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Description:	N/A
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ABENGOA SOLAR
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SUBMITTED ELECTRONICALLY

Subject:	**09-AFC-5C**
Condition:	**COMPLIANCE - 6**
Description:	**Monthly Compliance Report**
Date:	**August 14, 2014**
Distribution:	**Dale Rundquist, CEC; Carol Hammel-Smith, US DOE; Wendy Campbell, DFW; Ray Bransfield, FWS**

Dale Rundquist, CPM
California Energy Commission
1516 Ninth Street
Sacramento, California 95814

Dear Mr. Rundquist,

The attached Monthly Compliance Report for July 2014 is submitted for your review as part of ongoing reporting required by the California Energy Commission's Conditions of Certification for the Mojave Solar Project. This monthly report has been added to the archival site on Box.com.

Please direct any question to me.

Sincerely,
William "Bill" Grisolia
Compliance Management
(303) 885-2036 Cell

Attachment: Monthly Compliance Report

Mojave Solar Project
Monthly Compliance Report

July 2014 Reporting Period

Prepared for:

Mojave Solar LLC
13911 Park Avenue, Suite 206
Victorville, California 92392

Introduction

During construction of the Mojave Solar Project, monthly compliance reports are provided to the California Energy Commission (CEC) as required by Condition of Certification COMPLIANCE-6 of the License Decision, docket number 09-AFC-5C. This is the Monthly Compliance Report (MCR) for July 2014.

Construction activities included work on steam turbine generators (STG) and condensers, miscellaneous foundations in the Power Blocks (PB), PB minor auxiliary structure, motor control room in Water Treatment Plant (WTP), STG piping, balance of plant (BOP) piping, turbine auxiliary piping and cooling tower piping. Heat Transfer Fluid filling activity took place in the both Alpha and Beta main headers. This activity started in June and was still ongoing during the month of July.

Construction installation included cable trays, heat tracing cable, air compressor conduits system, carbon dioxide tank connections, pipe welding for PB (and insulation), ullage/overflow systems and expansion vessels, piping in the racks, WTP filters, filter equipment, pipe utilities and welding, electrical equipment panels connections (and testing), fire protection systems, solar field and PB grounding, steam generator HTF filling and BOP equipment insulation.

Also performed were flushing of the turbine lube oil system, WTP rack touch ups, various instrumentation and control tests and testing of the solar field instrumentation.

The following table provides a summary of all areas covered in this report.

Mojave Solar Project Monthly Compliance Reporting	
Condition of Certification (COC) Topics	Appendix
Air Quality	See Appendix A
Biological Resources	See Appendix B
Cultural Resources	See Appendix C
Paleontological Resources	See Appendix D
Waste Management	See Appendix F
Worker Safety	See Appendix E
Soil and Water	See Appendix F
General Conditions	See Appendix F
Civil	See Appendix F
Structural	See Appendix F
Mechanical	See Appendix F
Electrical	See Appendix F
Transmission System Engineering	See Appendix F
Compliance Forecast	See Appendix G
Compliance Matrix	See Appendix H

Appendix A
Air Quality Resources

Mojave Solar Project
Monthly Compliance Report
San Bernardino County, California

July 2014 Reporting Period

CH2M HILL
2485 Natomas Park Drive
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Sacramento, CA
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August 6, 2014

Dale Rundquist, CPM
California Energy Commission
Siting, Transmission & Environment Protection (STEP) Division
1516 Ninth Street (MS-2000)
Sacramento, CA 95814
drundqui@energy.state.ca.us

RE: AQ-SC3, AQ-SC4, AQ-SC5, and WORKER SAFETY-8 Monitoring and Mitigation Activities at Mojave Solar Project (09-AFC-5C) for July 1 through July 31, 2014

Dear Mr. Rundquist:

This letter is to update you on the air quality construction monitoring occurring at the Mojave Solar Project (MSP) site during July 2014. Compliance with the WORKER SAFETY-8 condition was also monitored. Construction activities occurred July 1 through 31, 2014. Compliance monitoring was performed by Jose Manuel Bravo Romero of Abengoa; who is the full-time onsite Air Quality Construction Mitigation Manager (AQCMM). I, Christopher Waller of CH2M HILL, am the designated AQCMM delegate and visited the site on July 31, 2014, to ensure compliance with record keeping and conditional requirements.

Overview

Construction activities in July included installation of: heat transfer fluid (HTF) pipe insulation, steam turbine generator (STG) insulation, fire protection system, water treatment plant (WTP) equipment and utilities, and heat trace. Construction also included balance of plant (BOP) piping assembly and equipment welding, solar field and power block grounding, miscellaneous foundation construction, and production well development. Construction was monitored for compliance with Conditions of Certification (COCs) AQ-SC3, AQ-SC4, AQ-SC5, and WORKER SAFETY-8. New equipment brought onsite during July was issued a tag in accordance with AQ-SC5a, and evaluated for compliance with AQ-SC5b through AQ-SC5d. A summary of the compliance with the Air Quality Construction Mitigation Plan (AQCMP) is provided in the following sections. Daily, weekly, and monthly observation logs and other site inspection forms are maintained onsite and available upon request.

Compliance Assessment

AQ-SC3 – Fugitive Dust Control

All of the AQ-SC3 COCs were in effect during July 2014. The following section summarizes each COC and describes the level of compliance.

- AQ-SC3a: Soil stabilizers on main access roads and delivery areas

  Soil stabilizers have been applied to finished access roads and delivery areas. Main roads in Beta have been paved.

- AQ-SC3b: Watering of disturbed areas

  Watering of actively disturbed areas was performed for all construction activities with the potential to create airborne dust plumes. When necessary, watering was intensified as directed by the onsite AQCMM and construction managers.

- AQ-SC3c: Speed limits

  The required speed limits have been enforced onsite.

- AQ-SC3d: Speed limit signage

  Speed limit signage has been posted and is clearly visible at all site entrances.

- AQ-SC3e: Tire inspection and washing prior to exiting to paved roadway

  Although tire washing stations have not been installed, all construction vehicles are inspected for dirt and other debris prior to exiting to paved public roadways.

- AQ-SC3f: Tire washing station

  As stated above, no tire washing stations have been installed. However, tires of construction vehicles are inspected for dirt and other debris prior to exiting to paved public roadways.

- AQ-SC3g: Unpaved exit treatment

  Rumble plates are installed at all site exits.

- AQ-SC3h: Construction vehicles use approved entrances only

  When traveling between sites, construction vehicles use approved entrances only.

- AQ-SC3i: Run-off onto public roadways

  Earthmoving activities have resulted in run-off being directed away from paved public roadways. In addition, fiber rolls have been placed where the potential for run-off onto public roadways exist. Watering has not resulted in run-off onto public roadways.

- AQ-SC3j: Sweeping of paved roads within construction site

  Sweeping of paved roads within the site is performed as necessary.

- AQ-SC3k: Sweeping of public paved roadways with access to the MSP site

  Sweeping of Harper Lake Road and Lockhart Road is performed as necessary.

- AQ-SC3l: Stabilization of storage piles

  Significant earthmoving activities performed during July 2014 included miscellaneous foundation excavation and construction within, and adjacent to, the power blocks. Areas disturbed during foundation construction were sufficiently watered during all construction activities. Storage piles generated as a result of excavation and construction activities will be used as backfill. Additional storage piles exist to the east of the Alpha evaporation pond. These storage piles are watered frequently, and will be re-distributed at a later date. All other soil piles are temporary excavation spoils or grading excesses that are re-distributed prior to exceeding the 10-day limit for cover or treatment.

- AQ-SC3m: Stabilization of transported solid bulk material

  Transported solid bulk materials are sufficiently watered, and at least one foot of freeboard is provided during transportation.

- AQ-SC3n: Wind control techniques

  Wind fencing has been installed in Alpha East, Alpha West, and Beta along the eastern and western borders of each area.

AQ-SC4 – Dust Plumes & WORKER SAFETY-8 – Site Worker Fugitive Dust Protection

The following construction activities were performed during the July 1 to July 31, 2014 reporting period:

- HTF pipe insulation installation.
- STG insulation installation.
- Turbine and turbine auxiliary piping installation.
- Turbine stair installation.
- Instrument and controls installation.
- Power block insulation installation.
- Power block grouting.
- Solar field and power block grounding.
- BOP piping assembly.
- BOP equipment installation.
- WTP rack, filter equipment, electrical equipment, and pipe utilities installation and welding.
- WTP chemical dosing installation.
- Beta raw water line installation and backfilling.
- Rack equipment and insulation installation.
- Miscellaneous foundation construction.
- Cable tray and cable tray insulation installation.
- Heat trace installation.
- Evaporation pond fence installation.
- Fire protection system installation.
- Production well development.

There were no high wind events (wind gusts of at least 25 mph) during July 2014. Therefore, there were no work stoppages due to inclement weather during July 2014.

Soil stabilization has been implemented on finished haul roads and delivery areas. In addition, main roads in Beta and Harper Lake Road south of Lockhart Road have been paved. Unfinished areas and haul roads without soil stabilizers are watered daily to mitigate against the formation of fugitive dust. A truck washing station has not been installed. However, rumble plates are installed at all site entrances/exits, and the tires of construction vehicles are inspected for dirt and other debris and swept clean as needed prior to exiting the site onto paved roadways.

AQ-SC5 – Diesel-Fueled Engine Control

Attachment 1 to this letter contains a list of equipment operated onsite during July 2014. The list contains equipment information including manufacturer, model, California Air Resources Board (CARB) Equipment Identification Number (EIN), engine model year, engine horsepower, and U.S. Environmental Protection Agency (USEPA) certified tier level.

The following list summarizes each COC for AQ-SC5 and describes the level of compliance.

- AQ-SC5a: Equipment Tags

  A visible air quality tag with a unique number (AQ #) was issued and adhered to all equipment that arrived onsite between July 1 and July 31, 2014.

- AQ-SC5b: USEPA Engine Tier Requirement

  All construction equipment that arrived onsite between July 1 and July 31, 2014 had Tier 3 engines.

- AQ-SC5c: Retrofit Control Termination

  No equipment with retrofit control technology was brought onsite.

- AQ-SC5d: Maintenance Records

  Maintenance records for all vehicles are available upon request.

- AQ-SC5e: "All diesel heavy construction equipment shall not idle for more than five minutes."

  Idle time was monitored by the activity managers and AQCMM. This condition was met during this reporting period.

- AQ-SC5f: Electric motors

  The use of construction equipment with electric motors was not feasible for current construction activities.

Please feel free to call (714) 435-6268 for questions, clarifications, or additional information.

Sincerely,

CH2M HILL

Christopher Waller
Staff Environmental Engineer
AQCMM Delegate
christopher.waller@ch2m.com

c: Jose Manuel Bravo Romero / Abengoa, AQCMM
Christopher Waller / CH2M HILL, AQCMM Delegate

Attachment 1
Construction Equipment Mojave Solar Project

Construction Equipment for Mojave Solar Project – July 2014 Equipment Inventory									
Manufacturer	**Model**	**EIN**	**Engine Year**	**Horse Power**	**Engine Tier**	**Vehicle Type**	**Date Arrived**	**Date Left Site**	**Comments**
CATERPILLAR	950G	GH6Y78	2005	183	2	Rubber-Tired Loader	2011		GFE Received
DEERE	200D	KF4B33	2011	159	3	Excavator	2011		
CATERPILLAR	CS683E	TX8P94	2005	173	2	Roller	2011		GFE Received
CATERPILLAR	834B	VF5F83	2010	440	3	Rubber-Tired Dozer	2011		
CATERPILLAR	325DL	JB4V37	2006	168	2	Excavator	1/3/2012		GFE Received
DEERE	410J	BB3T68	2011	97	4	Tractor/Loader/Backhoe	1/5/2012		
SKYTRAK	8042	HY9R57	2008	110	3	Forklift	1/23/2012		
CATERPILLAR	651B	JA9X63	2006	540	3	Scraper	3/9/2012		
CATERPILLAR	651B	TR7R75	2006	540	3	Scraper	3/9/2012		
CASE	580_SM	BJ8N36	2007	95	2	Tractor/Loader/Backhoe	4/23/2012		GFE Received
DEERE	310J	DA4B63	2007	75.1	2	Tractor/Loader/Backhoe	4/23/2012		GFE Received
CATERPILLAR	631C	JW5C94	2010	452	3	Scraper	4/23/2012		
CATERPILLAR	140H	HM5E53	2005	165	2	Grader	6/19/2012		GFE Received
DEERE	328	AA9M73	2007	82	2	Skid Steer Loader	8/10/2012		GFE Received
SKYTRAK	8042	KP9P46	2007	110	3	Forklift	8/17/2012		
P&H	453-130	BY3X34	2008	139	3	Crane	9/5/2012		
CATERPILLAR	414E	WJ4X56	2006	92	2	Tractor/Loader/Backhoe	9/5/2012		GFE Received
A&L	210LJ	HK4M87	2011	84	4	Tractor/Loader/Backhoe	10/5/2012		
DEERE	310J	SS4K74	2011	84	4	Tractor/Loader/Backhoe	10/5/2012		
TEREX	RT230-1	TB3E79	2006	130	2	Crane	10/5/2012		GFE Received
GROVE	RT518	XE8V88	2008	142	3	Crane	10/5/2012		

Construction Equipment for Mojave Solar Project – July 2014 Equipment Inventory									
Manufacturer	**Model**	**EIN**	**Engine Year**	**Horse Power**	**Engine Tier**	**Vehicle Type**	**Date Arrived**	**Date Left Site**	**Comments**
TEREX	RT 780	KT4X64	2005	275	2	Crane	10/05/12		GFE Received
TEREX	RT665	NB5R93	2007	215	3	Crane	10/25/2012		
DEERE	310SJ	SP4F87	2011	100	4	Tractor/Loader/Backhoe	10/25/2012		
CATERPILLAR	450E	UB3H55	2008	136	3	Tractor/Loader/Backhoe	10/25/2012		
DIECI	45.17 Icarus	EP4W64	2013	195	4	Rough Terrain Forklift	11/1/2012		
DEERE	210LJ	JW3M53	2011	74	4	Tractor/Loader/Backhoe	11/14/2012		
JLG	G10-55A	WR3G83	2011	130	3	Forklift	11/14/2012		
SKY TRACK	10054	HB6Y56	2012	100	4	Rough Terrain Forklift	11/19/2012		
TEREX	RT780	HR3X86	2006	275	3	Crane	11/19/2012		
GROVE	RT650E	YH5P85	2007	165	3	Crane	11/19/2012		
GENIE	GTH-1056	BJ6A33	2012	139	4	Forklift	11/30/2012		
DEERE	410J	LX6M39	2011	99	4	Tractor/Loader/Backhoe	11/30/2012		
HYSTER	H120FT	NM9Y89	2011	74	4	Forklift	11/30/2012		
JLG	G9-43A	PW7E85	2011	99	4	Forklift	11/30/2012		
GENIE	1056	WG4N88	2010	139	3	Forklift	11/30/2012		
GRADALL	534D9	LG6P89	2011	99	3	Forklift	12/10/2012		
SKY TRAK	10054	YW7Y65	2008	110	3	Forklift	12/10/2012		
CATERPILLAR	315D	BX7C54	2011	115	3	Excavator	12/19/2012		
CATERPILLAR	430E	CT9E46	2011	110	3	Backhoe	12/19/2012		
CATERPILLAR	966H	CU4A75	2008	261	3	Loader	12/19/2012		
JLG	10054	AW6L59	2011	110	3	Forklift	12/27/2012		

Construction Equipment for Mojave Solar Project – July 2014 Equipment Inventory									
Manufacturer	**Model**	**EIN**	**Engine Year**	**Horse Power**	**Engine Tier**	**Vehicle Type**	**Date Arrived**	**Date Left Site**	**Comments**
NEW HOLLAND	B95	DS7V79	2007	95	3	Backhoe	12/27/2012		
TEREX	GTH1056	PP3H77	2011	116	3	Forklift	12/27/2012		
SKYJACK	8042	CE4F84	2008	110	3	Forklift	1/3/2013		
CATERPILLAR	321D	CK7S75	2011	147	3	Excavator	1/3/2013		
TEREX	RT 780	VA3N64	2005	275	3	Crane	1/3/2013		
CATERPILLAR	140M2	XA6E55	2012	264	3	Graders	1/3/2013		
SKYTRAK	8042	HE9X93	2008	110	3	Forklift	1/7/2013		
CATERPILLAR	420F	AE5W73	2012	99.9	3	Backhoe	1/9/2013		
HAMM	3307	GC6S79	2012	74	3	Roller	1/11/2013		
BOMAG	BW177DH	TJ4G76	2010	110	3	Roller	1/11/2013		
CATERPILLAR	420F	AX9E77	2012	99.9	3	Backhoe	1/15/2013		
BOBCAT	S160	KY3G93	2003	56	3	Skid steer	1/15/2013		
KOBELCO	SK70SR	TK3Y36	2005	55	3	Excavator	1/15/2013		
SKYTRAK	10054	WS4M75	2012	100	3	Forklift	1/16/2013		
INGERSOLL - RAND	SD40	WM7E75	2000	80	3	Roller	1/18/2013		
VOLVO	SD100D	AH4W67	2008	130	3	Roller	1/23/2013		
DEERE	210LJ	UC9P95	2011	99.9	3	Backhoe	1/23/2013		
KOMATSU	WA380-6	US8T79	2006	191	3	Loader	1/23/2013		
DEERE	710J	XF3R63	2008	123	3	Backhoe	1/23/2013		
KOMATSU	Fd100t-8	KP8W75	2009	173	3	Forklift	1/23/2013		

Construction Equipment for Mojave Solar Project – July 2014 Equipment Inventory									
Manufacturer	**Model**	**EIN**	**Engine Year**	**Horse Power**	**Engine Tier**	**Vehicle Type**	**Date Arrived**	**Date Left Site**	**Comments**
HYUNDAI	160D-7E	NG7L33	2011	160	3	Forklift	2/2/2013		
DEERE	410J	TF9M89	2007	98	3	Backhoe	2/2/2013		
SKY_TRAK	6036	WK4S78	2006	75	3	Forklift	2/2/2013		
CASE	850L_LGP	MB4W34	2011	99	3	Dozer	2/2/2013		
JLG	G10-55A	LK4C88	2010	101	3	Forklift	2/2/2013		
CATERPILLAR	430F	TP8K57	2012	115.2	3	Backhoe	2/2/2013		
DEERE	210LE	YW3W53	2006	78	3	Backhoe	2/5/2013		
DEERE	135D	YF8D78	2008	97	3	Excavator	2/5/2013		
SKYJACK	VR-843D	UK9H48	2008	110	3	Forklift	2/5/2013		
TEREX	PT100	TT7L43	2010	99.9	3	Loader	2/8/2013		
DEERE	310J	MU8F49	2011	93	3	Backhoe	2/8/2013		
CATERPILLAR	420F	PJ4S33	2012	99.9	3	Backhoe	2/8/2013		
CATERPILLAR	420F	SH5P56	2012	99.9	3	Backhoe	2/11/2013		
OTHER	TJ-5000	MR6P63	2011	220	3	Trucks	2/11/2013		
JLG	G10-55A	KS9K64	2012	250	3	Forklift	2/11/2013		
JLG	G10-55A	Ty9H64	2012	150	3	Aerial Lift	2/11/2013		
HYSTER	H120FT	NM9Y89	2011	74	3	Forklift	2/11/2013		
JLG	660SJ	PC5J79	2012	49	3	Aerial Lift	2/11/2013		
CATERPILLAR	TL943	VT9L56	2011	99	3	Forklift	2/11/2013		
GENIE	Z45/25J	DK3J49	2012	49	3	Aerial Lift	2/19/2013		
TEREX	RT780	VT7C39	2008	275	3	Cranes	2/19/2013		

Construction Equipment for Mojave Solar Project – July 2014 Equipment Inventory									
Manufacturer	**Model**	**EIN**	**Engine Year**	**Horse Power**	**Engine Tier**	**Vehicle Type**	**Date Arrived**	**Date Left Site**	**Comments**
JLG	400S	UV6D76	2006	49	3	Aerial Lift	2/19/2013		
CATERPILLAR	226B3	NS7R98	2011	61	3	Skid-steer-loaders	2/19/2013		
DEERE	135D	YF8D78	2008	97	3	Excavator	2/19/2013		
JLG	G6-42A	TJ4R94	2011	99	3	Forklift	2/19/2013		
GENIE	GTH-5519	JD8F98	2011	67	3	Forklift	3/16/2013		
JLG	10054	CW3C83	2012	85	3	Forklift	3/16/2013		
SKY-TRAK	10054	VA9U73	2008	110	3	Forklift	3/16/2013		
OTHER	XRM1254	EP7D46	2006	122	2	Aerial Lift	3/16/2013		GFE Received
TEREX	RT780	LP9U53	2007	275	3	Cranes	3/16/2013		
HITACHI	ZX300LC	PF9G47	2005	200	2	Excavator	3/16/2013		GFE Received
VOLVO	BL60	BK6U58	2012	83	3	Backhoes	3/18/2013		
JLG	G10-55A	NJ3A43	2013	130	3	Forklift	3/18/2013		
HYSTER	H360HD2	BF6N74	2012	155	3	Forklift	3/18/2013		
GRADALL	544D	MN3Y45	2005	200	2	Forklift	3/19/2013		GFE Received
CASE	580SM/2	SH8S69	2007	95	2	Backhoes	3/22/2013		Onsite but not In use
CARELIFT	ZB20044-44	KV9A38	2011	160	3	Forklift	3/25/2013		
VOLVO	ECR88	RL9G83	2012	57	3	Excavator	3/28/2013		
JLG	G10-55A-CAB	WU9J47	2011	130	3	Forklift	3/28/2013		
CASE	580-SN	RT9H99	2011	97	3	Backhoes	3/29/2013		
JLG	G10-55A	WW6W44	2011	130	3	Forklift	3/29/2013		

Construction Equipment for Mojave Solar Project – July 2014 Equipment Inventory									
Manufacturer	**Model**	**EIN**	**Engine Year**	**Horse Power**	**Engine Tier**	**Vehicle Type**	**Date Arrived**	**Date Left Site**	**Comments**
CATERPILLAR	TL1255	SU4H58	2011	138	3	Forklift	3/29/2013		
HYSTER	H210	KH9A63	2004	195	2	Forklift	3/29/2013		GFE Received
JLG	G6-42A	JT4R94	2011	99	3	Forklift	3/16/2013		
JLG	G10-55A	UB3R85	2007	140	3	Forklift	3/26/2013		
GENIE	TH1056C	HX5Y45	2005	125	2	Forklift	3/29/2013		GFE Received
VOLVO	ERC145DL	RB7E53	2012	114	3	Excavator	4/2/2013		
INGERSOLL-RAND	SD45D/F	ES5C78	2006	80	2	Roller	4/2/2013		GFE Received
VOLVO	SD43D/F	TY8A44	2007	80	2	Paver	4/2/2013		GFE Received
CATERPILLAR	D8T	WJ8T88	2006	310	3	Tractors/Loaders/Backhoes	4/2/2013		
SKY-TRAK	10054	KB9Y73	2012	110	3	Forklift	4/2/2013		
DEERE	200D	AB7M73	2011	159	3	Excavator	4/2/2013		
LIEBHERR	LTM_1220-5.1	AD6Y38	2008	496	3	Crane	4/3/2013		
CATERPILLAR	345DL	EC8J65	2008	410	3	Excavator	4/3/2013		
VOLVO	L90G	UM9N34	2012	161	3	Tractors/Loaders/Backhoes	4/3/2013		
VOLVO	L90G	KR7W43	2012	161	3	Tractors/Loaders/Backhoes	4/3/2013		
VOLVO	SD-100D	VU9S58	2008	130	3	Roller	4/4/2013		
DEERE	JD450JLT	KM3W94	2010	77	3	Other	4/4/2013		
GRADALL	G6-42P	VH3R63	2005	99	2	Other	4/4/2013		GFE Received
GRADALL	G6-42A	AR6S85	2006	99.9	2	Forklift	4/4/2013		GFE Received
KOMATSU	PC400LC-7EO	TA7R86	2006	353	3	Backhoe	4/4/2013		

Construction Equipment for Mojave Solar Project – July 2014 Equipment Inventory									
Manufacturer	**Model**	**EIN**	**Engine Year**	**Horse Power**	**Engine Tier**	**Vehicle Type**	**Date Arrived**	**Date Left Site**	**Comments**
INGERSOLL-RAND	SD116DX	HT4J67	2007	160	3	Roller	4/4/2013		
OTHER	TJ-5000	VG9N57	2012	220	3	Truck	4/5/2013		
TEREX	RT-780	TH9R77	2005	275	2	Other	4/9/2013		GFE Received
MANITOWOC	16000	WC8X98	2010	500	3	Crane	4/11/2013		
TEREX	RT-230	SP8M78	2012	130	3	Crane	4/11/2013		
CATERPILLAR	328D	ME3U69	2010	204	3	Excavator	4/12/2013		
SANY-HEAVY-IND	SRC840_RT	VE4C37	2012	408	3	Crane	4/12/2013		
GENIE	Z45/25J-DSL-4WD	NK9E56	2006	48	2	Aerial Lift	4/17/2013		GFE Received
GENIE	GTH-1056	BG9E85	2012	139	3	Forklift	4/17/2013		
JLG	10054	JR6U95	2008	110	3	Forklift	4/17/2013		
DEERE	318D	LW3B46	2011	76.1	3	Tractors/Loaders/Backhoes	4/17/2013		
SKY-TRAK	SJ46AJ	MY4T53	2012	49	3	Aerial Lift	4/17/2013		
SKY_TRAK	10K_RCHLFT	KV5C43	2007	110	3	Forklifts	5/1/2013		
VOLVO	ECR305CL	VT9L86	2010	205	3	Excavator	5/2/2013		
DEERE	210LJ	UC3K76	2008	99	3	Backhoes	5/2/2013		
TEREX	RT345	JS3S84	2011	160	3	Cranes	5/6/2013		
MASSEY-FERGUSON	6255	GA8S84	2003	93	1	Tractor	5/8/2013	5/16/2013	Offsite
GRADALL	544D	EU9X67	2000	130	1	Forklifts	5/9/2013	5/10/2013	Offsite

Construction Equipment for Mojave Solar Project – July 2014 Equipment Inventory									
Manufacturer	**Model**	**EIN**	**Engine Year**	**Horse Power**	**Engine Tier**	**Vehicle Type**	**Date Arrived**	**Date Left Site**	**Comments**
BOBCAT	T190	WS8X94	2010	66	3	Loaders	5/13/2013		
CATERPILLAR	966H	WM3B35	2007	261	3	Loaders	5/17/2013		
SKY_TRAK	10K_RCHLFT	RA7A36	2007	110	3	Forklifts	5/20/2013		
CATERPILLAR	297C	BT6X94	2007	94	2	Loaders	5/30/2013	6/5/2013	Offsite
CATERPILLAR	TH460B	EH3K78	2005	100	1	Lifts	6/4/2013	6/6/2013	Offsite
SKY_TRAK	10054	CS5E84	2012	100	3	Forklifts	6/5/2013		
JCB	527-55	TJ8X64	2012	75	3	Forklifts	6/5/2013		
LJG	G10-55A	BJ5B48	2012	130	3	Forklifts	6/6/2013		
GEHL	DL11L-55	US9P64	2008	115	3	Forklifts	6/6/2013		
JLG	800S	CY3K64	2007	65	2	Lifts	6/7/2013	6/17/2013	Offsite
DEERE	326D	CX5A73	2011	75	3	Loaders	6/7/2013		
LINK-BELT	RTC 8075	FN9D69	2009	225	3	Cranes	6/7/2013		
JLG	120AJP_125ART	JE6P64	2011	74	3	Lifts	6/7/2013		
SNORKEL	T65RTCU	EG4G76	2008	65	3	Lifts	6/7/2013		
GENIE	Z-80/60J-W/GEN	AX5A64	2010	73	3	Lifts	6/10/2013		
JLG	800AJ	CY4A37	2011	50	3	Lifts	6/10/2013		
DEERE	310SJ	MC7U99	2010	93	3	Backhoes	6/14/2013		
DEERE	544K	SR5B39	2010	167	3	Backhoes	6/14/2013		
DEERE	310SJ	CE6E43	2007	93	2	Backhoes	6/14/2013	6/18/2013	Offsite
CASE	821F	PB4E64	2011	169	3	Backhoes	6/14/2013		

Construction Equipment for Mojave Solar Project – July 2014 Equipment Inventory									
Manufacturer	**Model**	**EIN**	**Engine Year**	**Horse Power**	**Engine Tier**	**Vehicle Type**	**Date Arrived**	**Date Left Site**	**Comments**
GROVE	RT765E-2	LV6V74	2013	240	3	Cranes	6/17/2013		
DEERE	310SG	NA3P73	2006	93	2	Backhoes	6/18/2013	6/19/2013	Offsite
TEREX	RT_780	UA6T98	2006	275	3	Cranes	6/19/2013		
CATERPILLAR	D8T	JB5X88	2004	310	2	Tractors	7/1/2013	7/8/2013	Offsite
KOMATSU	PC308USL_3	WG8P59	2005	189	2	Excavators	7/1/2013	7/9/2013	Offsite
CATERPILLAR	D8T	XF9M63	2006	310	3	Tractors	7/2/2013		
GENIE	Z-13570	YK7C77	2010	74	3	Lifts	7/8/2013		
TEREX	RT555	WS6S45	2005	185	2	Cranes	7/8/2013	7/18/2013	Offsite
SKY JACK	SJ66T	BP6P88	2012	64	3	Lifts	7/11/2013		
JLG	800AJ	CS9L37	2008	62	3	Lifts	7/16/2013		
DEERE	210KEP	BY5Y84	2012	70	3	Backhoes	8/5/2013		
HITACHI	225	AF8C99	2011	159	3	Excavators	8/5/2013		
CATERPILLAR	325DL	AN8W58	2008	204	3	Excavators	8/5/2013		
SKY-TRAK	10054	MM7D49	2007	110	3	Forklifts	9/4/2013		
TEREX	RT780	LD9M99	2007	275	3	Cranes	9/4/2013		
CATERPILLAR	450E	XH8D54	2007	157	3	Backhoes	9/4/2013		
DEERE	210LE	PA4G55	2006	78	2	Backhoes	9/10/2013	9/17/2013	
DEERE	624K	XP9L79	2008	146	3	Loaders	9/10/213		
SKY-TRAK	10054	XK6T97	2004	110	2	Lifts	9/13/2013	10/11/2013	GFE could not be obtained. Equipment was removed from site.

Construction Equipment for Mojave Solar Project – July 2014 Equipment Inventory									
Manufacturer	**Model**	**EIN**	**Engine Year**	**Horse Power**	**Engine Tier**	**Vehicle Type**	**Date Arrived**	**Date Left Site**	**Comments**
SNORKEL	TB-85J	RL5M33	2007	64	2	Lifts	9/13/2013	9/17/2013	
SANY-HEAVY-IND	SRC865-RT	TS5P46	2010	250	3	Cranes	9/13/2013		
JLG	800AJ-80ART-BO	DV7H57	2011	56	3	Lifts	9/17/2013		
JLG	SKYTRK-10K-RCH	SA4S95	2007	110	3	Forklifts	9/17/2013		
LIEBHERR	LR1200SX	AH8E76	2007	362	3	Cranes	9/17/2013		
GENIE	GTH-5519	NA4U95	2012	67	3	Forklifts	9/17/2013		
SKY-TRAK	1054-10,000-RCH	EU8D48	2006	82	2	Forklifts	9/19/2013	10/11/2013	GFE could not be obtained. Equipment was removed from site.
VOLVO	SD45	HE8X95	2011	99	3	Rollers	9/19/2013		
LIEBHERR	LR1200SX	SY5B57	2006	362	3	Cranes	9/19/2013		
DEERE	310SJ	WX9R94	2011	75	3	Backhoes	9/20/2013		
SKY-TRAK	10054	GL9X33	2010	110	3	Forklifts	9/20/2013		
GEHL	DL1240	DV3U39	2013	115	3	Forklifts	9/20/2013		
GRADALL	534D9	WM5W94	2011	110	3	Forklifts	9/23/2013		
SKY-TRAK	8042	EU5S37	2012	71	3	Forklifts	9/23/2013		
JLG	G12-55A	SW6X98	2011	130	3	Forklifts	9/24/2013		
VOLVO	MCT135C	MS7Y68	2011	91	3	Loaders	9/26/2013		
JLG	SKYTRK-10K-RCH	AJ66D98	2007	110	3	Forklifts	9/27/2013		

Construction Equipment for Mojave Solar Project – July 2014 Equipment Inventory									
Manufacturer	**Model**	**EIN**	**Engine Year**	**Horse Power**	**Engine Tier**	**Vehicle Type**	**Date Arrived**	**Date Left Site**	**Comments**
GENIE	Z-80/60	PJ3W77	2008	74	3	Lifts	9/27/2013		
GENIE	GHT-1056	TR6F45	2013	121	3	Forklifts	9/27/2013		
CASE	580N	SX5S95	2011	84	3	Backhoes	10/2/2013		
GROVE	RT880E	BN6H96	2013	275	3	Cranes	10/2/2013		
JLG	G6-42A	XR9V66	2011	69	3	Forklifts	10/2/2013		
CATERPILLAR	TL1255C	DX9N76	2013	141	3	Forklifts	10/4/2013		
JLG	800AJ	MY6J77	2012	62	3	Lifts	10/4/2013		
JLG	G-1055A	LU4S88	2008	125	3	Forklifts	10/7/2013		
JLG	600S	DA7J87	2012	49	3	Lifts	10/7/2013		
Other	XRM1254	NV8S66	2005	122	2	Lifts	10/7/2013	10/17/2013	Offsite
TEREX	RT780	CJ4V77	2012	260	3	Cranes	10/7/2013		
LIEBHERR	LR1200	RA6Y75	2006	362	3	Cranes	10/9/2013		
SKY-TRAK	1054-10,000-RCH	MC9W76	2007	110	3	Forklifts	10/10/2013		
LIEBHERR	LR1200SX	NU9L79	2007	362	3	Cranes	10/10/2013		
CATERPILLAR	430E	FE4P69	2008	95	3	Backhoes	10/16/2013		
SKY-TRAK	8042-CAB	SG3T73	2011	110	3	Forklifts	10/16/2013		
DEERE	310K	WG6W88	2013	56	3	Backhoes	10/16/2013		
JLG	6042	FA7K37	2013	85	3	Forklifts	10/18/2013		
JLG	G5-19A	AB8T34	2006	100	3	Forklifts	10/18/2013		
GENIE	GTH-1056	PL9W36	2013	121	3	Forklifts	10/22/2013		

Construction Equipment for Mojave Solar Project – July 2014 Equipment Inventory									
Manufacturer	**Model**	**EIN**	**Engine Year**	**Horse Power**	**Engine Tier**	**Vehicle Type**	**Date Arrived**	**Date Left Site**	**Comments**
TOYOTA	50-4FDK160	WK4X75	2011	168	3	Forklifts	10/22/2013		
CASE	580N	TX5K58	2011	84	3	Backhoes	10/23/2013		
LINK-BELT	225MSR	KG3E74	2011	163	3	Excavators	10/25/2013		
GENIE	S65	TH8R79	2012	49	3	Lifts	11/4/2013		
JLG	10054	KL5S59	2012	100	3	Forklifts	11/7/2013		
BOMAG	BW120AD_4	VU8F45	2006	34	2	Rollers	11/8/2013	11/15/2013	Offsite
GROVE	TM9120	VC3C38	1993	460	0	Cranes	11/12/2013	11/14/2013	Offsite
CASE	580N	TX5K58	2011	84	3	Backhoes	11/12/2013		
SKY-TRAK	10054	HL8E83	2012	110	3	Forklifts	11/25/2013		
JCB	3CX14-4EC	TP4C93	2011	68	3	Backhoes	11/25/2013		
HYSTER	H360HD	CU5C99	2007	155	3	Forklifts	11/25/2013		
DEERE	310J_EP	TP5F67	2013	70	3	Backhoes	11/26/2013		
JLG	G6-42A	DL9T78	2011	69	3	Forklifts	11/27/2013		
TREX	RT345XL	JS3S84	2011	160	3	Cranes	11/27/2013		
JLG	G10-55A	TY9H64	2012	130	3	Aerial Lifts	12/12/2013		
JLG	G10-55A	UC3F55	2012	174	3	Forklifts	12/12/2013		
JCB	550-170	PW7E59	2012	99	3	Forklifts	12/16/2013		
JLG	800AJ	VD8B84	2013	61.6	3	Aerial Lifts	12/16/2013		
GEHL	DL1155	XB7G76	2013	115	3	Forklifts	12/16/2013		
TEREX	RT450	MT8A46	2011	275	3	Cranes	12/16/2013		
SKY-TRAK	10054	BD7B67	2008	110	3	Forklifts	12/20/2013		

Construction Equipment for Mojave Solar Project – July 2014 Equipment Inventory									
Manufacturer	**Model**	**EIN**	**Engine Year**	**Horse Power**	**Engine Tier**	**Vehicle Type**	**Date Arrived**	**Date Left Site**	**Comments**
JLG	600AJ	WV7C48	2007	65	3	Aerial Lifts	12/23/2013		
GENIE	Z-80	BE5Y85	2010	74	3	Aerial Lifts	12/23/2013		
OTTOWA	TJ-1000	SH9Y35	2010	220	3	Trucks	1/3/2014		
Other	TJ-5000	PV5L96	2007	280	3	Tractors	1/7/2014		
Other	TJ-5000	BY5E66	2007	280	3	Tractors	1/8/2014		
TRAK	8042	UN8Y65	2012	100	3	Forklifts	1/13/2014		
TRAK	10054	HF8X98	2006	110	2	Forklifts	1/18/2014	1/28/2014	Offsite
GEHL	DL 1155	UT5Y35	2012	115	3	Forklifts	1/20/2014		
SKY-TRAK	10054L	DV4V97	2012	100	3	Forklifts	2/3/2014		
JLG	800S	CY3K64	2007	65	2	Lifts	2/5/2014	2/12/2014	Offsite
SKY-TRAK	10054	MX6V88	2013	100	3	Lifts	2/5/2014		
CATERPILLAR	TL 1055C	DT8W55	2012	125	3	Forklifts	2/10/2014		
JLG	10K	PJ9M37	2007	110	3	Forklifts	2/12/2014		
TEREX	RT_780_80TON	MR9U89	2005	275	2	Cranes	2/14/2014	2/19/2014	Offsite
GENIE	GTH_5519	BD9T36	2012	67	3	Forklifts	2/18/2014		
TEREX	TX5519	TU3D58	2006	62	2	Forklifts	2/18/2014	2/25/2014	Offsite
DEERE	210K	AE9V73	2013	56	3	Backhoes	3/10/2014		
JLG	10054	RC6M93	2012	75	3	Forklifts	3/12/2014		
DEERE	310K	NL6C48	2013	130	3	Backhoes	3/12/2014		
CASE	580N	SX5S95	2011	84	3	Backhoes	3/18/2014		
OTHER	TJ-5000	VT5V79	2007	280	3	Tractors	3/20/2014		

Construction Equipment for Mojave Solar Project – July 2014 Equipment Inventory									
Manufacturer	**Model**	**EIN**	**Engine Year**	**Horse Power**	**Engine Tier**	**Vehicle Type**	**Date Arrived**	**Date Left Site**	**Comments**
JLG	C6-42A	TX8D67	2012	100	3	Forklifts	3/20/2014		
OTHER	XRM1254	EK9A69	2008	99	3	Lifts	3/21/2014		
SKY-TRAK	10054	GM7C76	2013	100	3	Forklifts	3/25/2014		
JLG	800AJ	JF5J83	2002	64.5	0	Lifts	3/25/2014	3/28/2014	Offsite
JLG	G6-42A	UH3U65	2011	99	3	Forklifts	3/27/2014		
JCB	930	XN9J99	2011	84	3	Forklifts	3/27/2014		
SKY-TRAK	10054	PY8P48	2012	74	3	Forklifts	5/7/2014		
JLG	6042	JT4H67	2014	85	3	Forklifts	5/7/2014		
SKY-TRAK	10054	XL9A84	2007	110	3	Forklifts	5/8/2014		
GENIE	GTH-1056	YE9N46	2011	114	3	Forklifts	5/9/2014		
JLG	1200SJP	WK5B84	2012	74	3	Boom	5/16/2014		
SKY-TRAK	8042	CH6F45	2013	75	3	Forklifts	6/6/2014		
JCB	930	FR8A79	2012	134	3	Forklifts	7/15/2014		
JLG	1250AJP	KU3R59	2011	82	3	Lifts	7/16/2014		
JLG	Z-135/70	TS4F37	2008	74	3	Lifts	7/16/2014		
Genie	280-60	BE5Y85	2010	74	3	Lifts	7/16/2014		
JCB	510-56	BE8P43	2014	75	3	Forklifts	7/16/2014		
SKY-TRAK	10054	TW6E87	2012	100	3	Forklifts	7/17/2014		
Genie	S45	BP5H59	2012	49	3	Lifts	7/18/2014		

Appendix B
Biological Resources

Mojave Solar Project
Monthly Compliance Report
San Bernardino County, California

July 2014 Reporting Period

Biological Resources
Monthly Monitoring Report
Conditions of Certification
BIO-2, BIO-3, BIO-4, BIO-5, BIO-7, BIO-11, BIO-14, BIO-18

July 2014 Reporting Period

Prepared for:

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August 2014

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1 Introduction

Per the California Energy Commission's (CEC) Abengoa Mojave Solar Project Commission Decision, CEC-800-2010-008-CMF, Docket Number 09-AFC-5C, this monthly compliance report (MCR) summarizes compliance with biological resource protection requirements during construction activities from July 1 through July 31, 2014, on the Mojave Solar Project (MSP) in San Bernardino County, California (see Figure 1, figures are at the end of this report).

This report does not repeat information provided in previous MCRs and assumes environmental compliance was met unless otherwise noted.

As provided in the CEC Final Decision, the following biological conditions of certification (COC) pertaining to monitoring activity covered by this MCR include, but are not limited to:

- BIO-2 Designated Biologist Duties
- BIO-3 Biological Monitor Selection, Qualifications and Duties
- BIO-4 Designated Biologist and Biological Monitor Authority
- BIO-5 Worker Environmental Awareness Program (WEAP)
- BIO-6 Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) Development and Compliance
- BIO-7 Impact Avoidance and Minimization Measures
- BIO-11 Desert Tortoise (*Gopherus agassizii*) Exclusion Fencing, Clearance Surveys, and Translocation Plan
- BIO-14 American Badger (*Taxidea taxus*) and Desert Kit Fox (*Vulpes macrotis*) Impact Avoidance and Minimization Measures
- BIO-18 Common Raven (*Corvus corax)* Monitoring, Management, and Control

This MCR is also being provided to California Department of Fish and Wildlife (CDFW) and United States Fish and Wildlife Service (USFWS).

