest practicable level. It would not be desirable, for example, to hold the highest doses to individuals to some fraction of the applicable limit if this involved exposing additional people and significantly increasing the sum of radiation doses received by all involved individuals.

2. Radiation Safety Committee

a. Review of Operations

- (1) The RSC will thoroughly review operations with respect to types and quantities of materials and methods of use to ensure that appropriate measures have been taken to maintain exposure ALARA.
- (2) The RSC will ensure through their procedures that operations will maintain individual and collective doses ALARA.

b. Delegation of Authority

- (1) The RSC will delegate authority to the RSO for enforcement of the ALARA concept.
- (2) The RSC will support the RSO when it is necessary for the RSO to assert authority. If the RSC has overruled the RSO, it will record the basis for its action in the minutes of the quarterly meeting.

c. Review of ALARA Program

- (1) The RSC will encourage the review of current procedures and the development of new procedures, as appropriate, to implement the ALARA concept.
- (2) The RSC will perform a quarterly review of occupational radiation exposure with particular attention to instances in which the investigational levels in Table 1 are exceeded. The principal purpose of this review is to assess trends in occupational exposure as an index of the ALARA program quality and to decide if action is warranted when investigational levels are exceeded.

Table 1

Investigational Levels

	Investigational Levels (mrems per calendar quarter)	
	Level I	Level II
1. Whole body; head and trunk; active blood-forming organs; lens of eyes; or gonads	125	375
2. Hands and forearms; feet and ankles	1875	5625
3. Skin of whole body	750	2250

- (3) The RSC will evaluate MKMs overall efforts for maintaining doses ALARA on an annual basis. This review will include the efforts of the RSO, operations, and workers as well as those of management.

3. Radiation Safety Officer

a. Annual and Quarterly Review

- (1) Annual review of the radiation safety program. The RSO will perform an annual review of the radiation safety program for adherence to ALARA concepts. Reviews of specific methods of operation may be conducted on a more frequent basis.

- (2) Quarterly review of occupational exposures. The RSO will review at least quarterly the external radiation doses of all badged individuals to determine that their doses are ALARA in accordance with the provisions of this program and will prepare a summary report for the RSC.
- (3) Quarterly review of records of radiation surveys. The RSO will review radiation surveys in unrestricted and restricted areas to determine that dose rates and amounts of contamination were at ALARA levels during the previous quarter and will prepare a summary report for the RSC.

b. Education Responsibilities for ALARA Program

- (1) The RSO will schedule briefings and educational sessions to inform workers of ALARA program efforts.
- (2) The RSO will ensure that operations, workers, and ancillary personnel who may be exposed to radiation will be instructed in the ALARA philosophy and informed that management, the RSC, and the RSO are committed to implementing the ALARA concept.

c. Cooperative Efforts for Development of ALARA Procedures

Radiation workers will be given opportunities to participate in formulating the procedures that they will be required to follow.

- (1) The RSO will be in close contact with all users and workers in order to develop ALARA procedures for working with radioactive materials.
- (2) The RSO will establish procedures for receiving and evaluating the suggestions of individual workers for improving health physics practices and will encourage the use of those procedures.

d. Reviewing Instances of Deviation from Good ALARA Practices

The RSO will investigate all known instances of deviation from good ALARA practices and, if possible, will determine the causes. When the cause is known, the RSO will implement changes in the program to maintain doses ALARA.

4. Authorized Operations

a. New Operations Involving Potential Radiation Doses

- (1) Project Managers will consult with the RSO and/or RSC during the planning stage before using radioactive materials in any new method.
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b. Project Management Responsibility to Supervised Individuals

- (1) Project Managers will explain application of the ALARA concept as used on a particular project, and the need to maintain exposures ALARA to all supervised individuals.**
- (2) Project Managers and the RSO will ensure that supervised individuals who are subject to occupational radiation exposure are trained and educated in good health physics practices and in maintaining exposures ALARA.**

5. Individuals Who Receive Occupational Radiation Doses

- a. Workers will be instructed in the ALARA concept and its relationship to work procedures and work conditions.**
- b. Workers will be instructed in the recourses available if they feel that ALARA is not being promoted on the job.**

6. Establishment of Investigational Levels in Order to Monitor Individual Occupational External Radiation Doses

MKM hereby establishes investigational levels for occupational external radiation doses which, when exceeded, will initiate review or investigation by the RSC and/or the RSO. The investigational levels that we have adopted are listed in Table 1. These levels apply to the exposure of individual workers.

The RSO will review and record on Form NRC-5, "Current Occupational External Radiation Exposures," or an equivalent form (e.g., dosimeter processor's report) results of personnel monitoring not less than once in any calendar quarter as required by 20.2206 of 10 CFR Part 20. The following actions will be taken at the investigational levels as stated in Table 1:

- a. Personnel dose less than Investigational Level I.**

Except when deemed appropriate by the RSO, no further action will be taken in those cases where an individual's dose is less than Table 1 values for Investigational Level I.

- b. Personnel dose equal to or greater than Investigational Level I but less than Investigational Level II.**

The RSO will review the dose of each individual whose quarterly dose equals or exceeds Investigational Level I and will report the results of the reviews at the first RSC meeting following the quarter when the dose was recorded. If the dose does not equal or exceed Investigational Level II, no action related specifically to the exposure is required unless deemed appropriate by the Committee. The Committee will, however, review each such dose in comparison with those of others performing similar tasks as an index of ALARA program quality and will record the review in the

Committee minutes.

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The RSO will investigate in a timely manner the causes of all personnel doses equaling or exceeding Investigational Level II and, if warranted, will take action. A report of the investigation, any actions taken, and a copy of the individual's Form NRC-5 or its' equivalent will be presented to the RSC at its' first meeting following completion of the investigation. The details of these reports will be included in the RSC minutes.

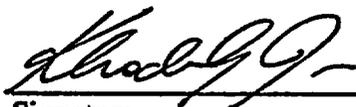
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In cases where a worker's or a group of workers' doses need to exceed an investigational level, a new, higher investigational level may be established for that individual or group on the basis that it is consistent with good ALARA practices. Justification for new investigational levels will be documented.

The RSC will review the justification for and must approve or disapprove all revisions of investigational levels.

7. **Signature of Certifying Official**

I hereby certify that MKM has implemented the ALARA Program set forth above.



Signature

Khodi G. Irani

Name (print or type)

President, MKM Engineers, Inc.

Title

ALARA COMMITMENT
MKM VICE PRESIDENT

ALARA Program

MKM Engineers, Inc.

September 1, 1999

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The RSO will investigate in a timely manner the causes of all personnel doses equaling or exceeding Investigational Level II and, if warranted, will take action. A report of the investigation, any actions taken, and a copy of the individual's Form NRC-5 or its' equivalent will be presented to the RSC at its' first meeting following completion of the investigation. The details of these reports will be included in the RSC minutes.

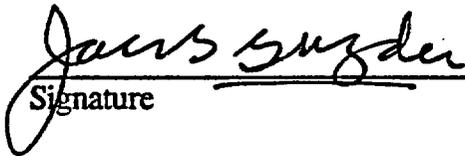
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The RSC will review the justification for and must approve or disapprove all revisions of investigational levels.

7. Signature of Certifying Official

I hereby certify that MKM has implemented the ALARA Program set forth above.


Signature

Jal Guzder
Name (print or type)

Vice-President, MKM Engineers, Inc.
Title

APPENDIX F

RADIATION SAFETY OFFICER CERTIFICATION

We certify that the individual to be named on this license to perform the function of Radiation Safety Officer:

1. Has read and understands the NRC regulations applicable to this license and the specific conditions in the license,
2. Has sufficient technical knowledge to perform the duties of a Radiation Safety Officer,
3. Has and will continue to have sufficient time to perform the duties of the Radiation Safety Officer,
4. Has and will continue to get sufficient resources to accomplish the tasks of the Radiation Safety Officer,
5. Is completely willing to perform the functions of the Radiation Safety Officer, and
6. Has and will continue to receive the support of the management of this license in ensuring that all licensed activities will be conducted in accordance with NRC regulations and the specific terms of the license.

Radiation Safety Officer Applicant

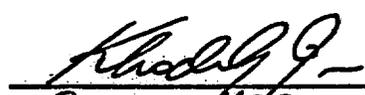
Date



1 September 1999

Corporate Officer/Certifying Official

Date



Sept 10 '99

APPENDIX F
LV PROGRAM MGR

APPENDIX F

RADIATION SAFETY OFFICER CERTIFICATION

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6. Has and will continue to receive the support of the management of this license in ensuring that all licensed activities will be conducted in accordance with NRC regulations and the specific terms of the license.

Radiation Safety Officer Applicant

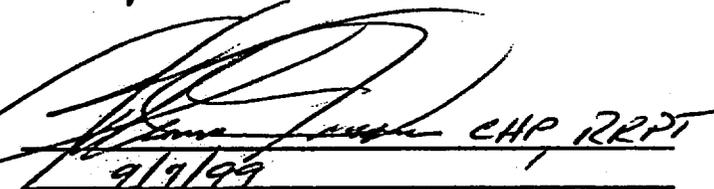
Date



1 September 1999

Corporate Officer/Certifying Official

Date

 CHP RRPT

9/9/99

APPENDIX H

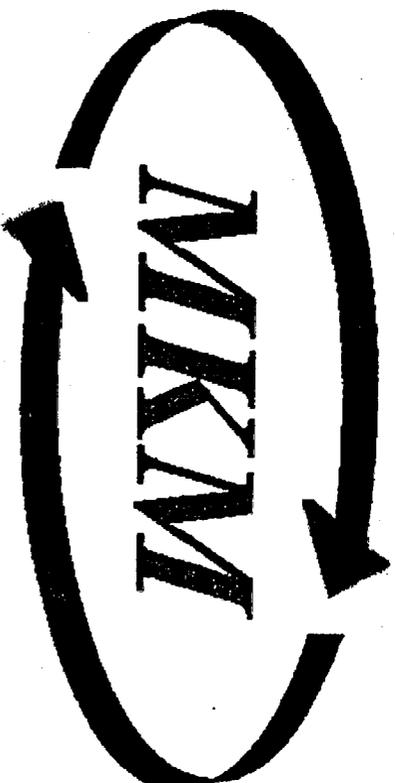
DUTIES AND RESPONSIBILITIES OF A BROAD SCOPE SAFETY OFFICER

