

DRAFT

ACCIDENT PREVENTION PLAN

Interim Measures for Parcel 21 – Solid Waste Management Unit (SWMU) No. 1 & Parcel 24 – Igloo Block A and Abandonment of Wells

Fort Wingate Depot Activity
McKinley County, New Mexico

February 4, 2016

Contract No. W9128F-13-D-0025
Task Order No. DS01, Mod No. 1

Prepared for:



**US Army Corps
of Engineers®**

US Army Corps of Engineers
Tulsa District
1645 South 101st East Avenue
Tulsa, OK 74128

Prepared by:



Zapata Incorporated
6302 Fairview Road, Suite 600
Charlotte, North Carolina 28210

REPORT DOCUMENTATION PAGE

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7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Zapata Incorporated 6302 Fairview Road, Suite 600 Charlotte, North Carolina 28210	8. PERFORMING ORGANIZATION REPORT NUMBER N/A
--	--

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) U.S. Army Corps of Engineers, Tulsa District 1645 South 101 st East Avenue Tulsa, OK 74128 Project Manager: M. Saqib Khan (USACE SWT)	10. SPONSOR/MONITOR'S ACRONYM(S) USACE
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14. ABSTRACT
The Accident Prevention Plan (APP) defines the activity being performed, the hazards posed, and control measures required to perform the work safely. Workers are briefed on the AHA before performing the work and their input is solicited before, during, and after the performance of work to further identify the hazards posed and control measures required.

15. SUBJECT TERMS
Fort Wingate Depot Activity, Interim Measures for Parcel 21 – SWMU 1, Parcel 24 – Igloo Block A, and Abandonment of Wells.

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Draft
Accident Prevention Plan
Interim Measures for
Parcel 21 – Solid Waste Management Unit 1,
Parcel 24 – Igloo Block A, and
Abandonment of Wells

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BIA-NR = Bureau of Indian Affairs – Navajo representative
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 BRACD = U. S. Army Base Realignment and Closure Division
 DOI/BLM = Department of Interior Bureau of Land Management
 EPA 6 = U. S. Environmental Protection Agency Region 6
 FWDA ARM = Fort Wingate Depot Activity Administrative Records Manager
 FWDA BEC = Fort Wingate Depot Activity Base Realignment and Closure Environmental Coordinator
 FWDA EIMS = Fort Wingate Depot Activity Environmental Information Management System
 NMED = New Mexico Environment Department
 NN = Navajo Nation
 POZ = Pueblo of Zuni
 USACE SPA = U. S. Army Corps of Engineers – Albuquerque District.*
 USACE SPK = U. S. Army Corps of Engineers – Sacramento District.*
 USACE SWF = U. S. Army Corps of Engineers – Fort Worth District
 USACE SWT = U. S. Army Corps of Engineers – Tulsa District
 USAEC = U. S. Army Environmental Command

***For MEC (Munitions and Explosives of Concern) investigations only.**

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Attachment 4	Material Safety Data Sheets

Attachment 5	Heat Stress and Cold Stress: Environmental Assessment and Management of Exposure
Attachment 6	Excavation Safety Plan
Attachment 7	Response to Comments

ACRONYMS AND ABBREVIATIONS

1		
2		
3	%	percent
4	⁰ F	degrees Fahrenheit
5		
6	AHA	Activity Hazard Analysis
7	AOC	Area of Concern
8	APP	Accident Prevention Plan
9		
10	BBLPS	Behavior-Based Loss Prevention System
11	BIA	Bureau of Indian Affairs
12		
13	CESPA	US Army Corps of Engineers, Albuquerque District
14	CESWT	US Army Corps of Engineers, Tulsa District
15	CFR	Code of Federal Regulations
16	CIH	Certified Industrial Hygienist
17	COR	Contracting Officer Representative
18	C.P.G.	Certified Professional Geologist
19	CPR	Cardiopulmonary Resuscitation
20	CRZ	Contaminant Reduction Zone
21	CSP	Certified Safety Professional
22	CY	cubic yard
23		
24	DDESB	Department of Defense Explosives Safety Board
25	DFWP	Drug-Free Workplace Program
26	DID	Data Item Description
27		
28	EM	Engineer Manual
29	EMR	Experience Modification Rate
30	EOD	explosive ordnance disposal
31		
32	FWDA	Fort Wingate Depot Activity
33		
34	GCAL	Gulf Coast Analytical Laboratories
35	GFCI	Ground Fault Circuit Interrupter
36	HAZWOPER	Hazardous Waste Operations and Emergency Response
37	HE	High Explosive
38		
39	IDW	Investigation Derived Waste
40	IIF	Incident Investigation Form
41	IM	Interim Measures
42	IRF	Incident Report Form
43		
44	LLC	Limited Liability Company
45	LPO	Loss Prevention Observation
46		

ACRONYMS AND ABBREVIATIONS (Continued)

47		
48		
49	MC	Munitions Constituents
50	MEC	Munitions and Explosives of Concern
51	MSDS	Material Safety Data Sheet
52		
53	NLI	Near-Loss Investigation
54	NM	New Mexico
55		
56	OESS	Ordnance and Explosive Safety Specialist
57	OSHA	Occupational Safety and Health Administration
58		
59	P.G.	Professional Geologist
60	PhD	Doctor of Philosophy
61	PM	Project Manager
62	POC	Point of Contact
63	PPE	Personal Protective Equipment
64	PSHA	Pre-task Safety and Health Analysis
65	PSM	Program Safety Manager
66		
67	QC	Quality Control
68		
69	RCAF	Root Cause Analysis Form
70	RCRA	Resources Conservation and Recovery Act
71		
72	SSHP	Site Safety and Health Plan
73	SSO	Site Safety Officer
74	SUXOS	Senior Unexploded Ordnance Supervisor
75	SWMU	Solid Waste Management Unit
76		
77	TNT	Trinitrotoluene
78		
79	UL	Underwriters Laboratories
80	USACE	United States Army Corps of Engineers
81	UXO	Unexploded Ordnance
82		
83	WBGT	Wet Bulb Globe Temperature
84		
85	ZAPATA	Zapata Incorporated
86		
87		
88		
89		

90 **1.0 SIGNATURE SHEET**

91 This Accident Prevention Plan (APP) has been approved for use during the conduct of interim
92 measures for Parcel 21 (Solid Waste Management Unit [SWMU] No. 1) and Parcel 24 (Igloo
93 Block A) and for the abandonment of wells at Fort Wingate Depot Activity (FWDA), New
94 Mexico.


95
96 **Plan Preparer**

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98 Title: Project Manager (PM)
99 Company: Zapata Incorporated (ZAPATA)
100 Telephone: (402) 871-2891

101
102 Signature:  _____

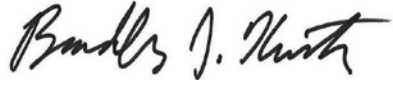
103
104 **Approved By**

105 Name: Michael Winningham
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108 Telephone: (704) 378-4935

109
110 Signature:  _____

111
112 **Plan Concurrence**

113 Name: Bradley J. Kuntz, CIH
114 Title: Program Safety Manager (PSM)
115 Company: ZAPATA
116 Telephone: (704) 378-4920

117
118 Signature:  _____

119 **2.0 BACKGROUND INFORMATION**

120 **2.1 CONTRACTOR**

121 Zapata Incorporated (ZAPATA) is the prime contractor for the conduct of interim measures for
122 Parcel 21 (SWMU No. 1) and Parcel 24 (Igloo Block A) and for the abandonment of wells at
123 FWDA), New Mexico. Contact information is as follows:

124 Zapata Incorporated – Corporate Office
125 6302 Fairview Road; Suite 600
126 Charlotte, NC 28210
127 (704) 358-8240

128
129 ZAPATA PM:
130 Steven E. Morrissette, P.G., C.P.G.
131 Zapata Incorporated
132 4312 South 198th Street
133 Omaha, NE 68135
134 (402) 871-2891

135 **2.2 CONTRACT NUMBER**

136 ZAPATA is completing this work for the United States Army Corps of Engineers (USACE),
137 Tulsa District (CESWT) under Contract No. W9128F-13-D-0025, Delivery Order DS01, Mod
138 No. 1.

139 **2.3 PROJECT NAME**

140 The project name is Interim Measures (IM) for Parcel 21 –SWMU No. 1 & Parcel 24 – Igloo
141 Block A and Abandonment of Wells for FWDA, New Mexico.

142 **2.4 PROJECT DESCRIPTION**

143 ZAPATA will be completing soil excavation, removal, and off-site disposal from Parcel 21 at
144 SWMU 1, at a portion of Parcel 21 commonly known as the Trinitrotoluene (TNT) leaching
145 beds. A potential 75,000 cubic yards (CY) of explosives-contaminated soil is planned to be
146 removed from the leaching beds. Once the contaminated soil is removed, clean fill that is
147 currently located on the FWDA will be used to backfill the excavations. Prior to beginning
148 excavation, surface and shallow subsurface soil that has a TNT concentration of 10 percent (%)
149 or more will be homogenized with soil from existing leach bed berms and the surface soil of the
150 leach beds that has lower TNT concentrations. This first step will be completed in order to
151 reduce any soil concentrations of TNT to below 10% levels, thereby removing any potential
152 explosive hazards from site soils. This homogenization will be conducted within the leaching
153 bed boundaries prior to the soil being excavated for disposal.

154 Work to be completed by ZAPATA in Igloo Block A includes Parcel 24. A total of 77 igloos
155 within Parcel 24 are equipped with dual metal drain pipes that exit the front walls of the igloos.
156 These drain pipes are painted with lead-based paint and will be removed by cutting the pipes off
157 flush with the concrete igloo walls, followed by backfilling the resulting holes in the igloo walls

158 with concrete cement. The removed drain pipes will be handled, packaged, and disposed as lead-
159 containing materials. Following drain pipe removal, approximately ¼ CY of soil will be hand
160 excavated from beneath each drain pipe outfall from select drains where exceedances of risk-
161 based screening levels for arsenic, lead, and/or mercury were detected during past sampling
162 efforts. The soils will be combined, sampled for waste characterization, and disposed at a
163 Resources Conservation and Recovery Act (RCRA) Subtitle D landfill. Confirmation soil
164 samples will be collected from the bottom of each drain pipe excavation for comparison to the
165 human health-based screening criteria.

166 The final work element to be completed by ZAPATA is the abandonment of up to six monitoring
167 wells located throughout the FWDA. ZAPATA will utilize a driller licensed in the state of New
168 Mexico to complete the well abandonment. It is expected that standard equipment (trucks,
169 appurtenances) used for abandoning wells will be used during this work element. Wells TMW-
170 32 and TMW-41 at the TNT leaching beds will only be abandoned if the excavation activities
171 planned at the TNT leaching beds impacts the locations of these wells. Note that four of these
172 wells, FW89, FW90, FW91 and FW26, have already been abandoned prior to issuing
173 Modification No. 01.

174 Available information indicates that the principal potential hazards during site activities will be:

- 175 • Potentially explosive soils at the TNT leach beds in Parcel 21 prior to soil mixing,
- 176 • Heavy equipment operation and large open excavations at the TNT leaching beds,
- 177 • Removal, handling and disposal of drain pipes painted with lead-based paint at the
- 178 Parcel 24 igloos,
- 179 • Inadvertently encountering Munitions and Explosives of Concern (MEC),
- 180 • Weather-related hazards (i.e., heat, storms, wet conditions), and,
- 181 • Biological hazards such as poisonous snakes and insects.

182 **2.5 DEFINABLE FEATURES OF WORK REQUIRING ACTIVITY HAZARD ANALYSIS**

183 One of the key elements in reducing project risk is the use of an Activity Hazard Analysis
184 (AHA) for each major phase of work. An AHA defines the activity being performed, the hazards
185 posed, and control measures required to perform the work safely. Workers are briefed on the
186 AHA before performing the work and their input is solicited before, during, and after the
187 performance of work to further identify the hazards posed and control measures required. AHAs
188 will be implemented before beginning each project activity posing health and safety hazards to
189 project personnel using the AHA forms provided in Attachment 2. The following phases of
190 work require AHAs:






- 191 • Mobilization and Site Preparation.
- 192 • Potentially explosive soil (>10% TNT) homogenization within the TNT Leaching beds
- 193 using heavy equipment.
- 194 • Explosives-contaminated soil excavation, stockpiling, and disposal from the TNT
- 195 Leaching beds using heavy equipment.
- 196 • Drain pipe with lead-based paint removal, handling, and disposal, and soil removal and
- 197 disposal using hand tools at Parcel 24 within Igloo Block A.
- 198 • Abandonment of up to six monitoring wells using power well abandonment equipment
- 199 (trucks, grout mixers, pumps, etc.).

200

- Demobilization.

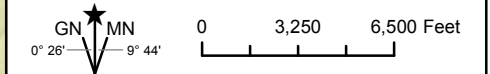
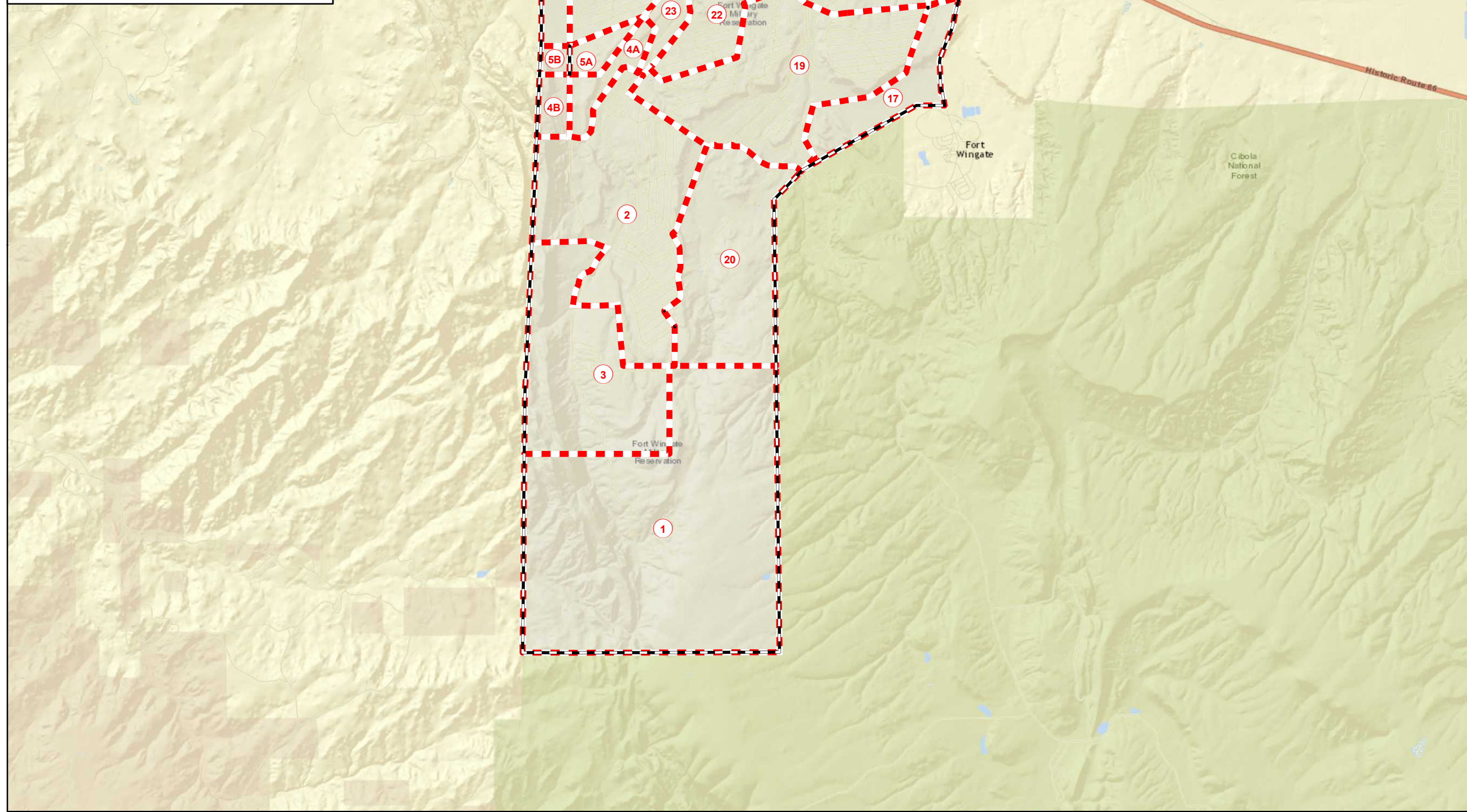
Installation Location Map & Parcel Designations
Parcel 21 & Parcel 24
Fort Wingate, NM

Project Number	Date	Figure
R20179	FEBRUARY 2016	2-1

- KEY**
-  SWMU 1
 -  Parcel 21
 -  Parcel 24
 -  Parcel Boundary
 -  Installation Boundary



Overview



Source(s)
ZAPATA, USACE, Esri

Projection
NAD 1983 StatePlane New Mexico West FIPS 3003 Feet
Note: Main Data Frame Rotated to True North

Note(s)
Engineering scale may only be accurate on a map size of 11 x 17

Magnetic Declination Date: 06/16/2014
Magnetic Declination Shifting by 0° 7' W per year





















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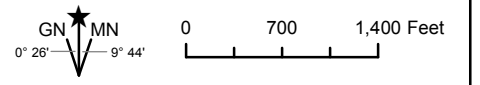
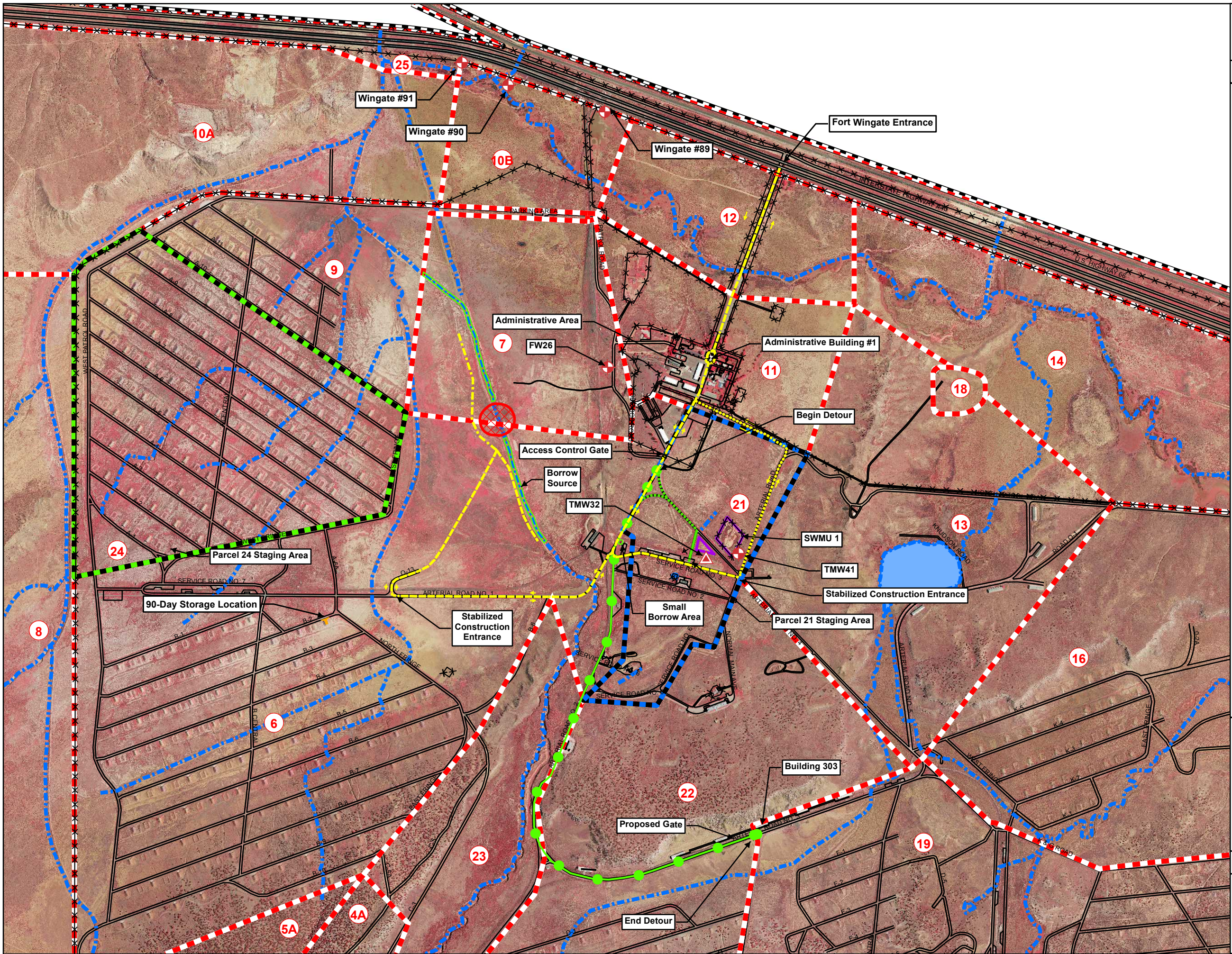


Proposed Well Abandonment
Locations & Access Routes
Parcel 21 & Parcel 24
Fort Wingate, NM

Project Number	Date	Figure
R20179	FEBRUARY 2016	2-2

KEY

-  Alluvial Monitoring Well Proposed for Abandonment
-  Bedrock Monitoring Well Proposed for Abandonment
-  Fence
-  Traffic Flow Direction
-  Access (Haul) Route
-  Alternate Access (Haul) Route
-  New Access (Haul) Road North of TCP
-  Proposed Detour for FWDA Traffic
-  Proposed Section of FWDA Roads To Be Temporarily Closed
-  Arroyo
-  Road
-  Borrow Source
-  Parcel 24
-  Parcel 21
-  SWMU 1 TNT Beds
-  90-Day Storage Location
-  Parcel Boundary
-  Traditional Cultural Property Buffer (200 ft)
-  Water Body
-  Installation Boundary



Source(s)
ZAPATA, USACE, 2009 Color Infrared Aerial Photo

Projection
NAD 1983 StatePlane New Mexico West FIPS 3003 Feet
Note: Main Data Frame Rotated to True North

Note(s)
Engineering scale may only be accurate on a map size of 11 x 17

Magnetic Declination Date: 06/16/2014
Magnetic Declination Shifting by 0° 7' W per year

Checked By	Engineering Scale	Drawn By
SEM	1" = 1,400'	ATD



222 **3.0 STATEMENT OF SAFETY AND HEALTH POLICY**

223 ZAPATA is committed to safety, and to a corporate culture in which all employees are
224 knowledgeable of potential workplace hazards and empowered to participate actively in accident
225 prevention and risk reduction. When asked the question: “Who is responsible for safety?” the
226 correct response is “I am!” Safety is the responsibility of employees at all levels. Managers are
227 expected to promote safety awareness through training programs for their employees, and
228 employees are encouraged to report any concerns about workplace health and safety to
229 management.

230 The ZAPATA Safety Department is charged with the recognition, evaluation, and management
231 of potential threats to health and safety in the work environment. The Safety Department also is
232 responsible for regulatory compliance in the area of workplace health and safety and for serving
233 as the role of liaison with client safety officials.

234 The Safety Department reports to the ZAPATA President, a corporate officer outside the chain
235 of command for project management. In matters related to workplace health and safety,
236 designated Site Safety Officers (SSOs) report directly to the Safety Department – not to project
237 or site managers. The Safety Department and/or the site safety officer may require changes in
238 site work procedures to reduce risks to employees. The safety officer may halt site work if
239 necessary.

240 The ZAPATA PM will designate a SSO responsible for implementing safety procedures. The
241 safety officer will hold safety meetings at a prescribed frequency (at least daily) to encourage
242 safe work during site work activities.

243 Project managers, field supervisors, and SSOs are expected to inspect the work environment
244 regularly, review potential project hazards, identify unsafe conditions, and make routine reports
245 to the corporate Safety Department. In addition, they are responsible for investigating accidents
246 and injuries that occur on their sites and preparing reports on these events for review by the
247 ZAPATA Manager of Health and Safety.

248 All employees are expected to maintain awareness of the potential hazards present at their work
249 site and to follow requirements of safety plans designed to manage those risks. They are
250 required to report unsafe conditions; work-related accidents, injuries, and illnesses; and “near-
251 miss” incidents that could have caused injury to people or damage to property. Corrective action
252 will be taken promptly by the Manager of Health and Safety, a PM, an SSO, or a senior
253 ZAPATA manager, as appropriate. ZAPATA will take no adverse action against any employee
254 who complains in good faith about an unsafe condition in the workplace.

255 Violation of a safety rule shall be grounds for termination. A PM or other senior manager may
256 issue a written warning after an employee’s first violation, if termination is deemed inappropriate
257 under the circumstances. The written warning shall be included in the employee’s personnel
258 record for three years. If the employee commits a second violation that results in a written
259 warning within a three-year period, then he or she shall be terminated.

260

261 Subcontractors will work under the same rules that apply to ZAPATA employees, unless some
262 other arrangement is deemed at least equally effective in promoting a safe and healthful work
263 environment. A PM or SSO shall order an employee of a subcontractor to leave the project site
264 and forbid his or her return if that employee shows disregard for site safety rules and/or protocol.
265 A subcontractor firm that fails to enforce site safety rules shall not be permitted to perform field
266 work on a ZAPATA project.

267 Visitors to project sites shall receive appropriate safety briefings. The field supervisor or SSO
268 shall verify that visitors possess any required training or medical certifications, and that they use
269 appropriate personal protective equipment (PPE).

270 The accident experience goal for this project is Target Zero; zero injuries, illnesses, and no
271 adverse environmental impacts. ZAPATA safety performance data are provided in Table 3-1.

272 **TABLE 3-1 EXPERIENCE MODIFICATION RATE (EMR) DATA**

Year	EMR for ZAPATA
2015	0.74
2014	0.75
2013	0.86
2012	0.87
2011	0.85
2010	0.74

273
274

275 **4.0 RESPONSIBILITIES AND LINES OF AUTHORITY**

276 With ZAPATA, the health and safety of employees, clients, and the community is the first
277 priority. The health and safety measures described herein are focused on field operations, but
278 these measures also extend to other areas over which we have stewardship. If an activity or
279 condition at a location under our control is determined to be inconsistent with our health and
280 safety policies and procedures, all efforts will be made to correct the situation immediately or as
281 soon as feasibly possible. At no time shall any employee perform duties in a work environment
282 that is immediately dangerous to life and health or in an imminently dangerous situation. In
283 these situations, the task will not proceed until the situation is corrected.

284 ZAPATA directs the subcontractor's supervisor regarding the work and the manner in which the
285 tasks are to be performed. Subcontractors are responsible for assigning specific tasks to their
286 employees; ensuring their employees are properly trained and are in compliance with applicable
287 regulations; and allocating sufficient time, materials, and equipment to safely complete activities
288 in accordance with this APP/Site Safety and Health Plan (SSHP), and their own health and safety
289 programs. Subcontractors will attend the daily health and safety meeting prior to starting field
290 work.

291 Individuals employed by subcontractors/vendors will receive a site-specific briefing regarding
292 potential MEC and other potential hazards present on the work site, required safety activities, and
293 their individual roles and responsibilities for safety practices. While onsite,
294 subcontractors/vendors will be under the direct supervision of the ZAPATA Site
295 Supervisor/Senior Unexploded Ordnance Supervisor (SUXOS). During the mixing of soils >
296 10% TNT at the TNT leaching beds an unexploded ordnance (UXO) Technician II and a UXO
297 Technician III will be present on site for those activities. All other work will also be under the
298 supervision of the on-site SSO.

299 **4.1 REQUIREMENTS FOR PRE-TASK SAFETY AND HEALTH ANALYSIS**

300 Daily safety meetings are held with all project personnel in attendance to review the hazards
301 posed and required health and safety procedures/AHAs that apply for each day's project
302 activities. The pre-task safety and health analysis (PSHA) serves the same purpose as these
303 general assembly safety meetings, but the PSHAs are held between the crew supervisor and their
304 work crews to focus on those hazards posed to individual work crews. At the start of each day's
305 activities, the crew supervisor completes the Tail-Gate Safety Meeting form with input from the
306 work crew, during their daily safety meeting. The day's tasks, personnel, tools, and equipment
307 that will be used to perform these tasks are listed, along with the hazards posed and required
308 health and safety procedures, as identified in the AHA. The use of PSHAs better promotes
309 worker participation in the hazard recognition and control process, while reinforcing the task-
310 specific hazard and required health and safety procedures with the crew each day.

311 **4.2 LINES OF AUTHORITY**

312 The organizational chart depicting lines of authority is included as Figure 4-1. ZAPATA will
313 require that personnel and subcontractors follow the requirements in this APP/SSHP and verify
314 that this requirement is being met.

315 **4.3 POLICIES AND PROCEDURES REGARDING NONCOMPLIANCE**

316 Under ZAPATA's APP, all employees including subcontractors are required to follow and
317 comply with company safety policies and procedures. When needed, employees will be
318 provided with additional training and information to maintain and supplement their knowledge.

319 ZAPATA's discipline policy is intended to encourage employee compliance with the APP and to
320 comply with the mandate of 29 Code of Federal Regulations (CFR) 1926 and the applicable
321 provisions of 29 CFR 1910.

322 While ZAPATA expressly reserves the right to discharge any employee "at will," anything
323 contained herein to the contrary notwithstanding, employees found performing work in an unsafe
324 manner that would endanger the employee or another employee shall be subject to discipline, up
325 to and including termination of employment.

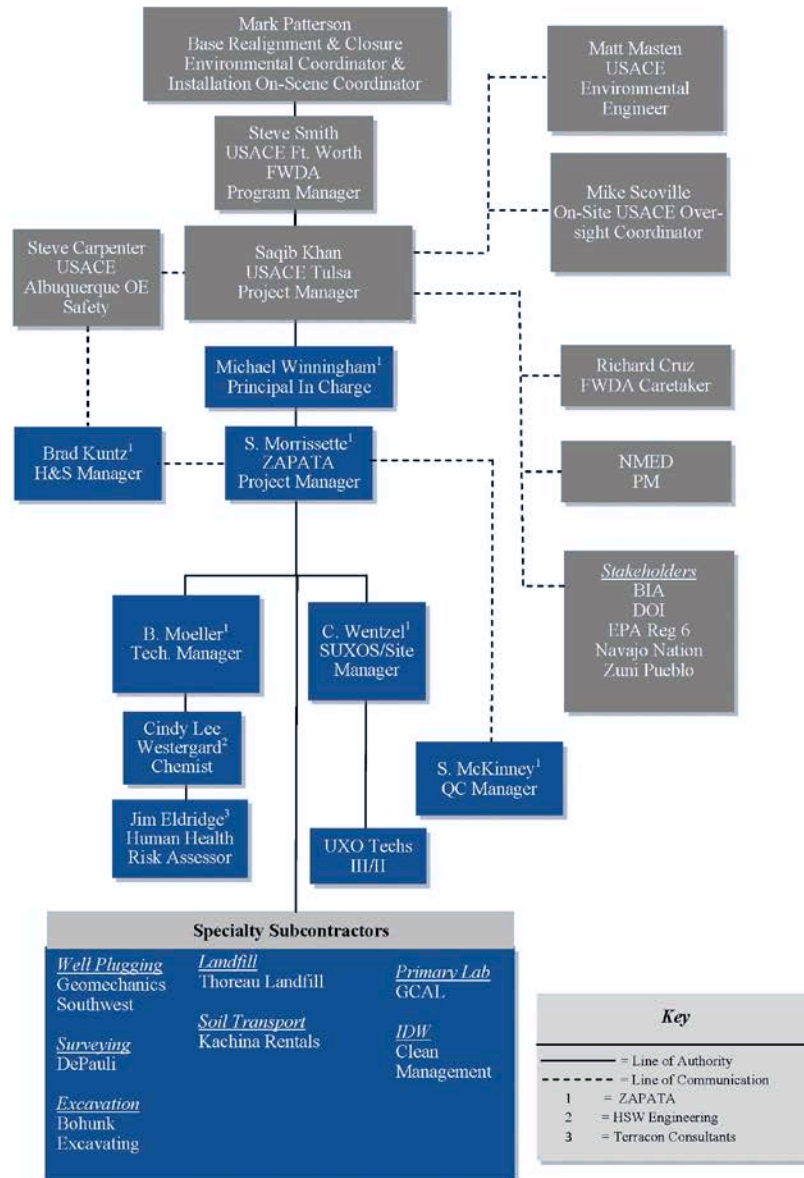
326 The PM will determine the course of action best suited to the circumstances. Depending upon
327 the severity and circumstances of the infraction, the steps to be taken may include the following:

- 328 • **Verbal Warning:** As a first step in correcting unacceptable safety related behavior, the
329 supervisor shall review the pertinent facts with the employee. The supervisor will
330 consider the severity of the problem and the employee's past performance. Depending
331 upon the severity of the problem, a verbal warning may be issued to the employee,
332 which will be documented by the supervisor in the supervisor's daily log and in the
333 employee's personnel file.
- 334 • **Written Warning:** If unacceptable performance continues, there will be a written
335 warning. The written warning will clearly state the safety policy violated and steps the
336 employee must take to correct the unacceptable performance and the time by which the
337 unacceptable performance shall be remedied. At the completion of the review period,
338 the supervisor will meet with the employee to determine if the employee has achieved
339 the required level of performance. The existing Counseling Statement/Reply Form will
340 be employed to document the written warning(s). The written warning may also
341 include suspension.
- 342 • **Suspension:** The employee may be suspended without pay for a period of up to three
343 days, if the infraction is sufficiently severe, if he/she does not improve his/her
344 performance during the review period, or if he/she has violated another company safety
345 policy within 12 months.
- 346 • **Termination:** The employee may be terminated if the infraction is sufficiently severe, if
347 he/she does not improve his/her performance during the review period, or if he/she has
348 violated another company safety policy within 12 months. The existing Termination
349 Report form will be employed to document termination of employment because of
350 employee noncompliance with safety.

351 **4.4 PROCEDURES FOR HOLDING MANAGERS AND SUPERVISOR ACCOUNTABLE FOR SAFETY**

352 Managers and supervisors bear the major responsibility for job site safety and compliance with
353 this APP and are fully subject to the immediately foregoing compliance/disciplinary policy.
354 Additionally, an integral part of the performance evaluation of all managers and supervisors is
355 their respective safety compliance. The safety incentive plan for project management provides
356 both positive and negative inducements for managerial and supervisory safety accountability.

357 **FIGURE 4-1 PROJECT ORGANIZATIONAL CHART**



358
359

360 **5.0 SUBCONTRACTORS AND SUPPLIERS**

361 Several subcontractors and suppliers/vendors will support ZAPATA during activities at FWDA.
362 Details regarding subcontractors and their responsibilities are found in the following sections.

363 **5.1 IDENTIFICATION OF SUBCONTRACTORS AND SUPPLIERS**

364 ZAPATA has solicited qualified subcontractors and vendors to complete limited portions of the
365 project scope. ZAPATA will subcontract drilling, laboratory, data validation, waste disposal,
366 explosives delivery, and surveying services at the site as listed in Table 5-1.

TABLE 5-1 KEY SUBCONTRACTORS

Organization	Primary POC(s)	Project Role
Geomechanics Southwest, Inc.	Branden L. Sanders (505) 345-5594	Monitoring well abandonment
Red Rocks Landfill	Gary Ford (505) 905-8402	Soil disposal landfill - Red Rocks Landfill
Bohunk Excavating	Kevin Shafer (928) 522-0117	Soil excavation and backfilling (Parcel 21), drain pipe removal and disposal and soil excavation (Parcel 24)
GCAL Laboratories, Inc.	Kimberly Drag (225) 769-4900	Laboratory analytical services
DePauli Engineering and Surveying, LLC	Marc DePauli (505) 863-5440	Surveying services
Clean Management Environmental Group, Inc.	Scott Bridgeman (843) 538-8131	IDW Disposal
Kachina Rentals	(505) 726-1740	Soil transportation to the landfill

368 During work in the TNT leaching beds to complete the >10% TNT containing soils
369 homogenization, all subcontractor personnel within the exclusion zone will be escorted by a
370 UXO trained technician to provide construction support and avoidance of potential explosive
371 hazards.

372 **5.2 SAFETY RESPONSIBILITIES OF SUBCONTRACTORS AND SUPPLIERS**

373 Project implementation will require subcontractor and supplier/vendor involvement. Individuals
374 employed by subcontractors and suppliers/vendors will receive a site-specific briefing regarding
375 the potential for MEC, Munitions Constituents (MC), and other hazards present on the work site;
376 required safety activities; and their individual roles and responsibilities for safety practices.

377 While on site, all subcontractors will be under the direct supervision of the Site
378 Supervisor/SUXOS.

379 The SSO will require that employees of any subcontractors adhere to all applicable site safety
380 requirements. This will involve consideration of the nature, location, and duration of their work
381 tasks. At a minimum, employees of subcontractors will receive a daily briefing on anticipated
382 risks and safety rules designed to mitigate those risks. The SSO will consult with the PSM if
383 questions arise. Subcontractors performing work at the site will attend a safety meeting as
384 required by and held by the SSO each day prior to the start of work. The SSO will monitor
385 subcontractor operations to ensure compliance with site safety requirements.

386 Subcontractors must fulfill the requirements established by this APP/SSHP and must
387 acknowledge receipt of the plan and the hazard communication briefing. On-site subcontractors
388 are responsible for providing their personnel with appropriate PPE as specified by this
389 APP/SSHP. Prior to the commencement or continuation of work, subcontractor and third-party
390 personnel have the authority to request a work area hazard assessment by the Site
391 Supervisor/SUXOS. Any member of the work party observing an imminent safety hazard or
392 potentially dangerous situation will immediately suspend field activities.

393 Most subcontractors have their own health and safety plans and/or corporate policies that are
394 specific to their specialty services. ZAPATA is responsible for ensuring that subcontractor
395 employees follow ZAPATA's policies and procedures and this APP/SSHP. If a subcontractor
396 health and safety plan is more restrictive, the subcontractor supervisor must ensure that their own
397 health and safety plan is also followed.

398 Hazards not listed in this APP/SSHP, but known by the subcontractor or known to be associated
399 with a subcontractor's specialty, must be identified and addressed prior to beginning work, both
400 in the subcontractor's health and safety plan and during the daily health and safety briefing. The
401 subcontractor will inform the SSO of these hazards.

402

403 **6.0 TRAINING**

404 All ZAPATA employees, subcontractors' employees, and site visitors must be trained in
405 accordance with this document. In every case, appropriate training will include briefings by the
406 SSO on site hazards and work rules. In addition, the SSO will require evidence of prior
407 completion of mandatory courses in some situations. The SSO will maintain a file of training
408 certificates or other documentation verifying that these requirements have been met.

409 In accordance with Hazardous Waste Operations and Emergency Response (HAZWOPER)
410 (Occupational Safety and Health Administration [OSHA] 29 CFR 1910.120) requirements, all
411 personnel performing work at designated fieldwork areas will meet HAZWOPER Training and
412 medical surveillance. The 40-hour HAZWOPER training requirement (and annual 8-hour
413 refresher training) is applicable to personnel permanently assigned to the field effort. Workers
414 temporarily assigned to enter the site but with limited role in field activities, such as biological
415 and cultural resources personnel, will only be required to have the 24-hour initial training.
416 However, subcontractor(s) assigned to the reconstruction of portions of Arterial Road No.
417 4/Service Road No. 3A will not require HAZWOPER training since they will not enter the
418 SWMU boundaries and have no contact with contaminated soils. ZAPATA site personnel with
419 40 hour HAZWOPER training will escort all road crew personnel while working near Parcel 21
420 – SWMU boundaries

421 **6.1 MANDATORY TRAINING FOR THOSE EXPOSED TO SIGNIFICANT SITE HAZARDS**

422 The SSO will verify that the following training courses have been completed by the personnel
423 permanently assigned to the site, as indicated below:

- 424 • Explosive ordnance disposal (EOD) training. Evidence of EOD certification is
425 required for the UXO technicians and SUXOS, who will provide instruction to team
426 members on avoidance of ordnance hazards.
- 427 • Forty-hour course on health and safety in hazardous waste operations. Evidence of
428 training as a site worker and participation in a medical surveillance program in
429 accordance with 29 CFR 1926.65 is required for site workers and visitors potentially
430 exposed to chemical, radiological, or ordnance hazards. Evidence of a recent annual
431 refresher course also is required.
- 432 • Eight-hour course on supervision of hazardous waste operations. Evidence of training
433 as a supervisor in accordance with 29 CFR 1926.65 is required for supervisory and
434 management personnel.
- 435 • First Aid/CPR. Evidence of current certification in first aid/Cardiopulmonary
436 Resuscitation (CPR) will be required for two ZAPATA employees on the project site at
437 all times. Procedures to manage blood-borne pathogens should be a component of this
438 training.
- 439 • Respirator training. The need for training in the use of respirators is not anticipated.
440 However, if the manager of health and safety deems that it is necessary, the SSO will
441 require that anyone who uses a respirator provide evidence of appropriate training.

442 In addition, the SSO will make inquiries to determine whether new employees have previous
443 experience on hazardous waste or ordnance sites. He will arrange for close supervision of

444 inexperienced workers by an experienced supervisor for at least the first three days of their work
445 on the site.

446 **6.2 SITE-SPECIFIC TRAINING**

447 A detailed presentation on site risks and the workplace health and safety requirements will be
448 conducted by the SSO before work commences on the site, and at other times when new site
449 workers arrive. Topics will include the following:

- 450 • Requirements and responsibilities for maintaining safe and healthful work environment
- 451 • General safety and health policy and procedures
- 452 • Employee and supervisor responsibilities for reporting all accidents
- 453 • Emergency-response plans and procedures for obtaining medical treatment
- 454 • Procedures for reporting and correcting unsafe conditions or practices
- 455 • Specific job hazards and the means to mitigate the risks
- 456 • Names of and contact information for those responsible for safety program
457 administration
- 458 • Site hazards, hazard recognition, and symptoms of excessive exposure to site hazards
- 459 • Proper use of required PPE
- 460 • Safe use of engineering controls and equipment on the project site

461 In addition, the SSO will provide detailed safety training in the following areas to workers
462 exposed to the hazards below:

- 463 • Chemical hazard communication. If chemicals are brought onto the job site, employees
464 potentially exposed to their hazards will receive appropriate safety training. This will
465 include the details of the chemical hazard communication program described in the
466 accompanying site safety and health plan.
- 467 • Fire prevention and response. The SSO will conduct training sessions on measures to
468 prevent fires and procedures for suppressing fires. Employees will receive training in
469 the use of fire extinguishers to fight incipient fires.
- 470 • Control of hazardous energy (lock out/tag out). If site work involves the potential for
471 injury from the release of stored energy, then employees will be trained in appropriate
472 lock-out / tag-out procedures described in the accompanying site safety and health
473 plan.

474 The SSO also will conduct appropriate safety briefings for visitors who will be on the site for
475 short periods. The topics covered will be determined by the nature of the potential hazards to
476 which they will be exposed.

477 If ZAPATA has reason to believe that any affected employee does not have the understanding
478 and skill required for the use of PPE, ZAPATA will make certain that the employee receives the
479 necessary re-training to acquire the appropriate skills.

480 **6.3 PERIODIC SAFETY AND HEALTH TRAINING**

481 The SSO will confer with the manager of health and safety to determine an appropriate schedule
482 for retraining employees in site-specific safety topics.

483 Daily safety briefings will be conducted by the SSO for site personnel prior to the start of each
484 day's activities. Such sessions will be used to discuss anticipated risks and safe practices to
485 mitigate hazards.

486 **6.4 REQUIREMENTS FOR EMERGENCY RESPONSE TRAINING**

487 The Site Supervisor/SUXOS and SSO are designated as members of the emergency action team.
488 These individuals will hold current training certifications in first aid and CPR and will possess
489 detailed knowledge of the Emergency Action Plan discussed in Section 9.2. The Site
490 Supervisor/SUXOS and SSO will provide site workers and visitors emergency action training as
491 part of the new employee/subcontractor health and safety training session or visitor training
492 session as applicable. The Site Supervisor/SUXOS and SSO will also be responsible for
493 describing updates or changes to the emergency action procedures during daily health and safety
494 meetings that will be held with all onsite project personnel. As part of the emergency action
495 training employees and visitors will be provided with information on the following subjects:

- 496 • Emergency recognition and communication procedures
- 497 • Emergency telephone numbers
- 498 • Location of emergency equipment staging areas, material safety data sheets (MSDSs),
499 emergency assembly areas, evacuation routes, and the nearest hospital

500
501

502 **7.0 SAFETY AND HEALTH INSPECTIONS**

503 This APP/SSHP shall provide for frequent safety inspections/audits, conducted by a competent
504 person and/or the SSO, of the work sites, material, and equipment to ensure compliance with the
505 plan and this manual. These inspections/audits shall be documented in writing and available
506 upon request to the USACE, Tulsa District (USACE SWT) PM, M. Saqib Khan. They shall
507 include the name of the inspector, date, and all findings. Also, should any outside agency such as
508 Federal Occupational Safety and Health Administration (OSHA) request an inspection,
509 notification shall be made immediately to M. Saqib Khan at USACE SWT.