1.1 Status of Biological Staff

Attachment 1 provides a summary table of the biological staff submitted for approval on this project and the status of their agency approvals. On July 31, five new biological monitors, Jason Brooks, Robert Hernandez, Russell Kokx, Chris McDaniel, and Onkar Singh, were submitted to the CEC for approval. MSP anticipates a sixth biological monitor may be needed, John Brooks Hart who was previously approved as a biological monitor in 2011 (with AECOM) and who conducted clearance surveys. Due to the changing requirements of the project, these individuals will not be submitted to USFWS for approval as desert tortoise Authorized Biologists. Two CEC-approved biological monitors, Mark Bratton and Ed Morgan, are pending USFWS approval as desert tortoise Authorized Biologists.

2 Ongoing Construction Monitoring

This section summarizes biological monitoring activities conducted by CH2M HILL throughout July 2014.

Please refer to sections "Desert Tortoise," "Invasive Weed Species," "Kit Fox and Other Mammals," "Nesting Birds," "Raven Monitoring, Management, and Control," and "Wildlife Injury and Mortalities," and "Observed Species" for specific information about wildlife and plants found by biological monitors in July.

The MSP requires that all onsite staff receive the WEAP training (via DVD) and a brochure prior to start of work. A total of 170 new staff went through WEAP training in July 2014. Attachment 2 provides an ongoing summary table of the project's WEAP attendance and the hard copy sign-in training logs for July 2014.

On a typical construction day, the biological monitor or designated biologist:

- Monitors Harper Dry Lake Road prior to increased morning and afternoon traffic (June through August). Due to desert tortoise observations on Harper Lake Road in June, biological staff monitored the road more often than twice a day during the morning and afternoons and when conditions are optimal for tortoise movement;
- Monitors active construction areas, parking lots, laydown yards, and any areas of potential threat to vegetation, soils, or wildlife;
- Inspects desert tortoise exclusion fences and tortoise guards as required;
- Inspects potential entrapment areas (e.g., trenches, vaults, basins);
- Monitors for formation of potential standing water;
- Inspects kit fox exclusion buffers and downloads motion-sensor cameras at shelter sites;
- Conducts raven observations and point-count surveys;
- Receives reports of hazardous waste spills to the designated biologist;
- Inspects pipes greater than 3 inches in diameter that are less than 8 inches above the ground surface; and
- Performs other special biological-resources-related activities, as required.

2.1 Construction Activities

In July, construction activities occurred in all project sectors, with the highest concentration in the Alpha and Beta power block areas. In Alpha, ground disturbance included various foundations, drilling holes, building construction, water connections, trenching for grounding and water lines, pressure testing and insulating heat transfer fluid (HTF) pipes and cable installation. In Beta, ground disturbance included various foundations, drilling holes, building construction, water connections, trenching for grounding and water lines, pressure testing and insulating HTF pipes and cable installation. Additionally, systematic trash removal by sector continued during the month and maintenance of desert tortoise

guards and exclusion fences occurred on an as-needed basis. The construction schedule includes day and night shifts during the regular work week and limited shifts on weekends.

Due to anticipated overflow pressure discharges, biological staff checked the wetland discharge pipe on a daily basis.

2.1.1 Desert Tortoise Exclusion Fence Repairs

In July, biological staff made comprehensive weekly inspections of the perimeter desert tortoise exclusion fence, which is more frequent than the monthly fence inspections required by BIO-11 and the Biological Opinion.

On July 23, biological staff was notified by construction staff of a hole that had been cut through the perimeter fence, which compromised the desert tortoise exclusion fence. The fence was repaired the same day.

2.2 Rain Events

One rain event occurred on July 28, with constant light drizzle for 3 hours that amounted to approximately 1.3 inches of precipitation. No standing water remained on site grounds the following day, although some water collected in the Alpha and Beta evaporation ponds. A post-rain event fence inspection was conducted and no breaches were found in the exclusion fence.

2.3 Hazardous Material Spills

Several hazardous spills were reported at MSP in July, including fuel and HTF spills. Biological staff were notified and all spills were subsequently cleaned up.

The commissioning team continued using HTF for filling of the Alpha and Beta pipes in July. Due to the hazardous nature of HTF and the environmental concern for prompt cleanup, biological staff worked with Abeinsa EPC (AEPC) to implement a reporting system that would comply with both the BIO-7 requirement that the designated biologist be immediately notified of hazardous materials spills, as well as other project-specific environmental cleanup requirements. The purpose of notifying biological staff immediately is to ensure that cleanup is timely and sufficient to minimize the risk to wildlife. Because drips of HTF were anticipated during the pressure testing phase, and cleanup of hazardous materials is conducted immediately by trained personnel, biological staff agreed that nominal drips that result in approximately 2 pints of soil contamination (about one shovelful) could be reported at the end of the week. Once AEPC reports a spill and the area is opened for safe entry by general construction personnel, then biological staff systematically confirms that cleanup was conducted for each reported spill. AEPC staff will immediately notify biological staff of any hazardous material spill of HTF that is greater than pressure testing drips (approximately one shovelful of contaminated soil) or any other hazardous material.

2.4 Non-compliance Notifications and Reports

There were no formal non-compliance reports (NCR) or notifications issued to MSP in July. Three NCRs are pending formal acceptance of CEC for the implementation of MSP proposed resolutions.

2.4.1 NCR-5: Trash Resolution

Despite improvements to trash disposal, AEPC subcontractors were still out of compliance on trash management in July. Biological staff notified AEPC and Abengoa personnel of the ongoing trash issues in daily meetings. MSP staff was also notified of the increased level of trash in the BLM-managed Area of Critical Environmental Concern (ACEC) and were advised to remove trash from this area. Biological staff are of the opinion that the issues are being slowly resolved.

2.4.2 NCR-6: Wildlife Entrapment Resolution

The wildlife entrapment issue at gate houses was resolved on May 1 upon the issuance of NCR-6. MSP submitted a formal request for review and approval of NCR-6 Resolution on July 10 and are now waiting for the CEC to give formal acceptance of resolution.

2.4.3 NCR-7: Unauthorized Road Use Resolution

On May 16, the CEC accepted the resolution requiring MSP to staff additional security guards at locations where unauthorized road use was occurring, provided that they are sent daily and weekly summary notifications of any unauthorized road use. On June 30, CEC decreased the reporting requirement to weekly updates and only daily if unauthorized road use is observed. No unauthorized road use by MSP personnel was observed in July.

2.5 Compliance Concerns

Biological staff managed several other biological compliance issues. They are described below:

2.5.1 Offsite Parking

Temporary and long-term offsite parking was observed by biological staff in July. MSP staff were observed temporarily parking offsite along Lockhart Road to load and unload shipments, stage construction vehicles, or speak on the phone. Both biological and AEPC staff engaged the operator of the vehicle and instructed them to conduct construction business within the desert tortoise guards or to inspect underneath the vehicle for desert tortoise prior to moving. In cases of long-term storage, when the operator was not present, biological staff deferred to AEPC who flagged the vehicle with a notice of the violation.

2.5.2 Wildlife Entrapment

On June 17, biological staff requested wildlife exclusion netting be placed in both Alpha and Beta power block water treatment plants because construction staff reported seeing birds use this building. By July 7, AEPC installed exclusion netting at both Alpha and Beta water treatment buildings.

2.5.3 Standing Water

In July, several incidents of standing water were observed by biological staff.

Three valves in the Beta power block were observed continuously leaking water, which resulted in small standing water puddles. Construction staff were notified and the issue was resolved by placing gravel underneath the valves, which reduced wildlife access to the standing water. In addition, exclusion netting was placed over the top of the values to stop ravens and other wildlife from drinking from the dripping valves. Construction staff has since replaced the valves, which has stopped the leaks and corrected the issue.

Additionally, a large body of standing water was found in the Alpha East solar field row adjacent to the power block. The water truck filling area was heavily eroding the soil, creating standing water in the adjacent row. Construction staff was notified and the issue was resolved by placing gravel and manually pumping out the water.

Although not a compliance concern, AEPC notified biological staff of water discharge into the Alpha cooling tower basin. Several drowned wildlife species were found in the basin and are discussed further in "Wildlife Injuries and Mortalities" section.

2.6 Desert Tortoise

In July, no construction activities required desert tortoise clearance surveys. No desert tortoises were observed on the project site or any access road to the project in July.

2.7 Invasive Weeds

Two target invasive weeds were observed in July: London rocket (*Sisymbrium irio*) and tamarisk (*Tamarix ramosissima*). Both species are included in the California Invasive Plant Council (Cal-IPC) "high" or "moderate" dispersal or establishment rating and in the project's *Tamarisk Eradication, Monitoring and Reporting Program* (Tamarisk Plan).

Two other weed species, Russian thistle (*Salsola tragus*) and fivehook bassia (*Bassia hyssopifolia*), were also observed onsite. Both of these species have only one of the Cal-IPC dispersal or establishment rating as "high" or "moderate." According to the BIO-16 Tamarisk Plan and guidance provided by CEC staff biologist, Ann Crisp via email on May 28, 2014, these two species are considered "exotic" and MSP must have less than 5 percent of the area infested by exotic species for BIO-16 to meet its success criteria goals. In addition to having exotic species in less than 5 percent of the area at MSP, the overall site expectation from the Tamarisk Plan is that the site will be devoid of vegetation during operations. Therefore, all target noxious weeds and other exotic plant species will ultimately need to be removed.

On July 27, AEPC started applying Roundup, a post-emergent herbicide, on Russian thistle in preparation for facility operations.

2.8 Kit Fox and Other Mammals

As of the end of July, there were seven active kit fox shelter sites, DKF #3, 4, 5, 6, 7, 8, and 9 (Figure 2). DKF #3 through #7 are located within a single exclusion buffer in the Alpha West solar field. DKF #8 is located in a laydown area approximately 500 meters north of the buffer area in Alpha West. DKF #9 is located near some dirt piles in a relatively unused area on the east side of the Alpha East solar field.

Kit fox activity is now concentrated at DKF #8 and DKF #9. DKF #3 through #7 were continuously active throughout July; however, these locations are rarely visited. Cameras recorded consistent activity by two adult kit foxes and their four pups at DKF #8 throughout July. Due to the location of DKF #8—in a heavily trafficked area—MSP staff were advised to follow site rules concerning the storage of materials to minimize use of these materials by wildlife. Cameras also recorded consistent activity by at least one adult and a few pups at DKF#9 throughout July. Due to the nature of the photographic documentation, biological staff have not been able to determine if the same kit fox individuals are using DKF#8 and DKF#9.

Biological staff inspected the integrity of the exclusion buffers and downloaded the motion-sensor camera on a daily basis.

On July 1, 9, 10, 15, 21, 22, 24, 25, 28, 30, and 31, biological staff monitored construction crews working within the 250-foot exclusion buffers. Prior to working within the buffer, construction crews signed a protocol verifying their understanding of correct procedure within the exclusion buffer. Additionally, all construction crews were verbally briefed before entering the buffer. Due to the presence of pups, the biological staff limited construction crews to walking within the buffer and limited driving to less than 5 mph when driving within the exclusion area. Prior to working within the buffer, biological staff checked the motion sensor camera to confirm whether the kit fox were within the shelter site. Depending on the type of construction activity, biological monitors also closed the adjacent solar field perimeter road to ensure that the kit fox would have a clear escape path if they exited the shelter sites.

MSP personnel had several incidental observations of kit fox throughout the site in July (Figure 2).

2.9 Nesting Birds

In July, biological monitors continued to look for potential bird nesting behavior in the Alpha and Beta cooling towers of birds protected by the Migratory Bird Treaty Act (MBTA). No MBTA species were observed nesting in the cooling towers. Biological staff observed use of the area by house sparrows (*Passer domesticus*), which is not an MBTA-protected species.

In July, AEPC notified biological staff of its intent to pump water through the top of Alpha cooling tower in early August. In advance of this activity, biological staff monitored bird

use within the cooling tower for a minimum of one hour each day. Biological staff observed use of the cooling towers by many bird species, but no nesting behavior, even by the house sparrows. Prior to cascading water in the cooling towers, AEPC will coordinate with biological staff to confirm that there are no active bird nests.

2.10 Raven Monitoring, Management, and Control

Common raven monitoring activities continued on the MSP site per BIO-18 and as outlined in the *Common Raven Monitoring, Management and Control Plan* (Raven Plan). The July Monthly Common Raven Monitoring Results provides information on monitoring activities, survey methods, maps, incidental raven observations, point count survey results, and datasheets (Attachment 3).

2.11 Wildlife Injuries and Mortalities

2.11.1 Migratory Bird Treaty Act Protected Species

In July, no injured MBTA-protected species were observed at MSP.

On July 1, a dead common raven, an MBTA-protected species, was found outside of a kit fox burrow in the DKF#9 shelter site in Alpha East (Figure 2). The cause of death is unknown as the carcass had been compromised, presumably by kit fox eating, prior to the time of discovery. The carcass was placed in the onsite freezer.

On July 3, MSP was issued an interim 6-month USFWS *Migratory Bird Special Purpose Utility Salvage Permit – Solar* (SPUT permit) that authorizes project staff to collect, transport, and possess carcasses of species protected by the MBTA. The new MSP SPUT permit expires January 3, 2015.

2.11.2 Special-status Species

On June 28, a juvenile desert kit fox was found dead on Harper Lake Road approximately 1 mile south of the construction site entrance. Since the individual it was killed on a Saturday when agency personnel were not available, biological staff placed the carcass into the onsite freezer. Upon guidance from CDFW, on July 8, biological staff shipped the carcass to a CDFW facility in Sacramento for testing. Biological staff called the facility in early August but the test results were not available yet. When the designated biologist receives the results, they will be reported in the MCR.

2.11.3 Other Species Mortalities

USFWS requests optional reporting of bat injuries and mortalities as part of monthly SPUT report. On July 26, two California myotis (*Myotis californicus*), which are not afforded any state or federal protection, were found dead in the Alpha cooling tower basin standing water (Figure 2). They were presumed to have drowned. The remains were placed in the onsite freezer and were reported in the July SPUT report.

On July 21 and 26, a total of six fledgling house sparrows (*Passer domesticus*) were found dead in the Alpha cooling tower basin standing water. They were presumed to have drowned. The remains were buried offsite by biological staff.

In July, five black-tailed jack rabbits (*Lepus californicus*), and one gopher snake (*Pituophis catenifer)* were found dead on Harper Lake Road. All remains were buried offsite by the biological staff.

2.12 Observed Species

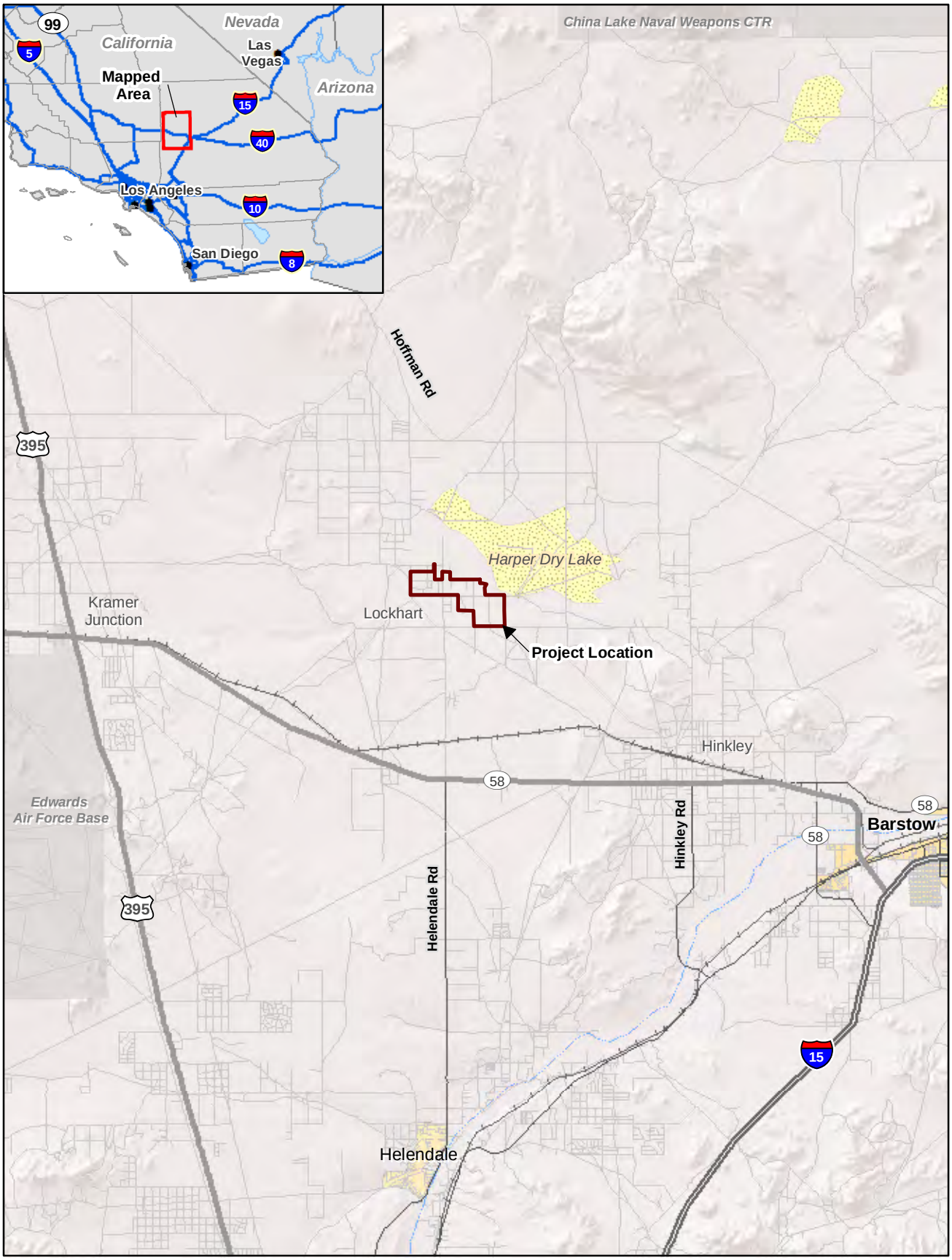
A list of wildlife species observed in July is included in Attachment 4. In addition to desert kit foxes, two additional sensitive species were observed at MSP: loggerhead shrike *(Lanius ludovicianus*), a CDFW Species of Concern, and LeConte's thrasher (*Toxostoma lecontei*), a CDFW Species of Concern and a USFWS Bird of Conservation Concern. Two California invasive wildlife species were also observed at MSP: Eurasian collared dove (*Streptopelia decaocto*) and brown-headed cowbird (*Molothrus ater*).

3 Operations Monitoring

3.1 Evaporation Pond Monitoring

During the transition between construction and operations phases of the project, MSP requested that the CEC allow water discharge into the evaporation ponds during construction and without a final approved Evaporation Pond Management and Monitoring Plan (Evaporation Pond Plan) in place. CEC Compliance Project Manager, Dale Rundquist gave conditional approval for MSP construction to discharge into the evaporation ponds between July 25 and August 8, with the caveat that the Evaporation Pond Plan is submitted to agencies by August 8.

MSP provided the draft monitoring section of the Evaporation Plan to the CEC on July 21. Without a final monitoring plan in place, the designated biologist and approved biological monitors implemented the draft monitoring protocols—biweekly (twice a month) avian point counts—while the Evaporation Pond Plan was being finalized. Avian point counts at the evaporation ponds commenced in August to support operational requirements.



LEGEND

Project Boundary

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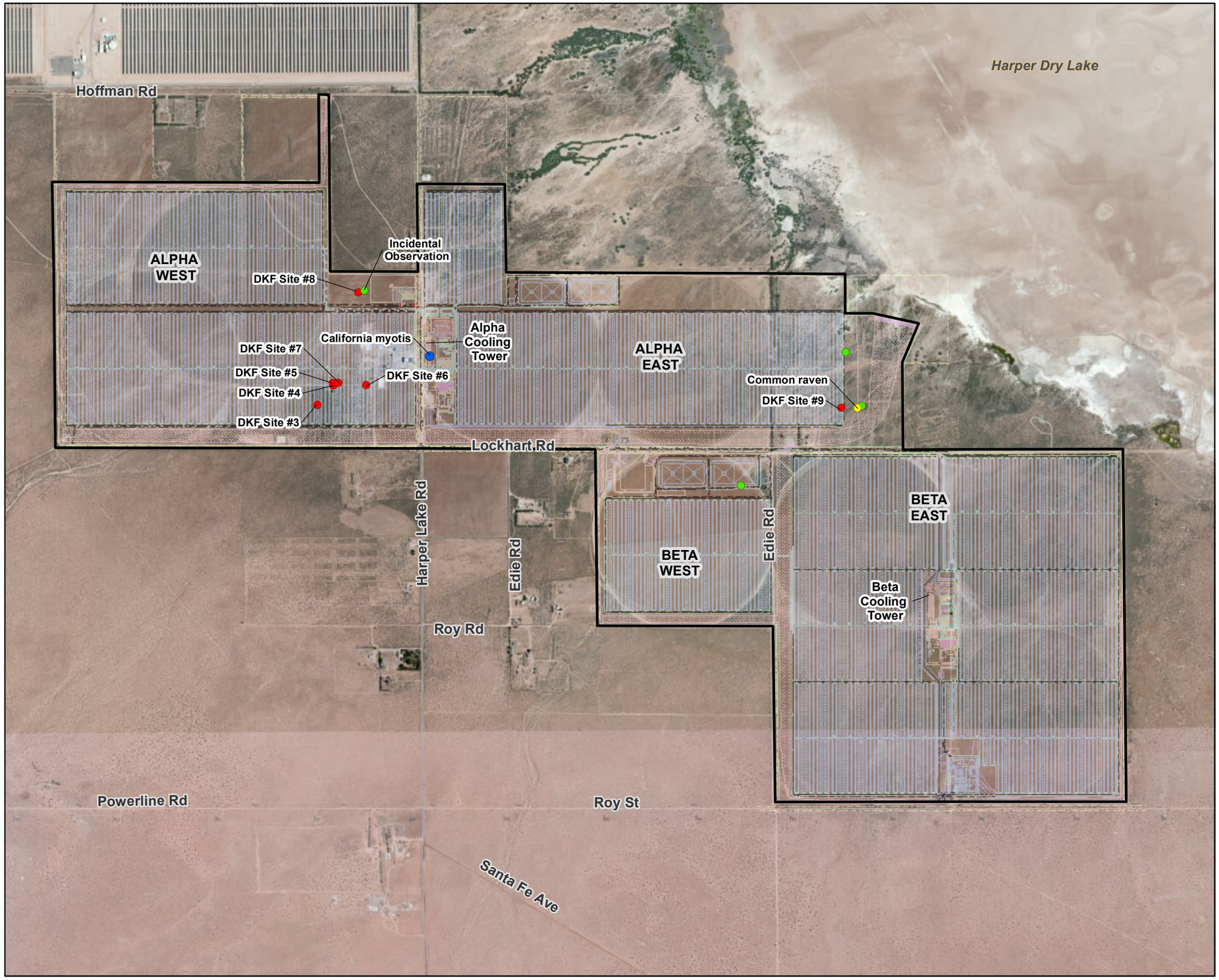
FIGURE 1
Regional Map
Abengoa Mojave Solar Project
San Bernardino County, California



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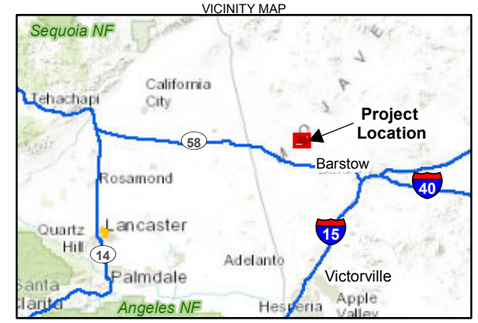

LEGEND

Desert Kit Fox

- Shelter Site (with 250ft Buffer)
- Incidental Observations

Wildlife Mortality

- Common raven
- California myotis

Project Boundary

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Feet

FIGURE 2
Biological Resources, July 2014
Abengoa Mojave Solar Project
San Bernardino County, California

CH2MHILL

Attachment 1
Agency Approval Status of Biological Staff

Agency Approval Status of Biological Monitor and Designated Biologist
Abengoa Mojave Solar Project

Biologist	CEC				CDFW				USFWS	
	BM		DB		BM		DB		AB	
	Submitted	Approved	Submitted	Approved	Submitted	Approved	Submitted	Approved	Submitted	Approved
Brent Finley	5/6/2013	5/9/13	—	—	—	—	—	—	5/14/2013; **Retracted 2/7/14**	NA
Tim Hamaker	5/9/2013	5/9/13	—	—	—		—	—	—	—
Josh Holloway	—	—	5/10/2013	5/13/13 (Alt-DB)	—	—	—	—	5/14/2013	5/20/13
Morgan King	—	—	5/2/2013	5/9/13 (DB)	—	—	—	—	9/4/2013	9/17/13
Linda Sands	5/9/2013	5/9/13	5/2/2013	Denied as Alt-DB 5/9/13	—	—	—	—	5/14/2013; **Retracted 2/7/14**	NA
Bruce Weise			5/10/2013	5/13/13 (Alt-DB)	—	—	—	—	5/14/2013	5/20/13
Amy Trexler	6/21/2013	7/30/13	—	—	—	—	—	—	6/26/2013; **Retracted 2/7/14**	NA
Catherine Wangen	6/21/2013	7/30/13	—	—	—	—	—	—	6/26/2013; **Retracted 2/7/14**	NA
Cindy Newman	6/21/2013	7/30/13	—	—	—	—	—	—	—	—
Susan Carlton	6/21/2013	7/30/13	—	—	—	—	—	—	6/26/2013; **Retracted 2/7/14**	NA

Agency Approval Status of Biological Monitor and Designated Biologist
Abengoa Mojave Solar Project

	CEC				CDFW				USFWS	
	BM		DB		BM		DB		AB	
Biologist	Submitted	Approved	Submitted	Approved	Submitted	Approved	Submitted	Approved	Submitted	Approved
Ursula Rogers (Carliss)	6/21/2013	7/8/13	—	—	—	—	—	—	6/26/2013; Retracted 2/7/14	NA
Eric Somers	7/30/2013	8/6/13	—	—	—	—	—	—	8/19/2013; ; Retracted 2/7/14	NA
Joey Verge	7/30/2013	8/6/2013	—	—	—	—	—	—	3/11/2011	4/4/11
William Clark	8/29/2013	9/4/2013	—	—	—	—	—	—	8/29/2013	9/17/13
Josh Utter	8/29/2013	9/4/2013	—	—	—	—	—	—	—	—
Michael Garvey	8/29/2013	9/4/2013	—	—	—	—	—	—	8/29/2013	9/17/13
Erich Green	3/11/2011	3/11/2011	—	—	—	—	—	—	3/11/2011	4/4/11
Ed Morgan	2/20/2014	3/7/14	—	—	—	—	—	—	2/20/2014	Pending
Mark Bratton	2/20/2014	3/7/14	—	—	—	—	—	—	2/20/2014	Pending
Jason Brooks	7/31/2014	Pending	—	—	—	—	—	—	—	—
Robert Hernandez	7/31/2014	Pending	—	—	—	—	—	—	—	—
Russell Kokx	7/31/2014	Pending	—	—	—	—	—	—	—	—

Agency Approval Status of Biological Monitor and Designated Biologist
Abengoa Mojave Solar Project

Biologist	CEC				CDFW				USFWS	
	BM		DB		BM		DB		AB	
	Submitted	Approved	Submitted	Approved	Submitted	Approved	Submitted	Approved	Submitted	Approved
Chris McDaniel	7/31/2014	Pending	—	—	—	—	—	—	—	—
Onkar Singh	7/31/2014	Pending	—	—	—	—	—	—	—	—
John Brooks Hart	3/11/2011	3/11/2011	3/11/2011 (Alt-DB)	Submitted	—	—	—	—	3/11/2011	3/11/2011

Legend:

CEC= California Energy Commission
CDFW=California Department Fish and Wildlife
USFWS= United States Fish & Wildlife Service
BM= Biological Monitor
AB=Authorized Biologist
Alt-DB = Alternate Designated Biologist
DB=Designated Biologist

Attachment 2
WEAP Summary and Training Logs

WEAP Summary Table through July 30, 2014 Mojave Solar Project	
Month Training Conducted	**Monthly Total of WEAP Attendees***
Mar-11	50
Apr-11	9
May-11	18
Jun-11	2
Jul-11	27
Aug-11	63
Sep-11	82
Oct-11	75
Nov-11	41
Dec-11	68
Jan-12	52
Feb-12	112
Mar-12	116
Apr-12	158
May-12	208
Jun-12	167
Jul-12	156
Aug-12	271
Sep-12	276
Oct-12	268
Nov-12	93
Dec-12	137
Jan-13	183
Feb-13	195
Mar-13	255
Apr-13	295
May-13	408
Jun-13	341
Jul-13	244
Aug-13	187
Sep-13	206

WEAP Summary Table through July 30, 2014 Mojave Solar Project	
Month Training Conducted	**Monthly Total of WEAP Attendees***
Oct-13	387
Nov-13	213
Dec-13	454
Jan-14	642
Feb-14	866
Mar-14	560
Apr-14	376
May-14	428
Jun-14	230
Jul-14	170
Total	9,089
*Attendance is based on training sign-in sheets	

7/1/14

Certification of Completion
Worker Environmental Awareness Program
Mojave Solar Project (09-AFC-5)

This is to acknowledge these individuals have completed a mandatory California Energy Commission-approved Worker Environmental Awareness Program (WEAP). The WEAP includes pertinent information on biological, cultural, and paleontological resources for all personnel (that is, construction supervisors, crews, and plant operators) working on site or at related facilities. By signing below, the participant indicates that he/she understands and shall abide by the guidelines set forth in the program materials. Include this completed form in the Monthly Compliance Report.

No.	Employee Name	Title/Company	Signature
1.	Greg Colacano	Journeyman Abacus	Greg M.
2.	Paul Sinclair	JW Abacus	Paul D. Sinclair
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Biological Trainer: _____ Signature: _____ Date: ___/___/___

Cultural Trainer: _____ Signature: _____ Date: ___/___/___

Paleo Trainer: _____ Signature: _____ Date: ___/___/___

7/2/14

Certification of Completion
Worker Environmental Awareness Program
Mojave Solar Project (09-AFC-5)

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No.	Employee Name	Title/Company	Signature
1.	DAVID STEIN	ABACUS	
2.	DON WILLIAMS	SUMMIT FIRE	
3.	BRIAN AMBERS	ABACUS	
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Cultural Trainer: _____ Signature: _____ Date: ___/___/___

Paleo Trainer: _____ Signature: _____ Date: ___/___/___

7/3/14

Certification of Completion
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Mojave Solar Project (09-AFC-5)

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No.	Employee Name	Title/Company	Signature
1.	Brian Seetoo	I/C Tech	
2.	BETHANY MIRANDA	IC TECH / ABACUS	
3.	Michael Scott	I C Tech / ABACUS	
4.	Evelyn Aguilar	Payroll Coord. / Abacus	
5.	Justin Nugent	Wood Group	
6.	Steve Hutt	Wood Group	
7.	CHRIS HOPKINS	WOOD GROUP	
8.	Steve Weitzer	WOOD Group	
9.	Paul Lane	Wood Group	
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Cultural Trainer: _____ Signature: _____ Date: ___/___/___

Paleo Trainer: _____ Signature: _____ Date: ___/___/___

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No.	Employee Name	Title/Company	Signature
1.	JESSE RAMOS	SUMMIT	
2.	ALBERT CHAVEZ	SUMMIT	
3.	Tim Weathers	HIGH LIGHT	
4.	DEAN GRASS	HIGH LIGHT	
5.	Josh Baker	ABACUS	
6.	Jared Foster	Abacus	
7.	John A. Glaros	ABACUS	
8.	Juan C. Jauregui	ABENGOA SOLAR	
9.	Neil A Anderson	TQS	Neil Anderson
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Biological Trainer: BRUCE ASHMO Signature: [signature] Date: 7-7-14

Cultural Trainer: " Signature: " Date: " / " / "

Paleo Trainer: " Signature: " Date: " / " / "

7/8/14

Certification of Completion
Worker Environmental Awareness Program
Mojave Solar Project (09-AFC-5)

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No.	Employee Name	Title/Company	Signature
1.	Raphael Hidalgo	ABACUS	
2.	ROBERT GURNEE	ECC	
3.	WALLY RIVERA	Operator/Zarp.	
4.	Fred Contreras	High desert Electric	
5.	FERNANDO PEREA	Abengoa Solar	
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Cultural Trainer: _____ Signature: _____ Date: ___/___/___

Paleo Trainer: _____ Signature: _____ Date: ___/___/___

7/9/14

Certification of Completion
Worker Environmental Awareness Program
Mojave Solar Project (09-AFC-5)

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No.	Employee Name	Title/Company	Signature
1.	MARCEL FORTIN	ABACUS	Marcel Fortin
2.	Ever Trujillo	ABACUS	E. Trujillo
3.	MICHAEL EDWARDS	ABACUS	
4.	Drake Ward	Abacus	Drake Ward
5.	BENNY VAUGHT	ABACUS	
6.	Michael Pulley	Abacus	
7.	Vidal QUEANTS	Abacus	
8.	JOSE Ramirez	ABACUS	
9.	Mike Hall	Abacus	
10.	RUBEN GONZALEZ	ABACUS	
11.	HM	"	
12.	Art Diaz	Abacus	
13.	David Martinez	Summit Fire	
14.	Tezadel CMS	Area Supervisor/Abacus	
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Biological Trainer: _____ Signature: _____ Date: ___/___/___

Cultural Trainer: _____ Signature: _____ Date: ___/___/___

Paleo Trainer: _____ Signature: _____ Date: ___/___/___

7/10/14

Certification of Completion
Worker Environmental Awareness Program
Mojave Solar Project (09-AFC-5)

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No.	Employee Name	Title/Company	Signature
1.	Don Wood	Elec/Vista	Don Wood
2.	GREGORY COLLINS	NINYO & MOORE	
3.	JOHN PLATTI	PIPEFITTER/ABACUS	John Platti
4.	Gregory Bell	Pipefitter/ABACUS	Gregory Bell
5.	Phil CAPUL	PIPEFITTER ABACUS	
6.	Danny Sandoval	welder/ABACUS	
7.	HUMBERTO LOPEZ	P/FITTER/ABACUS	
8.	DANNY HYLE	ELEC./ABACUS	
9.	FELIPE SUAREZ	PIPE WELDER	
10.	Valente Rios	Pipe Welder	Valente Rios
11.	Jacob Scheele	BM Abacus	
12.	Luis Miramontes	BM Abacus	
13.	TERRY DODD	PF ABACUS	
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Cultural Trainer: _____ Signature: _____ Date: ___/___/___

Paleo Trainer: _____ Signature: _____ Date: ___/___/___

7/11/14

Certification of Completion
Worker Environmental Awareness Program
Mojave Solar Project (09-AFC-5)

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No.	Employee Name	Title/Company	Signature
1.	Dorian Rowton	High Light	
2.	Daniel Swain	High Light	
3.	James Gutierrez	Highlight	
4.	Jay Girnus	ABECUS	
5.	Alphonso Williams	High Light	
6.	Doroteo G Corrales	Vista Energy	
7.	Jose Luis Gonzalez Pestana	ABEINSA E+C	
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Biological Trainer: _____ Signature: _____ Date: ___/___/___

Cultural Trainer: _____ Signature: _____ Date: ___/___/___

Paleo Trainer: _____ Signature: _____ Date: ___/___/___

7/12/14

Certification of Completion
Worker Environmental Awareness Program
Mojave Solar Project (09-AFC-5)

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No.	Employee Name	Title/Company	Signature
1.	Blake Randolph-Hawk	Woodgroup/Ethos	
2.	Richard Cordova	Woodgroup/Ethos	
3.	Gonzalo Garcia	Ethos/Woodgroup	
4.	Daniel Sevilla	Ethos Energy/Woodgroup	
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Cultural Trainer: _____ Signature: _____ Date: ___/___/___

Paleo Trainer: _____ Signature: _____ Date: ___/___/___

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Worker Environmental Awareness Program
Mojave Solar Project (09-AFC-5)

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No.	Employee Name	Title/Company	Signature
1.	RICK MCMASTERS	BILGLE/MECHANIC	
2.	JUAN Salinas	ABACOS	
3.	Kevin Speck	TECH / ADI	
4.	FRANCISCO RODRIGUEZ	TECH / ADI	
5.	THOMAS R. GONZALES	TECH ADI	
6.	MARIO SARABIA	P.C.I	
7.	ROBERTO LOPEZ	P.C.I	
8.	Raymond Debney	Adargoa	
9.	George AUSTIN	FIELD SERVICE SULZER PUMP	
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Biological Trainer: BRUCE PRATT Signature: [signature] Date: 7/14/14

Cultural Trainer: " Signature: " Date: ___/___/___

Paleo Trainer: " Signature: " Date: ___/___/___

7/15/14

Certification of Completion
Worker Environmental Awareness Program
Mojave Solar Project (09-AFC-5)

This is to acknowledge these individuals have completed a mandatory California Energy Commission-approved Worker Environmental Awareness Program (WEAP). The WEAP includes pertinent information on biological, cultural, and paleontological resources for all personnel (that is, construction supervisors, crews, and plant operators) working on site or at related facilities. By signing below, the participant indicates that he/she understands and shall abide by the guidelines set forth in the program materials. Include this completed form in the Monthly Compliance Report.

No.	Employee Name	Title/Company	Signature
1.	Bruce Swanson	M3 Environ	Bruce Swanson
2.	DeWayne Houston	M3 Environment	DeWayne Houston
3.	Pedro De la Torre	M3 Environment	Pedro de la Torre
4.	Jason Brannon	ABACUS	Jason B
5.	Paul Inman	ABACUS	
6.	Dawit Wasse	ABACUS	Dawit Wasse
7.	Daniel Jordan	ABACUS	Daniel Jordan
8.	Dana Willis	ABACUS	Dana Willis
9.	John Millett	ABACUS	John Millett
10.	Patrick Jorba	ABACUS	Peter B Jorba
11.	Robert Barnes	" "	
12.	Anish Yerramilli	Telvent	Y. Anish
13.	Donald Tin	ABACUS	Donald T
14.	David Fruit	ABACUS	
15.	Don. Velasco	abacus	
16.	Adan Nieto	ABACUS	
17.	Todd Schaeffer	ABACUS	
18.	Jason Carroll	Abacus	
19.	James Martinez	ABACUS	
20.	Mike Autry	Abacus	
21.	Mike Edwards	ABACUS	
22.	Alex Hernandez	ABACUS	
23.	Osbaldo Ornelas	ABACUS	
24.	Benny Vaught	ABACUS	
25.	Sam Freeman	Global Industrial	
26.	Jose Pinedo	ABACUS	
27.	Don Bussey	UNIVAR	
28.	Clyde Fewell	ABB	
29.	Todd E King	ABACUS	
30.			

Biological Trainer: _____ Signature: _____ Date: ___/___/___

Cultural Trainer: _____ Signature: _____ Date: ___/___/___

Paleo Trainer: _____ Signature: _____ Date: ___/___/___

7/16/14

Certification of Completion
Worker Environmental Awareness Program
Mojave Solar Project (09-AFC-5)

This is to acknowledge these individuals have completed a mandatory California Energy Commission-approved Worker Environmental Awareness Program (WEAP). The WEAP includes pertinent information on biological, cultural, and paleontological resources for all personnel (that is, construction supervisors, crews, and plant operators) working on site or at related facilities. By signing below, the participant indicates that he/she understands and shall abide by the guidelines set forth in the program materials. Include this completed form in the Monthly Compliance Report.

No.	Employee Name	Title/Company	Signature
1.	Andrew Bernard	ABACUS	Andrew Bernard
2.	Art Alvarado	Abacus	
3.	Robert Torrez	United Rentals	
4.	Richard Marshall	ABACUS	
5.	Mark Gentry	Summit Fire	
6.	Andres Cruz	ABACUS	Andres Cruz
7.	Joseph Scarficchio	Abacus	
8.	Alin Petruescu	Abacus	
9.	Jim Passaquindici	FCC? (California Centrifugal Pump) Exempt	
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Biological Trainer: _____ Signature: _____ Date: ___/___/___

Cultural Trainer: _____ Signature: _____ Date: ___/___/___

Paleo Trainer: _____ Signature: _____ Date: ___/___/___

Certification of Completion
Worker Environmental Awareness Program
Mojave Solar Project (09-AFC-5)

This is to acknowledge these individuals have completed a mandatory California Energy Commission-approved Worker Environmental Awareness Program (WEAP). The WEAP includes pertinent information on biological, cultural, and paleontological resources for all personnel (that is, construction supervisors, crews, and plant operators) working on site or at related facilities. By signing below, the participant indicates that he/she understands and shall abide by the guidelines set forth in the program materials. Include this completed form in the Monthly Compliance Report.

No.	Employee Name	Title/Company	Signature
1.	Elmer D. Flores	ABACUS	
2.	Daniel Nuñez	Electrician / Morse	Re-Train
3.	Cesar Cervantes	UNIVAR USA.	
4.	Scott McMillin	Summit Companies	
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Biological Trainer: BRUCE ASHMUN Signature: " Date: 7-17-14

Cultural Trainer: " Signature: " Date: ___/___/___

Paleo Trainer: " Signature: " Date: ___/___/___

Certification of Completion
Worker Environmental Awareness Program
Mojave Solar Project (09-AFC-5)

This is to acknowledge these individuals have completed a mandatory California Energy Commission-approved Worker Environmental Awareness Program (WEAP). The WEAP includes pertinent information on biological, cultural, and paleontological resources for all personnel (that is, construction supervisors, crews, and plant operators) working on site or at related facilities. By signing below, the participant indicates that he/she understands and shall abide by the guidelines set forth in the program materials. Include this completed form in the Monthly Compliance Report.

No.	Employee Name	Title/Company	Signature
1.	Aurelio R. Rubalcava	Cable Splicer / Abacus	Aurelio R. Rubalcava
2.	Felix P. Ricarte	Cable Splicer / Abacus	Felix P. Ricarte
3.	James P Staylor	Cable Splicer / Abacus	
4.	RICARDO OIBAJA	CABLE SPLICER/ABACUS	
5.	Anthony Marez	CABLE Splicer/ABACUS	
6.	Albert Zamora	CABLE SPLICER/ABACUS	
7.	JOSELITO RUITLEN	CABLE SPLICER/ABACUS	
8.	JORGE G. RUIZ, SR	CABLE SPLICER/ABACUS	
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Biological Trainer: Bruce Asano Signature: [signature] Date: 7/18/14

Cultural Trainer: " Signature: " Date: / /

Paleo Trainer: " Signature: " Date: / /

Certification of Completion
Worker Environmental Awareness Program
Mojave Solar Project (09-AFC-5)

This is to acknowledge these individuals have completed a mandatory California Energy Commission-approved Worker Environmental Awareness Program (WEAP). The WEAP includes pertinent information on biological, cultural, and paleontological resources for all personnel (that is, construction supervisors, crews, and plant operators) working on site or at related facilities. By signing below, the participant indicates that he/she understands and shall abide by the guidelines set forth in the program materials. Include this completed form in the Monthly Compliance Report.