1. **Maintain surveillance of overall activities involving radioactive material, including monitoring and surveys of all areas in which radioactive material is used.**
2. **Determine compliance with rules and regulations, license conditions, and the conditions of project approvals authorized by the Radiation Safety Committee.**
3. **Monitor and maintain absolute and other special filter systems associated with the use, storage, or disposal of radioactive material.**
4. **Provide necessary information on all aspects of radiation protection to personnel at all levels of responsibility, pursuant to 10 CFR 19.12, 10 CFR Part 20, and 10 CFR Part 35 (if applicable).**
5. **Oversee proper delivery, receipt, and conduct of radiation surveys of all shipments of radioactive material arriving at or leaving from the institution, as well as packaging and labeling all radioactive material leaving the institution.**
6. **Distribute and process personnel radiation monitoring equipment, determine the need for and evaluate bioassays, monitor personnel radiation exposure and bioassay records for trends and high exposures, notify individuals and their supervisors of radiation exposures approaching maximum permissible amounts, and recommend appropriate remedial action.**
7. **Conduct training programs and otherwise instruct personnel in the proper procedures for the use of radioactive material prior to use, at periodic intervals (refresher training), and as required by changes in procedures, equipment, regulations, etc.**

8. Supervise and coordinate the radioactive waste disposal program, including effluent monitoring and recordkeeping on waste storage and disposal records.
9. Store radioactive materials not in current use, including wastes.
10. Perform or arrange for leak tests on all sealed sources and calibration of radiation survey instruments.
11. Maintain an inventory of all radioisotopes at the institution and limit the quantity of radionuclides at the institution to the amounts authorized by the license.
12. Immediately terminate any activity that is found to be a threat to public health and safety or property.
13. Supervise decontamination and recovery operations.
14. Maintain other records not specifically designated above, for example, records on receipts, transfers, and surveys as required by 10 CFR 30.51, "Records," and Subpart L, "Records," of 10 CFR Part 20.¹
15. Hold periodic meetings with and provide reports to licensee management and the Radiation Safety Committee.

Note: If this request is for a medical broad scope license, the description of the RSO's duties and responsibilities must include the requirements of 10 CFR 35.22

¹See NUREG-1450, "Guide to NRC Reporting and Recordkeeping Requirements" (USNRC, November 1992), which provides information on compliance with the requirements specified in Title 10 of the Code of Federal Regulations. Copies are available for inspection or copying for a fee from the NRC Public Document Room at 2120 L Street NW., Washington, DC: the PDR's mailing address in Mail Stop LL-6, Washington, DC 20555; telephone (202) 634-3273; fax (202) 634-3343. Copies may be purchased at current rates from the U.S. Government Printing Office, Mail Stop SSOP, Washington, DC 20402-9328 (telephone (202) 512-2249 or (202) 512-2409); or from the National Technical Information Service by writing NTIS at 5285 Port Royal Road, Springfield, VA 22161.



MKM ENGINEERS

Radiation Worker Training

Outline

**"EDUCATION IS THE KEY THAT UNLOCKS THE
BOOK OF KNOWLEDGE"**

MKM ENGINEERS - 1999

RADIATION WORKER TRAINING INSTRUCTOR OUTLINE

Objective Number	Learning Objective	Supporting Information
N/A	Course Introduction. Provide brief introduction and description of instructor qualifications. Ensure students have name tents, pens, course handouts, and other supporting material as appropriate. Mention logistics such as breaks, bathrooms, exits, refreshments.	Viewgraph 1.0 - MKM Introduction slide with site specific logistics. Handout: Class Schedule and Table of Contents
LO-1	Upon completion of this lesson, the participant will be able to IDENTIFY the fundamentals of radiation, radioactive material and radioactive contamination.	Viewgraph 2.0 - Radiological Fundamentals Learning Objective.
EO-1	IDENTIFY the three basic parts of an atom.	Viewgraph 3.0 - Bohr Model of atom. Viewgraph 4.0 - Definition of Proton. Viewgraph 5.0 - Definition of Neutron. Viewgraph 6.0 - Definition of Electron.
EO-2	DEFINE radioactive material, radioactivity, and radioactive half life.	Viewgraph 7.0 - Definition of Radioactive Material. Viewgraph 7.1 - Graphic depicting unstable atoms emitting energy particles. Viewgraph 8.0 - Definition of Radioactivity. Viewgraph 8.1 - Graphic depicting measurement of radioactivity. Viewgraph 9.0 - Definition of Radioactive Half Life. Viewgraph 9.1 - Table depicting number of half lives and percent of remaining activity.

RADIATION WORKER TRAINING INSTRUCTOR OUTLINE

Objective Number	Learning Objective	Supporting Information
EO-4	DEFINE radiation.	Viewgraph 10.0 -Definition of radiation. Viewgraph 11.0 - Graphic depicting energy emitted as waves or as particles.
EO-5	DEFINE ionization and ionizing radiation.	Viewgraph 12.0 - Definition of ionization. Viewgraph 13.0 - Definition of ionizing radiation. Viewgraph 14.0 -Graphic depicting energy separating electrons from atoms.
EO-6	STATE the four basic types of ionizing radiation.	Viewgraph 15.0 - Graphic depicting alpha particle and defining properties. Viewgraph 16.0 - Graphic depicting beta particle and defining properties. Viewgraph 17.0 - Graphic depicting gamma rays and x-rays and their defining properties.
EO-7	DISTINGUISH between ionizing and non-ionizing radiation.	Viewgraph 18.0 - Definition of non-ionizing radiation.
EO-8	IDENTIFY the following for each of the four types of ionizing radiation: a. Physical characteristics. b. Range and Shielding. c. Biological Hazards.	Viewgraph 19.0 - Table depicting types of ionizing radiation and properties, hazards, and sources.
EO-9	IDENTIFY the units used to measure radiation (dose, dose rate, rem, mrem, TEDE)	Viewgraph 20.0 - Definition of dose and dose rate. Viewgraph 21.0 - Definition of rem, mrem, and TEDE.

RADIATION WORKER TRAINING INSTRUCTOR OUTLINE

Objective Number	Learning Objective	Supporting Information
LO-1 REVIEW	IDENTIFY the fundamentals of radiation, radioactive material and radioactive contamination.	Viewgraph 2.0 - Radiological Fundamentals Learning Objective.
LO-2	Upon completion of this lesson, the participant will be able to IDENTIFY the biological effects of ionizing radiation, its associated risks and benefits.	Viewgraph 22.0 - Biological Effects of Ionizing Radiation Learning Objective. Viewgraph 23.0 - Four groups of people studied to determine effects of radiation.
EO-1	IDENTIFY the major sources of natural background and man-made radiation.	Viewgraph 24.0 - Categories of radiation - doses to general public and occupational doses. Viewgraph 25.0 - Sources of background radiation: radon gas, cosmic, terrestrial, and internal. Viewgraph 26.0 - Sources of man-made radiation: medical/dental, consumer products, and other (includes fallout).
EO-2	IDENTIFY the average annual dose to the general population from natural background and manmade sources.	Viewgraph 27.0 - Viewgraph of pie chart depicting Natural and Man-Made Radiation Sources.

RADIATION WORKER TRAINING INSTRUCTOR OUTLINE

Objective Number	Learning Objective	Supporting Information
EO-3	STATE the methods by which radiation causes damage to cells.	Viewgraph 28.0 - Graphic depicting radiation interacting with vital part of cell. Viewgraph 29.0 - Graphic depicting radiation interacting indirectly with cell by the formation of toxic substances within cell.
EO-4	IDENTIFY possible effects of radiation on cells.	Viewgraph 30.0 - Graphic depicting four possible effects of radiation on cells: cell undamaged by radiation; cell injured, but damage repaired; cell injured but unable to repair damage; and cell injured severely and killed.
EO-5	DEFINE the terms "Acute Dose" and "Chronic Dose."	Viewgraph 31.0 - Definition of acute dose. Viewgraph 32.0 - Definition of chronic dose.
EO-6	STATE examples of chronic radiation dose.	Viewgraph 33.0 - List of examples of chronic radiation dose.
EO-7	DEFINE the terms "somatic effect" and "genetic effect."	Viewgraph 34.0 - Definition of somatic effect. Viewgraph 35.0 - Definition of genetic effect.
EO-8	STATE the potential effects associated with prenatal radiation doses.	Viewgraph 36.0 - Definition of teratogenic effect. Viewgraph 37.0 - List of factors that may cause teratogenic effect.

RADIATION WORKER TRAINING INSTRUCTOR OUTLINE

Objective Number	Learning Objective	Supporting Information
EO-9	COMPARE the biological risks from chronic radiation doses to health risks workers are subjected to in industry and daily life.	Viewgraph 38.0 - Comparison of Mortality Rates. Viewgraph 39.0 - Relative Occupational Death Rates. Viewgraph 40.0 - Relative Workplace Death Rates. Viewgraph 41.0 - Benefits of Radiation.
REVIEW LO-2	Upon completion of this lesson, the participant will be able to IDENTIFY the biological effects of ionizing radiation, its associated risks and benefits.	Viewgraph 22.0 - Biological Effects of Ionizing Radiation Learning Objective.
LO-3	Upon completion of this lesson, the participant will be able to IDENTIFY restrictions regarding dose limits and administrative control level.	Viewgraph 42.0 - Radiation Dose Limits Learning Objective.
EO-1	STATE the purpose for radiation dose limits.	Viewgraph 43.0 - Purpose of dose limits and agencies that establish them.
EO-2	STATE the occupational dose limits.	Viewgraph 44.0 - Table depicting NRC and DOE occupational dose limits.
EO-3	STATE MKM's administrative radiation dose level.	Viewgraph 45.0 - Explanation of MKM's administrative dose level.
EO-4	STATE the radiation dose limits for members of the general public.	Viewgraph 46.0 - Explanation of dose limits for general public.