510 **7.1 INSPECTIONS**

511 Daily site safety inspections will be conducted by the SSO during this field effort to ensure safe
512 work areas and compliance with the APP, SSHP, OSHA regulations, and Engineer Manual (EM)
513 385-1-1 requirements. Vehicle inspections will be performed daily on all trucks and any heavy
514 equipment. The results of the daily inspections will be documented on a checklist that will be
515 maintained on site. Weekly site inspections will be completed by the SSO and Site
516 Supervisor/SUXOS, or the field supervisor, or their designee. Daily inspections on the day(s) of
517 scheduled field activities will be performed and shall include the activities of ZAPATA, as well
518 as the activities of subcontractor's employees.

519 **7.2 PROOF OF INSPECTOR'S TRAINING/QUALIFICATIONS**

520 The SSO will be certified as a Hazardous Waste Operations and Emergency Response
521 (HAZWOPER) Supervisor under 29 CFR 1910.120(e)(4) and will serve as the Competent
522 Person for the project.

523 **7.3 DOCUMENTATION PROCEDURES**

524 Daily inspections will be noted in the site activity logbook and Inspection Forms (included as
525 Attachment 3). These inspections shall include the activities of ZAPATA, as well as the
526 activities of subcontractor's employees. The SSO will record any deficiencies in the on-site field
527 logbook.

528 **7.4 DEFICIENCY TRACKING SYSTEM**

529 If any deficiencies are identified, they will be noted on a deficiencies log as required by EM 385-
530 1-1, Section 01.A.12d. Deficiencies identified in these inspections will be corrected in a timely
531 manner, recorded in daily safety inspection reports, discussed at the daily on-site health and
532 safety meeting and supervisory meetings as required. The items noted during field audits will be
533 communicated to the PSM. Responsibility for resolving each item noted during these audits is
534 assigned and tracked through resolution. Results from field audits are also regularly
535 communicated within ZAPATA through training and electronic means as a method of
536 continuous program improvement.

537 **7.5 FOLLOW-UP PROCEDURES**

538 Identified safety and health issues and deficiencies, and the actions, timetable, and responsibility
539 for correcting the deficiencies, will be recorded in inspection reports. Follow-up inspections to
540 ensure correction of any identified deficiencies will be conducted and will also be documented in
541 the inspection reports.

542

543 **8.0 MISHAP REPORTING AND INVESTIGATION**

544 When an accident, incident or near-miss occurs, the Site Supervisor/SUXOS will immediately
545 notify (within 24 hours) the USACE PM, FWDA on-site USACE representative, Contracting
546 Officer's Representative (COR), PSM, and the SSO and will follow up in writing with a formal
547 report as necessary. All contractor property damage is reportable, but if an accident resulting in
548 damages equal to or exceeding \$5,000 occurs, a USACE Form ENG 3394 will be completed and
549 submitted to the USACE PM, FWDA on-site USACE representative, PSM and COR within 5
550 business days. USACE Form ENG 3394 (Attachment 3) will be completed by the SSO. If the
551 incident is an injury requiring more than first aid or property damages exceeding \$200,000, the
552 PM will immediately notify the USACE PM, COR, and FWDA on-site USACE representative.

553 If an accident resulting in an injury occurs, the ZAPATA SSO will immediately notify the
554 FWDA on-site USACE representative and the USACE PM. If no off-site medical treatment is
555 required, the accident will be recorded on a First Aid Log. If off-site medical treatment is
556 required which results in a lost time accident, ZAPATA will complete a USACE Form ENG
557 3394 and will submit the form to the USACE PM, FWDA on-site USACE representative, PSM
558 and COR within 5 business days.

559 **8.1 EXPOSURE DATA**

560 The records and reports information related to annual labor hours and workplace accidents,
561 injuries, and illnesses are prepared by ZAPATA as required under 29 CFR 1904. Where annual
562 summary postings are required under 29 CFR 1904.32(b)(6), they will be posted. A designated
563 representative from ZAPATA tabulates expended labor hours and recordable injuries, illnesses
564 and lost time work cases that are relevant to ZAPATA if they occur to verify ZAPATA safety
565 performance.

566 Exposure hours will be reported each month for exposure analysis. Exposure hours are defined
567 as the number of hours worked in the field by ZAPATA personnel plus the hours worked by
568 subcontractors. Exposure hours are reported internally to ZAPATA by the PM. ZAPATA shall
569 compose a report and a tabulation of field labor hours, lost workday accidents, and number of
570 lost workdays and the report shall be submitted monthly to the CESPAM PM.

571 **8.2 MISHAP INVESTIGATIONS, REPORTS, AND LOGS**

572 After the oral report, the Site Supervisor/SUXOS or SSO must complete a written event report
573 within 24 hours, using the "Contractor Accident Notification Form" in Attachment 3. Within 72
574 hours, a completed investigation report must be submitted. The investigation report is part of the
575 initial written report form. These forms can be completed by persons involved in the incident,
576 but the investigation must be completed by a supervisor and/or the SSO. All reports will be
577 reviewed by the PM and the PSM upon submission. Within the reporting system, corrective
578 actions and persons responsible for those corrective actions are identified. The system requires
579 follow-up to ensure completion of corrective actions. In addition, the PM or the SSO will
580 complete Form ENG 3394 within 48 hours for any injury beyond first aid on the job site or for
581 any property damage exceeding \$5,000.00. The Site Supervisor/SUXOS or the SSO will ensure

582 that a report is prepared and the forms are completed as requested by the COR and/or the PM and
583 PSM.

584 **8.3 IMMEDIATE NOTIFICATION OF MAJOR MISHAPS**

585 Immediate reporting of incidents is required within ZAPATA. The USACE PM and COR will
586 be immediately notified by the ZAPATA PM (or a designee) of an accident that is required to be
587 reported by the USACE and EM 385-1-1. An accident that must be reported immediately to
588 USACE is any injury requiring more than first aid including a fatal injury, permanent total
589 disability, permanent partial disability, the hospitalization of three or more people resulting from
590 a single occurrence or any property damage in excess of \$200,000. An ENG Form 3394 and the
591 SPK Form 385-1-R will be filled out and submitted to the USACER PM and COR and ZAPATA
592 PSM. If required, an OSHA Form 300 will be completed by the PSM, in consultation with the
593 SSO. If an accident resulting in damages equal to or exceeding \$5,000 occurs, a USACE Form
594 ENG 3394 will be completed and submitted to the USACE PM, FWDA on-site USACE
595 representative, and COR within 5 business days.

596

597 **9.0 PLANS (PROGRAMS, PROCEDURES) REQUIRED BY EM 385-1-1, THE**
598 **SAFETY MANUAL (AS APPLICABLE)**

599 ZAPATA has established written requirements for complying with regulations and implementing
600 ZAPATA policy to prevent accidents and injuries. This section describes how some of these
601 programs are implemented specifically for this project. The various safety plans listed below
602 will be implemented during work on the project.

603 **9.1 FATIGUE MANAGEMENT PLAN (01.A.20)**

604 **Purpose**

605 The purpose of the Fatigue Management Plan is to ensure that all employees and sub-contractors
606 are fit for duty at all times. When there is a possibility that our employees and sub-contractors
607 are required to work more than the following a Fatigue Management plan will be implemented:

- 608 • 10 hours a day for more than 4 consecutive days
- 609 • 50 hours in a 7 days' work week
- 610 • 12 hours a day for more than 3 consecutive days
- 611 • 58 hours a week for sedentary (to include office) work

612 **Procedures**

613 Equipment Operators shall not be permitted to exceed 12 hours of duty time in any 24 hour
614 period, including time worked at another occupation.

615 Motor Vehicle Operators shall not operate a motor vehicle continuous period of more than 10
616 hours in any 24 hour period.

617 Controls for fatigue will include consistent work scheduling (i.e., working daily from 7am until 7
618 pm), rotating jobs to prevent repetitive work, breaks at critical times in the work cycle, control of
619 environmental factors (heat, cold, use of personal protective equipment), buddy check-in for
620 individuals working alone, and alternate transportation for long commutes.

621 **Management Responsibility**

622 The Project Manager, SUXOS and SSHO (Project Management Team [PMT]) have a shared
623 responsibility to avoid fatigue related to performance impairment and to ensure all employees
624 and sub-contractors are fit for duty.

625 All employees have the duty of care to ensure adequate sleep is obtained and outside activities do
626 not cause fatigue or impair performance.

627 At no time should the PMT or sub-contractors put themselves or others at risk

628 **Training**

629 All employees will be trained on the symptoms of fatigue, habits and actions the workers may
630 take to avoid fatigue, actions workers should take if they observe fatigue in a co-worker, and

631 controls in place to prevent fatigue. Controls for fatigue shall include a discussion of driving to
632 and from work.

633 **9.2 EMERGENCY PLANS (01.E)**

634 The emergency response agencies listed in Section 11.0 SSHP are capable of providing the most
635 effective response; accordingly, they are designated as the primary responders. These agencies
636 are located within a reasonable distance from the area of site operations, which ensures adequate
637 emergency response time. The USACE COR will be notified if these response agencies are
638 contacted. See the Emergency Response Procedures in Section 11.0 of the SSHP.

639 **9.2.1 Procedures and Tests (01.E.01)**

640 Prior to the start of field work, the UXOSO will verify that emergency response processes are in
641 place and are capable of being executed. Since the immediate response to medical or fire
642 emergencies will be by off-site public responders, project-specific procedural response drills are
643 not deemed to be necessary. Therefore, UXOSO shall verify that the appropriate emergency
644 services are available for response, that contact information contained herein is appropriate and
645 current, and that the emergency responders know how to access the anticipated work areas.

646 **9.2.2 Spill Plans (01.E.01, 06.A.02)**

647 A very limited amount of spillable materials are expected to be used during the project work
648 activities. A list of the anticipated hazardous materials to be used on-site is provided below. In
649 the event that a spill does occur, site personnel will:

- 650 • Visually assess the spill to determine the nature, volume, extent, and source of the spilled
651 material.
- 652 • Stop the source of the spill if this task can be safely executed without further endangering
653 site personnel.
- 654 • If viable, use a commercially available spill kit available at the project support area to
655 contain the spill.
- 656 • Evacuate nearby personnel as necessary.
- 657 • Initiate emergency response, if warranted.

658 **9.2.2.1 Anticipated Hazardous Materials**

659 The following is a list of hazardous materials or chemicals that may be used onsite during the
660 fieldwork at Parcels 21 and 24. These hazardous materials or chemicals may require spill
661 prevention and countermeasure control processes to ensure sensitive environmental receptors are
662 not adversely impacted in the event of a spill or release of these materials. See Section 6 of the
663 Environmental Protection Plan (EPP) for more detail.

- 664 • Marking Paint
- 665 • Insect repellent
- 666 • Pesticide-grade isopropanol
- 667 • Fuel for heavy equipment

668 **9.2.2.2 Notification**

669 In the event of a spill, the Site Supervisor/SUXOS shall follow the Incident Notification Process
670 and Chain of Command structure described in this ASP/SSHP. In addition, the ZAPATA PM
671 shall notify CESPAs PM and FWDA personnel immediately so that additional appropriate
672 community and/or federal/state agencies may be engaged and notified, as applicable. The PM
673 shall coordinate with the designated CESPAs Environmental Compliance Manager for support
674 with regard to adhering to local, state, or federal regulations for spill notification clean-up and
675 closure requirements.

676 **9.2.3 Firefighting Plan (01.E.01; 19.A)**

677 Workers will not fight any fires other than incipient stage fires. Workers will also not fight any
678 fires that involve explosives. There will be at least one 20-pound 10B:C fire extinguisher at the
679 work site. Fire extinguishers will also be located in each field team vehicle. The fire
680 extinguishers are intended to fight only fires that have recently occurred and can be reasonably
681 extinguished immediately. In no case will workers attempt to fight any fire that cannot be
682 reasonably extinguished within 30 seconds to 1 minute. The fire extinguishers are only
683 sufficient to fight small fires. All other response shall be considered firefighting measures, and
684 ZAPATA team staff will retreat from the fire and notify the facility or public agency firefighting
685 teams by calling 911.

686 Additional fire prevention and response procedures can be found in Section 8.2 of the SSHP
687 (Attachment 1).

688 **9.2.4 Posting of Emergency Telephone Numbers (01.E.05)**

689 The list of emergency telephone numbers will be maintained in each site vehicle, any site offices
690 established by ZAPATA for the project, in the main administration building (Bldg. 1) at the
691 FWDA, and with the Site Supervisor/SUXOS. The emergency telephone numbers list is
692 included in the SSHP (Attachment 1) Section 11.2, Table 11-2.

693 **9.2.5 Man Overboard/Abandon Ship (19.A.04)**

694 This plan is not applicable to the FWDA fieldwork.

695 **9.2.6 Plan for Prevention of Alcohol and Drug Abuse (01.C.02)**

696 ZAPATA has a Drug-Free Workplace Program. All contractors and subcontractors on this
697 project are subject to drug and alcohol testing at any time. Supervisors, managers, and the
698 UXOSO are to determine the fitness of their workers, including assessing whether their workers
699 may be under the influence of any alcohol or drugs, including over-the-counter and prescription
700 medications. During the initial site orientation and training conducted at the beginning of the
701 project, all workers are reminded of the program and policies. Workers are encouraged to
702 confidentially list their medications on a medical information form that is provided to them and
703 retained by the UXOSO. If a worker is injured or involved in an accident, the worker(s) involved
704 may be asked to be tested. If a supervisor observes any worker who appears to be under the
705 influence of drugs or alcohol, he/she may request testing of the worker.

706 **9.3 SITE SANITATION/HOUSEKEEPING PLAN (02.B)**

707 ZAPATA will procure portable toilets and sanitation services. Workers will discard all food
708 debris and other detritus in a designated refuse container. This container will be emptied at least
709 once each week and taken to a local waste-management facility.

710 **9.4 MEDICAL SUPPORT (03.A.01, 03.A.03)**

711 ZAPATA will ensure that a minimum of two field team members have current certifications in
712 CPR, first aid, and blood-borne pathogens. Other than rendering basic CPR and first aid,
713 ZAPATA and subcontractor personnel are not expected to perform emergency medical duties;
714 however, they are authorized to perform emergency rescue or other duties up to the level of their
715 training.

716 Offsite medical and emergency support will be provided by the nearest hospital to the FWDA,
717 which is identified below:

718
719 Rehoboth McKinley Christian Health Care Services
720 1901 Red Rock Drive
721 Gallup, NM 87301
722 (505) 863-7000

723 A map and driving directions to this facility are provided in Section 11.2 of the SSHP.

724 **9.5 BLOOD-BORNE PATHOGEN PROGRAM (03.A.05)**

725 Employees designated as responsible for rendering first aid or medical assistance shall be
726 included in their employer's BBP program in accordance with 29 CFR 1910.1030 and shall:

- 727 • Be instructed in the sources, hazards, and avoidance of BBPs and be provided the training
728 specified in 29 CFR 1910.1030;
- 729 • Be provided with, and shall use and maintain, PPE (i.e., breathing barrier, latex-free
730 gloves, gowns, masks, eye protectors, and/or resuscitation equipment) when appropriate
731 for rendering first aid or other medical assistance to prevent contact with blood or other
732 potentially infectious materials;
- 733 • Institute a site-specific BBP program to include a site-specific Exposure Control Plan with
734 provisions for engineering and administrative controls, Hepatitis B vaccination, PPE,
735 training, recordkeeping, and a Post-Exposure Control Plan in the event of a blood-borne
736 exposure. Post-exposure protocol shall include a plan to ensure immediate medical
737 evaluation of exposed individual(s) per current recommendations of the Center for
738 Disease Control for human immunodeficiency virus, Hepatitis B virus, and Hepatitis C
739 virus.

740 **9.6 EXPOSURE CONTROL PLAN (03.A.05)**

741 Exposure, through inhalation, ingestion, skin absorption, or physical contact, to any chemical or
742 biological agent in excess of the acceptable limits specified in the current American Conference
743 of Governmental Industrial Hygienist (ACGIH) guideline, "Threshold Limit Values and

744 Biological Exposure Indices”,” published Department of the Army (DA) or DoD Exposure
745 Limits, or by OSHA shall be prohibited. For the purpose of this document, the applicable
746 standard is the Occupational Exposure Limit (OEL). Physical agents are addressed individually
747 in this section.

748 In case of conflicts between ACGIH, OSHA, DoD or DA standards or regulations referenced in
749 this manual, the more stringent shall be used as the OEL.

750 The employer shall comply with all applicable standards and regulations to reduce contaminant
751 concentration levels As Low As is Reasonably Achievable.

752 Should work activities present any potential exposure (of any part of the body) to toxic or
753 corrosive materials, drenching and/or flushing facilities shall be provided in the work area for
754 immediate emergency use.

755 See Section 6 of this APP and Section 8 of the SSHP (Attachment 1) for additional information.

756 **9.7 AUTOMATIC EXTERNAL DEFIBRILLATOR (AED) PROGRAM (03.B.04)**

757 The placement of AEDs is optional but highly recommended. The placement of AEDs on the
758 worksite shall be preceded by an assessment of the time and distance to emergency medical
759 services (EMS) and a justification for such equipment.

760 **9.8 SITE LAYOUT PLAN (04.A)**

761 As part of the various Work Plans produced to complete the required work at Parcels 21 and 24,
762 ZAPATA will include a brief layout plan for each Parcel. Work in Parcel 21 at the TNT
763 Leaching Beds, is expected to occur mainly within the boundaries of the leaching beds, or the
764 nearby vicinity. Work in Parcel 24, Igloo Block A, will entail access to several igloos over a
765 wide area. ZAPATA will coordinate establishment of a suitable layout area with USACE and
766 FWDA personnel. See Section 7 of the EPP for more detail.

767 Site storage requirements will include the use of storage trailers for equipment (Connex box),
768 several petroleum storage tanks or containers, office trailer, two portable toilets, an eye wash
769 station and a hand wash area. These storage and laydown areas are proposed southwest of the
770 south (triangle-shaped) TNT leaching bed; using the area between former building foundations
771 B501 and B503. This area is approximately 400 feet south of a small arroyo identified north of
772 the triangle-shaped leaching bed and across the main access road (Arterial Road # 4) between the
773 two leaching beds. The staging area will be approximately 150 ft by 75 ft in area and will be
774 utilized for operations at both Parcel 21 and 24. A small laydown area to stage tools and
775 equipment that will be utilized for interim measures at Parcel 24 will be established along the
776 entrance and haul route of Igloo Block A; at the intersection of West Fringe Road and A-1.
777 During field activities at Parcel 24, the project office, storage trailer, portable toilets and
778 petroleum containers will remain at the main storage and laydown area proposed at Parcel 21 –
779 SWMU 1. See Figures 2 and 3 in the EPP for proposed locations of both staging areas at Parcels
780 21 and 24, respectively.

781

782 In order to maintain uninterrupted operation of equipment, a temporary fueling station will be set
783 up at the main staging area of Parcel 21 using a double-walled 3,000 gallon diesel fuel tank
784 staged in a secure berm. Petroleum storage also includes auxiliary fuel tanks (100 gallons or
785 less) on site vehicles. Quantities of motor oil and hydraulic oil kept in approved containers (5-
786 gallons or less) may also be transported and stored in the support or crew trucks. Small
787 quantities of petroleum products (5-gallons or less), which may include oil, grease, and hydraulic
788 fluid for equipment maintenance, will be stored in enclosed storage areas at the laydown area on
789 site. Containers will not be stored where a leak or spill could enter a stormwater conveyance or
790 arroyo. Installation environmental personnel will be consulted to assure SPCC procedures/
791 permits are met. See the project specific SPCC Plan for more details on petroleum storage
792 (ZAPATA 2016c).

793 In addition, ZAPATA will construct a stabilized construction entrance and exit area to begin
794 operations. A decontamination area will be constructed before the exit point from the leaching
795 beds on the side of the excavation. All required safety and labor postings will be located at the
796 office trailer.

797 **9.9 ACCESS/HAUL ROAD PLAN (04.B)**

798 All roads used during the field activities will be used in a safe manner to reduce any potential
799 hazards involving vehicles. As part of the excavation activities in the southern leaching bed,
800 approximately 200 ft of asphalt road (Arterial Road No. 4) will require removal as part of the
801 excavation activities. Proper barricading and traffic controls, and a detour route, will be
802 implemented during the time period that the road section is removed. Subsequent to completion
803 of excavation activities, the asphalt roadway will be reconstructed to match the existing road.
804 All site vehicles will be driven in a safe manner with the driver being licensed and observing the
805 speed limits and adjusting speed to the existing road conditions. See Section 8 of the EPP for
806 more detail.

807 **9.10 HEARING CONSERVATION PROGRAM (05.C)**

808 The SSHO will evaluate the jobsite for noise hazards initially and regularly during the course of
809 work, if applicable. When noise hazards are known or expected, the SSHO and PM shall
810 develop a Hearing Conservation Program that includes identification and assessment of noise
811 hazards and the measures to be taken to protect personnel against them. USACE workplace
812 hearing conservation programs shall comply with the requirements of ER 385-1-89 and ACGIH
813 Threshold Limit Values (TLVs).

814 ***9.10.1 Identification of noise hazards***

815 Noise measurements shall be made whenever there is difficulty in communicating at distances
816 greater than 2 ft (0.6 m), upon worker complaint of excessive noise, or whenever hazardous
817 noise levels are suspected. Noise assessments and/or measurements shall be performed and
818 documented when any new facility or new equipment is placed in service and when areas that in
819 the past were not noise hazardous become noise hazardous for any reason.

820 **9.10.2 Assessment of noise hazards.**

821 Instruments used to measure noise shall meet or exceed the requirements listed below:

- 822 • Dosimeters shall measure the entire employee's work shift to be considered full-shift
823 sampling.
- 824 • Calibration of noise measuring equipment shall be in accordance with manufacturer's
825 instructions (USACE refer to ER 385-1-89).
- 826 • Workplaces known or suspected to include hazardous noise will be surveyed initially,
827 annually and whenever site conditions change impacting noise generation.

828 **9.10.3 Noise controls**

829 Practical engineering controls are the primary means of controlling exposures to excessive noise
830 in the workplace followed by administration controls. Engineering controls may include
831 lubrication, isolation, damping, baffles, or other methods.

832 See Section 8 of the SSHP (Attachment 1) for additional information.

833 **9.11 RESPIRATORY PROTECTION PLAN (05.G)**

834 It is highly unlikely that a Respiratory Protection Plan will be required for the project. The tasks
835 required do not include the necessity to use respiratory protection. If dust or sand become
836 airborne creating an inhalation hazard, the Site Supervisor/SUXOS will either cease operations
837 for the day or wet the immediate area down to minimize the impact and control dust generation.

838 **9.12 HEALTH HAZARD CONTROL PROGRAM (06.A)**

839 The primary health hazards associated with this project are physical hazards associated with
840 remote work locations using hand and power tools, heavy equipment, deep excavations, weather-
841 related hazards such as heat and storms, wet conditions and potentially dangerous wildlife.
842 Additionally, since the FWDA is a former Army ammunition depot there is a potential for
843 inadvertently encountering MEC during fieldwork activities. The Site Supervisor/SUXOS and
844 SSO will brief all site personnel on the potential for encountering MEC at the site, MEC
845 materials identification and MEC handling prohibitions. The SSHP describes mitigation
846 measures to reduce physical hazards and biological hazards (e.g., animals, poisonous plants,
847 insects, snakes). During soil-intrusive activities, site dust control measures may be used if
848 needed. Dust will be sprayed/misted with water as necessary to prevent visible dust generation.

849 **9.13 HAZARD COMMUNICATION PROGRAM (06.B.01)**

850 The SSO will control the entry of chemical products into the work environment, and limit the
851 number of such products to the minimum necessary for project execution. He will obtain a
852 copies of MSDSs for all such chemical products (unless an exception applies) and maintain these
853 on the site. In addition, the SSO will review the hazards inherent in the storage and anticipated
854 use of the chemicals, and provide training to workers exposed to these hazards. Such training

855 will be provided upon initial assignment to the site and before use of the product. Supplemental
856 training will be scheduled and presented whenever a new hazardous substance is introduced into
857 the work area or whenever an employee changes job locations where different products are
858 encountered.

859 The SSO will maintain the following documents and records on the site, and inform site workers
860 of their place of storage: (1) The OSHA standard on chemical hazard communication (29 CFR
861 1910.1200) and (2) A list of chemical products on the site, with associated material safety data
862 sheets (Attachment 4).

863 Subcontractors will comply with the requirements presented above and will supply the SSO with
864 copies of material safety data sheets for any chemical products that they bring onto the site.

865 **9.14 PROCESS SAFETY MANAGEMENT PLAN (06.B.04)**

866 Not applicable.

867 **9.15 LEAD COMPLIANCE PLAN (06.C.02)**

868 Not applicable.

869 **9.16 ASBESTOS ABATEMENT PLAN (06.C.03)**

870 Not applicable.

871 **9.17 RADIATION SAFETY PROGRAM (06.F)**

872 Not applicable.

873 **9.18 ABRASIVE BLASTING PLAN (06.I)**

874 Not applicable.

875 **9.19 HEAT STRESS MONITORING PLAN (HSMP) (06.J.02)**

876 The SSO will remain alert to site conditions that could cause heat-related illness. The SSO will
877 implement procedures found in Attachment 5, Heat Stress and Cold Stress: Environmental
878 Assessment and Management of Exposure, if necessary. These procedures require assessment of
879 the potential for heat-related illness when the air temperature exceeds 70 degrees Fahrenheit (°F).
880 A wet bulb globe temperature (WBGT) instrument will be present on the site and used for
881 environmental monitoring (except during cool weather). Heat stress monitoring is anticipated
882 due to year round continuous operations and the location of the project site in New Mexico. The
883 average high temperature in Gallup, NM in July is 88 °F.

884 **9.20 COLD STRESS MONITORING PLAN (CSMP) (06.J.04)**

885 The UXOSO will remain alert to site conditions that could cause cold-related illness. The
886 UXOSO will implement procedures found in Attachment 5, Heat Stress and Cold Stress:
887 Environmental Assessment and Management of Exposure, if necessary. These procedures

888 require assessment of the potential for cold-related illness when the air temperature drops below
889 50°F. Cold stress monitoring is anticipated due to year round continuous operations, and the
890 location of the project site in Gallup, NM, where average low temperatures in January are 12.7
891 °F.

892 **9.21 INDOOR AIR QUALITY MANAGEMENT PLAN (06.L)**

893 Not applicable.

894 **9.22 MOLD REMEDIATION PLAN (06.L.04)**

895 Not applicable.

896 **9.23 CHROMIUM (VI) EXPOSURE EVALUATION (06.M)**

897 Not applicable.

898 **9.24 CRYSTALLINE SILICA ASSESSMENT (06.N.02)**

899 Not applicable.

900 **9.25 LIGHTING PLAN FOR NIGHT OPERATIONS (07.A.06)**

901 Not applicable.

902 **9.26 TRAFFIC CONTROL PLAN (08.C.05)**

903 See Section 8 of the Excavation Safety Plan in Attachment 6..

904 **9.27 FIRE PREVENTION PLAN (09.A.01)**

905 Fire prevention and protection measures require pre-planning. At least one 20-pound 10B:C fire
906 extinguisher will be located at the project site and within each site vehicle. Employees will
907 follow safe work practices, including proper storage of flammable and combustible liquids, and
908 the following rules:

- 909 • **Sources of ignition shall be prohibited within 50 feet** of any operation or storage
910 location that could present a fire or explosion hazard. Such areas shall be marked
911 conspicuously with signs stating “NO SMOKING, MATCHES, OR OPEN
912 FLAME,” if the SSO deems such signs necessary.
- 913 • **Smoking is permitted only in designated areas.**
- 914 • **Vehicles may not be parked in areas where high vegetation is present.** (Catalytic
915 converters can be hot enough to ignite vegetation.)
- 916 • **Employees will watch for lightning strikes** that could ignite vegetation. (Other
917 safety procedures require avoidance of storms that could produce lightning.)

- 918 • **Employees will use care when making electrical connections**, because a short-
919 circuit could cause a fire.
- 920 • **Appropriately selected fire extinguishers will be available** in all vehicles and
921 storage containers.
- 922 • **Shovels will be available** in all vehicles.

923 Hot work is not planned. However, if required a hot work permit will be obtained and issued by
924 FWDA administrative personnel before any hot work is conducted. Additionally, no hot work is
925 permitted until it is determined that the area is gas-free and that there are no flammable or
926 combustible materials stored within 50 feet of the work area.

927 In the event of a fire or explosion, the appropriate authorities will be contacted. Any fire must be
928 reported to the CESPMA PM, the COR, the FWDA on-site USACE representative, and the PSM.
929 The person reporting the fire is required to provide the following information:

- 930 • His/her name;
- 931 • Location of the fire;
- 932 • Number of injured persons and nature of injuries, if known;
- 933 • Substance(s), chemical(s), or materials involved in the fire;
- 934 • Size of the fire and available fuel (estimate);
- 935 • Extent of fire;
- 936 • Rate that the fire is expanding (estimate);
- 937 • Time the fire started and the time the fire was extinguished; and
- 938 • Any other pertinent information.

939 The USACE PM and COR, in coordination with the SSO, will manage notifications as required.

940 **9.28 WILD LAND FIRE MANAGEMENT PLAN (09.L)**

941 Not applicable.

942 **9.29 ARC FLASH HAZARD ANALYSIS (11.B)**

943 Not applicable.

944 **9.30 ASSURED EQUIPMENT GROUNDING CONTROL PROGRAM (AEGCP) (11.D.05,**
945 **APPENDIX E)**

946 Not Applicable.

947 **9.31 HAZARDOUS ENERGY CONTROL PROGRAM AND PROCEDURES (12.A.01)**

948 All site personnel involved in the use of lock-out/tag-out for the control of hazardous energy will
949 receive on-site training. All training will comply with Section 12 of EM 385-1-1. In the event
950 that tag-out procedures are used on site, authorized personnel will be trained in the following
951 limitations of tags:

- 952 • Tags are essentially warning devices affixed to energy-isolating devices and do not
953 provide the physical restraint on those devices that is provided by a lock;
- 954 • When a tag is attached to an energy-isolating means, it is not to be removed without
955 authorization of the authorized person responsible for it, and it is never to be bypassed,
956 ignored or otherwise defeated;

- 957 • Tags must be legible and understandable by all authorized and affected personnel
958 whose work operations are, or may be, in the area; and

- 959 • Tags must be securely attached to energy-isolating devices so that they cannot be
960 inadvertently or accidentally detached during use.

961 **9.32 STANDARD PRE-LIFT PLAN – LHE (16.A.03)**

962 Not applicable.

963 **9.33 CRITICAL LIFT PLAN – LHE (16.H)**

964 Not applicable.

965 **9.34 NAVAL ARCHITECTURAL ANALYSIS – LHE (FLOATING) (16.L)**

966 Not applicable.

967 **9.35 FLOATING PLAN INSPECTION AND CERTIFICATION (19.A.01)**

968 Not applicable.

969 **9.36 SEVERE WEATHER PLAN FOR MARINE ACTIVITIES (19.A.03)**

970 Not applicable.

971 **9.37 EMERGENCY PLAN FOR MARINE ACTIVITIES (19.A.04)**

972 Not applicable.

973 **9.38 MAN OVERBOARD/ABANDON SHIP PROCEDURES (19.A.04)**

974 Not applicable.

975 **9.39 FLOAT PLAN FOR LAUNCHES, MOTORBOATS AND SKIFFS (19.F.04)**

976 Not applicable.

977 **9.40 FALL PROTECTION AND PREVENTION (21.D)**

978 Not applicable.

- 979 **9.41 DEMOLITION/RENOVATION PLAN (23.A)**
- 980 Not applicable.
- 981 **9.42 ROPE ACCESS WORK PLAN (24.H)**
- 982 Not applicable.
- 983 **9.43 EXCAVATION/TRENCHING PLAN**
- 984 An Excavation Safety Plan is found in Attachment 6.
- 985 **9.44 FIRE PREVENTION AND PROTECTION PLAN FOR UNDERGROUND CONSTRUCTION**
986 **(26.I.01)**
- 987 Not Applicable.
- 988 **9.45 COMPRESSED AIR WORK PLAN FOR UNDERGROUND CONSTRUCTION (26.I.01)**
- 989 Not applicable.
- 990 **9.46 ERECTION AND REMOVAL PLAN FOR FORMWORK AND SHORING (27.C)**
- 991 Not applicable.
- 992 **9.47 PRECAST CONCRETE PLAN (27.D)**
- 993 Not applicable.
- 994 **9.48 LIFT-SLAB PLANS (27.E)**
- 995 Not applicable.
- 996 **9.49 MASONRY BRACING PLAN (27.F.01)**
- 997 Not applicable.
- 998 **9.50 STEEL ERECTION PLAN (28.B)**
- 999 Not applicable.
- 1000 **9.51 EXPLOSIVE SAFETY SITE PLAN (ESSP) (29.A)**
- 1001 Not applicable.
- 1002 **9.52 BLASTING PLAN (29.A; 26.J)**
- 1003 Not applicable.

- 1004 **9.53 DIVE OPERATIONS PLAN (30.A.14, 30.A.16)**
- 1005 Not applicable.
- 1006 **9.54 SAFETY PRACTICES MANUAL FOR DIVING ACTIVITIES (30.A.15)**
- 1007 Not applicable.
- 1008 **9.55 EMERGENCY MANAGEMENT PLAN FOR DIVING (30.A.18)**
- 1009 Not applicable.
- 1010 **9.56 TREE FELLING/MAINTENANCE PROGRAM (31.A.01)**
- 1011 Not applicable.
- 1012 **9.57 AIRCRAFT/AIRFIELD CONSTRUCTION SAFETY & PHASING PLAN (CSPP) (32.A.02)**
- 1013 Not applicable.
- 1014 **9.58 AIRCRAFT/AIRFIELD CONSTRUCTION SAFETY PLAN COMPLIANCE DOCUMENT (SPCD)**
- 1015 Not applicable.
- 1016 **9.59 SITE SAFETY AND HEALTH PLAN (HTRW) (33.B)**
- 1017 The SSHP is included as Attachment 1.
- 1018 **9.60 CONFINED SPACE ENTRY PROCEDURES (34.A.05)**
- 1019 Not applicable.
- 1020 **9.61 CONTINGENCY PLAN FOR SEVERE WEATHER**
- 1021 In the event of severe weather: high winds, electrical storms, extremely hot weather (>100
- 1022 Fahrenheit [°F]), or extremely cold weather (<0°F), it may be necessary to cease operations and
- 1023 evacuate the site. The SSO will monitor the weather forecast daily. In preparation for an
- 1024 approaching storm, all equipment will be secured, and all vehicle doors and windows will be
- 1025 closed. All tools and supplies will be stored in a designated secure location. Procedures for
- 1026 actions during severe weather are included in Section 8.8 of the SSHP.
- 1027 **9.62 PLANS NOT REQUIRED**
- 1028 Other written site programs will be added if necessary in an ongoing process of program
- 1029 evaluation. The SSO and the PSM will confer frequently to assess the need for additions to the
- 1030 SSHP.

1031 **10.0 RISK MANAGEMENT PROCESSES**

1032 ZAPATA utilizes a Behavior-Based Loss Prevention System (BBLPS) to support the
1033 implementation of a Risk Management Process by identifying, analyzing and controlling certain
1034 risks (or liabilities) that may be encountered during the execution of its assigned projects. The
1035 BBLPS is a system to prevent or reduce losses using behavior-based tools and proven
1036 management techniques to focus on behaviors or acts that could lead to losses. The four basic
1037 loss prevention tools that will be used to implement the BBLPS on this project include:

- 1038 • Activity Hazard Analysis (AHA)
- 1039 • Loss Prevention Observations (LPOs)
- 1040 • Loss and Near-Loss Investigations (NLI)
- 1041 • Drug-Free Workplace Program (DFWP)

1042 The ZAPATA PM and individuals responsible for site operations (Site Supervisor/SUXOS and
1043 SSO) are responsible for implementing the BBLPS on the project site. In an effort to provide a
1044 safe and healthy workplace for all program participants, ZAPATA promotes and implements a
1045 DFWP. ZAPATA personnel must participate in and adhere to the requirements of the DFWP.

1046 **10.1 ACTIVITY HAZARD ANALYSIS**

1047 One of the key elements in executing the BBLPS, and subsequently reducing project risk, is the
1048 use of an AHA for each major phase of work. An AHA defines the activity being performed, the
1049 hazards posed, and control measures required to perform the work safely. Workers are briefed
1050 on the AHA before doing the work and their input is solicited before, during, and after the
1051 performance of work to further identify the hazards posed and control measures required.

1052 AHAs for planned activities are included in Attachment 2 of this APP and listed in Table 10-1.
1053 If any new tasks are identified, or if planned activities vary from the written AHAs, the SSO
1054 (with the assistance of the field team members) will develop or alter the existing AHAs to
1055 address the specific activities.

1056

1057

1058

1059

TABLE 10-1 ACTIVITY HAZARD ANALYSIS (AHA) LIST

AHA	TASK
1	Mobilization and Site Preparation
2	>10% TNT soils homogenization
3	Explosives-contaminated soil excavation, stockpiling, and disposal.
4	Drain pipe (w/ lead-based paint) removal, handling, and disposal, and soil removal and disposal using hand tools.
5	Monitoring Well Abandonment
6	Demobilization

1060

1061 **10.2 LOSS PREVENTION OBSERVATIONS LOG**

1062 LPOs will be conducted by the individuals responsible for site operations (SUXOS, SSO, and
1063 field supervisor) for specific work tasks or operations comparing the actual work process against
1064 established safe work procedures. LPOs are a tool to be used by supervisors to provide positive
1065 reinforcement for work practices performed correctly, while also identifying and eliminating
1066 deviations from safe work procedures that could result in a loss. The individual responsible for
1067 site operations will perform at least one LPO each week for tasks/operations addressed in the
1068 AHA and complete the form for the task/operation being observed, following the process below.

1069 **10.3 LOSS AND NEAR-LOSS INVESTIGATIONS**

1070 LNI's will be performed for the all ZAPATA and subcontractor incidents involving:

- 1071 • Person injuries/illnesses and near-miss injuries
- 1072 • Equipment/property damage
- 1073 • Spills, leaks, regulatory violations
- 1074 • Motor vehicle accidents

1075 The causes of loss and near-loss incidents are similar, so by identifying and correcting the causes
1076 of near-loss incidents, future loss incidents may be prevented. The following is the loss/near-loss
1077 investigation process:

- 1078 • Gather all relevant facts, focusing on fact-finding, not fault-finding, while answering
1079 the who, what, when, where, and how questions.
- 1080 • Draw conclusions, putting facts together into a probable scenario.
- 1081 • Determine incident root cause(s), which are basic causes on why an unsafe
1082 act/condition existed.

- 1083 • Develop and implement solutions, matching all identified root causes with solutions.
- 1084 • Communicate incident as a lesson learned to all project personnel.
- 1085 • File follow-up on implemented corrective action to confirm solution is appropriate.

1086 The Site Supervisor/SUXOS and SSO will perform an incident investigation as soon as practical
1087 after incident occurrence during the day of the incident, for all loss and near-loss incidents that
1088 occur on the project. Loss and near-loss incident investigations will be performed using the
1089 following incident investigation forms:

- 1090 • Incident Report Form (IRF)
- 1091 • Incident Investigation Form (IIF)
- 1092 • Root Cause Analysis Form (RCAF)

1093 **10.4 DRUG-FREE WORKPLACE PROGRAM**

1094 ZAPATA does not tolerate illegal drugs, or any use of drugs, controlled substances, or alcohol
1095 that impairs an employee’s work performance or behavior. ZAPATA has established a policy
1096 that its employees and subcontractors will not be involved in any manner with the unlawful
1097 manufacture, distribution, dispensation, possession, sale, or use of illegal drugs in the workplace.
1098 The use or possession of alcohol in the workplace is also prohibited. Any violation of these
1099 prohibitions may result in discipline or immediate discharge.

1100

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- 1127

ATTACHMENT 1
SITE SAFETY AND HEALTH PLAN

DRAFT

**ATTACHMENT 1
SITE SAFETY AND HEALTH PLAN**

**INTERIM MEASURES FOR PARCEL 21 – SOLID WASTE MANAGEMENT UNIT
(SWMU) No. 1 & PARCEL 24 – IGLOO BLOCK A AND ABANDONMENT OF WELLS
FORT WINGATE DEPOT ACTIVITY (FWDA), NEW MEXICO**

**CONTRACT No. W9128F-13-D-0025
DELIVERY ORDER DS01, MOD No. 1**

PREPARED FOR:



**US ARMY CORPS OF ENGINEERS
TULSA DISTRICT
1645 SOUTH 101ST EAST AVENUE
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SITE SAFETY AND HEALTH PLAN

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1 **1.0 SITE DESCRIPTION**

2 Fort Wingate Depot Activity (FWDA) is an inactive United States Army depot. The FWDA was
3 used to store, ship, and dispose of obsolete or deteriorated explosives and ammunition. It is
4 located in northwestern New Mexico (NM) near the city of Gallup. The depot is located
5 approximately 8 miles east of Gallup, New Mexico in McKinley County immediately south of
6 US Route 66 (Figure 2-1 of the Accident Prevention Plan [APP]).

7 The installation is surrounded by federally owned or administered lands for both national forest
8 and tribal lands. Lands to the North and West of the depot are allotted to the Navajo tribal trust.
9 Lands to the East of the depot are administered by the Bureau of Indian Affairs (BIA). The
10 original Fort Wingate headquarters site is located immediately East of the FWDA and it is
11 currently the location of the town of Fort Wingate, NM which is currently located on BIA
12 administered land. Land to the south and southeast is undeveloped, and is part of the Cibola
13 National Forest.

14 Fort Wingate trinitrotoluene (TNT) demilitarization operations were conducted between 1949
15 through 1967. Ordnance was received in Building 503 where the munitions were washed out
16 with hot water to remove the munitions constituents (MC). The water that contains the MC was
17 called “pink water”. The pink water was then pumped to a storage and drying tank located on the
18 second floor of the building. The dried flakes of explosives were then recovered and shipped to
19 various Army ammunition plants for reuse. Any remaining pink water was drained from the
20 storage/drying tanks into one of three exterior settling tanks that were located on the north and
21 eastern sides of the building. Before 1962 the overflow from these tanks was allowed to drain
22 into an unlined leaching bed located to the west of the building; this bed is triangular in shape
23 and measures approximately 250 feet by 250 feet. Two more unlined leaching beds were
24 constructed in 1962 to the north of Building 503 and across Arterial Road. Each bed measured
25 approximately 100 feet by 250 feet, and each bed was about 3 feet deep. These three leaching
26 beds were used until the washout operations ceased in 1967. It has been estimated that
27 approximately 2,400 gallons of pink water overflow per day were disposed of in the three
28 leaching beds (ANL, 1990).

29 Area of Concern (AOC) 18, or Igloo Block A, is one of several igloo blocks located on FWDA.
30 It is located within Parcel 24. The igloos were previously used to store munitions beginning in
31 the early 1940’s, and it consisted of 100 igloo structures and 81 revetments (an earthen
32 embankment structure used for open storage). One of the revetments has been noted as being
33 destroyed by an arroyo which brings the total number to 80. There are twenty-three igloos and
34 ten revetments that are encompassed in Parcel 9. All igloos in AOC 18 were constructed in 1941
35 with approximately 2,072 square feet of floor space each. The walls and floors of the igloos
36 were constructed from reinforced concrete with a six inch reinforced concrete roof (Corps,
37 2014).

38 AOC 18 igloos were used to store munitions propellant charges for 8-inch and 155 millimeter
39 shells, cluster bombs, 2.75-inch rocket motors, and 155 high explosive (HE) projectiles (FWDA,
40 1980). The igloos were used from the time of their construction in 1941 until the bases closure
41 in 1993. No records indicate the storage of chemical, biological, or radiological agents within
42 the igloos (PMC, 1997).

43

44 **1.1 HAZARD ANALYSIS AND RISK ASSESSMENT**

45 The principal anticipated hazards to site workers are:

- 46 • Potentially explosive soils at the TNT leach beds in Parcel 21 prior to soil mixing,
- 47 • Heavy equipment operation and large open excavations at the TNT leaching beds,
- 48 • Removal, handling and disposal of drain pipes painted with lead-based paint at the Parcel
- 49 24 igloos,
- 50 • Inadvertently encountering MEC,
- 51 • Weather-related hazards (i.e., heat, storms, wet conditions), and,
- 52 • Biological hazards such as poisonous snakes and insects.

53 These hazards will be managed through procedures stated in detail in the site Work Plans for
54 Parcels 21 and 24. There is no evidence that radiological hazards are present on the site.
55 However, if evidence of these is discovered, the ZAPATA site safety officer (SSO) will notify
56 the ZAPATA Project Manager (PM) and the Corporate Manager of Health and Safety as soon as
57 possible. At that time appropriate addenda to this plan will then be prepared.