	No.	Employee Name	Title/Company	Signature
	1.	Aaron McNair	ZARP / Operator	[signature]
ReTraining →	2.	Victor Crawford	ABACUS	[signature]
	3.	Richard Tirado	E) Supervisor (Abacus)	[signature]
Retraining →	4.	Richard Lawler	Superintendent (Abacus)	[signature]
	5.	Michael Glenn	Simosa IT	[signature]
	6.	Eric Hoglund	Vista Energy/Comm	[signature]
	7.	James Nunn	Service Eng / GE	[signature]
	8.	Luis O Santana Avila	Gen of fox	[signature]
	9.	Bradley Gocken	Abacus Steamfitter	[signature]
	10.	Aaron Palms	Vista Energy	[signature]
	11.	Jeffrey Wilson	Abacus/Fitter	[signature]
	12.	Howard Casner	Fitter / Abacus	[signature]
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Biological Trainer: Bruce Asano Signature: [signature] Date: 7-21-14

Cultural Trainer: " Signature: " Date: "

Paleo Trainer: " Signature: " Date: "

7/22/14

Certification of Completion
Worker Environmental Awareness Program
Mojave Solar Project (09-AFC-5)

This is to acknowledge these individuals have completed a mandatory California Energy Commission-approved Worker Environmental Awareness Program (WEAP). The WEAP includes pertinent information on biological, cultural, and paleontological resources for all personnel (that is, construction supervisors, crews, and plant operators) working on site or at related facilities. By signing below, the participant indicates that he/she understands and shall abide by the guidelines set forth in the program materials. Include this completed form in the Monthly Compliance Report.

No.	Employee Name	Title/Company	Signature
1.	Terry Tillerson	ABEINSA EPC	
2.	David Wilson	ABEINSA EPC	
3.	Tim Tran	Abeinsa EPC	
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Biological Trainer: _____ Signature: _____ Date: ___/___/___

Cultural Trainer: _____ Signature: _____ Date: ___/___/___

Paleo Trainer: _____ Signature: _____ Date: ___/___/___

7/24/14

Certification of Completion
Worker Environmental Awareness Program
Mojave Solar Project (09-AFC-5)

This is to acknowledge these individuals have completed a mandatory California Energy Commission-approved Worker Environmental Awareness Program (WEAP). The WEAP includes pertinent information on biological, cultural, and paleontological resources for all personnel (that is construction supervisors, crews, and plant operators) working on site or at related facilities. By signing below, the participant indicates that he/she understands and shall abide by the guidelines set forth in the program materials. Include this completed form in the Monthly Compliance Report.

No.	Employee Name	Title/Company	Signature
1.	William RATH	Serviceman/Flowserve	William Rath
2.	Marcelino Martinez	SE/Flowserve Corp	
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Biological Trainer: _____ Signature: _____ Date: ___/___/___

Cultural Trainer: _____ Signature: _____ Date: ___/___/___

Paleo Trainer: _____ Signature: _____ Date: ___/___/___

7/25/14

Certification of Completion
Worker Environmental Awareness Program
Mojave Solar Project (09-AFC-5)

This is to acknowledge these individuals have completed a mandatory California Energy Commission-approved Worker Environmental Awareness Program (WEAP). The WEAP includes pertinent information on biological, cultural, and paleontological resources for all personnel (that is, construction supervisors, crews, and plant operators) working on site or at related facilities. By signing below, the participant indicates that he/she understands and shall abide by the guidelines set forth in the program materials. Include this completed form in the Monthly Compliance Report.

James Alan Richmond →

No.	Employee Name	Title/Company	Signature
1.	Vista Energy	Lead Elect. Comm. Eng.	James Alan Richmond
2.	Priscilla Rascon	payroll / Abacus	Priscilla Rascon
3.	LORENZO RIVAS	LEF INGENIEROS	L Rivas
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Biological Trainer: _____ Signature: _____ Date: ___/___/___

Cultural Trainer: _____ Signature: _____ Date: ___/___/___

Paleo Trainer: _____ Signature: _____ Date: ___/___/___

Certification of Completion
Worker Environmental Awareness Program
Mojave Solar Project (09-AFC-5)

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No.	Employee Name	Title/Company	Signature
1.	Alex Lowman	Engineer / ABB	[signature]
2.	Thomas Peralta	Laborer / ABACUS	[signature]
3.	Darryl Witt	FHI	[signature]
4.	~~[illegible] NUNEZ V~~	~~ABACUS~~	~~[signature]~~
5.	Thomas Vincent Bursrygum	ABACUS	[signature]
6.	[illegible] FLORES	ABACUS	[signature]
7.	JEREMY CHAVEZ	ABACUS	[signature]
8.	Daniel Ruiz	ABACUS	[signature]
9.	Arturo Madrid	SYNFLEX	Arturo Madrid
10.	Juan D. Lopez	Abacus	[signature]
11.	Alejandro Renteria	Abacus	[signature]
12.	Edwin Mendoza	FHI	[signature]
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Biological Trainer: BRUCE ARMANO Signature: [signature] Date: 7-28-14

Cultural Trainer: " Signature: " Date: / " /

Paleo Trainer: " Signature: " Date: / " /

7/29/14

Certification of Completion
Worker Environmental Awareness Program
Mojave Solar Project (09-AFC-5)

This is to acknowledge these individuals have completed a mandatory California Energy Commission-approved Worker Environmental Awareness Program (WEAP). The WEAP includes pertinent information on biological, cultural, and paleontological resources for all personnel (that is construction supervisors, crews, and plant operators) working on site or at related facilities. By signing below, the participant indicates that he/she understands and shall abide by the guidelines set forth in the program materials. Include this completed form in the Monthly Compliance Report.

No.	Employee Name	Title/Company	Signature
1.	John Cormier	Fisher Summit	
2.	David Donegor	E.C.C	
3.	Iñaki Elorza	Electra Molins	
4.	Andoni Sarachaga	Electra Molins	
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Biological Trainer: _____ Signature: _____ Date: ___/___/___

Cultural Trainer: _____ Signature: _____ Date: ___/___/___

Paleo Trainer: _____ Signature: _____ Date: ___/___/___

7/30/14

Certification of Completion
Worker Environmental Awareness Program
Mojave Solar Project (09-AFC-5)

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No.	Employee Name	Title/Company	Signature
1.	DAVID DUBOIS	DRIVER UNIVAR	
2.	LUIS CRUZ	ABENGOA SOLAR	
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Biological Trainer: _____ Signature: _____ Date: ___/___/___

Cultural Trainer: _____ Signature: _____ Date: ___/___/___

Paleo Trainer: _____ Signature: _____ Date: ___/___/___

7/31/14

Certification of Completion
Worker Environmental Awareness Program
Mojave Solar Project (09-AFC-5)

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No.	Employee Name	Title/Company	Signature
1.	Alfredo Leyva	Rigger / Abacus	
2.	Ruben CANAS	Boilermaker / Abacus	
3.	Savitich Enriquez	Boilermaker/Abacus	
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Biological Trainer: _____ Signature: _____ Date: ___/___/___

Cultural Trainer: _____ Signature: _____ Date: ___/___/___

Paleo Trainer: _____ Signature: _____ Date: ___/___/___

Attachment 3
Monthly Common Raven Monitoring Results

Monthly Common Raven Monitoring Results for Abengoa Mojave Solar Project San Bernardino County, California

Monthly Compliance Report
July 2014

Prepared by:

CH2MHILL

2485 Natomas Park Drive
Sacramento, California 95833

August 2014

Table of Contents

List of Tables

List of Supplements

1.0 Introduction

The Abengoa Mojave Solar Project (MSP) is required to provide a monthly report on common ravens (*Corvus corax*) to the California Energy Commission (CEC), United States Fish and Wildlife Service (USFWS), and California Department of Fish and Wildlife (CDFW). The CEC Final Decision includes Condition of Certification (COC) BIO-18 stating that the project owner shall implement control measures to manage its construction site and related facilities in a manner to control raven populations and to mitigate cumulative and indirect impacts to desert tortoise associated with regional increase in raven numbers. In accordance with BIO-18, the CEC approved the Common Raven Monitoring, Management, and Control Plan (Raven Plan) on March 26, 2012. Refer to BIO-18 and the Raven Plan for monitoring and survey protocol description.

2.0 Construction Monitoring Activities

The following section summarizes biological monitoring activities conducted by CH2M HILL throughout July 2014.

On a typical weekday, one biological monitor or designated biologist:

- Monitors Harper Dry Lake Road prior to increased morning and afternoon traffic (June through August). Due to desert tortoise observations on Harper Lake Road in June, biological staff monitored the road more often than twice a day during the morning and afternoons and when temperatures are optimal for tortoise movement;
- Monitors active construction areas, parking lots, laydown yards, and any areas of potential threat to vegetation, soils, or wildlife;
- Inspects desert tortoise exclusion fences and tortoise guards as required;
- Inspects potential entrapment areas, e.g., trenches;
- Monitors for formation of potential standing water;
- Inspects kit fox exclusion buffers and downloads motion-sensor cameras at shelter sites;
- Conducts raven observations and bi-weekly point counts;
- Reports hazardous waste spills to the designated biologist;
- Inspects pipes greater than 3 inches in diameter that are less than 8 inches above the ground surface; and
- Performs other special biological activities as required.

3.0 Methods

The designated biologist ensures that the biological monitors are trained to implement the Raven Plan in both raven monitoring and management measures. Biological staff also conduct 10-minute stationary point count surveys at seven locations (Supplement 1). The purpose of the point counts is to record raven observations including date, time, location, number of individuals, age, behavior, distance from the station location, and any other

pertinent notes (e.g., nesting behavior). This information is recorded on a hard copy datasheet. Point count surveys are conducted with a minimum of 1 week in between.

Point count surveys were positioned to monitor project-specific activities and features that have potential to attract or subsidize ravens. The Raven Plan defines six "conditions of concern" as:

1. Availability of water from evaporation ponds;
2. Potential creation of new perching/roosting/nesting sites for ravens;
3. Temporary water ponding potential from dust suppression associated with construction, operation, and maintenance;
4. Raven food sources from soil disturbance (rodents, insects, etc.) and road kill associated with construction activity;
5. Human food and waste management; and
6. Landscaping that could provide foraging, perching, and available water opportunities.

During daily monitoring activities, biological staff records incidental observations of ravens interacting with MSP. This includes any raven observation within site boundaries, flying overhead, or adjacent to the site. These observations are recorded in field notebooks and include date, general site location, global positioning system (GPS) location, number of individuals, and activity. The GPS information is also presented on a map.

The incidental observations are also used to identify potential problem areas. Problem areas are those requiring management actions. If a problem area is identified, the surveys will be increased to a weekly basis until the issue is resolved. Habitual perching sites will be identified and actions taken to discourage use. If hazing techniques are employed to discourage raven use, biologists will record information on date, time, location, habitat, number of individuals, and response to hazing. Potential or active raven nests will be documented and removed according to Raven Plan specifications. Biological staff will report on whether control measures are working and provide further recommendations in the biological monthly compliance report.

4.0 Results

Incidental Observations

In July, ravens were observed foraging on food waste in the power block and solar fields, and drinking from construction-related supplemental water sources. Construction staff was notified of these issues and biological staff continues to monitor the situation.

During biological monitoring, 50 ravens were incidentally observed during 36 separate observations (Table 1). Because ravens are indistinguishable from one another, multiple sightings of individual birds likely occur. Therefore, the number of observations does not reflect the number of individual birds onsite. Common ravens were observed throughout the site (Supplement 2). The most common raven behavior observed was flying overhead. Many ravens were observed around the Alpha and Beta access roads and power block, as well as the Alpha West staging area. Ravens were also observed perched on fences and various transmission line poles, but were not using a habitual perch location.

Table 1 July 2014 Incidental Raven Observations			
Date	**Location**	**Number Observed**	**Activity**
7/1/14	Alpha East	2	Walking
7/2/14	Alpha East	2	Foraging
7/2/14	Alpha East	2	Flying
7/3/14	Alpha East	1	Perched
7/7/14	Alpha East	2	Flying
7/8/14	Alpha West	1	Flying
7/8/14	Beta East	1	Perched
7/9/14	Alpha West	1	Perched
7/9/14	Alpha West	1	Flying
7/9/14	Beta East	2	Flying
7/9/14	Beta West	1	Perched
7/9/14	Alpha West	1	Flying
7/11/14	Beta East	2	Perched
7/11/14	Beta West	1	Flying
7/12/14	Beta East	4	Flying
7/14/14	Alpha East	1	Flying
7/14/14	Beta East	1	Flying
7/14/14	Alpha East	1	Foraging
7/14/14	Alpha West	1	Flying
7/15/14	Beta East	1	Flying
7/16/14	Alpha East	1	Perched
7/17/14	Beta East	1	Flying
7/21/14	Alpha East	2	Walking
7/21/14	Beta East	2	Walking
7/21/14	Alpha West	1	Flying
7/22/14	Alpha East	1	Flying
7/22/14	Beta East	2	Perched
7/22/14	Beta West	1	Flying

Table 1 July 2014 Incidental Raven Observations			
Date	**Location**	**Number Observed**	**Activity**
7/23/14	Alpha East	1	Perched
7/24/14	Alpha West	1	Flying
7/25/14	Alpha West	2	Flying
7/27/14	Beta West	1	Foraging
7/27/14	Alpha West	1	Flying
7/28/14	Alpha East	1	Flying
7/28/14	Beta West	2	Flying
7/28/14	Alpha East	1	Foraging
Total Observations		50	

Point Count Surveys

In July, two biweekly point count surveys were conducted in accordance with the Raven Plan protocol. Point count surveys were conducted on July 5 and July 26, 2014. On July 5, one raven was observed at station 3. On July 26, no ravens were observed. Point count observations did not document any nesting behavior or problem areas. The Common Raven Fixed Point Observation Data Sheets are provided in Supplement 3.

Table 2 provides a summary of point count observations.

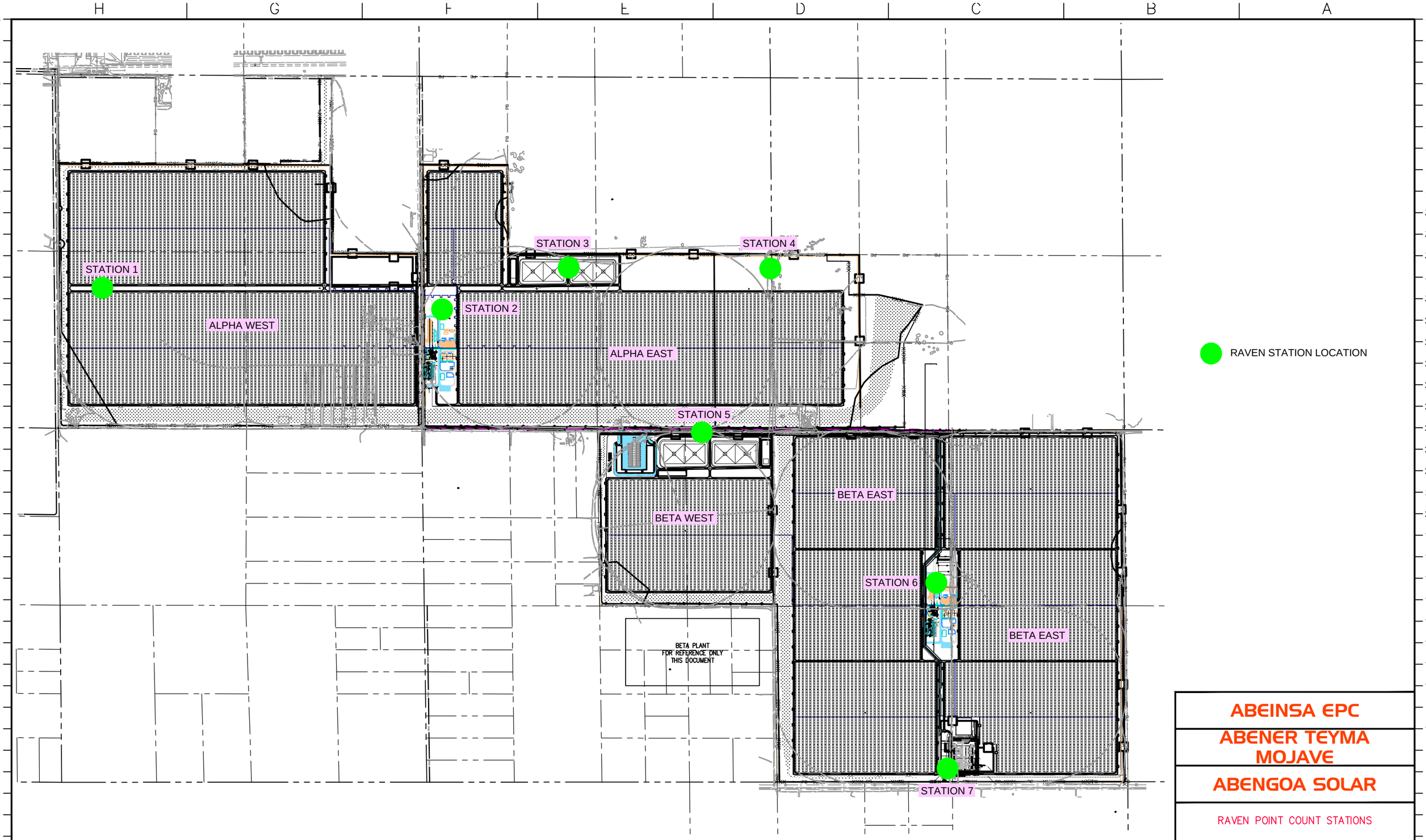
Table 2 Summary of Common Raven Point Count Observations				
Date: Time	**Station**	**Number of Ravens Observed**	**Location Description**	**Activity Observed**
7/5/2014: 09:03	#3	1	Alpha East	Flying
Total Observed 7/5/14		**1**		
Total Observed 7/26/2014		**0**		

Nest Monitoring

According to the Raven Plan, biweekly breeding raven nest surveys were not required in July. These surveys will commence again in March 2015.

Monthly Common Raven Monitoring Results
July 2014

Supplement 1—Common Raven Point Count Stations



1/25/13	For Monitoring
ISSUE DATE	PURPOSE OF ISSUE

PE STAMP

Plot Date/Time/User: 25-Jan-13/9:55 AM/TEGUR

ABEINSA EPC

ABENER TEYMA MOJAVE

ABENGOA SOLAR

RAVEN POINT COUNT STATIONS

MOJAVE SOLAR, LLC — HINKLEY, CALIFORNIA

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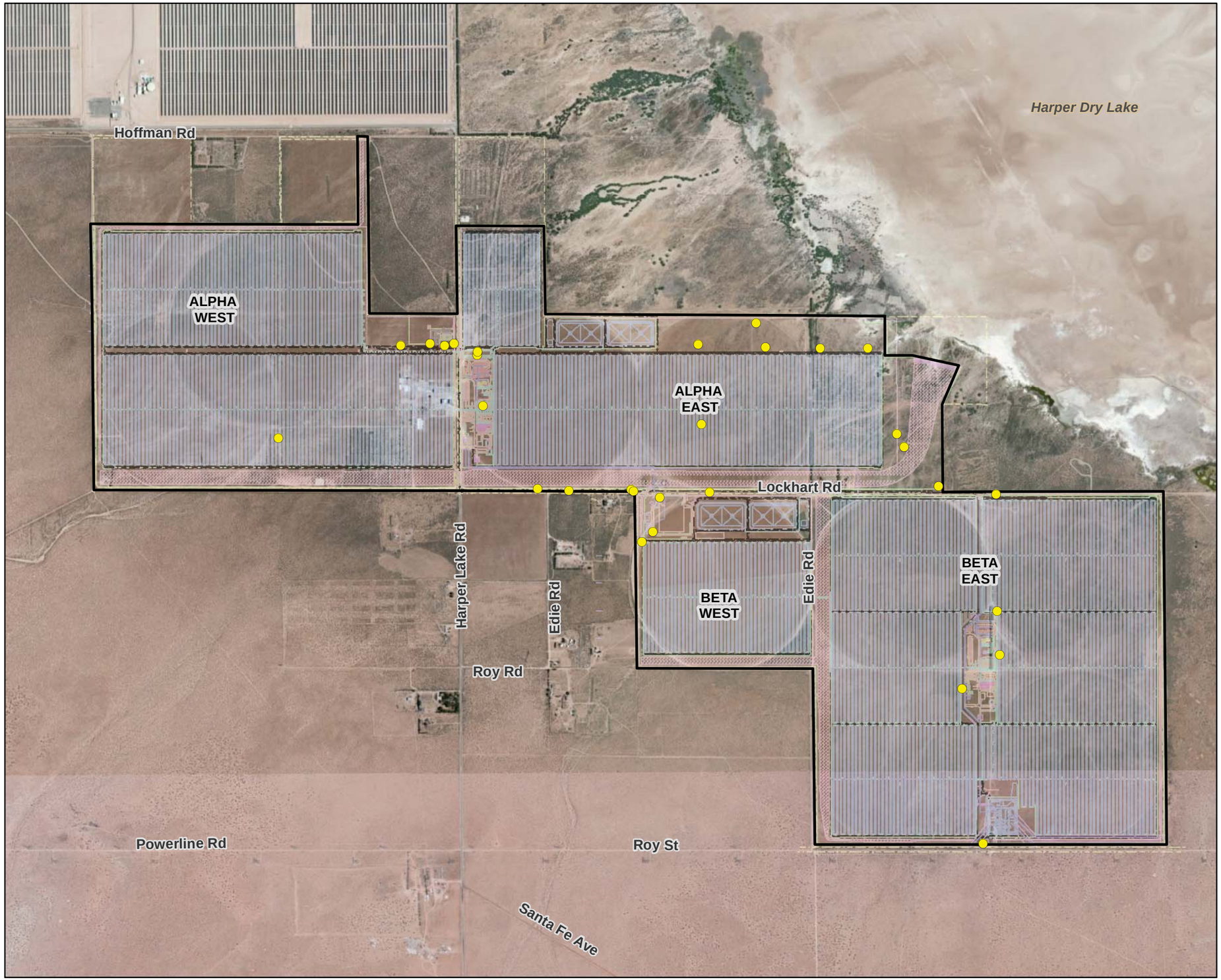
Monthly Common Raven Monitoring Results
July 2014

Supplement 2—Incidental Common Raven Observations



LEGEND

Common Raven

- Incidental Observations

Project Boundary

N

0 750 1,500

Feet

Supplement 2
Incidental Common Raven Observations, July 2014

Abengoa Mojave Solar Project

San Bernardino County, California

CH2MHILL

Monthly Common Raven Monitoring Results
July 2014

Supplement 3—Point Count Data Sheets

Mojave Solar

Common Raven Fixed Point Observation Data Sheet

Date (mm/dd/yy) 7/5/14 Observer (init.) JRV Start Time 0835 End Time 0845 Obs Pt. (1)

Page 1 of 7

Visibility: (Clear) or Min ____ Max ____ (m)

Wind Direction from (circle one): Calm N NE E SE S (SW) W NW Variable | Speed: (Low) ____ High ____ (km/h)

Precipitation (circle one): (none) light rain rain snow sleet hail fog other | Temp: 86 (°F) | Cloud Cover: 45 %

Obs #	Time	Sex	Age	# of birds	Activity (circle 1st, X others)	Flight Dir (to)	Horizontal Distance (m) 1st	Horizontal Distance (m) closest	Habitat Type/ Perch Structure	Aud?	Vis?	Notes
1					WA PE FL OT							
2					WA PE FL OT							NONE
3					WA PE FL OT							
4					WA PE FL OT							
5					WA PE FL OT							OBSERVED
6					WA PE FL OT							
7					WA PE FL OT							
8					WA PE FL OT							
9					WA PE FL OT							
10					WA PE FL OT							
11					WA PE FL OT							
12					WA PE FL OT							

Activity Codes: WA-walking on ground, PE-perched above ground, FL-flying, OT-other (please specify)

Habitat Codes: CBS-Creosote Bush Scrub, SD/SS-Sand Dunes/Sand Sheets, DP-Desert Pavement, OT-other (please specify, provide details of Project structure/facility)

OBS. # (Time)	ADDITIONAL NOTES

Mojave Solar

Common Raven Fixed Point Observation Data Sheet

Date (mmddyy) 7/5/14 Observer (init.) JRV Start Time 0847 End Time 0857 Obs Pt. (2)

Page 2 of 7

Visibility: (Clear) or Min ____ Max ____ (m)

Wind Direction from (circle one): Calm N NE E SE S (SW) W NW Variable Speed: (Low) High ____ (km/h)

Precipitation (circle one): (none) light rain rain snow sleet hail fog other Temp: 86 (°F) Cloud Cover: 45 %

Obs #	Time	Sex	Age	# of birds	Activity (circle 1st, X others)	Flight Dir (to)	Horizontal Distance (m) 1st	Horizontal Distance (m) closest	Habitat Type/ Perch Structure	Aud?	Vis?	Notes
1					WA PE FL OT							NONE OBSERVED
2					WA PE FL OT							
3					WA PE FL OT							
4					WA PE FL OT							
5					WA PE FL OT							
6					WA PE FL OT							
7					WA PE FL OT							
8					WA PE FL OT							
9					WA PE FL OT							
10					WA PE FL OT							
11					WA PE FL OT							
12					WA PE FL OT							

Activity Codes: WA-walking on ground, PE-perched above ground, FL-flying, OT-other (please specify)

Habitat Codes: CBS-Creosote Bush Scrub, SD/SS-Sand Dunes/Sand Sheets, DP-Desert Pavement, OT-other (please specify, provide details of Project structure/facility)

OBS. # (Time)	ADDITIONAL NOTES

Mojave Solar

Common Raven Fixed Point Observation Data Sheet

Date (mm/dd/yy) 7/5/14 Observer (init.) JRV Start Time 0900 End Time 0910 Obs Pt. (3)

Page 3 of 7

Visibility: (clear) or Min ____ Max ____ (m)

Wind Direction from (circle one): (calm) N NE E SE S (SW) W NW Variable Speed: (low) High ____ (km/h)

Precipitation (circle one): (none) light rain rain snow sleet hail fog other Temp: 86 (°F) Cloud Cover: 45 %

Obs #	Time	Sex	Age	# of birds	Activity (circle 1st, X others)		Flight Dir (to)	Horizontal Distance (m) 1st	closest	Habitat Type/ Perch Structure	Aud?	Vis?	Notes
1	0903	♂	A	1	WA	PE	E	200	200	SITE	N	Y	
					(FL)	OT							
2					WA	PE							
					FL	OT							
3					WA	PE							
					FL	OT							
4					WA	PE							
					FL	OT							
5					WA	PE							
					FL	OT							
6					WA	PE							
					FL	OT							
7					WA	PE							
					FL	OT							
8					WA	PE							
					FL	OT							
9					WA	PE							
					FL	OT							
10					WA	PE							
					FL	OT							
11					WA	PE							
					FL	OT							
12					WA	PE							
					FL	OT							

Activity Codes: WA-walking on ground, PE-perched above ground, FL-flying, OT-other (please specify)
Habitat Codes: CBS-Creosote Bush Scrub, SD/SS-Sand Dunes/Sand Sheets, DP-Desert Pavement, OT-other (please specify, provide details of Project structure/facility)

OBS. # (Time)	ADDITIONAL NOTES

Mojave Solar

Common Raven Fixed Point Observation Data Sheet

Date (mmddyy) 7/5/14 Observer (init.) SRV Start Time 0912 End Time 0922 Obs Pt. (4)

Page 4 of 7

Visibility: (Clear) or Min _____ Max _____ (m)

Wind Direction from (circle one): Calm N NE E SE S (SW) W NW Variable | Speed: (Low) ____ High ____ (km/h)

Precipitation (circle one): (none) light rain rain snow sleet hail fog other | Temp: 86 (°F) | Cloud Cover: 45 %

Obs #	Time	Sex	Age	# of birds	Activity (circle 1st, X others)	Flight Dir (to)	Horizontal Distance (m) 1st	Horizontal Distance (m) closest	Habitat Type/ Perch Structure	Aud?	Vis?	Notes
1					WA PE FL OT							NONE
2					WA PE FL OT							
3					WA PE FL OT							
4					WA PE FL OT							OBSERVED
5					WA PE FL OT							
6					WA PE FL OT							
7					WA PE FL OT							
8					WA PE FL OT							
9					WA PE FL OT							
10					WA PE FL OT							
11					WA PE FL OT							
12					WA PE FL OT							

Activity Codes: WA-walking on ground, PE-perched above ground, FL-flying, OT-other (please specify)

Habitat Codes: CBS-Creosote Bush Scrub, SD/SS-Sand Dunes/Sand Sheets, DP-Desert Pavement, OT-other (please specify, provide details of Project structure/facility)

OBS. # (Time)	ADDITIONAL NOTES

Mojave Solar

Common Raven Fixed Point Observation Data Sheet

Date (mmddyy) 7/5/14 Observer (init.) SRV Start Time 0927 End Time 0937 Obs Pt. (5)

Page 5 of 7

Visibility: (Clear) or Min ____ Max ____ (m)

Wind Direction from (circle one): Calm N NE E SE S (SW) W NW Variable Speed: (Low) High ____ (km/h)

Precipitation (circle one): (none) light rain rain snow sleet hail fog other Temp: 86 (°F) Cloud Cover: 45 %

Obs #	Time	Sex	Age	# of birds	Activity (circle 1st, X others)	Flight Dir (to)	Horizontal Distance (m) 1st	Horizontal Distance (m) closest	Habitat Type/ Perch Structure	Aud?	Vis?	Notes
1					WA PE FL OT							
2					WA PE FL OT							NONE
3					WA PE FL OT							
4					WA PE FL OT							
5					WA PE FL OT							OBSERVED
6					WA PE FL OT							
7					WA PE FL OT							
8					WA PE FL OT							
9					WA PE FL OT							
10					WA PE FL OT							
11					WA PE FL OT							
12					WA PE FL OT							

Activity Codes: WA-walking on ground, PE-perched above ground, FL-flying, OT-other (please specify)
Habitat Codes: CBS-Creosote Bush Scrub, SD/SS-Sand Dunes/Sand Sheets, DP-Desert Pavement, OT-other (please specify, provide details of Project structure/facility)

OBS. # (Time)	ADDITIONAL NOTES

Mojave Solar

Common Raven Fixed Point Observation Data Sheet

Date (mmddyy) 7/5/14 Observer (init.) JRV Start Time 0941 End Time 0951 Obs Pt. (6)

Page 6 of 7

Visibility: (Clear) or Min ____ Max ____ (m)

Wind Direction from (circle one): Calm N NE E SE S (SW) W NW Variable Speed: (Low) ____ High ____ (km/h)

Precipitation (circle one): (none) light rain rain snow sleet hail fog other Temp: 86 (°F) Cloud Cover: 45 %

Obs #	Time	Sex	Age	# of birds	Activity (circle 1st, X others)	Flight Dir (to)	Horizontal Distance (m) 1st	Horizontal Distance (m) closest	Habitat Type/ Perch Structure	Aud?	Vis?	Notes
1					WA PE FL OT							
2					WA PE FL OT							NONE
3					WA PE FL OT							
4					WA PE FL OT							OBSERVED
5					WA PE FL OT							
6					WA PE FL OT							
7					WA PE FL OT							
8					WA PE FL OT							
9					WA PE FL OT							
10					WA PE FL OT							
11					WA PE FL OT							
12					WA PE FL OT							

Activity Codes: WA-walking on ground, PE-perched above ground, FL-flying, OT-other (please specify)

Habitat Codes: CBS-Creosote Bush Scrub, SD/SS-Sand Dunes/Sand Sheets, DP-Desert Pavement, OT-other (please specify, provide details of Project structure/facility)

OBS. # (Time)	ADDITIONAL NOTES

Mojave Solar

Common Raven Fixed Point Observation Data Sheet

Date (mmddyy) 7/5/14 Observer (init.) JRV Start Time 0952 End Time 1002 Obs Pt. (7)

Page 7 of 7

Visibility: (Clear) or Min _____ Max _____ (m)

Wind Direction from (circle one): Calm N NE E SE S (SW) W NW Variable Speed: (Low) High ____ (km/h)

Precipitation (circle one): (none) light rain rain snow sleet hail fog other Temp: 86 (°F) Cloud Cover: 45 %

Obs #	Time	Sex	Age	# of birds	Activity (circle 1st, X others)	Flight Dir (to)	Horizontal Distance (m) 1st	Horizontal Distance (m) closest	Habitat Type/ Perch Structure	Auc?	Vis?	Notes
1					WA PE FL OT							NONE
2					WA PE FL OT							
3					WA PE FL OT							
4					WA PE FL OT							OBSERVED
5					WA PE FL OT							
6					WA PE FL OT							
7					WA PE FL OT							
8					WA PE FL OT							
9					WA PE FL OT							
10					WA PE FL OT							
11					WA PE FL OT							
12					WA PE FL OT							

Activity Codes: WA-walking on ground, PE-perched above ground, FL-flying, OT-other (please specify)

Habitat Codes: CBS-Creosote Bush Scrub, SD/SS-Sand Dunes/Sand Sheets, DP-Desert Pavement, OT-other (please specify, provide details of Project structure/facility)

OBS. # (Time)	ADDITIONAL NOTES

Mojave Solar

Common Raven Fixed Point Observation Data Sheet

Date (mmddyy) 7/26/14 Observer (init.) JKV Start Time 0815 End Time 0825 Obs Pt. (1)

Visibility: Clear or Min _____ Max _____ (m) Page 1 of 7

Wind Direction from (circle one): Calm N NE E SE S (SW) W NW Variable Speed: (Low) High ____ (km/h)

Precipitation (circle one): (none) light rain rain snow sleet hail fog other Temp: 83 (°F) Cloud Cover: 45 %

Obs #	Time	Sex	Age	# of birds	Activity (circle 1st, X others)	Flight Dir (to)	Horizontal Distance (m) 1st	Horizontal Distance (m) closest	Habitat Type/ Perch Structure	Aud?	Vis?	Notes
1					WA PE FL OT							NONE
2					WA PE FL OT							OBSERVED
3					WA PE FL OT							
4					WA PE FL OT							
5					WA PE FL OT							
6					WA PE FL OT							
7					WA PE FL OT							
8					WA PE FL OT							
9					WA PE FL OT							
10					WA PE FL OT							
11					WA PE FL OT							
12					WA PE FL OT							

Activity Codes: WA-walking on ground, PE-perched above ground, FL-flying, OT-other (please specify)
Habitat Codes: CBS-Creosote Bush Scrub, SD/SS-Sand Dunes/Sand Sheets, DP-Desert Pavement, OT-other (please specify, provide details of Project structure/facility)

OBS. # (Time)	ADDITIONAL NOTES

Mojave Solar

Common Raven Fixed Point Observation Data Sheet

Date (mm/dd/y) 7/26/14 Observer (init.) JRV Start Time 0838 End Time 0848 Obs Pt. (2)

Page 2 of 7

Visibility: ~~Clear~~ or Min ____ Max ____ (m)

Wind Direction from (circle one): Calm N NE E SE S (SW) W NW Variable Speed: (Low) High ____ (km/h)

Precipitation (circle one): (none) light rain rain snow sleet hail fog other Temp: 84 (°F) Cloud Cover: 45 %

Obs #	Time	Sex	Age	# of birds	Activity (circle 1st, X others)	Flight Dir (to)	Horizontal Distance (m) 1st	Horizontal Distance (m) closest	Habitat Type/ Perch Structure	Aud?	Vis?	Notes
1					WA PE FL OT							
2					WA PE FL OT							
3					WA PE FL OT							
4					WA PE FL OT							
5					WA PE FL OT							
6					WA PE FL OT							
7					WA PE FL OT							
8					WA PE FL OT							
9					WA PE FL OT							
10					WA PE FL OT							
11					WA PE FL OT							
12					WA PE FL OT							

NONE OBSERVED

Activity Codes: WA-walking on ground, PE-perched above ground, FL-flying, OT-other (please specify)

Habitat Codes: CBS-Creosote Bush Scrub, SD/SS-Sand Dunes/Sand Sheets, DP-Desert Pavement, OT-other (please specify, provide details of Project structure/facility)

OBS. # (Time)	ADDITIONAL NOTES

Mojave Solar

Common Raven Fixed Point Observation Data Sheet

Date (mmddyy) 7/26/14 Observer (init.) JBV Start Time 0849 End Time 0859 Obs Pt. (3)

Page 3 of 7

Visibility: (Clear) or Min _____ Max _____ (m)

Wind Direction from (circle one): Calm N NE E SE S (SW) W NW Variable Speed: (Low) High ____ (km/h)

Precipitation (circle one): (none) light rain rain snow sleet hail fog other Temp: 84 (°F) Cloud Cover: 45 %

Obs #	Time	Sex	Age	# of birds	Activity (circle 1st, X others)	Flight Dir (to)	Horizontal Distance (m) 1st	Horizontal Distance (m) closest	Habitat Type/ Perch Structure	Aud?	Vis?	Notes
1					WA PE FL OT							
2					WA PE FL OT							NONE OBSERVED
3					WA PE FL OT							
4					WA PE FL OT							
5					WA PE FL OT							
6					WA PE FL OT							
7					WA PE FL OT							
8					WA PE FL OT							
9					WA PE FL OT							
10					WA PE FL OT							
11					WA PE FL OT							
12					WA PE FL OT							

Activity Codes: WA-walking on ground, PE-perched above ground, FL-flying, OT-other (please specify)
Habitat Codes: CBS-Creosote Bush Scrub, SD/SS-Sand Dunes/Sand Sheets, DP-Desert Pavement, OT-other (please specify, provide details of Project structure/facility)

OBS. # (Time)	ADDITIONAL NOTES

Mojave Solar

Common Raven Fixed Point Observation Data Sheet

Date (mmddyy) 7/26/14 Observer (init.) SRV Start Time 0901 End Time 0911 Obs Pt. (4)

Page 4 of 7

Visibility: Clear or Min _____ Max _____ (m)

Wind Direction from (circle one): Calm N NE E SE S (SW) W NW Variable Speed: (Low) High ____ (km/h)

Precipitation (circle one): (none) light rain rain snow sleet hail fog other Temp: 84 (°F) Cloud Cover: 45 %

Obs #	Time	Sex	Age	# of birds	Activity (circle 1st, X others)	Flight Dir (to)	Horizontal Distance (m) 1st	closest	Habitat Type/ Perch Structure	Aud?	Vis?	Notes
1					WA PE FL OT							
2					WA PE FL OT							
3					WA PE FL OT							
4					WA PE FL OT							
5					WA PE FL OT							
6					WA PE FL OT							
7					WA PE FL OT							
8					WA PE FL OT							
9					WA PE FL OT							
10					WA PE FL OT							
11					WA PE FL OT							
12					WA PE FL OT							

NONE OBSERVED

Activity Codes: WA-walking on ground, PE-perched above ground, FL-flying, OT-other (please specify)

Habitat Codes: CBS-Creosote Bush Scrub, SD/SS-Sand Dunes/Sand Sheets, DP-Desert Pavement, OT-other (please specify, provide details of Project structure/facility)

OBS. # (Time)	ADDITIONAL NOTES

Mojave Solar

Common Raven Fixed Point Observation Data Sheet

Date (mmddyy) 7/26/14 Observer (init.) SRV Start Time 0924 End Time 0934 Obs Pt. (5)

Page 5 of 7

Visibility: (Clear) or Min _____ Max _____ (m)

Wind Direction from (circle one): Calm N NE E SE S (SW) W NW Variable Speed: (Low) High ____ (km/h)

Precipitation (circle one): (none) light rain rain snow sleet hail fog other Temp: 84 (°F) Cloud Cover: 45 %

Obs #	Time	Sex	Age	# of birds	Activity (circle 1st, X others)		Flight Dir (to)	Horizontal Distance (m) 1st	Horizontal Distance (m) closest	Habitat Type/ Perch Structure	Aud?	Vis?	Notes
1					WA	PE							
					FL	OT							
2					WA	PE							NONE
					FL	OT							
3					WA	PE							OBSERVED
					FL	OT							
4					WA	PE							
					FL	OT							
5					WA	PE							
					FL	OT							
6					WA	PE							
					FL	OT							
7					WA	PE							
					FL	OT							
8					WA	PE							
					FL	OT							
9					WA	PE							
					FL	OT							
10					WA	PE							
					FL	OT							
11					WA	PE							
					FL	OT							
12					WA	PE							
					FL	OT							

Activity Codes: WA-walking on ground, PE-perched above ground, FL-flying, OT-other (please specify)

Habitat Codes: CBS-Creosote Bush Scrub, SD/SS-Sand Dunes/Sand Sheets, DP-Desert Pavement, OT-other (please specify, provide details of Project structure/facility)

OBS. # (Time)	ADDITIONAL NOTES

Mojave Solar

Common Raven Fixed Point Observation Data Sheet

Date (mmddyy) 7/26/14 Observer (init.) JRV Start Time 0939 End Time 0949 Obs Pt. (6)

Page 6 of 7

Visibility: Clear or Min ____ Max ____ (m)

Wind Direction from (circle one): ~~calm~~ N NE E SE S (SW) W NW Variable Speed (Low) ____ High ____ (km/h)

Precipitation (circle one): (none) light rain rain snow sleet hail fog other Temp: 90 (°F) Cloud Cover: 45 %

Obs #	Time	Sex	Age	# of birds	Activity (circle 1st, X others)	Flight Dir (to)	Horizontal Distance (m) 1st	Horizontal Distance (m) closest	Habitat Type/ Perch Structure	Aud?	Vis?	Notes
1					WA PE FL OT							NONE
2					WA PE FL OT							
3					WA PE FL OT							OBSERVED
4					WA PE FL OT							
5					WA PE FL OT							
6					WA PE FL OT							
7					WA PE FL OT							
8					WA PE FL OT							
9					WA PE FL OT							
10					WA PE FL OT							
11					WA PE FL OT							
12					WA PE FL OT							

Activity Codes: WA-walking on ground, PE-perched above ground, FL-flying, OT-other (please specify)

Habitat Codes: CBS-Creosote Bush Scrub, SD/SS-Sand Dunes/Sand Sheets, DP-Desert Pavement, OT-other (please specify, provide details of Project structure/facility)

OBS. # (Time)	ADDITIONAL NOTES

Mojave Solar

Common Raven Fixed Point Observation Data Sheet

Date (mmddyy) 7/26/14 Observer (init.) SRV Start Time 0952 End Time 1012 Obs Pt. (7)

Visibility: (Clear) or Min _____ Max _____ (m) Page 7 of 7

Wind Direction from (circle one): Calm N NE E SE S (SW) W NW Variable Speed: (Low) High ____ (km/h)

Precipitation (circle one): (none) light rain rain snow sleet hail fog other Temp: 90 (°F) Cloud Cover: 45 %

Obs #	Time	Sex	Age	# of birds	Activity (circle 1st, X others)	Flight Dir (to)	Horizontal Distance (m) 1st	Horizontal Distance (m) closest	Habitat Type/ Perch Structure	Aud?	Vis?	Notes
1					WA PE FL OT							No NE OBS (RUFI)
2					WA PE FL OT							
3					WA PE FL OT							
4					WA PE FL OT							
5					WA PE FL OT							
6					WA PE FL OT							
7					WA PE FL OT							
8					WA PE FL OT							
9					WA PE FL OT							
10					WA PE FL OT							
11					WA PE FL OT							
12					WA PE FL OT							

Activity Codes: WA-walking on ground, PE-perched above ground, FL-flying, OT-other (please specify)
Habitat Codes: CBS-Creosote Bush Scrub, SD/SS-Sand Dunes/Sand Sheets, DP-Desert Pavement, OT-other (please specify, provide details of Project structure/facility)

OBS. # (Time)	ADDITIONAL NOTES

Attachment 4
Observed Wildlife Species List

Observed Wildlife Species List July 2014 Mojave Solar Project			
Common Name	*Scientific Name*	**Special-status State/Federal**	**Invasive Wildlife**
Reptiles			
Western Whiptail	*Aspidoscelis tigris*	__/__	__
Gopher Snake	*Pituophis catenifer*	__/__	__
Side-blotched Lizard	*Uta stansburiana*	__/__	__
Birds			__
Gambel's Quail	*Callipepla gambelii*	__/__	__
Common Raven	*Corvus corax*	__/__	__
Loggerhead Shrike	*Lanius ludoviscianus*	CSC/__	__
Brown-headed Cowbird	*Molothrus ater*	__/__	Cal Code 14:671
Ash-throated Flycatcher	*Myiarchus cinerascens*	__/__	__
House Sparrow	*Passer domesticus*	__/__	__
Say's Phoebe	*Sayornis saya*	__/__	__
Eurasian Collared-Dove	*Streptopelia decaocto*	__/__	Cal Code 14:671
LeConte's Thrasher	*Toxostoma lecontei*	CSC/BCC	__
Mourning Dove	*Zenaida macroura*	__/__	__
Mammals			
White-tailed Antelope Squirrel	*Ammospermophilus leucurus*	__/__	__
Black-tailed Jackrabbit	*Lepus californicus*	__/__	__
Desert Kit Fox	*Vulpes macrotis*	CSC/__	__

Status Codes:

Federal:

FE = Federally listed endangered: species in danger of extinction throughout a significant portion of its range

FT = Federally listed, threatened: species likely to become endangered within the foreseeable future

State:

SE = State listed as endangered

ST = State listed as threatened

CSC = California Species of Special Concern Species of concern to CDFW because of declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction.