RADIATION WORKER TRAINING INSTRUCTOR OUTLINE

Objective Number	Learning Objective	Supporting Information
EO-5	RECOGNIZE the definition of Planned Special Exposure.	Viewgraph 47.0 - Definition of PSE. Emphasize that MKM does not anticipate that a PSE will be used in any of the work performed by the company or its workers.
EO-6	STATE the MKM policy concerning prenatal radiation dose.	Viewgraph 48.0 - Definition of "declared pregnant worker." Viewgraph 49.0 - MKM's policy statement concerning prenatal radiation dose. Viewgraph 50.0 - Extract from Reg. Guide 8.13 regarding prenatal exposures. Handout - Reg. Guide 8.13
REVIEW LO-3	Upon completion of this lesson, the participant will be able to IDENTIFY restrictions regarding dose limits and administrative control level.	Viewgraph 42.0 - Radiation Dose Limits Learning Objective.
LO-4	Upon completion of this lesson, the participant will be able to EXPLAIN the methods used to implement MKM's ALARA program.	Viewgraph 51.0 - ALARA Program Learning Objective.
EO-1	STATE the purpose of the ALARA concept.	Viewgraph 52.0 - Explanation of purpose of ALARA concept.
EO-2	STATE the MKM management policy for the ALARA Program.	Viewgraph 53.0 - Explanation of four components of MKM policy on ALARA: controlling doses, ensuring adequate risk/benefit analysis, preventing unnecessary exposures, protecting environment.

RADIATION WORKER TRAINING INSTRUCTOR OUTLINE

Objective Number	Learning Objective	Supporting Information
EO-3	IDENTIFY both management and individual responsibilities regarding ALARA program.	Viewgraph 54.0 - Management responsibilities. Viewgraph 55.0 - Individual responsibilities.
EO-4	IDENTIFY the basic protective measures of time, distance shielding.	Viewgraph 56.0 - List of keys to minimizing time of exposure to radiation. Viewgraph 57.0 - List of keys to maximize distance from radiation source. Viewgraph 58.0 - List of keys to using shielding to lower dose rate.
EO-5	IDENTIFY the worker's responsibilities concerning dose limits.	Viewgraph 59.0 - List of individual's responsibilities concerning dose limits.
EO-6	DESCRIBE the actions a worker should take if he or she suspects that dose limits are being approached or exceeded.	Viewgraph 60.0 - List of steps workers should follow.
EO-7	IDENTIFY the purpose of interlock and alarm systems.	Viewgraph 61.0 - Example of engineering solutions that support ALARA concept.
REVIEW LO-4	Upon completion of this lesson, the participant will be able to EXPLAIN the methods used to implement MKM's ALARA program.	Viewgraph 51.0 - ALARA Program Learning Objective.
LO-5	Upon completion of this lesson, the participant will be able to DESCRIBE the personnel monitoring programs used in terms of purpose, types, and worker responsibilities.	Viewgraph 62.0 - Personnel Monitoring Programs Learning Objective.

RADIATION WORKER TRAINING INSTRUCTOR OUTLINE

Objective Number	Learning Objective	Supporting Information
EO-1	STATE the purpose of each of the personnel dosimeter devices used at MKM.	Viewgraph 63.0 - Purpose of Dosimetry. Viewgraph 64.0 - Thermoluminescent Dosimeters and MKM dosimetry program requirements. Viewgraph 65.0 - Self-Reading Dosimeters. Viewgraph 66.0 - Finger Ring TLD.
EO-2	IDENTIFY the correct use of each of the personnel dosimeter devices used.	Viewgraph 67.0 - Correct use of dosimetry devices.
EO-3	STATE the method for obtaining dose records.	Viewgraph 68.0 - Proper channel for requesting individual dose records.
EO-4	IDENTIFY worker responsibilities for reporting radiation dose received from other sites and from medical applications.	Viewgraph 69.0 - Types of occupational dose information that must be reported to supervisor or radiation safety officer. Viewgraph 70.0 - Types of nonoccupational dose information (medical treatment) that should be reported to supervisor or radiation safety officer.
REVIEW LO-5	Upon completion of this lesson, the participant will be able to DESCRIBE the personnel monitoring programs used in terms of purpose, types, and worker responsibilities.	Viewgraph 62.0 - Personnel Monitoring Programs Learning Objective.

RADIATION WORKER TRAINING INSTRUCTOR OUTLINE

Objective Number	Learning Objective	Supporting Information
LO-6	Upon completion of this lesson, the participant will be able to IDENTIFY types of radioactive material and DESCRIBE methods used to control the spread of radioactive contamination.	Viewgraph 71.0 - Radioactive Material Controls Learning Objective.
EO-1	DEFINE activated material, sealed sources, unsealed (dispersible) sources and radioactive contamination.	Viewgraph 72.0 - Definition of activated material. Viewgraph 73.0 - Definition of sealed sources. Viewgraph 74.0 - Definition of unsealed sources. Viewgraph 75.0 - Definition of radioactive contamination.
EO-2	DEFINE fixed, removable, and airborne contamination.	Viewgraph 76.0 - Definition of fixed contamination. Viewgraph 77.0 - Definition of removable contamination. Viewgraph 78.0 - Definition of airborne contamination.
EO-3	STATE the pathways radioactive material can enter the body.	Viewgraph 79.0 - Graphic depicting human body with pathways indicated.
EO-4	IDENTIFY the methods used to minimize internal radiation dose.	Viewgraph 80.0 - List of methods used to reduce internal radiation dose.
EO-5	STATE the purpose of internal monitoring.	Viewgraph 81.0 - Description of purpose of bioassay and whole body counting.
EO-6	IDENTIFY worker responsibilities concerning internal monitoring programs.	Viewgraph 82.0 - List of worker responsibilities to support internal monitoring.

RADIATION WORKER TRAINING INSTRUCTOR OUTLINE

Objective Number	Learning Objective	Supporting Information
EO-7	DESCRIBE the purpose and use of personnel contamination monitors.	Viewgraph 83.0 - Purpose of self monitoring (frisking) procedure. Viewgraph 84.0 - Steps taken to perform personnel monitoring.
EO-8	STATE the appropriate response to personnel contamination monitor alarms.	Viewgraph 85.0 - Explanation depicting notification of HP Technicians or supervisor.
REVIEW LO-6	Upon completion of this lesson, the participant will be able to IDENTIFY types of radioactive material and DESCRIBE methods used to control the spread of radioactive contamination.	Viewgraph 71.0 - Radioactive Material Controls Learning Objective.
LO-7	Upon completion of this lesson, the participant will be able to DESCRIBE radiological postings, General and Job-Specific Radiological Work Permits.	Viewgraph 86.0 - Radiological Postings and Controls Learning Objective.
EO-1	IDENTIFY the colors and symbols used on radiological postings, signs, and labels.	Viewgraph 87.0 - Graphic depicting various radiological postings, signs, and labels.
EO-2	STATE the radiological and administrative consequences of disregarding or unauthorized removal of radiological postings, signs, and labels.	Viewgraph 88.0 - List of consequences of disregarding or removing radiological postings, signs, or labels.

RADIATION WORKER TRAINING INSTRUCTOR OUTLINE

Objective Number	Learning Objective	Supporting Information
EO-3	<p>DEFINE Restricted, Radioactive Material, Radiation, Radiological Contaminated, High Radiation, Very High Radiation, and Airborne Radioactivity Areas.</p>	<p>Viewgraph 89.0 - Definition of Restricted Area. Viewgraph 90.0 - Definition of Radioactive Material Area. Viewgraph 91.0 - Definition of Radiation Area. Viewgraph 92.0 - Definition of Radiological Contaminated Area. Viewgraph 93.0 - Definition of High Radiation Area. Viewgraph 94.0 - Definition of Very High Radiation Area. Viewgraph 95.0 - Definition of Airborne Radioactivity Area.</p>
EO-4	<p>STATE the entry, working in, and exiting requirements for Restricted Areas, Radioactive Material Areas, Radiation Areas, and Radiological Contaminated Areas.</p>	<p>Viewgraph 96.0 - List of requirements for Restricted Areas. Viewgraph 97.0 - List of requirements for Radioactive Materials Areas. Viewgraph 98.0 - List of requirements for Radiation Areas. Viewgraph 99.0 - List of requirements for Radiological Contaminated Areas.</p>
EO-5	<p>IDENTIFY the radiological areas that a Radiological Worker may enter, and the postings for each area.</p>	<p>Viewgraph 100.0 - Graphic depicting appropriate radiological postings that a radiological worker encounter.</p>

RADIATION WORKER TRAINING INSTRUCTOR OUTLINE

Objective Number	Learning Objective	Supporting Information
EO-6	STATE the purpose of and information found on Radiological Work Permits (RWP).	Viewgraph 101.0 - Definition of RWP. Viewgraph 102.0 - List of typical information found on RWP.
EO-7	IDENTIFY the individual's responsibility in using Radiological Work Permits.	Viewgraph 103.0 - Individual's responsibilities to read, understand, and comply with requirements of RWP; and agreement to notify supervisor or HP Technician if something is incorrect or not understood.
REVIEW LO-7	Upon completion of this lesson, the participant will be able to DESCRIBE radiological postings, General and Job-Specific Radiological Work Permits.	Viewgraph 86.0 - Radiological Postings and Controls Learning Objective.
LO-8	Upon completion of this lesson, the participant will be able to IDENTIFY radiological emergencies and alarms and the appropriate response to each.	Viewgraph 104.0 - Radiological Emergencies Learning Objective.
EO-1	STATE the purpose of emergency alarms.	Viewgraph 105.0 - Definition of emergency alarms.
EO-2	IDENTIFY the correct responses to emergencies and/or alarms.	Viewgraph 106.0 - List of appropriate responses to emergencies and alarms.
EO-3	STATE the possible consequences for disregarding radiological alarms.	Viewgraph 107.0 - List of consequences of disregarding radiological alarms.

RADIATION WORKER TRAINING INSTRUCTOR OUTLINE

Objective Number	Learning Objective	Supporting Information
REVIEW LO-8	Upon completion of this lesson, the participant will be able to IDENTIFY radiological emergencies and alarms and the appropriate response to each.	Viewgraph 104.0 - Radiological Emergencies Learning Objective.
LO-9	Upon completion of this lesson, the participant will be able to UNDERSTAND the responsibilities of all individuals within MKM's Waste Management Services Program.	Viewgraph 108.0 - Responsibilities of Individuals Learning Objective. Handout - Responsibilities of Individuals.