58 In the unlikely event that a chemical weapon (or chemical weapons materiel) is encountered
59 during operations, work will halt immediately, and personnel will withdraw upwind from the
60 area. The FWDA administrative office and the USACE PM and ordnance and explosives safety
61 specialist (OESS) will be notified. Site personnel will then stand by and wait for instructions
62 from the USACE contracting officer.

63 Biological hazards anticipated for this project site include bees, wasps, hornets, spiders, ticks,
64 ants, mosquitoes, poisonous snakes, and blood-borne pathogens. Biological hazards are
65 discussed in detail in Section 9.13 of this document.

66 The potential for exposure to MC could exist during soil excavation activities and collection of
67 soil and sediment samples, and possibly during other times. Management of this hazard is
68 discussed in Section 9.14 of this document.

69 Other more routine hazards include the following:

- 70 1. Material-lifting hazards, such as back strain, pulled muscles and tendons, pinched or
71 crushed fingers and toes, and lacerations from sharp surfaces on objects lifted;
- 72 2. Hazards associated with the operation of hand and power tools, including lacerations and
73 flying objects;
- 74 3. Slip, trip, and fall hazards associated with ground cover, exposed tree/brush stumps,
75 uneven terrain, rocks, and vegetation growth;
- 76 4. Inclement weather events, such as heavy rain, and lightning;
- 77 5. Sharp objects, including nails, broken glass, and exposed tree/brush stumps;
- 78 6. Noise from heavy equipment; and
- 79 7. Conditions that could cause heat-related illness.

80 The following distinct phases of project work have been identified:

- 81 • Mobilization and Site Preparation.

- 82 • Potentially explosive soil (>10 percent [%] TNT) homogenization within the Post-1962
83 TNT Leaching beds using heavy equipment.
- 84 • Explosives-contaminated soil excavation, stockpiling, and disposal from the TNT
85 Leaching beds using heavy equipment, including removal of about 200 ft of Arterial
86 Road No. 4. Reconstruction of the removed segment of Arterial Road No. 4.
- 87 • Drain pipe with lead-based paint removal, handling, and disposal, and soil removal and
88 disposal using hand tools at Parcel 24 within Igloo Block A.
- 89 • Abandonment of up to six groundwater monitoring wells using power well abandonment
90 equipment (trucks, grout mixers, pumps, etc.).
- 91 • Demobilization.

92 An activity hazard analysis (AHA) for each phase is contained in Attachment 2 of the APP.

93 **If site conditions or activities occur that are not discussed in this document or in the APP,**
94 **the SSO will notify the ZAPATA corporate Manager of Health and Safety immediately,**
95 **and new procedures will be developed.**

96

97 **2.0 STAFF ORGANIZATION, QUALIFICATIONS, AND RESPONSIBILITIES**

98 This information is found in Section 4.0, Responsibilities and Lines of Authority, of the APP.

99 **3.0 TRAINING**

100 This information is found in Section 6.0 of the APP. Training certificates will be maintained in a
101 file on the site by the SSO.

102 **4.0 PERSONAL PROTECTIVE EQUIPMENT**

103 **4.1 PERSONAL PROTECTIVE EQUIPMENT HAZARD ASSESSMENTS**

104 The Program Safety Manager (PSM) has reviewed the applicable Work Plans, past reports and
105 documents, and other available information and has evaluated each major work activity to
106 determine the appropriate level of personal protective equipment (PPE) needed for the work.
107 This evaluation included a consideration of potential hazards present; work operations to be
108 performed; potential routes of exposure; concentrations of contaminants present; characteristics,
109 capabilities, and limitations of PPE; and, any hazards that the PPE may create or exacerbate (e.g.,
110 heat stress). Evaluation findings and recommendations are listed in the AHA matrix and include
111 the date the evaluation was conducted, the activity evaluated, PPE recommendations, and the
112 name of the person(s) performing the assessment.

113 Basic “level D” personal protective equipment for site work will consist of a basic work outfit
114 offering some protection against abrasion and sunlight, heavy work gloves, sturdy work boots,
115 and safety glasses with side shields or comparable side protection. The following additions to
116 this basic ensemble will be required under the circumstances indicated:

- 117 • A hard hat will be required at all times when employees are present on the work site to
118 address potential danger of head impacts with hard objects, including tree branches or
119 overhead heavy equipment.
- 120 • Steel-toe work boots, or boots offering comparable safety protection to the toes, will be
121 required at all times when employees are present on the work site to address potential
122 danger of crushing injuries to the foot. Boots must meet the requirements of ASTM F-
123 2412 and ASTM F-2413. When completing work involving unexploded ordnance
124 (UXO) composite toe safety boots may be substituted for steel-toed boots.
- 125 • Earplugs or ear muffs will be required when employees work around loud machinery.
126 The SSO will require the use of hearing protection by employees primarily through
127 measurement of sound levels at different operations. The SSO will monitor employees’
128 noise exposure with a calibrated sound level meter whenever noisy operations are in
129 progress, and require the use of hearing protection whenever the sound level measured in
130 a work area is 85 decibels or greater. The SSO will also automatically require the use of
131 hearing protection whenever personnel are using power equipment such as chainsaws, by
132 employees who approach a noisy drilling or heavy equipment operation, and by
133 employees engaged in similarly noisy work.
- 134 • Chaps or similar protection of the legs, if this is deemed necessary by the SSO for
135 protection against contact with machinery, underbrush, or snakes, or brush-clearing tools.
- 136 • Personnel conducting environmental sampling for site-related contaminants of concern
137 will wear disposable nitrile gloves that will be changed at least every 15 minutes during
138 collection activities. The SSO will require other measures to avoid skin contact with
139 contaminants or to limit inhalation exposures, if necessary.

140 The SSO will assess the adequacy of PPE during the course of the project, and consult with the
141 Manager of Health and Safety if modifications appear desirable. He will notify the Manager of
142 Health and Safety immediately if unexpected site conditions (such as soil contaminated with

143 chemicals) are encountered to discuss needed changes in protective equipment, work practices,
144 or both.

145 If ZAPATA has reason to believe that any affected employee does not have the understanding
146 and skill required for the use of PPE, ZAPATA will make certain that the employee receives the
147 necessary re-training to acquire the appropriate skills.

148 **4.2 HAZARD ASSESSMENT FOR SELECTION OF PPE**

149 The initial levels of protection were selected by performing a hazard assessment considering the
150 following:

- 151 • Potential site physical hazards present or suspected.
- 152 • Work operations to be performed.
- 153 • Potential routes of exposure.
- 154 • Characteristics, capabilities and limitations of PPE, and any hazards that the PPE presents
155 or magnifies.

156 **4.3 PPE USE AND MAINTENANCE**

157 Employees assigned to use PPE are required to inspect the equipment before and after each use;
158 discard any defective equipment; clean and maintain the equipment according to manufacturers'
159 recommendations; and store their PPE in a clean, secure area on site each day. Specific PPE
160 inspection, cleaning, and maintenance procedures vary according to the type of equipment being
161 used. Prior to being assigned to their jobs, employees will be informed of these equipment-
162 specific use and maintenance procedures. They will be instructed to inform the SSO if PPE is in
163 need of replacement.

164 **5.0 MEDICAL SURVEILLANCE**

165 Workers exposed significantly to site hazards, including all employees of ZAPATA, will
166 participate in a program of medical surveillance of the type specified in 29 Code of Federal
167 Regulations (CFR) 1926.65, the Occupational Safety and Health Administration (OSHA)
168 standard on “Workplace Health and Safety in Hazardous Waste Operations and Emergency
169 Response.” Such workers must present a physician’s statement that they are medically qualified
170 for (1) work in hazardous waste operations and (2) the use of respirators. The SSO will evaluate
171 all physicians’ letters and refer any questions to the PSM. Annual medical certification is
172 required; a physician’s statement must be no older than one year.

173 The SSO will take note of any restrictions stated on a physician’s statement, and make
174 arrangements to avoid any prohibited activity or condition. In addition, the SSO will monitor all
175 employees to detect early signs of exhaustion, heat stress, or other conditions that might suggest
176 a lack of fitness for a particular task.

177 Medical treatment received incident to a workplace injury or illness will be managed in
178 accordance with the OSHA standard referenced above. The SSO will notify the PSM
179 immediately if such an event occurs.

180 **6.0 EXPOSURE MONITORING AND AIR SAMPLING**

181 No routine exposure monitoring or air sampling is anticipated. The SSO and the corporate
182 Manager of Health and Safety will confer often to assess the need for such testing, and they will
183 implement a monitoring or sampling program if this is warranted by site activities or conditions.
184

185 The SSO will monitor employees' noise exposure with a calibrated sound level meter whenever
186 noisy operations are in progress, and require the use of hearing protection whenever the sound
187 level measured in a work area is 85 decibels or greater.
188

189 **7.0 HEAT AND COLD STRESS**

190 The SSO will remain alert to site conditions that could cause heat-related illness. The SSO will
191 implement procedures found in Attachment 6 of the APP, if necessary, for heat stress and cold
192 stress. These procedures require assessment of the potential for heat-related illness when the air
193 temperature exceeds 70°F. A wet bulb globe temperature (WBGT) instrument will be present on
194 the site and used for environmental monitoring (except during cool weather).

195
196 Work activities at FWDA Parcels 21 and 24 are planned year-round in 2016-2017 and will
197 therefore be potentially subject to both heat stress and cold stress. The SSO will remain alert to
198 site conditions that could cause heat- or cold-related illness, and implement ZAPATA procedures
199 to manage the hazards, if necessary.

200

201 **8.0 SAFETY PROCEDURES, CONTROLS, AND PRACTICES**

202 This section describes safety procedures, controls, and practices that all site personnel must
203 follow to mitigate risks from hazards. The following rules are generally applicable:

204 **Exclusion Zone Enforcement:** The SSO will establish an exclusion zone surrounding the
205 >10% TNT containing soils homogenization in Parcel 21.

206 **The Buddy System.** Employees shall not work alone. This “buddy system” requires that
207 every employee work near someone else who could offer assistance or summon help in the
208 event of an accident or illness. At all times, an employee on a field site must be observable
209 by at least one other person or sufficiently close to at least one other person to communicate
210 by voice.

211 **Reporting Unsafe Conditions.** Site personnel will immediately report to the SSO any
212 unsafe acts or conditions, including – but not limited to – violations of this document or the
213 accident prevention plan.

214 **Reporting Injuries and Illnesses.** All injuries or illnesses – including apparently minor
215 ones like insect bites – will be reported to the SSO promptly.

216 **Reporting of Pre-existing Medical Conditions.** Site personnel will inform the SSO of any
217 known medical conditions that may cause illness in the workplace, aggravate a possible
218 work-related illness, or increase the likelihood of accidents. This includes hypersensitive
219 allergic reactions to stinging and biting insects or to contact with poisonous plants; diabetes;
220 high blood pressure; skin or eye sensitivity to sunlight and UV radiation; chronic illness; and
221 acute illnesses, such as a cold, the flu, or stomach/intestinal disorders. Persons with known
222 hypersensitive allergic reactions to stinging/biting insects or to toxic plants will carry
223 appropriate emergency medical antidotes on their person at all times when on site.

224 **Prohibition on Horseplay.** Site personnel shall not engage in horseplay, running, or other
225 irresponsible behavior that may harm people, property, or the environment.

226 **Avoidance of Skin Contact with Poisonous Plants.** Personnel in vegetated or wooded
227 areas shall wear long-sleeve shirts with the sleeves rolled down to reduce contact with
228 poisonous plants.

229 **Eating, Drinking, and Smoking Restrictions.** Eating, drinking, and smoking shall be
230 permitted only in areas designated by the SSO and at designated break times, after employees
231 have washed their hands. Eating, drinking, and smoking shall be forbidden in any exclusion
232 zone or nearby decontamination area. See Section 9.2 for additional detail regarding
233 smoking restrictions.

234 **Prohibition on Ignition Sources.** Ignition of flammable materials in any work area is
235 prohibited, unless approved in writing by the SSO. Matches, lighters, or other sources of
236 sparks shall not be allowed in any exclusion zone or nearby decontamination area.

237 **Limit on Personnel Exposed to Potential Risks.** The number of personnel in any work
238 area will be the minimum number necessary to perform work tasks in a safe and efficient
239 manner.

240 **Reporting on the Location of Site Personnel.** Site personnel will check in with the SSO
241 and field supervisor prior to leaving the site and upon returning to the site.

242 **Escorts for Site Visitors.** Site visitors are to be escorted by the SSO, or an appropriate
243 designee, at all times.

244 **Qualifications for Specific Tasks.** Site personnel shall perform only those tasks which they
245 are qualified by training and, when applicable, appropriate certifications. Such certifications
246 shall include those required by this document and the Accident Prevention Plan.

247 **Limitation on Admission to Work Areas.** No one may enter a site work area without the
248 approval of the SSO, who shall consider the qualifications of each entrant and the risks
249 present in the areas into which entry is desired.

250 **Housekeeping.** All work areas will be maintained in a clean, neat, and orderly fashion, free
251 of loose debris and scrap. Any materials and equipment not being used will be stored or
252 discarded properly. All work areas will be supplied with a trash receptacle that includes a
253 lid. The contents of all trash receptacles will either be removed from the site daily or
254 emptied daily into a larger trash storage container that will be tightly closed each night prior
255 to departure of personnel from the sites.

256 **8.1 MATERIAL HANDLING AND LIFTING PROCEDURES**

257 Site personnel will exercise care in lifting and handling heavy or bulky items. No site worker
258 will attempt to lift any item in excess of **40 pounds** without assistance or use of a mechanical
259 device. Materials being lifted either mechanically or manually will not be moved, or suspended,
260 over personnel unless precautions have been made to protect the personnel from falling objects.
261 Whenever heavy or bulky material is to be moved manually, the size, shape, and weight of the
262 object and the distance and path of movement must be considered to prevent joint and back
263 injuries. The following hierarchy will be followed in selecting a means for material handling:

- 264 1. Movement of the material by mechanical device (i.e., lift truck, crane, etc.);
- 265 2. Movement by manual means using mechanical aid (i.e., dolly or cart); and
- 266 3. Movement manually in a planned manner with an adequate number of personnel.

267 The SSO will train employees in proper lifting techniques and require that they lift objects
268 properly. The following procedures shall be followed:

- 269 1. A firm grip on the object is essential. Therefore the hands and object will be free of oil,
270 grease, or water, any of which might prevent a firm grip.
- 271 2. The hands, and especially the fingers, will be kept away from any points where pinching
272 or crushing could occur, especially when setting the object down.
- 273 3. The item will be inspected for metal slivers, jagged edges, burrs, rough or slippery
274 surfaces and pinch points, and gloves will be used, if necessary, to protect the hands.
- 275 4. The feet will be placed far enough apart for good balance and stability.
- 276 5. Personnel will ensure that solid footing is available prior to lifting the object.
- 277 6. When lifting, personnel will remain as close to the load as possible, bend their legs at the
278 knees, keep their back as straight as possible, and lift the object with the legs, as they are
279 straightening from their bending position.

- 280 7. Never carry a load that cannot be seen over or around.
- 281 8. When placing an object down, the stance and position are identical to that for lifting, with
282 the back kept straight and the legs bent at the knees, while the object is lowered.
- 283 9. When two or more people are required to handle an object, care should be taken to ensure
284 the load is lifted and distributed uniformly between the individuals carrying the load.
285 Each person, if possible, will face the direction in which the object is being carried.

286 **8.2 FIRE PREVENTION AND RESPONSE**

287 Potential causes of fires in the work area are (1) smoking, (2) lightning, (3) parking hot vehicles
288 on dry brush, and (4) electrical short-circuits. The following rules will be followed to reduce the
289 likelihood of a dangerous fire:

291 **Sources of ignition shall be prohibited within 50 feet** of any operation or storage location
292 that could present a fire or explosion hazard. Such areas shall be marked conspicuously with
293 signs stating “NO SMOKING, MATCHES, OR OPEN FLAME,” if the SSO deems such
294 signs necessary.

295 **Smoking is permitted only in designated areas.**

296 **Vehicles may not be parked in areas where high vegetation is present.** (Catalytic
297 converters can be hot enough to ignite vegetation.)

298 **Employees will watch for lightning strikes** that could ignite vegetation. (Other safety
299 procedures require avoidance of storms that could produce lightning.)

300 **Employees will use care when making electrical connections** because a short-circuit could
301 cause a fire.

302 **Appropriately selected fire extinguishers will be available** in all vehicles and trailers.

303 **Shovels will be available** in all vehicles.

304 **All flammable materials will be stored in a flammable storage cabinet** when not in use.
305 The cabinet will be kept in a well-ventilated area. Stored quantities of flammable materials
306 will be minimized.

307 **8.3 ELECTRICAL SAFETY**

308 The use of electrical tools and apparatus safety will be conducted in accordance with Engineer
309 Manual (EM) 385-1-1, Section 11. These requirements (as applicable) include, but are not
310 limited to:

- 311 • All electrical equipment will be of a type listed by Underwriters Laboratories (UL) or
312 Factory Mutual Engineering Corp. to the maximum extent possible for the specific
313 application.
- 314 • Flexible cord passing through work areas will be covered or elevated to protect it
315 from damage by foot traffic, vehicles, sharp corners, or pinching.
- 316 • Patched, oil-soaked, worn, or frayed electric cords or cables will not be used.
- 317 • Extension cords or cables will not be fastened with staples, hung from nails, or
318 suspended by wire.

- 319 • Portable and semi-portable electrical tools and equipment will be grounded by a
320 multi-conductor cord having an identified grounding conductor and a multi-contact
321 polarized plug-in receptacle.
- 322 • Semi-portable equipment, floodlights, and work lights will be grounded, and the
323 protective ground will be maintained during moving unless supply circuits are de-
324 energized.
- 325 • Tools protected by an approved system of double insulation, or its equivalent, need
326 not be grounded.
- 327 • UL listed ground fault circuit interrupters (GFCIs), calibrated to trip within the
328 threshold values of 5 ma + 1 ma, are required on all circuits used for portable electric
329 tools.
- 330 • Flexible cord sets will be UL-listed, contain the number of conductors required for
331 the service plus an equipment ground wire, and will be classified as hard usage or
332 extra-hard usage (identified by "outdoor" or "WA" printed on the jacket).

333 **8.4 EXCAVATION AND TRENCHING SAFETY**

334 An Excavation Safety Plan is found in Attachment 6.

335 **8.5 MACHINE GUARDING**

336 In order to protect site personnel from unguarded moving machinery and equipment surfaces, the
337 requirements found in Subpart O of 29 CFR 1910, Section 16B of EM 385-1-1 and the general
338 provisions listed below will be followed:

- 339 • All reciprocating, rotating, or moving parts of machinery or equipment will be
340 guarded in accordance with manufacturer's specifications, if they create a hazard
341 through contact with personnel.
- 342 • No guard, safety appliance, or device will be removed from machinery or equipment
343 or made ineffective except when making immediate repairs, lubrication, or
344 adjustments, and then only after the power has been shut off.
- 345 • All guards or safety appliances removed for repair, lubrication, or adjustments will be
346 replaced immediately upon completion of said activity and before the power is
347 restored.

348 **8.6 HAZARDOUS ENERGY CONTROL**

349 All site personnel involved in the use of lock-out/tag-out for the control of hazardous energy will
350 receive on-site training. All training will comply with Section 12 of EM 385-1-1. In the event
351 that tagout procedures are used on site, authorized personnel will be trained in the following
352 limitations of tags:

- 353 • Tags are essentially warning devices affixed to energy-isolating devices and do not
354 provide the physical restraint on those devices that is provided by a lock;
- 355 • When a tag is attached to an energy-isolating means, it is not to be removed without
356 authorization of the authorized person responsible for it, and it is never to be bypassed,
357 ignored or otherwise defeated;

- 358 • Tags must be legible and understandable by all authorized and affected personnel whose
359 work operations are, or may be, in the area; and
- 360 • Tags must be securely attached to energy-isolating devices so that they cannot be
361 inadvertently or accidentally detached during use.

362 **8.7 ILLUMINATION**

363 Potentially hazardous operations will be performed only during the time period from 30 minutes
364 after sunrise to 30 minutes before sunset.

365 **8.8 LIGHTNING AND SEVERE STORMS**

366 The SSO will remain aware of weather forecasts and plan for inclement weather during project
367 work. If inclement weather appears imminent, the safety officer will direct site workers to halt
368 work and to take refuge in vehicles or FWDA Building 1. If the SSO deems that lightning is a
369 potential threat, he will order employees to take shelter in Building 1 or in a vehicle. Lightning
370 can strike as far as 10 miles from the area where it is raining, about the distance from which
371 thunder can be heard. Therefore, if thunder is audible field personnel may be within striking
372 distance. If thunder is heard by any field crew member, all field personnel will seek safe shelter
373 immediately in a vehicle or a building. Fieldwork will not resume until 30 minutes has elapsed
374 after the last thunder is heard.

375 **8.9 SANITATION AND DRINKING WATER**

376 An adequate supply of potable (drinkable) water will be provided on site at all times and will be
377 supplied in accordance with the following provisions:

- 378 • Containers will be clearly marked, capable of being tightly closed, equipped with a tap,
379 maintained in a sanitary manner, and cleaned at least weekly.
- 380 • Where single-service cups are provided, separate sanitary containers will be provided for
381 the storage of the unused cups and for the disposal of the used cups.
- 382 • Water or other supplied beverages will not be dipped from the container by any means,
383 and use of a common cup will not be allowed. Use of non-potable water is not
384 anticipated; however, if containers of such water are used, they will be conspicuously
385 labeled “Caution: water unfit for drinking, washing, or cooking.

386 Toilet and washing facilities will be available at the project site in Building 1. ZAPATA will
387 also arrange for the siting of portable toilets at the primary staging area near Parcel 21. The SSO
388 will require proper hygienic practices to remove contaminants that might be present on the
389 hands, clothing, or personal PPE, especially when personnel conduct environmental sampling for
390 munitions constituents.

391 **8.10 POWER AND HAND TOOL OPERATION**

392 To control the hazards associated with power tool operation, the requirements outlined in EM
393 385-1-1, Chapter 13; and the safe work practices listed below will be observed when using
394 power tools:

- 395 • Operation of power tools will be conducted by personnel trained in the use of the tool, its
396 operation, and safety precautions.

- 397 • Power tools will be inspected prior to use, and defective equipment will be removed from
398 service until repaired.
- 399 • Power tools with guards for moving parts will have such guards in place prior to and
400 during use, and loose fitting clothing or long hair will be secured away from moving
401 parts.
- 402 • Hands, feet, etc., will be kept away from all moving parts.
- 403 • Maintenance and/or adjustments to equipment will not be conducted while it is in
404 operation or connected to a power source, and maintenance on gasoline-powered tools
405 will be conducted only after the spark plug has been removed and secured.

406 Use of improper or defective hand tools can contribute significantly to the occurrence of
407 accidents on site. Therefore, the requirements outlined in EM 385-1-1, Chapter 13 and the safe
408 work practices listed below will be observed when using hand tools:

- 409 • Hand tools will be inspected for defects prior to each use.
- 410 • Defective hand tools will be removed from service and repaired or properly discarded.
- 411 • Tools will be selected and used in the manner for which they were designed.
- 412 • Be sure of footing and grip before using any tool.
- 413 • Do not use tools that have split handles, mushroom heads, worn jaws, or other defects.
- 414 • Leather work gloves will be worn to increase gripping ability and to protect the hand if a
415 cut, laceration, or puncture hazard exists during the use of the tool.
- 416 • Safety glasses or a face shield will be used if use of tools presents an eye/face hazard.
- 417 • Do not use makeshift tools or other improper tools.
- 418 • When working on elevated surfaces, tools will be secured to ensure they cannot fall on
419 someone below.

420 **8.11 CHEMICAL HAZARD COMMUNICATION**

421 The SSO will control the entry of other chemical products into the work environment, and limit
422 the number of such products to the minimum necessary for project execution. He will obtain a
423 copy of a material safety data sheet (MSDS) for all such chemical products (unless an exception
424 applies) and maintain these on the site. In addition, the SSO will review the hazards inherent in
425 the storage and anticipated use of the chemicals, and provide training to workers exposed to
426 these hazards. Such training will be provided upon initial assignment to the site and before use
427 of the product. Supplemental training will be scheduled and presented whenever a new
428 hazardous substance is introduced into the work area or whenever an employee changes job
429 locations where different products are encountered.

430 The SSO will maintain on the site the following documents and records, and inform site workers
431 of their place of storage: (1) The OSHA standard on chemical hazard communication (29 CFR
432 1910.1200) and (2) A list of chemical products on the site, with associated MSDSs (Attachment
433 4 of the APP).

434 Subcontractors will comply with the requirements presented above and will supply the SSO with
435 copies of MSDSs for any chemical products that they bring onto the site.

436 **8.12 SPILL CONTROL**

437 A portable spill-response kit containing oil/solvent absorbent pillows/pads, PPE and disposal
438 supplies will be maintained in a readily accessible location where fuels, oils, solvents and other
439 environmentally harmful materials are stored on site. The SSO will train workers in the proper
440 use of such equipment.

441 **8.13 BIOLOGICAL HAZARDS**

442 Biological hazards include insects, ticks, spiders, and scorpions. Poisonous snakes, domestic
443 dogs, and hazardous plants also may be encountered on the project site. Employee awareness
444 and the safe work practices listed below will minimize hazards. The SSO will make inquiries
445 about likely biological hazards at the work site, and tailor training material accordingly.

446 Mosquitoes, flies, and fleas are likely site pests. The SSO will maintain a supply of insect
447 repellent on the site and encourage its frequent use when the potential for insect bites exists.

448 The following practices should be followed to avoid risks from poisonous plants:

- 449 • Avoid contact with any poisonous or unidentified plants. If poisonous plants are
450 identified, warn others and notify the SSO;
- 451 • Wash hands, face or other exposed areas at the beginning of each break period and at the
452 end of each work day;
- 453 • Avoid contact with contaminated tools, equipment and clothing; and wash these
454 regularly;
- 455 • Consider the use of barrier creams, detoxification/wash solutions and orally administered
456 desensitization products.

457 All snakes should be considered venomous, and all should be avoided. Employees should be
458 extremely cautious when they remove brush, lift rocks and debris, or enter wooded or grassy
459 areas. Heavy gloves, high-top boots, chaps and other protective equipment should be used when
460 needed to prevent contact with snakes.

461 The following precautions should be followed to avoid the risks of tick bites:

- 462 • Standard field gear (work boots, socks, and work uniform) provides good protection
463 against tick bites, particularly if the openings are taped.
- 464 • Avoid direct skin contact with ticks by wearing long sleeves, long pants, socks, etc.
465 Consider taping openings in clothing, if this can be done safely.
- 466 • When in the field, check yourself often for ticks, particularly on your lower legs and
467 areas covered with hair.
- 468 • Spray outer clothing, particularly your pant legs and socks – but not your skin – with an
469 insect repellent that is effective against ticks.
- 470 • To the extent feasible, avoid contact with bushes, tall grass, or brush.

- 471 • If you find a tick, remove it by pulling on it gently with tweezers. (Do not use matches, a
472 lit cigarette, nail polish or any other type of chemical to "coax" the tick out.)
- 473 • Be sure to remove all parts of the tick's body, and disinfect the area with alcohol or a
474 similar antiseptic after removal.
- 475 • For several days to several weeks after removal of the tick, look for the signs of the onset
476 of Lyme disease, such as a rash that looks like a bulls-eye or an expanding red circle
477 surrounding a light area, frequently seen with a small welt in the center.
- 478 • Look for signs of the onset of Rocky Mountain spotted fever, such as inflammation in the
479 form of a rash comprising many red spots under the skin. Inflammation may occur three
480 to 10 days after the tick bite.
- 481 • Report symptoms such as flu-like chills, fever, headache, dizziness, fatigue, stiff neck,
482 and bone pain to the SSO promptly. These could be the result of tick-borne disease.

483 Contact with stinging insects like bees, hornets and wasps should be avoided to the extent
484 feasible. The SSO will modify work rules as necessary to minimize contact and implement the
485 following procedures:

- 486 • If a worker knows that he is hypersensitive to bee, wasp, or hornet stings, he must inform
487 the SSO of this condition prior to participation in site activities.
- 488 • All site personnel will be watchful for the presence of stinging insects and their nests, and
489 will advise the SSO if a nest or swarm is present in or near a work area.
- 490 • Any nests located will be treated with insecticide from a distance or marked for
491 avoidance.
- 492 • Any employee who receives a sting will notify the SSO immediately, so that he can
493 observe the affected employee for signs of allergic reaction.
- 494 • Site personnel with a known hypersensitivity to stinging insects will keep required
495 emergency medication on or near their person at all times.

496 Spiders (including the black widow and brown recluse) and scorpions should be avoided through
497 the same practices discussed above for avoidance of reptiles, ticks, and insects. Site personnel
498 will report any suspected spider bite or scorpion sting to the SSO immediately. Also, they will
499 report the location of any scorpions or possibly venomous spiders observed during the work.

500 Project personnel will avoid contact with domestic or feral dogs, or any potentially dangerous
501 large animals. They should do nothing to encourage dogs or other large animals to approach the
502 work area, and practice strict avoidance if any should come near. Any bite or close contact with
503 such animals should be reported to the SSO immediately.

504 **8.14 CONTACT WITH CONTAMINATED SOIL OR WATER**

505 Significant exposure to chemical contaminants in soil and water is unlikely. Limited potential
506 for exposure to munitions constituents will exist when employees collect samples of soil or
507 sediment, or otherwise come into contact with contaminated media. The SSO will inform site
508 workers of the risks discussed below, and implement the precautions described.

509 Inhalation of chemical vapors and contaminated dust could occur during sample operations.
510 Chemical vapors could be present above freshly exposed earth after excavation tasks are
511 complete. Personnel will attempt to remain upwind of excavation operations.

512 The SSO will implement procedures to minimize skin contact with potentially contaminated soil,
513 sediment, and water. Personnel collecting environmental samples will wear disposable nitrile
514 gloves that will be changed at least every fifteen (15) minutes during collection activities.

515 Employees will not permit garments to become grossly soiled with potentially contaminated
516 material. Grossly soiled clothing should be changed, to prevent possible prolonged skin contact
517 with chemical contaminants.

518 Ingestion of contaminants, which could occur through hand-to-mouth contact, should be avoided.
519 The SSO will require proper hygienic practices to prevent ingestion of contaminants that might
520 be present on the hands, clothing, or PPE.

521 The SSO will halt work immediately and confer with the ZAPATA Manager of Health and
522 Safety if evidence of grossly contaminated soil, sediment, or surface water is noted. Such
523 evidence could include unusual odors, unusually discolored soil, sediment, or surface water, or
524 the unexpected presence of chemical containers.

525 **8.15 WORKPLACE EXPOSURE TO LEAD BY INHALATION AND INGESTION**

526 The only activity that is expected to present a potential exposure hazard to lead is the removal of
527 igloo drain pipes at Parcel 24 as part of the IM to be completed there. If the SSO determines that
528 a work operation could result in workplace exposure to lead, he or she will require protective
529 measures to minimize the inhalation of lead dust or fumes, or the ingestion of lead through hand-
530 to-mouth transfer. He or she will require the following work practices:

- 531 ● Workers will take all possible measures to minimize activities that create dust when work
532 will disturb soil or debris potentially contaminated with lead.
- 533 ● Workers will minimize potential dermal and inhalation exposure to dust containing lead
534 by moving upwind from operations that create it, when this is feasible. The SSO will
535 assist in the determination of whether moving upwind will mitigate dust exposure, and
536 will conduct periodic inspections to ensure that workers are complying with this
537 procedure.
- 538 ● If lead-containing dust generation is determined to be an issue, and sufficient natural air
539 movement is not present to allow workers to locate themselves upwind, then workers will
540 employ local exhaust ventilation techniques. Portable electric fans operated by a
541 generator will be used to create necessary air movement if necessary. The SSO will
542 inspect the operations to determine whether this step is necessary.
- 543 ● Due to the potential for creating lead-containing fumes, cutting torches may not be used
544 on igloo pipes, nor may heat otherwise be applied.
- 545 ● If the use of respirators is deemed necessary, then the SSO will confer with the ZAPATA
546 manager of health and safety to develop and implement a respiratory protection program
547 for employees performing the igloo drain pipe work at Parcel 24.
- 548 ● The SSO will implement necessary rules on personal hygiene to prevent hand-to-mouth
549 transfer of dust or soil in which the presence of elevated amounts of lead is suspected.

550 Unacceptable activities that could result in hand-to-mouth transfer of lead-contaminated
551 dust or soil include:

- 552 1. Touching or wiping the eyes, nose or mouth at any time while working within Parcel
553 24 and handling potential lead-containing materials.
- 554 2. Drinking or eating at any time while working within Parcel 24 and handling potential
555 lead-containing materials.
- 556 3. Smoking at any time while working within Parcel 24 and handling potential lead-
557 containing materials.
- 558 ● Based on site conditions, the SSO will specify personal protective clothing, such as
559 goggles or other eye protection and outer garments, if this is necessary to reduce
560 exposure. All workers will at a minimum wear protective gloves at any time while
561 working within Parcel 24 and handling potential lead-containing materials.
562

563 The general procedures that will be used to remove the igloo drain pipes and mitigate these
564 exposure risks are as follows:
565

- 566 ● Drain pipes will be removed from each of the igloos (right and/or left drains) using a
567 flush cutting power saw (i.e., band saw or reciprocating saw).
- 568 ● Workers will wear protective gloves whenever sawing drain pipes off of the igloos, or
569 handling drain pipes once they are removed from the igloos.
- 570 ● To ensure lead paint particles will not endanger workers cutting the drain pipes, measures
571 will be implemented. The section of drain pipe to be cut will first be wrapped with at
572 least two layers of duct tape to prevent, or minimize, the creation of lead-containing
573 particles or chips. Cuttings from the drain pipes will be collected by a sheet of
574 polyethylene plastic placed under the drain pipe during the cutting process to ensure lead
575 particles are not spread onto surrounding uncontaminated soil.
- 576 ● If generation of dust from the igloo pipe cutting process is noted during the cutting
577 process, appropriate respiratory protection will be worn by all personnel in the work area.
- 578 ● Once the igloo drain pipes have been removed, the pipes and plastic sheeting will be
579 packaged, packed in 55-gallon drums, and labeled as lead-containing materials.
- 580 ● The cutoff pipes will then be transported to a local scrap metal recycler (All City
581 Recycling and Towing) in Gallup, New Mexico for recycling of the metal pipes.

582 **8.16 WORK AROUND HEAVY EQUIPMENT**

583 The SSO will verify that the operators of heavy equipment have been trained in the safe
584 operation of the equipment that they are required to use. The SSO will perform the inspection,
585 or ensure that competent persons complete the inspection, of all heavy equipment each day
586 before use. Equipment may not be used if safety devices, including kill switches, are not
587 functional. The SSO will brief employees on such safety equipment and its use before work
588 commences. The SSO will inform all employees of the mechanical hazards associated with the
589 heavy equipment, and instruct them on the avoidance of these hazards.

590 The SSO will enforce appropriate exclusion zones during work operations. At a minimum the
591 exclusion zones will include the following:

- 592 • Heavy Equipment Operations: Non-essential personnel will maintain a distance of 100
593 ft. from all operating heavy equipment.
- 594 • If dust generation is an issue, personnel will remain upwind of all dust-generating
595 activities at all times.
- 596 • Decontamination Operations: Personnel not-involved in decontamination operations will
597 maintain a distance of 20 ft. From hand decontamination operations, and 100 ft. (and
598 upwind) from decontamination operations involving power washing equipment.

599 The SSO will require work practices that avoid close approach to overhead power lines by raised
600 portions of heavy equipment used on the site. The SSO will make appropriate inquiries and take
601 proper precautions to avoid contacting underground pipes, cables, or other utilities during
602 drilling or excavation operations.
603

604 **9.0 SITE CONTROL**

605 **9.1 WORK ZONE ACCESS CONTROL AND SECURITY**

606 The SSO and other site managers will control access to the site during operations, and enforce
607 upon site visitors the restrictions found elsewhere in this document.

608 **9.2 WORK ZONES**

609 The exclusion zone around operations within the leaching beds will be established by the SSO.
610 The SSO will designate contamination-reduction zones (CRZs) where employees will remove
611 gross contamination before entry into the support zone, or before movement of tools and
612 equipment into the support zone.

613 **9.3 SITE COMMUNICATIONS**

614 Effective on-site and off-site communication will be established prior to initiation of site
615 activities. On-site communication will be used to coordinate site operations, to maintain site
616 control, to convey safety information, and to alert site personnel to emergency situations. Off-
617 site communication will be available to ensure effective coordination with off-site management
618 personnel, the USACE, and emergency response services.

619 All site personnel will be familiar with the different methods of both on-site and off-site
620 communication. The methods that will be used for on- and off-site communication will include:

- 621 1. On-site communications will consist of hand-held radios, cell phones or other supplied
622 communication systems. Air horns, bullhorns, sirens, or hand signals can also be used, as
623 needed, for communications.
- 624 2. Off-site communications will be accomplished by cell phones or other supplied
625 communication systems. The SSO will verify that 911 service is available, and make
626 appropriate alternative arrangements if it is not available.

627 **10.0 PERSONNEL AND EQUIPMENT DECONTAMINATION**

628 Rigorous decontamination procedures will not be necessary because contact with chemical
629 contaminants in soil and water is not anticipated. The SSO will enforce basic precautions to
630 prevent unnecessary skin contact with soil and water. In addition, the SSO will require washing
631 of hands upon completion of field work to prevent ingestion of contaminants through the hand-
632 to-mouth exposure route.

633
634 Equipment decontamination will be performed in accordance with the various parcel Work
635 Plans, submitted under separate cover.

636

637 **11.0 SITE EMERGENCIES**

638 The SSO will notify the ZAPATA corporate Manager of Health and Safety, the ZAPATA PM
639 and the USACE and FWDA contacts listed below as soon as possible after any site emergency
640 occurs.

- 641
- 642 • Richard Cruz, FWDA Caretaker: (505) 862-2416.
- 643 • Mike Scoville, On-site Field Representative: (817) 403-4931.

644 **11.1 EMERGENCY EQUIPMENT AND FIRST AID REQUIREMENTS**

645 The emergency equipment listed in Table 11-1 will be on site, stored in the location indicated
646 and available for use during the operation specified. Emergency equipment assigned to an area
647 or team will be maintained in proper working order by the team, as directed by the team leader.
648 The SSO will conduct an inspection of all emergency equipment at least weekly to ensure
649 completeness and proper working order.

650 **TABLE 11-1 EMERGENCY EQUIPMENT REQUIREMENTS**

Emergency Equipment	No. Per Location	Area Where Item(s) Will Be Stored	Operation Requiring Specified Equipment
CPR Mask	1 ea.	Building-1	All operations
Automated External Defibrillator (AED)	2 ea.	Building-1	All operations
Portable Eye Wash Kit	2 ea.	Each vehicle	All operations
15-Minute Eye Wash	1 ea.	Building-1	All operations
Biohazard Kit	1 ea.	Building-1	All operations
First Aid Kit	1 ea.	Each vehicle and Building-1	All operations
Fire Extinguisher	1 ea.	Support vehicles and Building-1	All operations
Cellular Phone and air horn	1 ea.	Site Supervisor, Site Safety Officer, and Building-1	All operations

651

652 The size and number of first aid kits will be sufficient to accommodate the maximum number of
653 people (including government personnel and visitors) on site at any given time.

654 Portable bottles of eyewash will be readily available in each vehicle. Portable eyewash bottles
655 will be available for immediate use while the injured person is transported to the area where the
656 15-minute eye flushing station will be available. After flushing, the eyes will be bandaged
657 lightly, and the person will be transported to the appropriate medical facility for further
658 evaluation and treatment, if needed.

659 Personnel administering first aid and/or CPR will comply with the following:

- 660 • Personnel will wear disposable latex gloves if there is any visible body fluid;
- 661 • The CPR Pocket Mask will be used when performing CPR and disposed of after;

- 662 • Personnel will immediately change clothing that becomes contaminated with body fluids
- 663 as a result of performing first aid, or as soon as feasible; and
- 664 • Personnel will wash their hands immediately after performing first aid procedures.

665 **11.2 RESPONSE TO SEVERE SITE EMERGENCIES**

666 The SSO will identify possible site emergencies that would require quick action. These will
667 include the following scenarios:

- 668 • A severely injured or ill employee must be transported to a medical facility.
- 669 • Emergency medical services must be summoned to the site.

670 The SSO will make appropriate plans to deal with foreseeable emergencies and communicate
671 this information to all site workers. These plans will include the following:

- 672 • Evacuation routes and assembly points
- 673 • Means of alerting all site workers of various types of emergencies
- 674 • Names and telephone numbers of providers of emergency services at the site
- 675 • Names and locations of facilities at which emergency medical treatment could be
676 provided

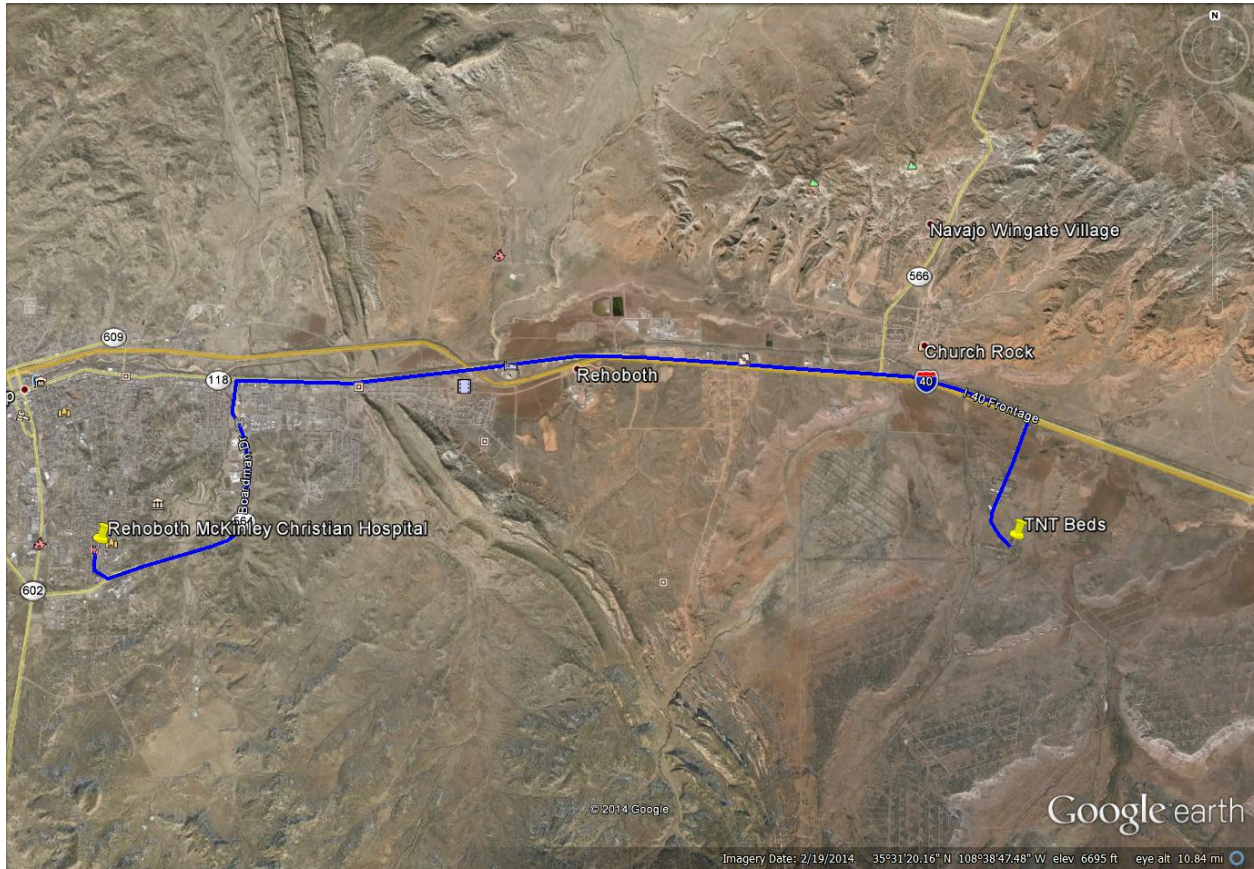
677 The SSO will verify that 911 service is available in the project location to summon emergency
678 services. If 911 service is not available, then the team leader will make appropriate inquiries to
679 obtain telephone numbers for police, ambulance, and fire services.

680 A partial list of emergency telephone numbers is found in Table 11-2. The SSO will add names
681 and numbers as appropriate. A map showing the route to the designated hospital is found in
682 Figure 1. The SSO will ensure that all employees are familiar with the route before site work
683 begins.