CCR = protected by the California Code of Regulations

WL = Watch List

CDF-S = California Department of Forestry Sensitive

Appendix C
Cultural Resources

Mojave Solar Project
Monthly Compliance Report
San Bernardino County, California

July 2014 Reporting Period

CH2M HILL
2485 Natomas Park Drive
Suite 600
Sacramento, CA
95833-2937
Tel: 916.920.0300
Fax: 916.920.8463

August 6, 2014

Dale Rundquist
Compliance Project Manager
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

Subject: Abengoa Mojave Solar Project (09-AFC-5C)
Monthly Compliance Report CUL-1 and CUL-6

Dear Mr. Rundquist:

CH2M HILL is assisting Abengoa Solar LLC. (Abengoa) in complying with California Energy Commission (CEC) Conditions of Certification, specifically, CUL-1 and CUL-6, for cultural resource monitoring, as set forth in the Commission Decision for the Mojave Solar Project (MSP). This report covers the cultural resources monitoring conducted from July 1, 2014 through July 31, 2014 by CH2M HILL.

Personnel Active in Cultural Monitoring This Period

The Cultural Resources Monitors (CRMs) included: Sonia Sifuentes, Jesse Shelmire and Ryan Rolston. The Native American Monitors (NAMs) included: Joseph Lente and David Perezchica. The monitoring program was directed by the Cultural Resource Specialist (CRS), Gloriella Cardenas.

Monitoring and Associated Activities This Period

Ground-disturbing activities subject to cultural resource monitoring occurred at MSP. In Alpha East, gate installations, transformer pads, MP-310 pump foundations, conduit excavations, electrical trenching, boreholes, corner load cable installations, light poles, grounding rods, fiber optics, and support foundations were monitored. In Alpha West, grounding rod installations and splice box excavations were subject to monitoring. In Beta East, gate installations, transformer pads, raw waterline, wind fence removals, boreholes, fiber optic trenching, grounding rod installations, well pump, cable trenching, corner load foundations, and electrical trenching were monitored.

Cultural Resources Discoveries This Period

Two isolate artifacts were discovered during this reporting period.

MSP-CH-IF-14 is an isolate and was discovered on July 14, 2014. This find comprises two interconnecting base and side wall fragments from a brown glass bottle. The fragments are embossed with "ORSE DISTILLE," "ASCOW SCOW," and also a "P" and a "W" are embossed on the bottom. Although of an unknown date, the isolate appears to be older

than 50 years of age. This artifact was found in the northeast corner of Alpha East solar field on a terrace of constructed backfill.

Photo 1. Isolate MSP-CH-14

This isolate find is a bottle fragment, it is not considered a significant resource and the location of the artifact is within previously disturbed soils. This artifact is an isolate find, which by definition, lacks immediate cultural context and, therefore, lacks the data potential that would be required to be considered eligible for the NRHP or CRHR.

MSP-CH-IF-15 is a prescribed treatment category isolate discovered on July 17, 2014. The artifact is a reddish-brown chert, secondary flake measuring 2.1 cm long, 2 cm wide, and 0.4 cm thick. The isolate was discovered in the solar field of the Beta East portion of the Mojave Solar Power Plant. The isolate was located between mirror rows 87 IJ and 86 IJ in the vault for substation 109.

Photo 2. Close up of isolate MSP-CH-IF-15

This resource is a non-diagnostic isolate, which by definition, lacks immediate cultural context and therefore lacks the data potential that would be required to be considered eligible for the NRHP or CRHR.

The completed DPR forms for these isolates are provided in Confidential Attachment 1.

Anticipated Changes in the Next Period

Monitoring will continue for various foundations, electrical trenching, drainages, water line trenching, and other activities. A cultural monitoring crew will remain onsite to continue monitoring and to respond to discoveries, if they occur.

Comments, Issues or Concerns

Pending Issues

During the reporting period, resolution completion of non-compliance report (NCR) No. 10, dated May 13, 2014, was adhered to and supporting documents were provided by the contractor on July 2, 2014.

Non-Compliance Issues

As stated in the June 2014 Monthly Compliance Report, the contractor's failure to comply with NCR No. 10 resolutions in the time frame stipulated by the CRS and supported by the CEC, is a non-compliance event.

Guidance regarding issuance of NCR. No. 11 against the contractor for failure to comply with NCR No. 10's resolutions and COCs, specifically, CUL-2 and CUL-6, with an infraction date of June 30, 2014, was requested by the CRS to the CEC. Response is pending.

The NCR No. 10 documentation submittals during this reporting period are included in Attachment 2.

Sincerely,

CH2M HILL

Gloriella Cardenas, M.A., RPA
Cultural Resources Specialist

Attachments: 1 Completed DPR Forms (Confidential)
2 NCR 10 Documentation Submittals

CONFIDENTIAL

Attachment 1
Completed DRP Forms

Note: Attachment 1, Completed DPR Forms, is confidential and not for public distribution.

Attachment 2
NCR 10 Documentation Submittals

NON-COMPLIANCE RESOLUTION REPORT

MOJAVE SOLAR, LLC

MOJAVE SOLAR PROJECT

NCR Number: Cultural NCR No. 10 **Date:** 5-13-2014 **NCRR Number:** 10

Documenter: Gloriella Cardenas **Time:** 12:00pm

Describe Affected Resources:

Potential impacts could have included undiscovered buried deposits of cultural resources.

Summary of Corrective Actions:

The recommendations were as follows:

1. Because this is the third infraction with the sub-contractor (see Cultural NCR No. 1 and 8), upon receipt of this NCR, the parties involved should undergo an immediate review of procedures for ground disturbing operations and be placed on suspension from work for a minimum of five working days. The subcontractor shall be placed on a probationary status for the remainder of the contract. Termination of work/contract should occur upon another infraction by these parties.
2. A general requirement should be provided by the Project Owner that no excavations whatsoever are to occur without a cultural resources monitor present, or without a specific clearance from the CRS directly.
3. Construction is recommended to realign their work to be in compliance with the Conditions of Certification, existing plans, and SHPO stipulations regarding Determination of No Adverse Effects, specifically, the specifications listed in the Modification in the Mojave Solar Plant Construction Cultural Monitoring Requirements, dated April 9, 2013.

From May 15, 2014 through June 30, 2014, several submittals of revised resolutions were made by the contractor, as reported in the June 2014 Monthly Compliance Report. The contractor received responses from the CRS and the CEC to adhere to the written stipulations. On July 2, 2014 the contractor provided documentation that written resolutions documented in NCR No. 10, were met and suspencion of participating parties would be in effect as of this date.

Conditions of Approval:

Approval:

(SIGNATURE) (NAME—PLEASE PRINT) (DATE)

Cardenas, Gloriella/SCO

From: Kathleen.Sullivan@solar.abengoa.com
Sent: Wednesday, July 02, 2014 9:14 AM
To: Cardenas, Gloriella/SCO
Cc: Frederick.Redell@solar.abengoa.com; Parker, Karen/SAC; Carrier, John/SAC
Subject: Fw: CUL 6 NCR 10 revised resolution report
Attachments: Cul-6 NCR10 Resolution, Rev 1.pdf

Gloriella,
Please see the attached revised CUL NCR 10 resolution report, which includes suspension of the crew.

Thank you,
Kathleen

----- Forwarded by Kathleen Sullivan/Solar/Abengoa on 07/02/2014 09:12 AM -----

ABEINSA EPC

Christian Oziel Bojorquez
07/02/2014 09:10 AM

Send To: Kathleen Sullivan/Solar/Abengoa@Abengoa

cc: Efrain Perez/AbeinsaEPC/Abengoa@Abengoa, Enrique Valades Nieto/AbeinsaEPC/Abengoa@Abengoa, Frances Sanchez/Solar/Abengoa@Abengoa, Frederick Redell/Solar/Abengoa@Abengoa, Larry Davis/AbeinsaEPC/Abengoa@Abengoa, Leonardo Bruno Carrero/AbeinsaEPC/Abengoa@Abengoa, Mercedes Macias Paris/AbeinsaEPC/Abengoa@Abengoa, Mojave Subs/Teyma/Abengoa@Abengoa, Nicholas Potrovitza/Solar/Abengoa@Abengoa, Nicolás Gallo Massa/AbeinsaEPC/Abengoa@Abengoa, Pablo Enrique Schenone Laborde/AbeinsaEPC/Abengoa@Abengoa, Steven Pochmara/AbeinsaEPC/Abengoa@Abengoa, Vernon Leeming/AbeinsaEPC/Abengoa@Abengoa, William Grisolia/Solar/Abengoa@Abengoa, José Manuel Bravo Romero/Solar/Abengoa@Abengoa.

Subject: CUL 6 NCR 10 revised resolution report

Hello, Kathleen.

Please find attached the revised resolution report for CUL 6 NCR 10. Document includes WEAP training signed sheet and Abacus workers suspension notification. Please let me know if you need any additional information.

Regards,

Christian Oziel Bojorquez - Quality Engineer

ABEINSA EPC
Abener Teyma Mojave General Partnership
42134 Harper Lake rd. Hinkley, CA. 92347
Cell: 661-754-6697
christian.oziel@abeinsaepc.abengoa.com

ABEINSA EPC
MOJAVE

Customer Non Conformity Report

Project: Mojave Solar Project	**Reference:** CUL-6 NCR 10
Date: 05/21/2014	
Affected Area: Construction	

Description of the problem:
On Tuesday May 13, 2014, cultural monitors were scheduled to monitor a trench for fiber optic installations between the hours of 7:00 am to 10:00 am with the sub-contractor Abacus. This excavation did not take place during this scheduled time period. On Wednesday May 14, 2014, cultural monitors were rescheduled to monitor the fiber optics trenching. The cultural monitors arrived at 7:00 am to the location to find the excavation had already taken place, the day before starting at 12:00 pm. The non-monitored trench measured 5 ft in length, 2 ft in width and 2 ft in depth and was located in Alpha East, in the solar field, between mirror rows H-126 and H-127. Soils were examined to assess for impacts to cultural resources; none were noted as a result of this non-compliance event. Because conducting ground disturbance of native sediments without cultural monitoring is a non-compliance issue per CUL-6, this NCR was issued. Additionally, this is the sub-contractor's third non-compliance incident regarding excavating without cultural monitors present for ground disturbing activities.

Requires preventive action: No ☐ Yes ☒ (IA Opening)

IRP No:	**Date:** 5/15/14
IRP Evaluator:	

Preventative measures to prevent any future infraction of CUL-6.

Root Cause:

Unfulfilled Procedure - Potential impacts could have included destruction of buried cultural deposits.

Corrective Action:

IRP Coordinator: Steven Pochmara	**Date: 7/01/2014**

ABENSA EPC
MOJAVE

Comment:

There appears to have been a miscommunication in closing out this issue for which Abener Teyma Mojave acknowledges responsibility. Abener Teyma Mojave initial response to the NCR was to place Abacus on probation, suspend from the site the individuals involved in the incident. Provide corrective training for all personnel connected with the incident and improve the reporting and coordinating between construction personnel and monitors. Subsequent to the initial response Abener Teyma Mojave question whether the work fell within CUL-6 or CUL-2 since the soil had been previously excavated. We requested a rescission of the NCR, but none-the-less continued with re-fresher WEAP training as well as the improved coordination efforts between construction and CRS monitors that continue to this day. We inadvertently failed to address whether we should continue with the suspension of the individuals involved in the incident. Due to our interpretation of events we then assumed the incident closed and continued our coordination efforts in order ensure no additional events occur. We have recently been informed that this issue remains open and that the Project is non-compliant with NCR 10.

As a result of this recent notice we have: (1) Informed Abacus it is on probationary status, and the personnel involved in the incident shall be suspended for 5 days effective July 2, 2014 (see attached for suspension notification); (2) Implemented a general rule that no excavations whatsoever are to occur without a cultural resources monitor present, or without a specific clearance from the CRS directly; (3) Provided daily monitoring schedule maps to the CRS and all cultural monitors along with the daily request for monitors needed. Furthermore, construction will work with the CRS and cultural staff to assure nothing is missed and both staffs are on the same page. (4) As recommended Construction is continues to realign their work to be in compliance with the Conditions of Certification, existing plans, and SHPO stipulations regarding Determination of No Adverse Effects, specifically, the specifications listed in the Modification in the Mojave Solar Plant Construction Cultural Monitoring Requirements, dated April 9, 2013. (5) Additionally, activity managers, supervisors and coordinators associated with this activity underwent a review of the procedures for ground disturbance, the COC's and SHPO for the Mojave Solar project in regards to cultural compliance (see attached sign-in sheet dated 5/16/2014).

Attachments :

- **WEAP Training Sign-In Sheet – (5/20/14)**
- **Abacus workers suspension notification**

NCR Coordinator:
Steven Pochmara

Position: Permitting Manager

Signature of Coordinator:

NCR Evaluator:
Nicolas Gallo Massa

Position: Project Sub-Director

Signature of Evaluator:

ABEINSA EPC
MOJAVE

NCR Supervisor:
Efrain Perez

Position: Quality Manager

Signature of Supervisor:

Abener Teyma Mojave General Partnership
CA License # 956219

ABEINSA EPC

Mr. Russell Thompson
Abacus Project Management, Inc.
20201 SW Birch St. Suite 240,
Newport Beach, CA 92660

Re: Site Civil Works Notice of Probation

Dear Mr. Thompson:

Reference is made to the Time & Materials Services Contract (hereinafter referred to as "Contract") dated August 23, 2013, between Abener Teyma Mojave General Partnership (hereinafter referred to as "Abener Teyma Mojave") and Abacus Project Management, Inc. (hereinafter referred to as "Contractor").

On Tuesday May 13, 2014 Abacus excavated a trench, in the Solar Field, for fiber optic installations without the presence of cultural monitors. This is Abacus' third non-compliance incident regarding excavating without cultural monitors present for ground disturbing activities. Effective immediately Abacus is placed a probationary status for the remainder the Contract for this Work, Abener Teyma Mojave may take further action including but not limited to removing this Scope of Work from Abacus for any future violation.

Additionally, effective July 2, 2014 the below listed individuals shall be barred from the site for a period of no less than five (5) days:

Fernando Mariscal
Domingo Nunez
Manuel Velazquez

In accordance with your contractual obligations Abacus shall only perform excavations with a cultural resources monitor present or in the alternative with a specific clearance from the CRS directly.

Very truly yours,

Pablo Schenone
Project Director
Abener Teyma Mojave

Certification of Completion
Worker Environmental Awareness Program
Mojave Solar Project (09-AFC-5)

This is to acknowledge these individuals have completed a mandatory California Energy Commission-approved Worker Environmental Awareness Program (WEAP). The WEAP includes pertinent information on biological, cultural, and paleontological resources for all personnel (that is, construction supervisors, crews, and plant operators) working on site or at related facilities. By signing below, the participant indicates that he/she understands and shall abide by the guidelines set forth in the program materials. Include this completed form in the Monthly Compliance Report.

No.	Employee Name	Title/Company	Signature
1.	LANCE HUSTED	SQUARE 1 / SCHNEIDER ELECTRIC	
2.	Greig Honish	Teamster / Cinplex	
3.	DENIS FRUTOS	INSPECTOR / ABACUS	
4.	Alberto Cortés	ANGELUS C.U.P	Alberto Cortés
5.	Armando Cortés	ANGELUS W.P	Armando Cortés
6.	JOHN NIBLACK	ABENGOA	
7.	MATTHEW NEAL	ABACUS	
8.	MANUEL VELAZQUEZ	ABACUS	RE TRAINING
9.	Antonio Ortiz	ABACUS	RE Training
10.	Richard Shelton	Site Safety / Abacus	
11.	JOSE MANUEL ROMERO	ABEINSA EPC	
12.			
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30.			

Biological Trainer: BRUCE ASARO Signature: Date: 5/20/14

Cultural Trainer: " Signature: " Date: / /

Paleo Trainer: " Signature: " Date: / /

by reply email. Please advise immediately if you or your employer does not consent to Internet email for messages of this kind. Opinions, conclusions and other information in this message that do not relate to the official business of my firm shall be understood as neither given nor endorsed by it.

Appendix D
Paleontological Resources

Mojave Solar Project
Monthly Compliance Report
San Bernardino County, California

July 2014 Reporting Period

SWCA
ENVIRONMENTAL CONSULTANTS
Sound Science. Creative Solutions.

Pasadena Office
150 S. Arroyo Parkway, 2nd Floor
Pasadena, CA 91105
Tel 626.240.0587 Fax 626.240.0607
www.swca.com

Mr. Dale Rundquist, CPM
(09-AFC-5C)
California Energy Commission
1516 Ninth Street (MS-2000)
Sacramento, CA 95814

August 6, 2014

RE: PAL-5, Summary of Paleontological Monitoring and Mitigation Activities at the Mojave Solar Project (MSP) for the period of July 2014

Dear Mr. Rundquist:

This letter is to confirm SWCA Environmental Consultants paleontological monitoring and mitigation activities at the MSP site during the period of July 1 through July 31, 2014. As of February 28, 2014, major ground-disturbing activities for the MSP had been completed and SWCA's monitoring services were no longer required onsite. No paleontological monitoring occurred during the above-referenced period.

It has been a pleasure working with you on this project. If you have any questions please do not hesitate to contact me at 626 240 0587 ext 6605 or at ccorsetti@swca.com.

Respectfully,

Cara Corsetti, M.S.
Principal
Paleontological Resources Specialist, MSP

Appendix E
Worker Safety

Mojave Solar Project
Monthly Compliance Report
San Bernardino County, California

July 2014 Reporting Period

Monthly Safety Inspection Report
Larry Davis, Mojave Solar Project Safety Manager
July, 2014

Record of all employees trained for the month
Worked **5,677,811** hours project to date with **75** recordable incidents. **9,046** new employee orientations completed to date. **6,249** visitor safety orientations completed to date. **161** new employee orientations were completed in the month of July.

Summary report of safety management actions and safety-related incidents that occurred:

- **ERT's have been reorganized and H&S is scheduling the next drill with SBCFD. ERT Supervisor's meeting was held on 7/23/2014.**
- **Trash control efforts have been evaluated and more concentrated efforts are being applied to the Alpha and Beta power blocks.**
- **Light level measurements continue to be taken on night shift to ensure compliance for OSHA standards.**
- **Cool down tents in Alpha and Beta has been set up with tables and benches.**
- **Master Chemical List has been updated for all subcontractors on site.**
- **Solutia VP-1 deliveries continue in both Alpha and Beta to the Overflow tanks.**
- **H&S continues to audit H&S incidents and injuries including follow up corrective actions.**

Safety management actions included WEAP and new employee orientation training, safety committee meetings and training classes for HTF Awareness, Heat Injury Prevention Program/Off Angle Focus and LOTO/ 70E. H&S continues with monthly subcontractor audits. Weekly inspection with Bureau Veritas revealed no major safety issues and all other issues corrected right away. Zero off road violations were reported to site biologist/CEC for the month of July 2014.

Recordable incidents in previous months (Updates on bold)

August 2013 open case

- Case #3 8/15/13. Milco. Worker fell while unloading HTF flex pipe resulting in a bruised tailbone. First Aid case reclassified as Lost Time on January 8, 2014.

October 2013 open cases

- Case #4: 10/16/2013. HLC. Left shoulder strain. Recordable reclassified as Lost Time.
- 10/16/2013. E.W. Corp. Physical Altercation Case. This non-occupational case is currently under worker compensation court review.

November 2013 open cases pending closure by Zurich

- Case #1: 11/19/2013. HLC. Worker suffered right clavicle dislocation resulting in RTW modified Duty. Retrained in safe work practices. Classified as recordable.

December 2013 open cases

- Case #1: 12/18/2013. Murray. Worker was unloading material from a flatbed trailer lost his footing and fell backwards to the ground and landed on left hip and leg area. Classified as Lost Time.

Report of accidents and injuries that occurred during the month of July:

Three RWDC's, 1 recordable only and 1 LWDC were incurred in the month of July 2014.

Case #1: 7/1/2014 – AEPC, Hernia right inguinal; Classified as RWDC
- **Awaiting surgery, has been transferred to another project.**

Case #2: 7/10/2014 – Abacus, Abdominal Strain; Classified as Recordable Only
- **Re-train on lifting/bending techniques.**

Case #3: 7/16/2014 – Abacus, Cervical Strain; Classified as LWDC
- **RE-train on proper work area awareness/overhead hazards.**

Case #4: 7/18/2014 – Abacus, Thoracic Lumbar Strain; Classified as RWDC
- **Trained on back injury prevention techniques.**

Case #5: 7/20/2014 – Abacus, Foreign object in right eye; Classified as RWDC
- **Re-train on proper use of PPE, wear safety glasses at all times, spoggles for windy days.**

No report of any continuing or unresolved situations and incidents that may pose danger to life or health.

Currently we have an average of **1,401** employees on site daily.
Landing Zone prepared for emergency evacuation cleared at all times.

Construction has worked **5,677,811** hours with **75** recordable cases.
Total Recordable Incident Rate, (TRIR), for Project in the month of July is **2.64%**
Total Recordable Incident Rate, (TRIR), for year to date is **2.70%**
Total Recordable Incident Rate, (TRIR), for Project to date is **3.33%**
Total Lost Work day cases- **15**, Lost Work days total – **1,079.**

ABENER TEYMA MOJAVE

Safety Conditions Check List

Internal by Work Site

Mojave Solar Project	
Activities performed:	
Safety Inspection Report **Record periodically (monthly)** **July, 2014**	

Date:	Time:	Project Name & Number
7.9.14	11:45 am	Mojave Solar Project -4A6007
Inspected by:		**Title**
Larry Davis		Safety Manager
Accompanied by:		**Title**
Raivo Neggo		BV Safety

A	Safety & Risk Management Program Administration & Record Keeping	Values				Comments
		1	2	3	N/A	
1	Is there a Safety Manual, 29 CFR Sub Part 1926 and HAZCOM Manuals available on-site?			3		
2	Are there Weekly Safety meetings (Toolbox Talks) conducted and documented?			3		
3	Is the Weekly Job Safety Inspection conducted and documented?	1				Abacus not submitting weekly inspections for safety.
4	Are the Federal & State Labor Notices posted in a conspicuous location?			3		
5	Are the Emergency phone numbers & Doctors list posted conspicuously?			3		
6	Are the Company vehicle operators authorized per company policy?			3		
7	Are the New employee orientations documented for all new subcontractor employees?			3		
8	Are the PM follow up letters to subcontractors re: Serious Violations on file?			3		
9	Is the approved safety plan including the emergency action plan on site?			3		
10	Is the Safety Plan updated to reflect any/all scope changes?			3		
B	**Ladders & Stairways - OSHA Subpart X**	**Values**				**Comments**
1	Are the ladders inspected for defects?			3		
2	Are extension ladders extending 3 ft. above landing?			3		
3	Are extension ladders pitched at 1 ft. out from vertical for every 4 ft. of height?			3		
4	Are straight ladders secured in place?			3		
5	Are the straight ladders equipped with safety feet?			3		

Safety Conditions Check List

Internal by Work Site

6	Are the step ladders used only in open position?	1				Synflex using A frame ladders in the closed position Corrected at time of discovery
7	Are the stepladders tall enough for job without using top step, second step from top step or platform?			3		
8	Is the use on non-conductive (non-metal) ladders only in proximity of electricity?			3		
9	Are the stairways, ramps, and landing equipped with rails and handrails?			3		.
10	Are the stairways and/or landings in use poured, filled, finished and free of debris, slip, trip or fall hazards?			3		
11	Are the stairways adequately lighted?			3		
12	Do the permanent ladders meet OSHA 1910 standards?			3		
C	**Fall Protection OSHA - Subpart M**	**Values**				**Comments**
1	Are the floor/roof deck openings protected with properly secured and marked covers or guardrails?			3		
2	Are the wall openings/open-sided floors protected with fall protection/prevention systems?			3		
3	Are the workers exposed to falls of 6' or more provided with and required to use personal fall arrest systems (PFAS) when not protected by guardrails?			3		
4	Are the exposed rebar in work areas properly protected - capped, etc.? Both vertical and horizontal?			3		
5	Are specialty trades, I.e., roofers, ironworkers, etc., working under fall protection plans prepared by them and approved by controlling contractor?			3		
6	Are the PFAS - Harnesses, Lanyards, Anchorage Points, Lifelines and Retractables inspected?	1				FHI / Synflex found to have uninspected harness' in their work area's . Corrected at time of discovery
7	Are the anchorage Points 5K per person?			3		
D	**Demolition – OSHA Subpart T**	**Values**				**Comments**
1	Is the Engineering Survey completed and documented?				N/A	
2	Is the work area "Identified & Protected", i.e., electricity, gas, water, sprinkler system?				N/A	
E	**Scaffolds and Aerial Lifts – OSHA Subpart L**	**Values**				**Comments**
1	Is there a competent Person, designated in writing, assigned to supervise operations and conduct documented daily inspections and on-site full time?			3		
2	Are the working surfaces 6' or higher equipped with guardrails?			3		
3	Are the working surfaces clear of debris, slip, trip and fall hazards?			3		
4	Are the plumbs, tied in as necessary, safe footing, base plates, mudsills assembled and erected properly -? Are they equipped with all pins and bracing? Is a complete platform?			3		

Safety Conditions Check List

Internal by Work Site

5	Is there a safe means of access to platform provided?			3		
6	Are the wheels locked on rolling units when platform occupied?			3		
7	Are the scaffolds at least 10 ft. from energized power lines?			3		
8	Are the workers tied off in articulating boom lift?			3		
9	Is the aerial lift on level surface?			3		
10	Has safety been notified in advance of erecting a suspended scaffold?			3		
11	Is there a competent Scaffold Person inspected and signed-off on scaffold prior to each shift daily?			3		
12	Is a Tagging system used?			3		
F	**Excavations & Trenches – OSHA Subpart P**	**Values**				**Comments**
1	Is there a competent Person, designated in writing, assigned to supervise operations and conduct documented daily inspections and on site full time?			3		
2	Are all excavations and trenches 5 ft. or greater in depth equipped with Protective Systems (shoring/shielding or sloped/benched)?			3		
3	Are the ladders or other means of quick exit within 25 ft. of lateral travel for workers?			3		
4	Is the Spoil pile at least 3 ft. from edge of excavation or trench?			3		
5	Are the Underground utilities located & marked before excavation starts? (Verify ticket/maps/plans)			3		
6	Are the barricades provided around all open excavations?	1				Abacus/ Synflex missing information tags on barricades Corrected at time of discovery
7	Is the Equipment kept at proper distance from occupied excavations/trenches to minimize risk of cave-in or equipment falling in on workers?			3		
8	IF 20' OR DEEPER Has Safety been notified?			3		
9	IF 20' OR DEEPER, are the protective systems designed by a RPE?			3		
10	Are the Surface and subsurface encumbrances identified?			3		
11	Are the Water, atmospheric conditions, & surcharge loads considered?			3		
G	**Motor Vehicles, Mechanized Equipment – OSHA Subpart**	**Values**				**Comments**
1	Are the Tractors, backhoes, other vehicles equipped with operable backup alarms?			3		
2	Are the Operators required wearing seat belts when provided on equipment?			3		
3	Is the Forklift/Lull operator certification documented and available on project?			3		
4	Is a High visible vest worn around earth moving equipment?			3		
H	**Electrical – OSHA Subpart K**	**Values**				**Comments**

Safety Conditions Check List

Internal by Work Site

1	Are the Ground fault circuit interrupters (GFCI) used with all temporary wiring, e.g., extension cords and power from welding machines?			3		
2	Is the GFCI in good appearance and in working order?			3		
3	Are All tools and equipment inspected for defects in cords and plugs?	1				ABACUS cords not being inspected prior to use. Cords removed from service with damages. Corrected
4	Are the Extension cords and ground pins are in good condition?	1				ABACUS cords not being inspected prior to use. several removed from service without ground pins Corrected
5	Are the Sources of electricity, such as energized panel boxes, overhead lines, etc., properly marked, barricaded and protected? Inspected by a Qualified Person?			3		
6	Is there an adequate lockout/tag out/try out procedures in place to protect employees?			3		
7	Is the Temporary Lighting installed properly? (i.e. parking, construction trailer, & site)			3		
I	**Personal Protective Equipment – OSHA Subpart E**	**Values**				**Comments**
1	Is an adequate eye protection available and worn when required?			3		
2	Is a Hearing protection available and used when necessary?			3		
3	Are Hard hats available and worn at all times?			3		
4	Are Work boots with protective toes worn by all employees?			3		
5	Are All employees wearing shirts with sleeves?			3		
6	Is a Hand protection available and in use when required?			3		
7	Is there a Written respirator program available?			3		
8	Are they Using N95 respirators for "voluntary use"?			3		
9	Are the PFAS inspected by employees prior to use?			3		
J	**Fire Prevention – OSHA Subpart F**	**Values**				**Comments**
1	Are the flammable/combustible liquids stored away from ignition sources and identified by warning signs?			3		
2	Are the approved metal safety cans utilized for storing all liquid flammables?			3		
3	Are the fuel tanks surrounded by containment and 20' from building?			3		
4	Are an adequate number of charged fire extinguishers available? With-in 75'?			3		
5	Are the Extinguishers properly located, protected, Inspected?			3		
6	Are the Flammable/combustible debris & storage kept away from welding & cutting?			3		
K	**Welding & Cutting - OSHA Subpart J**	**Values**				**Comments**
1	Are welding leads in good condition?			3		

Safety Conditions Check List

Internal by Work Site

2	Is a Portable fire extinguisher located within 20' of all welding operations?			3		
3	Are Fire blankets available and used to cover combustible material located around welding operations?			3		
4	Are Hot Work Permits used when required?			3		
5	Is an Adequate use of fire curtains to enclose and shield welding operations?			3		
6	Are Hoses, torches, and gauges free from defects, dirt and hydrocarbons such as oil and grease?			3		
7	Are Regulators provided with flash arrestors?			3		
8	Are Welding / cutting helmets, eye protection, gloves, bibs, face shields available and properly used when necessary?			3		
9	Are the Stored oxygen and fuel cylinders separated by a minimum of 20 ft. with valve protection caps in place?	1				FHI improper storage corrected at time of discovery
10	Are All cylinders firmly secured in upright position?			3		
11	Are Cylinders secured to welding cart, valve closed and caps on when not in use?		2			FHI Corrected at time of discovery
12	Are Empty and full cylinders separated and marked?			3		
13	Are Flammable gas cylinders and oxygen gas cylinders are separated 20' apart?			3		
L	**Tools – Hand & Powered – OSHA Subpart I**	**Values**				**Comments**
1	Are Tools and equipment in good condition?			3		
2	Is the Defective equipment tagged as such and removed from work area?		2			ABACUS hand tool not tagged out in the work area.
3	Are Tools and equipment guards and handles in place and in good condition?		2			FHI worker without T handle on grinder Disciplinary actions applied.
4	Are the Powder actuated tool operators properly trained and documented?			3		
M	**Confined Space Entry - OSHA 29CFR1910.146**	**Values**				**Comments**
1	Is a competent Person / Entry Supervisor designated in writing? On site full time?			3		
2	Is an Entry permit properly issued prior to work starting?			3		
3	Is the Air sampling equipment available and properly used? Calibrated?			3		
4	Are the Air samples show acceptable oxygen concentrations of (19.5% to 23.5%)?			3		
5	Are the Air samples show space is free of toxic/flammable/explosive gases?			3		
6	Is there a Trained attendant assigned to maintain constant contact with workers inside space?			3		
7	Is there Trained person assigned to recheck air quality frequently throughout the project?			3		
8	Is there an Emergency rescue plan and equipment in place?			3		
N	**Hazard Communication - OSHA 29CFR1910.1200**	**Values**				**Comments**

Safety Conditions Check List

Internal by Work Site

1	Is there an Abeinsa EPC, Subcontractor MSDS's available?			3		
2	Is there an Abeinsa EPC List of Hazardous Chemicals current?			3		
3	Is there an Abeinsa EPC, Subcontractor written programs on site?			3		
4	Are the Containers labelled? Are the Notices posted?			3		
O	**Health and Safety - OSHA Subparts C & D**	**Values**				**Comments**
1	Is illumination, task lighting adequate?			3		
2	Are sanitary facilities adequate and clean?			3		
3	Is drinking water properly dispensed and community water containers cleaned and secured?			3		
4	Is First Aid kit stocked including latex gloves and Bloodborne clean-up kit?			3		
5	Are Eye wash stations available & accessible?			3		
P	**Housekeeping - OSHA Subparts C & D**	**Values**				**Comments**
1	Are Suitable containers available for disposal of trash, debris and recyclables?		2			ABACUS without proper trash containers near the break area.
2	Are Walkways, aisles, hallways and passageways clear of trash, debris, materials?		2			FHI work area's tight not keeping paths and walkways clear
3	Are Tools not in use stored in job boxes?			3		
4	Is the Equipment not in use stored properly?			3		
5	Are Pipes and other materials stored kept neatly?			3		
6	Are Appropriate sub-contractors dumpsters available?			3		
Q	**Cranes and Hoists - OSHA Subpart N**	**Values**				**Comments**
1	Are Operator's "daily inspections" available for review?			3		
2	Is there an Annual Inspection and 3rd party crane inspection documented?			3		
3	Are the Swing radius barricaded?			3		
4	Are the Hydraulic crane outriggers padded and on stable ground?			3		
5	Are the Power lines at safe distance? De-energized or protected? (Check clearance heights)			3		
6	Are the Uniform signals properly used?			3		
7	Are Cable and slings regularly inspected and in good condition? Red is dead!			3		
8	Are Operable safety catches provided on load hooks?			3		
9	Is there a Proper rigging used for loads?			3		
10	Are the Operator qualifications on site?			3		
11	Is a competent training person involved with safe rigging practices?			3		
R	**Abatement & Remediation - OSHA Subparts D & Z**	**Values**				**Comments**
1	Is the Personnel trained & medically qualified including fit tests? Documentation on site?				N/A	

Safety Conditions Check List

Internal by Work Site

2	Are the three work zones delineated?				N/A	
3	Are workers wearing the correct level of protection?				N/A	
4	Is on-going air monitoring documented?				N/A	
5	Are vision panels installed where practical?				N/A	

S	Public Safety & General Liability – ANSI A.10-30-2001	Values				Comments
1	Is an adequate placement of flashers, barricades, signs around excavations and equipment or materials located in foot/vehicle traffic areas?			3		
2	Is Security in place? Is the Access control plan established?			3		
3	Is the fencing erected around laydown/material storage areas?			3		
4	Is the Site lighting meets 5-foot candles?			3		
5	Have All contractors submitted COI?			3		
6	Are the way (Traffic signs) signs clear?			3		
7	Are the Off-site work hazards identified?			3		
	Safety Deficiency Point Reduction **Inspection Score: 389 /408 = 95.3 %**					

Comments:

- PTD worked hours 5,677,811 hours with 75 recordable incidents.
- 9,046 New employee orientations completed to date.
- 6,249 Visitor safety orientations completed to date.
- 161 new employee orientations were completed in the month of July.

Weekly Safety Committee Meetings were held and the following trainings were offered: LOTO/70E, HTF Awareness, HIPP/Off Angle Focus.

Appendix F
Engineering

Soil & Water
Waste
General Conditions
Civil
Structural
Mechanical
Electrical
Transmission System

Mojave Solar Project
Monthly Compliance Report
San Bernardino County, California

July 2014 Reporting Period

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Subject:	Mojave Solar Project (09-AFC-5C)
Condition No.:	Compliance5
Description:	Monthly Compliance Matrix
Submittal No.:	COMPLIANCE5-00-00

August 8, 2014
Mr. Dale Rundquist, CPM
California Energy Commission
1516 Ninth Street (MS-2000)
Sacramento, CA 95814
drundqui@energy.state.ca.us

Dear Mr. Rundquist,

As required by the California Energy Commission and more specifically by Condition of Certification COMPLIANCE5, attached please find an update to the following Compliances:

COMPLIANCE-2 [ASI + A/T]

The project owner shall maintain project files on-site or at an alternative site approved by the CPM for the life of the project, unless a lesser period of time is specified by the Conditions of Certification. The files shall contain copies of all "as-built" drawings, documents submitted as verification for Conditions, and other project-related documents. Energy Commission staff and delegate agencies shall, upon request to the project owner, be given unrestricted access to the files maintained pursuant to this Condition.
Hardcopy files of all "as-built" drawings and documents are available for review at the Abeinsa EPC Alpha east main site trailer.

COMPLIANCE-6 [ASI + A/T]

The first Monthly Compliance Report is due one month following the Energy Commission business meeting date upon which the project was approved, unless otherwise agreed to by the CPM. The first Monthly Compliance Report shall include the AFC number and an initial list of dates for each of the events identified on the Key Events List found at the end of this section of the Decision.

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The Key Events list has been included with current completed activity dates listed, please see attachment. The 2-month look-ahead schedule has been included, please see attachment.

AIR QUALITY PERMIT

Air Quality permit amendment was submitted to MDAQMD on 10/19/2013. MDAQMD approved on 02/24/2014. MDAQMD submitted this approval to the CPM on 02/24/2014, MDAQMD submitted revised ATC to CPM on 03/14/2014. CPM provided revised conditions of certification on 03/21/2014. CPM staff review and public comment period took place on 04/22/2014, CEC approved air quality permit revision. CEC issued revised air quality permits on 04/28/2014.

AQ-12

Specifications for the Ullage Venting System were approved by CPM on 06/10/2014 and MDAQMD on 05/28/2014.

AQ-32

Hour meter for diesel fuel emergency backup generator submitted to CPM and MDAQMD on 05/20/2014.

AQ-43

Hour meter for diesel fuel emergency backup generator for fire pumps submitted to CPM and MDAQMD on 04/20/2014.

AQ-64

Carbon Absorption System monitoring and change-out plan submitted to MDAQMD and CPM on 06/25/2014. Plan resubmitted to MDAQMD and CPM on 07/25/2014, please see attachment.

HAZ-1 [ASI and A/T]

The project owner shall not use any hazardous materials not listed in Appendix A (Hazardous Materials Proposed for Use at AMS During Operations), below, or in greater quantities or strengths than those identified by chemical name in Appendix A (Hazardous Materials Proposed for Use at AMS During Operations), below, unless approved in advance by the Compliance Project Manager (CPM). The project owner shall provide to the CPM, in the Annual Compliance Report, a list of hazardous materials contained at the facility. A revised chemical list is included, please see attachment. HTF, diesel fuel and gasoline and the other listed chemicals were delivered during the month. The HTF, Beck Oil, and other chemical spreadsheets for July 2014 are included, as well as this month's Beck Oil

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delivery tickets, please see attachments. A revised hazardous materials list was submitted to the CPM on 07/11/2014, please see attachment.