GENERIC WORK PLAN



Radiation Safety Procedure

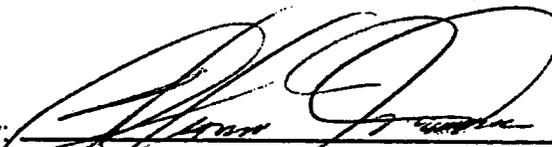
for

Site Specific Generic Detailed Work Plan

SDWP

Revision 0

Reviewed By:  8/28/99
D.J. Wells, RPPT, Radiation Safety Officer Date

Approved By:  8/30/99
T.J. O'Dou, CHP, MKM Health Physicist Date

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INTRODUCTION

This plan describes a generic method which would be accomplished in each specific work plan for facility characterization or remediation by MKM Engineering, Inc. This plan includes a description of radiation protection services which would be required for oversight on a typical project. Work will be conducted under the direction of MKM using the procedures and policies of the Nuclear Regulatory Commission Radioactive Materials License.

OBJECTIVE

MKM personnel, will perform the radiological surveys necessary to complete contract requirements in the work area and maintain exposure to radiological hazards As Low As Reasonably Achievable. MKM will utilize fully qualified radiological control technicians trained in the use of procedures of the MKM NRC license to survey and decontaminate personal and property identified as contaminated in accordance with current standards for unrestricted release acceptable to the NRC, DOE, DOD, or other regulatory authority.

SITE LOCATION AND DESCRIPTION

The work will be conducted within the United States of America. If the work location is within an agreement state, the regulatory authority for that state will be contacted and if required an arrangement for reciprocity will be completed with that authority. This section will typically provide a detailed description of the facility and it's geographic location.

SCOPE OF WORK

Under the terms of the contract to this work, MKM will perform radiological surveys, remove radioactive contamination from real property and personal property, remove personal property, and cleanup and release real property to the client. MKM will also provide a final report of the radiological condition of the personal and real property sufficient to ensure to regulators that release criteria have been satisfied. All work completed under this contract will comply with the requirements for radiological protection stated in Title 10 of the Code of Federal Regulations and radiological release criteria that are specified in the contract.

MKM will perform radiological work on this contract under the Nuclear Regulatory Commission (NRC) License.

PRELIMINARY ACTIVITIES

Prior to actual work at the site, plans will be prepared to ensure the Health and Safety of MKM, and other site workers and to ensure that the quality of the work does not permit activity above allowed levels to be released from the facility.

SUBMITTALS

Under the terms of the contract for this project all submittals must be approved by the MKM Radiation Safety Committee prior to the initiation of physical work. The MKM submittals of interest are (in most cases):

- Health and Safety Plan (HASP)
 - ◊ Elevated Work Surface Plan
 - ◊ Confined Space Entry Plan
 - ◊ Welding and Burning Plan
- Lock Out / Tag Out (LO/TO) Program
- Hoisting and Rigging Program
- Quality Assurance Plan
- Detailed Schedule
- Waste Management Plan
- NEPA Checklist

RADIATION PROTECTION

Radiation protection services for this project will be provided by MKM Engineering Inc. (MKM) under the direction given in their assigned Nuclear Regulatory License. In this regard, MKM will provide radiation protection services as follows:

1. Train personnel to the requirements of the MKM NRC license.
2. Evaluation of equipment and facilities for activity.
3. Coverage of personnel performing decontamination services
4. Coverage of personnel evaluating material for release.
5. Quality assurance that material to be released has been decontaminated as required.

Radiation protection on site will be continuously supported by MKM management as a representative of the MKM Radiation Safety Officer, Dixie Wells, and by direction of the MKM Radiation Safety Committee under the direction of Thomas J. O'Dou, CHP. All personnel will obey the directions provided by MKM personnel regarding radiation protection.

MANAGEMENT PERSONNEL

Overall project guidance for completion will be provided by:

Thomas J. O'Dou, CHP, RRPT
MKM Engineering, Inc.
6461 Plumcrest Road
Las Vegas, Nevada
Phone: 702-395-2814
Fax: 702-395-2824

Onsite activities will be controlled under the radiation protection guidance of:

Dixie J. Wells, RRPT
Radiation Safety Officer
MKM Engineering, Inc.
6461 Plumcrest Road
Las Vegas, Nevada
Phone: 702-395-2814
Fax: 702-395-2824

On site work activities will be conducted under the supervision of:

Thomas J. O'Dou, CHP, RRPT
MKM Engineering, Inc.
6461 Plumcrest Road
Las Vegas, Nevada
Phone: 702-395-2814
Fax: 702-395-2824

BASE CREW ON SITE

This section will typically indicate the number and job category of people who will be present for the majority of the job. This will typically include a project manager, a project supervisor, health physics technicians, a health and safety manager, and other personnel to complete the work task.

TRAINING AND QUALIFICATIONS

Any special training of personnel who will do the work on-site will be specified here. In general, people working to control radioactive material at the site will be trained in the use of the MKM procedures, Radiation Protection Manual, and Specific work plans.

CHARACTERIZATION

Prior to any work on the equipment or facilities, any equipment to be decontaminated will be characterized for radioactive and hazardous materials

MKM will review all existing data and documentation to identify the contaminants present on the equipment or facilities section of interest. Should there be questions regarding the reason for contamination or some abnormal situation be presented, existing conditions will be compared with past conditions so that any anomalies can be identified.

Surveys for fixed and removable radioactive materials will be conducted to identify levels of protection necessary for personnel and dose rate measurements will be made to identify areas requiring posting as radiation areas.

Hazardous materials will be identified and labeled. Personnel will be made aware of identified hazards as the information becomes available. Area boundaries will be defined based on the results of the characterization.

SAFETY AND HEALTH

Personnel from MKM will hold Pre-Job Briefings with all employees and observers to ensure personnel are aware of actual and potential hazards in the work area. Safety at the site shall be conducted in accordance with the guidelines of the MKM Site Health and Safety Plan.

SURVEYS

There will be three primary types of surveys performed during this project.

- 1) Radiological control surveys to determine measures for and ensure continued control. These surveys will be completed in order to initially assess the degree of contamination present in the work facility and will be performed periodically (daily as a minimum) to ensure control of contaminated material is maintained and to ensure personnel protection is adequate.
- 2) Pre-decontamination survey of equipment. These surveys will be done to identify the areas of equipment to be decontaminated and the degree of control needed to ensure proper protection of workers during decontamination.
- 3) Post-decontamination survey of equipment - release surveys. These surveys will be done in low background areas to ensure that adequate decontamination is accomplished prior to release of materials from control as radioactive. All contamination identified during this type of survey will be properly controlled to prevent release of the equipment from the facility.

Radiation surveys will be conducted daily throughout the work area and will consist of general area measurements of external radiation using a Ludlum Model 19 Micro-R meter or equivalent. All measurements of dose rate shall be recorded on survey forms which will be signature verified by a qualified senior technician.

Contamination surveys of the general work area will consist of surface evaluations for activity using 2 inch diameter cloth disks and large area cloths. A cloth disk survey of the general work area will be evaluated using a low background alpha-beta counting system at least weekly. Surveys of this type may be conducted as determined by the on-site radiation safety officer but shall not be done less than weekly. All measurements of surface contamination shall be recorded on survey forms which will be signature verified by a qualified senior technician.

Contamination surveys of specific work areas will be conducted immediately before the work and periodically during the disassembly process. These surveys will consist of contact and general area dose rate measurement and surface contamination evaluations using cloth disk smears. All cloth disk smears will be evaluated with portable instruments for this type of survey.

Evaluations of equipment and areas ready for release as clean will be conducted as the equipment and facility areas become available for survey. Release surveys will be completed by or under the direct supervision of a qualified senior radiation protection technician or the on-site MKM Radiation Safety Officer representative. All release surveys will be reviewed by the on-site MKM Radiation Safety Officer representative prior to release of the equipment from the controlled area. Loose surface activity will be evaluated on equipment using cloth smears which will be evaluated using a low background alpha/beta counting system (Ludlum 2929 or equivalent). The cloth smears shall be rubbed with even pressure over an area of 100 square centimeters. Fixed surface activity concentrations will be evaluated by direct measurements on the surface of the equipment within ½ inch from the surface for beta radiation evaluations and within ¼ inch for alpha emission evaluations. The response of portable alpha instruments (Ludlum Model 3 rate meter with a Model 43-5 or instrument with similar or better detection characteristics) should be similar to background to allow release with a background count rate less than 10 counts per minute. The response of beta detection instruments (Ludlum Model 3 rate meter with a Model 44-9 probe or instrument with similar or better detection characteristics) should be less than 100 counts per minute above background with the background count rate less than 200 counts per minute. For irregular surfaces and crevices where direct measurements may not be adequate, cotton swabs (dry or wetted with alcohol) may be used to ensure activity is not present above the release guidelines.

Release criteria shall be in accordance with the U.S. Nuclear Regulatory Commission as indicated in the U.S. NRC Policy Statement "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licensees for Byproduct, Source, or Special Nuclear Material", April 1993 or the most current regulatory guidance available.

All instruments used for surveys shall be verified and approved by the MKM Radiation Safety Officer or her on-site representative. All instruments used for radiation measurements shall be calibrated to standards traceable to the National Institute of Standards and Technology at intervals not to exceed six (6) months.

DECONSTRUCTION

The facility will be laid out in a manner to promote ALARA in exposure of personnel and in control of radioactive materials. Exposure to safety hazards, construction work, radioactive and hazardous materials, and traffic will be minimized.

Specific areas of the facility will be established for the dis-assembly and decontamination of equipment. Physical barriers will be established around these areas to provide control of radiation exposure and contamination control. The floor of the disassembly area will be covered and walls or postings established around the area to prevent unauthorized personnel access and control of the spread of contamination. An access/egress control point area will be established to control entry and exit from the area. Staging areas for contaminated waste will be set up within the radioactive materials boundaries.

An area for survey of equipment will be set up near the disassembly and decontamination area. However, controls will be established to ensure that only clean materials are moved from the contaminated to the potentially contaminated area to minimize spread of activity to the area where surveys for release will be conducted.

The flow of the disassembly/decontamination area will be established in a manner that allows for omni-directional flow of material where there is no chance for cross contamination of equipment which is in the decontamination process.

SET BOUNDARIES

- Upon completion of area surveys MKM will establish, delineate, and post deconstruction area boundaries, hazardous material control boundaries, radiological boundaries and boundary control stations.
- Establish and post staging areas for clean trash, clean scrap, and contaminated waste.
- Establish inventory system for waste containers.