684 **TABLE 11-2 EMERGENCY TELEPHONE NUMBERS**

AGENCY	TELEPHONE No.
Rehoboth McKinley Christian Hospital	505-863-7000
Fire Department	911
Ambulance	911
Police Department	911
Bradley J. Kuntz, CIH ZAPATA Manager of Health and Safety	704-378-4920 (o) 704-907-5115 (c)
WorkCare (administrator of the ZAPATA medical program)	510-748-6900
Saqib Khan, USACE, Albuquerque District Project Manager	(918) 669-7374
Steve Carpenter, CESP OESS	817-821-2118 913-481-6778
Dennis Myers, CESWF OESS	817-609-5014 720-670-0493
Poison Control Center	800-222-1222

685 **FIGURE 11-1 HOSPITAL ROUTE**



686

687

688 **DIRECTIONS TO REHOBOTH MCKINLEY CHRISTIAN HOSPITAL**

689

690

- Leave FWDA
- Turn left onto US Highway 66
- Turn left onto Boardman Drive
- Turn right onto College Drive
- Turn right onto Hospital Drive
- Turn right onto Redrock Drive

691

692

693

694

695

696 Emergency and non-emergency medical services can be obtained at the Rehoboth McKinley
697 Christian Hospital in Gallup, NM at 1901 Redrock Drive. The telephone number of the facility
698 is **505-863-7000**. This is the general and emergency telephone number.

699

700 **12.0 LOGS, REPORTS, AND RECORD KEEPING**

701 **12.1 SAFETY, TRAINING, AND VISITOR**

702 The SSO will maintain a safety log to record all significant information related to workplace
703 health and safety each day. The safety log should include: (1) a record of safety briefings;
704 details of any accidents, injuries, illnesses, or near misses; details related to the conduct and
705 outcome of internal and external audits; the reason for and duration of safety-related “stop work”
706 orders; and any other issues pertaining to site or personnel safety or health.

707 The SSO will document all safety-related training sessions in a training log or on appropriate
708 forms collected in a file or notebook and maintained on the site. This log will include the initial
709 site-specific training conducted prior to the start of site activities, the safety briefings, hazard-
710 specific training, etc.

711 The SSO will maintain a visitor log, which will be used to record the entry and exit of all
712 visitors. No visitors will be allowed to enter the project site without providing the information
713 required.

714 **12.2 INJURY/ILLNESS/ACCIDENT REPORTS**

715 Accident reporting is discussed in Section 8.0 of the APP.

ATTACHMENT 2
ACTIVITY HAZARDS ANALYSES

ACTIVITY HAZARDS ANALYSIS

Overall Risk Assessment Code (RAC)
(Use highest code)

M

Date: December 2014 Project: W9128F-13-D-0025

Activity: Mobilization and Site Preparation

Activity Location: Fort Wingate Depot Activity, New Mexico

Prepared By: George A. Dwiggins, Ph.D., CIH, CSP

Risk Assessment Code Matrix

E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

		Probability				
		Frequent	Likely	Occasional	Seldom	Unlikely
Severity	Catastrophic	E	E	H	H	M
	Critical	E	H	H	M	L
	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L

Add Identified Hazards

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	Delivery and set-up of site trailer, surveying and project planning, etc.	Slips, trips, and falls; lacerations from sharp objects; pinched or crushed fingers, feet, and toes; eye injury from flying projectiles or impacts with tree limbs, head injury from impacts; sunburn.	Basic PPE will consist of a hardhat (around mechanical equipment), safety glasses with side shields or comparable side protection, steel-toe work boots or boots offering comparable protection of the toes, leather work gloves; and a basic work outfit offering some protection against abrasion and sunlight. The safety officer will require good housekeeping practices.	M
X		Musculo-skeletal injury from heavy lifting or strenuous exertions.	The safety officer will require proper lifting techniques and enforce a 40 pound limit on any unassisted lift. The safety officer will provide training to all employees concerning proper lifting techniques (i.e., lift with legs and not the back, etc.). The safety officer will remind employees frequently that magnetometer use can cause repetitive trauma, and require frequent breaks.	M
X		Heat stress / Cold stress.	The safety officer will monitor conditions and implement controls in ZAPATA Procedures HS-M-12 and HS-M-13, as appropriate. (The safety officer will keep a copy of HS-M-12 and HS-M-13 on the site.). The safety officer will keep and maintain a Wet Globe Bulb Thermoter (WGBT) on site at all times.	M
X		Biological hazards (including poisonous plants and animals)	The safety officer will require avoidance of wild animals and – to the extent feasible – avoidance of poisonous plants, insects, spiders, etc.. He will maintain a supply of insect repellent and encourage its use. Initial training on the potential species present and avoidance techniques will be given to all employees.	M

ACTIVITY HAZARDS ANALYSIS

JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	Activity Hazard Analysis for Mobilization and Site Preparation Page 2 of 2	Munitions hazards The safety officer will permit only authorized project personnel to enter the work area. No disturbance of ordnance items is anticipated during this activity. While mixing soils with explosives >10% are conducted, a UXO Tech II and UXO Tech III will be present on-site at all times.	M
X		Inclement weather The safety officer will remain aware of weather forecasts and plan for inclement weather during project work. If inclement weather appears imminent, the safety officer will direct site workers to halt work and to take refuge in vehicles or nearby buildings. If thunder is audible, personnel will take immediate shelter in vehicles or buildings. Work will not resume until 1/2 hour has elapsed after hearing the last thunder.	M
X		Noise The safety officer will require the use of earplugs whenever employees work around noisy operations. A sound level meter will be used and hearing protection will be required any time sound levels are 85 decibels or greater.	M
X		Vehicle accidents The safety officer will confirm that only drivers qualified under the ZAPATA fleet safety program are permitted to drive vehicles. The safety officer will enforce appropriate vehicle safety rules, including a reasonable speed limit, if one is not imposed by site authorities.	M
X		Unauthorized site visitors The safety officer will enforce an exclusion zone sufficient to prevent entry of unauthorized personnel into a potentially dangerous area.	M

Add Items

EQUIPMENT	TRAINING	INSPECTION	
X	<p>Various vehicles</p> <p>Shovels and other implements</p> <p>Powered hand tools</p>	<p>All site workers will be briefed on the requirements of the site safety plan, including emergency plans.</p> <p>At least two site workers present at all times must have current first aid and CPR certifications.</p> <p>The safety officer will conduct a daily safety briefing.</p> <p>The safety officer will confirm that workers who drive vehicles for ZAPATA business are on the list of qualified drivers.</p>	<p>Daily check for adequacy of site communication.</p> <p>Daily inspection of fire extinguishers and first aid kits.</p> <p>Daily activity inspections by the safety officer.</p> <p>Daily vehicle inspections, in accordance with the ZAPATA fleet-safety program.</p> <p>Inspect all hand tools prior to use and repair or replace damaged tools.</p>

ACTIVITY HAZARDS ANALYSIS

Involved Personnel:

Site safety officer and other ZAPATA and subcontractors' employees.

Acceptance Authority (digital signature):

ACTIVITY HAZARDS ANALYSIS

Overall Risk Assessment Code (RAC)
(Use highest code)

M

Date: December 2014 Project: W9128F-13-D-0025

Activity: Mixing of Soil within the TNT Leaching Beds

Activity Location: Fort Wingate Depot Activity, New Mexico

Prepared By: George A. Dwiggins, Ph.D., CIH, CSP

Risk Assessment Code Matrix

E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

		Probability				
		Frequent	Likely	Occasional	Seldom	Unlikely
S e v e r i t y	Catastrophic	E	E	H	H	M
	Critical	E	H	H	M	L
	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L

Add Identified Hazards

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	Excavation of soil. Mixing, testing, and stockpiling of soil. Removal of soil from the site.	Slips, trips, and falls; lacerations from sharp objects; pinched or crushed fingers, feet, and toes; eye injury from flying projectiles or impacts with tree limbs, head injury from impacts; sunburn.	Basic PPE will consist of a hardhat (around mechanical equipment), safety glasses with side shields or comparable side protection, work boots, leather work gloves; and a basic work outfit offering some protection against abrasion and sunlight. The safety officer will require good housekeeping practices.	M
X		Musculo-skeletal injury from heavy lifting or strenuous exertions.	The safety officer will require proper lifting techniques and enforce a 40 pound limit on any unassisted lift. he safety officer will provide training to all employees concerning proper lifting techniques (i.e., lift with legs and not the back, etc.). The safety officer will remind employees frequently about repetitive trauma, and require frequent breaks.	M
X		Heat stress / Cold stress.	The safety officer will monitor conditions and implement controls in ZAPATA Procedures HS-M-12 and HS-M-13, as appropriate. (The safety officer will keep a copy of HS-M-12 and HS-M-13 on the site.). The safety officer will keep and maintain a Wet Globe Bulb Thermoter (WGBT) on site at all times.	M
X		Biological hazards (including poisonous plants and animals)	The safety officer will require avoidance of wild animals and – to the extent feasible – avoidance of poisonous plants, insects, spiders, etc.. He will maintain a supply of insect repellent and encourage its use. Initial training on the potential species present and avoidance techniques will be given to all employees.	M

ACTIVITY HAZARDS ANALYSIS

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	Activity Hazard Analysis for Mixing of Soil within the TNT Leaching Beds Page 2 of 4.	Electrical shock	The safety officer will ensure that overhead utility lines are not present in the work area, and that diligent efforts have been made to locate and mark underground utility lines and pipes.	M
X		Inclement weather	The safety officer will remain aware of weather forecasts and plan for inclement weather during project work. If inclement weather appears imminent, the safety officer will direct site workers to halt work and to take refuge in vehicles or nearby buildings. If thunder is audible, personnel will take immediate shelter in vehicles or buildings. Work will not resume until 1/2 hour has elapsed after hearing the last thunder.	M
X		Noise	The safety officer will require the use of earplugs whenever employees work around noisy operations. A sound level meter will be used and hearing protection will be required any time sound levels are 85 decibels or greater.	M
X		Vehicle accidents	The safety officer will confirm that only drivers qualified under the ZAPATA fleet safety program are permitted to drive vehicles. The safety officer will enforce appropriate vehicle safety rules, including a reasonable speed limit, if one is not imposed by site authorities.	M
X		Unauthorized site visitors	The safety officer will enforce an exclusion zone sufficient to prevent entry of unauthorized personnel into a potentially dangerous area.	M
X		Munitions hazards	The UXOSO will permit only properly trained and authorized personnel to enter the work area. He will require adherence to stringent procedures to avoid unplanned detonation of ordnance. The UXOSO will enforce an exclusion zone sufficient to prevent entry of unauthorized personnel into a potentially dangerous area. The UXOSO will limit the number of personnel within the exclusion zone to the minimum necessary to accomplish the work.	M
X		Excavations	The safety officer will forbid entry into excavations deeper than four feet unless proper sloping and/or benching is completed, and implement necessary rules to prevent collapse of trench sides. Excavations will be back-filled as soon as possible. Cones and other safety barriers will be placed surrounding all excavations overnight. An OSHA competent person shall be present to direct excavation work.	M

ACTIVITY HAZARDS ANALYSIS

JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC	
X	Activity Hazard Analysis for Mixing of Soil within the TNT Leaching Beds Page 3 of 4.	Chemical munitions, or other unanticipated site hazards	<p>The safety officer will order the immediate withdrawal of all site personnel upon the discovery of chemical munitions or other unanticipated site hazards.</p> <p>The safety officer will contact the USACE PM, USACE on-site representative, ZAPATA PM and manager of health and safety as soon as possible if unanticipated site hazards are encountered.</p>	M
X		Injury from contact with backhoe or excavator	<p>The safety officer will verify that operators have been trained in the safe operation of the heavy equipment that they are required to use. Personnel near operations involving heavy equipment will wear brightly colored safety vest, maintain a distance that is greater than the reach of the equipment, and maintain eye contact with the operator. Hard hats will be worn around excavating equipment. The backhoe or excavator bucket will be lowered to the ground and equipment will be turned off when material is collected from the bucket or when workers approach for any other reason.</p>	M
X		Inhalation of dust or chemical vapors during work near potentially contaminated freshly exposed earth.	<p>Personnel will attempt to remain upwind of freshly exposed earth and operations that generate dust. Periodic wetting of soils will be used to control dust during excavation work.</p>	M
X		Skin contact with contaminated soil or water.	<p>The safety officer will require procedures that prevent skin contact with potentially contaminated soil or water. He or she may require the use of disposable nitrile gloves and other necessary PPE.</p>	M
X		Ingestion of contaminants	<p>The SSHO will require proper hygienic practices to prevent ingestion of contaminants that might be present on the hands, clothing, or PPE.</p>	M

Add Items

EQUIPMENT	TRAINING	INSPECTION
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ACTIVITY HAZARDS ANALYSIS

	EQUIPMENT	TRAINING	INSPECTION
X	Activity Hazard Analysis for Mixing of Soil within the TNT Leaching Beds Page 4 of 4. Various vehicles Shovels and other implements Excavating equipment	All site workers will be briefed on the requirements of the site safety plan, including emergency plans. At least two site workers present at all times must have current first aid and CPR certifications. The safety officer will conduct a daily safety briefing. The safety officer will confirm that workers who drive vehicles for ZAPATA business are on the list of qualified drivers. The safety officer will obtain assurances that operators of any heavy equipment have received appropriate training.	Daily check for adequacy of site communication. Daily inspection of fire extinguishers and first aid kits. Daily activity inspections by the safety officer. Daily vehicle inspections, in accordance with the ZAPATA fleet-safety program. Inspect all hand tools prior to use and repair or replace damaged tools. Daily magnetometer inspections and calibration prior to use. Daily inspections of heavy equipment.

Involved Personnel:
 Site safety officer and other ZAPATA and subcontractors' employees.

Acceptance Authority (digital signature): _____

ACTIVITY HAZARDS ANALYSIS

Overall Risk Assessment Code (RAC)
(Use highest code)

M

Date: December 2014 Project: W9128F-13-D-0025

Activity: Removal and Disposal of Igloo Drain Pipes

Activity Location: Fort Wingate Depot Activity, New Mexico

Prepared By: George A. Dwiggins, Ph.D., CIH, CSP

Risk Assessment Code Matrix

E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

		Probability				
		Frequent	Likely	Occasional	Seldom	Unlikely
Severity	Catastrophic	E	E	H	H	M
	Critical	E	H	H	M	L
	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L

Add Identified Hazards

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	Removal of drain pipes with cutting tools. Handling and disposal of drain pipes.	Slips, trips, and falls; lacerations from sharp objects; pinched or crushed fingers, feet, and toes; eye injury from flying projectiles or impacts with tree limbs, head injury from impacts; sunburn.	Basic PPE will consist of a hardhat (around mechanical equipment), safety glasses with side shields or comparable side protection, work boots, leather work gloves; and a basic work outfit offering some protection against abrasion and sunlight. The safety officer will require good housekeeping practices.	M
X		Musculo-skeletal injury from heavy lifting or strenuous exertions.	The safety officer will require proper lifting techniques and enforce a 40 pound limit on any unassisted lift. The safety officer will provide training to all employees concerning proper lifting techniques (i.e., lift with legs and not the back, etc.). The safety officer will remind employees frequently that magnetometer use can cause repetitive trauma, and require frequent breaks.	M
X		Heat stress / Cold stress.	The safety officer will monitor conditions and implement controls in ZAPATA Procedures HS-M-12 and HS-M-13, as appropriate. (The safety officer will keep a copy of HS-M-12 and HS-M-13 on the site.). The safety officer will keep and maintain a Wet Globe Bulb Thermoter (WGBT) on site at all times.	M
X		Biological hazards (including poisonous plants and animals)	The safety officer will require avoidance of wild animals and – to the extent feasible – avoidance of poisonous plants, insects, spiders, etc.. He will maintain a supply of insect repellent and encourage its use. Initial training on the potential species present and avoidance techniques will be given to all employees	M

ACTIVITY HAZARDS ANALYSIS

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	Activity Hazard Analysis for Removal and Disposal of Igloo Drain Pipes Page 2 of 3.	Electrical shock	The safety officer will ensure that electricity-powered equipment is in good condition.	M
X		Inclement weather	<p>The safety officer will remain aware of weather forecasts and plan for inclement weather during project work. If inclement weather appears imminent, the safety officer will direct site workers to halt work and to take refuge in vehicles or nearby buildings.</p> <p>If thunder is audible, personnel will take immediate shelter in vehicles or buildings. Work will not resume until 1/2 hour has elapsed after hearing the last thunder.</p>	M
X		Noise	The safety officer will require the use of earplugs whenever employees work around noisy operations. A sound level meter will be used and hearing protection will be required any time sound levels are 85 decibels or greater.	M
X		Vehicle accidents	<p>The safety officer will confirm that only drivers qualified under the ZAPATA fleet safety program are permitted to drive vehicles.</p> <p>The safety officer will enforce appropriate vehicle safety rules, including a reasonable speed limit, if one is not imposed by site authorities.</p>	M
X		Unauthorized site visitors	The safety officer will enforce an exclusion zone sufficient to prevent entry of unauthorized personnel into a potentially dangerous area.	M
X		Inhalation of dust containing lead-based paint or other toxic metals.	<p>The safety officer will require work practices that minimize the production of dust. Procedures that will be used to minimize potential for inhalation of dust include:</p> <ul style="list-style-type: none"> - Personnel will attempt to remain upwind of operations that generate dust. - Plastic sheeting will be placed under the Igloo drain while cutting operations are in progress. Cuttings will be contained on the plastic sheeting, followed by wrapping and taping of the plastic after cutting operations are complete. The wrapped cuttings will be properly disposed off-site as lead-containing materials. - If the safety officer observes that dust and inhalation are a concern, proper particulate masks will be required of all field personnel. - If large amounts of dust (cuttings) generation are observed, the safety officer will require the field crew to place an isolation box around the Igloo drain while cutting is in progress. 	M

ACTIVITY HAZARDS ANALYSIS

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	Activity Hazard Analysis for Removal and Disposal of Igloo Drain Pipes Page 3 of 3.	Skin contact with contaminated dust.	The safety officer will require procedures that prevent skin contact with potentially contaminated dust. He or she may require the use of disposable nitrile gloves and other necessary PPE.	M
X		Ingestion of contaminants	The SSHO will require proper hygienic practices to prevent ingestion of contaminants that might be present on the hands, clothing, or PPE. The safety officer will prohibit the following in the work zone: - Smoking - Eating - Drinking from containers that have been exposed to the work zone - Wiping the eyes, mouth, nose, or other mucous membranes with surfaces that have been exposed to lead-containing dust and that have not been decontaminated.	M

Add Items

	EQUIPMENT	TRAINING	INSPECTION
X	Activity Hazard Analysis for Removal and Disposal of Igloo Drain Pipes Page 3 of 3. Various vehicles Cutting equipment and other implements	All site workers will be briefed on the requirements of the site safety plan, including emergency plans. At least two site workers present at all times must have current first aid and CPR certifications. The safety officer will conduct a daily safety briefing. The safety officer will confirm that workers who drive vehicles for ZAPATA business are on the list of qualified drivers.	Daily check for adequacy of site communication. Daily inspection of fire extinguishers and first aid kits. Daily activity inspections by the safety officer. Daily vehicle inspections, in accordance with the ZAPATA fleet-safety program. Inspect all hand tools prior to use and repair or replace damaged tools.

Involved Personnel:
 Site safety officer and other ZAPATA and subcontractors' employees.

Acceptance Authority (digital signature): _____

ACTIVITY HAZARDS ANALYSIS

Overall Risk Assessment Code (RAC)
(Use highest code)

M

Date: December 2014 Project: W9128F-13-D-0025

Activity: Abandonment of Monitoring Wells

Activity Location: Fort Wingate Depot Activity, New Mexico

Prepared By: George A. Dwiggins, Ph.D., CIH, CSP

Risk Assessment Code Matrix

E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

		Probability				
		Frequent	Likely	Occasional	Seldom	Unlikely
S e v e r i t y	Catastrophic	E	E	H	H	M
	Critical	E	H	H	M	L
	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L

Add Identified Hazards

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	Abandonment of up to six monitoring wells using pumps, grout mixers, etc.	Slips, trips, and falls; lacerations from sharp objects; pinched or crushed fingers, feet, and toes; eye injury from flying projectiles or impacts with tree limbs, head injury from impacts; sunburn.	Basic PPE will consist of a hardhat (around mechanical equipment), safety glasses with side shields or comparable side protection, work boots, leather work gloves; and a basic work outfit offering some protection against abrasion and sunlight. The safety officer will require good housekeeping practices.	M
X		Musculo-skeletal injury from heavy lifting or strenuous exertions.	The safety officer will require proper lifting techniques and enforce a 40 pound limit on any unassisted lift. The safety officer will provide training to all employees concerning proper lifting techniques (i.e., lift with legs and not the back, etc.). The safety officer will remind employees frequently that certain activities can cause repetitive trauma, and require frequent breaks.	M
X		Heat stress / Cold stress.	The safety officer will monitor conditions and implement controls in ZAPATA Procedures HS-M-12 and HS-M-13, as appropriate. (The safety officer will keep a copy of HS-M-12 and HS-M-13 on the site.). The safety officer will keep and maintain a Wet Globe Bulb Thermoter (WGBT) on site at all times.	M
X		Biological hazards (including poisonous plants and animals)	The safety officer will require avoidance of wild animals and – to the extent feasible – avoidance of poisonous plants, insects, spiders, etc.. He will maintain a supply of insect repellent and encourage its use. Initial training on the potential species present and avoidance techniques will be given to all employees.	M

ACTIVITY HAZARDS ANALYSIS

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X		Electrical shock	The safety officer will ensure that overhead utility lines are not present in the work area, and that diligent efforts have been made to locate and mark underground utility lines and pipes.	M
X	Activity Hazard Analysis for Abandonment of Monitoring Wells Page 2 of 3.	Inclement weather	The safety officer will remain aware of weather forecasts and plan for inclement weather during project work. If inclement weather appears imminent, the safety officer will direct site workers to halt work and to take refuge in vehicles or nearby buildings. If thunder is audible, personnel will take immediate shelter in vehicles or buildings. Work will not resume until 1/2 hour has elapsed after hearing the last thunder.	M
X		Noise	The safety officer will require the use of earplugs whenever employees work around noisy operations. A sound level meter will be used and hearing protection will be required any time sound levels are 85 decibels or greater.	M
X		Vehicle accidents	The safety officer will confirm that only drivers qualified under the ZAPATA fleet safety program are permitted to drive vehicles. The safety officer will enforce appropriate vehicle safety rules, including a reasonable speed limit, if one is not imposed by site authorities.	M
X		Unauthorized site visitors	The safety officer will enforce an exclusion zone sufficient to prevent entry of unauthorized personnel into a potentially dangerous area.	M
X		Chemical munitions, or other unanticipated site hazards	The safety officer will order the immediate withdrawal of all site personnel upon the discovery of chemical munitions or other unanticipated site hazards. The safety officer will immediately contact the USACE PM and on-site representative, ZAPATA PM, and ZAPATA manager of health and safety if unanticipated site hazards are encountered.	M
X		Inhalation of chemical vapors.	Personnel will attempt to remain upwind of wells or other potential sources of chemical vapors. Although volatile vapors are not expected to be a concern at any of the FWDA wells, if unusual odors or other indications of potential hazardous vapors are noticed a field portable volatile vapor analyzer will be secured and used to monitor breathing zones during fieldwork.	M

ACTIVITY HAZARDS ANALYSIS

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X		Skin contact with contaminated water.	The safety officer will require procedures that prevent skin contact with potentially contaminated soil or water. He or she may require the use of disposable nitrile gloves and other necessary PPE.	M
X		Ingestion of contaminants	<p>The SSHO will require proper hygienic practices to prevent ingestion of contaminants that might be present on the hands, clothing, or PPE. The safety officer will prohibit the following in the work zone:</p> <ul style="list-style-type: none"> - Smoking - Eating - Drinking from containers that have been exposed to the work zone - Wiping the eyes, mouth, nose, or other mucous membranes with surfaces that have been exposed to lead-containing dust and that have not been decontaminated. 	M

Add Items

	EQUIPMENT	TRAINING	INSPECTION
X	<p>Activity Hazard Analysis for Abandonment of Monitoring Wells Page 3 of 3.</p> <p>Various vehicles</p> <p>Shovels and other implements</p> <p>Excavating equipment</p>	<p>All site workers will be briefed on the requirements of the site safety plan, including emergency plans.</p> <p>At least two site workers present at all times must have current first aid and CPR certifications.</p> <p>The safety officer will conduct a daily safety briefing.</p> <p>The safety officer will confirm that workers who drive vehicles for ZAPATA business are on the list of qualified drivers.</p>	<p>Daily check for adequacy of site communication.</p> <p>Daily inspection of fire extinguishers and first aid kits.</p> <p>Daily activity inspections by the safety officer.</p> <p>Daily vehicle inspections, in accordance with the ZAPATA fleet-safety program.</p> <p>Inspect all hand tools prior to use and repair or replace damaged tools.</p>

Involved Personnel:
Site safety officer and other ZAPATA and subcontractors' employees.

Acceptance Authority (digital signature): _____

ACTIVITY HAZARDS ANALYSIS

Overall Risk Assessment Code (RAC)
(Use highest code)

M

Date: December 2014 Project: W9128F-13-D-0025

Activity: Demobilization

Activity Location: Fort Wingate Depot Activity, New Mexico

Prepared By: George A. Dwiggins, Ph.D., CIH, CSP

Risk Assessment Code Matrix

E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

		Probability				
		Frequent	Likely	Occasional	Seldom	Unlikely
S e v e r i t y	Catastrophic	E	E	H	H	M
	Critical	E	H	H	M	L
	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L

Add Identified Hazards

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	Completion of work activities and removal of equipment.	Slips, trips, and falls; lacerations from sharp objects; pinched or crushed fingers, feet, and toes; eye injury from flying projectiles or impacts with tree limbs, head injury from impacts; sunburn.	Basic PPE will consist of a hardhat (around mechanical equipment), safety glasses with side shields or comparable side protection, steel-toe work boots or boots offering comparable protection of the toes, leather work gloves; and a basic work outfit offering some protection against abrasion and sunlight. The safety officer will require good housekeeping practices.	M
X		Musculo-skeletal injury from heavy lifting or strenuous exertions.	The safety officer will require proper lifting techniques and enforce a 40 pound limit on any unassisted lift. The safety officer will provide training to all employees concerning proper lifting techniques (i.e., lift with legs and not the back, etc.). The safety officer will remind employees frequently that certain activities can cause repetitive trauma, and require frequent breaks.	M
X		Heat stress / Cold stress.	The safety officer will monitor conditions and implement controls in ZAPATA Procedures HS-M-12 and HS-M-13, as appropriate. (The safety officer will keep a copy of HS-M-12 and HS-M-13 on the site.). The safety officer will keep and maintain a Wet Globe Bulb Thermoter (WGBT) on site at all times.	M
X		Biological hazards (including poisonous plants and animals)	The safety officer will require avoidance of wild animals and – to the extent feasible – avoidance of poisonous plants, insects, spiders, etc.. He will maintain a supply of insect repellent and encourage its use. Initial training on the potential species present and avoidance techniques will be given to all employees.	M

ACTIVITY HAZARDS ANALYSIS

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	Activity Hazard Analysis for Demobilization Page 2 of 2	Munitions hazards	<p>The safety officer will permit only authorized project personnel to enter the work area. No disturbance of ordnance items is anticipated during this activity.</p> <p>While mixing soils with explosives >10% are conducted, a UXO Tech II and UXO Tech III will be present on-site at all times.</p>	M
X		Inclement weather	<p>The safety officer will remain aware of weather forecasts and plan for inclement weather during project work. If inclement weather appears imminent, the safety officer will direct site workers to halt work and to take refuge in vehicles or nearby buildings.</p> <p>If thunder is audible, personnel will take immediate shelter in vehicles or buildings. Work will not resume until 1/2 hour has elapsed after hearing the last thunder.</p>	M
X		Noise	The safety officer will require the use of earplugs whenever employees work around noisy operations. A sound level meter will be used and hearing protection will be required any time sound levels are 85 decibels or greater.	M
X		Vehicle accidents	<p>The safety officer will confirm that only drivers qualified under the ZAPATA fleet safety program are permitted to drive vehicles.</p> <p>The safety officer will enforce appropriate vehicle safety rules, including a reasonable speed limit, if one is not imposed by site authorities.</p>	M
X		Unauthorized site visitors	The safety officer will enforce an exclusion zone sufficient to prevent entry of unauthorized personnel into a potentially dangerous area.	M

Add Items

	EQUIPMENT	TRAINING	INSPECTION
X	<p>Various vehicles</p> <p>Shovels and other implements</p> <p>Powered hand tools</p>	<p>All site workers will be briefed on the requirements of the site safety plan, including emergency plans.</p> <p>At least two site workers present at all times must have current first aid and CPR certifications.</p> <p>The safety officer will conduct a daily safety briefing.</p> <p>The safety officer will confirm that workers who drive vehicles for ZAPATA business are on the list of qualified drivers.</p>	<p>Daily check for adequacy of site communication.</p> <p>Daily inspection of fire extinguishers and first aid kits.</p> <p>Daily activity inspections by the safety officer.</p> <p>Daily vehicle inspections, in accordance with the ZAPATA fleet-safety program.</p> <p>Inspect all hand tools prior to use and repair or replace damaged tools.</p>

ACTIVITY HAZARDS ANALYSIS

Involved Personnel:

Site safety officer and other ZAPATA and subcontractors' employees.

Acceptance Authority (digital signature):

ACTIVITY HAZARDS ANALYSIS

Overall Risk Assessment Code (RAC)
(Use highest code)

M

Date: December 2014 Project: W9128F-13-D-0025

Activity: Excavation of Soil

Activity Location: Fort Wingate Depot Activity, New Mexico

Prepared By: George A. Dwiggins, Ph.D., CIH, CSP

Risk Assessment Code Matrix

E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

		Probability				
		Frequent	Likely	Occasional	Seldom	Unlikely
S e v e r i t y	Catastrophic	E	E	H	H	M
	Critical	E	H	H	M	L
	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L

Add Identified Hazards

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	Excavation of soil. Mixing, testing, and stockpiling of soil. Removal of soil from the site.	Slips, trips, and falls; lacerations from sharp objects; pinched or crushed fingers, feet, and toes; eye injury from flying projectiles or impacts with tree limbs, head injury from impacts; sunburn.	Basic PPE will consist of a hardhat (around mechanical equipment), safety glasses with side shields or comparable side protection, work boots, leather work gloves; and a basic work outfit offering some protection against abrasion and sunlight. The safety officer will require good housekeeping practices.	M
X		Musculo-skeletal injury from heavy lifting or strenuous exertions.	The safety officer will require proper lifting techniques and enforce a 40 pound limit on any unassisted lift. The safety officer will provide training to all employees concerning proper lifting techniques (i.e., lift with legs and not the back, etc.). The safety officer will remind employees frequently that certain activities can cause repetitive trauma, and require frequent breaks.	M
X		Heat stress / Cold stress.	The safety officer will monitor conditions and implement controls in ZAPATA Procedures HS-M-12 and HS-M-13, as appropriate. (The safety officer will keep a copy of HS-M-12 and HS-M-13 on the site.). The safety officer will keep and maintain a Wet Globe Bulb Thermoter (WGBT) on site at all times.	M
X		Biological hazards (including poisonous plants and animals)	The safety officer will require avoidance of wild animals and – to the extent feasible – avoidance of poisonous plants, insects, spiders, etc.. He will maintain a supply of insect repellent and encourage its use. Initial training on the potential species present and avoidance techniques will be given to all employees.	M

ACTIVITY HAZARDS ANALYSIS

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	Activity Hazard Analysis for Excavation of Soil Page 2 of 4.	Electrical shock	The safety officer will ensure that overhead utility lines are not present in the work area, and that diligent efforts have been made to locate and mark underground utility lines and pipes.	M
X		Inclement weather	The safety officer will remain aware of weather forecasts and plan for inclement weather during project work. If inclement weather appears imminent, the safety officer will direct site workers to halt work and to take refuge in vehicles or nearby buildings. If thunder is audible, personnel will take immediate shelter in vehicles or buildings. Work will not resume until 1/2 hour has elapsed after hearing the last thunder.	M
X		Noise	The safety officer will require the use of earplugs whenever employees work around noisy operations. A sound level meter will be used and hearing protection will be required any time sound levels are 85 decibels or greater.	M
X		Vehicle accidents	The safety officer will confirm that only drivers qualified under the ZAPATA fleet safety program are permitted to drive vehicles. The safety officer will enforce appropriate vehicle safety rules, including a reasonable speed limit, if one is not imposed by site authorities.	M
X		Unauthorized site visitors	The safety officer will enforce an exclusion zone sufficient to prevent entry of unauthorized personnel into a potentially dangerous area.	M
X		Munitions hazards	The safety officer will permit only authorized project personnel to enter the work area. No disturbance of ordnance items is anticipated during this activity. While mixing soils with explosives >10% are conducted, a UXO Tech II and UXO Tech III will be present on-site at all times.	M
X		Excavations	The safety officer will forbid entry into excavations deeper than four feet unless excavation sides are properly sloped or benched, and implement necessary rules to prevent collapse of trench sides. Excavations will be back-filled as soon as possible. An OSHA competent person shall be present to direct excavation work.	M

ACTIVITY HAZARDS ANALYSIS

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	Activity Hazard Analysis for Excavation Soil Page 3 of 4.	Chemical munitions, or other unanticipated site hazards	The safety officer will order the immediate withdrawal of all site personnel upon the discovery of chemical munitions or other unanticipated site hazards. The safety officer will immediately contact the USACE PM and on-site representative, ZAPATA PM, and ZAPATA manager of health and safety if unanticipated site hazards are encountered.	M
X		Injury from contact with backhoe or excavator	The safety officer will verify that operators have been trained in the safe operation of the heavy equipment that they are required to use. Personnel near operations involving heavy equipment will wear brightly colored safety vest, maintain a distance that is greater than the reach of the equipment, and maintain eye contact with the operator. Hard hats will be worn around excavating equipment. The backhoe or excavator bucket will be lowered to the ground and equipment will be turned off when material is collected from the bucket or when workers approach for any other reason.	M
X		Inhalation of dust or chemical vapors during work near potentially contaminated freshly exposed earth.	Personnel will attempt to remain upwind of freshly exposed earth or other potential sources of chemical vapors. Although volatile vapors are not expected to be a concern at any of the FWDA sites, if unusual odors or other indications of potential hazardous vapors are noticed a field portable volatile vapor analyzer will be secured and used to monitor breathing zones during fieldwork.	M
X		Skin contact with contaminated soil or water.	he safety officer will require procedures that prevent skin contact with potentially contaminated soil or water. He or she may require the use of disposable nitrile gloves and other necessary PPE.	M
X		Ingestion of contaminants	The SSHO will require proper hygienic practices to prevent ingestion of contaminants that might be present on the hands, clothing, or PPE. The safety officer will prohibit the following in the work zone: - Smoking - Eating - Drinking from containers that have been exposed to the work zone - Wiping the eyes, mouth, nose, or other mucous membranes with surfaces that have been exposed to lead-containing dust and that have not been decontaminated.	M

Add Items

EQUIPMENT	TRAINING	INSPECTION
------------------	-----------------	-------------------

ACTIVITY HAZARDS ANALYSIS

	EQUIPMENT	TRAINING	INSPECTION
X	Activity Hazard Analysis for Excavation of Soil Page 4 of 4.	All site workers will be briefed on the requirements of the site safety plan, including emergency plans. At least two site workers present at all times must have current first aid and CPR certifications.	Daily check for adequacy of site communication. Daily inspection of fire extinguishers and first aid kits. Daily activity inspections by the safety officer.
	Various vehicles	The safety officer will conduct a daily safety briefing.	Daily vehicle inspections, in accordance with the ZAPATA fleet-safety program.
	Shovels and other implements	The safety officer will confirm that workers who drive vehicles for ZAPATA business are on the list of qualified drivers.	Inspect all hand tools prior to use and repair or replace damaged tools.
	Excavating equipment	The safety officer will obtain assurances that operators of any heavy equipment have received appropriate training.	Daily magnetometer inspections and calibration prior to use. Daily inspections of heavy equipment.

Involved Personnel:
Site safety officer and other ZAPATA and subcontractors' employees.

Acceptance Authority (digital signature): _____

**ATTACHMENT 3
SAMPLE FORMS**

(FOR USE ON THE PROJECT SITE)

***SITE SAFETY OFFICER (SSO)
WET BULB GLOBE THERMOMETER (WBGT)
LOG***

DATE	TIME	DRY BULB TEMP	WBGT TEMP	RECOMMENDED WORK/REST REGIMEN (PER HOUR)	
				WORK	REST
				/	
				/	
				/	
				/	
				/	
				/	
				/	
				/	
				/	
				/	
				/	

***Permissible WBGT Heat Exposure Threshold Limit Values
Values are given in °F***

Work/Rest Regimen (each hour)	Work Load		
	LIGHT	MODERATE	HEAVY
Continuous Work	85.1	81.5	78.8
75% Work - 25% Rest	86.9	83.3	81.5
50% Work – 50% Rest	88.7	85.1	83.3
25% Work – 75% Rest	90.5	87.8	86.0

*Final Site Safety and Health Plan
Interim Measures for Parcels 21 and 24 and Abandonment of Wells
Fort Wingate Depot Activity, New Mexico*

11. CAUSAL FACTOR(S) (Read Instruction Before Completing)					
a. (Explain YES answers in item 13)		YES NO	a. (CONTINUED)		YES NO
DESIGN: Was design of facility, workplace or equipment a factor?		<input type="checkbox"/> <input type="checkbox"/>	CHEMICAL AND PHYSICAL AGENT FACTORS: Did exposure to chemical agents, such as dust, fumes, mists, vapors or physical agents, such as, noise, radiation, etc., contribute to accident?		<input type="checkbox"/> <input type="checkbox"/>
INSPECTION/MAINTENANCE: Were inspection & maintenance procedures a factor?		<input type="checkbox"/> <input type="checkbox"/>	OFFICE FACTORS: Did office setting such as, lifting office furniture, carrying, stooping, etc., contribute to the accident?		<input type="checkbox"/> <input type="checkbox"/>
PERSON'S PHYSICAL CONDITION: In your opinion, was the physical condition of the person a factor?		<input type="checkbox"/> <input type="checkbox"/>	SUPPORT FACTORS: Were inappropriate tools/resources provided to properly perform the activity/task?		<input type="checkbox"/> <input type="checkbox"/>
OPERATING PROCEDURES: Were operating procedures a factor?		<input type="checkbox"/> <input type="checkbox"/>	PERSONAL PROTECTIVE EQUIPMENT: Did the improper selection, use or maintenance of personal protective equipment contribute to the accident?		<input type="checkbox"/> <input type="checkbox"/>
JOB PRACTICES: Were any job safety/health practices not followed when the accident occurred?		<input type="checkbox"/> <input type="checkbox"/>	DRUGS/ALCOHOL: In your opinion, was drugs or alcohol a factor to the accident?		<input type="checkbox"/> <input type="checkbox"/>
HUMAN FACTORS: Did any human factors such as, size or strength of person, etc., contribute to accident?		<input type="checkbox"/> <input type="checkbox"/>	b. WAS A WRITTEN JOB/ACTIVITY HAZARD ANALYSIS COMPLETED FOR TASK BEING PERFORMED AT TIME OF ACCIDENT?		
ENVIRONMENTAL FACTORS: Did heat, cold, dust, sun, glare, etc., contribute to the accident?		<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> YES (If yes, attach a copy.) <input type="checkbox"/> NO		
12. TRAINING					
a. WAS PERSON TRAINED TO PERFORM ACTIVITY/TASK?		b. TYPE OF TRAINING.		c. DATE OF MOST RECENT FORMAL TRAINING.	
<input type="checkbox"/> YES <input type="checkbox"/> NO		<input type="checkbox"/> CLASSROOM <input type="checkbox"/> ON JOB		(Month) (Day) (Year)	
13. FULLY EXPLAIN WHAT ALLOWED OR CAUSED THE ACCIDENT; INCLUDE DIRECT AND INDIRECT CAUSES (See instruction for definition of direct and indirect causes.) (Use additional paper, if necessary)					
a. DIRECT CAUSE					
b. INDIRECT CAUSE(S)					
14. ACTION(S) TAKEN, ANTICIPATED OR RECOMMENDED TO ELIMINATE CAUSE(S).					
DESCRIBE FULLY:					
15. DATES FOR ACTIONS IDENTIFIED IN BLOCK 14.					
a. BEGINNING (Month/Day/Year)			b. ANTICIPATED COMPLETION (Month/Day/Year)		
c. SIGNATURE AND TITLE OF SUPERVISOR COMPLETING REPORT		d. DATE (Mo/Da/Yr)	e. ORGANIZATION IDENTIFIER (Div, Br, Sect)	f. OFFICE SYMBOL	
CORPS _____					
CONTRACTOR _____					
16. MANAGEMENT REVIEW (1st)					
a. <input type="checkbox"/> CONCUR b. <input type="checkbox"/> NON CONCUR c. COMMENTS					
SIGNATURE		TITLE		DATE	
17. MANAGEMENT REVIEW (2nd - Chief Operations, Construction, Engineering, etc.)					
a. <input type="checkbox"/> CONCUR b. <input type="checkbox"/> NON CONCUR c. COMMENTS					
SIGNATURE		TITLE		DATE	
18. SAFETY AND OCCUPATIONAL HEALTH OFFICE REVIEW					
a. <input type="checkbox"/> CONCUR b. <input type="checkbox"/> NON CONCUR c. ADDITIONAL ACTIONS/COMMENTS					
SIGNATURE		TITLE		DATE	
19. COMMAND APPROVAL					
COMMENTS					
COMMANDER SIGNATURE				DATE	

SITE VISITORS LOG

CONTRACT NO: W912DY-10-D-0028 TO NO: DY04

PROJECT NO: 0056600

LOCATION: Interim Measures for Parcels 21 and 24 and Abandonment of Wells, Fort Wingate Depot Activity, New Mexico

DATE	NAME	TITLE	COMPANY	SAFETY BRIEF: Y/N	US CITIZEN Y/N	TIME		REMARKS
						IN	OUT	

Zapata Incorporated

Safety Inspection Log

Date: _____ Time: _____ Contract Number: W9128F-13-D-0025			
Task Order: _____		Location: <u>Fort Wingate Depot Activity, New Mexico</u>	
Weather Conditions: _____			
Type of Inspection: Daily: _____ Weekly _____ Special: _____ Reinspection _____			
Location inspected: _____			
Activity inspected: _____			
II. Inspection Requirement			
	Satisfactory	Unsatisfactory	N/A
Surface Sweep			
Subsurface Sweep			
Excavation Technique			
Personal Protection Equipment			
Work Practices			
Site Control			
First Aid Equipment			
Fire Fighting Equipment			
Explosive Transportation			
Explosive Storage			
Disposal Operations			
Overall Inspection Results			
III. Comments:			
❖ Worked stopped due to safety violations: Yes _____ No _____			
❖ Personnel Involved: _____			
❖ Corrective Measures: _____			
❖ Reinspection required : Yes _____ No _____			
IV. Signatures: I acknowledge that I have been briefed on the results of this inspection and will take corrective actions (If required)			
_____ Site Safety Officer		_____ Sr. UXO Supervisor/Project Manager	

VEHICLE ACCIDENT REPORT

Vehicle

Driver _____ Accident Date _____ Driver's License/State _____
Address _____
City _____ State _____ Zip _____ Phone _____
Vehicle # _____ Year _____ Make _____ Model _____ Plate # _____
State _____ Vehicle Owner: () GSA () Leased/Rent () Private Vehicle
Vehicle Damage _____ Est. Repair Cost \$ _____

Other Vehicles

Driver _____ Driver's License _____ State _____
Address _____
City _____ State _____ Zip _____
Phone _____ SSN _____
Owner's Name (Check if same as driver { }) _____
Address _____ City _____ State _____ Zip _____
Insurance Company _____ Policy # _____
Vehicle: Year _____ Make _____ Model _____ Plate # _____ State _____
Vehicle Damage _____
Passenger(s) () Yes () No (List on back) Injuries () Yes () No (List names and address on back)

Accident Description

Date _____ Time _____
Location _____
Description _____

Witness _____ Address _____
Phone # _____
Police Officer's Name _____ Dept. _____

Employee _____
(Print Name) (Signature) (Date)

SUXOS _____
(Print Name) (Signature) (Date)

General Liability, Property Damage, and Loss Report

PROJECT LOCATION _____ TASK ORDER # _____ DATE _____

HOW DID THE DAMAGE OR LOSS OCCUR: _____

DESCRIPTION OF DAMAGE OR LOSS: _____

IDENTIFICATION OF DAMAGED OR LOST PROPERTY: _____

LOCATION OF DAMAGED OR LOST PROPERTY (BEFORE LOSS): _____

DATE AND TIME OF DAMAGED OR LOST PROPERTY: _____

OWNER OF DAMAGED OR LOST PROPERTY:

NAME _____ PHONE # _____

ADDRESS _____ CITY/STATE _____

EMPLOYER NAME & ADDRESS _____

INJURED PARTIES (ALSO COMPLETE A SUPERVISOR EMPLOYEE INJURY REPORT)

1. NAME _____ PHONE # _____

ADDRESS _____ CITY/STATE _____

EMPLOYER NAME & ADDRESS _____

2. NAME _____ PHONE # _____

ADDRESS _____ CITY/STATE _____

EMPLOYER NAME & ADDRESS _____

WITNESSES:

1. NAME _____ PHONE # _____

ADDRESS _____ CITY/STATE _____

EMPLOYER NAME & ADDRESS _____

2. NAME _____ PHONE # _____

ADDRESS _____ CITY/STATE _____

EMPLOYER NAME & ADDRESS _____

WERE PICTURES TAKEN? () YES () NO

WERE POLICE NOTIFIED? () YES () NO DEPT. _____

EMPLOYEE _____
(PRINT NAME) (SIGNATURE) (DATE)

SUXOS _____
(PRINT NAME) (SIGNATURE) (DATE)

SUPERVISOR'S EMPLOYEE INJURY REPORT

This is an official document to be initiated by the employee's supervisor. Please answer all questions completely.
This report must be forwarded to the Safety Manager's office within 24 hours of the injury.