HAZ-2 [ASI and A/T]

At least 60 days prior to receiving any hazardous material on the site for commissioning or operations, the project owner shall provide a copy of a final Hazardous Materials Business Plan (HMBP), Spill Prevention, Control, and Countermeasure (SPCC) Plan, and a Process Safety Management (PSM) Plan to the CPM for approval.
The HMBP was submitted to the CPM and San Bernardino Fire Department on 07/23/2013. The CPM and SBCFD Haz Mat Division approved the HMBP on 08/01/2013 and 10/09/2013 respectively. The SPCC and PSM plans were submitted to the CPM on 10/29/2013, and SBCFD Haz Mat Division on 11/01/2013. The plans were approved by SBC Haz Mat Division as they stated that their only requirement is to have a copy of the SPCC on file at the site should a representative visit. The SPCC was approved by CPM on 11/25/2013. The PSM plan was returned with comments on 12/09/2013. Revised PSM plan, PHA, LOPA and O&M Manuals were resubmitted to the CPM on 01/29/2014, CEC approved on 02/10/2014. The HTF End Loop Testing procedure was submitted to the CPM on 01/17/2014, CPM approved on 01/27/2014. SBCFD provided comments to the SPCC on 02/13/2014. Comments were addressed and submitted to CPM on 02/28/2014, please see attachment. CPM comments for the PSM plan were addressed and submitted to CPM on 01/27/2014. CPM approved PSM plan on 02/10/2014, please see attachment. HMBP was resubmitted on 03/26/2014 to include the hydrogen and CO2 for the turbine cooling system, CEC approved on 04/16/2014, please see attachments. Submittal for steam generator chemical pipe cleaning procedure submitted to CPM on 04/23/2014. Location map showing storage locations of chemical pipe cleaning chemicals submitted to CPM on 04/25/2014, please see attachments. Conditional approval of Chemical Pipe Cleaning process approved by CEC on 04/29/2014. SBC permit to place baker tanks in Harper Lake Road right-of-way for the chemical pipe cleaning submitted to SBC on 03/17/2014, SBC approval on 03/20/2014. HAZ-2-04-00, the revised Hazardous Materials Business Plan (HMBP) was submitted to CPM on 05/01/2014, CPM approved 05/02/2014. HAZ-2-07-00, the revised Hazardous Materials Business Plan (HMBP) was submitted on 07/11/2014, please see attachment.

WASTE-2 [ASI and A/T]

Project owner shall keep a copy of the identification number on file at the project site and provide documentation of the hazardous waste generation notification and receipt of the number to the CPM after receipt of the number. Waste generator number issued by California EPA on September 28, 2012. CEC reviewed and approved submittal on

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November 27, 2012. The application for the USEPA hazardous waste generation notification number was submitted on July 9. 2013. EPA approval issued on 10/02/2013.

WASTE-10 [ASI and A/T]

The project owner shall document all releases and spills of HTF as described in Condition of Certification WASTE-9 and as required in the Soil & Water Resources section of this Decision. Cleanup and temporary staging of HTF-contaminated soils shall be conducted in accordance with the approved Operation Waste Management Plan required in Condition of Certification of WASTE-6. The project owner shall sample HTF-contaminated soil in accordance with the United States Environmental Protection Agency's (USEPA) current version of "Test Methods for Evaluating Solid Waste" (SW-846). Samples shall be analyzed in accordance with USEPA Method 1625B or other method to be reviewed and approved by DTSC and the CPM.
Within 28 days of an HTF spill the project owner shall provide the results of the analyses and their assessment of whether the HTF-contaminated soil is considered hazardous or non-hazardous to DTSC and the CPM for review and approval. If DTSC and the CPM determine the HTF-contaminated soil is considered hazardous it shall be disposed of in accordance with California Health and Safety Code (HSC) Section 25203 and procedures outlined in the approved Operation Waste Management Plan required in Condition of Certification WASTE-9 and reported to the CPM in accordance with Condition of Certification WASTE-12. If DTSC and the CPM determine the HTF-contaminated soil is considered nonhazardous it shall be retained in the land farm and treated on-site in accordance with the Waste Discharge Requirements contained in the Soil & Water Resources section of this Decision.
The HTF contaminated soil samples have been submitted to a testing lab. Lab results submitted to the CPM on 04/25/2014 and to DTSC on 05/09/2014, please see attachments. CPM approved on 05/22/2014 and DTSC on 05/09/2014. HTF contaminated soil sample lab results resubmitted to CEC after testing for biphenyl and diphenyl on 07/09/2014, please see attachments.

WORKER SAFETY-2

At least 30 days prior to the start of commissioning, the project owner shall submit to the SBCFD the final Operations Fire Prevention Plan and Emergency Action for review and the final Project Operations and Maintenance Safety and Health Program to the CPM for approval.
Health & Safety, Fire Prevention and Emergency Response plans for operations submitted to SBCFD and CPM on 02/14/2014, please see attachments. SBCFD issued comments on 02/26/2014, comments addressed and resubmitted to CPM on 02/26/2014. CPM issued comments on 03/03/2014, package resubmitted on 03/05/2014, please see attachment.

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CPM approved package on 03/10/2014, please see attachment. CPM clarified its approval of this compliance on 03/25/2014.

SOIL&WATER-1

Provide an analysis on the effectiveness of the drainage, erosion, and sediment control measures and the results of monitoring and maintenance activities.
Please see the attached Construction Site Stormwater Runoff Control Inspection forms. A light rain event occurred on site for the week of July 29, 2014. All site BMP's functioned accordingly and there was no runoff from the site. The contractor reports as of July 31, 2014 that 0 lf (24,730 lf total for project) of straw rolls and 0 lf (16,219 lf total for project) of new swale have been installed for this month, maintenance required for this month included cleaning all waddles running north/south in Alpha East due to sand buildup. The existing fiber rolls and swales continued being monitored, maintained, and replaced as needed. These BMP's were effective in preventing sediment run off from the site. There are three concrete washout stations (1 in Alpha and 2 in Beta). Additionally, the steel rumble strips remain in place at the Alpha east main entrance (north), Alpha east (south) entrance, Alpha west entrance, and on Lockhart Road adjacent to the TAB main entrance. They were effective in preventing dirt and mud from being tracked from the site onto Harper Lake Road and Lockhart Road as well as an effective deterrent against the spreading of noxious weeds. The steel beams are continuously maintained to prevent clogging. Street sweeping of the construction entrances and Harper Lake Road and Lockhart Road is occurring on an as needed basis as a means of good housekeeping; it has improved and will continue to be the main activity to keep the streets free of dirt and mud, especially when high winds and storm events occur. Soil stabilizer wasn't used for this month on traffic areas as daily watering was an effective means for dust control. Project site areas for the month that have been stabilized are 0 acres for Alpha East (279.50 acres total), 0 acres in Alpha West (369 acres total), 0 acres in Beta East (502 acres total), and 0 acres in Beta West (102.50 acres total). No sand build-up was reported in the retention basins between collectors. Trash collection was taken care of daily, as AEPC has 12 full time workers dedicated to trash duty. Due to the increase in on site contractors trash has escalated and became a major concern. Notification to the subcontractors to clean up their own trash, especially any accumulating in the trenches, pipes and power block areas has reduced the problem. Sand removal along tortoise fences was done daily. Since the new crews have been on site and new trash policies have been followed, the site trash issues have improved but concern of trash buildup in the ACEC remains a concern. Trash crews are waiting to schedule a time to go into the ACEC to access the hard to reach areas and clean the trash. The DB will be notified prior to this task so they can clear the area. Still awaiting word from the BLM if trash crews can go into the ACEC immediately to clear the area of trash. Please see attachments, which include the weekly Construction Site Stormwater Runoff Control Inspection forms signed by the project QSP and the Bureau Veritas site inspector.

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SOIL&WATER-2

The project owner shall comply with the Waste Discharge Requirements (WDRs) established in Soil and Water Resources Appendices C, D, and E for the construction and operation of the surface impoundments (evaporation ponds), land treatment units, and storm water management system. These requirements relate to discharges, or potential discharges, of waste that could affect the quality of waters of the state, and were developed in consultation with staff of the State Water Resources Control Board and/or the applicable California Regional Water Quality Control Board (hereafter "Water Boards"). It is the Commission's intent that these requirements be enforceable by both the Commission and the Water Boards. In furtherance of that objective, the Commission hereby delegates the enforcement of these requirements, and associated monitoring, inspection and annual fee collection authority, to the Water Boards. Accordingly, the Commission and the Water Board shall confer with each other and coordinate, as needed, in the enforcement of the requirements. The project owner shall pay the annual waste discharge permit fee associated with this facility to the Water Boards. In addition, the Water Boards may "prescribe" these requirements as waste discharge requirements pursuant to Water Code Section 13263 solely for the purposes of enforcement, monitoring, inspection, and the assessment of annual fees, consistent with Public Resources Code Section 25531, subdivision (c). No later than sixty (60) days prior to any wastewater or storm water discharge or use of land treatment units, the AMS project shall provide documentation to the CPM, with copies to the Lahontan RWQCB, demonstrating compliance with the WDRs established in Appendices C, D, and E. Any changes to the design, construction, or operation of the ponds, treatment units, or storm water system shall be requested in writing to the CPM, with copies to the Lahontan RWQCB, and approved by the CPM, in consultation with the Lahontan RWQCB, prior to initiation of any changes. The AMS project shall provide to the CPM, with copies to the Lahontan RWQCB, all monitoring reports required by the WDRs, and fully explain any violations, exceedances, enforcement actions, or corrective actions related to construction or operation of the ponds, treatment units, or storm water system. SWAT2-01-00, construction plans for the Evaporation ponds and LTU's were submitted to the CEC, Lahontan and CBO on June 6, 2013 and approved by all agencies on June 11, 2013. SWAT2-02-00, a modification to the LTU plans was submitted to the CEC and Lahontan on August 5, 2013, and an approval was issued on August 8, 2013. SWAT2-04-00 for a change in verification was requested by the CEC but AEPC suggested that any change will be covered by the closure compliances, COMPLIANCE-12, -13 and -14. The CEC responded on September 12, 2013 that they were in agreement. SWAT2-03-00, for the monitoring well system was submitted to the CEC and Lahontan the week of 10/28. Abeinsa EPC engineering staff is still coordinating with the CEC and Lahontan on the final design. Abeinsa EPC submitted a well plan for CEC review on 11/27/2013. CEC provided comments to the well plan on 12/17/2013. Revised well plan submitted to the CEC on 12/23/2013, CPM approved on 01/14/2014. **DMP submitted to CEC on 06/03/2014, please see attachment. CEC provided comments, DMP resubmitted on 06/30/2014, please see attachment. SWAT-2-08-02 request to use Cooling Tower and pipe cleaning water for dust control submitted and approved on 06/17/2014, please see attachment. SWAT-2-06-01, Bioremediation Manual, was submitted to CPM on 06/20/2014. CPM approved SWAT-2-06-01 Bioremediation Manual on 07/02/2014, please see attachment.**

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SOIL&WATER-4

Well abandonment status for remaining abandonments submitted to CPM on 09.06.12, As of 09.06.12, the CEC has approved all well abandonments with the exception of wells 11 and 14 (stuck pump wells). They require a wildlife survey in the area of the two wells to ensure that their habitats won't be disrupted with the use of explosives for the stuck pump wells. As of 10.13.2012, the well contractor was able to remove the pump from Well #11 by conventional means. However, Well #2 has now been determined as having a stuck pump and needing explosives to remove. The abandonment package was revised and resubmitted to the CEC on 10.22.2012. CEC has approved the use of explosives on Wells #2 and #14 as of October 31, 2012. As of March 5, 2013, the remaining wells to be abandoned are: Ryken and Wetlands. Wells #2 and #14 (by explosives) and 8, 10, 19, were abandoned during January 2013 but their well completion reports were finalized this month, please see attachments. Ryken and Wetlands wells were approved to be abandoned by SBC on May 7, 2013. Final abandonment was completed on May 17, 2013 and well completion reports were submitted to the CEC for approval. ASI and Abeinsa EPC have agreed on a new location of the Beta #4. An exhibit indicating final production well locations (including Beta #4) was provided to CPM on 11/27/2013. CPM responded asking for the well design by well contractor that will show a sealed upper layer which prevents any infiltration of the perched layer into the lower aquifer. Well contractor submitted a permit to SBC on 12/07/2013 but decision was made to go with a different contractor. New contractor submitted a permit for the Beta #4 well on 01/14/2014, SBC approved on 01/31/2014 based on the condition that Beta #1 be retrofitted as a monitoring well and the Beta #2 conductor casing be destroyed. The CPM further approved the use of Beta #1 for construction water while Beta #3 construction was completed. CPM approved the Beta #4 permit on 02/04/2014. A request to extend the discharge permit for well test water to the BLM marsh was submitted to CPM on 02/10/2014, CPM approved on 02/12/2014. Beta #4 well completion report submitted to CPM on 05/22/2014. Water line between Beta #3 and Beta #4 complete.

SOIL&WATER-5

Beginning six (6) months after the start of construction, the project owner shall prepare a semi-annual summary report of the amount of water used for construction purposes. The summary shall include the monthly range and monthly average of daily water usage in gallons per day.
For July 2014, 182,300 gallons were pumped from Beta #3, 8,253,000 gallons from Alpha #2 (North), and 2,805,000 gallons from Alpha #1 (South). Of this total, 88,000 gallons was used by SBC for maintenance of Harper Lake Road. The overall total site water usage for July 2014 is 11,240,300 gallons. The running total of water usage for construction/testing purposes from January 1, 2014 to July 31, 2014 is 34,414,451 gallons. To date, there have been 164 working days for 2014 which equates to 209,844 gal/day. This equates to 4,916,350 gal/month, please see attachments.

SOIL&WATER-6

The project owner shall do all of the following:
1. At least sixty (60) days prior to project construction, the project owner shall

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submit to the CPM, for review and approval, a comprehensive plan (Groundwater Level Monitoring and Reporting Plan) presenting all the data and information required in Item A above. The project owner shall submit to the both the CPM all calculations and assumptions made in development of the plan.
2. During project construction, the project owner shall submit to the CPM quarterly reports presenting all the data and information required in Item B above. The project owner shall submit to the CPM all calculations and assumptions made in development of the report data and interpretations.
3. No later than sixty (60) days after commencing project operation, the project owner shall provide to the CPM, for review and approval, documentation showing that any mitigation to private well owners during project construction was satisfied, based on the requirements of the property owner as determined by the CPM.
4. During project operation, the project owner shall submit to CPM, applicable quarterly, semi-annual, and annual reports presenting all the data and information required in Item C above. The project owner shall submit to the CPM all calculations and assumptions made in development of report data and interpretations, calculations, and assumptions used in development of any reports.
5. The project owner shall provide mitigation as described in Item D above, if the CPM's inspection of the monitoring information confirms project-induced changes to water levels and water level trends relative to measured preproject water levels, and well yield has been lowered by project pumping. The type and extent of mitigation shall be determined by the amount of water level decline and site-specific well construction and water use characteristics. The mitigation of impacts will be determined as set forth in Item D above.
6. No later than 30 days after CPM approval of the well drawdown analysis, the project owner shall submit to the CPM for review and approval all documentation and calculations describing necessary compensation for energy costs associated with additional lift requirements.
7. The project owner shall submit to the CPM all calculations, along with any letters signed by the well owners indicating agreement with the calculations, and the name and phone numbers of those well owners that do not agree with the calculations.
8. If mitigation includes monetary compensation, the project owner shall provide documentation to the CPM that compensation payments have been made by March 31 of each year of project operation or, if a lump-sum payment is made, payment shall be made by March 31 of the following year. Within 30 days after compensation is paid, the project owner shall submit to the CPM a compliance report describing compensation for increased energy costs necessary to comply with the provisions of this condition.
9. After the first 5-year operational and monitoring period, and every subsequent 5-year period, the project owner shall submit a 5-year monitoring report to the CPM for review and approval. This report shall contain all monitoring data collected and provide a summary of the findings and a recommendation about whether the frequency of water level measurements should be revised or eliminated.
10. During the life of the project, the project owner shall provide to the CPM all monitoring reports, complaints, studies, and other relevant data within 10 days of being received by the project owner.

Fourth quarter water quality report submitted to CPM on 03/28/2014 CPM provided comments, report resubmitted on 04/25/2014.

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SOIL&WATER-9

Prior to the start of construction of the sanitary waste system, the project owner shall submit to the County of San Bernardino for review and comment, and to the CPM for review and approval, plans for the construction and operation of the project's proposed sanitary waste septic system and leach field. These plans shall comply with the requirements set forth in County of San Bernardino Code Title 3, Division 3, Chapter 8 Waste Management, Article 5, Liquid Waste Disposal and Title 6, Division 3, Chapter 3, and the Uniform Plumbing Code. Project construction shall not proceed until the CPM has approved the plans. The project owner shall remain in compliance with the San Bernardino County code requirements for the life of the project.

The septic plans were submitted to CEC on 04/03/2012 for review and approval. CEC approved on 04/23/2012. Plans were resubmitted to SBC on 12/16/2013 to include the addition of the sanitary lift station, comments received regarding the addition and reason for the sanitary lift station, package resubmitted to SBC on 02/19/2014, SBC approved on 02/20/2014. Plans were submitted to CPM on 02/28/2014, CPM approved on 04/23/2014.

SOIL&WATER-10

The project owner shall obtain a permit to operate a nontransient, non-community water system with the County of San Bernardino at least sixty (60) days prior to commencement of construction at the site. The project owner shall supply updates annually for all monitoring requirements and submittals to County of San Bernardino related to the permit, and proof of annual renewal of the operating permit. To date, potable water system is not installed, thus no monitoring requirements are in effect.
Alpha #1 well permit issued by San Bernardino County on 01/10/2012.
Alpha #2 well permit issued by San Bernardino County on 01/10/2012.
Beta #3 well permit issued by San Bernardino County on 06/04/2012.
Non-transient, non-community water system submitted to SBC on 05/05/2014.
Non-transient, non-community water system resubmitted to SBC on 07/30/2014, please see attachment.

GEN-2

Provide schedule updates in the monthly compliance report.
All engineering disciplines have submitted updated master drawing/spec lists. In addition, the latest construction schedule has been provided. Please see attached copies.

CIVIL-1

At least 15 days (or project owner and CBO approved alternative time frame) prior to the start of site grading the project owner shall submit the documents described above to the CBO for design review and approval. In the next monthly compliance report following the

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CBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the CBO.

Civil-1-17.03: Alpha & Beta Wildlife Exclusionary Fence plans for evaporation ponds submitted to CBO on 07/16/2014, CBO approval on 07/28/2014, please see attachment.

STRUC-1

Submit to the CPM, in the next monthly compliance report, a copy of a statement from the CBO that the proposed structural plans, specifications, and calculations have been approved and comply with the requirements set forth in applicable engineering LORS.

Struc-1-9.00: Generator Circuit Breaker Support Platform Addition plans submitted to CBO on 06/24/2014, CBO approval on 07/02/2014, please see attachment.
Struc-1-82.00: Turnstile Foundation plans submitted to CBO on 07/01/2014, CBO approved on 07/10/2014, please see attachment.

MECH-1

Send the CPM a copy of the transmittal letter.

Mech-1-30.01: Alpha & Beta Mechanical Assembly plans submitted to CBO on 10/17/2013, CBO approval on 07/22/2014, please see attachment.

ECN-1

Send the CPM a copy of the transmittal letter in the next monthly compliance report.

ECN-1-25.00: Alpha Steam Blow Piping Installation submitted to CBO on 07/22/2014, CBO approval on 07/28/2014, please see attachment.

ELEC-1

Send the CPM a copy of the transmittal letter in the next monthly compliance report.

Elec-1-0.03: Electrical Specifications submitted to CBO on 04/22/2014, CBO approved on 07/08/2014, please see attachment.
Elec-1-42.06: Alpha & Beta Temporary Power for UPS-1312 submitted to CBO on 04/21/2014, CBO approved on 07/02/2014, please see attachment.
Elec-1-42.12: Alpha & Beta Temporary Power for Water Treatment Plant MCC1 submitted to CBO on 06/19/2014, CBO approved on 07/08/2014, please see attachment.
Elec-1-48.01: Alpha & Beta Short Circuit Protective Device Coordination and Arc Flash Report submitted to CBO on 04/29/2014, CBO approved on 07/22/2014, please see attachment.

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Elec-1-52.00: Alpha Utilities Area WTP Laboratory Layout plans submitted to CBO on 06/09/2014, CBO approved on 07/18/2014, please see attachment.
Elec-1-54.00: Alpha & Beta CP Fire Alarm package submitted to CBO on 07/17/2014, CBO approved on 07/25/2014, please see attachment.

TRANS-5 [A/T]

The project owner shall not allow hazardous materials deliveries during non-daylight periods (during both construction and operation) to enhance safety at the rail crossing. A record of hazardous materials deliveries shall be provided to the CPM as required in HAZ-3.
Please see attached Beck Oil delivery lists and HTF delivery list.

TSE-1

Provide schedule updates in the MCR.
Please see attached Electrical Master List.

TSE-4

At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of construction, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations for equipment and systems of the power plant switchyard, outlet line and termination, including a copy of the signed and stamped statement from the responsible electrical engineer attesting to compliance with the applicable LORS, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report. The following activities shall be reported in the Monthly Compliance Report:
A. Receipt or delay of major electrical equipment;
Please see attached list of receipt of major electrical equipment.
B. Testing or energization of major electrical equipment;
Please see attachments for electrical tests to date.
C. The number of electrical drawings approved, submitted for approval, and still to be submitted.
Please see attached Electrical Master List.

TSE-5

At least 60 days prior to the start of construction of transmission facilities (or a lesser number of days mutually agreed to by the project owner and CBO), the project owner shall submit to the CBO for approval:

A. Design drawings, specifications and calculations conforming with CPUC General Order 95 or NESC, Title 8, Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders", NEC, applicable interconnection standards and related industry standards, for the poles/towers, foundations, anchor bolts, conductors, grounding systems and major switchyard equipment.

B. For each element of the transmission facilities identified above, the submittal package to the CBO shall contain the design criteria, a discussion of the calculation method(s), a sample calculation based on "worst case conditions"7

13911 Park Avenue, Suite 208
Victorville, CA 92392
Phone: 480-287-1419

and a statement signed and sealed by the registered engineer in responsible charge, or other acceptable alternative verification, that the transmission element(s) will conform with CPUC General Order 95 or NESC, Title 8, California Code of Regulations, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", NEC, applicable interconnection standards, and related industry standards.

C. Electrical one-line diagrams signed and sealed by the registered professional electrical engineer in responsible charge, a route map, and an engineering description of equipment and the configurations covered by requirements TSE-5 a) through f) above. 7 Worst case conditions for the foundations would include for instance, a dead-end or angle pole.

D. The Special Protection System (SPS) sequencing and timing if applicable shall be provided concurrently to the CPM.

E. A letter stating the mitigation measures or projects selected by the transmission owners for each reliability criteria violation are acceptable,
F. An Operational study report based on the expected or current COD from the California ISO and/or SCE, and
G. A copy of the executed LGIA signed by the California ISO and the project owner.

Submittal of project LGIA sent to CPM on 11/08/2013, CPM approved on 12/02/2013.

TLSN-5

The project owner shall ensure that all permanent metallic objects within the right-of-way of the project-related lines are grounded according to industry standards regardless of ownership.
At least 30 days before the lines are energized, the project owner shall transmit to the CPM a letter confirming compliance with this Condition.
Confirmation letter sent to the CPM on 11/06/2013, CPM approved on 11/07/2013.

VIS-1

Revised Surface Treatment Package was submitted to CPM on 04/14/2014. CPM approved plans on 05/16/2014.

VIS-3

Permanent Lighting plans. Package was submitted to CPM on 05/05/2014. CPM approved plans on 05/05/2014.

ABENER TEYMA MOJAVE

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Should you have any questions or need any additional information, please do not hesitate to contact me.

Sincerely,

Steven Pochmara
ABEINSA EPC
13911 Park Avenue, Suite 208
Victorville, CA 92392
Cell: (480) 287-1419

KEY EVENTS LIST

PROJECT: MOJAVE SOLAR PROJECT

DOCKET #: 09-AFC-5

COMPLIANCE PROJECT MANAGER: DALE RUNDQUIST

EVENT DESCRIPTION	DATE
Certification Date	09/2010
Obtain Site Control	
Online Date	
POWER PLANT SITE ACTIVITIES	
Start Site Mobilization	08/2011
Start Ground Disturbance	08/2011
Start Grading	08/2011
Start Construction	08/2011
Begin Pouring Major Foundation Concrete	09/2011
Begin Installation of Major Equipment	07/2012
Completion of Installation of Major Equipment	
First Combustion of Gas Turbine	N/A
Obtain Building Occupation Permit	
Start Commercial Operation	
Complete All Construction	
TRANSMISSION LINE ACTIVITIES	
Start T/L Construction	11/2012
Synchronization with Grid and Interconnection	05/2014
Complete T/L Construction	02/2013
FUEL SUPPLY LINE ACTIVITIES	
Start Gas Pipeline Construction and Interconnection	N/A
Complete Gas Pipeline Construction	N/A
WATER SUPPLY LINE ACTIVITIES	
Start Water Supply Line Construction	01/2013
Complete Water Supply Line Construction	

ABENER TEYMA MOJAVE

LETTER OF TRANSMITTAL

Date: July 25, 2014
Subject: Mojave Solar Project (09-AFC-5C)
Condition Number: AQ-64
Description: **Carbon Adsorption System Monitoring and Change Out Plan**
Submittal No.: AQ64-01-00
To: Mr. Dale Rundquist, CPM
California Energy Commission

WE ARE SENDING YOU

Document Name	Title	REV
AQ-64 Cover Letter		
Carbon Adsorption System Monitoring and Change Out Plan	Carbon Adsorption System Monitoring and Change Out Plan	B

THESE ARE TRANSMITTED as checked below:

☒ For Review

REMARKS

COPY TO: File

SIGNED BY:

Vernon D. Leeming
Permitting Engineer
ABEINSA EPC

ABENER TEYMA MOJAVE

Cover Letter

Date:	July 25, 2014
Subject:	Mojave Solar Project (09-AFC-5C)
Condition Number:	AQ-64
Description:	**Monitoring and Change Out Plan for the Carbon Adsorption System.**
Submittal No.:	AQ64-01-00

Mr. Dale Rundquist, CPM
California Energy Commission
1516 Ninth Street (MS-2000)
Sacramento, CA 95814
DRundquist@energy.state.ca.us

Dear Mr. Rundquist,

Abengoa Solar LLC has revised and condensed the plan previously submitted to make it better suited for daily operations, while including all the items that are required in the compliance. In accordance with AQ-64 we are submitting this revision for your approval.

For your convenience, we are including the Compliance language below:

AQ-64: The project owner shall prepare and submit a monitoring and change out plan for the carbon adsorption system which ensures that the system is operating at optimal control efficiency at all times for District approval 60 days prior to commercial operation date (COD). Once approved, any subsequent changes to the monitoring and change-out plan must be submitted in writing to the District for approval prior to implementation.

Verification: The project owner shall provide the District for review and approval and the CPM for review the required monitoring and change-out plan within the timeframe required by this condition.

Should you have any questions or comments, please don't hesitate to contact me.

COPY TO: File

SIGNED BY:

Vernon D. Leeming
Permitting Engineer
ABEINSA EPC

ABENGOA SOLAR

Mojave Solar LLC

Operation Procedure

Title:
Carbon Adsorption System Monitoring and Change Out Plan

Document:	
Revision:	B
Date:	

Produced by:	
Szewan Lam	July 15, 2014

Reviewed by:	

Approved by:	

Revision Control Sheet

Revision	Date	Reason for the Revision
01		Initial Release

Contents

1 Objective

This procedure specifies the monitoring and change out requirements of the Carbon Adsorption System of the HTF Ullage Area. This procedure satisfies the California Energy Commission condition AQ-64 for the Mojave Solar Project.

2 Scope

This procedure specifies the periodic monitoring and record keeping requirements for the operations of the Carbon Adsorption System of the HTF Ullage Area. Compliance reporting and annual compliance testing of the ullage stack vent is outside the scope of this procedure.

The Carbon Adsorption System is identical for Alpha Plant and Beta Plant. This procedure is applicable to both plants.

3 References

MDAQMD Permit to Operate

California Energy Commission Final Commission Decision

4 Definitions

DCS: Distributed Control System

HTF: Heat Transfer Fluid

LOTO: Lock Out Tag Out

PID: Photo Ionization Detector

Spare carbon bed: Carbon bed that is loaded with unused/fresh activated carbon

Spent carbon bed: Carbon bed that has been in service and has been determined to have reached the end of its service life based on VOC monitoring

VOC: Volatile Organic Compound

5 Procedure

5.1 System Description

The Mojave Solar Project uses HTF to transfer heat energy from the sun collected throughout the solar field. The HTF system has several overflow tanks and expansion vessels to allow for the thermal expansion of the HTF. Vents from these

vessels and tanks are vented through the carbon adsorption system to reduce the VOCs emission.

The carbon adsorption system is designed to achieve at least 95% VOC removal efficiency. Each carbon bed is filled with activated carbon that adsorbs VOCs until the carbon is saturated (or spent).

Vents from the overflow tanks are routed through MF-206A/B. MF-206A/B are two identical carbon beds arranged in parallel with 100% spare. One bed is always in service and the other bed is on standby (or spent).

Similarly, vents from the expansion vessels are routed through MF-206C/D. MF-206C/D are two identical carbon beds arranged in parallel with 100% spare. One bed is always in service and the other bed is on standby (or spent).

5.2 Breakthrough Monitoring

The carbon beds that are in service are monitored during venting once per week for VOC breakthrough. This inspection utilizes a portable PID to monitor VOC concentrations on the outlet of the carbon beds. The PID shall be set to read VOC concentrations as hexane and it shall be calibrated according to the manufacturer recommendation. The calibration log shall be maintained and stored with the instrument.

The theoretical outlet VOC concentration for the beds with 95% removal efficiency is approximately 960 ppm VOC as hexane for MF-206A/B (overflow tank vent) and 87 ppm VOC as hexane for MF-206C/D (expansion vessel vent).Note that these are the theoretical concentrations and depend highly on the inlet vent gas concentrations; readings above these values do not necessarily mean the removal efficiency is less than 95%. Nonetheless, these values are referred to as threshold values in this procedure.

The carbon beds are approaching breakthrough when the outlet VOC concentrations are:

At or above 750 ppm VOC as hexane for MF-206A/B

At or above 70 ppm VOC as hexane for MF-206C/D

These values are selected to be about 80% of the threshold values for 95% removal efficiency.

Upon reaching these values, operators may one of following two actions:

1) Take corrective actions within five operating days; or
2) Begin daily monitoring the VOC outlet concentration for this carbon bed, and take correction actions within five operating days after the VOC outlet

concentration reaches the threshold values: 960 ppm for MF-206A/B and 87 ppm for MF-206C/D.

The results of all monitoring readings shall be documented in accordance with Section 8 Records.

5.3 Corrective Actions: Carbon Bed Change Out

Follow the LOTO process and the carbon bed operating procedure to safely put the spare carbon bed in service and align valve positions.

The spare carbon bed should be lined up to allow flow before taking the spare carbon bed out of service.

Document the change out in accordance with Section 8 Records.

Notify the appropriate personnel to schedule for the replacement and removal of the spent carbon.

5.4 Maintenance

Except for components that need periodic lubrication, preventative maintenance is not required for this system.

6 Health, Safety and Environment

Participants in this process are to ensure that Abengoa Solar standards of environmental, health & safety are followed at all times. For field procedures, follow the PPE and other safety and health requirements specified in the LOTO/work clearance document included in every SAP work order.

7 Responsibilities

Any and all personnel that carry out this procedure will have the responsibility to adhere to all safety and environmental policies in place. Proper communication will be conducted prior, during, and after any plant equipment manipulation.

7.1 Field Operator

- Perform the work based on the reference procedure
- Comply with and enforce the safety standards
- Inform the maintenance supervisor of any variation in the work that could affect the performance and safety of the work
- Inform the control room operator before starting any maintenance or isolation
- Register the tasks performed every day in the incident sheet

- Return the work order upon completion
- Obtain the tools and spare parts needed for each type of activity described
- Follow LOTO procedures

7.2 Control Room Operator

- Operate power plant safely, efficiently, and environmentally compliant.
- Coordinate LOTO as needed
- Communicate with Operations Supervisor on daily operating plant/strategy.

8 Records

The following records shall be logged and maintained on site for five years.

8.1 Breakthrough Monitoring

The weekly (or more frequent) monitoring shall contain the following information:

- Tag numbers of carbon beds in service
- Date and time the VOC readings are taken
- Outlet VOC reading (in ppm as hexane) for each carbon bed in service

8.2 Carbon Change Out

This information shall be logged and maintained in the maintenance and work order database.

- Date when a spent carbon bed is taken out of service and the spare bed put in service and the bed tag numbers
- Date when the spent carbon bed is loaded with fresh carbon and the bed tag number

9 Annex

Not applicable.

HTF Deliveries - July - Mojave Solar Project

Solutia Trucks

Date	Arriving	Start loading	End loading	Quantity (lb)	Destination
3/17/14	8:15 AM	11:30 AM	12:05 PM	47060	Alpha
3/17/14	8:15 AM	12:35 PM	1:00 PM	48220	Alpha
3/18/14	7:15 AM	8:45 AM	9:15 AM	46980	Alpha
3/18/14	8:30 AM	9:48 AM	10:15 AM	47380	Alpha
3/18/14	9:20 AM	11:30 AM	1:15 PM	47640	Beta
3/18/14	1:00 PM	2:15 PM	3:00 PM	47720	Beta
3/19/14	7:00 AM	9:00 AM	9:45 AM	48640	Beta
3/19/14	8:45 AM	10:00 AM	11:25 AM	48420	Alpha
3/19/14	9:30 AM	11:15 AM	12:45 PM	45800	Beta
3/19/14	10:15 AM	1:00 PM	1:45 PM	45860	Alpha
3/19/14	12:15 PM	1:00 PM	2:30 PM	45200	Beta
3/20/14	7:30 AM	7:45 AM	8:40 AM	41160	Beta
3/20/14	8:00 AM	9:50 AM	10:45 AM	47160	Alpha
3/20/14	8:15 AM	9:15 AM	9:35 AM	46280	Alpha
3/20/14	8:15 AM	10:35 AM	11:00 AM	45840	Alpha
3/20/14	8:15 AM	11:25 AM	12:10 PM	45340	Beta
3/20/14	10:30 AM	11:30 AM	12:00 PM	45580	Alpha
3/20/14	12:25 PM	2:00 PM	2:50 PM	46120	Beta
3/21/14	7:00 AM	7:25 AM	8:10 AM	45560	Beta
3/21/14	7:00 AM	8:30 AM	8:45 AM	46980	Alpha
3/21/14	8:15 AM	9:20 AM	9:45 AM	46960	Alpha
3/21/14	9:15 AM	9:00 AM	10:15 AM	45960	Beta
3/21/14	12:00 PM	12:15 PM	1:00 PM	43000	Beta
3/21/14	12:00 PM	1:25 PM	2:15 PM	45420	Alpha
3/24/14	7:00 AM	7:15 AM	7:35 AM	42980	Beta
3/24/14	8:30 AM	9:20 AM	10:00 AM	45100	Beta
3/24/14	7:30 AM	9:30 AM	10:15 AM	44840	Beta
3/24/14	7:30 AM	11:15 AM	11:50 AM	45360	Beta
3/24/14	7:30 AM	11:30 AM	12:10 PM	43920	Alpha
3/24/14	9:30 AM	1:45 PM	2:20 PM	44300	Alpha
3/25/14	7:00 AM	8:15 AM	8:40 AM	45280	Beta
3/25/14	7:06 AM	8:50 AM	9:25 AM	51080	Beta
3/25/14	8:45 AM	9:15 AM	10:20 AM	45580	Beta
3/26/14	6:51 AM	8:20 AM	8:45 AM	44200	Alpha
3/26/14	7:57 AM	9:00 AM	9:20 AM	44740	Alpha
3/26/14	8:08 AM	10:50 AM	11:20 AM	44880	Alpha
4/7/14	7:07 AM	9:30 AM	10:55 AM	43140	Alpha
4/7/14	7:50 AM	11:35 AM	12:00 PM	42840	Alpha
4/7/14	8:00 AM	12:20 PM	12:45 PM	42740	Alpha
4/8/14	11:30 AM	12:50 PM	1:20 PM	42740	Alpha
4/8/14	12:30 PM	1:30 PM	2:00 PM	44560	Alpha
4/8/14	2:00 PM	2:14 PM	2:38 PM	44500	Alpha
4/9/14	7:12 AM	7:30 AM	8:10 AM	46740	Alpha
4/9/14	7:15 AM	9:00 AM	9:40 AM	45540	Alpha
4/9/14	9:50 AM	11:40 AM	12:05 PM	43940	Alpha
4/10/14	7:30 AM	8:45 AM	9:10 AM	47440	Alpha
4/10/14	8:24 AM	9:55 AM	10:30 AM	45220	Alpha
4/11/14	7:00 AM	9:08 AM	9:25 AM	44940	Alpha

4/11/14	7:00 AM	9:50 AM	10:30 AM	46400 Alpha
4/11/14	7:30 AM	10:45 AM	11:30 AM	45920 Alpha
4/14/14	7:06 AM	9:00 AM	9:30 AM	45420 Alpha
4/14/14	7:12 AM	10:00 AM	10:30 AM	44780 Alpha
4/14/14	7:17 AM	12:30 PM	1:10 PM	43280 Alpha
4/14/14	8:41 AM	1:20 PM	2:00 PM	45760 Alpha
4/15/14	7:00 AM	8:45 AM	9:10 AM	45420 Alpha
4/15/14	7:00 AM	9:20 AM	9:50 AM	45640 Alpha
4/15/14	8:20 AM	10:15 AM	11:50 AM	42840 Alpha
4/15/14	10:21 AM	12:00 PM	12:30 PM	45040 Alpha
4/16/14	7:10 AM	9:00 AM	9:25 AM	46560 Alpha
4/16/14	7:10 AM	9:50 AM	10:20 AM	45160 Alpha
4/16/14	9:40 AM	10:50 AM	11:00 AM	44360 Alpha
4/16/14	9:50 AM	11:30 AM	11:50 AM	45300 Alpha
4/17/14	6:56 AM	9:10 AM	9:35 AM	45780 Alpha
4/17/14	8:48 AM	9:50 AM	10:20 AM	44460 Alpha
4/17/14	8:04 AM	10:45 AM	11:10 AM	45020 Alpha
4/17/14	7:00 AM	11:20 AM	11:45 AM	45580 Alpha
4/18/14	7:10 AM	9:20 AM	10:00 AM	47160 Beta
4/18/14	8:10 AM	10:20 AM	11:00 AM	45240 Beta
4/18/14	9:10 AM	11:20 AM	12:00 PM	45200 Beta
4/18/14	2:20 PM	3:00 PM	3:30 PM	47080 Beta
4/21/14	7:30 AM	8:00 AM	8:25 AM	46440 Alpha
4/21/14	8:00 AM	9:10 AM	9:40 AM	46700 Beta
4/21/14	10:21 AM	10:50 AM	11:25 AM	42940 Beta
4/21/14	10:35 AM	12:15 PM	12:40 PM	46300 Beta
4/22/14	7:10 AM	8:20 AM	8:45 AM	46820 Alpha
4/22/14	8:34 AM	9:00 AM	9:30 AM	45780 Alpha
4/22/14	9:30 AM	1:00 PM	1:35 PM	46180 Alpha
4/22/14	9:48 AM	12:50 PM	1:15 PM	46100 Alpha
4/23/14	7:30 AM	8:20 AM	8:45 AM	45900 Alpha
4/23/14	7:38 AM	10:50 AM	11:25 AM	44460 Beta
4/23/14	7:44 AM	12:00 PM	12:35 PM	45720 Beta
4/23/14	9:47 AM	12:50 PM	1:20 PM	43540 Beta
4/23/14	9:55 AM	1:40 PM	2:00 PM	46640 Beta
4/23/14	9:58 AM	2:10 PM	2:35 PM	46400 Beta
4/24/14	7:09 AM	11:57 AM	12:40 PM	46080 Alpha
4/24/14	7:15 AM	12:45 PM	1:20 PM	43560 Alpha
4/24/14	8:06 AM	1:45 PM	2:10 PM	48500 Alpha
4/24/14	8:51 AM	2:25 PM	2:50 PM	45040 Alpha
4/24/14	8:55 AM	3:05 PM	3:25 PM	47040 Alpha
4/24/14	9:34 AM	3:40 PM	2:00 PM	45700 Alpha
4/25/14	7:08 AM	10:30 AM	10:55 AM	45240 Alpha
4/25/14	7:15 AM	11:10 AM	11:35 AM	44200 Alpha
4/25/14	7:25 AM	11:55 AM	12:20 PM	43380 Alpha
4/25/14	10:03 AM	12:45 PM	1:20 PM	42920 Alpha
4/25/14	12:15 PM	2:00 PM	2:35 PM	45180 Alpha
5/8/14	7:04 AM	8:00 AM	8:30 AM	48200 Alpha
5/8/14	7:13 AM	8:50 AM	9:15 AM	42080 Alpha
5/8/14	7:19 AM	9:35 AM	9:55 AM	42120 Alpha
5/9/14	7:02 AM	8:00 AM	8:25 AM	46240 Alpha
5/9/14	8:00 AM	8:40 AM	9:05 AM	45860 Alpha
5/9/14	8:08 AM	9:25 AM	10:00 AM	46300 Alpha