DECONTAMINATION

Decontamination will be accomplished utilizing the least obtrusive method. Non-aggressive cleaning will be applicable on the majority of equipment and facility surfaces. Loose surface contaminants will be removed using damp wipes or mild detergents. Fixed contamination will be removed from equipment surfaces using contained media blasting or mild chemical treatment. Mechanical and chemical methods will be accomplished in a controlled enclosure with HEPA ventilation and stack monitoring.

Fixed contaminants will be removed from floors and structural component using scabblers and/or blast units equipped with vacuum recovery units.

DOCUMENTATION

Documentation on the disposition of all equipment/materials will be provided to the customer on a weekly basis. Unique identifiers such as model and serial number of equipment will be specified on survey forms.

MKM will provide a final report of the project actions including the radiological condition of the personal and real property remaining in the project area.

GENERIC HASP



Radiation Safety Procedure

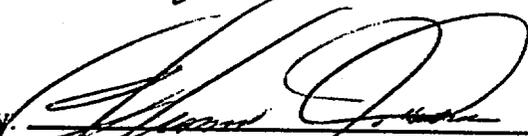
for

Site Specific Generic Health & Safety Plan

HASP

Revision 0

Reviewed By:  8/28/99
D.J. Wells, RRPT, Radiation Safety Officer Date

Approved By:  8/30/99
T.J. O'Dou, CHP, MKM Health Physicist Date

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1.0 INTRODUCTION

This Site Health and Safety Plan (HASP) document defines the applicability and responsibilities with respect to compliance with MKM safety procedures and State and Federal Regulations.

1.1 Scope/Applicability of the Site Health and Safety Plan

The purpose of this Site Health and Safety Plan (HASP) is to define the requirements and designate protocols to be followed at the work area during the characterization of the area of concern and surrounding grounds and structures. Applicability extends to all Military, Civil Servants, contractors, subcontractors, and visitors.

All MKM and contractor personnel working on site shall be made aware of health, or safety hazards associated with the characterization or remediation operation. This HASP summarizes those hazards in Table 3.1, and defines protective measures planned for the site.

This plan must be reviewed, approved, and an agreement to comply with the requirements must be signed by all personnel prior to entering the restricted zone or contamination reduction zone. Documentation of the review, approval, and the agreement to comply; as well as certification(s) of 40 hour training (29 CFR 1910.120), all appropriate refresher training, radiation safety training, and fitness for duty shall be completed prior to the start of the project. This documentation is established and maintained by the MKM Health and Safety Officer (HSO)/Radiation Protection Supervisor (RPS).

During development of this plan, consideration was given to current safety and health standards, adverse health effects of known contaminants, and procedures designated to account for the potential exposure to unknown substances. Specifically, the following reference sources have been consulted:

- 10 CFR 20, "Standards for Protection Against Radiation"
- 10 CFR 71, "Packaging and Transportation of Radioactive Materials"
- 29 CFR 1910.120, "Labor/National Labor Relations Board"
- 29 CFR 1910.1000 series, "Labor/OSHA, Department of Labor"
- 29 CFR 1926, "Labor/OSHA, Department of Labor"
- 49 CFR, "Transportation"
- Occupational Safety and Health Guidelines for Hazardous Waste Site Activities
- EPA Publication "Air Surveillance for Hazardous Materials"
- U.S. Army Corps of Engineers "Safety Concepts and Basic Considerations for Unexploded Ordnance (UXO) Operations."

1.2 Visitors

All visitors entering the contamination reduction zone and restricted zone at the work area will be required to read and comply with the provisions of this HASP. In addition, visitors will be expected to comply with relevant OSHA requirements such as medical monitoring (Section 6.0), training (Section 4.0), respiratory protection and PPE (Personal Protective Equipment) (Section 5.0), and the included appendices. Visitors will also be expected to provide their own protective equipment. Dosimetry for visitors will be handled in accordance with the Radiation Safety Manual, Section 4.2.

In the event that a visitor does not adhere to the provisions of the HASP, he/she will be required to leave the work area. All non-conformance incidents will be reported and documented in the site log.

2.0 KEY PERSONNEL/IDENTIFICATION OF HEALTH AND SAFETY PERSONNEL

2.1 Key Personnel

The following personnel and organizations are critical to the planned activities at DOD (US Army) work sites. The organizational structure will be reviewed and updated as appropriate by the site supervisor. In a site specific plan, this section would include key customer personnel. The example given is from the US Army Industrial Operations Command.

Name/Title	Organization/Branch	Address	Telephone
(Person)	(Appropriate)	(City, State)	(Phone) (Fax)

2.2 Site Specific Health and Safety Personnel

The Project Manager (PM) in charge of this project is Thomas J. O'Dou. All on-site personnel will report to the Project Manager. If initial characterization involves only a few people, Mr. O'Dou will also serve as the Site Health and Safety Officer (HSO) and has total responsibility for ensuring that the radiological and non-radiological provisions of this HASP are adequate and implemented in the field.

The site Radiation Protection Supervisor (RPS) will provide on-site radiation protection and report to MKM RSO as needed for radiation protection instructions. The RPS will be assisted by a Radiation Control Technician (RCT) as required. The RPS will report (on-site) to the Project Manager, with the PM having ultimate responsibility for the site. Changing field conditions may require decisions to be made concerning the adequacy of programs. Therefore, it is vital that the individual assigned as the RPS be experienced and meet the additional training requirements specified by OSHA in 29 CFR 1910.120 (see Section 4.0 of this HASP). The RPS is also responsible for conducting site inspections on a regular basis in order to ensure the effectiveness of this plan.

The RPS will contact the PM prior to any downgrades in level of protection or monitoring frequency or for items identified in the site specific work plan. The downgrade will be entered in project records and approved by the RSO or on-site representative.

3.0 TASK/OPERATION SAFETY AND HEALTH RISK ANALYSIS

3.1 Historical Overview of Site

This Health and Safety Plan defines the known existing hazards and methods to protect personnel from hazards identified in the Scope of Work, background information, and on-site investigation.

For a review of available historical information concerning the building of concern, see the following documents:

3.1.1 Surveys of the work building.

3.1.2 Description of Work.

3.2 Task by Task Risk Analysis

The evaluation of hazards is based upon the knowledge of site background presented in Section 3.1, and anticipated risks posed by the specific operation.

The following subsections describe each task/operation in terms of the specific hazards associated with it. In addition, the protective measures to be implemented during the completion of those operations are also identified.

Tables 3.1 and 3.2 provide a summary of hazards and protective measures planned for each task at the work site.

TABLE 3.1
TASK ANALYSIS
CHEMICAL HAZARDS OF CONCERN / AIR HAZARDS
EXAMPLE
Unidentified Site

CHEMICAL	CONCENTRATION	LIMIT	NOTES
²³⁸ U	.1 DAC	10 DAC Hours/Week	1 DAC =
Concrete Dust	< 1 mg/m ³	5 mg/m ³	CAS# 1305-78-8 CaO, OSHA Unpublished limit is listed. Employee exposure must be minimized.
No other information given about chemical hazards in SOW.			

TABLE 3.2

TASK ANALYSIS
PHYSICAL HAZARDS OF CONCERN

EXAMPLE
Unspecified Work Site

<u>Task</u>	<u>Hazard Description</u>	<u>Prevention/Monitoring Technique</u>
Mobilization	Injury/Strain/Sprain	Ensure proper lifting in accordance with established Materials Handling Practices.
Site Work	Explosives	The site is a weapons testing facility and has been for many years. As a result, there may be unexploded ordinance in the ground or stored in areas at the facility. Trained personnel will be on-site during the initial phase to sweep all work areas to identify unexploded or unidentified ordinance. All personnel shall pay attention to orders given by the persons assigned to protect us from explosive hazards. This hazard and items found shall be discussed daily with personnel during characterization.
	Heat Stress	Implement heat stress control measures as necessary. It may be hot in the work area and in the early phase, when personnel are wearing outside protective clothing, and it may be necessary to break frequently to ensure that workers do not overheat. During continuation of the characterization phase, personnel working outside may need to protect exposed skin from potential radiant damage from the sun. A modified work/rest schedule will be implemented as needed to prevent heat stress.
	Fire	Ensure Class A, B, C fire extinguishers are on site for control of incipient stage fires.
	Radiation	Ensure all components of MKM Radiation Protection Plan spelled out in the MKM Radiation Safety Manual are implemented. Personnel disassembling and moving contaminated equipment will use radiation survey equipment and swipe surveys in accordance with MKM survey procedures. Personnel leaving the contamination reduction zone will be surveyed for ionizing radiation emitting contamination prior to leaving the zone.
	Strain/Sprain	Ensure proper lifting. Use mechanical assistance for any loads over, or expected to weigh over 50 pounds. Refer to the Work Plan for material handling specifics that may pertain to this site.

Dropping	Ensure personnel wear steel toed boots designed to prevent injury to feet and toes during handling of heavy items such as tools or pieces of concrete. In addition, head protection shall be mandatory in any area where it is possible for material to be dropped from cranes or other lifting devices (overhead) onto workers in the area.
Projectiles	When handing materials it is always possible to cause injury to eyes from chipped concrete, broken chipping bits, or dropped or shattered items. Ensure personnel take proper precautions to prevent eye injury at all times when working at the characterization site. Safety glasses shall be worn as practical to prevent injury.
Contamination	Prior to evaluation of the contamination hazards which may be present at the characterization site, and after they are identified, it is necessary that personnel take action to protect skin and clothing from radioactive and chemical contamination, by using PPE and/or engineering methods as needed.
Slivers/Protrusions	Ensure personnel take precautions to minimize cuts, slivers, and other damage to skin surfaces by covering the skin as practical to prevent injury.
Trips/Slips/Falls	When moving around in tight areas of the building, on the gazebo, outside in the field area, or near the brook, personnel will take precautions to prevent tripping, slipping, or falling. A lack of attention to the workers' situation here could cause very serious injury. This shall be a continuous safety reminder to personnel.
Noise	Ensure personnel take precautions to protect hearing from power tool operations and other actions which may not be associated with the characterization activities.
Power tools	Ensure precautions are taken to prevent injuries during the use of heavy equipment and power tools. Only personnel who are experienced in the use of power tools and heavy equipment shall be used for this type of work. Precautions shall be taken to minimize the possibility of injury to the equipment operator and to others in the area. Ensure control of electrical boxes to prevent electric shock.
Respiratory Protection	All personnel shall take precautions to prevent respiratory system injury when wearing respirators. Respirators on this job may be used to prevent entry of solids, both radioactive and non-radioactive dusts, particulates (ex. mists, vapors, fumes, and dust) into the breathing zone. Be sure to exit the area and remove your respirator should you feel weak or in case of rupture or plugging of a filter. Do not work under respiratory system distress.
Concrete Dust Exposure	Exposure to concrete dust may occur at low levels while inside building 611 B. For long term exposure to concrete dusts, skin surfaces may be protected with gloves. Personnel should wash residual concrete dust from their skin each day after the work shift.