Injured Name _____ Sex ____ SSN _____ DOB _____
Home Address _____ City _____ State _____ Zip _____
Phone _____ Job Title _____

SUPERVISOR

Date of Incident _____ Time _____ Time Reported _____ To Whom? _____
Project _____ Project Address _____
Exact Location of Incident _____ Did employee leave work? _____ When? _____
Has employee returned to work () Yes () No When? _____
Doctor/Hospital name _____ Address _____
Witness name(s) _____ Statement attached? () Yes () No
Nature of injury _____ Exact body part _____
Medical attention: () None () First Aid on-site () Doctor's office () Hospital
Job assignment at time of incident _____
Describe incident _____

What corrective action has been taken to prevent recurrence? _____

Supervisor _____
(Print) (Signature) (Date)

Senior UXO Supervisor

Comments on incident and corrective action

SUXOS _____
(Print) (Signature) (Date)

Safety Manager

Concur with action taken? Yes No Remarks _____

OSHA Classification:

Incident Only First Aid No lost workdays Lost Workdays Fatal

Days away from work _____ Days restricted work _____ Total days charged _____

Coding: A. Injury type or illness _____ B. Injured body part _____ C. Activity at time of accident _____

D. Injury cause code _____ E. Safety rule violated code _____ F. Accident prevention code _____

Name _____

(Print)

(Signature)

(Date)

**MUST BE COMPLETED WITHIN 72 HOURS
ACCIDENT/INJURY INVESTIGATION**

Date _____ Project _____ Date of Accident/Injury _____

Employee Name _____

Supervisor Name _____

Project Number/Location _____

Description (Provide facts, describe how incident occurred, provide diagram or photos)

Analysis 1 (What unsafe acts or conditions contributed to the incident?)

Analysis 2 (What systematic or management deficiencies contributed to the incident)

Corrective Action(s) (List corrective actions, responsible person, scheduled completion date)

Witnesses (Attach statements or indicate why not available)

Investigated by _____ (Print Name) _____ (Signature) _____ (Date)

SUXOS _____ (Print Name) _____ (Signature) _____ (Date)

ATTACHMENT 4
CHEMICAL PRODUCTS WITH ASSOCIATED SAFETY DATA SHEETS
(FOR USE ON THE PROJECT SITE)

**Safety Data Sheets Will Be Inserted Into the On-Site APP
by Field Team For Reference**



MATERIAL SAFETY DATA SHEET

Diesel Fuel (All Types)

MSDS No. 9909

EMERGENCY OVERVIEW

CAUTION!

**OSHA/NFPA COMBUSTIBLE LIQUID - SLIGHT TO MODERATE IRRITANT
EFFECTS CENTRAL NERVOUS SYSTEM
HARMFUL OR FATAL IF SWALLOWED**

Moderate fire hazard. Avoid breathing vapors or mists. May cause dizziness and drowsiness. May cause moderate eye irritation and skin irritation (rash). Long-term, repeated exposure may cause skin cancer.

If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs).



NFPA 704 (Section 16)

1. CHEMICAL PRODUCT AND COMPANY INFORMATION

**Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095-0961**

EMERGENCY TELEPHONE NUMBER (24 hrs): CHEMTREC (800) 424-9300

COMPANY CONTACT (business hours): Corporate Safety (732) 750-6000

MSDS INTERNET WEBSITE: www.hess.com (See Environment, Health, Safety & Social Responsibility)

SYNONYMS: Ultra Low Sulfur Diesel (ULSD); Low Sulfur Diesel; Motor Vehicle Diesel Fuel; Diesel Fuel #2; Dyed Diesel Fuel; Non-Road, Locomotive and Marine Diesel Fuel; Tax-exempt Diesel Fuel

See Section 16 for abbreviations and acronyms.

2. COMPOSITION and CHEMICAL INFORMATION ON INGREDIENTS

INGREDIENT NAME (CAS No.)	CONCENTRATION PERCENT BY WEIGHT
Diesel Fuel (68476-34-6)	100
Naphthalene (91-20-3)	Typically < 0.01

A complex mixture of hydrocarbons with carbon numbers in the range C9 and higher. Diesel fuel may be dyed (red) for tax purposes. May contain a multifunctional additive.

3. HAZARDS IDENTIFICATION

EYES

Contact with liquid or vapor may cause mild irritation.

SKIN

May cause skin irritation with prolonged or repeated contact. Practically non-toxic if absorbed following acute (single) exposure. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed.

INGESTION

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.



MATERIAL SAFETY DATA SHEET

Diesel Fuel (All Types)

MSDS No. 9909

INHALATION

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

CHRONIC EFFECTS and CARCINOGENICITY

Similar products produced skin cancer and systemic toxicity in laboratory animals following repeated applications. The significance of these results to human exposures has not been determined - see Section 11 Toxicological Information.

IARC classifies whole diesel fuel exhaust particulates as probably carcinogenic to humans (Group 2A). NIOSH regards whole diesel fuel exhaust particulates as a potential cause of occupational lung cancer based on animal studies and limited evidence in humans.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash).

4. FIRST AID MEASURES

EYES

In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

SKIN

Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or waterless hand cleanser. Obtain medical attention if irritation or redness develops.

INGESTION

DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

INHALATION

Remove person to fresh air. If person is not breathing provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES:

FLASH POINT:	> 125 °F (> 52 °C) minimum PMCC
AUTOIGNITION POINT:	494 °F (257 °C)
OSHA/NFPA FLAMMABILITY CLASS:	2 (COMBUSTIBLE)
LOWER EXPLOSIVE LIMIT (%):	0.6
UPPER EXPLOSIVE LIMIT (%):	7.5

FIRE AND EXPLOSION HAZARDS

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

EXTINGUISHING MEDIA

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO₂, water spray, fire fighting foam, or Halon.



MATERIAL SAFETY DATA SHEET

Diesel Fuel (All Types)

MSDS No. 9909

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

FIRE FIGHTING INSTRUCTIONS

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment.

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

See Section 16 for the NFPA 704 Hazard Rating.

6. ACCIDENTAL RELEASE MEASURES

ACTIVATE FACILITY'S SPILL CONTINGENCY OR EMERGENCY RESPONSE PLAN.

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal - caution, flammable vapors may accumulate in closed containers. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

7. HANDLING and STORAGE

HANDLING PRECAUTIONS

Handle as a combustible liquid. Keep away from heat, sparks, and open flame! Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Diesel fuel, and in particular low and ultra low sulfur diesel fuel, has the capability of accumulating a static electrical charge of sufficient energy to cause a fire/explosion in the presence of lower flashpoint products such as gasoline. The accumulation of such a static charge occurs as the diesel flows through pipelines, filters, nozzles and various work tasks such as tank/container filling, splash loading, tank cleaning; product sampling; tank gauging; cleaning, mixing, vacuum truck operations, switch loading, and product agitation. There is a greater potential for static charge accumulation in cold temperature, low humidity conditions.

Documents such as 29 CFR OSHA 1910.106 "Flammable and Combustible Liquids, NFPA 77 Recommended Practice on Static Electricity, API 2003 "Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents and ASTM D4865 "Standard Guide for Generation and Dissipation of Static



MATERIAL SAFETY DATA SHEET

Diesel Fuel (All Types)

MSDS No. 9909

Electricity in Petroleum Fuel Systems" address special precautions and design requirements involving loading rates, grounding, bonding, filter installation, conductivity additives and especially the hazards associated with "switch loading." ["Switch Loading" is when a higher flash point product (such as diesel) is loaded into tanks previously containing a low flash point product (such as gasoline) and the electrical charge generated during loading of the diesel results in a static ignition of the vapor from the previous cargo (gasoline).]

Note: When conductivity additives are used or are necessary the product should achieve 25 picosiemens/meter or greater at the handling temperature.

STORAGE PRECAUTIONS

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

WORK/HYGIENIC PRACTICES

Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use solvents or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

8. EXPOSURE CONTROLS and PERSONAL PROTECTION

EXPOSURE LIMITS

Components (CAS No.)	Source	Exposure Limits		Note
		TWA/STEL		
Diesel Fuel: (68476-34-6)	OSHA	5 mg/m, as mineral oil mist		A3, skin
	ACGIH	100 mg/m ³ (as totally hydrocarbon vapor) TWA		
Naphthalene (91-20-3)	OSHA	10 ppm TWA		A4, Skin
	ACGIH	10 ppm TWA / 15 ppm STEL		

ENGINEERING CONTROLS

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

EYE/FACE PROTECTION

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

SKIN PROTECTION

Gloves constructed of nitrile, neoprene, or PVC are recommended. Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.



MATERIAL SAFETY DATA SHEET

Diesel Fuel (All Types)

MSDS No. 9909

RESPIRATORY PROTECTION

A NIOSH/MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

9. PHYSICAL and CHEMICAL PROPERTIES

APPEARANCE

Clear, straw-yellow liquid. Dyed fuel oil will be red or reddish-colored.

ODOR

Mild, petroleum distillate odor

BASIC PHYSICAL PROPERTIES

BOILING RANGE: 320 to 690 oF (160 to 366 °C)
VAPOR PRESSURE: 0.009 psia @ 70 °F (21 °C)
VAPOR DENSITY (air = 1): > 1.0
SPECIFIC GRAVITY (H₂O = 1): 0.83 to 0.88 @ 60 °F (16 °C)
PERCENT VOLATILES: 100 %
EVAPORATION RATE: Slow; varies with conditions
SOLUBILITY (H₂O): Negligible

10. STABILITY and REACTIVITY

STABILITY: Stable. Hazardous polymerization will not occur.

CONDITIONS TO AVOID and INCOMPATIBLE MATERIALS

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources. Keep away from strong oxidizers; Viton ®; Fluorel ®

HAZARDOUS DECOMPOSITION PRODUCTS

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

11. TOXICOLOGICAL PROPERTIES

ACUTE TOXICITY

Acute dermal LD50 (rabbits): > 5 ml/kg Acute oral LD50 (rats): 9 ml/kg
Primary dermal irritation: extremely irritating (rabbits) Draize eye irritation: non-irritating (rabbits)
Guinea pig sensitization: negative

CHRONIC EFFECTS AND CARCINOGENICITY

Carcinogenic: OSHA: NO IARC: NO NTP: NO ACGIH: A3

Studies have shown that similar products produce skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation.

MUTAGENICITY (genetic effects)

This material has been positive in a mutagenicity study.




MATERIAL SAFETY DATA SHEET

Diesel Fuel (All Types) **MSDS No. 9909**

12. ECOLOGICAL INFORMATION
 Keep out of sewers, drainage areas, and waterways. Report spills and releases, as applicable, under Federal and State regulations.

13. DISPOSAL CONSIDERATIONS
 Consult federal, state and local waste regulations to determine appropriate disposal options.

14. TRANSPORTATION INFORMATION

PROPER SHIPPING NAME:	Diesel Fuel	Placard (International Only):
HAZARD CLASS and PACKING GROUP:	3, PG III	
DOT IDENTIFICATION NUMBER:	NA 1993 (Domestic)	
	UN 1202 (International)	
DOT SHIPPING LABEL:	None	

Use Combustible Placard if shipping in bulk domestically

15. REGULATORY INFORMATION
U.S. FEDERAL, STATE, and LOCAL REGULATORY INFORMATION
 This product and its constituents listed herein are on the EPA TSCA Inventory. Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other regulations at the state and/or local level. Consult those regulations applicable to your facility/operation.

CLEAN WATER ACT (OIL SPILLS)

Any spill or release of this product to "navigable waters" (essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802) as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)

The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

SARA SECTION 311/312 - HAZARD CLASSES

<u>ACUTE HEALTH</u>	<u>CHRONIC HEALTH</u>	<u>FIRE</u>	<u>SUDDEN RELEASE OF PRESSURE</u>	<u>REACTIVE</u>
X	X	X	--	--

SARA SECTION 313 - SUPPLIER NOTIFICATION

This product may contain listed chemicals below the *de minimis* levels which therefore are not subject to the supplier notification requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372. If you may be required to report releases of chemicals listed in 40 CFR 372.28, you may contact Hess Corporate Safety if you require additional information regarding this product.

CALIFORNIA PROPOSITON 65 LIST OF CHEMICALS

This product contains the following chemicals that are included on the Proposition 65 "List of Chemicals" required by the California Safe Drinking Water and Toxic Enforcement Act of 1986:

<u>INGREDIENT NAME (CAS NUMBER)</u>	<u>Date Listed</u>
Diesel Engine Exhaust (no CAS Number listed)	10/01/1990

CANADIAN REGULATORY INFORMATION (WHMIS)

Class B, Division 3 (Combustible Liquid) and Class D, Division 2, Subdivision B (Toxic by other means)



MATERIAL SAFETY DATA SHEET

Diesel Fuel (All Types)

MSDS No. 9909

16. OTHER INFORMATION

NFPA® HAZARD RATING HEALTH: 0
FIRE: 2
REACTIVITY: 0

Refer to NFPA 704 "Identification of the Fire Hazards of Materials" for further information

HMIS® HAZARD RATING HEALTH: 1 * * Chronic
FIRE: 2
PHYSICAL: 0

SUPERSEDES MSDS DATED: 02/28/2001

ABBREVIATIONS:

AP = Approximately < = Less than > = Greater than
N/A = Not Applicable N/D = Not Determined ppm = parts per million

ACRONYMS:

ACGIH	American Conference of Governmental Industrial Hygienists	NTP	National Toxicology Program
AIHA	American Industrial Hygiene Association	OPA	Oil Pollution Act of 1990
ANSI	American National Standards Institute (212) 642-4900	OSHA	U.S. Occupational Safety & Health Administration
API	American Petroleum Institute (202) 682-8000	PEL	Permissible Exposure Limit (OSHA)
CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act	RCRA	Resource Conservation and Recovery Act
DOT	U.S. Department of Transportation [General info: (800) 467-4922]	REL	Recommended Exposure Limit (NIOSH)
EPA	U.S. Environmental Protection Agency	SARA	Superfund Amendments and Reauthorization Act of 1986 Title III
HMIS	Hazardous Materials Information System	SCBA	Self-Contained Breathing Apparatus
IARC	International Agency For Research On Cancer	SPCC	Spill Prevention, Control, and Countermeasures
MSHA	Mine Safety and Health Administration	STEL	Short-Term Exposure Limit (generally 15 minutes)
NFPA	National Fire Protection Association (617)770-3000	TLV	Threshold Limit Value (ACGIH)
NIOSH	National Institute of Occupational Safety and Health	TSCA	Toxic Substances Control Act
NOIC	Notice of Intended Change (proposed change to ACGIH TLV)	TWA	Time Weighted Average (8 hr.)
		WEEL	Workplace Environmental Exposure Level (AIHA)
		WHMIS	Canadian Workplace Hazardous Materials Information System

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

AMERADA HESS CORPORATION

MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

MSDS No. 9950

EMERGENCY OVERVIEW

DANGER!

**EXTREMELY FLAMMABLE - EYE AND MUCOUS MEMBRANE IRRITANT
- EFFECTS CENTRAL NERVOUS SYSTEM - HARMFUL OR FATAL IF
SWALLOWED - ASPIRATION HAZARD**



NFPA 704 (Section 16)

High fire hazard. Keep away from heat, spark, open flame, and other ignition sources.

If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs). Contact may cause eye, skin and mucous membrane irritation. Harmful if absorbed through the skin. Avoid prolonged breathing of vapors or mists. Inhalation may cause irritation, anesthetic effects (dizziness, nausea, headache, intoxication), and respiratory system effects.

Long-term exposure may cause effects to specific organs, such as to the liver, kidneys, blood, nervous system, and skin. Contains benzene, which can cause blood disease, including anemia and leukemia.

1. CHEMICAL PRODUCT and COMPANY INFORMATION (rev. Jan-04)

Amerada Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095-0961

EMERGENCY TELEPHONE NUMBER (24 hrs):

CHEMTREC (800)424-9300

COMPANY CONTACT (business hours):

Corporate Safety (732)750-6000

MSDS Internet Website

www.hess.com/about/enviro.html

SYNONYMS: Hess Conventional (Oxygenated and Non-oxygenated) Gasoline; Reformulated Gasoline (RFG); Reformulated Gasoline Blendstock for Oxygenate Blending (RBOB); Unleaded Motor or Automotive Gasoline

See Section 16 for abbreviations and acronyms.

2. COMPOSITION and INFORMATION ON INGREDIENTS * (rev. Jan-04)

INGREDIENT NAME (CAS No.)	CONCENTRATION PERCENT BY WEIGHT
Gasoline (86290-81-5)	100
Benzene (71-43-2)	0.1 - 4.9 (0.1 - 1.3 reformulated gasoline)
n-Butane (106-97-8)	< 10
Ethyl Alcohol (Ethanol) (64-17-5)	0 - 10
Ethyl benzene (100-41-4)	< 3
n-Hexane (110-54-3)	0.5 to 4
Methyl-tertiary butyl ether (MTBE) (1634-04-4)	0 to 15.0
Tertiary-amyl methyl ether (TAME) (994-05-8)	0 to 17.2
Toluene (108-88-3)	1 - 25
1,2,4- Trimethylbenzene (95-63-6)	< 6
Xylene, mixed isomers (1330-20-7)	1 - 15

A complex blend of petroleum-derived normal and branched-chain alkane, cycloalkane, alkene, and aromatic hydrocarbons. May contain antioxidant and multifunctional additives. Non-oxygenated Conventional Gasoline and RBOB do not have oxygenates (Ethanol or MTBE and/or TAME). Oxygenated Conventional and Reformulated Gasoline will have oxygenates for octane enhancement or as legally required.

AMERADAHESSE CORPORATION

MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

MSDS No. 9950

3. HAZARDS IDENTIFICATION (rev. Dec-97)

EYES

Moderate irritant. Contact with liquid or vapor may cause irritation.

SKIN

Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are exposed repeatedly.

INGESTION

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

INHALATION

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

CHRONIC EFFECTS and CARCINOGENICITY

Contains benzene, a regulated human carcinogen. Benzene has the potential to cause anemia and other blood diseases, including leukemia, after repeated and prolonged exposure. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with systemic toxicity. See also Section 11 - Toxicological Information.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash). Chronic respiratory disease, liver or kidney dysfunction, or pre-existing central nervous system disorders may be aggravated by exposure.

4. FIRST AID MEASURES (rev. Dec-97)

EYES

In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

SKIN

Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or waterless hand cleanser. Obtain medical attention if irritation or redness develops.

INGESTION

DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

INHALATION

Remove person to fresh air. If person is not breathing, ensure an open airway and provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

AMERADAHESSE CORPORATION

MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

MSDS No. 9950

5. FIRE FIGHTING MEASURES (rev. Dec-97)

FLAMMABLE PROPERTIES:

FLASH POINT:	-45 °F (-43°C)
AUTOIGNITION TEMPERATURE:	highly variable; > 530 °F (>280 °C)
OSHA/NFPA FLAMMABILITY CLASS:	1A (flammable liquid)
LOWER EXPLOSIVE LIMIT (%):	1.4%
UPPER EXPLOSIVE LIMIT (%):	7.6%

FIRE AND EXPLOSION HAZARDS

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. Flowing product may be ignited by self-generated static electricity. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

EXTINGUISHING MEDIA

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO₂, water spray, fire fighting foam, or Halon.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

During certain times of the year and/or in certain geographical locations, gasoline may contain MTBE and/or TAME. Firefighting foam suitable for polar solvents is recommended for fuel with greater than 10% oxygenate concentration - refer to NFPA 11 "Low Expansion Foam - 1994 Edition."

FIRE FIGHTING INSTRUCTIONS

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment.

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

See Section 16 for the NFPA 704 Hazard Rating.

6. ACCIDENTAL RELEASE MEASURES (rev. Dec-97)

ACTIVATE FACILITY SPILL CONTINGENCY or EMERGENCY PLAN.

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product

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MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

MSDS No. 9950

vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal - caution, flammable vapors may accumulate in closed containers. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

7. HANDLING and STORAGE (rev. Dec-97)

HANDLING PRECAUTIONS

*****USE ONLY AS A MOTOR FUEL*****

*****DO NOT SIPHON BY MOUTH*****

Handle as a flammable liquid. Keep away from heat, sparks, and open flame! Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents.

STORAGE PRECAUTIONS

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

WORK/HYGIENIC PRACTICES

Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use solvents or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

8. EXPOSURE CONTROLS and PERSONAL PROTECTION (rev. Jan-04)

EXPOSURE LIMITS

Component (CAS No.)	Source	TWA (ppm)	STEL (ppm)	Exposure Limits	Note
Gasoline (86290-81-5)	ACGIH	300	500	A3	
Benzene (71-43-2)	OSHA	1	5	Carcinogen	
	ACGIH	0.5	2.5	A1, skin	
	USCG	1	5		
n-Butane (106-97-8)	ACGIH	800	--	2003 NOIC: 1000 ppm (TWA) Aliphatic Hydrocarbon Gases Alkane (C1-C4)	
Ethyl Alcohol (ethanol) (64-17-5)	OSHA	1000	--		
	ACGIH	1000	--	A4	
Ethyl benzene (100-41-4)	OSHA	100	--		
	ACGIH	100	125	A3	

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Gasoline, All Grades

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Component (CAS No.)	Source	TWA (ppm)	STEL (ppm)	Exposure Limits	Note
n-Hexane (110-54-3)	OSHA	500	--		
	ACGIH	50	--	skin	
Methyl-tertiary butyl ether [MTBE] (1634-04-4)	ACGIH	50		A3	
Tertiary-amyl methyl ether [TAME] (994-05-8)				None established	
Toluene (108-88-3)	OSHA	200		Ceiling: 300 ppm; Peak: 500 ppm (10 min.)	
	ACGIH	50	--	A4 (skin)	
1,2,4-Trimethylbenzene (95-63-6)	ACGIH	25	--		
Xylene, mixed isomers (1330-20-7)	OSHA	100	--		
	ACGIH	100	150	A4	

ENGINEERING CONTROLS

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

EYE/FACE PROTECTION

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

SKIN PROTECTION

Gloves constructed of nitrile or neoprene are recommended. Chemical protective clothing such as that made of of E.I. DuPont Tychem®, products or equivalent is recommended based on degree of exposure.

Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

RESPIRATORY PROTECTION

A NIOSH-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection and limitations.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

9. PHYSICAL and CHEMICAL PROPERTIES (rev. Jan-04)

APPEARANCE

A translucent, straw-colored or light yellow liquid

ODOR

A strong, characteristic aromatic hydrocarbon odor. Oxygenated gasoline with MTBE and/or TAME may have a sweet, ether-like odor and is detectable at a lower concentration than non-oxygenated gasoline.

ODOR THRESHOLD

	<u>Odor Detection</u>	<u>Odor Recognition</u>
Non-oxygenated gasoline:	0.5 - 0.6 ppm	0.8 - 1.1 ppm
Gasoline with 15% MTBE:	0.2 - 0.3 ppm	0.4 - 0.7 ppm
Gasoline with 15% TAME:	0.1 ppm	0.2 ppm

BASIC PHYSICAL PROPERTIES

BOILING RANGE:	85 to 437 °F (39 to 200 °C)
VAPOR PRESSURE:	6.4 - 15 RVP @ 100 °F (38 °C) (275-475 mm Hg @ 68 °F (20 °C)
VAPOR DENSITY (air = 1):	AP 3 to 4
SPECIFIC GRAVITY (H ₂ O = 1):	0.70 – 0.78
EVAPORATION RATE:	10-11 (n-butyl acetate = 1)
PERCENT VOLATILES:	100 %

AMERAD HESS CORPORATION

MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

MSDS No. 9950

SOLUBILITY (H₂O): Non-oxygenated gasoline - negligible (< 0.1% @ 77 °F). Gasoline with 15% MTBE - slight (0.1 - 3% @ 77 °F); ethanol is readily soluble in water

10. STABILITY and REACTIVITY (rev. Dec-94)

STABILITY: Stable. Hazardous polymerization will not occur.

CONDITIONS TO AVOID

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources

INCOMPATIBLE MATERIALS

Keep away from strong oxidizers.

HAZARDOUS DECOMPOSITION PRODUCTS

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke). Contact with nitric and sulfuric acids will form nitrocresols that can decompose violently.

11. TOXICOLOGICAL PROPERTIES (rev. Dec-97)

ACUTE TOXICITY

Acute Dermal LD50 (rabbits): > 5 ml/kg

Acute Oral LD50 (rat): 18.75 ml/kg

Primary dermal irritation (rabbits): slightly irritating

Draize eye irritation (rabbits): non-irritating

Guinea pig sensitization: negative

CHRONIC EFFECTS AND CARCINOGENICITY

Carcinogenicity: OSHA: NO IARC: YES - 2B

NTP: NO

ACGIH: YES (A3)

IARC has determined that gasoline and gasoline exhaust are possibly carcinogenic in humans. Inhalation exposure to completely vaporized unleaded gasoline caused kidney cancers in male rats and liver tumors in female mice. The U.S. EPA has determined that the male kidney tumors are species-specific and are irrelevant for human health risk assessment. The significance of the tumors seen in female mice is not known. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with effects to the central and peripheral nervous systems, liver, and kidneys. The significance of these animal models to predict similar human response to gasoline is uncertain.

This product contains benzene. Human health studies indicate that prolonged and/or repeated overexposure to benzene may cause damage to the blood-forming system (particularly bone marrow), and serious blood disorders such as aplastic anemia and leukemia. Benzene is listed as a human carcinogen by the NTP, IARC, OSHA and ACGIH.

This product may contain methyl tertiary butyl ether (MTBE): animal and human health effects studies indicate that MTBE may cause eye, skin, and respiratory tract irritation, central nervous system depression and neurotoxicity. MTBE is classified as an animal carcinogen (A3) by the ACGIH.

12. ECOLOGICAL INFORMATION (rev. Jan-04)

Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations. If released, oxygenates such as ethers and alcohols will be expected to exhibit fairly high mobility in soil, and therefore may leach into groundwater. The API (www.api.org) provides a number of useful references addressing petroleum and oxygenate contamination of groundwater.

13. DISPOSAL CONSIDERATIONS (rev. Dec-97)

Consult federal, state and local waste regulations to determine appropriate disposal options.

AMERAD HESS CORPORATION

MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

MSDS No. 9950

14. TRANSPORTATION INFORMATION (rev. Jan-04)

DOT PROPER SHIPPING NAME: Gasoline
 DOT HAZARD CLASS and PACKING GROUP: 3, PG II
 DOT IDENTIFICATION NUMBER: UN 1203
 DOT SHIPPING LABEL: FLAMMABLE LIQUID

PLACARD:



15. REGULATORY INFORMATION (rev. Jan-04)

U.S. FEDERAL, STATE, and LOCAL REGULATORY INFORMATION

This product and its constituents listed herein are on the EPA TSCA Inventory. Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other federal, state, or local regulations; consult those regulations applicable to your facility/operation.

CLEAN WATER ACT (OIL SPILLS)

Any spill or release of this product to "navigable waters" (essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802) or, if not practical, the U.S. Coast Guard with follow-up to the National Response Center, as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)

The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

SARA SECTION 311/312 - HAZARD CLASSES

<u>ACUTE HEALTH</u>	<u>CHRONIC HEALTH</u>	<u>FIRE</u>	<u>SUDDEN RELEASE OF PRESSURE</u>	<u>REACTIVE</u>
X	X	X	--	--

SARA SECTION 313 - SUPPLIER NOTIFICATION

This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372:

INGREDIENT NAME (CAS NUMBER)	CONCENTRATION WT. PERCENT
Benzene (71-43-2)	0.1 to 4.9 (0.1 to 1.3 for reformulated gasoline)
Ethyl benzene (100-41-4)	< 3
n-Hexane (110-54-3)	0.5 to 4
Methyl-tertiary butyl ether (MTBE) (1634-04-4)	0 to 15.0
Toluene (108-88-3)	1 to 15
1,2,4- Trimethylbenzene (95-63-6)	< 6
Xylene, mixed isomers (1330-20-7)	1 to 15

US EPA guidance documents (www.epa.gov/tri) for reporting Persistent Bioaccumulating Toxics (PBTs) indicate this product may contain the following deminimis levels of toxic chemicals subject to Section 313 reporting:

<u>INGREDIENT NAME (CAS NUMBER)</u>	<u>CONCENTRATION - Parts per million (ppm) by weight</u>
Polycyclic aromatic compounds (PACs)	17
Benzo (g,h,i) perylene (191-24-2)	2.55
Lead (7439-92-1)	0.079

AMERADA HESS CORPORATION

MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

MSDS No. 9950

CANADIAN REGULATORY INFORMATION (WHMIS)

Class B, Division 2 (Flammable Liquid)

Class D, Division 2A (Very toxic by other means) and Class D, Division 2B (Toxic by other means)

16. OTHER INFORMATION (rev. Jan-04)

NFPA® HAZARD RATING HEALTH: 1 Slight
FIRE: 3 Serious
REACTIVITY: 0 Minimal

HMIS® HAZARD RATING HEALTH: 1 * Slight
FIRE: 3 Serious
REACTIVITY: 0 Minimal
* CHRONIC

SUPERSEDES MSDS DATED: 12/30/97

ABBREVIATIONS:

AP = Approximately < = Less than > = Greater than
N/A = Not Applicable N/D = Not Determined ppm = parts per million

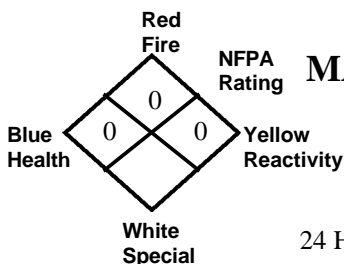
ACRONYMS:

ACGIH	American Conference of Governmental Industrial Hygienists	NTP	National Toxicology Program
AIHA	American Industrial Hygiene Association	OPA	Oil Pollution Act of 1990
ANSI	American National Standards Institute (212)642-4900	OSHA	U.S. Occupational Safety & Health Administration
API	American Petroleum Institute (202)682-8000	PEL	Permissible Exposure Limit (OSHA)
CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act	RCRA	Resource Conservation and Recovery Act
DOT	U.S. Department of Transportation [General Info: (800)467-4922]	REL	Recommended Exposure Limit (NIOSH)
EPA	U.S. Environmental Protection Agency	SARA	Superfund Amendments and Reauthorization Act of 1986 Title III
HMIS	Hazardous Materials Information System	SCBA	Self-Contained Breathing Apparatus
IARC	International Agency For Research On Cancer	SPCC	Spill Prevention, Control, and Countermeasures
MSHA	Mine Safety and Health Administration	STEL	Short-Term Exposure Limit (generally 15 minutes)
NFPA	National Fire Protection Association (617)770-3000	TLV	Threshold Limit Value (ACGIH)
NIOSH	National Institute of Occupational Safety and Health	TSCA	Toxic Substances Control Act
NOIC	Notice of Intended Change (proposed change to ACGIH TLV)	TWA	Time Weighted Average (8 hr.)
		WEEL	Workplace Environmental Exposure Level (AIHA)
		WHMIS	Workplace Hazardous Materials Information System (Canada)

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

Alconox®**MATERIAL SAFETY DATA SHEET**

Alconox, Inc.
30 Glenn Street
White Plains, NY 10603

24 Hour Emergency Number – Chem-Tel (800) 255-3924

I. IDENTIFICATION

Product Name (as appears on label)	ALCONOX
CAS Registry Number:	Not Applicable
Effective Date:	January 1, 2001
Chemical Family:	Anionic Powdered Detergent
Manufacturer Catalog Numbers for sizes	1104, 1125, 1150, 1101, 1103 and 1112

II. HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

There are no hazardous ingredients in ALCONOX as defined by the OSHA Standard and Hazardous Substance List 29 CFR 1910 Subpart Z.

III. PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point (F):	Not Applicable
Vapor Pressure (mm Hg):	Not Applicable
Vapor Density (AIR=1):	Not Applicable
Specific Gravity (Water=1):	Not Applicable
Melting Point:	Not Applicable
Evaporation Rate (Butyl Acetate=1):	Not Applicable
Solubility in Water:	Appreciable-Soluble to 10% at ambient conditions
Appearance:	White powder interspersed with cream colored flakes.
pH:	9.5 (1%)

IV. FIRE AND EXPLOSION DATA

Flash Point (Method Used):	None
Flammable Limits:	LEL: No Data UEL: No Data
Extinguishing Media:	Water, dry chemical, CO ₂ , foam
Special Fire fighting Procedures:	Self-contained positive pressure breathing apparatus and protective clothing should be worn when fighting fires involving chemicals.
Unusual Fire and Explosion Hazards:	None

V. REACTIVITY DATA

Stability:	Stable
Hazardous Polymerization:	Will not occur
Incompatibility (Materials to Avoid):	None
Hazardous Decomposition or Byproducts:	May release CO ₂ on burning

VI. HEALTH HAZARD DATA

Route(s) of Entry:	Inhalation? Yes Skin? No Ingestion? Yes
Health Hazards (Acute and Chronic):	Inhalation of powder may prove locally irritating to mucous membranes. Ingestion may cause discomfort and/or diarrhea. Eye contact may prove irritating.
Carcinogenicity:	NTP? No IARC Monographs? No OSHA Regulated? No
Signs and Symptoms of Exposure:	Exposure may irritate mucous membranes. May cause sneezing.
Medical Conditions Generally Aggravated by Exposure:	Not established. Unnecessary exposure to this product or any industrial chemical should be avoided. Respiratory conditions may be aggravated by powder.
Emergency and First Aid Procedures:	Eyes: Immediately flush eyes with water for at least 15 minutes. Call a physician. Skin: Flush with plenty of water. Ingestion: Drink large quantities of water or milk. Do not induce vomiting. If vomiting occurs administer fluids. See a physician for discomfort.

VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be Taken if Material is Released or Spilled:	Material foams profusely. Recover as much as possible and flush remainder to sewer. Material is biodegradable.
Waste Disposal Method:	Small quantities may be disposed of in sewer. Large quantities should be disposed of in accordance with local ordinances for detergent products.
Precautions to be Taken in Storing and Handling:	Material should be stored in a dry area to prevent caking.
Other Precautions:	No special requirements other than the good industrial hygiene and safety practices employed with any industrial chemical.

VIII. CONTROL MEASURES

Respiratory Protection (Specify Type):	Dust mask - Recommended
Ventilation:	Local Exhaust-Normal Special-Not Required Mechanical-Not Required Other-Not Required
Protective Gloves:	Impervious gloves are useful but not required.
Eye Protection:	Goggles are recommended when handling solutions.
Other Protective Clothing or Equipment:	None
Work/Hygienic Practices:	No special practices required

THE INFORMATION HEREIN IS GIVEN IN GOOD FAITH BUT NO WARRANTY IS EXPRESSED OR IMPLIED.

Material Safety Data Sheet



308166

Rev. D
Updated: 5/02

 INSTRUCTIONS	This Data Sheet contains important information. READ AND KEEP FOR REFERENCE.
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First choice when quality counts.

IMPORTANT: Read this MSDS before handling or disposing of this product and pass this information on to employees, customers and users of this product.

Emergency Overview			
Physical State	Liquid.		
Color	Clear to light amber.	Odor	Mild petroleum odor
WARNING!			
Oil injected into the skin from high-pressure leaks in hydraulic systems can cause severe injury.			
Most damage occurs during the first few hours.			
Seek medical attention immediately.			
Surgical removal of oil may be necessary.			
Spills may create a slipping hazard.			

Hazard Rankings		
	HMIS	NFPA
Health Hazard	1	0
Fire Hazard	1	1
Reactivity	0	0
* = Chronic Health Hazard		
Protective Equipment		
Minimum Requirements See Section 8 for Details		

1.0 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Hydraulic Fluid

Chemical Name: Industrial Oils

Graco Inc.

P.O. Box 1441

60 11th Ave. NE

Minneapolis, MN 55440-1441

Part Number(s): 218-797

Use: Hydraulic Fluid used in PT2500 electric driver hydraulic pump.

Emergency Information

Health Emergency (RMPC): (303)- 623-5716

Chemical Spills (Chemtrec): (800)- 424-9300

2.0 COMPOSITION / INFORMATION ON INGREDIENTS

Component %	CAS#	% by Weight
1)Distillates, petroleum, solvent-refined light paraffinic	64741-89-5	30 – 50
2)Distillates, petroleum, solvent-refined heavy paraffinic	64741-89-5	40 – 60
3) Proprietary Ingredients	Proprietary Mixture	0 – 2
4) Zinc alkyldithiophosphate	68649-42-3	0 - 1

For exposure data, see 8.0, Exposure Controls / Personal Protection.

3.0 HAZARDS IDENTIFICATION

Emergency Overview: **Physical State:** Liquid **Odor:** Mild petroleum odor **Color:** Clear to light amber

Potential Health Effects:

Eye Contact	This product can cause transient mild eye irritation with short-term contact with liquid sprays or mists
Skin Contact	This material can cause mild skin irritation from prolonged or repeated skin contact. Injection under the skin can cause inflammation, swelling and mild central nervous system depression. Injection of pressurized hydrocarbons can cause severe, permanent tissue damage. Initial symptoms may be minor. Injection of petroleum hydrocarbons requires immediate medical attention.
Inhalation	At elevated temperatures or in enclosed spaces, product mist or vapors may irritate the mucous membranes of the nose, the throat, bronchi, and lungs
Ingestion	If swallowed, large volumes of material can cause generalized depression, headache, drowsiness, nausea, vomiting and diarrhea. Smaller doses can cause a laxative effect. If aspirated into the lungs, liquid can cause lung damage.
Chronic Health Effects Summary	Contains a petroleum-based mineral oil. Prolonged or repeated skin contact can cause mild irritation and inflammation characterized by drying, cracking, (dermatitis) or oil acne. Repeated or prolonged inhalation of petroleum-based mineral oil mists at concentrations above applicable workplace exposure levels can cause respiratory irritation or other pulmonary effects.
Conditions Aggravated by Exposure	Medical conditions aggravated by exposure to this material may include pre-existing skin disorders.
Target Organs	This material may cause damage to the following organs: skin.
Carcinogenic Potential	This product does not contain any components at concentrations above 0.1% which are considered carcinogenic by OSHA, IARC or NTP.

OSHA Hazard Classification is indicated by an "X" in the box adjacent to the hazard title. If no "X" is present, the product does not exhibit the hazard as defined in the OSHA Hazard Communication Standard (29 CFR 1910.1200).

OSHA Health Hazard Classification		OSHA Physical Hazard Classification			
Irritant <input type="checkbox"/>	Toxic <input type="checkbox"/>	Combustible <input type="checkbox"/>	Explosive <input type="checkbox"/>	Pyrophoric <input type="checkbox"/>	
Sensitizer <input type="checkbox"/>	Highly Toxic <input type="checkbox"/>	Flammable <input type="checkbox"/>	Oxidizer <input type="checkbox"/>	Water-reactive <input type="checkbox"/>	
Corrosive <input type="checkbox"/>	Carcinogenic <input type="checkbox"/>	Compressed Gas <input type="checkbox"/>	Organic Peroxide <input type="checkbox"/>	Unstable <input type="checkbox"/>	

4.0 FIRST AID MEASURES

Take proper precautions to ensure your own health and safety before attempting rescue or providing first aid. For more specific information, refer to Exposure Controls and Personal Protection in Section 8 of this MSDS.

Eye	Check for and remove contact lenses. Flush eyes with cool, clean, low-pressure water while occasionally lifting and lowering eyelids. Seek medical attention if excessive tearing, redness, or pain persists.
Skin	Remove contaminated shoes and clothing. Wipe off excess material. Wash exposed skin with mild soap and water. Seek medical attention if tissue appears damaged or if pain or irritation persists. Thoroughly clean contaminated clothing before reuse. Discard contaminated leather goods. If material is injected under the skin, seek medical attention immediately.
Inhalation	Move victim to fresh air. If victim is not breathing, immediately begin rescue breathing. If breathing is difficult, 100 percent humidified oxygen should be administered by a qualified individual. Seek medical attention immediately. Keep the affected individual warm and at rest.
Ingestion	Do not induce vomiting unless directed to by a physician. Do not give anything to drink unless directed to by a physician. Never give anything by mouth to a person who is not fully conscious. Seek medical attention immediately.
Notes to Physician	In the event of injection in underlying tissue, immediate treatment should include extensive incision, debridement and saline irrigation. Inadequate treatment can result in ischemia and gangrene. Early symptoms may be minimal.

. NOTES: NA = Not Applicable;

NE = Not Established;

UN = Unavailable

5.0 FIREFIGHTING MEASURES

Flashpoint	OPEN CUP: 212°C (414°F) (Cleveland.).
UFL	No Data
LFL	No Data
Autoignition Temperature	Not Available
Flammability Classification	NFPA Class-IIIB combustible material. Slightly combustible!
Extinguishing Media	Use dry chemical, foam, Carbon Dioxide or water fog
Special Properties	This material can burn but will not readily ignite. This material will release vapors when heated above the flash point temperature that can ignite when exposed to a source of ignition. In enclosed spaces, heated vapor can ignite with explosive force. Mists or sprays may burn at temperatures below the flash point.
Firefighting Equipment	Firefighters must use full bunker gear including NIOSH-approved positive pressure self-contained breathing apparatus to protect against potential hazardous combustion or decomposition products and oxygen deficiencies.
Hazardous Combustion Products	Carbon dioxide, carbon monoxide, smoke, fumes, unburned hydrocarbons and trace oxides of sulfur, phosphorus, zinc and/or nitrogen.

6.0 ACCIDENTAL RELEASE MEASURES

Take proper precautions to ensure your own health and safety before attempting spill control or clean-up. For more specific information, refer to the Emergency Overview on Page 1, Exposure Controls and Personal Protection in Section 8 and Disposal Considerations in Section 13 of this MSDS.

Do not touch damaged containers or spilled material unless wearing appropriate protective equipment. Slipping hazard; do not walk through spilled material. Stop leak if you can do so without risk. For small spills, absorb or cover with dry earth, sand, or other inert non-combustible absorbent material and place into waste containers for later disposal. Contain large spills to maximize product recovery or disposal. Prevent entry into waterways or sewers. In urban area, cleanup spill as soon as possible. In natural environments, seek cleanup advice from specialists to minimize physical habitat damage. This material will float on water. Absorbent pads and similar materials can be used. Comply with all laws and regulations.

7.0 HANDLING AND STORAGE

Handling	Avoid water contamination and extreme temperatures to minimize product degradation. Empty containers may contain product residues that can ignite with explosive force. Do not pressurize, cut, weld, braze solder, drill, grind or expose containers to flames, sparks, heat or other potential ignition sources. Consult appropriate federal, state and local authorities before reusing, reconditioning, reclaiming, recycling or disposing of empty containers and/or waste residues of this product
Storage	Keep container closed. Do not store with strong oxidizing agents. Do not store at temperatures above 120° F or in direct sunlight for extended periods of time. Consult appropriate federal, state and local authorities before reusing, reconditioning, reclaiming, recycling or disposing of empty containers or waste residues of this product.