5/9/14	9:00 AM	10:25 AM	10:55 AM	44960	Alpha
5/9/14	10:37 AM	11:15 AM	11:35 AM	45640	Alpha
5/12/14	7:06 AM	8:00 AM	8:25 AM	43780	Alpha
5/12/14	7:28 AM	8:35 AM	8:55 AM	43900	Alpha
5/12/14	7:52 AM	9:10 AM	9:35 AM	43880	Alpha
5/12/14	7:56 AM	9:45 AM	10:05 AM	44160	Alpha
5/12/14	8:56 AM	10:10 AM	10:30 AM	43120	Alpha
5/13/14	7:00 AM	8:20 AM	8:45 AM	45240	Alpha
5/13/14	7:05 AM	9:00 AM	9:20 AM	44240	Alpha
5/13/14	7:35 AM	9:40 AM	10:00 AM	45820	Alpha
5/13/14	9:45 AM	10:10 AM	10:35 AM	44300	Alpha
5/13/14	9:52 AM	10:55 AM	11:20 AM	44240	Alpha
5/14/14	6:58 AM	9:10 AM	9:35 AM	45920	Beta
5/14/14	7:05 AM	9:55 AM	10:20 AM	46260	Beta
5/14/14	7:43 AM	10:45 AM	11:20 AM	44880	Beta
5/14/14	8:37 AM	11:35 AM	12:00 PM	44600	Beta
5/14/14	9:00 AM	12:15 PM	12:40 PM	47360	Beta
5/14/14	9:08 AM	12:50 PM	1:15 PM	47180	Beta
5/15/14	7:52 AM	9:00 AM	9:40 AM	44360	Beta
5/15/14	9:00 AM	10:55 AM	11:20 AM	44180	Beta
5/15/14	9:20 AM	11:25 AM	11:50 AM	46480	Beta
5/15/14	9:28 AM	12:05 PM	12:30 PM	45300	Beta
5/15/14	9:47 AM	12:40 PM	1:00 PM	46880	Beta
5/15/14	9:55 AM	1:10 PM	1:35 PM	50060	Beta
5/16/14	7:01 AM	10:00 AM	10:20 AM	43260	Beta
5/16/14	7:10 AM	10:25 AM	10:40 AM	46580	Beta
5/16/14	8:10 AM	10:50 AM	11:25 AM	44820	Beta
5/16/14	8:57 AM	11:40 AM	12:05 PM	47220	Beta
5/16/14	9:05 AM	12:15 PM	12:35 PM	46300	Beta
5/16/14	10:45 AM	12:50 PM	1:15 PM	42360	Beta
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5/19/14	7:25 AM	8:45 AM	9:05 AM	45740	Beta
5/19/14	7:35 AM	9:15 AM	9:40 AM	44060	Beta
5/19/14	8:40 AM	9:55 AM	10:20 AM	45460	Beta
5/19/14	9:40 AM	10:35 AM	11:00 AM	45280	Beta
5/19/14	2:00 PM	2:20 PM	2:45 PM	44520	Beta
5/20/14	7:15 AM	8:00 AM	8:25 AM	45620	Beta
5/20/14	7:20 AM	8:35 AM	9:00 AM	46900	Beta
5/20/14	7:30 AM	9:00 AM	9:25 AM	46620	Alpha
5/20/14	8:30 AM	9:35 AM	10:00 AM	45980	Alpha
5/20/14	9:25 AM	10:15 AM	10:45 AM	46780	Alpha
5/21/14	7:15 AM	7:50 AM	8:15 AM	45200	Alpha
5/21/14	7:25 AM	8:25 AM	8:50 AM	46880	Alpha
5/21/14	7:35 AM	9:00 AM	9:25 AM	45100	Alpha
5/21/14	7:45 AM	9:40 AM	9:55 AM	46260	Alpha
5/21/14	8:50 AM	10:10 AM	10:35 AM	44760	Alpha
5/21/14	9:30 AM	11:00 AM	11:25 AM	45900	Alpha
5/22/14	7:10 AM	8:00 AM	8:25 AM	45620	Alpha
5/22/14	7:20 AM	8:35 AM	9:00 AM	47300	Alpha
5/22/14	7:30 AM	9:10 AM	9:35 AM	45480	Alpha
5/22/14	7:50 AM	9:50 AM	10:15 AM	45900	Alpha
5/22/14	9:00 AM	10:25 AM	10:50 AM	45180	Alpha
5/22/14	9:15 AM	11:00 AM	11:25 AM	44940	Alpha

5/23/14	7:00 AM	8:00 AM	8:20 AM	45340	Alpha
5/23/14	7:20 AM	8:30 AM	8:50 AM	44280	Alpha
5/23/14	7:25 AM	9:00 AM	9:25 AM	44100	Alpha
5/23/14	7:30 AM	9:35 AM	10:00 AM	46020	Alpha
5/23/14	9:50 AM	10:10 AM	10:35 AM	44640	Alpha
5/23/14	10:00 AM	10:45 AM	11:05 AM	44080	Alpha
5/27/14	7:15 AM	8:00 AM	8:25 AM	43220	Beta
5/27/14	7:40 AM	8:35 AM	9:00 AM	45580	Beta
5/27/14	8:00 AM	9:15 AM	9:35 AM	45520	Beta
5/27/14	8:40 AM	9:45 AM	10:05 AM	44600	Beta
5/27/14	9:25 AM	10:15 AM	10:35 AM	43960	Beta
5/27/14	9:55 AM	10:50 AM	11:15 AM	46560	Beta
5/28/14	7:15 AM	8:00 AM	8:25 AM	45460	Beta
5/28/14	7:45 AM	8:35 AM	9:00 AM	44000	Beta
5/28/14	8:25 AM	9:10 AM	9:30 AM	44120	Beta
5/28/14	8:45 AM	9:40 AM	10:05 AM	45340	Beta
5/28/14	8:50 AM	10:15 AM	10:35 AM	44520	Beta
5/28/14	8:55 AM	10:50 AM	11:15 AM	45460	Beta
5/29/14	7:10 AM	8:00 AM	8:25 AM	45660	Beta
5/29/14	7:20 AM	9:00 AM	9:20 AM	44920	Beta
5/29/14	7:30 AM	9:40 AM	10:00 AM	44260	Beta
5/29/14	7:40 AM	10:10 AM	10:40 AM	44500	Beta
5/29/14	8:30 AM	11:00 AM	11:25 AM	44680	Beta
5/29/14	8:45 AM	11:35 AM	11:55 AM	45080	Beta
5/30/14	7:05 AM	7:50 AM	8:15 AM	46260	Beta
5/30/14	7:35 AM	9:20 AM	9:45 AM	44620	Beta
5/30/14	7:45 AM	9:55 AM	10:20 AM	45260	Beta
5/30/14	8:00 AM	10:30 AM	10:55 AM	45320	Alpha
5/30/14	8:25 AM	11:10 AM	11:35 AM	44060	Alpha
5/30/14	8:45 AM	11:45 AM	12:10 PM	44280	Beta
6/2/14	7:05 AM	7:50 AM	8:15 AM	45120	Beta
6/2/14	7:15 AM	8:25 AM	8:50 AM	44680	Beta
6/2/14	9:00 AM	9:10 AM	9:35 AM	42740	Beta
6/2/14	9:35 AM	9:50 AM	10:15 AM	45040	Beta
6/2/14	9:45 AM	10:25 AM	10:50 AM	44980	Beta
6/2/14	12:10 PM	12:20 PM	12:45 PM	44380	Beta
6/3/14	7:20 AM	8:00 AM	8:25 AM	44040	Beta
6/3/14	7:30 AM	8:45 AM	9:10 AM	45160	Beta
6/3/14	9:20 AM	9:25 AM	9:50 AM	44660	Alpha
6/3/14	11:00 AM	11:15 AM	11:45 AM	45580	Beta
6/3/14	11:25 AM	12:30 PM	12:50 PM	43680	Beta
6/3/14	12:10 PM	1:00 PM	1:25 PM	42580	Beta
6/4/14	7:10 AM	8:00 AM	8:25 AM	42300	Beta
6/4/14	7:20 AM	8:45 AM	9:05 AM	43660	Beta
6/4/14	7:35 AM	9:15 AM	9:35 AM	45680	Beta
6/4/14	9:50 AM	10:20 AM	10:45 AM	42460	Beta
6/4/14	11:00 AM	11:10 AM	11:35 AM	43140	Beta
6/4/14	11:25 AM	11:35 AM	12:00 PM	45540	Beta
6/5/14	7:20 AM	7:50 AM	8:15 AM	43000	Beta
6/5/14	7:30 AM	8:20 AM	8:45 AM	45120	Beta
6/5/14	8:15 AM	9:10 AM	9:35 AM	45040	Alpha
6/5/14	9:10 AM	9:40 AM	10:05 AM	44180	Alpha
6/5/14	10:25 AM	10:35 AM	11:00 AM	46580	Alpha

6/5/14	10:35 AM	11:10 AM	11:25 AM	47740	Alpha
6/6/14	7:00 AM	8:00 AM	8:25 AM	43360	Alpha
6/6/14	7:20 AM	8:35 AM	8:55 AM	44680	Alpha
6/6/14	7:45 AM	9:05 AM	9:30 AM	46100	Alpha
6/6/14	7:55 AM	9:45 AM	10:10 AM	43160	Alpha
6/6/14	10:00 AM	10:25 AM	10:50 AM	45380	Alpha
6/6/14	10:15 AM	11:00 AM	11:25 AM	42160	Alpha
6/9/14	7:15 AM	8:00 AM	8:25 AM	45780	Alpha
6/9/14	7:35 AM	8:35 AM	9:00 AM	43260	Beta
6/9/14	7:50 AM	9:10 AM	9:35 AM	43380	Beta
6/9/14	8:10 AM	9:55 AM	10:20 AM	45320	Beta
6/9/14	9:20 AM	10:50 AM	11:15 AM	47120	Beta
6/9/14	12:00 PM	12:25 PM	12:50 PM	38440	Beta
6/10/14	7:10 AM	8:10 AM	8:35 AM	46260	Alpha
6/10/14	7:50 AM	8:40 AM	9:05 AM	45940	Alpha
6/10/14	8:05 AM	9:15 AM	9:40 AM	46840	Alpha
6/10/14	8:50 AM	9:55 AM	10:20 AM	44100	Alpha
6/10/14	9:15 AM	10:30 AM	10:45 AM	43680	Alpha
6/10/14	9:40 AM	10:55 AM	11:20 AM	46500	Alpha
6/11/14	7:15 AM	8:10 AM	8:35 AM	44220	Alpha
6/11/14	7:25 AM	8:45 AM	9:05 AM	43540	Alpha
6/11/14	8:00 AM	9:15 AM	9:40 AM	44940	Alpha
6/11/14	8:40 AM	9:50 AM	10:15 AM	44620	Alpha
6/11/14	8:50 AM	10:25 AM	10:50 AM	44320	Alpha
6/11/14	9:05 AM	11:00 AM	11:25 AM	45280	Alpha
6/12/14	7:10 AM	8:00 AM	8:25 AM	43500	Alpha
6/12/14	7:20 AM	8:40 AM	9:05 AM	44380	Alpha
6/12/14	8:00 AM	9:20 AM	9:45 AM	44040	Alpha
6/12/14	9:30 AM	9:55 AM	10:20 AM	44300	Alpha
6/12/14	9:40 AM	10:30 AM	10:50 AM	45280	Alpha
6/12/14	10:00 AM	11:10 AM	11:35 AM	48400	Alpha
1/7/14	12:35 PM	12:50 PM	1:25 PM	43900	Beta
7/2/14	9:57 AM	10:10 AM	10:45 AM	45720	Beta
7/2/14	11:35 AM	11:45 AM	12:10 PM	38200	Beta
7/2/14	11:58 AM	12:25 PM	12:50 PM	38500	Beta
7/3/14	7:19 AM	8:10 AM	8:35 AM	40980	Beta
7/3/14	7:55 AM	8:50 AM	9:10 AM	46360	Beta
7/3/14	10:00 AM	10:15 AM	10:40 AM	46700	Beta
7/3/14	10:50 AM	11:00 AM	11:25 AM	42280	Beta
7/3/14	11:40 AM	12:10 PM	12:40 PM	46640	Beta
7/3/14	11:55 AM	1:00 PM	1:30 PM	41600	Beta
7/7/14	7:10 AM	8:00 AM	8:25 AM	45420	Beta
7/7/14	7:50 AM	8:35 AM	9:00 AM	43660	Beta
7/7/14	8:10 AM	9:30 AM	9:55 AM	41260	Beta
7/7/14	8:15 AM	10:15 AM	10:40 AM	47520	Alpha
7/7/14	8:20 AM	11:00 AM	11:25 AM	43520	Beta
7/7/14	9:00 AM	11:40 AM	12:05 PM	46140	Beta
7/8/14	7:25 AM	8:00 AM	8:30 AM	45020	Beta
7/8/14	7:35 AM	8:45 AM	9:10 AM	45180	Beta
7/8/14	7:45 AM	9:20 AM	9:50 AM	43440	Beta
7/8/14	8:30 AM	10:10 AM	10:40 AM	44500	Beta
7/8/14	8:50 AM	11:00 AM	11:30 AM	46740	Beta
7/8/14	9:25 AM	12:20 PM	12:50 PM	49560	Beta

7/9/14	7:10 AM	8:00 AM	8:25 AM	43520	Alpha
7/9/14	7:20 AM	8:35 AM	9:00 AM	40100	Alpha
7/9/14	7:30 AM	9:30 AM	10:00 AM	45060	Alpha
7/9/14	8:35 AM	10:30 AM	10:55 AM	45600	Alpha
7/9/14	8:45 AM	12:30 PM	12:55 PM	47500	Alpha
7/9/14	2:00 PM	3:30 PM	3:55 PM	41280	Alpha

Alpha	5383260
Beta	4513520
Total	9896780

BECK OIL, INC.

PETROLEUM PRODUCTS - CARDLOCKS

WETHOSE SHEET

CUSTOMER: Absolute Construction DATE: 7/29/14

DRIVER-PRINT NAME: Harlow TRUCK#: 121

	UNIT #/LICENSE #	DESCRIPTION	RED	GAS	87
1	10080879		133		
2	10095669		192 +		
3	1006387		56 +		65
4	ALPHA SOUTH	YALO HAWK	141 +	19	
5	ALPHA SOUTH	YARD CORE	212 +		
6	118 2373		62		
7	110957		239		
8	10058215		81 +		
9	BOTA SCRU		166 +		
10	FUEL TRUCK		93 +		
11	FUEL TRUCK			112	
12					
13					
14					
15					
16					
17					
18					
19					
20					
		TOTAL :	1375	112	

MASTER METER TOTALS

	RED	GAS	CLR
FINISH	335939.4	82692.4	
START	334564.3	82580.5	
TOTAL	1375.1	111.2	

BILLING BASED ON MASTER METER

dw 1/29

BECK OIL, INC.

PETROLEUM PRODUCTS - CARDLOCKS

WETHOSE SHEET

CUSTOMER: ABNER CONSTRUCTION DATE: 7.25.14

DRIVER-PRINT NAME: Larry TRUCK#: 35

	UNIT #/LICENSE #	DESCRIPTION	RED	CLR ~~GAS~~	87
1	10063822	Generator Alpha	851		
2	10095669	Generator Alpha	197		
3	10080879	Generator Alpha	103		
4	K249	Generator Alpha	106		
5	Fuel Cell	DROP YARD	17		
6	~~K366~~ 1000gal Fuel Cell	Alpha Pwr BLK	201		
7	K366	Generator TABS	47		
8	1000gal Fuel Cell	Beta Pwr BLK	301		
9	K272	Beta Switchyard	81		
10	10058215	Beta Building Lb	58		
11	1109531		200		
12	1182373		48		
13		Beta South Cell	110		
14					
15		Fuel Truck & Transfer			104
16		50g Fuel Cell (87)			49
17					
18					
19					
20					
		TOTAL :	1520		153

MASTER METER TOTALS

	RED	GAS	CLR
FINISH	385 7769	528343.5	
START	384257.4	528191.1	
TOTAL	1519.5	152.4	

BILLING BASED ON MASTER METER

dc 1/29

BECK OIL, INC.

PETROLEUM PRODUCTS - CARDLOCKS

WETHOSE SHEET

CUSTOMER: Abner Const. DATE: 7-22-14

DRIVER-PRINT NAME: Harold TRUCK#: 153

	UNIT #/LICENSE #	DESCRIPTION	RED	CLR ~~GAS~~	87
1	10080879	Alpha Building 10	66		
2	10095669		1666		
3	10063822		63		
4	K249	Alpha Switchyard	119		
5		Alpha S Cell	246		
6		Tab Guard shack	127		
7		Kayle Christison	200		
8	1182373	Beta Building 10	82		
9	1109531		221		
10	10058215		80		
11	K272	Beta Switchyard	112		
12		Beta S Cell	233		
13		Fuel T Transfer	65		
14		Fuel T E Transfer			65
15					47
16	87 Beta	50gal Fuel Cell			31
17					
18					
19					
20					
		TOTAL :			178

MASTER METER TOTALS

	RED	GAS	CLR
FINISH	2383901.0	12121.24	
START	2382112.0	12104.5.3	
TOTAL	1789.0	178	

BILLING BASED ON MASTER METER

start 1:30 pm

END

1789 1779 dc

167 143 dc 1/29

BECK OIL, INC.

PETROLEUM PRODUCTS - CARDLOCKS

(S) 7:00 AM
(E) 9:00 AM

WETHOSE SHEET

CUSTOMER: Abner Construction DATE: 7.15.14

DRIVER-PRINT NAME: RHINO TRUCK#: 31

	UNIT #/LICENSE #	DESCRIPTION (Switchyard)	RED	GAS	87
1	K249	~~Gen Alpha Building~~	114		
2	10080879 Alpha	Building 10 Gen	63		
3	10095669 Alpha	Building 10 Gen	150		
4	10063822 Alpha	Building 10 Gen.	48		
5	Alpha Lay down yard		120		
6	Beta switchyard Gen		107		
7	1182373 Beta building 10 Gen		53		
8	1109531 Beta building 10 Gen.		138		
9	10058215 Beta building 10 Gen.		67		
10	Beta Lay down yard		48		
11	~~fuel truck~~		92		
12				153	
13					
14					
15					
16					
17					
18					
19					
20					
		TOTAL :	1000	153	

MASTER METER TOTALS

	RED	GAS	CLR
FINISH	3827678.1	1114510.7	
START	3826678.2	1114358.1	
TOTAL	1000	152.6	

BILLING BASED ON MASTER METER

BECK OIL, INC.

PETROLEUM PRODUCTS - CARDLOCKS

87

WETHOSE SHEET

CUSTOMER: Abner Const. DATE: 7-15-14

DRIVER-PRINT NAME: Larry TRUCK#: 35

	UNIT #/LICENSE #	DESCRIPTION	RED	~~GAS~~ CLR	87
1	85543E1	Fuel Truck & Transfer			92.4
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
		TOTAL :			

MASTER METER TOTALS

	RED	GAS	CLR
FINISH		526007.5	
START		525915.1	
TOTAL		92	

BILLING BASED ON MASTER METER

Start 8:00
End 9:30

7/15 dc

BECK OIL, INC.

PETROLEUM PRODUCTS - CARDLOCKS

Red

WETHOSE SHEET

CUSTOMER: Abner Const. DATE: 7-15-14

DRIVER-PRINT NAME: Larry TRUCK#: 35

	UNIT #/LICENSE #	DESCRIPTION	RED	~~GAS~~ CLR	87
1	10063822	Alpha Building 10	57 ✓		
2	10095669		185 ✓		
3	10080879		122 ✓		
4		Alpha Switchyard	108 ✓		
5		Alpha South Cell	270 ✓		
6	K36C	Tab Guard Shack	220 ✓		
7	10058215	Beta Building 10	76 ✓		
8	1109531		217 ✓		
9	1182373		106 ✓		
10	K272	Beta Switchyard	72 ✓		
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
		TOTAL :			

1443 Total Red

MASTER METER TOTALS

	RED	GAS	CLR
FINISH	367427.9		
START	365985.4		
TOTAL	1443		

BILLING BASED ON MASTER METER

start: 9:00
End: 9:30

1433 dc 7/18/14

BECK OIL, INC

WETHOSE SHEET

CUSTOMER: TRUCK #: 35

DATE: 7-11-14 DRIVER: Larry

(CIRCLE ONE)

PRODUCT: RED DIESEL CLEAR DIESEL REGULAR GAS

	UNIT NUMBER	DESCRIPTION		GALLONS
Red 1	10063822	Alpha Building 10		53 ✓
2	10095669			170 ✓
3	10080879			142 ✓
4		Alpha Switch yard		85 ✓
5		Alpha South Cell		174 ✓
6	10058215	Beta Building 10		68
7	1109531			124
8	1182373			107
9		Beta South Cell		142 ✓
10		Beta Switch yard		122 ✓
11		Fuel Truck Transfer		43
87 12		Fuel Truck & Transfer		138 87
13				
14				
15				
16				
17				
18				
19				
20				
		TOTAL DIESEL GALLONS:		1230
		REGULAR GAS GALLONS:		138

MASTER METER: START: Red FINISH: TOTAL:

363142.5 364372.6

BECK OIL INC
16640 D STREET
VICTORVILLE, CA 92395
760) 245-4191

NOTE: BILLING BASED ON MASTER METER

87

START 525577.0

END 525715.1

START 11:15 am
End 1:15 pm

JAMIE PAGE 02/03/12

7/16

NALCO

SAFETY DATA SHEET

PRODUCT

NALCO ELIMIN-OX®

EMERGENCY TELEPHONE NUMBER(S)
(800) 424-9300 (24 Hours) CHEMTREC

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : **NALCO ELIMIN-OX®**

APPLICATION : OXYGEN SCAVENGER

COMPANY IDENTIFICATION :
Nalco Company
1601 W. Diehl Road
Naperville, Illinois
60563-1198

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

NFPA 704M/HMIS RATING
HEALTH : 2 / 2* FLAMMABILITY : 0 / 0 INSTABILITY : 0 / 0 OTHER :
0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme * = Chronic Health Hazard

2. COMPOSITION/INFORMATION ON INGREDIENTS

Our hazard evaluation has identified the following chemical substance(s) as hazardous. Consult Section 15 for the nature of the hazard(s).

Hazardous Substance(s)	CAS NO	% (w/w)
Modified amino compound	Proprietary	5.0 - 10.0

3. HAZARDS IDENTIFICATION

****EMERGENCY OVERVIEW****

WARNING
May cause sensitization by skin contact.
Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of water. Protect product from freezing.
Wear chemical resistant apron, chemical splash goggles, impervious gloves and boots.
Not flammable or combustible. May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of nitrogen (NOx) under fire conditions.

PRIMARY ROUTES OF EXPOSURE :
Eye, Skin

HUMAN HEALTH HAZARDS - ACUTE :

EYE CONTACT :
May cause irritation with prolonged contact.

SKIN CONTACT :
May cause irritation with prolonged contact. May cause sensitization by skin contact.

INGESTION :
Not a likely route of exposure. There may be irritation to the gastro-intestinal tract with nausea and vomiting.

INHALATION :
Not a likely route of exposure. Repeated or prolonged exposure may irritate the respiratory tract.

AGGRAVATION OF EXISTING CONDITIONS :
A review of available data does not identify any worsening of existing conditions.

HUMAN HEALTH HAZARDS - CHRONIC :
No adverse effects expected other than those mentioned above.

4. FIRST AID MEASURES

EYE CONTACT :
Immediately flush with plenty of water for at least 15 minutes. If symptoms develop, seek medical advice.

SKIN CONTACT :
Immediately flush with plenty of water for at least 15 minutes. If symptoms develop, seek medical advice.

INGESTION :
Do not induce vomiting without medical advice. If conscious, washout mouth and give water to drink. Get medical attention.

INHALATION :
Remove to fresh air, treat symptomatically. If symptoms develop, seek medical advice.

NOTE TO PHYSICIAN :
Based on the individual reactions of the patient, the physician's judgement should be used to control symptoms and clinical condition.

5. FIRE FIGHTING MEASURES

FLASH POINT : None

EXTINGUISHING MEDIA :
This product would not be expected to burn unless all the water is boiled away. The remaining organics may be ignitable. Use extinguishing media appropriate for surrounding fire.

FIRE AND EXPLOSION HAZARD :
Not flammable or combustible. May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of nitrogen (NOx) under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :
In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS :
Restrict access to area as appropriate until clean-up operations are complete. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection). Stop or reduce any leaks if it is safe to do so. Keep people away from and upwind of spill/leak. Ventilate spill area if possible. Remove sources of ignition. Ensure clean-up is conducted by trained personnel only. Do not touch spilled material. Have emergency equipment (for fires, spills, leaks, etc.) readily available. Notify appropriate government, occupational health and safety and environmental authorities.

METHODS FOR CLEANING UP :
SMALL SPILLS: Soak up spill with absorbent material. Place residues in a suitable, covered, properly labeled container. Wash affected area. LARGE SPILLS: Contain liquid using absorbent material, by digging trenches or by diking. Reclaim into recovery or salvage drums or tank truck for proper disposal. Clean contaminated surfaces with water or aqueous cleaning agents. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).

ENVIRONMENTAL PRECAUTIONS :
Do not contaminate surface water.

7. HANDLING AND STORAGE

HANDLING :
Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. Ensure all containers are labeled. Keep the containers closed when not in use. Do not breathe vapors/gases/dust. Have emergency equipment (for fires, spills, leaks, etc.) readily available.

STORAGE CONDITIONS :
Store the containers tightly closed. Store in suitable labeled containers.

UNSUITABLE CONSTRUCTION MATERIAL :
Shipping and long term storage compatibility with construction materials can vary; we therefore recommend that compatibility is tested prior to use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS :
This product does not contain any substance that has an established exposure limit.

ENGINEERING MEASURES :

General ventilation is recommended. Use local exhaust ventilation if necessary to control airborne mist and vapor.

RESPIRATORY PROTECTION :
Where concentrations in air may exceed the limits given in this section or when significant mists, vapors, aerosols, or dusts are generated, an approved air purifying respirator equipped with suitable filter cartridges is recommended. Consult the respirator / cartridge manufacturer data to verify the suitability of specific devices. In event of emergency or planned entry into unknown concentrations a positive pressure, full-facepiece SCBA should be used. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection.

HAND PROTECTION :
When handling this product, the use of chemical gauntlets is recommended. The choice of work glove depends on work conditions and what chemicals are handled. Please contact the PPE manufacturer for advice on what type of glove material may be suitable. Gloves should be replaced immediately if signs of degradation are observed.

SKIN PROTECTION :
Wear standard protective clothing.

EYE PROTECTION :
Wear safety glasses with side-shields.

HYGIENE RECOMMENDATIONS :
Use good work and personal hygiene practices to avoid exposure. Keep an eye wash fountain available. Keep a safety shower available. If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse. Always wash thoroughly after handling chemicals. When handling this product never eat, drink or smoke.

HUMAN EXPOSURE CHARACTERIZATION :
Based on our recommended product application and personal protective equipment, the potential human exposure is:
Low

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	Liquid
APPEARANCE	Colorless
ODOR	None
SPECIFIC GRAVITY	1.02 @ 68 °F / 20 °C
DENSITY	8.5 - 8.6 lb/gal
SOLUBILITY IN WATER	Complete
pH . (1 %)	6.7
VISCOSITY	2.9 cps @ 60 °F / 15.6 °C
FREEZING POINT	28 °F / -2 °C
VAPOR PRESSURE	12 mm Hg @ 68 °F / 20 °C
VOC CONTENT	0.17 % EPA Method 24

Note: These physical properties are typical values for this product and are subject to change.

10. STABILITY AND REACTIVITY

STABILITY :
Stable under normal conditions.

HAZARDOUS POLYMERIZATION :
Hazardous polymerization will not occur.

CONDITIONS TO AVOID :
At temperatures below 4 °C (40 °F), this product loses its stability and forms precipitates. Once formed, the precipitate cannot be resolubilized and loss of product activity will occur. Storage temperature must be above 58 °F (14 °C) and below 90 °F (32 °C) to prevent crystallization at low temperatures and instability at high temperatures.

MATERIALS TO AVOID :
Contact with strong oxidizers (e.g. chlorine, peroxides, chromates, nitric acid, perchlorate, concentrated oxygen, permanganate) may generate heat, fires, explosions and/or toxic vapors. Contact with strong acids (e.g. sulfuric, phosphoric, nitric, hydrochloric, chromic, sulfonic) may generate heat, splattering or boiling and toxic vapors. Nitrites

HAZARDOUS DECOMPOSITION PRODUCTS :
Under fire conditions: Oxides of carbon, Oxides of nitrogen

11. TOXICOLOGICAL INFORMATION

The following results are for the product.

ACUTE ORAL TOXICITY :

Species:	Rat
LD50:	> 5,000 mg/kg
Test Descriptor:	Product

ACUTE DERMAL TOXICITY :

Species:	Rabbit
LD50:	> 2,000 mg/kg
Test Descriptor:	Product

PRIMARY SKIN IRRITATION :

Species:	Rabbit
Draize Score:	0.2 /8.0
Test Descriptor:	Product

PRIMARY EYE IRRITATION :

Species: Rabbit
Draize Score: 0.3 /110.0
Test Descriptor: Product

SENSITIZATION :
Repeated or prolonged contact may cause skin sensitization.

CARCINOGENICITY :
None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).

HUMAN HAZARD CHARACTERIZATION :
Based on our hazard characterization, the potential human hazard is: Moderate

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL EFFECTS :

The following results are for the product.

Acute Fish Results :

Species	Exposure	Test Type	Value	Test Descriptor
Rainbow Trout	96 hrs	LC50	360 mg/l	Product
Bluegill Sunfish	96 hrs	LC50	190 mg/l	Product
Fathead Minnow	96 hrs	LC50	400 mg/l	Product

ACUTE INVERTEBRATE RESULTS :

Species	Exposure	Test Type	Value	Test Descriptor
Daphnia magna	48 hrs	LC50	96 mg/l	Product

PERSISTENCY AND DEGRADATION :

Chemical Oxygen Demand (COD) : 24,000 mg/l

The organic portion of this preparation is expected to be readily biodegradable.

MOBILITY :
The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models.
If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air	Water	Soil/Sediment

<5%	30 - 50%	50 - 70%

The portion in water is expected to be soluble or dispersible.

BIOACCUMULATION POTENTIAL
This preparation or material is not expected to bioaccumulate.

ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION
Based on our hazard characterization, the potential environmental hazard is: Low
Based on our recommended product application and the product's characteristics, the potential environmental exposure is: Low

If released into the environment, see CERCLA/SUPERFUND in Section 15.

13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it is not a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, nor is it listed under Subpart D.

As a non-hazardous waste, it is not subject to federal regulation. Consult state or local regulation for any additional handling, treatment or disposal requirements. For disposal, contact a properly licensed waste treatment, storage, disposal or recycling facility.

14. TRANSPORT INFORMATION

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are as follows.

The presence of an RQ component (Reportable Quantity for U.S. EPA and DOT) in this product causes it to be regulated with an additional description of RQ for road, or as a class 9 for road and air, ONLY when the net weight in the package exceeds the calculated RQ for the product.

LAND TRANSPORT :

Proper Shipping Name :	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
Technical Name(s) :	HYDRAZINE
UN/ID No :	UN 3082
Hazard Class - Primary :	9
Packing Group :	III
Flash Point :	None
Reportable Quantity (per package) :	10,000 lbs
RQ Component :	HYDRAZINE

AIR TRANSPORT (ICAO/IATA) :

The presence of an RQ component (Reportable Quantity for U.S. EPA and DOT) in this product causes it to be regulated with an additional description of RQ for road, or as a class 9 for road and air, ONLY when the net weight in the package exceeds the calculated RQ for the product.

Proper Shipping Name :	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
Technical Name(s) :	HYDRAZINE
UN/ID No :	UN 3082
Hazard Class - Primary :	9
Packing Group :	III
Reportable Quantity (per package) :	10,000 lbs
RQ Component :	HYDRAZINE

MARINE TRANSPORT (IMDG/IMO) :

Proper Shipping Name :	PRODUCT IS NOT REGULATED DURING TRANSPORTATION

15. REGULATORY INFORMATION

This section contains additional information that may have relevance to regulatory compliance. The information in this section is for reference only. It is not exhaustive, and should not be relied upon to take the place of an individualized compliance or hazard assessment. Nalco accepts no liability for the use of this information.

NATIONAL REGULATIONS, USA :

OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200 :
Based on our hazard evaluation, the following substance(s) in this product is/are hazardous and the reason(s) is/are shown below.

Modified amino compound : Dermal Sensitizer

CERCLA/SUPERFUND, 40 CFR 302 :
This product contains the following Reportable Quantity (RQ) Substance. Also listed is the RQ for the product. If a reportable quantity of product is released, it requires notification to the NATIONAL RESPONSE CENTER, WASHINGTON, D.C. (1-800-424-8802).

RQ Substance	RQ
Hydrazine	10,000 lbs

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (TITLE III) - SECTIONS 302, 311, 312, AND 313 :

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355) :
This product does not contain substances listed in Appendix A and B as an Extremely Hazardous Substance.

SECTIONS 311 AND 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370) :
Our hazard evaluation has found this product to be hazardous. The product should be reported under the following indicated EPA hazard categories:

X	Immediate (Acute) Health Hazard
-	Delayed (Chronic) Health Hazard
-	Fire Hazard
-	Sudden Release of Pressure Hazard
-	Reactive Hazard

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372) :
This product does not contain substances on the List of Toxic Chemicals.

TOXIC SUBSTANCES CONTROL ACT (TSCA) :
The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

FOOD AND DRUG ADMINISTRATION (FDA) Federal Food, Drug and Cosmetic Act :
When use situations necessitate compliance with FDA regulations, this product is acceptable under : the following use conditions.

This product may be used in pulp and papermill boilers where the steam is used to treat pulp in the manufacture of paper and paperboard that may be used to package food.

NSF NON-FOOD COMPOUNDS REGISTRATION PROGRAM (former USDA List of Proprietary Substances & Non-Food Compounds) :
NSF Registration number for this product is : 145925
This product is acceptable for treatment of cooling and retort water (G5) in and around food processing areas. This product is acceptable for treating boilers, steam lines, and/or cooling systems (G7) where neither the treated water nor the steam produced may contact edible products in and around food processing areas.

This product has been certified as KOSHER/PAREVE for year-round use INCLUDING THE PASSOVER SEASON by the CHICAGO RABBINICAL COUNCIL.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR 116.4 / formerly Sec. 311 :
Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

CLEAN AIR ACT, Sec. 112 (Hazardous Air Pollutants, as amended by 40 CFR 63), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances) :
This product may contain trace levels (<0.1% for carcinogens, <1% all other substances) of the following substance(s) listed under the regulation. Additional components may be unintentionally present at trace levels.

Substance(s)	Citations
• Hydrazine	Sec. 112

CALIFORNIA PROPOSITION 65 :
This product contains the following substances which require warning under California Proposition 65. Additional components may be unintentionally present at trace levels.

Substance(s)	Concentration	EFFECTS
• Hydrazine	<= .01 %	Causes Cancer

MICHIGAN CRITICAL MATERIALS :
Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

STATE RIGHT TO KNOW LAWS :
Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

INTERNATIONAL CHEMICAL CONTROL LAWS :

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :
The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

AUSTRALIA
All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).

CHINA
All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on or exempt from the Inventory of Existing Chemical Substances China (IECSC).

EUROPE
The substances in this preparation have been reviewed for compliance with the EINECS or ELINCS inventories.

JAPAN
All substances in this product comply with the Law Regulating the Manufacture and Importation Of Chemical Substances and are listed on the Existing and New Chemical Substances list (ENCS).

KOREA
All substances in this product comply with the Toxic Chemical Control Law (TCCL) and are listed on the Existing Chemicals List (ECL)

NEW ZEALAND
All substances in this product comply with the Hazardous Substances and New Organisms (HSNO) Act 1996,and are listed on or are exempt from the New Zealand Inventory of Chemicals.

PHILIPPINES
All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippines Inventory of Chemicals & Chemical Substances (PICCS).

16. OTHER INFORMATION

Due to our commitment to Product Stewardship, we have evaluated the human and environmental hazards and exposures of this product. Based on our recommended use of this product, we have characterized the product's general risk. This information should provide assistance for your own risk management practices. We have evaluated our product's risk as follows:

* The human risk is: Low

* The environmental risk is: Low

Any use inconsistent with our recommendations may affect the risk characterization. Our sales representative will assist you to determine if your product application is consistent with our recommendations. Together we can implement an appropriate risk management process.

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

REFERENCES

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS™ CD-ROM Version),
Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH,
(TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

Prepared By : Product Safety Department
Date issued : 02/22/2013
Version Number : 1.18

ABENER TEYMA MOJAVE

LETTER OF TRANSMITTAL

Date: July 11, 2014
Subject: Mojave Solar Project
Condition Number: HAZ-1
Reference: Mojave Solar Project Hazardous Materials List
To: Mr. Dale Rundquist, CPM
California Energy Commission

WE ARE SENDING YOU

☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop Drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Copy of Letter ☐ Change Order ☐

COPIES	DATE	NO.	DESCRIPTION
1	07/11/14	1	Technical Memo to CEC
1	03/01/11	1	Original Hazardous Materials Appendix A
1	07/01/14	1	Hazardous Materials Additions to Appendix A

THESE ARE TRANSMITTED as checked below:

☒ For Approval
☐ For your use
☐ As requested
☐ For review
☐ Approved as submitted
☐ Approved as noted
☐ Returned for corrections
☐ For review and comment

REMARKS _____

COPY TO: File SIGNED BY: Steven Pochmara

Steven Pochmara
ABEINSA EPC

ABENER TEYMA MOJAVE

13911 Park Ave., Suite 208
Victorville, CA 92392
Phone: 480-287-1419

TECHNICAL MEMO

Subject: Mojave Solar Project (09-AFC-5C)
Condition No.: HAZ-1
Description: Site Security and Hazardous Materials Storage Plan
Submittal No.: HAZ1-02-00

July 11, 2014

Mr. Dale Rundquist, CPM
California Energy Commission
1516 Ninth Street (MS-2000)
Sacramento, CA 95814
drundqui@energy.state.ca.us

Dear Mr. Rundquist,

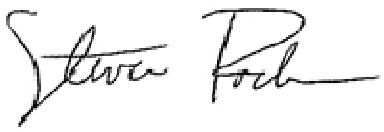
In accordance to the CEC Commission decision HAZ-1 compliance, we are submitting to your office the amended Hazardous Materials Appendix A for the Mojave Solar Project, for your review and consideration. The revised Appendix A lists all chemicals onsite to date.

For your convenience, referenced below is the HAZ-1 CEC Compliance Condition:

HAZ-1 The project owner shall not use any hazardous materials not listed in Appendix A, below, or in greater quantities or strengths than those identified by chemical name in Appendix A, below, unless approved in advance by the Compliance Project Manager (CPM).
Verification: The project owner shall provide to the CPM, in the Annual Compliance Report, a list of hazardous materials contained at the facility.

Should you have any questions or comments, please don't hesitate to contact me.

Sincerely,



Steven Pochmara
ABEINSA EPC
13911 Park Ave., Suite 208
Victorville, CA 92392
Cell: (480) 287-1419

HAZARDOUS MATERIALS
APPENDIX A

Hazardous Materials Proposed for Use at AMS

During Operations

Hazardous Materials Management Appendix A
Hazardous Materials Proposed for Use at AMS During Operations

Material	CAS No.	Application	Hazardous Characteristics	Maximum Quantity On Site	CERCLA SARA RQ[a]
Acetylene	74-86-2	Welding gas	Health: hazardous if inhaled Physical: combustible, flammable	1,600 cubic feet	N/A
Air Conditioning Fluids	None			40 pounds	N/A
Argon	7440-37-1	Welding gas	Health: low toxicity Physical: non reactive	1,600 cubic feet	N/A
Bathroom Supplies – Liquid Soap	None			25 gallons	N/A
Chem Treat, Inc. BL-1260 or similar Carbohydrazide	497-18-7		Health: moderate toxicity	Totes, 4 x 300 gallons	N/A
ChemTreat, Inc. BL-1558 or similar 3-Methoxyproplyamine Cyclohexlyamine Diethydroxylamine	 5332-73-0 108-91-8 3710-84-7		Health: high toxicity Physical: corrosive, combustible	Totes, 4 x 300 gallons	 N/A 10,000 pounds N/A
ChemTreat, Inc. BL-180 or similar Nitrous Acid, Sodium Salt Sodium Tetraborate Pentahydrate	 7632-00-0 12179-04-3		Health: moderate toxicity	Totes, 2 x 300 gallons	 100 pounds N/A

Material	CAS No.	Application	Hazardous Characteristics	Maximum Quantity On Site	CERCLA SARA RQ[a]
ChemTreat, Inc. CL-1432 or similar Potassium Phosphate, Tribasic 1-Hydroxyethylidene-1, 1-Diphosphonic Acid, Tetrapotassium Salt Tetrapotassium Pyrophosphate Potassium Hydroxide Tolytriazole, Sodium Salt	 7778-53-2 14860-53-8 7320-34-5 1310-58-3 64665-57-2		Health: high toxicity Physical: corrosive	Totes, 2 x 1,000 gallons	 N/A N/A N/A 1,000 pounds N/A
ChemTreat, Inc. BL-124 or similar Sodium Bisulfite	7631-90-5		Health: low toxicity, irritant	Totes, 2 x 300 gallons	5,000 pounds
ChemTreat, Inc. BL-1794 or similar Trisodium Phosphate	7601-54-9		Health: high toxicity Physical: corrosive	Plastic Totes, 2 x 300 gallons	N/A
Cleaning Chemicals (Janitorial Supplies)	None	Periodic cleaning of combustion turbine	Health: various Physical: various	20 gallons	NA
Diesel Fuel			Health: low toxicity Physical: combustible	14,200 gallons	N/A
Fertilizer (Bioremediation) Urea	57-13-6 1317-25-5		Health: low toxicity	300 pounds	N/A
Fertilizer (Bioremediation)	7778-77-0		Health: low toxicity	2,000 pounds	N/A

Material	CAS No.	Application	Hazardous Characteristics	Maximum Quantity On Site	CERCLA SARA RQ[a]
Monopotassium Phosphate			Physical: combustible		
Gasoline	86290-81-5			1,000 – 2,000 gallons	N/A
Heat Transfer Fluid: Diphenyl Ether (73.5%) Biphenyl (26.5%)	101-84-8 92-52-4	Heat transfer from solar array to steam generator	Health: moderately toxic, skin irritant Physical: combustible	2,292,000 gallons	100 pounds
Herbicide Roundup® or equivalent (Glyphosate, Isopropylamine Salt)	38641-94-0		Health: low toxicity, irritant	No onsite storage, brought on site by licensed contractor, used immediately	N/A
Herbicides and Pesticides	None			5 gallons	N/A
Lab Gases	None			150 cubic feet	N/A
Lab Reagents	None			10 gallons	N/A
Lube Oil	64742-55-8	Lubricate rotating equipment	Health: hazardous if ingested Physical: may be flammable/combustible	5,00 gallons in equipment and piping, additional maintenance inventory of up to 550 gallons in 55-gallon steel drums	N/A
Mineral Insulating Oil	64742-53-6 68037-01-4	Transformers/switchyard	Health: hazardous if ingested Physical: may be flammable/combustible	64,000 gallons	N/A
Natural Gas (Methane)	74-82-8	Auxiliary boiler and domestic use (space heating)	Health: low toxicity Physical: flammable	No on-site storage, natural gas in equipment and piping; pressurized carbon steel pipeline for delivery to site	N/A
Nitrogen	7727-37-9			37,200 gallons	N/A
Office Supplies (Batteries, etc)	None			1 cubic foot	N/A
Oxygen	7782-44-7	Welding gas	Health: low toxicity, skin irritant Physical: flammable	3,200 cubic feet	NA

Material	CAS No.	Application	Hazardous Characteristics	Maximum Quantity On Site	CERCLA SARA RQ[a]
Paint and Paint Thinners	Various	Touchup of painted surfaces	Health: various Physical: various	50 gallons	NA
Propane	74-98-6	Torch gas	Health: low toxicity, causes frostbites Physical: flammable, oxidizing	5,000 gallons	NA
Sodium Hydroxide	1310-73-2	Water treatment	Health: high toxicity Physical: corrosive	2,000 gallons	1,000 pounds
Sodium Hypochlorite	7681-52-9 10022-70-5	Water treatment	Health: low toxicity Physical: corrosive, flammable	12,000 gallons	100 pounds
Soil Stabilizer Coherex or similar	64742-11-6		None	No onsite storage, supplied in 400-gallon totes, used immediately	N/A
Sulfuric Acid (29.5%)	7664-93-9 8014-95-7	Water treatment	Health: high toxicity Physical: corrosive and water reactive	2,000 gallons	1,000 pounds
Sulfuric Acid (93%)	7664-93-9 8014-95-7	Water treatment	Health: high toxicity Physical: corrosive and water reactive	1,600 gallons	1,000 pounds
Water Treatment Chemical ChemTreat, Inc. CT-9004 or similar 1-Hydroxyethylidene-1, 1-Diphosphonic Acid	2809-21-4			Totes, 2 x 300 gallons	N/A
Water Treatment Chemical ChemTreat, Inc. P-813 E or similar Petroleum Distillate Hydrotreated	64742-47-8		None	Totes, 2 x 275 gallons	N/A

Material	CAS No.	Application	Hazardous Characteristics	Maximum Quantity On Site	CERCLA SARA RQ[a]
Light					
Water Treatment Chemical			Physical: corrosive	Totes, 2 x 300 gallons	
ChemTreat, Inc. CL-2156 or similar					
5-Chloro-2-Methyl-4-Isothiazolin-3-One	26172-55-4				N/A
2-Methyl-4-Isothiazolin-3-One	2682-20-4				N/A
Magnesium Nitrate	10377-60-3				N/A
Magnesium Chloride	7786-30-3				N/A
Welding Rods	7439-89-6			100 pounds	N/A

Source: ESH 2009c Tables 9 and 10 and AS 2009a Table 5.6-3

a. Reportable quantities for a pure chemical, per the Comprehensive Environmental Response, Compensation, and Liability Act.