Demobilization Injury/Strain/Sprain Ensure proper lifting in accordance with established Materials Handling Practices.

4.0 PERSONNEL TRAINING REQUIREMENTS

All site personnel are required to be trained in accordance with the OSHA (29 CFR 1910.120) regulation covering Hazardous Waste Operations and Emergency Response. 10 CFR Part 19 - "Notices, Instructions, and Reports to Workers: Inspections" - lists applicable posting and training requirements for workers exposed to radiation. This training will be provided by the HSO/RPS and is detailed in Attachment A to this plan. All personnel are required to be trained to recognize the hazards onsite, the provisions of this HASP, and the responsible personnel. Training shall be conducted and documented in accordance with procedure MKM-19, Training.

4.1 Pre-Assignment and Annual Refresher Training

Each employer will be responsible for certifying that his/her employees meet the training requirements. Consistent with 29 CFR 1910.120 paragraph (e)(3), each employee shall provide a document certifying 40 hours of (OSHA) training for general site workers. Personnel must receive 8 hours of annual refresher training, as required. In addition, hazard communication (29 CFR 1910.1200) training will be provided as it pertains to radioactive or hazardous materials onsite.

4.2 Site Supervisors Training

Consistent with 29 CFR 1910.120 paragraph (e)(8), individuals designated as site supervisors require an additional 8 hours of training. The following individuals are identified as site supervisors:

<u>Name</u>	<u>Title/Responsibility</u>
Thomas J. O'Dou, CHP	Program Manager
Dixie J. Wells	Radiation Safety Officer

4.3 Training and Briefing Topics

The following items will be discussed by a qualified individual at the site pre-entry briefing(s), as well as daily or periodic site briefings. This check list identifies site specific hazards and the frequency to refresh personnel in the necessary protective requirements.

Site Specific Training:

Initial	Daily	Periodic	Training Type
<u>X</u>	—	—	Site characterization and analysis, Sec. 3.0; [(29 CFR 1910.120 (I).)]
<u>X</u>	<u>X</u>	—	Physical hazards, Table 3.2
<u>X</u>	—	—	Chemical hazards (Concrete dust and Radiation)
<u>X</u>	—	—	Medical surveillance requirements, Sec. 6.0; [(29 CFR 1910.120 (f).)]
<u>X</u>	—	—	Symptoms of overexposure to hazards; [(29 CFR 1910.120 (e),(2),(vi).)]
<u>X</u>	—	—	Animal bites and stings

<u>X</u>	<u>X</u>	—	Site control, Sec. 8.0; [29 CFR 1910.120 (d).]
<u>X</u>	—	—	Training requirements Sec. 4.0; [29 CFR 1910.120 (e).]
<u>X</u>	—	—	Engineering controls and work practices, Sec. 8.5; [29 CFR 1910.120 (g).]
<u>X</u>	—	—	Heavy machinery
<u>X</u>	—	—	Forklift [29 CFR 1910.178 (e).]
<u>X</u>	—	—	Backhoe
<u>X</u>	—	—	Manlift [29 CFR 1910.66-.70]
<u>X</u>	—	—	Crane
<u>X</u>	—	—	Tools [29 CFR 1910.242-.247]
<u>X</u>	—	—	Overhead and underground utilities
<u>X</u>	—	—	Ladders [29 CFR 1910.25-.27 (a).]
<u>X</u>	—	—	Structural integrity
<u>X</u>	—	—	Pressurized air or gas cylinders [29 CFR 1910.101 (b).]
<u>X</u>	—	—	Personal protective equipment, Sec. 5.0; [29 CFR 1910.120 (g), 29 CFR 1910.134.]
<u>X</u>	—	—	Respiratory protection Sec. 5.8; [29 CFR 1910.120 (g) ANSI Z88.2-1980.] And [29 CFR 134]
<u>X</u>	—	—	Air Monitoring, Sec. 7.0; [29 CFR 1910.120 (h).]
<u>X</u>	—	—	Characterization, Sec. 9.0; [29 CFR 1910.120 (k).]
<u>X</u>	<u>X</u>	—	Emergency response plan, Sec. 10.0; [29 CFR 1910.120 (1).]
<u>X</u>	—	—	Handling drums and containers, [29 CFR 1910.120 (j).]
<u>X</u>	—	—	Radioactive waste
<u>X</u>	—	—	Confined space entry procedure, Sec. 11.0, [29 CFR 1910.146]
<u>X</u>	—	—	Sanitation, [29 CFR 1910.120 (n).]
<u>X</u>	—	—	Spill Containment, Sec. 12.0 [29 CFR 1910.120 (b)(4)(j).]

5.0 PERSONAL PROTECTIVE EQUIPMENT TO BE USED

This section describes the general requirements of the EPA designated Levels of Protection (A-D), and the specific levels of protection required for each task at the work site.

5.1 Levels of Protection

The level of protective equipment needed will depend on the following hazards:

Potential for radioactive airborne particulates in enclosed spaces (HEPA system and target room)

Potential for confined space controls behind the instrument room, and

Control of surface contamination inside the work enclosure.

Personnel shall wear protective equipment when response activities involve known or suspected atmospheric contamination, when vapors, gases, or particulates may be generated by site activities, or when direct contact with skin-affecting substances may occur. Full face piece respirators protect lungs, gastrointestinal tract, and eyes against airborne toxicants. Chemical-resistant clothing protects the skin from contact with skin-destructive and absorbable chemicals.

The specific levels of protection and necessary components for each have been divided into the two categories according to the degrees of protection afforded:

- Level A:** Should be worn when the highest level of respiratory, skin and eye protection is required.
- Level B:** Should be worn when the highest level of respiratory protection is needed, but a lesser level of skin protection is required.
- Level C:** Should be worn when the criteria for using air-purifying respirators are met, and a lesser level of skin protection is needed.
- Level D:** Should be worn only as a work uniform and not in any area with respiratory or skin hazards. It provides minimal protection against chemical hazards.

Modifications to these levels are permitted, and routinely employed during site work activities to maximize efficiency. For example, Level D respiratory protection and Level C skin protection may be required for a given task. Likewise the type of chemical protective ensemble (i.e., material, format) will depend upon contaminants and degrees of contact. If there is a potential for downgrading, HSO/RPS will ensure that all radiological and non-radiological concerns have been addressed.

The Level of Protection selected is based upon the following:

- Type and measured concentration of the chemical/radiological substance in the ambient atmosphere and the toxicity of that substance.
- Potential for exposure to substances in air, splashes of liquids, or other direct contact with material due to work being done.
- Knowledge of contaminants onsite along with properties such as toxicity, route of exposure, and contaminant matrix.

- Potential synergistic effects from multiple materials.

In situations where the type of radionuclide/chemical, concentration, and possibilities of contact are not known, the appropriate Level of Protection must be selected based on professional experience and judgement until the hazards can be better identified. Since there is minimal potential for airborne activity and there is no deficiency of oxygen, the maximum level of protection for this job is level C.

5.2 Level A Personal Protective Equipment (PPE):

The use of Level A PPE's are not anticipated and therefore not described.

5.3 Level B Personal Protective Equipment:

The use of Level B PPE's are not anticipated and therefore not described.

5.4 Level C Personal Protective Equipment:

- Air-purifying respirator (APR), full-face, cartridge-equipped (MSHA/NIOSH approved). MKM anticipated using full-face respirators with HEPA cartridges where APR use is appropriate. HEPA cartridges provide protection against: radionuclides, asbestos, dust and other materials as listed in manufacturers literature.
 - Disposable one piece suit. Regular Tyvek "bag suits"
 - Long-sleeved cotton shirts and pants
 - Gloves (outer): latex, rubber, or nitrile
Outer work gloves of cotton or leather may be worn to handle or move metal pieces
 - Gloves (inner): cotton liners or latex
 - Boots (outer): rubber overshoes
 - Boots (middle): plastic, Tyvek or PVC 4 mil "bootie"
 - Boots (inner): steel toes
 - Hard hat (as required)
 - Safety Glasses
- 5.5 Level D Personal Protective Equipment:**
- As for Level C, but without respiratory protection.
 - Long sleeve cotton shirts and pants
 - Use of coveralls or Tyveks.
 - Gloves; rubber, and leather or cotton
 - Boots/shoes, leather or chemical-resistant, steel-toe

- Safety Glasses (as required)
- Hard hat (as required)

5.6 Reassessment of Protection Program

The Level of Protection provided by PPE selection shall be upgraded or downgraded based upon a change in site conditions or findings of investigations. The exact PPE requirements for any task will be specified in the Radiation Work Permit posted at the site. Downgrades will be made based on input from the personnel specified in section 2.0.

When a significant change in hazard potential occurs, the hazards will be reassessed. Some indicators of the need for reassessment are:

- Change in job tasks during a work phase.
- Change of weather.
- When temperatures or individual medical considerations limit the effectiveness of PPE.
- Contaminants other than those previously identified are encountered.
- Change in ambient levels of contaminants.
- Change in work scope which affects the degree of contact with contaminants.

5.7 Work Mission Duration

Before the workers actually begin work in their PPE, the anticipated duration of the work mission should be established. Several factors could limit mission length, including:

- Ambient temperature and weather conditions
- Capacity of personnel to work in PPE.

This is not anticipated to be a limiting condition at this work site, because the on-site job duration is a maximum of less than 30 work days, the maximum number of days in areas requiring PPE is less than 10 work days.

5.8 Chemical Resistance and Integrity of Protective Material

Tyvek suits were selected for the following reasons: Tyveks are effective against a broad range of potential radiological/chemical hazards. There are no anticipated liquids which would cause a spill hazard on-site. Based on information available to date concerning this characterization, Tyvek will be effective. Any materials splashed or spilled will need to be removed from outer clothing immediately.

Additionally, Tyvek will provide some protection from low energy beta particles.