8.0 EXPOSURE CONTROLS / PERSONAL PROTECTION

<p>Eye</p>	<p>Safety glasses equipped with side shields should be adequate protection under most conditions of use. Wear goggles and/or face shield if splashing or spraying is anticipated. Wear goggles and face shield if material is heated above 125°F (51°C). Have suitable eye wash water available</p>		
<p>Personal Protective Equipment</p>	<p>Personal protective equipment should be selected based upon the conditions under which this material is used. A hazard assessment of the work area for PPE requirements should be conducted by a qualified professional pursuant to OSHA regulations. The following pictograms represent the minimum requirements for personal protective equipment. For certain operations, additional PPE may be required.</p>		
<p>Hand Protection</p>	<p>Use gloves constructed of chemical resistant materials such as neoprene or heavy nitrile rubber if frequent or prolonged contact is expected. Use heat-protective gloves when handling product at elevated temperatures.</p>		
<p>Body Protection</p>	<p>Use clean and impervious protective clothing (e.g., neoprene or Tyvek®) if splashing or spraying conditions are present. Protective clothing may include long-sleeve outer garment, apron, or lab coat. If significant contact occurs, remove oil-contaminated clothing as soon as possible and promptly shower. Launder contaminated before reuse or discard. Wear heat protective boots and protective clothing when handling material at elevated temperatures</p>		
<p>Engineering Controls</p>	<p>Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of mists and/or vapors below the recommended exposure limits (see below). An eye wash station and safety shower should be located near the work-station</p>		
<p>Respiratory Protection</p>	<p>Vaporization is not expected at ambient temperatures. Therefore, the need for respiratory protection is not anticipated under normal use conditions and with adequate ventilation. If elevated airborne concentrations above applicable workplace exposure levels are anticipated, a NIOSH-approved organic vapor respirator equipped with a dust/mist prefilter should be used. Protection factors vary depending upon the type of respirator used. Respirators should be used in accordance with OSHA requirements (29 CFR 1910.134).</p>		
<p>General Comments</p>	<p>Use good personal hygiene practices. Wash hands and other exposed skin areas with plenty of mild soap and water before eating, drinking, smoking, use of toilet facilities, or leaving work. DO NOT use gasoline, kerosene, solvents or harsh abrasives as skin cleaners. Since specific exposure standards/control limits have not been established for this product, the "Oil Mist, Mineral" exposure limits shown below are suggested as minimum control guidelines.</p>		
<p>Occupational Exposure Guidelines</p>	<table border="0"> <tr> <td> <p>Substance 1) Oil Mist, Mineral</p> </td> <td> <p>Applicable Workplace Exposure Levels ACGIH (United States). TWA: 5 mg/m³ STEL: 10 mg/m³ OSHA (United States). TWA: 5 mg/m³</p> </td> </tr> </table>	<p>Substance 1) Oil Mist, Mineral</p>	<p>Applicable Workplace Exposure Levels ACGIH (United States). TWA: 5 mg/m³ STEL: 10 mg/m³ OSHA (United States). TWA: 5 mg/m³</p>
<p>Substance 1) Oil Mist, Mineral</p>	<p>Applicable Workplace Exposure Levels ACGIH (United States). TWA: 5 mg/m³ STEL: 10 mg/m³ OSHA (United States). TWA: 5 mg/m³</p>		

9.0 CHEMICAL AND PHYSICAL PROPERTIES

Appearance and Odor	Mild petroleum odor
pH	Not Applicable
Vapor Pressure (mm Hg)	<0.001 kPa (<0.01 mmHg) (at 20°C)
Vapor Density (Air = 1)	>1 (Air = 1)
Boiling Point	Not available
Melting Point	Not available
Solubility in Water	Insoluble in cold water.
Specific Gravity (Water = 1)	0.87 (Water = 1)
Physical State	Liquid
Color	Clear to light amber
Viscosity (cST @ 40°C)	33
Volatile Characteristics	Negligible volatility
Additional Properties	Gravity, °API (ASTM D287) = 31.3 @ 60° F Density = 7.42 Lbs/gal. Viscosity (ASTM D2161) = 170 SUS @ 100° F

10.0 STABILITY AND REACTIVITY

Stability	Stable.
Conditions to Avoid	Keep away from extreme heat, sparks, open flame, and strongly oxidizing conditions.
Materials to Avoid	Strong oxidizers.
Hazardous Decomposition	No additional hazardous decomposition products were identified other than the combustion products identified in Section 5 of this MSDS
Hazardous Polymerization	Not expected to occur

11.0 TOXICOLOGICAL INFORMATION

For other health-related information, refer to the Emergency Overview on Page 1 of the Hazards Identification in Section 3 of this MSDS.

Distillates, petroleum, solvent-refined light paraffinic:

ORAL (LD50): Acute: >5000 mg/kg [Rat].

DERMAL (LD50): Acute: >2000 mg/kg [Rabbit].

Distillates, petroleum, solvent-refined heavy paraffinic:

ORAL (LD50): Acute: >5000 mg/kg [Rat].

DERMAL (LD50): Acute: >2000 mg/kg [Rabbit].

Distillates, petroleum, solvent-refined light paraffinic:

Mineral oil mists derived from highly refined oils are reported to have low acute and sub-acute toxicities in animals. Effects from single and short-term repeated exposures to high concentrations of mineral oil mists well above applicable workplace exposure levels include lung inflammatory reaction, lipoid granuloma formation and lipoid pneumonia. In acute and sub-acute studies involving exposures to lower concentrations of mineral oil mists at or near current work place exposure levels produced no significant toxicological effects. In long term studies (up to two years) no carcinogenic effects have been reported in any animal species tested.

Distillates, petroleum, solvent-refined heavy paraffinic:

Mineral oil mists derived from highly refined oils are reported to have low acute and sub-acute toxicities in animals. Effects from single and short-term repeated exposures to high concentrations of mineral oil mists well above applicable workplace exposure levels include lung inflammatory reaction, lipoid granuloma formation and lipoid pneumonia. In acute and sub-acute studies involving exposures to lower concentrations of mineral oil mists at or near current work place exposure levels produced no significant toxicological effects. In long term studies (up to two years) no carcinogenic effects have been reported in any animal species tested.

Hydraulic Oils:

Repeated or prolonged skin contact with certain hydraulic oils can cause mild skin irritation characterized by drying, cracking (dermatitis) or oil acne. Injection under the skin, in muscle or into the blood stream can cause irritation, inflammation, swelling, fever, and systemic effects, including mild central nervous system depression. Injection of pressurized hydrocarbons can cause severe, permanent tissue damage.

12.0 ECOLOGICAL INFORMATION

Ecotoxicity

Analysis for ecological effects has not been conducted on this product. However, if spilled, this product and any contaminated soil or water may be harmful to human, animal, and aquatic life. Also, the coating action associated with petroleum and petroleum products can be harmful or fatal to aquatic life and waterfowl.

Environmental Fate

An environmental fate analysis has not been conducted on this specific product. Plants and animals may experience harmful or fatal effects when coated with petroleum-based products. Petroleum-based (mineral) lube oils will normally float on water. In stagnant or slow-flowing waterways, an oil layer can cover a large surface area. As a result, this oil layer might limit or eliminate natural atmospheric oxygen transport into the water. With time, if not removed, oxygen depletion in the waterway can result in a loss of marine life or create an anaerobic environment. This material contains phosphorus which is a controlled element for disposal in effluent waters in most sections of North America. Phosphorus is known to enhance the formation of algae. Severe algae growth can reduce oxygen content in the water possibly below levels necessary to support marine life.

13.0 DISPOSAL INFORMATION

Hazard characteristic and regulatory waste stream classification can change with product use. Accordingly, it is the responsibility of the user to determine the proper storage, transportation, treatment and/or disposal methodologies for spent materials and residues at the time of disposition.

Conditions of use may cause this material to become a "hazardous waste", as defined by federal or state regulations. It is the responsibility of the user to determine if the material is a "hazardous waste" at the time of disposal. Transportation, treatment, storage, and disposal of waste material must be conducted in accordance with RCRA regulations (see 40 CFR 260 through 40 CFR 271). State and/or local regulations may be more restrictive. Contact the RCRA/Superfund Hotline at (800) 424-9346 or your regional US EPA office for guidance concerning case specific disposal issues. Empty drums and pails retain residue. DO NOT pressurize, cut, weld, braze, solder, drill, grind, or expose this product's empty container to heat, flame, or other ignition sources. DO NOT attempt to clean it. Empty drums and pails should be drained completely, properly bunged or sealed, and promptly sent to a reconditioner.

14.0 TRANSPORTATION INFORMATION

U.S. Dept. of Transportation: Not a US Department of Transportation regulated material.

Hazard Class - Not regulated

Packing Group(s) – Not applicable

UN/NA ID – Not regulated

Reportable Quantity – A Reportable Quantity (RQ) has not been established for this material.

Placards



Emergency Response Guide No. Not applicable

Hazmat STCC No. – Not assigned

MARPOL III Status – Not a DOT “Marine Pollutant” Per 49 CFR 171.8

15.0 REGULATORY INFORMATION

<p>CERCLA Sections 102A/103 Hazardous Substances (40 CFR Part 302.4)</p>	<p>The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center concerning release of quantities of "hazardous substances" equal to or greater than the reportable quantities (RQ's) listed in 40 CFR 302.4. As defined by CERCLA, the term "hazardous substance" does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically designated in 40 CFR 302.4. Chemical substances present in this product or refinery stream that may be subject to this statute are: Zinc and Zinc Compounds, Concentration: 0 - 1%</p>
<p>SARA Title III Section 302 Extremely Hazardous Substances (40 CFR Part 355)</p>	<p>The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires facilities subject to Subparts 302 and 304 to submit emergency planning and notification information based on Threshold Planning Quantities (TPQs) and Reportable Quantities (RQs) for "Extremely Hazardous Substances" listed in 40 CFR 302.4 and 40 CFR 355. No components were identified</p>
<p>SARA Title III Section 311/312 Hazardous Categorization (40 CFR Part 370)</p>	<p>The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires facilities subject to this subpart to submit aggregate information on chemicals by "Hazard Category" as defined in 40 CFR 370.2. This material would be classified under the following hazard categories: No SARA 311/312 hazard categories identified.</p>
<p>SARA Title III Sections 313 (40 CFR Part 372)</p>	<p>This product contains the following components in concentrations above de minimis levels that are listed as toxic chemicals in 40 CFR Part 372 pursuant to the requirements of Section 313 of SARA: No components were identified.</p>
<p>U.S. Inventory (TSCA)</p>	<p>This product and/or its components are listed on the Toxic Substances Control Act (TSCA) inventory.</p>
<p>CWA</p>	<p>This material is classified as an oil under Section 311 of the Clean Water Act (CWA) and the Oil Pollution Act of 1990 (OPA). Discharges or spills which produce a visible sheen on waters of the United States, their adjoining shorelines, or into conduits leading to surface waters must be reported to the EPA's National Response Center at (800) 424-8802.</p>
<p>California Proposition 65</p>	<p>This material may contain the following components which are known to the State of California to cause cancer, birth defects or other reproductive harm, and may be subject to the requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5): Toluene: 0.001%</p>
<p>New Jersey Right-to-Know Label</p>	<p>Petroleum Oil (Hydraulic Fluid)</p>
<p>Additional Regulatory Remarks</p>	<p>No additional regulatory remarks</p>

16.0 OTHER INFORMATION

Refer to the top of Page 1 for the HMIS and NFPA Hazard Ratings for this product.

ABBREVIATIONS

AP = Approximately, EQ = Equal, > = Greater Than, < = Less Than, NA = Not Applicable, ND = No Data, NE = Not Established

ACGIH = American Conference of Governmental Industrial Hygienists

IARC = International Agency for Research on Cancer

NIOSH = National Institute of Occupational Safety and Health

NPCA = National Paint and Coating Manufacturers Association

NFPA = National Fire Protection Association

AIHA = American Industrial Hygiene Association

NTP = National Toxicology Program

OSHA = Occupational Safety and Health Administration

HMIS = Hazardous Materials Information System

EPA = Environmental Protection Agency

Prepared By	Graco, Inc.
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This Material Safety Data Sheet and the information it contains is offered to you in good faith as accurate. We have reviewed any information contained in this data sheet which we have received from sources outside our company. We believe that information to be correct, but cannot guarantee its accuracy or completeness. Health and safety precautions in this Data Sheet may not be adequate for all individuals and/or situations. It is the users' obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. No statement made in this data sheet shall be construed as a permission or recommendation for the use of any product in a manner that might infringe existing patents. No warranty is made, either express or implied.

NOTES: NA = Not Applicable; NE = Not Established; UN = Unavailable

All written and visual data contained in this document reflects the latest product information available at the time of publication.

Graco reserves the right to make changes at any time without notice.

Sales Offices: Minneapolis, Detroit,

International Offices: Belgium, Korea, Hong Kong, Japan

www.graco.com

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select the "back" button on your browser.

HYDROCHLORIC ACID, 33 - 40%

MSDS Number: H3880 --- *Effective Date: 11/17/99*

1. Product Identification

Synonyms: Muriatic acid; hydrogen chloride, aqueous

CAS No.: 7647-01-0

Molecular Weight: 36.46

Chemical Formula: HCl

Product Codes:

J.T. Baker: 5367, 5537, 5575, 5800, 5814, 5839, 6900, 7831, 9529, 9530, 9534, 9535, 9536, 9537, 9538, 9539, 9540, 9544, 9548

Mallinckrodt: 2062, 2612, 2624, 2626, 5587, H611, H613, H987, H992, H999, V078, V628

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent
Hazardous		
-----	-----	-----

Hydrogen Chloride	7647-01-0	33 - 40%
Yes		
Water	7732-18-5	60 - 67%
No		

3. Hazards Identification

Emergency Overview

POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED. INHALATION MAY CAUSE LUNG DAMAGE.

J.T. Baker SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Poison)

Flammability Rating: 0 - None

Reactivity Rating: 2 - Moderate

Contact Rating: 3 - Severe (Corrosive)

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD;
PROPER GLOVES

Storage Color Code: White (Corrosive)

Potential Health Effects

Inhalation:

Corrosive! Inhalation of vapors can cause coughing, choking, inflammation of the nose, throat, and upper respiratory tract, and in severe cases, pulmonary edema, circulatory failure, and death.

Ingestion:

Corrosive! Swallowing hydrochloric acid can cause immediate pain and burns of the mouth, throat, esophagus and gastrointestinal tract. May cause nausea, vomiting, and diarrhea.

Swallowing may be fatal.

Skin Contact:

Corrosive! Can cause redness, pain, and severe skin burns. Concentrated solutions cause deep ulcers and discolor skin.

Eye Contact:

Corrosive! Vapors are irritating and may cause damage to the eyes. Contact may cause severe burns and permanent eye damage.

Chronic Exposure:

Long-term exposure to concentrated vapors may cause erosion of teeth. Long term exposures seldom occur due to the corrosive properties of the acid.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders or eye disease may be more susceptible to the effects of this substance.

4. First Aid Measures

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:

DO NOT INDUCE VOMITING! Give large quantities of water or milk if available. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Skin Contact:

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:

Extreme heat or contact with metals can release flammable hydrogen gas.

Explosion:

Not considered to be an explosion hazard.

Fire Extinguishing Media:

If involved in a fire, use water spray. Neutralize with soda ash or slaked lime.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Structural firefighter's protective clothing is ineffective for fires involving hydrochloric acid. Stay

away from ends of tanks. Cool tanks with water spray until well after fire is out.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker NEUTRASORB(R) or TEAM(R) 'Low Na+' acid neutralizers are recommended for spills of this product.

7. Handling and Storage

Store in a cool, dry, ventilated storage area with acid resistant floors and good drainage. Protect from physical damage. Keep out of direct sunlight and away from heat, water, and incompatible materials. Do not wash out container and use it for other purposes. When diluting, the acid should always be added slowly to water and in small amounts. Never use hot water and never add water to the acid. Water added to acid can cause uncontrolled boiling and splashing. When opening metal containers, use non-sparking tools because of the possibility of hydrogen gas being present. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

-OSHA Permissible Exposure Limit (PEL):

5 ppm Ceiling

-ACGIH Threshold Limit Value (TLV):

5 ppm Ceiling

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded, a full facepiece respirator with an acid gas cartridge may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. **WARNING:** Air purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Rubber or neoprene gloves and additional protection including impervious boots, apron, or coveralls, as needed in areas of unusual exposure to prevent skin contact.

Eye Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:

Colorless, fuming liquid.

Odor:

Pungent odor of hydrogen chloride.

Solubility:

Infinite in water with slight evolution of heat.

Density:

1.18

pH:

For HCL solutions: 0.1 (1.0 N), 1.1 (0.1 N), 2.02 (0.01 N)

% Volatiles by volume @ 21C (70F):

100

Boiling Point:

53C (127F) Azeotrope (20.2%) boils at 109C (228F)

Melting Point:

-74C (-101F)

Vapor Density (Air=1):

No information found.

Vapor Pressure (mm Hg):

190 @ 25C (77F)

Evaporation Rate (BuAc=1):

No information found.

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage. Containers may burst when heated.

Hazardous Decomposition Products:

When heated to decomposition, emits toxic hydrogen chloride fumes and will react with water or steam to produce heat and toxic and corrosive fumes. Thermal oxidative decomposition produces toxic chlorine fumes and explosive hydrogen gas.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

A strong mineral acid, concentrated hydrochloric acid is incompatible with many substances and highly reactive with strong bases, metals, metal oxides, hydroxides, amines, carbonates and other alkaline materials. Incompatible with materials such as cyanides, sulfides, sulfites, and formaldehyde.

Conditions to Avoid:

Heat, direct sunlight.

11. Toxicological Information

Inhalation rat LC50: 3124 ppm/1H; oral rabbit LD50: 900 mg/kg (Hydrochloric acid concentrated); investigated as a tumorigen, mutagen, reproductive effector.

-----\Cancer Lists

Ingredient Category	---NTP Carcinogen---		IARC
	Known	Anticipated	
Hydrogen Chloride (7647-01-0)	No	No	3
Water (7732-18-5)	No	No	None

12. Ecological Information

Environmental Fate:

When released into the soil, this material is not expected to biodegrade. When released into the soil, this material may leach into groundwater.

Environmental Toxicity:

This material is expected to be toxic to aquatic life.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: HYDROCHLORIC ACID

Hazard Class: 8

UN/NA: UN1789

Packing Group: II

Information reported for product/size: 475LB

International (Water, I.M.O.)

Proper Shipping Name: HYDROCHLORIC ACID

Hazard Class: 8

UN/NA: UN1789

Packing Group: II

Information reported for product/size: 475LB

15. Regulatory Information

-----\Chemical Inventory Status - Part 1

Ingredient	TSCA	EC	Japan
Australia			
Hydrogen Chloride (7647-01-0)	Yes	Yes	Yes
Water (7732-18-5)	Yes	Yes	Yes

-----\Chemical Inventory Status - Part 2

Ingredient	Korea	DSL	NDSL	Phil.
Hydrogen Chloride (7647-01-0)	Yes	Yes	No	
Water (7732-18-5)	Yes	Yes	No	

-----\Federal, State & International Regulations - Part 1

Ingredient	RQ	TPQ	List	Chemical
Hydrogen Chloride (7647-01-0)	5000	500*	Yes	No
Water (7732-18-5)	No	No	No	No

-----\Federal, State & International Regulations - Part 2

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Hydrogen Chloride (7647-01-0)	5000	No	
Water (7732-18-5)	No	No	

Chemical Weapons Convention: No TSCA 12(b): No CDTA: Yes
 SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
 Reactivity: No (Mixture / Liquid)

Australian Hazchem Code: 2R

Poison Schedule: No information found.

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products

Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 3 Flammability: 0 Reactivity: 0

Label Hazard Warning:

POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED. INHALATION MAY CAUSE LUNG DAMAGE.

Label Precautions:

Do not get in eyes, on skin, or on clothing.
Do not breathe vapor or mist.
Use only with adequate ventilation.
Wash thoroughly after handling.
Store in a tightly closed container.
Remove and wash contaminated clothing promptly.

Label First Aid:

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases get medical attention immediately.

Product Use:

Laboratory Reagent.

Revision Information:

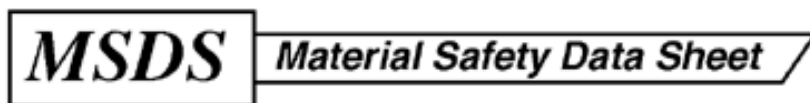
No changes.

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Prepared by: Strategic Services Division

Phone Number: (314) 539-1600 (U.S.A.)



TSI Incorporated
500 Cardigan Road
Shoreview, MN 55126-3996

24 hour Emergency telephone
CHEMTREC: 1-800-424-9300

Outside US and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC number to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-874-2811) for assistance.

ISOPROPYL ALCOHOL (90 - 100%)

1. Product Identification

Synonyms: 2-Propanol; sec-propyl alcohol; isopropanol; sec-propanol; dimethylcarbinol

CAS No.: 67-63-0

Molecular Weight: 60.10

Chemical Formula: (CH₃)₂CHOH

Product Codes:

TSI products: 8016, 8016M, 2918011

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Isopropyl Alcohol	67-63-0	90 - 100%	Yes
Water	7732-18-5	0 - 10%	No

3. Hazards Identification

Emergency Overview

WARNING! FLAMMABLE LIQUID AND VAPOR. HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM. MAY BE HARMFUL IF ABSORBED THROUGH SKIN. MAY CAUSE IRRITATION TO SKIN.

SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate

Flammability Rating: 3 - Severe (Flammable)

Reactivity Rating: 2 - Moderate

Contact Rating: 3 - Severe

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES; CLASS B EXTINGUISHER

Storage Color Code: Red (Flammable)

Potential Health Effects

Inhalation:

Inhalation of vapors irritates the respiratory tract. Exposure to high concentrations has a narcotic effect, producing symptoms of dizziness, drowsiness, headache, staggering, unconsciousness and possibly death.

Ingestion:

Can cause drowsiness, unconsciousness, and death. Gastrointestinal pain, cramps, nausea, vomiting, and diarrhea may also result. The single lethal dose for a human adult = about 250 mls (8 ounces).

Skin Contact:

May cause irritation with redness and pain. May be absorbed through the skin with possible systemic effects.

Eye Contact:

Vapors cause eye irritation. Splashes cause severe irritation, possible corneal burns and eye damage.

Chronic Exposure:

Chronic exposure may cause skin effects.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders or impaired liver, kidney, or pulmonary function may be more susceptible to the effects of this agent.

4. First Aid Measures

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion:

Give large amounts of water to drink. Never give anything by mouth to an unconscious person. Get medical attention.

Skin Contact:

Immediately flush skin with plenty of water for at least 15 minutes. Call a physician if irritation develops.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:

Flash point: 12C (54F) CC

Autoignition temperature: 399C (750F)

Flammable limits in air % by volume:

lel: 2.0; uel: 12.7

Listed fire data is for Pure Isopropyl Alcohol.

Explosion:

Above flash point, vapor-air mixtures are explosive within flammable limits noted above. Contact with strong oxidizers may cause fire or explosion. Vapors can flow along surfaces to distant ignition source and flash back. Sensitive to static discharge.

Fire Extinguishing Media:

Water spray, dry chemical, alcohol foam, or carbon dioxide. Water spray may be used to keep fire exposed containers cool, dilute spills to nonflammable mixtures, protect personnel attempting to stop leak and disperse vapors.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! If a leak or spill has not ignited, use water spray to disperse the vapors, to protect personnel attempting to stop leak, and to flush spills away from exposures.

7. Handling and Storage

Protect against physical damage. Store in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from incompatibles. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Containers of this material

may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product. Small quantities of peroxides can form on prolonged storage. Exposure to light and/or air significantly increases the rate of peroxide formation. If evaporated to a residue, the mixture of peroxides and isopropanol may explode when exposed to heat or shock.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

For Isopropyl Alcohol (2-Propanol):

-OSHA Permissible Exposure Limit (PEL):
400 ppm (TWA)

-ACGIH Threshold Limit Value (TLV):

200 ppm (TWA), 400 ppm (STEL), A4 - not classifiable as a human carcinogen.

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded, a full facepiece respirator with organic vapor cartridge may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. **WARNING:** Air purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Neoprene and nitrile rubber are recommended materials.

Eye Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:

Clear, colorless liquid.

Odor:

Rubbing alcohol.

Solubility:

Miscible in water.

Specific Gravity:

0.79 @ 20C/4C

pH:

No information found.

% Volatiles by volume @ 21C (70F):

100

Boiling Point:

82C (180F)

Melting Point:

-89C (-128F)

Vapor Density (Air=1):

2.1

Vapor Pressure (mm Hg):

44 @ 25C (77F)

Evaporation Rate (BuAc=1):

2.83

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage. Heat and sunlight can contribute to instability.

Hazardous Decomposition Products:

Carbon dioxide and carbon monoxide may form when heated to decomposition.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Heat, flame, strong oxidizers, acetaldehyde, acids, chlorine, ethylene oxide, hydrogen-palladium combination, hydrogen peroxide-sulfuric acid combination, potassium tert-butoxide, hypochlorous acid, isocyanates, nitroform, phosgene, aluminum, oleum and perchloric acid.

Conditions to Avoid:

Heat, flames, ignition sources and incompatibles.

11. Toxicological Information

Oral rat LD50: 5045 mg/kg; skin rabbit LD50: 12.8 gm/kg; inhalation rat LC50: 16,000 ppm/8-hour; investigated as a tumorigen, mutagen, reproductive effector.

Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Isopropyl Alcohol (67-63-0)	No	No	3
Water (7732-18-5)	No	No	None

12. Ecological Information

Environmental Fate:

When released into the soil, this material is expected to quickly evaporate. When released into the soil, this

material may leach into groundwater. When released into the soil, this material may biodegrade to a moderate extent. When released to water, this material is expected to quickly evaporate. When released into the water, this material is expected to have a half-life between 1 and 10 days. When released into water, this material may biodegrade to a moderate extent. This material is not expected to significantly bioaccumulate. When released into the air, this material is expected to be readily degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life between 1 and 10 days. When released into the air, this material may be removed from the atmosphere to a moderate extent by wet deposition.

Environmental Toxicity:

The LC50/96-hour values for fish are over 100 mg/l. This material is not expected to be toxic to aquatic life.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: ISOPROPANOL
Hazard Class: 3
UN/NA: UN1219
Packing Group: II
Information reported for product/size: 355LB

International (Water, I.M.O.)

Proper Shipping Name: ISOPROPANOL
Hazard Class: 3
UN/NA: UN1219
Packing Group: II
Information reported for product/size: 355LB

15. Regulatory Information

-----\Chemical Inventory Status - Part 1\----- Ingredient	TSCA	EC	Japan	Australia
----- Isopropyl Alcohol (67-63-0)	Yes	Yes	Yes	Yes

Water (7732-18-5) Yes Yes Yes Yes

-----\Chemical Inventory Status - Part 2\-----

Ingredient	--Canada--			
	Korea	DSL	NDSL	Phil.
Isopropyl Alcohol (67-63-0)	Yes	Yes	No	Yes
Water (7732-18-5)	Yes	Yes	No	Yes

-----\Federal, State & International Regulations - Part 1\-----

Ingredient	-SARA 302-		-----SARA 313-----	
	RQ	TPQ	List	Chemical Catg.
Isopropyl Alcohol (67-63-0)	No	No	Yes	No
Water (7732-18-5)	No	No	No	No

-----\Federal, State & International Regulations - Part 2\-----

Ingredient	CERCLA	-RCRA-	-TSCA-
		261.33	8 (d)
Isopropyl Alcohol (67-63-0)	No	No	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: Yes
 SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No
 Reactivity: No (Mixture / Liquid)

Australian Hazchem Code: 2[S]2

Poison Schedule: None allocated.

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 2 Flammability: 3 Reactivity: 0

Label Hazard Warning:

WARNING! FLAMMABLE LIQUID AND VAPOR. HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM. MAY BE HARMFUL IF ABSORBED THROUGH SKIN. MAY CAUSE IRRITATION TO SKIN.

Label Precautions:

Keep away from heat, sparks and flame.

Keep container closed.

Use only with adequate ventilation.

Wash thoroughly after handling.

Avoid breathing vapor or mist.

Avoid contact with eyes, skin and clothing.

Label First Aid:

If swallowed, give large amounts of water to drink. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases, get medical attention.

Product Use:

Laboratory Reagent.

Revision Information:

MSDS Section(s) changed since last revision of document include: 8.

Disclaimer:

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LIQUINOX MSDS

Section 1 : PRODUCT AND COMPANY IDENTIFICATION

Chemical family: Detergent.

Manufacturer: Alconox, Inc.
30 Glenn St.
Suite 309
White Plains, NY 10603.

Manufacturer emergency phone number: 800-255-3924.
813-248-0585 (outside of the United States).

Supplier: Same as manufacturer.

Product name: Liquinox

Section 2 : INGREDIENT INFORMATION

C.A.S.	CONCENTRATION %	Ingredient Name	T.L.V.	LD/50	LC/50
25155-30-0	10-30	SODIUM DODECYLBENZENESULFONATE	NOT AVAILABLE	438 MG/KG RAT ORAL 1330 MG/KG MOUSE ORAL	NOT AVAILABLE

Section 3 : HAZARD IDENTIFICATION

Route of entry: Skin contact, eye contact, inhalation and ingestion.

Effects of acute exposure

Eye contact: May cause irritation.

Skin contact: Prolonged and repeated contact may cause irritation.

Inhalation: May cause headache and nausea.

Ingestion: May cause vomiting and diarrhea.
May cause gastric distress.

Effects of chronic exposure: See effects of acute exposure.

Section 4 : FIRST AID MEASURES

Skin contact: Remove contaminated clothing.
Wash thoroughly with soap and water.
Seek medical attention if irritation persists.

- Eye contact:** Check for and remove contact lenses.
Flush eyes with clear, running water for 15 minutes while holding eyelids open: if irritation persists, consult a physician.
- Inhalation:** Remove victim to fresh air.
If irritation persists, seek medical attention.
- Ingestion:** Do not induce vomiting, seek medical attention.
Dilute with two glasses of water.
Never give anything by mouth to an unconscious person.

Section 5 : FIRE FIGHTING MEASURES

- Flammability:** Not flammable.
- Conditions of flammability:** Surrounding fire.
- Extinguishing media:** Carbon dioxide, dry chemical, foam.
Water
Water fog.
- Special procedures:** Self-contained breathing apparatus required.
Firefighters should wear the usual protective gear.
Use water spray to cool fire exposed containers.
- Auto-ignition temperature:** Not available.
- Flash point (°C), method:** None
- Lower flammability limit (% vol):** Not applicable.
- Upper flammability limit (% vol):** Not applicable.
- Explosion Data**
- Sensitivity to static discharge:** Not available.
- Sensitivity to mechanical impact:** Not available.
- Hazardous combustion products:** Oxides of carbon (COx).
Hydrocarbons.
- Rate of burning:** Not available.
- Explosive power:** Containers may rupture if exposed to heat or fire.

Section 6 : ACCIDENTAL RELEASE MEASURES

- Leak/Spill:** Contain the spill.
Prevent entry into drains, sewers, and other waterways.
Wear appropriate protective equipment.
Small amounts may be flushed to sewer with water.
Soak up with an absorbent material.
Place in appropriate container for disposal.
Notify the appropriate authorities as required.

Section 7 : HANDLING AND STORAGE

- Handling procedures and equipment:** Protect against physical damage.
Avoid breathing vapors/mists.

Wear personal protective equipment appropriate to task.
Wash thoroughly after handling.
Keep out of reach of children.
Avoid contact with skin, eyes and clothing.
Avoid extreme temperatures.
Launder contaminated clothing prior to reuse.

Storage requirements: Store away from incompatible materials.
Keep containers closed when not in use.

Section 8 : EXPOSURE CONTROLS / PERSONAL PROTECTION

Precautionary Measures

Gloves/Type:



Wear appropriate gloves.

Respiratory/Type: None required under normal use.

Eye/Type:



Safety glasses recommended.

Footwear/Type: Safety shoes per local regulations.

Clothing/Type: As required to prevent skin contact.

Other/Type: Eye wash facility should be in close proximity.
Emergency shower should be in close proximity.

Ventilation requirements: Local exhaust at points of emission.

Exposure limit of material: Not available.

Section 9 : PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Liquid.

Appearance & odor: Odourless.
Pale yellow.

Odor threshold (ppm): Not available.

Vapour pressure @ 20°C (68°F):
(mmHg): 17

Vapour density (air=1): >1

Volatiles (%)

By volume: Not available.

Evaporation rate (butyl acetate = 1): < 1.

Boiling point (°C): 100 (212F)

Freezing point (°C): Not available.

pH: 8.5

Specific gravity @ 20 °C: (water = 1).
1.083

Solubility in water (%): Complete.
Coefficient of water\oil dist.: Not available.
VOC: None
Chemical family: Detergent.

Section 10 : STABILITY AND REACTIVITY

Chemical stability: Product is stable under normal handling and storage conditions.
Conditions of instability: Extreme temperatures.
Hazardous polymerization: Will not occur.
Incompatible substances: Strong acids.
Strong oxidizing agents.
Hazardous decomposition products: See hazardous combustion products.

Section 11 : TOXICOLOGICAL INFORMATION

LD50 of product, species & route: > 5000 mg/kg rat oral.
LC50 of product, species & route: Not available.
Sensitization to product: Not available.
Carcinogenic effects: Not listed as a carcinogen.
Reproductive effects: Not available.
Teratogenicity: Not available.
Mutagenicity: Not available.
Synergistic materials: Not available.

Section 12 : ECOLOGICAL INFORMATION

Environmental toxicity: No data at this time.
Environmental fate: No data at this time.

Section 13 : DISPOSAL CONSIDERATIONS

Waste disposal: In accordance with local and federal regulations.

Section 14 : TRANSPORT INFORMATION

D.O.T. CLASSIFICATION: Not regulated.
Special shipping information: Not regulated.

Section 15 : REGULATORY INFORMATION

Canadian Regulatory Information

WHMIS classification: Not controlled.

DSL status: Not available.

**USA Regulatory
Information**

SARA hazard categories sections 311/312: Immediate (Acute) Health Hazard: No.
Delayed (Chronic) Health Hazard: No.
Fire Hazard: No.
Sudden Release of Pressure: No.
Reactive: No.

SARA Section 313: None

TSCA inventory: All components of this product are listed on the TSCA inventory.

NFPA

Health Hazard: 1

Flammability: 0

Physical hazard: 0

Section 16 : OTHER INFORMATION

Supplier MSDS date: 2005/02/24

Data prepared by: Global Safety Management
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General note: This material safety data sheet was prepared from information obtained from various sources, including product suppliers and the Canadian Center for Occupational Health and Safety.

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MSDS Identification:

- **Key:** 14280
- **Name:** Methanol

Catalog Numbers:

, S75162, S75163, S75959, S75965, S75965A, S75965HPLC, S75965SPEC, A408-1, A408-4, A408-4LC, A408SK-4, A411-20, A411-4, A412-1, A412-20, A412-200, A412-200LC, A412-4, A412-4LC, A412-500, A412-500LC, A412CU1300, A412FB115, A412FB19, A412FB200, A412FB50, A412J500, A412P-4, A412P-4LC, A412POP19, A412POP200, A412POP50, A412POPB19, A412POPB200, A412POPB50, A412RB115, A412RB200, A412RB50, A412RS115, A412RS19, A412RS200, A412RS28, A412RS50, A412SK-4, A412SS-115, A412SS-19, A412SS-200, A412SS28, A412SS50, A413-20, A413-200, A413-4, A413-500, A433F-1GAL, A433P-4, A433P1GAL, A433RS50, A433S-20, A433S-200, A433S-4, A434-20, A450-4, A452-1, A452-212, A452-4, A452-4LC, A452J1, A452N119, A452N219, A452NB219, A452POP19, A452POP200, A452POP28, A452POP50, A452POPN19, A452RS-115, A452RS-19, A452RS-200, A452RS-28, A452RS-50, A452SK-1, A452SK-4, A452SS-115, A452SS-19, A452SS-200, A452SS-50, A452SS28, A452SS50, A453-1, A453-1LC, A453-500, A453J1, A454-1, A454-1LC, A454-4, A454-4LC, A454J1, A454POP19, A454POP200, A454POP50, A454RS-115, A454RS-200, A454RS-28, A454SS-19, A454SS-28, A454SS-50, A454SS115, A454SS200, A455-1, A455POP19, A455POP200, A455POP50, A455RS19, A455SS19, A455SS200, A455SS50, A457-4, A4574LC, A935-4, A935FB200, A935POPB200, A935RB200, A947-4, A947-4LC, A947POP19, A947POP200, A947POP50, A947RS-115, A947RS-200, A947RS-28, A947SS-115, A947SS-19, A947SS-200, A947SS-28, A947SS-50, BP1105-1, BP1105-4, BP1105POP19, BP1105POP20, BP1105POP50, BP1105SS115, BP1105SS19, BP1105SS200, BP1105SS28, BP1105SS50, BP2618100, FLA452SS20, FLA452SS50, FLA457-4LC, HC400 1GAL, NC9105104, NC9115030, NC9125138, NC9134255, NC9173853, NC9905242, NC9942270, NC9964975, SC95-1, SW2-1, TIA9474, TIA947P200L

Synonyms:

- Carbinol; Methyl alcohol; Methyl hydroxide; Monohydroxymethane; Wood
- alcohol; Wood naphtha; Wood spirits; Columbian spirits; Methanol.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fairlawn, NJ 07410

For information, call:

- 201-796-7100

Emergency Number:

- 201-796-7100

For CHEMTREC assistance, call:

- 800-424-9300

For International CHEMTREC assistance, call:

- 703-527-3887

SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS

CAS #	Chemical Name	%	EINECS #
67-56-1	Methanol	>99.0	200-659-6

Hazard Symbols: T F

Risk Phrases: 11 23/24/25 39/23/24/25

SECTION 3 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Appearance: clear, colorless liquid. Flash Point: 11 deg C. Danger! Flammable liquid and vapor. Causes respiratory tract irritation. May cause central nervous system depression. Poison! Cannot be made non-poisonous. Causes eye and skin irritation. May be fatal or cause blindness if swallowed. Harmful if swallowed, inhaled, or absorbed through the skin. Vapor harmful.

Target Organs: Eyes, nervous system, optic nerve.

POTENTIAL HEALTH EFFECTS

Eye: Methanol is a mild to moderate eye irritant. Inhalation, ingestion or skin absorption of methanol can cause significant disturbances in vision, including blindness.

Skin: Causes moderate skin irritation. Harmful if absorbed through the skin. Prolonged and/or repeated contact may cause defatting of the skin and dermatitis. Methanol can be absorbed through the skin, producing systemic effects that include visual disturbances.

Ingestion: Harmful if swallowed. May be fatal or cause blindness if swallowed. Aspiration hazard. May cause systemic toxicity with acidosis. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure.

Inhalation: Methanol is toxic and can very readily form extremely high vapor concentrations at room temperature. Inhalation is the most common route of occupational exposure. At first, methanol causes CNS depression with nausea, headache, vomiting, dizziness and incoordination. A time period with no obvious symptoms follows (typically 8-24 hrs). This latent period is followed by metabolic acidosis and severe visual effects which may include reduced reactivity and/or increased sensitivity to light, blurred, double and/or snowy vision, and blindness. Depending on the severity of exposure and the promptness of treatment, survivors may recover completely or may have permanent blindness, vision disturbances and/or nervous system effects.

Chronic: Prolonged or repeated skin contact may cause dermatitis. Chronic exposure may cause effects similar to those of acute exposure. Methanol is only very slowly eliminated from the body. Because of this slow elimination, methanol should be regarded as a cumulative poison. Though a single exposure may cause no effect, daily exposures may result in the accumulation of a harmful amount. Methanol has produced fetotoxicity in rats and teratogenicity in mice exposed by inhalation to high concentrations that did not produce significant maternal toxicity.

SECTION 4 - FIRST AID MEASURES

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

Ingestion: Potential for aspiration if swallowed. Get medical aid immediately. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Effects may be delayed.

Antidote: Ethanol may inhibit methanol metabolism.

SECTION 5 - FIRE FIGHTING MEASURES

General Information: Containers can build up pressure if exposed to heat and/or fire. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Water may be ineffective. Material is lighter than water and a fire may be spread by the use of water. Flammable liquid and vapor. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas.

Extinguishing Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. Water may be ineffective. For large fires, use water spray, fog or alcohol-resistant foam. Do NOT use straight streams of water.

Autoignition Temperature: 464 deg C (867.20 deg F)

Flash Point: 11 deg C (51.80 deg F)

Explosion Limits, lower: 6.0 vol %

Explosion Limits, upper: 36.00 vol %

NFPA Rating: (estimated) Health: 1; Flammability: 3; Instability: 0

SECTION 6 - ACCIDENTAL RELEASE MEASURES

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Use water spray to disperse the gas/vapor. Remove all sources of ignition. Provide ventilation. A vapor suppressing foam may be used to reduce vapors. Water spray may reduce vapor but may not prevent ignition in closed spaces.

SECTION 7 - HANDLING AND STORAGE

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Do not ingest or inhale. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Use only with adequate ventilation. Keep away from heat, sparks and flame. Avoid use in confined spaces. Avoid breathing vapor or mist.

Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-area. Keep containers tightly closed.

SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION

Engineering Controls: Use explosion-proof ventilation equipment. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

EXPOSURE LIMITS

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Methanol	200 ppm; 250 ppmSTEL; skin -potential for cutaneous absorption	200 ppm TWA; 260mg/m ³ TWA 6000ppm IDLH	200 ppm TWA; 260mg/m ³ TWA

OSHA Vacated PELs:

Methanol: 200 ppm TWA; 260 mg/m³ TWA

PERSONAL PROTECTIVE EQUIPMENT

Eyes: Wear chemical goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements

or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid

Color: clear, colorless

Odor: alcohol-like - weak odor

pH: Not available.

Vapor Pressure: 127 mm Hg @ 25 deg C

Vapor Density: 1.11 (Air=1)

Evaporation Rate: 5.2 (Ether=1)

Viscosity: 0.55 cP 20 deg C

Boiling Point: 64.7 deg C @ 760 mm Hg

Freezing/Melting Point: -98 deg C

Decomposition Temperature: Not available.

Solubility in water: miscible

Specific Gravity/Density: .7910 g/cm³ @ 20°C

Molecular Formula: CH₄O

Molecular Weight: 32.04

SECTION 10 - STABILITY AND REACTIVITY

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: High temperatures, ignition sources, confined spaces.

Incompatibilities with Other Materials: Strong oxidizing agents, strong acids, powdered aluminum, powdered magnesium.

Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide, formaldehyde.

Hazardous Polymerization: Will not occur.

SECTION 11 - TOXICOLOGICAL INFORMATION

RTECS#:

- CAS# 67-56-1: PC1400000

LD50/LC50:

- CAS# 67-56-1: Draize test, rabbit, eye: 40 mg Moderate; Draize test, rabbit, eye: 100 mg/24H Moderate; Draize test, rabbit, skin: 20 mg/24H Moderate; Inhalation, rabbit: LC50 = 81000 mg/m³/14H; Inhalation, rat: LC50 = 64000 ppm/4H; Oral, mouse: LD50 = 7300 mg/kg; Oral, rabbit: LD50 = 14200 mg/kg; Oral, rat: LD50 = 5600 mg/kg; Skin, rabbit: LD50 = 15800 mg/kg. Human LDLo Oral: 143 mg/kg. Human LDLo Oral: 428 mg/kg. Human TCLo Inhalation; 300 ppm caused visual field changes & headache. Monkey LDLo Skin: 393 mg/kg. Methanol is significantly less toxic to most experimental animals than humans, because most animal species metabolize methanol differently. Non-primate species do not ordinarily show symptoms of metabolic acidosis or the visual effects which have been observed in primates and humans.

Carcinogenicity:

Methanol -

- Not listed by ACGIH, IARC, or NTP.

Epidemiology:

No data available.

Teratogenicity:

There is no human information available. Methanol is considered to be a potential developmental hazard based on animal data. In animal experiments, methanol has caused fetotoxic or teratogenic effects without maternal toxicity.

Reproductive Effects:

See actual entry in RTECS for complete information.

Neurotoxicity:

ACGIH cites neuropathy, vision and CNS under TLV basis.

Mutagenicity:

See actual entry in RTECS for complete information.

Other Studies:

No data available.

SECTION 12 - ECOLOGICAL INFORMATION

Ecotoxicity:

Fish: Fathead Minnow: 29.4 g/L; 96 Hr; LC50 (unspecified)Fish:

Goldfish: 250 ppm; 11 Hr; resulted in deathFish: Rainbow trout: 8000

mg/L; 48 Hr; LC50 (unspecified)Fish: Rainbow trout: LC50 = 13-68

- mg/L; 96 Hr.; 12 degrees CFish: Fathead Minnow: LC50 = 29400 mg/L; 96 Hr.; 25 degrees C, pH 7.63Fish: Rainbow trout: LC50 = 8000 mg/L; 48 Hr.; UnspecifiedBacteria: Phytobacterium phosphoreum: EC50 = 51,000-320,000 mg/L; 30 minutes; Microtox test

SECTION 13 - DISPOSAL CONSIDERATIONS

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: CAS# 67-56-1: waste number U154 (Ignitable waste).

SECTION 14 - TRANSPORT INFORMATION

US DOT

- Shipping Name: METHANOL
- Hazard Class: 3
- UN Number: UN1230
- Packing Group: II

Canadian TDG

- Shipping Name: METHANOL (METHANOL)
- Hazard Class: 3.61
- UN Number: UN1230
- Packing Group: II

USA RQ: CAS# 67-56-1: 5000 lb final RQ; 2270 kg final RQ

SECTION 15 - REGULATORY INFORMATION

US FEDERAL

TSCA

- CAS# 67-56-1 is listed on the TSCA inventory.

Health & Safety Reporting List

- None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

- None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

- None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

- None of the chemicals in this material have a SNUR under TSCA.

SARA

CERCLA Hazardous Substances and corresponding RQs

- CAS# 67-56-1: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

- None of the chemicals in this product have a TPQ.

SARA Codes

- CAS # 67-56-1: acute, flammable.

Section 313

- This material contains Methanol (CAS# 67-56-1, 99 0%), which is subject to the reporting

requirements of Section 313 of SARA Title III and 40 CFR Part 372.