Item #	Name of Hazardous Material or Waste	Maximum Quantity	Size of Largest Container	Unit of Measure
1	Diesel Fuel	9700	4000	gallon
2	Gasoline	2000	2000	gallon
3	Hydraulic Oil	5280	330	gallon
4	Paints/Solvents	550	55	gallon
5	Motor Oil	110	55	gallon
6	Propane Fuel	300	50	gallon
7	Acetylene Gas – (Welding)	3600	300	Cu ft
8	Oxygen Gas – (Welding)	3500	282	Cu ft
9	Aqueous Ammonia – 12.5%	660	330	gallon
10	Argon Gas	8064	336	Cu ft
11	Carbon Dioxide Gas	6272	196	Cu ft
12	Hydrogen Gas	3196	196	Cu ft
13	Nitrogen	26000	13000	gallon
14	Liquid Carbon Dioxide	26000	13000	gallon tank
15	Galvanizing Compound	15	5	gallon
16	Silicon	36.7	3.67	Liters
17	Acetone	5	1	gallon
18	MSI410	10	10	gallon
19	Kalraid 1172	15	15	gallon
20	Sodium Hypochlorite – 12.5%	5280	2640	gallon
21	Metasodium Bisulfite	55	55	gallon
22	Carbohydrazide	1200	300	gallon
23	Tri-Sodium Phosphate Solution	250	200	gallon
24	Phosphoric Acid – 60 – 70%	660	330	gallon
25	Sodium Bisulfite – 38%	660	330	gallon
26	Magnesium Sulfate – 27%	15320	7660	gallon silo
27	Slacked Lime	21664	21664	gallon silo
28	Soda Ash - 95% Sodium Carbonate	15320	7660	gallon silo
29	Anionic Flocculant Polymer Powder	660	330	gallon
30	Ferric Chloride – 40%	660	330	gallon
31	Sodium Bisulfite – 35%	660	330	gallon

32	Phosphoric Acid	660	330	gallon
33	Liquid Carbon Dioxide	26000	13000	gallon tank
34	Sodium EDTA	600	100	Lb bags
35	Sulfuric Acid - 98%	660	330	gallon
36	Sodium Hydroxide - 50%	3350	330	gallon
37	Heat Transfer Fluid – Biphenyl	2,300,000	57,000	gallon
38	Ammonium Hydroxide	8840	6900	gallon
39	Citric Acid	9420	6900	gallon
40	Bonderite	240	55	gallon
41	Sodium Nitrite	8200	50	Lb
42	Surfactant NP95	440	55	gallon
43	Caustic Soda 50%	1000	500	gallon
44	Sodium Bisulfite – 50%	1000	500	gallon
45	Sulfuric Acid 50%	1000	500	gallon
46	Antiscalant V4000	1000	500	gallon

ABENER TEYMA MOJAVE

LETTER OF TRANSMITTAL

Date: July 11, 2014
Subject: Mojave Solar Project
Condition Number: HAZ-2
Reference: Mojave Hazardous Materials Business Plan (HMBP)
To: Mr. Dale Rundquist, CPM
California Energy Commission

WE ARE SENDING YOU

☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop Drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Copy of Letter ☐ Change Order ☐

COPIES	DATE	NO.	DESCRIPTION
1	7/11/14	1	Cover Letter to CEC
1	7/11/14	1	Technical Memo to CEC
1	7/11/14	3	Revised Hazardous Materials Business Plan
1	7/11/14	3	Annex 1 Chemical Inventory and Description
1	7/11/14	3	Annex 2 Chemical MSDS's

THESE ARE TRANSMITTED as checked below:

☒ For Approval
☐ For your use
☐ As requested
☐ For review
☐ Approved as submitted
☐ Approved as noted
☐ Returned for corrections
☐ For review and comment

REMARKS _____

COPY TO: File SIGNED BY: Steven Pochmara
ABEINSA EPC

ABENER TEYMA MOJAVE

13911 Park Ave, Suite 208
Victorville, CA 92392
Phone: 480-287-1419

Subject:	Mojave Solar Project (09-AFC-5C)
Condition No.:	HAZ-2
Description:	Safety Management Plan for Commissioning
Submittal No.:	HAZ2-07-00

July 11, 2014

Mr. Dale Rundquist, CPM
California Energy Commission
1516 Ninth Street (MS-2000)
Sacramento, CA 95814
drundqui@energy.state.ca.us

Dear Mr. Rundquist,

As required by the California Energy Commission and more specifically by Condition of Certification HAZ-2, attached please find the revised Hazardous Materials Business plan for your review and comment. The revised plan provides an update to the hazardous chemicals that will be on site during commissioning/operations.

Should you have any questions or need any additional information, please do not hesitate to contact me.

Sincerely,

Steven Pochmara
ABEINSA EPC
13911 Park Ave, Suite 208
Victorville, CA 92392
Cell: (480) 287-1419

ABENER TEYMA MOJAVE

13911 Park Ave., Suite 208
Victorville, CA 92392
Phone: 480-287-1419

TECHNICAL MEMO

Subject: Mojave Solar Project (09-AFC-5C)
Condition No.: HAZ-2
Description: Hazardous Materials Business Plan
Submittal No.: HAZ2-07-00

July 11, 2014

Mr. Dale Rundquist, CPM
California Energy Commission
1516 Ninth Street (MS-2000)
Sacramento, CA 95814
drundqui@energy.state.ca.us

Dear Mr. Rundquist,

In accordance to the CEC Commission decision report HAZ-2 compliance, we are submitting to your office the revised Hazardous Materials Business plan (HMBP) for the Mojave Solar Project, for your review and consideration. This revised plan provides an update for the chemicals that will be on site for commissioning/operations.

For your convenience, referenced below is the HAZ-2 CEC Compliance Condition:

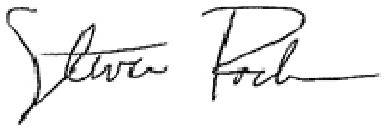
HAZ-2
The project owner shall provide a Hazardous Materials Business Plan (HMBP), a Spill Prevention, Control, and Countermeasure Plan (SPCC), and a Process Safety Management Plan (PSMP) to the San Bernardino County Fire Department and the CPM for review. After receiving comments from the San Bernardino County Fire Department and the CPM, the project owner shall reflect all final recommendations in the final documents. Copies of the final HMBP, SPCC, and PSMP shall then be provided to the San Bernardino County Fire Department for information and to the CPM for approval.
Verification: At least 60 days prior to receiving any hazardous material on the site for commissioning or operations, the project owner shall provide a copy of a final Hazardous Materials Business Plan, Spill Prevention, Control, and Countermeasure Plan, and a Process Safety Management Plan to the CPM for approval.

Should you have any questions or comments, please don't hesitate to contact me.

ABENER TEYMA MOJAVE

13911 Park Ave., Suite 208
Victorville, CA 92392
Phone: 480-287-1419

Sincerely,



Steven Pochmara
ABEINSA EPC
13911 Park Ave., Suite 208
Victorville, CA 92392
Cell: (480) 287-1419

ABEINSA EPC
MOJAVE

Emergency Plan - Hazardous Material Management Plan (HMBP)

Title: Business Emergency Contingency Plan
Process: Hazardous Material Business Plan (HMBP)
Project: Mojave Solar Project

Document:	**PEM-0002-01**
Revision:	03
Date:	07/05/14

Prepared by:		
Manjunath Shivalingappa	Environmental Engineer	Electronic Signatures

Reviewed by:		
Efrain Perez	Quality & Environmental Manager	Electronic Signatures
Steven Pochmara	Permitting Manager	Electronic Signatures

Approved by:		
Nicolas Gallo	Project Sub Director	Electronic Signatures
Pablo Enrique Schenone Laborde	Project Director	Electronic Signatures

Revision Control Sheet

Rev.	Date	Cause for Revision	Prepared	Reviewed	Approved
00	6/21/13	Document Created	KIA		
01	03/15/14	PEM-0002-01 Annex 01- Inventory Update PEM-0002-01 Annex 02 – MSDS update	KIA		
02	04/30/14	PEM-0002-01 Annex 01- Inventory Update PEM-0002-01 Annex 02 – MSDS update	KIA		
03	07/05/14	PEM-0002-01 Annex 01- Inventory Update PEM-0002-01 Annex 02 – MSDS update PEM-0002-01 HMBP- • Procedure Update • Removed Annex 03	MS	EFP	NGM-PES

Table of Contents

1. Objective

The primary purpose of this plan is to provide readily available information regarding the location, type, and health risks associated with hazardous materials at the Mojave Solar Project. Each business in San Bernardino County that handles, uses, generates or stores hazardous materials is required to comply with State and Federal community right to know laws, and to submit a Hazardous Materials Business Plan (HMBP). The Hazardous Materials Division of the San Bernardino County Fire Department is the Administering Agency and the Certified Unified Program Agency (CUPA) for San Bernardino County with responsibility for regulating hazardous materials handlers, hazardous waste generators, underground storage tank facilities, above ground storage tanks, and stationary sources handling regulated substances.

1.1 Project Location

Project Name: Mojave Solar Project
Project Address: 42134 Harper Lake Road
City, State: Hinkley, CA
County: San Bernardino
Zip Code: 92347

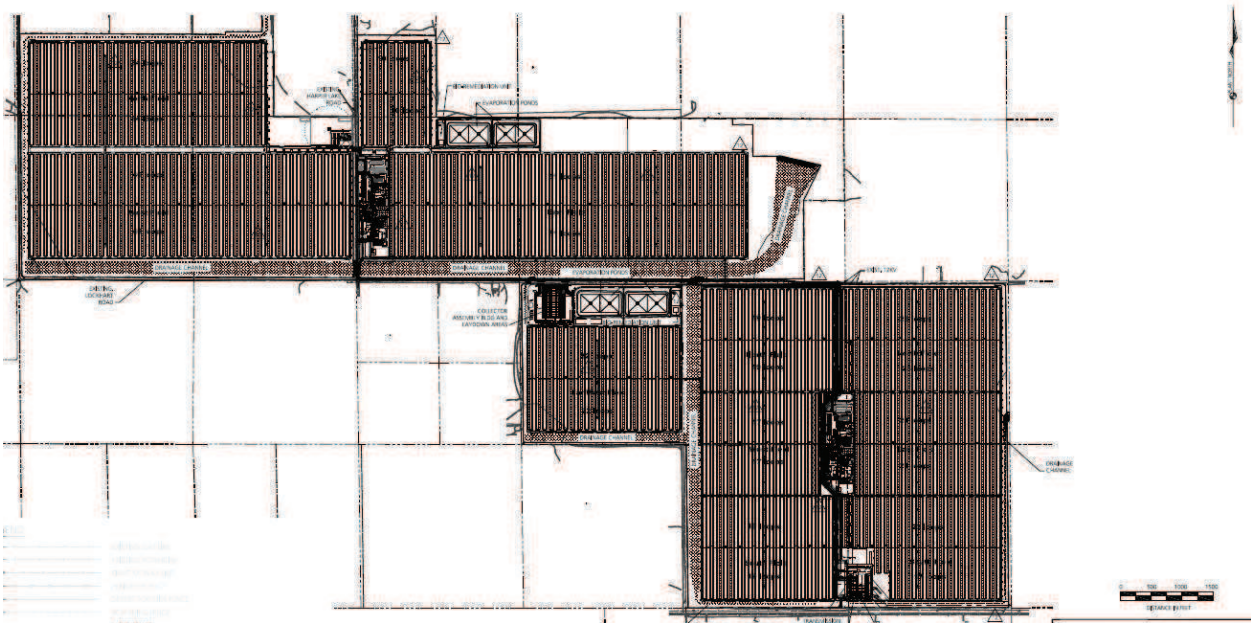


Figure 1 – Site Layout Map

1.2. Key Contacts

Primary Site Contact: Pablo Enrique Schenone Laborde (Project Director)
Nicolas Gallo (Deputy Project Director)

Address: 42134 Harper Lake Road
City/ State/ Zip: Hinkley, CA, 92347

EHS Responsible Parties: Manjunath Shivalingappa (Environmental Engineer)
(480) 768-7793

Larry Davis (H&S Site Manager)
(480) 370-7063

2. Definitions

Hazardous Materials - means any chemical, substance or material regulated or governed by any Applicable Permit or Applicable Law, or any substance, emission or material now or hereafter deemed by any Governmental Authority to be a "regulated substance," "hazardous material," "hazardous waste," "hazardous constituent," "hazardous substance," "toxic substance," "radioactive substance" or "pesticide".

ATM – Abener Teyma Mojave

MSDS/SDS – Material Safety Data Sheet or Safety Data Sheet

CEC – California Energy Commission

3. Scope of Application

This plan applies to the entire Mojave Solar Project site for the construction and commissioning phases, which will overlap. The final phase, operations, will differ slightly from the commissioning phase, as there will be different staff operating the plant. Prior to operations, this plan will be updated with current personnel and emergency contacts.

This plan will apply to all direct hire personnel of ATM's, Owner, Contractors and Subcontractors performing work at the construction site or while working inside any subsidiary facilities or suppliers when delivering to the site.

4. Applicable Documentation

- OSHA 29 CFR 1926 and 1910
- California Hazardous Waste Control Law (California Health and Safety Code, Div 20 Chapter 6.5)
- Hazardous Waste Control Regulations (California Code of Regulations, Title 22, Division 4.5)
- EPA 40 CFR 260-299 Managing Hazardous Waste
- EPA CERCLA
- OSHA 29 CFR Part 110.119
- Emergency Planning Community Right-to-Know Act of 1986 (42 USC 11001 et seq.)
- EPA 40 CFR 355 List of Extremely Hazardous Substances
- SARA Title III California Accidental Release Prevention (CalARP)
- Hazardous Materials Transportation Act (HMTA)
- SWRCB – State Water Resources Control Board
- Cal-EPA
- Cal-OSHA
- Department of Toxic Substances Control (DTSC)
- ISO 9001:2008, Quality Management Systems-requirements
- ISO 14001: 2004, Environmental Management System-requirements
- OHSAS 18001:2007, Occupational Health and Safety and Assessment System
- California Health & Safety Code (CHSC), Division 20, Chapter 6.95
- California Code of Regulations (CCR), Title 19, Division 2
- Title 40, Code of Federal Regulations (CFR)
- California Energy Commission Decision – Hazardous Materials (HAZ 2)
- EPA (SARA, Title III)

5. Development

5.1. General Facility Information

Mojave Solar LLC is a wholly owned subsidiary of Abengoa Solar Inc. The project will use established parabolic trough solar thermal technology to produce electrical power using a steam turbine generator fed from a solar steam generator. The solar steam generator receives heated heat transfer fluid (HTF) from solar thermal equipment comprised of arrays of parabolic mirrors that collect energy from the sun. The California Energy Commission (CEC) has exclusive jurisdiction to license this project. The Mojave Solar site will occupy a 1,765-acre site in an unincorporated area of San Bernardino County near the community of Hinkley, California. The project site is accessed by Harper Lake Road, which is located approximately 20 miles west of Barstow along the Highway 58 corridor. The project site is approximately six miles north of where Harper Lake Road intersects with Highway 58.

The project will have a combined nominal electric output of 250 MW from twin, independently operable solar fields. Each field will feed a 125 MW power island. One site, known as the Alpha site, is in the northwest portion of the project site and will occupy 884 acres. The Beta site is in the southwest portion of the project site and will occupy 800 acres. The Alpha and Beta sites will share the remaining 81 acres of the project site for activities that include receiving and discharging offsite drainage improvements. The collector fields are comprised of single-axis-tracking parabolic trough solar collectors. These collectors are arranged to form many parallel rows aligned on a north-south axis. Each solar collector has a linear, parabolic-shaped reflector that focuses the sun's radiation on a specially designed linear receiver known as a heat collection element (HCE). The collectors track the sun from east to west to ensure that the maximum amount of the sun's radiation is continuously focused on the HCE. The HTF is heated to approximately 740° F as it circulates through the HCEs and returns to a series of heat exchangers where the fluid is used to generate steam in the solar steam generator system at the power island, thereby providing steam to the steam turbine generator.

The project will use a wet cooling tower for power plant cooling. Water for cooling and other plant purposes will come from Harper Valley Ground Basin groundwater obtained from onsite wells. A single treatment facility will be installed for each pair of wells to treat the groundwater to meet potable standards for employee use. A septic system and onsite leach field will be used to dispose of sanitary wastewater. The sun will provide 100 percent

of the power supplied to the project through solar thermal collectors. No supplementary fossil-based energy source such as natural gas is proposed for electrical power production. However, each power island will have a natural-gas-fired auxiliary boiler to provide equipment freeze protection and HTF freeze protection.

The auxiliary boiler will supply steam to HTF heat exchangers as needed during offline hours to keep the HTF in a liquid state when ambient temperatures fall below its freezing point of 54° F. Each power island will also have a diesel engine-driven firewater pump for fire protection and a diesel engine-driven backup generator for power plant essentials. The Mojave Solar electrical transmission lines will interconnect with the Southern California Edison (SCE) 230-kV Kramer-Cool Water #1 transmission, which is located adjacent to the southern border of the site. SCE is constructing the new Lockhart Substation and associated facilities (including fiber optic cable routes located outside the site), to interconnect the project to the Kramer–Coolwater 220-kV line.

5.2. General Requirements

- Subcontractor is responsible for identifying all hazardous material and waste that can possibly be used or produced during service provided at the project site.

- Subcontractors that may be expected to create or could accidentally create a material that could be classified to be hazardous waste shall provide ATM a copy of their EPA Disposal number (or equivalent).

- Material Safety Data Sheets (MSDS) supplied by the manufacturers, suppliers, contractors, subcontractors, and/or property owner will be the principal source of health hazard information.

- MSDS information must be provided by all contractors and suppliers.

- All containers must be appropriately labeled, identifying the material(s), their potential hazard(s), and any personal protective equipment requirements.

- When personnel are working with chemicals, they shall know the following:

1. Methods and observations that may be used to detect and identify chemicals, such as odor, visual appearance, etc.
2. The potential health and environmental hazards associated with the chemicals they use.
3. The location of the applicable MSDS information and the format by which they are maintained.
4. Methods for protection against chemical exposure.

- Workers should always review the MSDS before working with a new or unknown product.

- Workers should never handle harmful or work near harmful, toxic materials, flammable liquids, or gases until they have been instructed in the safe handling and use of said materials.

- Each Subcontractor is responsible for preparing a plan to control such hazards including compliance and observance to the state and/or federal OSHA Hazard Communication standards. The plan shall be prepared by a competent employee and periodically reviewed for change implementation.

- Hazardous materials (or any other materials) **must not** be discharged into sewer systems. For additional information regarding this matter, contact the ATM's safety representative for the proper storage and drainage procedures. Water discharge guidelines will be enclosed within the local permit for the project. In the event of a spill, the subcontractor shall follow appropriate procedures and protocol for spill response and notify the project HS and Environmental representatives. After incident, the ATM's site EHS representatives shall follow up with the details regarding level of spill response and appropriate reporting procedures to governmental agencies (reference Emergency Plan, Emergency Response Plan, Incident Investigation, and Reporting Accidents and Injuries and the SPCC plan). ATM will ensure that subcontractors have the appropriate training and are aware of project procedures and requirements in order to perform their work.

- Outside Storage Lockers built as a separate building set apart from the main facility are acceptable. These lockers must be constructed of material that will be separated from any ignition source and include signage with conspicuous lettering, "FLAMMABLE – Keep Fire Away".

- All hazardous waste or waste which could be considered hazardous waste, as determined by the methodology and definitions from applicable environmental regulators shall be stored and collected in special areas and properly disposed of by contractor and subcontractors. ATM will supervise all hazardous waste storage and disposal (if any).

- ATM will perform inspections to ensure materials are being stored according to Applicable Laws.

- ATM will perform inspections and require from subcontractors that produce and dispose of hazardous waste all information pertinent regarding storing, transportation and the facility where waste will be send to.

- No waste haulers, disposers, recyclers or scavengers shall be allowed on the site without the permission of ATM.

- No waste may be removed from the site by any person without the authorization of ATM. No waste may be brought onto the site and disposed of.

5.3 Transportation, Storage and Handling

All materials contained on-site will be stored in appropriate containers protected from environmental conditions, including rain, wind, and direct heat and physical hazards such as vehicle traffic and sources of heat and impact. Additionally, hazardous material storage and management will be in accordance with requirements set forth by the San Bernardino County Fire department (SBCFD), California Energy Commission, DTSC, and CUPA for storage and handling of hazardous materials. Further, construction activities would occur according to Cal-OSHA regulatory requirements; therefore, it is not anticipated that the construction activities for this project would release hazardous emissions or result in the

handling of hazardous or acutely hazardous materials, substances or waste in large quantities.

The Community Right-to-Know (EPCRA) concerns the environmental and safety hazards posed by the storage and handling of toxic chemicals. It provisions help increase the public's knowledge and access to information on chemicals at the facilities, their uses, and releases into the environment.

ATM will not permit any of the subcontractors to directly or indirectly, manufacture, storage, transmission or presence of any hazardous materials on the site, and the release, discharge or other disposal of any hazardous materials on the site, in each case except in accordance with Applicable Law and as required for the performance of the work.

Any hazardous material transportation will be done according to Hazardous Materials Transportation Act (HMTA) that has the objectives to provide adequate protection against the risk to life property inherent in the transportation of hazardous material by improving regulatory and enforcement authority of the Secretary of Transportation.

5.4 Disposal of Hazardous Waste

An "EPA disposal number" must be provided by subcontractor who produces and disposes of any kind of hazardous materials classified according to California laws.

The disposal of hazardous waste (i.e. used oil, gasoline spill, motor oil spill, etc.) will be done according to DTSC which establish rules governing the use of hazardous materials and the management of hazardous waste. Applicable state and local laws include the following:

- Public Safety/Fire Regulations/Building Codes
- Hazardous Waste Control Law
- Hazardous Substances Information and Training Act

5.5 Notice of Hazardous Materials

If discovered, encountered or is notified of any spill or release of any Hazardous Materials at the Site:

- Project Environmental Engineer and H&S Manager shall be notified immediately.
- Notification to CA Emergency Management Agency, CEC shall be provided.
- Site Owner (Abengoa Solar Inc) shall be notified upon receiving knowledge of release.
- Project Environmental Engineer/ H&S Manager shall restrict access to the area containing such hazardous materials as required by Applicable Law or Applicable Permits.
- Subcontractor responsible from bringing such hazardous materials onto the Site or generated such material is responsible for remediating such hazardous materials under this document and immediately notifying the Project Environmental Engineer/designee and H&S Manager/designee. The responsible party shall promptly contain and remediate the material in accordance with all Applicable Laws and Applicable Permits (to the extent the Applicable Permits relate to the Work).

5.5.1 Local Emergency Contact

In the event of a release or threatened release of a hazardous material the following agencies shall be notified:

Name	Phone Number
Project Environmental Engineer	(480) 768-7793
Project HS Manager	(480) 370-7063
Local Emergency Response Agencies	911
Hazardous Materials Division	1-800-33-TOXIC or (909) 386-8425
CA Emergency Management Agency	(800) 852-7550/(916) 262-1621
National Response Center	(800) 424-8802

6. Records

These records are required to be retained for the life of the project and as specified by Cal-OSHA:

- MSDS
- EPA Disposal number

- Employee training records

7. Annexes

6007-INS-ATM-77-13-0003 Annex 01 HMBP Forms

6007-INS-ATM-77-13-0003 Annex 02 MSDS Forms

ABEINSA EPC
MOJAVE

Emergency Plan - Hazardous Material Management Plan (HMBP)

Title: Annex 01 HMBP
Process: Hazardous Material Business Plan (HMBP)
Project: Mojave Solar Project

Document:	**PEM-0002-01 Annex 01**
Revision:	03
Date:	07/05/14

Prepared by:		
Manjunath Shivalingappa	Environmental Engineer	Electronic Signatures

Reviewed by:		
Efrain Perez	Quality & Environmental Manager	Electronic Signatures
Steven Pochmara	Permitting Manager	Electronic Signatures

Approved by:		
Nicolas Gallo	Project Sub Director	Electronic Signatures
Pablo Enrique Schenone Laborde	Project Director	Electronic Signatures

Revision Control Sheet

Rev.	Date	Cause for Revision	Prepared	Reviewed	Approved
00	6/21/13	Document Created	KIA		
01	03/15/14	Inventory Update	KIA		
02	04/30/14	Inventory Update	KIA		
03	07/05/14	- Format Changes - Inventory Update	MS	EFP	NGM-PES

Table of Contents

1. Chemical Inventory

San Bernardino County Fire Department • Hazardous Materials Division

INVENTORY SUMMARY FORM

I. FACILITY IDENTIFICATION

FACILITY ID #	F	A	0	0	1	4	6	0	7	(This number is on your CUPA permit.) 1

BUSINESS NAME (Same as FACILITY NAME or DBA)
3

Mojave Solar Project LLC – Chemical Inventory – (page 1)

Item #	Name of Hazardous Material or Waste	Maximum Quantity	Size of Largest Container	Unit of Measure
1	Diesel Fuel	9700	4000	gallon
2	Gasoline	2000	2000	gallon
3	Hydraulic Oil	5280	330	gallon
4	Paints/Solvents	550	55	gallon
5	Motor Oil	110	55	gallon
6	Propane Fuel	300	50	gallon
7	Acetylene Gas – (Welding)	3600	300	Cu ft
8	Oxygen Gas – (Welding)	3500	282	Cu ft
9	Aqueous Ammonia – 12.5%	660	330	gallon
10	Argon Gas	8064	336	Cu ft
11	Carbon Dioxide Gas	6272	196	Cu ft
12	Hydrogen Gas	3196	196	Cu ft

Summarize the Business Plan inventory on this page. Place this summary in front of the inventory section of the Business Plan. Make copies of this sheet as necessary. Reminder: You need not report hazardous materials with a maximum quantity of less than 55 gallons, 500/5000 pounds, 200/1000 cubic feet, or the threshold planning quantity of an extremely hazardous substance. However, hazardous wastes, Category 1 and 2 pesticides, and explosives are reportable at any quantity.

III. SIGNATURE- EPCRA Facilities MUST sign the bottom of each individual attached inventory form.

SIGNATURE OF OWNER/OPERATOR	NAME OF SIGNER (print)	DATE
	Manjunath Shivalingappa	07/02/2014

San Bernardino County Fire Department • Hazardous Materials Division

INVENTORY SUMMARY FORM

I. FACILITY IDENTIFICATION

FACILITY ID #	F	A	0	0	1	4	6	0	7	(This number is on your CUPA permit.) 1

BUSINESS NAME (Same as FACILITY NAME or DBA)
3

Mojave Solar Project LLC – Chemical Inventory – (page 2)

Item #	Name of Hazardous Material or Waste	Maximum Quantity	Size of Largest Container	Unit of Measure
13	Nitrogen	26000	13000	gallon
14	Liquid Carbon Dioxide	26000	13000	gallon
15	Galvanizing Compound	15	5	gallon
16	Silicon	36.7	3.67	Liters
17	Acetone	5	1	gallon
18	MSI410 – Hydrochloric acid	10	10	gallon
19	Aluminum Chlorhydroxide- kalraid 1172	15	15	Gallon
20	Sodium Hypochlorite – 12.5%	5280	2640	gallon
21	Metasodium Bisulfite	55	55	gallon
22	Carbohydrazide	1200	300	gallon
23	Tri-Sodium Phosphate Solution	250	200	gallon
24	Phosphoric Acid – 60 – 70%	660	330	gallon

Summarize the Business Plan inventory on this page. Place this summary in front of the inventory section of the Business Plan. Make copies of this sheet as necessary. Reminder: You need not report hazardous materials with a maximum quantity of less than 55 gallons, 500/5000 pounds, 200/1000 cubic feet, or the threshold planning quantity of an extremely hazardous substance. However, hazardous wastes, Category 1 and 2 pesticides, and explosives are reportable at any quantity.

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SIGNATURE OF OWNER/OPERATOR	NAME OF SIGNER (print)	DATE
	Manjunath Shivalingappa	07/02/2014

San Bernardino County Fire Department • Hazardous Materials Division

INVENTORY SUMMARY FORM

I. FACILITY IDENTIFICATION

FACILITY ID #	F	A	0	0	1	4	6	0	7	(This number is on your CUPA permit.) 1

BUSINESS NAME (Same as FACILITY NAME or DBA)
3

Mojave Solar Project LLC – Chemical Inventory – (page 3)

Item #	Name of Hazardous Material or Waste	Maximum Quantity	Size of Largest Container	Unit of Measure
25	Sodium Bisulfite – 38%	660	330	gallon
26	Magnesium Sulfate – 27%	15320	7660	gallon silo
27	Slacked Lime	21664	21664	gallon silo
28	Soda Ash - 95% Sodium Carbonate	15320	7660	gallon silo
29	Anionic Flocculant Polymer Powder	660	330	gallon
30	Ferric Chloride – 40%	660	330	gallon
31	Sodium Bisulfite – 35%	660	330	gallon
32	Phosphoric Acid	660	330	gallon
33	Liquid Carbon Dioxide	26000	13000	gallon
34	Sodium EDTA	600	100	Lb. bags
35	Sulfuric Acid - 98%	660	330	gallon
36	Sodium Hydroxide - 50%	3350	330	gallon

Summarize the Business Plan inventory on this page. Place this summary in front of the inventory section of the Business Plan. Make copies of this sheet as necessary. Reminder: You need not report hazardous materials with a maximum quantity of less than 55 gallons, 500/5000 pounds, 200/1000 cubic feet, or the threshold planning quantity of an extremely hazardous substance. However, hazardous wastes, Category 1 and 2 pesticides, and explosives are reportable at any quantity.

III. SIGNATURE- EPCRA Facilities MUST sign the bottom of each individual attached inventory form.

SIGNATURE OF OWNER/OPERATOR	NAME OF SIGNER (print)	DATE
	Manjunath Shivalingappa	07/02/2014

San Bernardino County Fire Department • Hazardous Materials Division

INVENTORY SUMMARY FORM

I. FACILITY IDENTIFICATION

FACILITY ID #	F	A	0	0	1	4	6	0	7	(This number is on your CUPA permit.) 1

BUSINESS NAME (Same as FACILITY NAME or DBA)
3

Mojave Solar Project LLC – Chemical Inventory – (page 4)

Item #	Name of Hazardous Material or Waste	Maximum Quantity	Size of Largest Container	Unit of Measure
37	Heat Transfer Fluid – Biphenyl	2,300,000	57,000	gallon
38	Ammonium Hydroxide	8840	6900	gallon
39	Citric Acid	9420	6900	gallon
40	Bonderite	240	55	gallon
41	Sodium Nitrite	8200	50	Lb
42	Surfactant NP95	440	55	gallon
43	Caustic Soda 50%	1000	500	gallon
44	Sodium Bisulfite – 50%	1000	500	gallon
45	Sulfuric Acid 50%	1000	500	gallon
46	Antiscalant V4000	1000	500	gallon

Summarize the Business Plan inventory on this page. Place this summary in front of the inventory section of the Business Plan. Make copies of this sheet as necessary. Reminder: You need not report hazardous materials with a maximum quantity of less than 55 gallons, 500/5000 pounds, 200/1000 cubic feet, or the threshold planning quantity of an extremely hazardous substance. However, hazardous wastes, Category 1 and 2 pesticides, and explosives are reportable at any quantity.

III. SIGNATURE- EPCRA Facilities MUST sign the bottom of each individual attached inventory form.

SIGNATURE OF OWNER/OPERATOR	NAME OF SIGNER (print)	DATE
	Manjunath Shivalingappa	07/02/2014

2. Chemical Description

Please see next page for the chemical descriptions. Templates will only be used as areference.

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3
Mojave Solar Project LLC

FACILITY ID #	F	A	0	0	1	4	6	0	7	1	MAP# 1-A 203	GRID# F36,C20 204

II. CHEMICAL INFORMATION

CHEMICAL NAME 205
Diesel Fuel

TRADE SECRET ☐ Yes ☒ No 206
If Subject to EPCRA, refer to instructions

COMMON NAME 207
Diesel Fuel

EHS* ☐ Yes ☒ No 208

CAS# 209

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) ☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE 211

RADIOACTIVE ☐ Yes ☒ No 212

CURIES 213

PHYSICAL STATE (Check one item only) ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS 214

LARGEST CONTAINER 4000 gallon tank 215

FED HAZARD CATEGORIES (Check all that apply) ☒ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH 216

AVERAGE DAILY AMOUNT	MAXIMUM DAILY AMOUNT	ANNUAL WASTE AMOUNT	STATE WASTE CODE
217: 5500	218: 9700	219:	220:

UNITS* (Check one item only) ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS 221
* If EHS, amount must be in pounds.

DAYS ON SITE: 365 222

STORAGE CONTAINER
☒ a. ABOVE GROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BUILDING ☐ d. STEEL DRUM ☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☐ g. CARBOY ☐ h. SILO ☐ i. FIBER DRUM ☐ j. BAG ☐ k. BOX ☐ l. CYLINDER ☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☐ o. TOTE BIN ☐ p. TANK WAGON ☐ q. RAIL CAR ☐ r. OTHER 223

STORAGE PRESSURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT 224

STORAGE TEMPERATURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC 225

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	100 226	Petroleum Products 227	☐ Yes ☒ No 228	229
2	230	231	☐ Yes ☐ No 232	233
3	234	235	☐ Yes ☐ No 236	237
4	238	239	☐ Yes ☐ No 240	241
5	242	243	☐ Yes ☐ No 244	245

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION 246
Diesel fuel tanks are in various locations around project. Some are mobile.

If EPCRA, Please Sign Here

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3
Mojave Solar Project LLC

FACILITY ID #	F	A	0	0	1	4	6	0	7	1	MAP# 203	GRID# 204
											1-A	F30

II. CHEMICAL INFORMATION

CHEMICAL NAME 205	TRADE SECRET ☐ Yes ☒ No 206
Gasoline	If Subject to EPCRA, refer to instructions
COMMON NAME 207	EHS* ☐ Yes ☒ No 208
Gasoline	
CAS# 209	*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) 211	RADIOACTIVE ☐ Yes ☒ No 212	CURIES 213
☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE		
PHYSICAL STATE (Check one item only) 214	LARGEST CONTAINER	
☐ a. SOLID ☒ b. LIQUID ☐ c. GAS	250 gallon tank	215

FED HAZARD CATEGORIES (Check all that apply) 216
☒ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
1500	2000		

UNITS* (Check one item only) 221
☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS
* If EHS, amount must be in pounds.

DAYS ON SITE: 222
365

STORAGE CONTAINER 223
☒ a. ABOVE GROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BUILDING ☐ d. STEEL DRUM ☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☐ g. CARBOY ☐ h. SILO ☐ i. FIBER DRUM ☐ j. BAG ☐ k. BOX ☐ l. CYLINDER ☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☐ o. TOTE BIN ☐ p. TANK WAGON ☐ q. RAIL CAR ☐ r. OTHER

STORAGE PRESSURE 224
☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225
☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	100 226	Petroleum Distillates 227	☐ Yes ☒ No 228	86290-81- 229
2	230	231	☐ Yes ☐ No 232	233
3	234	235	☐ Yes ☐ No 236	237
4	238	239	☐ Yes ☐ No 240	241
5	242	243	☐ Yes ☐ No 244	245

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION 246

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3: Mojave Solar Project LLC

FACILITY ID # 1: F A 0 0 1 4 6 0 7 | MAP# 203: 1-A | GRID# 204: E26

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Hydraulic Oil | TRADE SECRET 206: ☐ Yes ☒ No (If Subject to EPCRA, refer to instructions)

COMMON NAME 207: Hydraulic Oil | EHS* 208: ☐ Yes ☒ No

CAS# 209: | *If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) 211: ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE | RADIOACTIVE 212: ☐ Yes ☒ No | CURIES 213:

PHYSICAL STATE (Check one item only) 214: ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS | LARGEST CONTAINER 215: 330 gallon tote/tank

FED HAZARD CATEGORIES (Check all that apply) 216: ☒ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☒ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
3200	5280		

UNITS* (Check one item only) 221: ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS (* If EHS, amount must be in pounds.) | DAYS ON SITE: 222: 365

STORAGE CONTAINER 223:
☐ a. ABOVE GROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BUILDING ☐ d. STEEL DRUM
☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☐ g. CARBOY ☐ h. SILO
☐ i. FIBER DRUM ☐ j. BAG ☐ k. BOX ☐ l. CYLINDER
☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☒ o. TOTE BIN ☐ p. TANK WAGON
☐ q. RAIL CAR ☐ r. OTHER

STORAGE PRESSURE 224: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	100 (226)	Petroleum (227)	☐ Yes ☒ No (228)	64742-55-8 (229)
2	(230)	(231)	☐ Yes ☐ No (232)	(233)
3	(234)	(235)	☐ Yes ☐ No (236)	(237)
4	(238)	(239)	☐ Yes ☐ No (240)	(241)
5	(242)	(243)	☐ Yes ☐ No (244)	(245)

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3: Mojave Solar Project LLC

FACILITY ID # 1: F A 0 0 1 4 6 0 7 | MAP# 203: 1-A | GRID# 204: F32, C21

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Paints/Solvents

TRADE SECRET 206: ☐ Yes ☒ No (If Subject to EPCRA, refer to instructions)

COMMON NAME 207: Paints/Solvents

EHS* 208: ☐ Yes ☒ No

CAS# 209:

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) 211: ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE

RADIOACTIVE 212: ☐ Yes ☒ No

CURIES 213:

PHYSICAL STATE (Check one item only) 214: ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS

LARGEST CONTAINER 215: 55 gallon drum

FED HAZARD CATEGORIES (Check all that apply) 216: ☒ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☒ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
350	550		

UNITS* (Check one item only) 221: ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS (* If EHS, amount must be in pounds.)

DAYS ON SITE: 222: 365

STORAGE CONTAINER 223:
- ☐ a. ABOVE GROUND TANK
- ☐ b. UNDERGROUND TANK
- ☐ c. TANK INSIDE BUILDING
- ☒ d. STEEL DRUM
- ☐ e. PLASTIC/NONMETALLIC DRUM
- ☒ f. CAN
- ☐ g. CARBOY
- ☐ h. SILO
- ☐ i. FIBER DRUM
- ☐ j. BAG
- ☐ k. BOX
- ☐ l. CYLINDER
- ☐ m. GLASS BOTTLE
- ☐ n. PLASTIC BOTTLE
- ☐ o. TOTE BIN
- ☐ p. TANK WAGON
- ☐ q. RAIL CAR
- ☒ r. OTHER

STORAGE PRESSURE 224: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	50 (226)	Misc. paints (227)	☐ Yes ☒ No (228)	(229)
2	50 (230)	Organic solvents (231)	☐ Yes ☒ No (232)	(233)
3	(234)	(235)	☐ Yes ☐ No (236)	(237)
4	(238)	(239)	☐ Yes ☐ No (240)	(241)
5	(242)	(243)	☐ Yes ☐ No (244)	(245)

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3: Mojave Solar Project LLC

FACILITY ID # 1: F A 0 0 1 4 6 0 7

MAP# 203: 1-A

GRID# 204: F32, C21

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Motor Oil

TRADE SECRET 206: ☐ Yes ☒ No (If Subject to EPCRA, refer to instructions)

COMMON NAME 207: Motor Oil

EHS* 208: ☐ Yes ☒ No

CAS# 209:

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) 211: ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE

RADIOACTIVE 212: ☐ Yes ☒ No

CURIES 213:

PHYSICAL STATE (Check one item only) 214: ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS

LARGEST CONTAINER 215: 55 gallon drum

FED HAZARD CATEGORIES (Check all that apply) 216: ☒ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
85	110		

UNITS* (Check one item only) 221: ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS (* If EHS, amount must be in pounds.)

DAYS ON SITE: 222: 365

STORAGE CONTAINER 223:
☐ a. ABOVE GROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BUILDING ☒ d. STEEL DRUM
☐ e. PLASTIC/NONMETALLIC DRUM ☒ f. CAN ☐ g. CARBOY ☐ h. SILO
☐ i. FIBER DRUM ☐ j. BAG ☐ k. BOX ☐ l. CYLINDER
☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☐ o. TOTE BIN ☐ p. TANK WAGON
☐ q. RAIL CAR ☐ r. OTHER

STORAGE PRESSURE 224: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	100 (226)	Petroleum based oils (227)	☐ Yes ☒ No (228)	64742-55-8 (229)
2	(230)	(231)	☐ Yes ☐ No (232)	(233)
3	(234)	(235)	☐ Yes ☐ No (236)	(237)
4	(238)	(239)	☐ Yes ☐ No (240)	(241)
5	(242)	(243)	☐ Yes ☐ No (244)	(245)

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION 246:

If EPCRA, Please Sign Here

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3: Mojave Solar Project LLC

FACILITY ID #	F	A	0	0	1	4	6	0	7	1	MAP# 203	GRID# 204
											1-A	F32, C21,

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Propane

TRADE SECRET 206: ☐ Yes ☒ No
If Subject to EPCRA, refer to instructions

COMMON NAME 207: Propane

EHS* 208: ☐ Yes ☒ No

CAS# 209:

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) 211: ☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE

RADIOACTIVE 212: ☐ Yes ☒ No

CURIES 213:

PHYSICAL STATE (Check one item only) 214: ☐ a. SOLID ☐ b. LIQUID ☒ c. GAS

LARGEST CONTAINER 215: 50 gallon

FED HAZARD CATEGORIES (Check all that apply) 216: ☒ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
200	300		

UNITS* 221 (Check one item only): ☐ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS
* If EHS, amount must be in pounds.