Gloves have a higher potential for contact with radionuclides and chemicals. Based on information available and expected potential hazards, nitrile, latex or rubber gloves will be used for hand protection against contamination. The outer glove will be worn over cotton or latex inner gloves. The inner glove mainly provides for worker comfort, limited protection from contamination is obtained from inner gloves. If the type of work warrants, work gloves of sturdy materials (cotton, leather, etc.) may then be

worn over the outer gloves. The work glove will tend to provide protection for the integrity of the outer glove. Also, gross contamination can be removed immediately by removing and discarding the work gloves. Personnel shall be aware that contaminated gloves require controlled disposal.

If a change of PPE is needed based on contaminant exposure, PPE will be doffed in accordance with Figure 9.1. In summary, if work gloves become contaminated, a new work glove will be placed over the outer glove, if the outer glove is not grossly contaminated. If the contamination is on the outer glove as well, then both the outer glove and the work glove will be replaced. If a suit becomes contaminated, the worker will take off the PPE following the order listed in Figure 9.1, and don with clean PPE in the reverse. For other contaminated PPE, don and doff in accordance with Figure 9.1.

5.9 Standard Operating Procedures for Respiratory Protection Devices

The following subsections define standard operating procedures for air-purifying respirators and self-contained breathing apparatus.

5.9.1 Cleaning and Disinfecting Respirators

Provided that respirators have not been radiologically contaminated, they shall be cleaned and disinfected at least daily with a MSA cleaner/sanitizer solution, or with a non-alcohol based cleaner/sanitizer wipe. If respirators have become radiologically contaminated, they shall be surveyed and "free-released", prior to cleaning. Respirators shall be washed in the cleaner/sanitizer solution at least weekly.

5.9.1.1 Daily Cleaning Procedure

The steps to be followed for cleaning and disinfecting daily are as follows:

- **Respirator Disassembly.** Respirators will be taken to a clean location where the filters, cartridges or canisters are removed, and damaged to prevent accidental reuse, and discarded (used respirator filters are considered potentially contaminated and should be packaged and treated the same as other soiled PPE). For thorough cleaning, the inhalation and exhalation valves, speaking diaphragm, and any hoses are removed and cleaned separately. The head straps should be fully extended.
- **Cleaning.** Usually, the cleaning and disinfecting solution provided by the manufacturer is used and is dissolved in warm water in an appropriate container. Using gloves, the respirator is placed in the container with the solution and swirled for a few moments. The removed parts may be cleaned in the same manner. A soft brush may be used to facilitate cleaning.
- **Rinsing.** The cleaned and disinfected respirator face pieces are rinsed thoroughly in warm water to remove all traces of detergent and disinfectant. This is very important for preventing contact dermatitis. All respirator pieces should be rinsed in this manner, as the thorough removal of cleaners extends the life of the material.
- **Drying.** The respirator and its' parts may be allowed to dry in room air on a clean surface. The facepiece and hose may also be hung upside down (like drying clothes), but care must be taken not to damage or distort the facepiece. The preferred method of hanging the facepiece is to utilize the lower back head strap which inverts the facepiece for drying.

- **Reassembly and Inspection.** The clean, dry respirator should be reassembled and inspected in an area separate from the disassembly area to avoid any possible cross contamination. Special emphasis should be given to inspecting the respirator for detergent or soap residue left by inadequate rinsing. This appears most often under the seat of the exhalation valve, and can cause valve leakage or sticking. Should the exhalation valve flapper stick; attempt to free by reimmersion in clean rinse water. Pulling the flapper loose may cause distortion which renders the valve useless.

5.9.1.2 After Routine Use in Contaminated Areas

The steps to be followed for cleaning and disinfecting in the field are as follows:
Provided that the mask has been checked for radioactive material contamination and found to be non-contaminated;

- The mask must either be wiped with disinfectant wipes and allowed to air dry in a clean area or washed and rinsed with MSA Cleaner/Sanitizer solution, and allowed to air dry in a clean area, daily. Do not use alcohol wipes.
- The mask must be washed/rinsed with MSA Cleaner/Sanitizer at least weekly.

5.9.2 Respirator Inspection and Checkout

1. Visually inspect the entire unit for any obvious damages, defects, or deteriorated rubber.
2. Make sure that the facepiece harness is not damaged. The serrated portion of the harness can fragment which will prevent proper face seal adjustment.
3. Inspect lens for damage and proper seal in facepiece.
4. Exhalation Valve - pull off plastic cover and check valve for debris or for tears in the neoprene valve (which could cause leakage).
5. Inhalation Valves (two)(if applicable) - screw off cartridges/canisters and visually inspect neoprene valves for tears. Make sure that the inhalation valves and cartridge receptacle gaskets are in place.
6. Make sure a protective cover lens is attached.
7. Make sure the speaking diaphragm retainer ring is hand tight.
8. Make sure that you have the correct cartridge.
9. Don and perform negative and positive pressure test.

5.9.3 Storage of Respirators

OSHA requires that respirators be stored to protect against:

- Dust
- Sunlight
- Heat
- Extreme Cold

- Excessive Moisture
- Damaging Chemicals
- Mechanical Damage

Storage of respirators should be in a clean, secure area which minimizes the chance for contamination or unsanitary conditions, inside of plastic bags labeled "respirator".

5.10 Standard Operating Procedures for Personal Protective Clothing

5.10.1 Inspection

Proper inspection of PPE features several sequences of inspection depending upon specific articles of PPE and it's frequency of use. The different levels of inspection are as follows:

- Inspection and operational testing of equipment received from the factory or distributor.
- Inspection of equipment as it is issued to workers.
- Inspection after use or training and prior to maintenance.
- Periodic inspection of stored equipment.
- Periodic inspection when a question arises concerning the appropriateness of the selected equipment, or when problems with similar equipment arise.

The primary inspection of PPE in use for activities at the project will occur immediately prior to use and will be conducted by the user. This ensures that the specific device or article has been checked out by the user, and that the user is familiar with its use.

Table 5.1 Sample PPE Inspection Checklists

CLOTHING

Before use:

- Determine that the clothing material is correct for the specified task at hand (refer to the RWP for the task(s) to be performed).
- Visually inspect for:
 - imperfect seams
 - non-uniform coatings
 - tears
 - malfunctioning closures
- Hold up to light and check for pinholes.
- Flex product:
 - observe for cracks
 - observe for other signs of shelf deterioration
- If the product has been used previously, inspect inside and out for signs of chemical attack:
 - discoloration
 - swelling
 - stiffness

During the work task, periodically inspect for:

- Closure failure
- Tears
- Punctures
- Seam Discontinuities

GLOVES

Before use:

- Visually inspect for:
 - imperfect seams
 - tears, abrasions
 - non-uniform coating
 - pressurize rubber or latex gloves with air; listen for pin-hole leaks.

5.11 Specific Levels of Protection Planned for the Project Task Assignments

The following levels of protection will be utilized during activities at the work site.

- Level C This section would identify the the levels of PPE expected for this job.
- Level D Modified Level D

Table 5.2 presents the level of protection planned for the completion of individual task assignments and the specific components of each protective ensemble.

TABLE 5.2
SPECIFIC LEVELS OF PROTECTION PLANNED FOR THE
TASK ASSIGNMENTS

- Level A Tasks: None.
- Level B Tasks: None.
- Level C Tasks: Survey of any controlled areas.

Movement of contaminated materials inside of the controlled areas if there is no potential to generate or increase airborne radioactivity levels.

Opening and surveys conducted in the HEPA ventilation system.
- Modified Level D Tasks:

Mobilization/Demobilization

Sampling and surveys of general site areas.

Movement of potentially contaminated materials to storage/transport trailers.

6.0 MEDICAL SURVEILLANCE REQUIREMENTS

Medical monitoring programs are designed to track the physical condition of employees on a regular basis as well as survey pre-employment or baseline conditions prior to potential exposures. The medical surveillance program is a part of each employer's Health and Safety Program.

8.0 SITE CONTROL MEASURES

The following section defines measures and procedures for maintaining site control. Site control is an essential component in the implementation of the Site Health and Safety Program.

8.1 Buddy System

During all Level B activities, should any be needed, or when some conditions present a risk to personnel, the implementation of a buddy system is mandatory. A buddy system requires at least two people who work as a team; each looking out for the other.

8.2 Site Communications Plan

Successful communication between field teams and contact with personnel in the support zone is essential. The following communications systems will be available during all work activities:

Radios: Two way

Intrinsically safe - normal voice, visual contact, or yelling

Hand Signals:

<u>Signal</u>	<u>Definition</u>
Hands clutching throat	Out of air/can't breath
Hands on top of head	Need assistance
Thumbs up	OK/I'm alright/I understand
Thumbs down	No/Negative
Arms waving upright	Send backup support
Grip partner's wrist	Exit area immediately

8.3 Work Zone Definition

The three general work zones established at the work site are the Restricted Zone, Contamination Reduction Zone, and Support Zone. Figure 8.1 provides a site map of the work zones.

The Restricted Zone is defined as the area where contamination is either known or likely to be present, or because of activity, will provide a potential to cause harm to personnel. Entry into the Restricted Zone requires training and the use of personal protective equipment.

The Contamination Reduction Zone is the area where personnel conduct personal and equipment decontamination. It is essentially a buffer zone between contaminated areas and clean areas. Activities to be conducted in this zone will require personal protection as defined in the detailed work plan.

8.4 Nearest Medical Assistance

Figure 8.2 provides a map of the route to the nearest medical facility which can provide emergency care for individuals who may experience an injury or exposure on-site. The route to the medical facility shall be verified by the HSO, and should be familiar to all site personnel.

***** Phone Number: Site specific number listed here

8.5 Safe Work Practices

Table 8.1 provides a list of standing orders for the Restricted Zone.

Table 8.2 provides a list of standing orders for the Contamination Reduction Zone.

8.6 Emergency Alarm Procedures

The warning signals described in Section 10.4 "Evacuation Routes and Procedures", will be deployed in the event of an emergency. Communication signals will also be used according to Section 8.2.

FIGURE 8.1
SITE MAP DEPICTING WORK ZONE

INSERT

SITE

MAP

HERE

FIGURE 8.2
MAP DEPICTING ROUTE TO NEAREST MEDICAL FACILITIES

INSERT

MAP

TO MEDICAL

FACILITY

HERE

TABLE 8.1
STANDING ORDERS FOR RESTRICTED ZONE

- No smoking, eating, drinking or application of cosmetics in this zone.
- No horse play.
- No matches, lighters or tobacco products in this zone.
- Check-in on entrance to this zone (sign the APPROPRIATE RWP).
- Check-out on exit from this zone.
- Implement the communications system.
- Line of sight must be in position.
- Wear the appropriate level of protection as defined in the RWP.