Clean Air Act:

- CAS# 67-56-1 is listed as a hazardous air pollutant (HAP).
- This material does not contain any Class 1 Ozone depleters.
- This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

- None of the chemicals in this product are listed as Hazardous Substances under the CWA.
- None of the chemicals in this product are listed as Priority Pollutants under the CWA.
- None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

- None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

Methanol can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

- Hazard Symbols: T F
- Risk Phrases:
 - R 11 Highly flammable.
 - R 23/24/25 Toxic by inhalation, in contact with skin and if swallowed.
 - R 39/23/24/25 Toxic : danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed.
- Safety Phrases:
 - S 7 Keep container tightly closed.
 - S 16 Keep away from sources of ignition - No smoking.
 - S 36/37 Wear suitable protective clothing and gloves.
 - S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

- CAS# 67-56-1: 1

United Kingdom Occupational Exposure Limits

- CAS# 67-56-1: OES-United Kingdom, TWA 200 ppm TWA; 266 mg/m³ TWA
- CAS# 67-56-1: OES-United Kingdom, STEL 250 ppm STEL; 333 mg/m³ STEL

United Kingdom Maximum Exposure Limits

Canada

- CAS# 67-56-1 is listed on Canada's DSL List.
- This product has a WHMIS classification of B2, D1B, D2B.
- CAS# 67-56-1 is listed on Canada's Ingredient Disclosure List.

Exposure Limits

- CAS# 67-56-1: OEL-ARAB Republic of Egypt:TWA 200 ppm (260 mg/m³);Skin

SECTION 16 - ADDITIONAL INFORMATION

MSDS Creation Date: 7/21/1999, **Revision #11 Date:** 10/21/2002

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

Material Safety Data Sheet

Nitric acid solution, 5 - 20%

ACC# 88992

Section 1 - Chemical Product and Company Identification

MSDS Name: Nitric acid solution, 5 - 20%

Catalog Numbers: AC611900010, AC611905000, S756233, NC9875853, SA95

Synonyms: HNO₃ in water.

Company Identification:

Fisher Scientific

1 Reagent Lane

Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7732-18-5	Water	80-95	231-791-2
7697-37-2	Nitric acid	5-20	231-714-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear, colorless liquid.

Danger! Causes eye and skin burns. Causes digestive and respiratory tract burns.

Corrosive to metal.

Target Organs: Respiratory system, gastrointestinal system, eyes, skin.

Potential Health Effects

Eye: Causes eye burns.

Skin: Causes skin burns.

Ingestion: Causes gastrointestinal tract burns.

Inhalation: Causes chemical burns to the respiratory tract.

Chronic: Exposure to high concentrations of nitric acid vapor may cause pneumonitis and pulmonary edema which may be fatal. Symptoms may or may not be delayed.

Continued exposure to the vapor & mist of nitric acid may result in a chronic bronchitis, & more severe exposure results in a chemical pneumonitis. The vapor & mists of nitric acid may erode the teeth, particularly affecting the canines & incisors.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for a t least 15 minutes. Get medical aid immediately.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Concentrated nitric acid is a strong oxidizer and contact with other material may cause fire.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower:Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Avoid runoff into storm sewers and ditches which lead to waterways. Wash area with soap and water. Clean up spills immediately, observing precautions in the

Protective Equipment section. Absorb spill using an absorbent, non-combustible material such as earth, sand, or vermiculite. Do not use combustible materials such as sawdust. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Avoid contact with clothing and other combustible materials. Discard contaminated shoes. Do not use with metal spatula or other metal items. Do not breathe vapor or mist.

Storage: Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from reducing agents.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Water	1 mg/m ³ TWA (as W) (listed under Tungsten, soluble compounds). 3 mg/m ³ STEL (as W) (listed under Tungsten, soluble compounds).	3 mg/m ³ TWA (as W) (listed under Tungsten, soluble compounds).	none listed
Nitric acid	2 ppm TWA; 4 ppm STEL	2 ppm TWA; 5 mg/m ³ TWA 25 ppm IDLH	2 ppm TWA; 5 mg/m ³ TWA

OSHA Vacated PELs: Water: No OSHA Vacated PELs are listed for this chemical. Nitric acid: 2 ppm TWA; 5 mg/m³ TWA

Personal Protective Equipment

Eyes: Wear chemical splash goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance: clear, colorless
Odor: None reported.
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: >1.0
Evaporation Rate:Not available.
Viscosity: Not available.
Boiling Point: > 100 deg C
Freezing/Melting Point:> 0 deg C
Decomposition Temperature:Not available.
Solubility: Miscible with water.
Specific Gravity/Density:Not available.
Molecular Formula:Mixture
Molecular Weight:Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Light, excess heat.
Incompatibilities with Other Materials: Reducing agents, strong bases, alcohols, metal powders, aldehydes, organic solvents, combustible materials, cyanides, Incompatible with many substances.
Hazardous Decomposition Products: Nitrogen oxides.
Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 7732-18-5: ZC0110000

CAS# 7697-37-2: QU5775000; QU5900000

LD50/LC50:

CAS# 7732-18-5:

Oral, rat: LD50 = >90 mL/kg;

CAS# 7697-37-2:

Inhalation, rat: LC50 = 260 mg/m³/30M;

Inhalation, rat: LC50 = 130 mg/m³/4H;

Inhalation, rat: LC50 = 67 ppm(NO₂)/4H;

Carcinogenicity:

CAS# 7732-18-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

CAS# 7697-37-2: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found.
Teratogenicity: No information found.
Reproductive Effects: No information found.
Mutagenicity: No information found.
Neurotoxicity: No information found.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Nitric Acid Solution	NITRIC ACID
Hazard Class:	8	8
UN Number:	UN2031	UN2031
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7732-18-5 is listed on the TSCA inventory.

CAS# 7697-37-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 7697-37-2: 1000 lb final RQ; 454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

CAS# 7697-37-2: 1000 lb TPQ

SARA Codes

CAS # 7697-37-2: acute, chronic, flammable.

Section 313

This material contains Water (listed as Water Dissociable Nitrate Compounds), 80-95%, (CAS# 7732-18-5) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

This material contains Nitric acid (CAS# 7697-37-2, 5-20%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 7697-37-2 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

CAS# 7697-37-2 is considered highly hazardous by OSHA.

STATE

CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 7697-37-2 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

C

Risk Phrases:

R 34 Causes burns.

Safety Phrases:

S 23 Do not inhale gas/fumes/vapour/spray.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 36 Wear suitable protective clothing.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 7732-18-5: No information available.

CAS# 7697-37-2: 1

Canada - DSL/NDSL

CAS# 7732-18-5 is listed on Canada's DSL List.

CAS# 7697-37-2 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of E.

Canadian Ingredient Disclosure List

CAS# 7732-18-5 is not listed on the Canadian Ingredient Disclosure List.

CAS# 7697-37-2 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 12/12/1997

Revision #8 Date: 3/03/2005

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.



MATERIAL SAFETY DATA SHEET

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

CHS Inc.
P.O. Box 64089
Mail station 525
St. Paul, MN 55164-0089

Transportation Emergency (CHEMTREC): 1-800-424-9300
Technical Information: 1-651-355-8443
MSDS Information: 1-651-355-8438

PRODUCT NAME: Regular, Midgrade & Premium
Unleaded Gasoline

MSDS: 0147- M6A0 - Rev. F (12/24/03)

COMMON NAME: Unleaded Gasoline, Premium Unleaded
Gasoline

CHEMICAL FORMULA: Mixture

CHEMICAL NAME: Light Petroleum Distillate

CHEMICAL FAMILY: Mixed Petroleum Hydrocarbon

Section 2 - COMPOSITION AND INFORMATION ON INGREDIENTS

INGREDIENTS	PERCENTAGES PEL (OSHA) (by weight)	TLV (ACGIH)	CAS #
<u>Product</u> Gasoline (Mixture)	100	300 ppm TWA 500 ppm STEL	8006-61-9
<u>Ingredients</u> Toluene	< 20	100 ppm TWA 150 ppm STEL	108-88-3
Xylene Isomers	< 20	100 ppm TWA 150 ppm STEL	1330-20-7
Benzene	< 6	1 ppm TWA 5 ppm STEL	71-43-2
1,2,4-Trimethylbenzene	< 5	25 ppm TWA	95-63-6
Ethyl Benzene	< 3	100 ppm TWA 125 ppm STEL	100-41-4

(TWA) - Time Weighted Average is the employee's average airborne exposure in any 8-hour work shift of a 40-hour work week which shall not be exceeded.

(STEL) - Short Term Exposure Limit is the employee's 15-minute time weighted average exposure which shall not be exceeded at any time during a work day unless another time limit is specified.

Section 3 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Reddish golden brown liquid with gasoline odor - HIGHLY FLAMMABLE LIQUID.

DANGER! Contains Benzene. Cancer Hazard. Can cause kidney, liver and blood disorders.

OSHA HAZARD CLASS

Based on OSHA definitions, the following ingredients in this product are hazardous. The OSHA physical and health hazard categories are shown below. **Note: CHS has not conducted specific toxicity tests on this product. Our hazard evaluation is based on information from similar products, the ingredients, technical literature, and/or professional experience.**

Gasoline - Flammable, toxic, irritant, target organ (CNS)
Toluene - Flammable, toxic, irritant, target organ (CNS)
Xylene - Flammable, toxic, irritant
Benzene - Flammable, irritant, carcinogen, target organ (kidney, liver, blood)
1,2,4-Trimethylbenzene - Flammable, toxic, irritant, target organ (CNS, blood)
Ethylbenzene - Flammable, toxic, irritant

POTENTIAL HEALTH EFFECTS

ROUTES OF ENTRY: Inhalation, Dermal, Ingestion.

ACUTE EFFECTS OF OVER EXPOSURE:

Eyes - Slight to moderate eye irritation.

Skin - Moderately irritating; causes redness, drying of skin.

Inhalation - Irritating to mucous membranes and respiratory tract. Causes dizziness, irritation of eyes, nose and throat, signs of intoxications. Can act as a simple asphyxiant.

Ingestion - Burning of the throat and stomach, loss of consciousness, convulsions, cyanosis, congestion and capillary hemorrhaging of the lungs and internal organs. Possible pneumonia (if vomited), loss of consciousness, and death.

CHRONIC EFFECTS OF OVER EXPOSURE: Suspect carcinogen from long term exposure studies on laboratory animals. Recent studies with laboratory animals have shown that gasoline vapors caused kidney damage and kidney cancer in rats and liver cancer in mice.

Mouse skin painting studies have shown that petroleum middle distillates (boiling range of 100-700°F) can cause skin cancer when repeatedly applied and never washed from the animal's skin. The relative significance of this to the skin and the resulting skin effects (irritation, cell damage, etc.) may play a role in the tumorigenic response. Studies have shown that washing the animal's skin with soap and water between treatments greatly reduces the carcinogenic effect of some petroleum oils.

A few studies have indicated that workers exposed many years to high concentrations of benzene have a slightly higher incidence of leukemia. Benzene can also be toxic to the blood and blood-forming tissues. For additional information on employee monitoring, information and training, medical surveillance, methods of compliance, etc., refer to the OSHA benzene standard, CFR 1910.1028.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: May aggravate pre-existing dermatitis, respiratory illness, or other conditions which have the same symptoms or effects as stated above.

CARCINOGENICITY:

Unleaded Gasoline - NTP: <u>No</u>	IARC: <u>No</u>	OSHA: <u>No</u>
Benzene - NTP: <u>Yes</u>	IARC: <u>Yes</u>	OSHA: <u>Yes</u>

Section 4 - FIRST AID MEASURES

EMERGENCY AND FIRST AID PROCEDURES:

Eye Contact - If material comes in contact with the eyes, immediately wash the eyes with large amounts of water, occasionally lifting the lower and upper lids until medical attention can be obtained.

Skin Contact - Remove contaminated clothing. Wash affected areas with soap and water. If irritation or redness develops, seek medical attention.

Inhalation - Move person away from source of exposure and into fresh air. If symptoms persist, seek immediate medical attention. Apply artificial respiration or cardiopulmonary resuscitation if not breathing. Get medical attention.

Ingestion - Never give anything by mouth to an unconscious person. Do **not** induce vomiting. Aspiration of material into the lungs due to vomiting can cause chemical pneumonitis which can be fatal. If spontaneous vomiting occurs, keep head below hips to prevent aspiration of liquid into lungs and monitor for breathing difficulty. Seek medical attention immediately. Keep victim warm and quiet.

Section 5 - FIRE - FIGHTING MEASURES

FLASH POINT: -40°F (TCC)**AUTO IGNITION TEMP:** 495-850°F**FLAMMABLE LIMITS IN AIR****LOWER****UPPER**

% BY VOLUME

1.4

7.6

EXTINGUISHING MEDIA: Dry Chemical, Foam, Carbon Dioxide (CO₂), Water (fog pattern).

SPECIAL FIRE FIGHTING PROCEDURES: Water may be ineffective on flames, but should be used to keep fire-exposed containers cool. Large fires, such as tank fires, should be fought with caution. If possible, pump the contents from the tank and keep adjoining structures cool and protect personnel. Avoid spreading burning liquid with water used for cooling purposes. Do not flush down public sewers. The use of a self-contained breathing apparatus and protective clothing is recommended for fire fighters. Avoid inhalation of vapors.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Highly volatile material. Flowing gasoline can be ignited by self-generated static electricity; containers should be bonded and grounded. Vapors may travel along the ground to a source of ignition (pilot light, heater, electric motor) some distance away. Containers, drums (even empty) can explode when heat (welding, cutting, etc.) is applied.

HAZARD RATINGS:	NFPA 704:	Health- <u>1</u>	Fire- <u>3</u>	Reactivity- <u>0</u>
	HMIS:	Health- <u>2</u>	Fire- <u>4</u>	Reactivity- <u>0</u>

Section 6 - ACCIDENTAL RELEASE MEASURES

STEPS TO TAKE IF MATERIAL IS RELEASED OR SPILLED: Notify emergency response personnel as appropriate. If facility or operation has an "Oil or Hazardous Substance Contingency Plan", "Spill Prevention Control & Countermeasures (SPCC) Plan" or equivalent, activate its procedures. REMOVE ALL SOURCES OF IGNITION. Keep unnecessary people away; isolate hazard area and deny entry. Contain spill if possible. Small spills can be removed with inert absorbent. Dike area of large spill to prevent run-off to sewers, streams, etc. Ventilate area. Avoid breathing vapors. Use appropriate personal protective equipment during clean up. Contact fire authorities and notify appropriate Federal, State, and Local agencies.

Section 7 - HANDLING AND STORAGE

HANDLING AND STORING: Transport, handle and store in accordance with OSHA Regulation 29 CFR 1910.106, and applicable D.O.T. Regulations. Store in tightly closed containers in a dry cool place, away from sources of heat or ignition. Ground and bond all transfer and storage equipment and equip with self-closing valves, pressure vacuum bungs and flame arrestors. **Caution:** Misuse of empty containers can be hazardous. Empty containers can be hazardous if used to store toxic, flammable, or reactive materials. Cutting, welding or other of empty containers might cause fire, explosion or toxic fumes from residues. Do not pressurize or expose to open flame, heat, sparks or other sources of ignition. Do not siphon gasoline by mouth.

WARNING: Danger! Contains Benzene. Cancer Hazard. Can cause kidney, liver and blood disorders. **Other:** Do not siphon gasoline by mouth. May cause irritation to eyes, skin and respiratory system. Avoid liquid, mist and vapor contact. Harmful or fatal if swallowed. Aspiration hazard, can enter lungs and cause damage. May cause irritation or be harmful if inhaled or absorbed through the skin. Flammable Liquid. Vapors may explode.

Section 8 - EXPOSURE CONTROL - PERSONAL PROTECTION

ENGINEERING CONTROLS: Provide adequate ventilation to keep vapors below permissible concentrations.

RESPIRATORY EQUIPMENT: Use appropriate NIOSH-approved respiratory protection where atmospheric concentrations may exceed acceptable exposure limits. Self-contained breathing apparatus or supplied air respiratory protection required for entry into tanks, vessels, or other confined spaced containing gasoline.

EYE PROTECTION: Chemical type goggles or face shield where contact with liquid or mist may occur.

PROTECTIVE CLOTHING: Wear impervious clothing and gloves when contact with skin may occur. **OTHER (SAFETY SHOWERS, EYE WASH STATIONS, ETC.):** Emergency eye wash station and safety shower where operations and exposure warrant. Loading, unloading, tank gauging, etc., remain upwind.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Reddish golden brown liquid

ODOR: Gasoline odor (odor threshold approximately 10 ppm).

BOILING POINT: 760 mmHg @ 80°F

SPECIFIC GRAVITY (water=1): .72

VAPOR PRESSURE: 400 mmHg @ 68°F

VAPOR DENSITY (air=1): 4

SOLUBLE IN WATER: Negligible

EVAPORATION RATE (ether=1): Slower

pH: N/D

Section 10 - STABILITY AND REACTIVITY

STABILITY

STABLE X (At room temperature and pressure. See handling and storage section)

UNSTABLE _____

INCOMPATIBILITY -

CONDITIONS TO AVOID: Heat, sparks, flame, build-up of static electricity, and other sources of ignition should be avoided.

MATERIALS TO AVOID: Strong oxidizing agents, halogens, strong acids, and alkalies.

HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, carbon dioxide, and hydrocarbons.

HAZARDOUS POLYMERIZATION: Has not been reported to occur under normal temperatures and pressures.

Section 11 - TOXICOLOGY INFORMATION

Note: CHS has not conducted specific toxicity tests on this product.

Section 12 - ECOLOGICAL INFORMATION

Note: CHS has not conducted specific ecological tests on this product.

Section 13 - DISPOSAL CONSIDERATION

WASTE DISPOSAL PROCEDURES: Recycle as much of the recoverable product as possible. Do not flush to drain or storm sewer or otherwise release to the environment. Dispose of non-recyclable material as a RCRA hazardous waste, complying with federal, state and local regulations. Note: Re-evaluation of this product may be required by the user at the time of disposal, since the product uses, transformations, mixtures and processes may change classification to non-hazardous or hazardous for reasons other than, or in addition to ignitable.

Section 14 - TRANSPORTATION

DOT PROPER SHIPPING NAME: Gasoline*

DOT HAZARD CLASS: Flammable Liquid*

DOT IDENTIFICATION NUMBER: UN 1203

DOT EMER. RESPONSE GUIDE NO.: 128

*EFFECTIVE 10/1/93 DOT's HM-181 changes how materials are classified. Proper Shipping Name - **Gasoline**; Hazard Class - **3**; UN/NA Identification # - **UN 1203**; Packing Group **II**; Placard - **FLAMMABLE**

Section 15 - REGULATORY INFORMATION

This product contains the following toxic chemicals subject to the reporting requirements of SARA Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40 CFR 372:

<u>CAS Number</u>	<u>Chemical Name</u>	<u>Percent by Weight</u>
108-88-3	Toluene	Up to 18.1%
1330-20-7	Xylene	Up to 15.3%
71-43-2	Benzene	Up to 5.3%
95-63-6	1,2,4 Trimethylbenzene	Up to 4.8%
100-41-4	Ethylbenzene	Up to 2.6%

SARA SECTION 311-312 HAZARD CATEGORIES (40 CFR 370.2):

FIRE: Yes **SUDDEN RELEASE OF PRESSURE:** No **REACTIVE:** No **ACUTE:** Yes **CHRONIC:** Yes

Section 16 - OTHER INFORMATION

Updated By: Hue Lam DATE: December 24, 2003

Title: EHS Compliance Specialist Supersedes: September 8, 2003

Reason for Issue: Company Name Change

THE INFORMATION CONTAINED IN THIS MSDS RELATES ONLY TO THE SPECIFIC MATERIAL IDENTIFIED. IT DOES NOT COVER USE OF THAT MATERIAL IN COMBINATION WITH ANY OTHER MATERIAL OR IN ANY PARTICULAR PROCESS. IN COMPLIANCE WITH 29 C.F.R. 1910.1200(g), CHS HAS PREPARED THIS MSDS IN SEGMENTS, WITH THE INTENT THAT THOSE SEGMENTS BE READ TOGETHER AS A WHOLE WITHOUT TEXTUAL OMISSIONS OR ALTERATIONS. CHS BELIEVES THE INFORMATION CONTAINED HEREIN TO BE ACCURATE, BUT MAKES NO REPRESENTATION, GUARANTEE, OR WARRANTY, EXPRESS OR IMPLIED, ABOUT THE ACCURACY, RELIABILITY, OR COMPLETENESS OF THE INFORMATION OR ABOUT THE FITNESS OF CONTENTS HEREIN FOR EITHER GENERAL OR PARTICULAR PURPOSES. PERSONS REVIEWING THIS MSDS SHOULD MAKE THEIR OWN DETERMINATION AS TO THE MATERIAL'S SUITABILITY AND COMPLETENESS FOR USE IN THEIR PARTICULAR APPLICATIONS.



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MSDS Number: **S3050** * * * * * *Effective Date: 02/12/04* * * * * * *Supercedes: 05/17/01*

MSDS **Material Safety Data Sheet**

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865



24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

SODIUM BISULFATE

1. Product Identification

Synonyms: Sodium hydrogen sulfate; sodium acid sulfate; sulfuric acid, monosodium salt, monohydrate

CAS No.: 7681-38-1 (Anhydrous)

Molecular Weight: 138.08

Chemical Formula: NaHSO₄ . H₂O

Product Codes:

J.T. Baker: 3534

Mallinckrodt: 7432

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent
Hazardous		
Sodium Bisulfate	7681-38-1	90 - 100%
Yes		

3. Hazards Identification

Emergency Overview

DANGER! CORROSIVE. CAUSES BURNS TO ANY AREA OF CONTACT. MAY BE HARMFUL OR FATAL IF SWALLOWED.

J.T. Baker SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate

Flammability Rating: 0 - None

Reactivity Rating: 0 - None

Contact Rating: 3 - Severe (Corrosive)

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES

Storage Color Code: White (Corrosive)

Potential Health Effects

Inhalation:

Inhalation produces damaging effects on the mucous membranes and upper respiratory tract. Symptoms may include irritation of the nose and throat, and labored breathing. May cause lung edema, a medical emergency.

Ingestion:

Corrosive. Swallowing can cause severe burns of the mouth, throat, and stomach, leading to death. Can cause sore throat, vomiting, diarrhea.

Skin Contact:

Corrosive. Symptoms of redness, pain, and severe burn can occur.

Eye Contact:

Acidic irritant. Pain, tearing and redness can occur. Crystalline dust may also be abrasive. Solutions are acidic and splashes may cause eye damage.

Chronic Exposure:

Lung irritation, tracheal bronchitis, persistent coughing, and corrosion of teeth are possible effects from long term exposure to dust, mist or fumes from wet or moist sodium bisulfate.

Aggravation of Pre-existing Conditions:

No information found.

4. First Aid Measures

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion:

If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Skin Contact:

Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:

Not considered to be a fire hazard.

Explosion:

Not considered to be an explosion hazard.

Fire Extinguishing Media:

Use any means suitable for extinguishing surrounding fire. Water may be used to cool containers and to knock down vapors in a fire situation. Do not use water on material itself or allow water to get inside container.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Keep unnecessary and unprotected people away from area of spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

None established.

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded and engineering controls are not feasible, a half-face respirator with an acid gas cartridge and particulate (NIOSH type N95 or better) filter may be worn for up to ten times the exposure

limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece respirator with an acid gas cartridge and particulate (NIOSH type N100) filter may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. **WARNING:** Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:

Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:

Colorless crystals.

Odor:

Odorless.

Solubility:

67g/100g water.

Density:

2.10

pH:

1.4

% Volatiles by volume @ 21C (70F):

0

Boiling Point:

Not applicable.

Melting Point:

58C (136F)

Vapor Density (Air=1):

No information found.

Vapor Pressure (mm Hg):

No information found.

Evaporation Rate (BuAc=1):

No information found.

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage. Hygroscopic.

Hazardous Decomposition Products:

Oxides of sulfur and the contained metal.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Strong bases, calcium hypochlorite and sodium carbonate.

Conditions to Avoid:

Moisture, dusting and incompatibles.

11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure. Anhydrous salt has been investigated as a mutagen.

Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Sodium Bisulfate (7681-38-1)	No	No	None

12. Ecological Information

Environmental Fate:

No information found.

Environmental Toxicity:

No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S. (SODIUM BISULFATE)

Hazard Class: 8

UN/NA: UN3260

Packing Group: III

Information reported for product/size: 12KG**International (Water, I.M.O.)****Proper Shipping Name:** CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S. (SODIUM BISULFATE)**Hazard Class:** 8**UN/NA:** UN3260

Packing Group: III

Information reported for product/size: 12KG**International (Air, I.C.A.O.)****Proper Shipping Name:** CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S. (SODIUM BISULFATE)**Hazard Class:** 8**UN/NA:** UN3260

Packing Group: III

Information reported for product/size: 12KG

15. Regulatory Information

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-----\Chemical Inventory Status - Part 1\-----
Ingredient                                     TSCA   EC     Japan  Australia
-----
Sodium Bisulfate (7681-38-1)                 Yes   Yes   Yes

```

Yes

```

-----\Chemical Inventory Status - Part 2\-----
Ingredient                                     Korea  --Canada--  Phil.
                                     Korea  DSL   NDSL
-----
Sodium Bisulfate (7681-38-1)                 Yes   Yes   No   Yes

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-----\Federal, State & International Regulations - Part 1\-----
Ingredient                                     -SARA 302-  -SARA 313-
                                     RQ   TPQ   List  Chemical Catg.
-----
Sodium Bisulfate (7681-38-1)                 No   No   No   No

```

```

-----\Federal, State & International Regulations - Part 2\-----
Ingredient                                     -RCRA-  -TSCA-
                                     CERCLA  261.33  8(d)
-----
Sodium Bisulfate (7681-38-1)                 No   No   No

```

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Mixture / Solid)

Australian Hazchem Code: 2X

Poison Schedule: S5

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: **3** Flammability: **0** Reactivity: **0**

Label Hazard Warning:

DANGER! CORROSIVE. CAUSES BURNS TO ANY AREA OF CONTACT. MAY BE HARMFUL OR FATAL IF SWALLOWED.

Label Precautions:

Do not get in eyes, on skin, or on clothing.

Do not breathe dust.

Keep container closed.

Use only with adequate ventilation.

Wash thoroughly after handling.

Label First Aid:

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. In all cases get medical attention immediately.

Product Use:

Laboratory Reagent.

Revision Information:

MSDS Section(s) changed since last revision of document include: 14.

Disclaimer:

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Prepared by: Environmental Health & Safety

Phone Number: (314) 654-1600 (U.S.A.)

ATTACHMENT 5

**HEAT STRESS AND COLD STRESS
ENVIRONMENTAL ASSESSMENT AND MANAGEMENT OF EXPOSURE**

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Attachment: Background Material

1 **1.0 INTRODUCTION**

2 Work in hot, humid environments can cause heat to accumulate in the body faster than it can
3 dissipated. This accumulation of heat can produce serious illnesses, which range from mild to
4 fatal. These heat-related illnesses include heat rash, heat cramps, heat exhaustion, and heat
5 stroke. The first three conditions normally do not have extremely serious consequences – unless
6 an exhausted employee falls and suffers injury. Heat stroke, however, can cause death or
7 permanent injury to the brain. For this reason, heat stroke should be treated as a medical
8 emergency and all heat-related illnesses should be prevented through application of the
9 precautions discussed in this procedure.

10 Likewise, exposure to freezing or cold temperatures can cause serious injuries. Among these is
11 frostbite, the freezing of fluid in body tissue. Trench foot is another injury that can be produced
12 by cold, but not necessarily freezing, conditions when the feet are damp. Hypothermia, the
13 severe drop in the core temperature of the body, is the most serious cold-related injury. It can
14 occur after prolonged exposure to cold air, or after a much briefer period of immersion in cold
15 water. These workplace hazards are discussed in more detail in the attachment.

16 This document describes procedures for assessing the potential for cold-related injury in the
17 workplace and for implementing work rules to protect employees. It is designed to prevent
18 exposure to conditions that could lead to either the freezing of exposed skin (frostbite) or a
19 dangerous decrease in body temperature (hypothermia). With a few exceptions, these procedures
20 are those recommended by the American Conference of Governmental Industrial Hygienists in
21 its publication entitled *Threshold Limit Values for Chemical Substances and Physical Agents*
22 (2005 edition).

23 If situations are encountered that are not addressed in this document, the project manager or the
24 site safety officer should contact Corporate Safety to discuss appropriate protective measures.
25 Project managers and safety officers should consult Corporate Safety before any major
26 modifications to this procedure are implemented.

27

28

29 **2.0 HEAT STRESS**

30 **2.1 ASSESSMENT OF THE POTENTIAL FOR HEAT-RELATED ILLNESS**

31 A person's body becomes warmer when heat is added faster than it is dissipated. Many factors
32 affect the rate of heat addition and the rate of heat loss. Increased heat accumulation occurs when
33 a person works more strenuously or exposes himself to a source of radiant heat (e.g., the sun or
34 an industrial boiler). Loss of heat from the body is hindered by high humidity, low air
35 movement, and high temperature of air and surrounding objects. Heavy clothing or additional
36 protective equipment, which might be required on a project site, also can reduce the loss of heat
37 and thus increase heat accumulation.

38 **2.1.1 Environmental Determinants**

39 The environmental determinants of the potential for heat stress are the temperature and humidity
40 of the air, the amount of air movement, and radiant heat from the sun or nearby hot objects.
41 These parameters can be measured easily and combined to calculate the "wet bulb globe
42 temperature index" (WBGT), a useful single-number indicator of the environmental contribution
43 to heat stress exposure (see HS-T-4). When workers are exposed to direct sunlight, that index is
44 defined in the following way:

45
$$\text{WBGT} = 0.7 \times T_{\text{nw}} + 0.2 \times T_{\text{g}} + 0.1 \times T_{\text{db}}$$

46
47 Where: WBGT is the Wet Bulb Globe Temperature Index,

48 T_{g} is the globe temperature (influenced by air temperature and radiant heat flux),

49 T_{db} is the dry bulb temperature (influenced by air temperature), and

50 T_{nw} is the natural wet bulb temperature (influenced by air temperature, air humidity, and
51 air movement).

52 When workers are not exposed to direct sunlight, the index is calculated in the following way:

53
$$\text{WBGT} = 0.7 \times T_{\text{nw}} + 0.3 \times T_{\text{g}}$$

54 A higher value of WBGT indicates a greater potential for heat stress. Both higher air temperature
55 and higher radiant heat increase the value of the WBGT index. Higher air movement and lower
56 air humidity decrease the WBGT value by enhancing evaporative cooling and lowering the T_{nw}
57 measurement. (Of course, higher air movement would not lower T_{nw} if the relative humidity
58 were 100%.)

59 An alternative to the WBGT index is "adjusted temperature," which is easier to estimate, but
60 much less informative. It is obtained through the following simple calculation:

61
$$\text{Adjusted Temperature} = [\text{actual air temperature} + (13 \times \{\text{sunshine fraction}\})]$$

62 The actual air temperature is measured by means of a standard mercury thermometer with the
63 bulb shielded from direct sunlight. "Sunshine fraction" is obtained through an estimate of the
64 percent of the time that the sun is not covered by clouds thick enough to produce a shadow
65 (100% sunshine = no cloud cover and sharp distinct shadows, and 0% sunshine = no shadows).

66 Note that “sunshine fraction” = (percent sunlight)/100. Relative humidity and wind speed are not
67 included in this much cruder determination of the potential for heat related illness.

68 **2.1.2 The Contribution of Metabolic Heat**

69 Work generates body heat, which must be dissipated into the environment. More strenuous work
70 generates more heat. At a given WBGT value (e.g., 85°F), it could be safe to perform continuous
71 light work for hours – but very dangerous to perform heavy work without frequent breaks and
72 other precautions. Any assessment of the potential for heat-related illness requires consideration
73 of the work load. The following classification system may be used:

74

Work Load	Examples
Light	Sitting with moderate arm and leg movements. Standing with light work requiring mostly arm movement. Standing with light work at a machine with some walking about.
Moderate	Scrubbing in a standing position. Walking about with moderate lifting or pushing. Walking on level ground at 6 km/hr while carrying a 3 kg load.
Heavy	Shoveling dry sand. Intermittent heavy lifting with pushing or pulling (e.g., pick and shovel work).
Very Heavy	Shoveling wet sand.

75

76 Many jobs involve several task elements, some of which are more or less strenuous than others.
77 It is appropriate in such cases to estimate an average work load over a 15 - 60 minute period. For
78 example, the “moderate” category might be appropriate for a job that required walking and light
79 carrying, with occasional digging with a shovel and moving of heavy objects.

80 **2.1.3 The Contributions of Other Factors**

81 Work load and environmental factors are not the only determinants of the potential for heat-
82 related illness. Heavy or impermeable protective clothing can increase the risk greatly, even if
83 the work is not strenuous and the temperature is not high. Also, workers who are not
84 acclimatized to hot work environments are much more likely to experience the harmful effects of
85 heat stress. Many other health and “lifestyle” variables are important as well. These are discussed
86 in the sections that follow, and in the appendix.

87 **2.2 THRESHOLDS OF CONCERN**

88 The risk of heat-related illness among healthy workers who are acclimatized to hot work is low if
89 the WBGT value does not exceed the American Conference of Governmental Industrial
90 Hygienists (ACGIH) “screening criteria” shown below:

91
92

ACGIH Screening Criteria for Heat Stress Exposure (WBGT Values in Degrees Fahrenheit)				
Hourly Work Requirement	Physical Demand of the Work Task			
	Light	Moderate	Heavy	Very Heavy
100% Work*	85.1 °F	81.5 °F	78.8 °F	-
75% Work 25% Rest	86.9 °F	83.3 °F	81.5 °F	-
50% Work 50% Rest	88.7 °F	85.1 °F	83.3 °F	81.5 °F
25% Work 75% Rest	90.5 °F	87.8 °F	86.0 °F	85.1 °F
* The schedule includes normal lunch and rest breaks.				

93

94 Under these criteria, workers could perform moderately strenuous work, with only the usual rest
95 and lunch breaks, if the WBGT value were 81.5°F or lower. At a WBGT value of 85°F, light
96 work could be performed without added breaks, but moderate work could be performed for only
97 30 minutes out of each hour.

98 These values should be reduced by several °F if workers are not acclimatized to hot work. Even
99 greater reduction is necessary if workers must wear clothing other than a summer work uniform
100 or its equivalent. The corporate Safety Department should be consulted for guidance in these
101 situations, and the project safety plan should be modified accordingly.

102 If the adjusted temperature is below about 72.5°F, then the risk of heat-related illness may be
103 considered low if employees are wearing normal work clothing and working at a low or
104 moderate level or exertion.

105 **2.3 PREVENTION OF HEAT-RELATED ILLNESS**

106 The project manager or site safety and health officer (SSHO) should first determine whether the
107 appropriate threshold of concern is, or likely will be, exceeded. This should be done through
108 consultation with the corporate Safety Department and/or by making actual measurements during

109 project work. The assessment must consider the acclimatization status of workers and the
110 permeability of their work clothing. If the air temperature exceeds, or likely will exceed 70°F,
111 then the potential for heat-related illness should be assessed.

112 If the selected threshold of concern is exceeded, then the SSHO will implement the program
113 described below. Some elements of the program – those involving training and observation –
114 should be implemented in borderline situations as well, because some individuals could be
115 unusually susceptible to heat-related illness.

116 **2.3.1 Generally Applicable Precautions**

117 The SSHO will implement a program to prevent heat-related illness among employees. The
118 program will include the following elements:

- 119 ● Education of employees on the dangers of heat-related illnesses, the risk factors that
120 make these illnesses more likely, and the means of preventing them (including the
121 frequent consumption of water, good nutrition, physical fitness, and avoidance of alcohol
122 and drugs).
- 123 ● Observation throughout the shift of other factors that could affect the potential for heat-
124 related illnesses, including intense solar radiation, high humidity, still air, unusually
125 strenuous work tasks, etc.
- 126 ● Observation of employees throughout the shift to detect signs of heat-related illness (see
127 attachment) and to identify individuals who might be unacclimatized or otherwise unfit
128 for work in a stressful environment. Older or obese workers, and those with certain
129 medical conditions, could be at increased risk.

130 The SSHO will give special consideration to unacclimatized workers who are newly assigned to
131 the project (and to those who are returning from an extended absence). Such workers should be
132 allowed to acclimatize over a period of several days, during which time their exposure to
133 stressful conditions should be increased gradually. They should be observed carefully during the
134 acclimatization period; so that any early symptoms of heat stress can be detected. The corporate
135 Safety Department should be consulted for assistance, if necessary.

136 In addition, the SSHO will make recommendations on the scheduling of tasks to reduce
137 employees' exposure to stressful environments. For example, he or she might propose one or
138 more of the following modifications to the schedule:

- 139 ● Work in shaded zones should be scheduled for periods when solar radiation is more
140 intense.
- 141 ● Heavy and moderate work (and perhaps all work) should be cancelled during the hottest
142 part of the day, and performed earlier or later.
- 143 ● Work in direct sunlight should be performed only when humidity is low and air
144 movement is noticeable (producing a lower natural wet bulb temperature reading).

- 145 ● Personnel should be rotated to alternate job functions to reduce time spent by any one
146 worker or team at a stressful task.
- 147 ● Additional, and perhaps longer, breaks from strenuous tasks should be taken.

148 **2.3.2 Work/Rest Regimens**

149 If, after the SSHO’s best efforts to make feasible schedule modifications, measurements indicate
150 that the appropriate threshold of concern is exceeded, he or she will implement a work/rest cycle.
151 The protocol selected will depend upon which index of environmental conditions was selected
152 for use during work on the project. Section 2.3.2.1 or Section 2.3.2.2 will apply.

153 **2.3.2.1 Protocol for Use of ACGIH Screening Criteria**

154 If the ACGIH screening criteria are exceeded, the SSHO will implement a work/rest cycle with
155 **at least a 15 minute rest period following a work interval no longer than 45 minutes.** The
156 guidelines below should be followed, if feasible:

157

Work/Rest Cycles Conforming to ACGIH Screening Criteria (WBGT Values in Degrees Fahrenheit)				
Hourly Work/Rest Cycle	Physical Demand of the Work Task			
	Light	Moderate	Heavy	Very Heavy
100% Work*	≤ 85.1 °F	≤ 81.5 °F	≤ 78.8 °F	-
75% Work 25% Rest	85.1 - 86.9 °F	81.5 - 83.3 °F	78.8 - 81.5 °F	-
50% Work 50% Rest	86.9 - 88.7 °F	83.3 - 85.1 °F	81.5 - 83.3 °F	≤ 81.5 °F
25% Work 75% Rest	88.7 - 90.5 °F	85.1 - 87.8 °F	83.3 - 86.0 °F	81.5 - 85.1 °F
* The schedule includes normal lunch and rest breaks.				

158 When the air temperature exceeds 70°F, the SSHO will begin measuring and recording the
159 WBGT index at least once each hour. He or she then will specify an hourly work/rest cycle
160 consistent with the data in the table above (to the extent feasible) for acclimatized workers
161 wearing normal, permeable work clothing. (A more protective regimen will be specified for
162 unacclimatized workers. The corporate Safety Department will specify alternate regimens for
163 workers wearing very heavy or impermeable protective clothing.)

164 The SSHO will make feasible adjustments for more or less demanding tasks, as the ACGIH
165 criteria indicate. Additional adjustments will be necessary if heavy protective clothing is worn by
166 workers. (See the applicable site health and safety plan.)

167 **2.3.2.2 Protocol for Use of Adjusted Temperature**

168 If the adjusted temperature exceeds 72.5°F, then the SSHO will require that employees take at
169 least a 15-minute break following each work period of maximum duration shown in the table
170 below.

Adjusted Air Temperature *	Break Frequency for Employees Wearing Normal Work Clothing
≥ 90 °F	After not more than 45 minutes of work
87.5 - 90 °F	After not more than 60 minutes of work
82.5 - 87.5 °F	After not more than 90 minutes of work
77.5 - 82.5 °F	After not more than 120 minutes of work
72.5 - 77.5 °F	After not more than 150 minutes of work
* Adjusted temperature = [actual air temperature + (13 x {sunshine fraction})]. Measure actual air temperature with a standard mercury thermometer with the bulb shielded from direct sunlight. Estimate sunshine by judging what percent of the time the sun is not covered by clouds that are thick enough to produce a shadow (100% sunshine = no cloud cover and a sharp distinct shadow, and 0% sunshine = no shadows). Note that “sunshine fraction” = Percent sunlight / 100.	

171
172 The SSHO will require physiological monitoring as described in Section 2.3.3 during each rest
173 break, and take appropriate action as required by that section.

174 The SSHO will be very cautious in the use of adjusted temperature to protect employees,
175 especially when humidity is high and air movement is low. Longer breaks and shorter work
176 periods should be required in such situations. Extreme caution is warranted if work tasks are
177 more than moderately strenuous, if heavy clothing is worn, or if the adjusted temperature greatly
178 exceeds 90 °F. The Safety Department should be consulted in such situations.

179 **2.3.3 Physiological Monitoring**

180 Physiological monitoring to detect the symptoms of heat stress is required under the following
181 circumstances:

182 (1) A feasible work/rest cycle is not sufficiently protective to conform to the ACGIH
183 recommendations in Section 2.3.2.1,

184 (2) The adjusted-temperature protocol described in Section 2.3.2.2 is used and the adjusted
185 temperature in the workplace exceeds 72.5°F, or

186 (3) Impermeable protective clothing is worn by workers in hot environments.

187 The SSHO will use one of the methods found in the National Institute for Occupational Safety
188 and Health (NIOSH) Publication 85-115 to conduct the physiological monitoring. (See
189 references.) One of the following measurements shall be used:

190 (1) Heart Rate. Count the radial (wrist) pulse during a 30-second period as early as possible
191 in the rest period.

192 (a) If the heart rate exceeds 110 beats per minute at the beginning of the rest period,
193 shorten the next work cycle by one-third and keep the rest period the same.

194 (b) If the heart rate still exceeds 110 beats per minute at the next rest period, shorten the
195 following work cycle by one-third and keep the rest period the same.

196 (2) Oral Temperature. Use a clinical thermometer (3 minutes under the tongue), or a similar
197 device to measure the oral temperature, at the end of each work period (before drinking).

198 (a) If oral temperature exceeds 99.6°F (37.6°C), shorten the next work cycle by one-third
199 without changing the rest period.

200 (b) If oral temperature still exceeds 99.6°F (37.6°C) at the beginning of the next rest
201 period, shorten the following work cycle by one-third.

202 Tympanic membrane (ear) temperature may be considered equivalent to oral temperature.

203 Personal monitoring devices that continuously measure heart rate and/or body temperature may
204 be used with the approval of the Safety Department. The SSHO should become familiar with the
205 operation of the devices and instruct employees on their proper use.

206 **2.3.4 Maintenance of Records**

207 The SSHO will maintain a written (or electronic) record of measurements and observations
208 required by this procedure. This information may be recorded as entries in the project safety log
209 or as entries on a data sheet created for this purpose.

210
211

212 **3.0 COLD STRESS**

213 **3.1 ASSESSMENT OF THE POTENTIAL FOR COLD STRESS**

214 The potential for cold stress is determined primarily by two variables: the temperature of the air
215 and the speed of the wind. At a given temperature, calm air is less dangerous. The “cooling
216 power” of moving air on exposed flesh can be expressed as an equivalent chill temperature
217 (ECT), which combines temperature and air speed. The following table shows values of ECT for
218 various air-temperature and wind-speed combinations.

219

EQUIVALENT CHILL TEMPERATURE (°F)												
AT VARIOUS AIR TEMPERATURES AND WIND SPEEDS												
Estimated Wind Speed (mph)	Actual Temperature Reading (°F)											
	50	40	30	20	10	Zero	- 10	- 20	- 30	- 40	- 50	- 60
calm	50	40	30	20	10	0	- 10	- 20	- 30	- 40	- 50	- 60
5	48	37	27	16	6	- 5	- 15	- 26	- 36	- 47	- 57	- 68
10	40	28	16	4	- 9	- 24	- 33	- 46	- 58	- 70	- 83	- 95
15	36	22	9	- 5	- 18	- 32	- 45	- 58	- 72	- 85	- 99	
20	32	18	4	- 10	- 25	- 39	- 53	- 67	- 82	- 96		
25	Zone A			- 15	- 29	- 44	- 59	- 74	- 88			
30	Little Danger (in < 1 hour, if skin is dry)			- 18	- 33	Zone B *	- 63	- 79				
35				- 20	- 35		- 67	- 82				
40	26	10	- 6	- 21	- 37	- 53	- 69	- 85			Zone C Great Danger (Flesh may freeze within 30 seconds.)	

* Zone B: Increasing Danger (from freezing of exposed flesh within one minute)

220 The conditions represented by Zones B and C are extremely dangerous to exposed skin.
221 Continuous exposure of uncovered skin should not be permitted if the equivalent chill
222 temperature is -25°F or less. Work under conditions represented by Zone A is much less
223 dangerous to exposed skin. However, workers can suffer frostbite injury in the less severe
224 environment if they develop a false sense of security and fail to take precautions. Trench foot can
225 occur under any condition defined in the table above.

226 The potential for hypothermia also is dependent upon air temperature and air speed. At low ECT
227 values, precautions against this hazard are necessary, even if workers are dressed in well

228 insulating clothing. The danger of hypothermia is especially severe if immersion in water is
229 possible during the work.

230 **3.2 PREVENTION OF COLD-RELATED ILLNESS**

231 The project or SSHO will make an assessment of the potential for cold stress before field work
232 begins. Work rules related to the prevention of cold-related injury will be required if conditions
233 of the type represented in Zones A, B, or C are anticipated. Under such conditions, the SSHO
234 will measure temperature and wind speed when work commences each day and at routine
235 intervals (at least every four hours) thereafter, unless he or she believes that some other means of
236 hazard assessment is adequate. Corporate Safety must approve any alternative means of hazard
237 assessment.

238 When work is conducted under conditions represented in Zones A, B, or C, the SSHO will
239 implement work rules described below to manage the potential hazard, in consultation with
240 Corporate Safety.

241 **3.2.1 Generally Applicable Precautions**

242 ● Employees will receive training on the dangers and symptoms of cold-related injury
243 and the work rules adopted to prevent it.

244 ● Site workers will be warned that older individuals, people with circulatory problems,
245 and those with existing frostbite injuries might be at increased risk for cold-related
246 injury, and that added precautions might be necessary to protect them.

247 ● Each employee will be under protective observation by someone else during work
248 (i.e., use of the “buddy system” will be required, as it is on all ZAPATA projects.)

249 ● Employees who experience pain in the extremities or evident shivering will be
250 removed from exposure to the cold work environment.

251 ● Work must be halted if frostbite cannot be prevented. Continuous skin exposure will
252 not be permitted when the ECT is -25°F or less (Zones B and C).

253 ● Tasks should be scheduled to avoid long periods during which workers must sit or
254 stand still. Very strenuous work that could cause heavy sweating should be avoided,
255 unless Corporate Safety approves additional procedures for protecting employees.

256 ● Work expectations for new employees should be adjusted downward for the first few
257 days, to permit acclimatization to the cold conditions.

258 ● Dehydration, which decreases blood flow to the extremities, should be avoided.
259 Employees will be encouraged to replenish water lost to perspiration and respiration.
260 The SSHO will provide soups and warm sweet drinks as appropriate.

261 ● The SSHO will develop procedures that reduce the likelihood of immersion in water
262 or soaking of the clothing by other means during project work. Such precautions
263 should apply to work near surface water and to work with liquids like gasoline,
264 alcohols, solvents, or cleaning fluids.

265 ● The SSHO will plan for any scenarios that would lead to wet clothing (through
266 perspiration, immersion in water, soaking by mist, etc.) and provide for quick
267 changing into dry clothing and, if necessary, treatment for hypothermia.

268 ● Emergency plans will give special attention to the prevention of cold-related injury.

269 **3.2.2 Selection of Protective Clothing**

270 The rules implemented by the SSHO will require that employees wear adequately insulating dry
271 clothing if conditions of the type represented in Zones A, B, or C are anticipated. Workers
272 should wear cold-protective clothing appropriate for the environmental conditions and the level
273 of physical activity. The following considerations should guide the selection and use of
274 protective clothing:

275 ● Layered clothing should be used to preserve body heat. An easily removable outer
276 windbreak garment should be worn in windy conditions.

277 ● Inner garments and underwear should be made of fabrics that dry quickly and wick
278 moisture away from the body.

279 ● Outer garments should be made with provisions for good ventilation, to prevent the
280 wetting of inner layers by sweat.

281 ● An employee should not enter or remain in a cold work environment if his or her clothing
282 is wet as a consequence of sweating. If clothing is wet, then the employee should change
283 into dry clothing before returning to the cold environment.

284 ● Gloves and/or mittens should be used as necessary to protect the hands, and employees
285 should be warned not to touch very cold objects and surfaces with bare skin.

286 ● Workers should routinely change socks and removable felt insoles to reduce moisture
287 around the feet.

288 ● Eye protection suitable to the type of hazard should be used. Special precautions against
289 ultraviolet light and glare might be necessary in snow-covered terrain.

290 ● Hardhat liners should be used if necessary. If work must be done on slippery surfaces,
291 then shoe attachments that enhance traction should be used.

292 **3.2.3 Work/Warming Regimens**

293 If continuous work must be performed at an ECT below 19.4°F, then the SSHO or project
294 manager will provide a heated shelter (tent, cabin, or similar space) for warming after exposure
295 to the cold environment. Employees should be encouraged to use the shelter at frequent intervals,
296 and upon (1) onset of heavy shivering, (2) occurrence of minor frostbite, or (3) onset of feelings
297 of excessive fatigue, drowsiness, irritability, or euphoria.

298 The SSHO will monitor environmental conditions and implement a mandatory work/warming
299 regimen that is at least as protective as the one recommended in the following table for those
300 conditions.

WORK/WARMING SCHEDULE FOR A 4-HOUR SHIFT					
Air Temp. (°F)	Air Speed (mph)				
	Calm	5	10	15	20
- 15 to -19	Normal Breaks (1)	Normal Breaks (1)	75 min. max. work period with 2 breaks	55 min. max. work period with 3 breaks	40 min. max. work period with 4 breaks
- 20 to - 24	Normal Breaks (1)	75 min. max. work period with 2 breaks	55 min. max. work period with 3 breaks	40 min. max. work period with 4 breaks	30min. max. work period with 5 breaks
- 25 to - 29	75 min. max. work period with 2 breaks	55 min. max. work period with 3 breaks	40 min. max. work period with 4 breaks	30 min. max. work period with 5 breaks	Non-emergency work should cease.
- 30 to - 34	55 min. max. work period with 3 breaks	40 min. max. work period with 4 breaks	30 min. max. work period with 5 breaks		
- 35 to - 39	40 min. max. work period with 4 breaks	30 min. max. work period with 5 breaks			
- 40 to - 44	30 min. max. work period with 5 breaks				
- 45 and below					

301 **4.0 REFERENCES**

302 Threshold Limit Values for Chemical Substances and Physical Agents (American Conference of
303 Governmental Industrial Hygienists, 2005).

304 NIOSH Publication 85-115, *Occupational Safety and Health Guidance Manual for Hazardous*
305 *Waste Site Activities* (National Institute for Occupational Safety and Health, 1985).

306 *Extreme Heat: A Prevention Guide to Promote Your Personal Health and Safety* (Office of
307 Public Affairs, Centers for Disease Control and Prevention, 1996).

308

309

ATTACHMENT
BACKGROUND MATERIAL

312 **Heat Stroke**

313 Heat stroke occurs when the body becomes unable to control its temperature. The body's
314 temperature rises rapidly, the sweating mechanism fails, and the body is unable to cool down.
315 Body temperature may rise to 106 °F or higher within 10-15 minutes. **Heat stroke can cause**
316 **death or permanent disability if emergency treatment is not given.**

317 Warning signs of heat stroke vary but may include:

- 318 ● an extremely high body temperature (oral temperature above 103 °F)
- 319 ● red, hot, and dry skin (no sweating)
- 320 ● rapid, strong pulse
- 321 ● throbbing headache
- 322 ● dizziness
- 323 ● nausea
- 324 ● confusion
- 325 ● unconsciousness

326 If you see any of these signs, you may be dealing with a life threatening emergency. Have
327 someone call for immediate medical assistance while you begin cooling the victim:

- 328 ● Get the victim to a shady area.
- 329 ● Cool the victim rapidly using whatever methods you can. For example, immerse the
330 victim in a tub of cool water; place in a cool shower; spray with cool water from a garden
331 hose; sponge with cool water; or if the humidity is low, wrap the victim in a cool, wet
332 sheet and fan him or her vigorously.
- 333 ● Monitor body temperature and continue cooling efforts until the body temperature drops
334 to 101-102 °F.
- 335 ● If emergency medical personnel are delayed, call the hospital emergency room for further
336 instructions.
- 337 ● Do not give the victim alcohol to drink.
- 338 ● Get medical assistance as soon as possible.

339

340 Sometimes a victim's muscles will begin to twitch uncontrollably as a result of heat stroke. If this
341 happens, keep the victim from injuring himself, but do not place any object in the mouth and do
342 not give fluids. If there is vomiting, make sure the airway remains open by turning the victim on
343 his or her side.

344 **Heat Exhaustion**

345 Heat exhaustion is the body's response to an excessive loss of the water and salt contained in
346 sweat. Those most at risk are elderly people, people with high blood pressure, and people
347 working or exercising in a hot environment.

348 Warning signs of heat exhaustion include:

- 349 ● heavy sweating
- 350 ● paleness
- 351 ● muscle cramps

- 352 ● tiredness
- 353 ● weakness
- 354 ● dizziness
- 355 ● headache
- 356 ● nausea or vomiting
- 357 ● fainting

358 The skin may be cool and moist. The victim's pulse rate will be fast and weak, and breathing will
359 be fast and shallow. If heat exhaustion is untreated it may progress to heat stroke. Seek medical
360 attention immediately if symptoms are severe or the victim has heart problems or high blood
361 pressure. Otherwise, help the victim to cool off, and seek medical attention if symptoms worsen
362 or last longer than one hour.

363 Cooling measures that may be effective include:

- 364 ● cool, non-alcoholic beverages, as directed by your physician
- 365 ● rest
- 366 ● cool shower, bath, or sponge bath
- 367 ● an air-conditioned environment
- 368 ● lightweight clothing

370 **Heat Cramps**

371 Heat cramps usually affect people who sweat a lot during strenuous activity. This sweating
372 depletes the body's salt and moisture. The low salt level in the muscles causes painful cramps.
373 Heat cramps may also be a symptom of heat exhaustion.

374 Heat cramps are muscle pains or spasms – usually in the abdomen, arms, or legs – that may
375 occur in association with strenuous activity. If you have heart problems or are on a low sodium
376 diet, get medical attention for heat cramps.

377 If medical attention is not necessary, take these steps:

- 378 ● Stop all activity, and sit quietly in a cool place.
- 379 ● Drink clear juice or a sports beverage.
- 380 ● Do not return to strenuous activity for a few hours after the cramps subside because
381 further exertion may lead to heat exhaustion or heat stroke.
- 382 ● Seek medical attention for heat cramps if they do not subside in one hour.

384 **Heat Rash**

385 Heat rash is a skin irritation caused by excessive sweating during hot, humid weather. It can
386 occur at any age but is most common in young children.

387 Heat rash looks like a red cluster of pimples or small blisters. It is more likely to occur on the
388 neck and upper chest, in the groin, under the breasts, and in elbow creases.

389 The best treatment for heat rash is to provide a cooler, less humid environment. Keep the
390 affected area dry. Dusting powder may be used to increase comfort, but avoid using ointments or

391 creams. They keep the skin warm and moist and may make the condition worse. Treating heat
392 rash is simple and it usually does not require medical assistance. Other heat-related problems can
393 be much more severe.

394 **Sunburn**

395 Sunburn should be avoided because it is damaging to the skin. Although the discomfort is
396 usually minor and healing often occurs in about a week, a more severe sunburn may require
397 medical attention.

398 Symptoms of sunburn are well known. The skin becomes red, painful, and abnormally warm
399 after sun exposure.

400 Consult a doctor if these symptoms are present:

- 401 ● fever
- 402 ● fluid-filled blisters
- 403 ● severe pain

404 Also, remember these tips when treating sunburn:

- 405 ● Avoid repeated sun exposure.
- 406 ● Apply cold compresses or immerse the sunburned area in cool water.
- 407 ● Apply moisturizing lotion to affected areas. Do not use salve, butter, or ointment.
- 408 ● Do not break blisters.

409
410

411 **REFERENCE MATERIAL ON MEDICAL CONDITIONS**

412 **Frostbite**

413 What happens to the body: (1) Freezing in the deep layers of skin and tissue; (2) Pale, waxy-
414 white skin color; (3) Skin becomes hard and numb; (4) Fingers, hands, toes, feet, ears, and nose
415 normally are affected first.

416 What should be done:

- 417 • Move the person to a warm dry area. Don't leave the person alone.
- 418 • Remove any wet or tight clothing that may cut off blood flow to the affected area.
- 419 • DO NOT rub the affected area, because rubbing causes damage to the skin and tissue.
- 420 • Gently place the affected area in a warm (105°F) water bath and monitor the water
421 temperature to warm the tissue slowly. Don't pour warm water directly on the affected
422 area because it will warm the tissue too fast causing tissue damage. Warming takes about
423 25-40 minutes.
- 424 • After the affected area has been warmed, it may become puffy and blister. The affected
425 area may have a burning feeling or numbness. When normal feeling, movement, and skin
426 color have returned, the affected area should be dried and wrapped to keep it warm. (If
427 there is a chance that the affected area may get cold again, do not warm the skin. If the
428 skin is warmed and then becomes cold again, severe tissue damage can occur.)
- 429 • Seek medical attention as soon as possible.

430
431 **Hypothermia** (Medical Emergency)

432 What happens to the body: (1) Normal body temperature drops to 95 °F or below; (2) Cool,
433 bluish skin, (3) Fatigue or drowsiness, uncontrolled shivering, slurred speech, clumsy
434 movements; (3) Irritable, irrational, or confused behavior.

435 What should be done if there was no immersion in water:

- 436 • Call for emergency assistance.
- 437 • Move the person to a warm, dry area. Don't leave the person alone. Remove any wet
438 clothing and replace with warm, dry clothing, or wrap the person in blankets.
- 439 • Have the person drink warm, sweet drinks (sugar water or sports-type drinks) if he or she
440 is alert. Avoid drinks with caffeine (coffee, tea, or hot chocolate) or alcohol.
- 441 • Have the person move the arms and legs to create muscle heat. If he or she is unable to do
442 this, place warm bottles or hot packs at armpit, groin, neck, and/or head. DO NOT rub the
443 person's body or place him or her in a warm water bath. This may stop the heart.

444 What should be done if there is immersion in water:

- 445 • Call for emergency assistance. Body heat is lost up to 25 times faster in water.
- 446 • DO NOT remove any clothing. Button, buckle, zip, and tighten any collars, cuffs, shoes,
447 and hoods because the layer of trapped water closest to the body provides a layer of
448 insulation that slows the loss of heat. Keep the head out of the water and put on a hat or
449 hood.

- 450 • Get out of the water as quickly as possible or climb on anything floating. DO NOT
451 attempt to swim unless a floating object or another person can be reached, because
452 swimming or other physical activity uses the body's heat and reduces survival time by
453 about 50 percent.
- 454 • If getting out of the water is not possible, wait quietly and conserve body heat by folding
455 arms across the chest, keeping thighs together, bending knees, and crossing ankles. If
456 another person is in the water, huddle together with chests held closely.

457 **Trench foot**

458 What happens to the body: (1) Nerve damage from impaired circulation; (2) Severe pain,
459 tingling, and itching; (3) edema and/or blisters. What should be done: See material above on
460 frostbite.

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ATTACHMENT 6
EXCAVATION SAFETY PLAN

WORKPLACE HEALTH AND SAFETY PROGRAM

EXCAVATION SAFETY PLAN

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FIGURES

Figure 1 Parcel 21 - SWMU 1 Excavation Map

1 **1.0 CONDITIONS**

2 Zapata Incorporated (ZAPATA) will excavate soil from the TNT Leaching Beds for the purpose
3 of removing soils contaminated with site-related chemicals of concern and of collecting
4 confirmation soil samples for analytical testing to determine that residual contamination does not
5 exceed applicable screening levels. The diagram included in this attachment shows the areas in
6 which excavations are planned.
7

8 **2.0 COMPETENT PERSON**

9 A Competent Person trained in accordance with Occupational Safety and Health Administration
10 (OSHA) 29 CFR 1926, Subpart P, shall be present to direct excavation work. It is anticipated
11 that ZAPATA employee Chuck W. Wentzel, who has received formal training in trenching and
12 excavation, will serve in this role. The OSHA Competent Person will work with the site safety
13 officer (SSO), Unexploded Ordnance (UXO) technicians, and Senior Unexploded Ordnance
14 Supervisor SUXOS to implement requirements of this excavation plan, as well as other
15 requirements found in the Accident Prevention Plan (APP). The UXO technicians (UXO Tech II
16 and Tech III) will only be required to be present on-site during the early Leaching Bed fieldwork
17 when soils containing >10% explosive compounds are excavated and mixed with other soils.
18 During the remainder of the excavation activities at the Leaching Beds, the UXO Tech II and III
19 will not be required to be on-site.

20 **3.0 EXCAVATION DEPTHS**

21 The depth of excavations over the Leaching Bed footprints is expected to be as deep as 35 feet
22 bgs (see attached Figure). Excavations will be sloped 1V to 1.5H meeting the 385-1-1
23 requirement for a 1V to 1.5H for Type C soils. Personnel and excavation equipment will enter
24 the excavations to construct the excavation and collect soil samples. All water that enters the
25 excavation will be dewatered before the excavation is entered each day. The competent person
26 will inspect the excavation each day for stability and signs of possible collapse or other safety
27 hazards. At the end of each day all excavations will be marked by warning barricades or
28 flagging to be placed at least six ft from the edge of excavation. The site safety officer (SSO)
29 will specify personal protective equipment to minimize dermal exposure to contaminated soil
30 during confirmation soil sampling.

31 **4.0 SOIL TYPE**

32 The soils at the TNT Leaching Beds are expected to consist of the Aquima-Hawaikuh soil
33 complex as determined from the USDA McKinley County New Mexico Soil Survey. These
34 soils are typified by silt loams with shallow, 1 to 5 percent, slopes. They tend to lie at elevations
35 of 6,000 to 6,800 ft. elevation above msl, have a mean annual precipitation of 10 to 13 in., an
36 average annual air temperature of 49 to 54 degrees F, and an annual frost-free period of 120 to
37 140 days.

38
39 The Aquima soils are described as follows:

40 Aquima and similar soils are typically silty clay loams at the surface and within the shallow
41 subsurface, grading to sandy and then gravelly clay loams with increasing depth. These soils are
42 present on stream terraces and on valley floors and alluvial fans on valley sides. The soil parent
43 material is alluvial fan and stream alluvium derived from siltstone, sandstone and shale with
44 slopes averaging 1 to 5 percent. These soils are typically at least 60 in. deep. Aquima soils are
45 typically well drained and have moderately slow permeability. They have a high water
46 availability and a moderate shrink-swell potential.

47
48 The Hawaikuh soils are described as follows:

49 Hawaikuh and similar soils are typically silty clay loams at the surface with sandy clay loams at
50 increasing depth. These soils are present on valley sides and stream terraces. The soil parent
51 material is alluvial fan and stream alluvium derived from sandstone and shale with slopes
52 averaging 1 to 5 percent. These soils are typically at least 60 in. deep. Hawaikuh soils are
53 typically well drained and have moderately slow permeability. They have a high water
54 availability and a moderate shrink-swell potential. They are very slightly saline, and are clayey
55 soils.

56
57 Given the expected soil types at the TNT Leaching Beds, the soils are expected to be modestly
58 cohesive and should not present a high potential for caving or sloughing. Consideration may be
59 required for maintaining soil moisture and minimizing drying of soils which would be expected
60 to increase the potential for these soils to cave or slough. Application of water will be used to
61 control dust generation and to maintain soil moisture and minimize soil instability. However,
62 given the increasing percent of sand and gravel expected with these soils with increasing depth,
63 the Competent Person will assume that all soil is of “type C,” and is therefore relatively unstable.

64 **5.0 SLOPING AND/OR BENCHING**

65 Because the excavation depths over the majority of the Leaching Bed footprints are expected to
66 be greater than 4 feet deep below the surrounding terrain, sloping or benching is expected to be
67 necessary for most of the excavated areas. In the areas within the Leaching Bed boundaries
68 where excavations deeper than four feet below the surrounding terrain are planned, excavation
69 sidewalls will be sloped at a rate of 1.5 feet laterally for every 1 foot vertically. The sloping and
70 benching design was performed by a Registered Professional Engineer; Ms. Heather McArthur,
71 PE, Civil Engineer, licensed in North Carolina (see Figure 1 of this attachment). Entry into these
72 excavations, after sloping, by personnel is anticipated, to collect confirmation soil samples.

73
74 The Competent Person will inspect all excavations on a daily basis to determine the stability of
75 the excavation sidewalls. If the Competent Person determines that the excavation sidewalls are
76 unstable, measures including additional sloping and/or benching will be completed. To ensure
77 personnel safety, all excavations with a depth greater than four feet below the surrounding terrain
78 will be marked by warning barricades or flagging to be placed at least six feet from the edge of
79 excavation.

80
81 The Competent Person will assume that all soil is of “type C,” and is therefore relatively
82 unstable. He will require that the sides of excavations be sloped as necessary to prevent collapse.
83 In addition the Competent Person will conduct routine inspections of excavation sides to detect
84 signs of instability. He will require that excavated material be placed as far as feasible from the
85 excavation opening, but in no case at a distance less than two feet. The SSO and the Competent
86 Person will confer, as necessary, to ensure that excavations do not undermine structures or roads.

87 **6.0 UTILITIES**

88 The SSO and the Competent Person will make appropriate inquiries and take proper precautions
89 to avoid contacting underground pipes, cables, or other utilities during digging of excavations.
90 Before completing any intrusive work, a utility locate/survey will be completed according to all
91 FWDA standard procedures. Additionally, during fieldwork surveys magnetometers may be
92 conducted by field personnel before digging commences and routinely thereafter as the
93 excavations progress.

94

95 There are no overhead utilities present at the TNT Leaching Beds, and other overhead
96 features/structures (i.e., trees) are also not present.

97 **7.0 EXCAVATED SOIL MANAGEMENT**

98 Excavated soil will be managed according to the procedures described in the Interim Measures
99 Work Plan (IMWP) for Parcel 21. A staging area will be established for the excavated soil to
100 allow for waste characterization sampling of the stockpiled soil, followed by loading of the soil
101 onto dump trucks and transportation off-site to the disposal facility. The stockpile staging areas
102 and loading areas are described in the IMWP for Parcel 21. Asphalt or concrete is expected to be
103 excavated from the TNT Leaching Beds (Arterial Road No. 4) during this project.

104 **8.0 TRAFFIC CONTROL**

105 The SSO will assess the need for traffic control on nearby roads (i.e., Arterial Rd. and Arterial
106 Rd. No. 4), and implement necessary rules to prevent accidents during movement of excavation
107 equipment. Since this road is a main thoroughfare on FWDA, and is heavily used by FWDA and
108 other contractor personnel, measures taken to control traffic will be implemented in order to
109 minimize disruptions to traffic flow. Traffic near the excavation should be minimized. Possible
110 instability caused by vibration should be evaluated regularly by the Competent Person. Potential
111 traffic control measures that may be considered include:

- 112
- 113 • Placement of traffic cones to direct traffic around obstructions or active excavation
- 114 areas.
- 115 • Placing flagmen on the subject road to direct and control traffic flow.
- 116 • Barricading of Arterial Rd./Arterial Rd. No. 4 when necessary to prevent traffic flow
- 117 through the construction zone, and emplacement of detour signs to direct traffic to
- 118 alternate routings

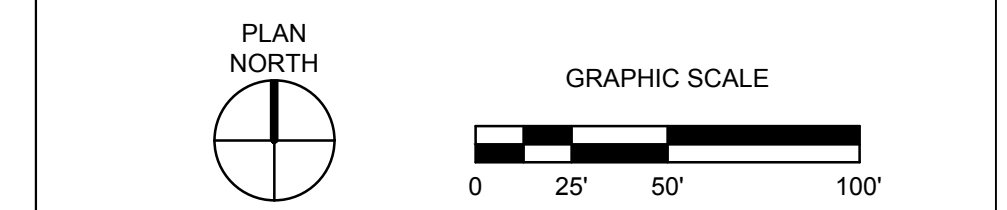
119 **9.0 EXCAVATION INSPECTION AND TESTING**

120 The Competent Person will inspect excavations, adjacent areas, and protective measures/systems
121 on a daily basis. These inspections will be completed prior to each work shift, periodically
122 throughout work shifts, after significant weather events (i.e., rainstorms), or any other event that
123 could cause a change in physical site conditions and that could create a hazardous situation for
124 site workers.

125
126 If actual conditions or operations differ from those described here, the SSO or the Competent
127 Person will report such deviations to the corporate manager of health and safety, and appropriate
128 precautions will be developed for safe continuation of work.

FIGURE 1
EXCAVATION MAP

- NOTES**
1. ALL SOILS ARE ASSUMED TO BE TYPE C.
 2. MAXIMUM ALLOWABLE SLOPES FOR CLASS C SOILS SHALL BE 1.5:1 PER OSHA SLOPING AND BENCHING TABLE B-1.
 3. ALL EXCAVATIONS GREATER THAN 20' SHALL BE DESIGNED BY A REGISTERED PROFESSIONAL ENGINEER.
 4. WHEN SURCHARGE LOADS FROM STORED MATERIAL OR EQUIPMENT, OPERATING EQUIPMENT, OR TRAFFIC ARE PRESENT, A COMPETENT PERSON SHALL DETERMINE THE DEGREE TO WHICH THE ACTUAL SLOPE MUST BE REDUCED BELOW THE MAXIMUM ALLOWABLE SLOPE, AND SHALL ASSURE THAT SUCH REDUCTION IS ACHIEVED. SURCHARGE LOADS FROM ADJACENT STRUCTURES SHALL BE EVALUATED.
 5. DAILY INSPECTIONS OF EXCAVATIONS, THE ADJACENT AREAS, AND PROTECTIVE SYSTEMS SHALL BE MADE BY A COMPETENT PERSON FOR EVIDENCE OF A SITUATION THAT COULD RESULT IN POSSIBLE CAVE-INS, INDICATIONS OF FAILURE OF PROTECTIVE SYSTEMS, HAZARDOUS ATMOSPHERES, OR OTHER HAZARDOUS CONDITIONS. AN INSPECTION SHALL BE CONDUCTED BY THE COMPETENT PERSON PRIOR TO THE START OF WORK AND AS NEEDED THROUGHOUT THE SHIFT. INSPECTIONS SHALL ALSO BE MADE AFTER EVERY RAINSTORM OR OTHER HAZARD INCREASING OCCURRENCE. THESE INSPECTIONS ARE ONLY REQUIRED WHEN EMPLOYEE EXPOSURE CAN BE REASONABLY ANTICIPATED. WHERE THE COMPETENT PERSON FINDS EVIDENCE OF A SITUATION THAT COULD RESULT IN A POSSIBLE CAVE-IN, INDICATIONS OF FAILURE OF PROTECTIVE SYSTEMS, HAZARDOUS ATMOSPHERES, OR OTHER HAZARDOUS CONDITIONS, EXPOSED EMPLOYEES SHALL BE REMOVED FROM THE HAZARDOUS AREA UNTIL THE NECESSARY PRECAUTIONS HAVE BEEN TAKEN TO ENSURE THEIR SAFETY.
 7. ADEQUATE PROTECTION SHALL BE PROVIDED TO PROTECT EMPLOYEES FROM LOOSE ROCK OR SOIL THAT COULD POSE A HAZARD BY FALLING OR ROLLING FROM AN EXCAVATION FACE. SUCH PROTECTION SHALL CONSIST OF SCALING TO REMOVE LOOSE MATERIAL; INSTALLATION OF PROTECTIVE BARRICADES AT INTERVALS AS NECESSARY ON THE FACE TO STOP AND CONTAIN FALLING MATERIAL; OR OTHER MEANS THAT PROVIDE EQUIVALENT PROTECTION.
 8. EMPLOYEES SHALL NOT WORK IN EXCAVATIONS IN WHICH THERE IS ACCUMULATED WATER, OR IN EXCAVATIONS IN WHICH WATER IS ACCUMULATING, UNLESS ADEQUATE PRECAUTIONS HAVE BEEN TAKEN TO PROTECT EMPLOYEES AGAINST THE HAZARDS POSED BY WATER ACCUMULATION. THE PRECAUTIONS NECESSARY TO PROTECT EMPLOYEES ADEQUATELY VARY WITH EACH SITUATION, BUT COULD INCLUDE SPECIAL SUPPORT OR SHIELD SYSTEMS TO PROTECT FROM CAVE-INS, WATER REMOVAL TO CONTROL THE LEVEL OF ACCUMULATING WATER, OR USE OF A SAFETY HARNESS AND LIFELINE.
 9. IF WATER IS CONTROLLED OR PREVENTED FROM ACCUMULATING BY THE USE OF WATER REMOVAL EQUIPMENT, THE WATER REMOVAL EQUIPMENT AND OPERATIONS SHALL BE MONITORED BY A COMPETENT PERSON TO ENSURE PROPER OPERATION.
 10. WARNING SYSTEM FOR MOBILE EQUIPMENT. WHEN MOBILE EQUIPMENT IS OPERATED ADJACENT TO AN EXCAVATION, OR WHEN SUCH EQUIPMENT IS REQUIRED TO APPROACH THE EDGE OF AN EXCAVATION, AND THE OPERATOR DOES NOT HAVE A CLEAR AND DIRECT VIEW OF THE EDGE OF THE EXCAVATION, A WARNING SYSTEM SHALL BE UTILIZED SUCH AS BARRICADES, HAND OR MECHANICAL SIGNALS, OR STOP LOGS. IF POSSIBLE, THE GRADE SHOULD BE AWAY FROM THE EXCAVATION.
 11. KEEP EXCAVATED SOIL (SPOILS) AND OTHER MATERIALS AT LEAST 2 FEET FROM EXCAVATION EDGES.
 12. EMPLOYEES SHALL BE PROTECTED FROM EXCAVATED OR OTHER MATERIALS OR EQUIPMENT THAT COULD POSE A HAZARD BY FALLING OR ROLLING INTO EXCAVATIONS. PROTECTION SHALL BE PROVIDED BY PLACING AND KEEPING SUCH MATERIALS OR EQUIPMENT AT LEAST 2 FEET (61 M) FROM THE EDGE OF EXCAVATIONS, OR BY THE USE OF RETAINING DEVICES THAT ARE SUFFICIENT TO PREVENT MATERIALS OR EQUIPMENT FROM FALLING OR ROLLING INTO EXCAVATIONS, OR BY A COMBINATION OF BOTH IF NECESSARY.



Source(s)
ZAPATA, USACE, 2009 Color Infrared Photo

Projection
NAD 1983 State Plane New Mexico FIPS 3003 Feet
Note: Main Data Frame Rotated to True North

Note(s)
Engineering scale may only be accurate on a map size of 11x17

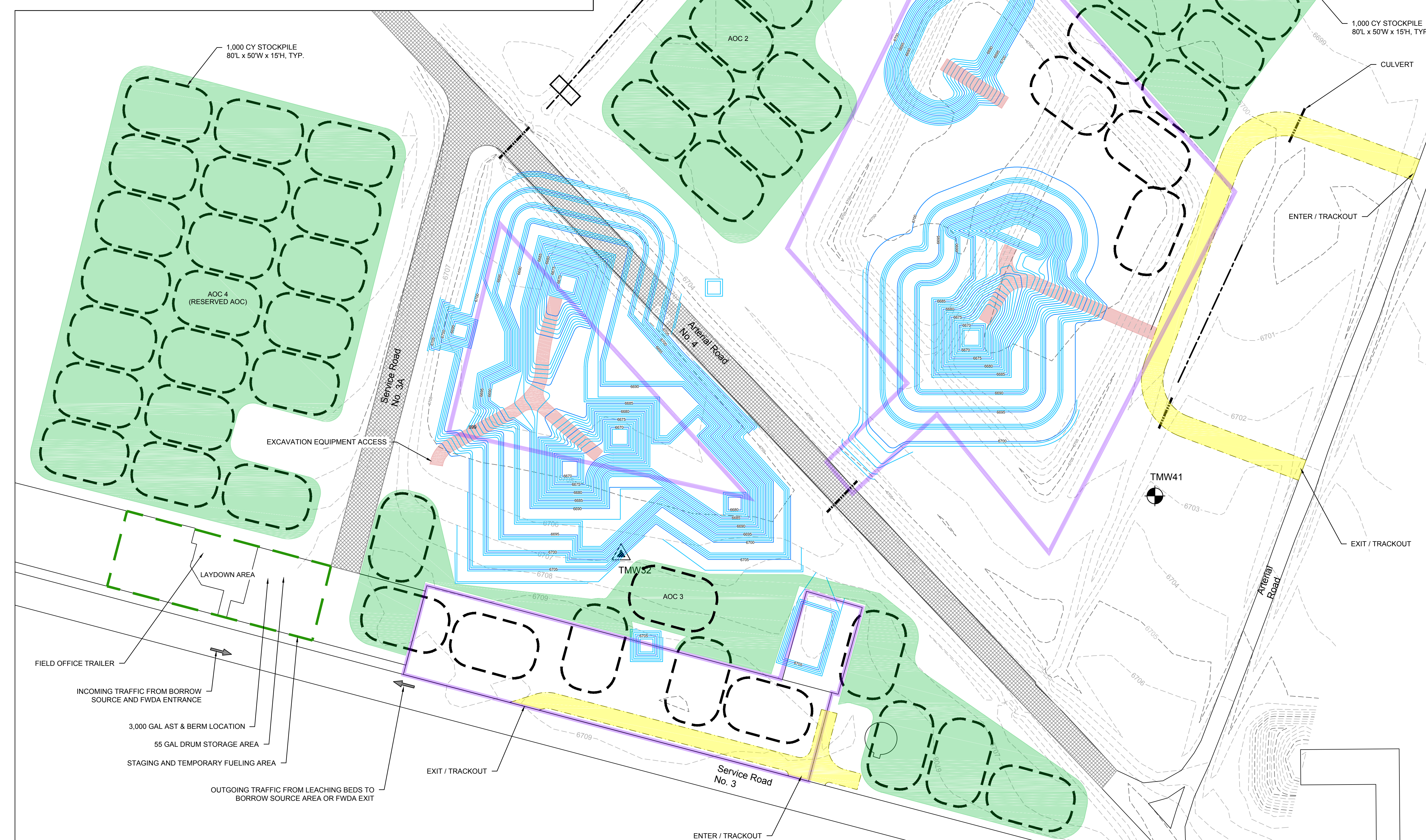
Magnetic Declination Date: 06/16/2014
Magnetic Declination Shifting by 0° 7' W per year

Checked By X Engineering Scale 1" = 100' Drawn By GIS Staff



LEGEND:

	TEMPORARY ACCESS ROAD FOR HAUL TRUCKS		MAJOR CONTOUR
	SOIL STOCKPILE AREA OF CONTAMINATION (AOC)		MINOR CONTOUR
	EXCAVATION EQUIPMENT ACCESS		PROPOSED MAJOR CONTOUR
	ROAD CLOSURE		PROPOSED MINOR CONTOUR
	INFERRED 1,000 CY SOIL STOCKPILE (APPROXIMATE)		CULVERT
			STAGING AND TEMPORARY FUELING AREA
			SWMU 1 BOUNDARY



ATTACHMENT 7
RESPONSE TO COMMENTS

Comment Responses Table
Draft Interim Measures for Parcels 21 and 24 and Abandonment of Wells

Cmt. No.	Page No./Line No.	Comment	Recommendation	Response
<i>CESWD Safety Office – Morgan</i>				
1	18 –para 8.2 AAP	Ensure they address that all accidents are reportable to the onsite government representative within 24 hours. I am attaching the initial notification that they should use. All contractor property damage is reportable, but any over \$2,000 requires a ENG 3394. In 8.2 that reference 200,000 and that is when the immediate notification should take place. They reference the SPK form and should remove that and just reference the initial notification I have attached. All contractor injury accident with medical treatment away from the jobsite must be reported and if it results in treatment then an ENG 3394 is required.	Agree.	APP section 8.2 has been modified in accordance with this comment.
2	25 –para 9.13 AAP	If excavation is conducted a more in-depth plan is required as per the EM 385-1-1, 25.A.01 and the competent person for excavation/trenching needs to be identified as well.	Agree.	An Excavation Safety Plan can now be found in Attachment 6. APP section 9.13 and SSHP section 8.4 refer the reader to this new attachment.
3	6 – para 4.0 SSHP	Foot wear must meet the ASTM F2412 and F2413 standards and sturdy boots will not meet this. For those doing any UXO work they can wear the composite toe instead of the steel toed boots. Need to make changes to what is said about the sturdy boots (will not meet the requirements unless steel or composite toe).	Agree.	The specification has been added to SSHP section 4.1.
4	14 –para 8.4 SSHP	Reference the excavation/trenching plan and this plan must be added to the APP and referenced in the SSHP.	Agree.	An Excavation Safety Plan can now be found in Attachment 6. APP section 9.13 and SSHP section 8.4 refer the reader to this new attachment.
5	General	Need to at least submit their trenching plan in accordance with section 25.A.01 for review and the other items they need to update in the manual. The initial notification for contractor accident which includes property damage is attached and this along with other safety information is available on our website: http://www.swf.usace.army.mil/About/Organization/SafetyandOccupationalHealth.aspx	Agree.	An Excavation Safety Plan can now be found in Attachment 6. APP section 9.13 and SSHP section 8.4 refer the reader to this new attachment. The Contractor Accident Notification Form is now included in Attachment 3.

Draft APP IM for Parcels 21 and 24 FWDA

t. No.	Page No./Line No.	Comment	Recommendation	Response
<p><i>Commenter – Carpenter, Martin S.</i> <i>Respondent – George A. Dwiggin,</i></p>				
1	Page 26 Section 9.14	<p>Lead Abatement Plan: Are we sure we do not need a Lead compliance plan? It is mentioned in your SSHP and that may be enough.</p> <p>Silica Plan: Also we do not specifically mention the Silica plan but because we have a large amount of Silica in the soil here I believe we should</p> <p>Confined Space Plan: The SSHP references 4 feet as the depth were no person will enter. This depth is a confined space depth which leads me to believe we do need a confined space plan.</p>		<p>Lead abatement plan: Comment noted. Section 8.15 discusses measures to be taken to mitigate potential exposures to lead. Additionally, text has been added to describe the basic procedures that will be followed when cutting the igloo drains at Parcel 24.</p> <p>Silica Plan: Comment noted. Dust/silica are not expected to be a concern as wetting of soils to control dust is already planned and discussed in the plans.</p> <p>Confined Space Plan: Comment noted. Please see the Excavation Plan (Attachment 6). No personnel are anticipated to require entry into excavations of 4 feet or greater.</p>
2	SSHP PAGE 2 Hazard analysis and Risk assessment	Have we considered dust/silica as a hazard and taken any controls?		Comment noted. Dust/silica are not expected to be a concern as wetting of soils to control dust is already planned and discussed in the plans.
3	Page 6 Section 4.1	The PPE section is vague and seems more appropriate wording for an APP instead of the requirement for site specific information. In example, EM 385-1-105.E.05 requires safety toed boots on all construction sites. How far away is “approaching” when referring to hearing protection?		Agree. Additional text has been added to SSHP section 4.1. ZAPATA’s safety officer will use the sound level meter to provide guidance on hearing protection.
4	Page 9 Section 6	If you want to have your SSHO use a decibel meter onsite and then determine hearing protection that is acceptable. Seems easier to just set a distance some		Comment noted. ZAPATA’s safety officer will use the sound level meter to provide guidance on hearing

Draft APP IM for Parcels 21 and 24 FWDA

t. No.	Page No./Line No.	Comment	Recommendation	Response
		distance away from heavy equipment where we will wear hearing protection.		protection.
7.	Page 14 Section 8.4	EM 385-1-1 also requires an excavation plan which can be completed onsite prior to excavations similar to a hot work permit. This requirement should be mentioned here.		Agree. An Excavation Safety Plan can now be found in Attachment 6. APP section 9.13 and SSHP section 8.4 refer the reader to this new attachment.
8	Page 19 Section 8.15	This section should explain the procedures Zapata will enforce to ensure that workers are not exposed to lead and not just tell us workers will take some unknown action. This statement applies to almost every bulleted sentence in this section.	More specifics	Agree. Comment noted. Additional text has been added to describe the procedures that will be followed when cutting the igloo drains at Parcel 24.
	Page 16 Section 8.16	What are the distances for the “appropriate exclusion zones”	More specifics	Agree. Additional text has been added to section 8.16 to describe exclusion zone distances. ZAPATA’s safety officer will specify an exclusion zone for various operations, as appropriate.
	General comments on AHAs	Again I would like them to be more specific and address the exact procedures we will use while performing task. In example, “Removal and disposal of the drain pipes” The Safety officer will require practices that minimize dust but if there is dust then employees will just attempt to remain upwind.	More specifics	Comment noted. Additional text has been added to the AHAs as requested. ZAPATA’s safety officer and other ZAPATA employees will be familiar with detailed requirements in the Accident Prevention Plan, and that they will implement these in addition to the more abbreviated rules in the AHAs.
	General comment	We will need to review this APP/SSHP/AHAs again once the WP is completed to ensure the work we have planned is completely covered by these safety documents.		Comment noted. Please see the numerous changes made to the APP and the SSHP. In addition, we have revised the submittal schedule so that the Final APP/SSHP is submitted after receipt of Draft USACE comments on the IMWP.

**ARMY DRAFT, “SSHP/APP”, ZAPATA, SWMU 1
FORT WINGATE DEPOT ACTIVITY, MCKINLEY COUNTY, NM
COMMENT RESPONSE TABLE
DATED SEPT 2014**

Comment Number	Page No./Line No.	Comment	Recommendation	Response
<i>RPEC, OESS, DJ MYERS</i>				
1	APP Para 8.0 and throughout the document.	Damage amount is listed as 200,000.00 and is correct, although this should be 2,000.00 or more to complete USACE Form 3394. See attached documents and flow charts.		Agree. The following text has been added to the pertinent sections: “If an accident resulting in damages equal to or exceeding \$2,000 occurs, a USACE Form ENG 3394 will be completed and submitted to the USACE PM, FWDA on-site USACE representative, PSM and COR within 5 business days.”
2	APP Para 8.0	Contractor will also notify the USACE PM and On-site USACE Rep immediately of all accidents, incidents and near misses.		Agree. The requested statement has been added to the text.
3	APP Para 9.2.3	Contractor will not fight any fires that involve explosives.		Agree. The requested statement has been added to the text.
4	APP Para 9.10	Hot work permit will be issued prior to any hot work being performed.		Agree. The paragraph has been edited as follows: “Hot work is not planned. However, if

**ARMY DRAFT, “SSHP/APP”, ZAPATA, SWMU 1
 FORT WINGATE DEPOT ACTIVITY, MCKINLEY COUNTY, NM
 COMMENT RESPONSE TABLE
 DATED SEPT 2014**

Comment Number	Page No./Line No.	Comment	Recommendation	Response
				required a hot work permit will be obtained and issued by FWDA administrative personnel before any hot work is conducted. Additionally, no hot work is permitted until it is determined that the area is gas-free and that there are no flammable or combustible materials stored within 50 feet of the work area.”
5	APP Para 9.12	References the incorrect paragraph in the SSHP. Should be paragraph 8.8, not 9.8.		Agree. The typographical error and section numbering have been corrected.
6	APP Para 9.14	Delete this paragraph unless required by the regulations or state guidance. There should be no need to address non-required plans.		Agree. The section has been deleted except for the statement: “Other written site programs will be added if necessary in an ongoing process of program evaluation. The SSO and the PSM will confer frequently to assess the need for additions to the SSHP.”
7	SSHP Index	This is mis-numbered. Please correct.		Agree. The SSHP Table

**ARMY DRAFT, “SSHP/APP”, ZAPATA, SWMU 1
 FORT WINGATE DEPOT ACTIVITY, MCKINLEY COUNTY, NM
 COMMENT RESPONSE TABLE
 DATED SEPT 2014**

Comment Number	Page No./Line No.	Comment	Recommendation	Response
				of Contents has been corrected.
8	SSHP Para 8.4	Personnel may enter an excavation if properly sloped and two means of access and egress. Stating that no person shall be allowed in excavations more than 4 feet limits your operation.		Agree. In fulfillment of other review comments an excavation safety plan has now been added as Attachment 6 to the SSHP.
9	SSHP Para 8.8	Work will stop when lightening is within how many miles? Suggest adding a bench mark distance when storms approach.		Agree. The following text has been added to this section: “Lightning can strike as far as 10 miles from the area where it is raining, about the distance from which thunder can be heard. Therefore, if thunder is audible field personnel may be within striking distance. If thunder is heard by any field crew member, all field personnel will seek safe shelter immediately. Fieldwork will not resume until 30 minutes has elapsed after the last thunder is heard.”
10	SSHP Para 8.16	States: The UXOSO will require inspection of drilling equipment each day before use. Suggest using the Site		Agree. The sentence has been changed to:

**ARMY DRAFT, “SSHP/APP”, ZAPATA, SWMU 1
 FORT WINGATE DEPOT ACTIVITY, MCKINLEY COUNTY, NM
 COMMENT RESPONSE TABLE
 DATED SEPT 2014**

Comment Number	Page No./Line No.	Comment	Recommendation	Response
		Safety Officer to inspect drill equipment or observe the inspection is being done competent person.		“The SSO will perform the inspection, or ensure that competent persons complete the inspection of all heavy equipment each day before use.”
11	SSHP Table 12-1	Table should be 11-1. Table should include an automated external defibrillator (AED).		Agree. The table number has been corrected and an AED has been added to the table.
12	AHA Excavations	No one allowed in a excavation deeper than four feet. This will limit your operations and suggest you comply with OSHA regulations on trenching and excavations for sloping and shoring.		Agree. In fulfilment of other review comments an excavation safety plan has now been added as Attachment 6 to the SSHP.