TABLE 8.2
STANDING ORDERS FOR CONTAMINATION REDUCTION ZONE

- No smoking, eating, drinking or application of cosmetics in this zone.
- No horse play.
- No matches, lighters or tobacco products in this zone.
- Wear the appropriate level of protection as defined in the RWP.
- Perform whole body frisk prior to exiting area.

9.0 DECONTAMINATION PLAN

Table 5.2 lists the tasks and specific levels of protection required for each task. Consistent with the levels of protection required, Figure 9.1 provides a step by step representation of the personnel decontamination process for Levels B and C.

9.1 Standard Operating Procedures

Decontamination involves the orderly controlled removal of contaminants. Standard decontamination sequences are presented in Figure 9.1. All site personnel should minimize contact with contaminants in order to minimize the need for extensive decontamination. This is accomplished through the use of PPE, proper work practices, engineering controls, labels, and barriers.

9.2 Levels of Decontamination Protection Required for Personnel

The levels of protection required for personnel assisting with decontamination are modified Level D.

The HSO/RPS is responsible for monitoring decontamination procedures and determining their effectiveness.

9.3 Equipment Decontamination

All equipment will be decontaminated to the free release levels specified in the Work Plan.

FIGURE 9.1
LEVEL C & D DECONTAMINATION PROCESS

Step 1 Segregated equipment drop

Step 2 Tape removal

Step 3 Outer Boot removal

Step 4 Outer Glove removal

Step 5 Tyvek removal

Step 6 Respirator removal

----- **HOT LINE** -----

Step 7 Remove one bootie, step across line

Step 8 Remove next bootie, step across line

Step 9 Remove inner gloves

Step 10 Frisk

Step 11 Redress, if applicable

Step 12 Wash face and hands (Shower at end of the day at hotel)

10.0 EMERGENCY RESPONSE/CONTINGENCY PLAN

This section describes contingencies and emergency planning procedures to be implemented at the site. This plan is compatible with local, state and federal disaster and emergency management plans as appropriate.

10.1 Pre-Emergency Planning

During the site briefings, all employees will be trained in and reminded of provisions of the emergency response plan, communication plan, and evacuation routes. Table 10.1 identifies the hazardous conditions associated with specific site activities.

10.2 Personnel Roles and Lines of Authority

The Project Manager has primary responsibility for responding to and correcting emergency situations. This includes taking appropriate measures to ensure the safety of site personnel and the public. Possible actions may involve evacuation of personnel from the site area. He/she is additionally responsible for ensuring that corrective measures have been implemented, appropriate authorities notified, and follow-up reports completed. The HSO/RPS may be called upon to act on behalf of the Project Manager, and will direct responses to any medical emergency.

The Project Manager will notify MKM management personnel of accidents/incidents involving general safety, chemical exposure or radioactive material/radiation exposure. Table 10.2 identifies the MKM personnel that should be contacted in case of an emergency.

10.3 Emergency Recognition/Prevention

Table 3.1 provides a listing of physical hazards onsite. Potential additional hazards as a direct result of site activities are listed in Table 10.1. Personnel will be familiar with techniques of hazard recognition from pre-assignment training and site specific briefings. The HSO/RPS is responsible for ensuring that prevention devices or equipment is available to personnel.

10.4 Evacuation Routes/Procedures

In the event of an emergency which necessitates an evacuation of the site, the following alarm procedures will be implemented: Three Horn Blasts.

Personnel will be expected to proceed to the closest exit with their buddy, and mobilize to the posted, pre-designated meeting area. Personnel will remain at that area until an authorized individual provides further instructions.

Figure 10.1 provides a map depicting evacuation routes for the site and immediate area.

10.5 Emergency Contact/Notification System

The following list provides names and telephone numbers for emergency contact personnel. In the event of a medical emergency, personnel will take direction from the HSO and notify the appropriate emergency organization. In the event of a fire or spill, the Site Supervisor will notify the appropriate local, state, and federal agencies.

<u>Local Organization</u>	<u>Contact</u>	<u>Telephone</u>
Ambulance		
Police (Base)		
Police (Civil)		
Fire		
Hospital		
Poison Control Center		800-366-8888
Region X EPA		
National Response Center		Emergency 415-744-1305
Center for Disease Control	CDC	800-232-1311
State Environmental Protection Division		

10.6 Emergency Medical Treatment Procedures

Any person who becomes ill or injured in the Restricted Zone must be "frisked" to the maximum extent practical without delaying or affecting medical support or care. If the injury or illness is minor, full decontamination should be completed and first aid administered prior to transport. If the patient's condition is serious, decontamination may be delayed, but emergency response personnel must be appraised of the situation. First aid should be administered while awaiting an ambulance or paramedics. All injuries must be immediately reported to the Project Manager.

Any person being transported to a clinic or hospital for treatment should take with them information on the materials they may have been exposed to at the site. The HSO/RPS or a RCT will accompany an injured person to the clinic or hospital.

Any vehicle used to transport contaminated personnel will be treated and cleaned as necessary.

10.7 Fire or Explosion

In the event of a fire or explosion, the base fire department should be summoned immediately. Upon their arrival, the Project Manager or designated alternate will advise the Fire Marshall of the location, nature, and identification of the hazardous materials on site.

If it is safe to do so, qualified site personnel may:

- Use fire fighting equipment available on site to extinguish incipient stage fires; and,
- Remove or isolate flammable or other hazardous materials which may contribute to the fire.

NOTE: Extinguishing media available on site: Class A, B, C extinguisher for all fires.

10.8 Spill or Leaks

In the event of a spill or a leak, site personnel will:

- Inform their supervisor immediately;
- Locate the source of the spillage and stop the flow if it can be done safely; and,
- Begin decontamination and recovery of the spilled materials.

10.9 Emergency Equipment/Facilities

Figure 10.2 provides a map of the site and identifies the location of the following emergency equipment:

- | | |
|--|--|
| <input checked="" type="checkbox"/> First Aid Kit | <input checked="" type="checkbox"/> Eye Wash |
| <input checked="" type="checkbox"/> Fire Extinguisher | <input checked="" type="checkbox"/> Emergency Shower |
| <input checked="" type="checkbox"/> Stretcher | <input checked="" type="checkbox"/> Two-way Radio |
| <input checked="" type="checkbox"/> Public Telephone | <input checked="" type="checkbox"/> Off-site Telephone |
| <input checked="" type="checkbox"/> Site Telephone | <input checked="" type="checkbox"/> Drums or B-25 boxes |
| <input checked="" type="checkbox"/> Mobile Telephone | <input checked="" type="checkbox"/> Berm Material |
| <input checked="" type="checkbox"/> Absorbent Material | <input checked="" type="checkbox"/> Air Monitoring Station |
| <input checked="" type="checkbox"/> Spill Kits | <input checked="" type="checkbox"/> Emergency SCBAs |
| <input checked="" type="checkbox"/> Decon basins | <input checked="" type="checkbox"/> Other |

TABLE 10.1
EMERGENCY RECOGNITION/CONTROL MEASURES

<u>Hazard</u>	<u>Specific Condition/Location</u>	<u>Prevention/Control</u>
Fire/Explosion	Site	A, B, C, D extinguishers
Spill	All areas	Absorbent Materials
Air Release	Site	Assess extent of contamination, from the site, notify the project manager immediately.

FIGURE 10.1
EVACUATION ROUTES AND SAFE DISTANCES

INSERT SITE MAP WITH EVACUATION

ROUTES AND SAFE WORKING DISTANCES

FIGURE 10.2
SITE MAP WITH EMERGENCY EQUIPMENT LOCATED

- | | |
|----------------------------|---------------------------|
| <u>A</u> First Aid Kit | <u>D</u> Eye Wash |
| <u>B</u> Fire Extinguisher | <u>—</u> Emergency Shower |
| <u>C</u> Site Telephone | <u>F</u> Mobile Telephone |

INSERT SITE MAP WITH
EMERGENCY EQUIPMENT LOCATIONS

11.0 SPILL CONTAINMENT PROGRAM

The procedures defined in this section comprise the spill containment program in place for project activities.

- All containers used shall meet the appropriate DOT, OSHA, and EPA regulations for the waste that they will contain.
- Containers shall be inspected and their integrity assured prior to being moved. Containers that cannot be inspected before being moved because of storage conditions, shall be positioned in an accessible location and inspected prior to further handling.
- Operations on site will be organized so as to minimize the amount of container movement.
- Employees involved in the container operations shall be warned of the hazards associated with the containers.
- Where spills, leaks, or ruptures may occur, adequate quantities of spill containment equipment (absorbent) will be stationed in the immediate area. The spill containment program must be sufficient to contain and isolate the entire volume of hazardous substances being transferred.
- Fire extinguishing equipment meeting 29 CFR Part 1910, Subpart 1 shall be on hand and ready for use to control incipient fires. This will consist of Class A, B, C fire extinguisher.
- Containers in poor condition will be overpacked.
- Containers shall have sufficient labels and markings to meet site requirements.

12.0 Unexploded Ordnance (UXO) Safety Precautions

DANGER

No MKM personnel or visitors will be allowed to sample in areas which are outside of the work area boundaries. All work areas must be checked for the presence of UXO prior to working in those areas.

All personnel working in these areas:

- Shall be trained.**
 - Shall comply with UXO safety procedures.**
 - Shall work only in areas that have been checked for UXO.**
 - Shall NOT touch or move suspect ordnance.**
-

- **All contractor personnel will receive training regarding working in the areas where the potential for UXO exists prior to any work at the work site. This training will be given by the UXO supervisor.**
- **UXO personnel will comply with all applicable provisions for safety as described in: The U.S. Army Engineering and Support Center's SAFETY CONCEPTS AND BASIC CONSIDERATIONS FOR UNEXPLODED ORDNANCE (UXO) OPERATIONS.**
- **All personnel will restrict their activities to the established boundaries of the work site that have been searched by the UXO team.**
- **If the need arises to characterize beyond the identified area, then the new area will be investigated by the contractor's UXO personnel prior to any work being conducted.**
- **No personnel will touch or move any suspect piece of ordnance.**