DAYS ON SITE: 222: 365

STORAGE CONTAINER 223:
☐ a. ABOVE GROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BUILDING ☐ d. STEEL DRUM
☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☐ g. CARBOY ☐ h. SILO
☐ i. FIBER DRUM ☐ j. BAG ☐ k. BOX ☒ l. CYLINDER
☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☐ o. TOTE BIN ☐ p. TANK WAGON
☐ q. RAIL CAR ☐ r. OTHER

STORAGE PRESSURE 224: ☐ a. AMBIENT ☒ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	100 226	Propane Gas 227	☐ Yes ☒ No 228	74-98-6 229
2	230	231	☐ Yes ☐ No 232	233
3	234	235	☐ Yes ☐ No 236	237
4	238	239	☐ Yes ☐ No 240	241
5	242	243	☐ Yes ☐ No 244	245

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION 246:

If EPCRA, Please Sign Here

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3: Mojave Solar Project LLC

FACILITY ID # 1: F A 0 0 1 4 6 0 7

MAP# 203: 1-A

GRID# 204: E35, F31,

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Acetylene

TRADE SECRET 206: ☐ Yes ☒ No (If Subject to EPCRA, refer to instructions)

COMMON NAME 207: Acetylene

EHS* 208: ☐ Yes ☒ No

CAS# 209:

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) 211: ☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE

RADIOACTIVE 212: ☐ Yes ☒ No

CURIES 213:

PHYSICAL STATE (Check one item only) 214: ☐ a. SOLID ☐ b. LIQUID ☒ c. GAS

LARGEST CONTAINER 215: 300 cu ft

FED HAZARD CATEGORIES (Check all that apply) 216: ☒ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
2000	3600		

UNITS* (Check one item only) 221: ☐ a. GALLONS ☒ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS (* If EHS, amount must be in pounds.)

DAYS ON SITE: 222: 365

STORAGE CONTAINER 223:
- ☐ a. ABOVE GROUND TANK
- ☐ b. UNDERGROUND TANK
- ☐ c. TANK INSIDE BUILDING
- ☐ d. STEEL DRUM
- ☐ e. PLASTIC/NONMETALLIC DRUM
- ☐ f. CAN
- ☐ g. CARBOY
- ☐ h. SILO
- ☐ i. FIBER DRUM
- ☐ j. BAG
- ☐ k. BOX
- ☒ l. CYLINDER
- ☐ m. GLASS BOTTLE
- ☐ n. PLASTIC BOTTLE
- ☐ o. TOTE BIN
- ☐ p. TANK WAGON
- ☐ q. RAIL CAR
- ☐ r. OTHER

STORAGE PRESSURE 224: ☐ a. AMBIENT ☒ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	100 (226)	Acetylene Gas (227)	☐ Yes ☒ No (228)	74-86-2 (229)
2	(230)	(231)	☐ Yes ☐ No (232)	(233)
3	(234)	(235)	☐ Yes ☐ No (236)	(237)
4	(238)	(239)	☐ Yes ☐ No (240)	(241)
5	(242)	(243)	☐ Yes ☐ No (244)	(245)

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION 246:

If EPCRA, Please Sign Here

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒MATERIAL ☐WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3
Mojave Solar Project LLC

FACILITY ID # F A 0 0 1 4 6 0 7 1 | MAP# 203: 1-A | GRID# 204: E35, F31,

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Oxygen
TRADE SECRET ☐ Yes ☒ No 206
If Subject to EPCRA, refer to instructions

COMMON NAME 207: Oxygen
EHS* ☐ Yes ☒ No 208

CAS# 209
*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) 211: ☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE
RADIOACTIVE ☐ Yes ☒ No 212
CURIES 213

PHYSICAL STATE (Check one item only) 214: ☐ a. SOLID ☐ b. LIQUID ☒ c. GAS
LARGEST CONTAINER 282 cu ft 215

FED HAZARD CATEGORIES (Check all that apply) 216: ☒ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
2400	3500		

UNITS* (Check one item only) 221: ☐ a. GALLONS ☒ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS
* If EHS, amount must be in pounds.
DAYS ON SITE: 365 222

STORAGE CONTAINER 223:
☐ a. ABOVE GROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BUILDING ☐ d. STEEL DRUM ☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☐ g. CARBOY ☐ h. SILO ☐ i. FIBER DRUM ☐ j. BAG ☐ k. BOX ☒ l. CYLINDER ☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☐ o. TOTE BIN ☐ p. TANK WAGON ☐ q. RAIL CAR ☐ r. OTHER

STORAGE PRESSURE 224: ☐ a. AMBIENT ☒ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	100 226	Oxygen Gas 227	☐ Yes ☒ No 228	7782-44-7 229
2	230	231	☐ Yes ☐ No 232	233
3	234	235	☐ Yes ☐ No 236	237
4	238	239	☐ Yes ☐ No 240	241
5	242	243	☐ Yes ☐ No 244	245

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒MATERIAL ☐WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3
Mojave Solar Project LLC

FACILITY ID # F A 0 0 1 4 6 0 7 1 | MAP# 203: 1-A | GRID# 204: E35, F31,

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Sodium Hypochlorite – 12.5%
TRADE SECRET ☐ Yes ☒ No 206
If Subject to EPCRA, refer to instructions

COMMON NAME 207: Sodium Hypochlorite
EHS* ☐ Yes ☒ No 208

CAS# 7681-52-9 209
*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE 211
RADIOACTIVE ☐ Yes ☒ No 212
CURIES 213

PHYSICAL STATE (Check one item only) ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS 214
LARGEST CONTAINER 330 215

FED HAZARD CATEGORIES (Check all that apply) 216
☐ a. FIRE ☒ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☒ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
4000	5280		

UNITS* (Check one item only) 221: ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS
* If EHS, amount must be in pounds.
DAYS ON SITE: 222: 365

STORAGE CONTAINER 223:
☒ a. ABOVE GROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BUILDING ☐ d. STEEL DRUM ☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☐ g. CARBOY ☐ h. SILO ☐ i. FIBER DRUM ☐ j. BAG ☐ k. BOX ☐ l. CYLINDER ☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☒ o. TOTE BIN ☐ p. TANK WAGON ☐ q. RAIL CAR ☐ r. OTHER

STORAGE PRESSURE 224: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	12.5 226	Sodium Hypochlorite 227	☐ Yes ☒ No 228	7681-52-9 229
2	230	231	☐ Yes ☐ No 232	233
3	234	235	☐ Yes ☐ No 236	237
4	238	239	☐ Yes ☐ No 240	241
5	242	243	☐ Yes ☐ No 244	245

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒MATERIAL ☐WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3
Mojave Solar Project LLC

FACILITY ID #	F	A	0	0	1	4	6	0	7	1	MAP# 203	GRID# 204
											1-A	E35, F31,

II. CHEMICAL INFORMATION

CHEMICAL NAME 205
Magnesium Sulfate – 27%

TRADE SECRET ☐ Yes ☒ No 206
If Subject to EPCRA, refer to instructions

COMMON NAME 207
Magnesium Sulfate

EHS* ☐ Yes ☒ No 208

CAS# 7487-88-9 209

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE 211

RADIOACTIVE ☐ Yes ☒ No 212

CURIES 213

PHYSICAL STATE (Check one item only) ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS 214

LARGEST CONTAINER 7660 gallon silo 215

FED HAZARD CATEGORIES (Check all that apply) 216
☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
10000	15320		

UNITS* (Check one item only) 221
☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS
* If EHS, amount must be in pounds.

DAYS ON SITE: 365 222

STORAGE CONTAINER 223
☐ a. ABOVE GROUND TANK ☐ e. PLASTIC/NONMETALLIC DRUM ☐ i. FIBER DRUM ☐ m. GLASS BOTTLE ☐ q. RAIL CAR
☐ b. UNDERGROUND TANK ☐ f. CAN ☐ j. BAG ☐ n. PLASTIC BOTTLE ☐ r. OTHER
☐ c. TANK INSIDE BUILDING ☐ g. CARBOY ☐ k. BOX ☐ o. TOTE BIN
☐ d. STEEL DRUM ☒ h. SILO ☐ l. CYLINDER ☐ p. TANK WAGON

STORAGE PRESSURE 224
☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225
☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1 27 226	Magnesium Sulfate 227	☐ Yes ☒ No 228	7487-88-9 229
2 230	231	☐ Yes ☐ No 232	233
3 234	235	☐ Yes ☐ No 236	237
4 238	239	☐ Yes ☐ No 240	241
5 242	243	☐ Yes ☐ No 244	245

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION 246

If EPCRA, Please Sign Here

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3: Mojave Solar Project LLC

FACILITY ID # F A 0 0 1 4 6 0 7 1 | MAP# 203: 1-A | GRID# 204: E35, F31,

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Calcium Hydroxide - Slaked Lime

TRADE SECRET ☐ Yes ☒ No 206 — If Subject to EPCRA, refer to instructions

COMMON NAME 207: Lime

EHS* ☐ Yes ☒ No 208

CAS# 1305-62-0 209

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE 211

RADIOACTIVE ☐ Yes ☒ No 212

CURIES 213

PHYSICAL STATE (Check one item only) ☒ a. SOLID ☐ b. LIQUID ☐ c. GAS 214

LARGEST CONTAINER 215: 21664 gallon silo

FED HAZARD CATEGORIES (Check all that apply) 216: ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
35000	43328		

UNITS* (Check one item only) 221: ☐ a. GALLONS ☐ b. CUBIC FEET ☒ c. POUNDS ☐ d. TONS
* If EHS, amount must be in pounds.

DAYS ON SITE: 222: 365

STORAGE CONTAINER 223:
- ☐ a. ABOVE GROUND TANK
- ☐ b. UNDERGROUND TANK
- ☐ c. TANK INSIDE BUILDING
- ☐ d. STEEL DRUM
- ☐ e. PLASTIC/NONMETALLIC DRUM
- ☐ f. CAN
- ☐ g. CARBOY
- ☒ h. SILO
- ☐ i. FIBER DRUM
- ☐ j. BAG
- ☐ k. BOX
- ☐ l. CYLINDER
- ☐ m. GLASS BOTTLE
- ☐ n. PLASTIC BOTTLE
- ☐ o. TOTE BIN
- ☐ p. TANK WAGON
- ☐ q. RAIL CAR
- ☒ r. OTHER

STORAGE PRESSURE 224: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1 226	Slaked Lime 22	☐ Yes ☒ No 228	1305-62-0 229
2 230	23	☐ Yes ☐ No 232	233
3 234	23	☐ Yes ☐ No 236	237
4 238	2	☐ Yes ☐ No 240	241
5 242	2	☐ Yes ☐ No 244	245

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION 246

If EPCRA, Please Sign Here

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3: Mojave Solar Project LLC

FACILITY ID # 1: F A 0 0 1 4 6 0 7

MAP# 203: 1-A

GRID# 204: E35, F31,

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: 95% Sodium Carbonate

TRADE SECRET 206: ☐ Yes ☒ No
If Subject to EPCRA, refer to instructions

COMMON NAME 207: Soda Ash

EHS* 208: ☐ Yes ☒ No

CAS# 209: 497-19-8

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) 211: ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE

RADIOACTIVE 212: ☐ Yes ☒ No

CURIES 213:

PHYSICAL STATE (Check one item only) 214: ☒ a. SOLID ☐ b. LIQUID ☐ c. GAS

LARGEST CONTAINER 215: 7660 gallon silo

FED HAZARD CATEGORIES (Check all that apply) 216: ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
10000	15320		

UNITS* (Check one item only) 221: ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS
* If EHS, amount must be in pounds.

DAYS ON SITE: 222: 365

STORAGE CONTAINER 223:
☐ a. ABOVE GROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BUILDING ☐ d. STEEL DRUM
☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☒ h. SILO
☐ i. FIBER DRUM ☐ j. BAG ☐ k. BOX ☐ l. CYLINDER
☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☐ o. TOTE BIN ☐ p. TANK WAGON
☐ q. RAIL CAR ☒ r. OTHER

STORAGE PRESSURE 224: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	95 (226)	Sodium Carbonate (227)	☐ Yes ☒ No (228)	497-19-8 (229)
2	(230)	(231)	☐ Yes ☐ No (232)	(233)
3	(234)	(235)	☐ Yes ☐ No (236)	(237)
4	(238)	(239)	☐ Yes ☐ No (240)	(241)
5	(242)	(243)	☐ Yes ☐ No (244)	(245)

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION 246

If EPCRA, Please Sign Here

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒MATERIAL ☐WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3
Mojave Solar Project LLC

FACILITY ID # F A 0 0 1 4 6 0 7 1 | MAP# 203: 1-A | GRID# 204: E35, F31,

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Anionic Flocculant
TRADE SECRET ☐ Yes ☒ No 206
If Subject to EPCRA, refer to instructions

COMMON NAME 207: Flocculant
EHS* ☐ Yes ☒ No 208

CAS# 209:
*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE 211
RADIOACTIVE ☐ Yes ☒ No 212
CURIES 213:

PHYSICAL STATE (Check one item only) ☒ a. SOLID ☐ b. LIQUID ☐ c. GAS 214
LARGEST CONTAINER 330 gal 215

FED HAZARD CATEGORIES (Check all that apply) 216
☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
450	660		

UNITS* (Check one item only) 221: ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS
* If EHS, amount must be in pounds.
DAYS ON SITE: 222: 365

STORAGE CONTAINER 223:
☐ a. ABOVE GROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BUILDING ☐ d. STEEL DRUM
☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☐ g. CARBOY ☐ h. SILO
☐ i. FIBER DRUM ☐ j. BAG ☐ k. BOX ☐ l. CYLINDER
☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☒ o. TOTE BIN ☐ p. TANK WAGON
☐ q. RAIL CAR ☒ r. OTHER

STORAGE PRESSURE 224: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	226	Anionic Flocculant 227	☐ Yes ☒ No 228	229
2	230	231	☐ Yes ☐ No 232	233
3	234	235	☐ Yes ☐ No 236	237
4	238	239	☐ Yes ☐ No 240	241
5	242	243	☐ Yes ☐ No 244	245

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION 246:

If EPCRA, Please Sign Here

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3: Mojave Solar Project LLC

FACILITY ID # A F0 0 1 4A 6 0 7 0 0 | MAP# 1-A1 203 | GRID# 4 E35, F31, 6 204 | 0

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Ferric Chloride – 40%		TRADE SECRET ☐ Yes ☒ No 206	If Subject to EPCRA, refer to instructions
COMMON NAME 207: Ferric Chloride		EHS* ☐ Yes ☒ No 208	
CAS# 7705-08-0 209		*If EHS is "Yes", all amounts below must be in lbs.	

HAZARDOUS MATERIAL TYPE (Check one item only) ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE 211	RADIOACTIVE ☐ Yes ☒ No 212	CURIES 213	
PHYSICAL STATE (Check one item only) ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS 214	LARGEST CONTAINER 330 gal 215		
FED HAZARD CATEGORIES (Check all that apply) ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☒ e. CHRONIC HEALTH 216			

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
450	660		

UNITS* (Check one item only) ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS 221
* If EHS, amount must be in pounds.

DAYS ON SITE: 365 222

STORAGE CONTAINER 223
- ☐ a. ABOVE GROUND TANK
- ☐ b. UNDERGROUND TANK
- ☐ c. TANK INSIDE BUILDING
- ☐ d. STEEL DRUM
- ☐ e. PLASTIC/NONMETALLIC DRUM
- ☐ f. CAN
- ☐ g. CARBOY
- ☐ h. SILO
- ☐ i. FIBER DRUM
- ☐ j. BAG
- ☐ k. BOX
- ☐ l. CYLINDER
- ☐ m. GLASS BOTTLE
- ☐ n. PLASTIC BOTTLE
- ☒ o. TOTE BIN
- ☐ p. TANK WAGON
- ☐ q. RAIL CAR
- ☐ r. OTHER

STORAGE PRESSURE 224: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1 40 226	Ferric Chloride 227	☐ Yes ☒ No 228	7705-08-0 229
2 230	231	☐ Yes ☐ No 232	233
3 234	235	☐ Yes ☐ No 236	237
4 238	239	☐ Yes ☐ No 240	241
5 242	243	☐ Yes ☐ No 244	245

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION 246

If EPCRA, Please Sign Here

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒MATERIAL ☐WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3
Mojave Solar Project LLC

FACILITY ID #	F	A	0	0	1	4	6	0	7	1	MAP# 203	GRID# 204
											1-A	E35, F31,

II. CHEMICAL INFORMATION

CHEMICAL NAME 205
Sodium Bisulfite – 35%

TRADE SECRET ☐ Yes ☒ No 206
If Subject to EPCRA, refer to instructions

COMMON NAME 207
Sodium Bisulfite

EHS* ☐ Yes ☒ No 208

CAS# 7631-90-5 209

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE 211

RADIOACTIVE ☐ Yes ☒ No 212

CURIES 213

PHYSICAL STATE (Check one item only) ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS 214

LARGEST CONTAINER 330 gallon 215

FED HAZARD CATEGORIES (Check all that apply) 216
☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☒ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
450	660		

UNITS* (Check one item only) 221
☐ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS
* If EHS, amount must be in pounds.

DAYS ON SITE: 365 222

STORAGE CONTAINER 223
☐ a. ABOVE GROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BUILDING ☐ d. STEEL DRUM
☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☐ g. CARBOY ☐ h. SILO
☐ i. FIBER DRUM ☐ j. BAG ☐ k. BOX ☐ l. CYLINDER
☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☒ o. TOTE BIN ☐ p. TANK WAGON
☐ q. RAIL CAR ☐ r. OTHER

STORAGE PRESSURE 224
☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225
☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	35 226	Sodium Bisulfite 227	☐ Yes ☒ No 228	7631-90-5 229
2	230	231	☐ Yes ☐ No 232	233
3	234	235	☐ Yes ☐ No 236	237
4	238	239	☐ Yes ☐ No 240	241
5	242	243	☐ Yes ☐ No 244	245

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION 246

If EPCRA, Please Sign Here

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3: Mojave Solar Project LLC

FACILITY ID # 1: F A 0 0 1 4 6 0 7

MAP# 203: 1-A

GRID# 204: E35, F31,

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Phosphoric Acid

TRADE SECRET 206: ☐ Yes ☒ No
If Subject to EPCRA, refer to instructions

COMMON NAME 207: Phosphoric Acid

EHS* 208: ☐ Yes ☒ No

CAS# 209: 7664-38-2

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) 211: ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE

RADIOACTIVE 212: ☐ Yes ☒ No

CURIES 213:

PHYSICAL STATE (Check one item only) 214: ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS

LARGEST CONTAINER 215: 330 gallon

FED HAZARD CATEGORIES (Check all that apply) 216: ☐ a. FIRE ☒ b. REACTIVE ☐ c. PRESSURE RELEASE ☒ d. ACUTE HEALTH ☒ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
330	660		

UNITS* (Check one item only) 221: ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS
* If EHS, amount must be in pounds.

DAYS ON SITE: 222: 365

STORAGE CONTAINER 223:
☐ a. ABOVE GROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BUILDING ☐ d. STEEL DRUM ☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☐ g. CARBOY ☐ h. SILO ☐ i. FIBER DRUM ☐ j. BAG ☐ k. BOX ☐ l. CYLINDER ☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☒ o. TOTE BIN ☐ p. TANK WAGON ☐ q. RAIL CAR ☐ r. OTHER

STORAGE PRESSURE 224: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	226	Phosphoric Acid 227	☐ Yes ☒ No 228	7664-38-2 229
2	230	231	☐ Yes ☐ No 232	233
3	234	235	☐ Yes ☐ No 236	237
4	238	239	☐ Yes ☐ No 240	241
5	242	243	☐ Yes ☐ No 244	245

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION 246

If EPCRA, Please Sign Here

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3: Mojave Solar Project LLC

FACILITY ID # 1: F A 0 0 1 4 6 0 7

MAP# 203: 1-A

GRID# 204: E35, F31,

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Liquid Carbon

TRADE SECRET 206: ☐ Yes ☒ No
If Subject to EPCRA, refer to instructions

COMMON NAME 207: Liquid CO2

EHS* 208: ☐ Yes ☒ No

CAS# 124-38-9 209

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) 211: ☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE

RADIOACTIVE 212: ☐ Yes ☒ No

CURIES 213:

PHYSICAL STATE (Check one item only) 214: ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS

LARGEST CONTAINER 215: 13000 gallon

FED HAZARD CATEGORIES (Check all that apply) 216: ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☒ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
20000	26000		

UNITS* (Check one item only) 221: ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS
* If EHS, amount must be in pounds.

DAYS ON SITE: 222: 365

STORAGE CONTAINER 223:
☒ a. ABOVE GROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BUILDING ☐ d. STEEL DRUM ☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☐ g. CARBOY ☐ h. SILO ☐ i. FIBER DRUM ☐ j. BAG ☐ k. BOX ☐ l. CYLINDER ☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☐ o. TOTE BIN ☐ p. TANK WAGON ☐ q. RAIL CAR ☐ r. OTHER

STORAGE PRESSURE 224: ☐ a. AMBIENT ☒ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☐ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☒ d. CRYOGENIC

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	100 226	Carbon Dioxide 227	☐ Yes ☒ No 228	124-38-9 229
2	230	231	☐ Yes ☐ No 232	233
3	234	235	☐ Yes ☐ No 236	237
4	238	239	☐ Yes ☐ No 240	241
5	242	243	☐ Yes ☐ No 244	245

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION 246

If EPCRA, Please Sign Here

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3
Mojave Solar Project LLC

FACILITY ID # F A 0 0 1 4 6 0 7 1 | MAP# 203: 1-A | GRID# 204: E35, F31,

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Sodium EDTA
TRADE SECRET ☐ Yes ☒ No 206 (If Subject to EPCRA, refer to instructions)
COMMON NAME 207: Sodium EDTA
EHS* ☐ Yes ☒ No 208
CAS# 8013-51-2 209
*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE 211
RADIOACTIVE ☐ Yes ☒ No 212
CURIES 213
PHYSICAL STATE (Check one item only) ☒ a. SOLID ☐ b. LIQUID ☐ c. GAS 214
LARGEST CONTAINER 100 lb bags 215
FED HAZARD CATEGORIES (Check all that apply) ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☒ e. CHRONIC HEALTH 216

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
350	600		

UNITS* (Check one item only) ☐ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS 221
* If EHS, amount must be in pounds.
DAYS ON SITE: 365 222

STORAGE CONTAINER
☐ a. ABOVE GROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BUILDING ☐ d. STEEL DRUM
☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☐ g. CARBOY ☐ h. SILO
☐ i. FIBER DRUM ☒ j. BAG ☐ k. BOX ☐ l. CYLINDER
☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☐ o. TOTE BIN ☐ p. TANK WAGON
☐ q. RAIL CAR ☐ r. OTHER 223

STORAGE PRESSURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT 224

STORAGE TEMPERATURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC 225

%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1 226	Sodium EDTA 227	☐ Yes ☒ No 228	8013-51-2 229
2 230	231	☐ Yes ☐ No 232	233
3 234	235	☐ Yes ☐ No 236	237
4 238	239	☐ Yes ☐ No 240	241
5 242	243	☐ Yes ☐ No 244	245

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION 246

If EPCRA, Please Sign Here

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒MATERIAL ☐WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3
Mojave Solar Project LLC

FACILITY ID # F A 0 0 1 4 6 0 7 1 | MAP# 203: 1-A | GRID# 204: E35, F31,

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Sulfuric Acid – 98%
TRADE SECRET ☐ Yes ☒ No 206 (If Subject to EPCRA, refer to instructions)
COMMON NAME 207: Sulfuric Acid
EHS* ☐ Yes ☒ No 208
CAS# 7664-93-9 209
*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE 211
RADIOACTIVE ☐ Yes ☒ No 212
CURIES 213

PHYSICAL STATE (Check one item only) ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS 214
LARGEST CONTAINER 330 215

FED HAZARD CATEGORIES (Check all that apply) 216
☐ a. FIRE ☒ b. REACTIVE ☐ c. PRESSURE RELEASE ☒ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
400	660		

UNITS* (Check one item only) 221: ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS
* If EHS, amount must be in pounds.
DAYS ON SITE: 222: 365

STORAGE CONTAINER 223:
☐ a. ABOVE GROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BUILDING ☐ d. STEEL DRUM
☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☐ g. CARBOY ☐ h. SILO
☐ i. FIBER DRUM ☐ j. BAG ☐ k. BOX ☐ l. CYLINDER
☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☒ o. TOTE BIN ☐ p. TANK WAGON
☐ q. RAIL CAR ☐ r. OTHER

STORAGE PRESSURE 224: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	98 226	Sulfuric Acid 227	☐ Yes ☒ No 228	7664-93-9 229
2	230	231	☐ Yes ☐ No 232	233
3	234	235	☐ Yes ☐ No 236	237
4	238	239	☐ Yes ☐ No 240	241
5	242	243	☐ Yes ☐ No 244	245

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION 246

If EPCRA, Please Sign Here

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒MATERIAL ☐WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3
Mojave Solar Project LLC

FACILITY ID #	F	A	0	0	1	4	6	0	7	1	MAP# 203	GRID# 204
											1-A	E35, F31,

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Sodium Hydroxide
TRADE SECRET 206: ☐ Yes ☒ No (If Subject to EPCRA, refer to instructions)
COMMON NAME 207: Sodium Hydroxide
EHS* 208: ☐ Yes ☒ No
CAS# 209:
*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) 211: ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE
RADIOACTIVE 212: ☐ Yes ☒ No
CURIES 213:
PHYSICAL STATE (Check one item only) 214: ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS
LARGEST CONTAINER 215: 330 gal
FED HAZARD CATEGORIES (Check all that apply) 216: ☐ a. FIRE ☒ b. REACTIVE ☐ c. PRESSURE RELEASE ☒ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
2500	3350		

UNITS* (Check one item only) 221: ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS
* If EHS, amount must be in pounds.
DAYS ON SITE: 222: 365

STORAGE CONTAINER 223:
☒ a. ABOVE GROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BUILDING ☐ d. STEEL DRUM ☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☐ g. CARBOY ☐ h. SILO ☐ i. FIBER DRUM ☐ j. BAG ☐ k. BOX ☐ l. CYLINDER ☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☐ o. TOTE BIN ☐ p. TANK WAGON ☐ q. RAIL CAR ☐ r. OTHER

STORAGE PRESSURE 224: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	50 226	Sodium Hydroxide 227	☐ Yes ☒ No 228	1310-73-2 229
2	230	231	☐ Yes ☐ No 232	233
3	234	235	☐ Yes ☐ No 236	237
4	238	239	☐ Yes ☐ No 240	241
5	242	243	☐ Yes ☐ No 244	245

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION 246

If EPCRA, Please Sign Here

UPCF (Rev. 12/2007)

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3: Mojave Solar Project LLC

FACILITY ID # 1: F A 0 0 1 4 6 0 7 | MAP# 203: 1-A | GRID# 204: E35, F31,

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Diphenyl Ether, Biphenyl

TRADE SECRET 206: ☐ Yes ☒ No (If Subject to EPCRA, refer to instructions)

COMMON NAME 207: Heat Transfer Fluid

EHS* 208: ☐ Yes ☒ No

CAS# 209: 101-84-8, 92-52-4

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) 211: ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE

RADIOACTIVE 212: ☐ Yes ☒ No

CURIES 213:

PHYSICAL STATE (Check one item only) 214: ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS

LARGEST CONTAINER 215: 57000 gallon tank

FED HAZARD CATEGORIES (Check all that apply) 216: ☒ a. FIRE ☒ b. REACTIVE ☐ c. PRESSURE RELEASE ☒ d. ACUTE HEALTH ☒ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
2,000,000	2,300,000		

UNITS* (Check one item only) 221: ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS (* If EHS, amount must be in pounds.)

DAYS ON SITE: 222: 365

STORAGE CONTAINER 223:
☒ a. ABOVE GROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BUILDING ☐ d. STEEL DRUM ☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☐ g. CARBOY ☐ h. SILO ☐ i. FIBER DRUM ☐ j. BAG ☐ k. BOX ☐ l. CYLINDER ☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☐ o. TOTE BIN ☐ p. TANK WAGON ☐ q. RAIL CAR ☒ r. OTHER

STORAGE PRESSURE 224: ☐ a. AMBIENT ☒ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☐ a. AMBIENT ☒ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	73.5 (226)	Diphenyl Ether (227)	☐ Yes ☒ No (228)	101-84-8 (229)
2	26.5 (230)	Biphenyl (231)	☐ Yes ☐ No (232)	92-52-4 (233)
3	(234)	(235)	☐ Yes ☐ No (236)	(237)
4	(238)	(239)	☐ Yes ☐ No (240)	(241)
5	(242)	(243)	☐ Yes ☐ No (244)	(245)

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION 246

If EPCRA, Please Sign Here

San Bernardino County Fire Department • Hazardous Materials Division

HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3: Mojave Solar Project LLC

FACILITY ID # 1: F A 0 0 1 4 6 0 7 | MAP# 203: 1-A | GRID# 204: E35, F31,

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Carbon Dioxide

TRADE SECRET 206: ☐ Yes ☒ No — If Subject to EPCRA, refer to instructions

COMMON NAME 207: Carbon Dioxide

EHS* 208: ☐ Yes ☒ No

CAS# 209:

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) 211: ☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE

RADIOACTIVE 212: ☐ Yes ☒ No

CURIES 213:

PHYSICAL STATE (Check one item only) 214: ☐ a. SOLID ☐ b. LIQUID ☒ c. GAS

LARGEST CONTAINER 215: 196 Cu ft

FED HAZARD CATEGORIES (Check all that apply) 216: ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
4800	6272		

UNITS* (Check one item only) 221: ☐ a. GALLONS ☒ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS — * If EHS, amount must be in pounds.

DAYS ON SITE: 222: 365

STORAGE CONTAINER 223:
- ☐ a. ABOVE GROUND TANK
- ☐ b. UNDERGROUND TANK
- ☐ c. TANK INSIDE BUILDING
- ☐ d. STEEL DRUM
- ☐ e. PLASTIC/NONMETALLIC DRUM
- ☐ f. CAN
- ☐ g. CARBOY
- ☐ h. SILO
- ☐ i. FIBER DRUM
- ☐ j. BAG
- ☐ k. BOX
- ☒ l. CYLINDER
- ☐ m. GLASS BOTTLE
- ☐ n. PLASTIC BOTTLE
- ☐ o. TOTE BIN
- ☐ p. TANK WAGON
- ☐ q. RAIL CAR
- ☐ r. OTHER

STORAGE PRESSURE 224: ☐ a. AMBIENT ☒ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	100 226	Carbon Dioxide 227	☐ Yes ☒ No 228	229
2	230	231	☐ Yes ☐ No 232	233
3	234	235	☐ Yes ☐ No 236	237
4	238	239	☐ Yes ☐ No 240	241
5	242	243	☐ Yes ☐ No 244	245

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3: Mojave Solar Project LLC

FACILITY ID # F A 0 0 1 4 6 0 7 1 | MAP# 203: 1-A | GRID# 204: E35, F31,

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Hydrogen Gas

TRADE SECRET ☐ Yes ☒ No 206 — If Subject to EPCRA, refer to instructions

COMMON NAME 207: Hydrogen Gas

EHS* ☐ Yes ☒ No 208

CAS# 133-74-0 209

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) ☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE 211

RADIOACTIVE ☐ Yes ☒ No 212

CURIES 213

PHYSICAL STATE (Check one item only) ☐ a. SOLID ☐ b. LIQUID ☒ c. GAS 214

LARGEST CONTAINER 196 Cu ft 215

FED HAZARD CATEGORIES (Check all that apply) ☒ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH 216

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
1800	3196		

UNITS* (Check one item only) ☐ a. GALLONS ☒ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS 221
* If EHS, amount must be in pounds.

DAYS ON SITE: 222: 365

STORAGE CONTAINER
☐ a. ABOVE GROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BUILDING ☐ d. STEEL DRUM
☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☐ g. CARBOY ☐ h. SILO
☐ i. FIBER DRUM ☐ j. BAG ☐ k. BOX ☒ l. CYLINDER
☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☐ o. TOTE BIN ☐ p. TANK WAGON
☐ q. RAIL CAR ☐ r. OTHER 223

STORAGE PRESSURE ☐ a. AMBIENT ☒ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT 224

STORAGE TEMPERATURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC 225

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	100 226	Hydrogen 227	☐ Yes ☒ No 228	133-74-0 229
	230	231	☐ Yes ☐ No 232	233
3	234	235	☐ Yes ☐ No 236	237
4	238	239	☐ Yes ☐ No 240	241
5	242	243	☐ Yes ☐ No 244	245

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3: Mojave Solar Project LLC

FACILITY ID # 1: F A 0 0 1 4 6 0 7 | MAP# 203: 1-A | GRID# 204: E35, F31,

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Nitrogen

TRADE SECRET 206: ☐ Yes ☒ No (If Subject to EPCRA, refer to instructions)

COMMON NAME 207: Nitrogen

EHS* 208: ☐ Yes ☒ No

CAS# 209: 7727-37-9

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) 211: ☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE

RADIOACTIVE 212: ☐ Yes ☒ No

CURIES 213:

PHYSICAL STATE (Check one item only) 214: ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS

LARGEST CONTAINER 215: 13000 gallon

FED HAZARD CATEGORIES (Check all that apply) 216: ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
18000	26000		

UNITS* (Check one item only) 221: ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS (* If EHS, amount must be in pounds.)

DAYS ON SITE: 222: 365

STORAGE CONTAINER 223:
- ☒ a. ABOVE GROUND TANK
- ☐ b. UNDERGROUND TANK
- ☐ c. TANK INSIDE BUILDING
- ☐ d. STEEL DRUM
- ☐ e. PLASTIC/NONMETALLIC DRUM
- ☐ f. CAN
- ☐ g. CARBOY
- ☐ h. SILO
- ☐ i. FIBER DRUM
- ☐ j. BAG
- ☐ k. BOX
- ☐ l. CYLINDER
- ☐ m. GLASS BOTTLE
- ☐ n. PLASTIC BOTTLE
- ☐ o. TOTE BIN
- ☐ p. TANK WAGON
- ☐ q. RAIL CAR
- ☐ r. OTHER

STORAGE PRESSURE 224: ☐ a. AMBIENT ☒ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☐ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☒ d. CRYOGENIC

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	100 226	Nitrogen 227	☐ Yes ☒ No 228	7727-37-9 229
	230	231	☐ Yes ☐ No 232	233
3	234	235	☐ Yes ☐ No 236	237
4	238	239	☐ Yes ☐ No 240	241
5	242	243	☐ Yes ☐ No 244	245

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒MATERIAL ☐WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3: Mojave Solar Project LLC

FACILITY ID # F A 0 0 1 4 6 0 7 1 | MAP# 203: 1-A | GRID# 204: E35, F31,

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Ammonium Hydroxide

TRADE SECRET ☐ Yes ☒ No 206 — If Subject to EPCRA, refer to instructions

COMMON NAME 207: Ammonium Hydroxide

EHS* ☐ Yes ☒ No 208

CAS# 1336-21-6 209

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE 211

RADIOACTIVE ☐ Yes ☒ No 212

CURIES 213

PHYSICAL STATE (Check one item only) ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS 214

LARGEST CONTAINER 6900 gallon 215

FED HAZARD CATEGORIES (Check all that apply) 216: ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☒ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
6400	8840		

UNITS* (Check one item only) 221: ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS
* If EHS, amount must be in pounds.

DAYS ON SITE: 222: 365

STORAGE CONTAINER 223:
- ☒ a. ABOVE GROUND TANK
- ☐ b. UNDERGROUND TANK
- ☐ c. TANK INSIDE BUILDING
- ☐ d. STEEL DRUM
- ☐ e. PLASTIC/NONMETALLIC DRUM
- ☐ f. CAN
- ☐ g. CARBOY
- ☐ h. SILO
- ☐ i. FIBER DRUM
- ☐ j. BAG
- ☐ k. BOX
- ☐ l. CYLINDER
- ☐ m. GLASS BOTTLE
- ☐ n. PLASTIC BOTTLE
- ☒ o. TOTE BIN
- ☐ p. TANK WAGON
- ☐ q. RAIL CAR
- ☐ r. OTHER

STORAGE PRESSURE 224: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	100 226	Ammonium Hydroxide 227	☐ Yes ☒ No 228	1336-21-6 229
	230	231	☐ Yes ☐ No 232	233
3	234	235	☐ Yes ☐ No 236	237
4	238	239	☐ Yes ☐ No 240	241
5	242	243	☐ Yes ☐ No 244	245

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒MATERIAL ☐WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3: Mojave Solar Project LLC

FACILITY ID # 1: F A 0 0 1 4 6 0 7 | MAP# 203: 1-A | GRID# 204: E35, F31,

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Citric Acid

TRADE SECRET 206: ☐ Yes ☒ No (If Subject to EPCRA, refer to instructions)

COMMON NAME 207: Citric Acid

EHS* 208: ☐ Yes ☒ No

CAS# 77-92-9 209

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) 211: ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE

RADIOACTIVE 212: ☐ Yes ☒ No

CURIES 213:

PHYSICAL STATE (Check one item only) 214: ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS

LARGEST CONTAINER 215: 6900 gallon

FED HAZARD CATEGORIES (Check all that apply) 216: ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☒ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
7000	9420		

UNITS* (Check one item only) 221: ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS
* If EHS, amount must be in pounds.

DAYS ON SITE: 222: 365

STORAGE CONTAINER 223:
☒ a. ABOVE GROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BUILDING ☐ d. STEEL DRUM ☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☐ g. CARBOY ☐ h. SILO ☐ i. FIBER DRUM ☐ j. BAG ☐ k. BOX ☐ l. CYLINDER ☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☒ o. TOTE BIN ☐ p. TANK WAGON ☐ q. RAIL CAR ☐ r. OTHER

STORAGE PRESSURE 224: ☐ a. AMBIENT ☒ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☐ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☒ d. CRYOGENIC

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	100 226	Citric Acid 227	☐ Yes ☒ No 228	77-92-9 229
	230	231	☐ Yes ☐ No 232	233
3	234	235	☐ Yes ☐ No 236	237
4	238	239	☐ Yes ☐ No 240	241
5	242	243	☐ Yes ☐ No 244	245

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3: Mojave Solar Project LLC

FACILITY ID # 1: F A 0 0 1 4 6 0 7 | MAP# 203: 1-A | GRID# 204: E35, F31,

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Bonderite

TRADE SECRET 206: ☐ Yes ☒ No (If Subject to EPCRA, refer to instructions)

COMMON NAME 207: Bonderite

EHS* 208: ☐ Yes ☒ No

CAS# 107-21-1 209

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) 211: ☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE

RADIOACTIVE 212: ☐ Yes ☒ No

CURIES 213:

PHYSICAL STATE (Check one item only) 214: ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS

LARGEST CONTAINER 215: 55 gallon

FED HAZARD CATEGORIES (Check all that apply) 216: ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
180	240		

UNITS* (Check one item only) 221: ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS (* If EHS, amount must be in pounds.)

DAYS ON SITE: 222: 365

STORAGE CONTAINER 223:
- ☐ a. ABOVE GROUND TANK
- ☐ b. UNDERGROUND TANK
- ☐ c. TANK INSIDE BUILDING
- ☐ d. STEEL DRUM
- ☒ e. PLASTIC/NONMETALLIC DRUM
- ☐ f. CAN
- ☐ g. CARBOY
- ☐ h. SILO
- ☐ i. FIBER DRUM
- ☐ j. BAG
- ☐ k. BOX
- ☐ l. CYLINDER
- ☐ m. GLASS BOTTLE
- ☐ n. PLASTIC BOTTLE
- ☐ o. TOTE BIN
- ☐ p. TANK WAGON
- ☐ q. RAIL CAR
- ☐ r. OTHER

STORAGE PRESSURE 224: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	100 226	Bonderite 227	☐ Yes ☒ No 228	107-21-1 229
	230	231	☐ Yes ☐ No 232	233
3	234	235	☐ Yes ☐ No 236	237
4	238	239	☐ Yes ☐ No 240	241
5	242	243	☐ Yes ☐ No 244	245

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3: Mojave Solar Project LLC

FACILITY ID # 1: F A 0 0 1 4 6 0 7 | MAP# 203: 1-A | GRID# 204: E35, F31,

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Sodium Nitrite

TRADE SECRET 206: ☐ Yes ☒ No
If Subject to EPCRA, refer to instructions

COMMON NAME 207: Sodium Nitrite

EHS* 208: ☐ Yes ☒ No

CAS# 7632-00-0 209

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) 211: ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE

RADIOACTIVE 212: ☐ Yes ☒ No

CURIES 213:

PHYSICAL STATE (Check one item only) 214: ☒ a. SOLID ☐ b. LIQUID ☐ c. GAS

LARGEST CONTAINER 215: 50 lb bag

FED HAZARD CATEGORIES (Check all that apply) 216: ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
6000	8200		

UNITS* (Check one item only) 221: ☐ a. GALLONS ☐ b. CUBIC FEET ☒ c. POUNDS ☐ d. TONS
* If EHS, amount must be in pounds.

DAYS ON SITE: 222: 365

STORAGE CONTAINER 223:
☐ a. ABOVE GROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BUILDING ☐ d. STEEL DRUM
☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☐ g. CARBOY ☐ h. SILO
☐ i. FIBER DRUM ☒ j. BAG ☐ k. BOX ☐ l. CYLINDER
☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☐ o. TOTE BIN ☐ p. TANK WAGON
☐ q. RAIL CAR ☐ r. OTHER

STORAGE PRESSURE 224: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	100 226	Sodium Nitrite 227	☐ Yes ☒ No 228	7632-00-0 229
	230	231	☐ Yes ☐ No 232	233
3	234	235	☐ Yes ☐ No 236	237
4	238	239	☐ Yes ☐ No 240	241
5	242	243	☐ Yes ☐ No 244	245

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒MATERIAL ☐WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3
Mojave Solar Project LLC

FACILITY ID #	F	A	0	0	1	4	6	0	7	1	MAP# 203	GRID# 204
											1-A	E35, F31,

II. CHEMICAL INFORMATION

CHEMICAL NAME 205	TRADE SECRET ☐ Yes ☒ No 206
Surfactant NP95	If Subject to EPCRA, refer to instructions
COMMON NAME 207	EHS* ☐ Yes ☒ No 208
Surfactant	
CAS# 9016-45-9 209	*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only)	RADIOACTIVE	CURIES
☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE 211	☐ Yes ☒ No 212	213
PHYSICAL STATE (Check one item only)	LARGEST CONTAINER	
☐ a. SOLID ☒ b. LIQUID ☐ c. GAS 214	55 gallon drum 215	

FED HAZARD CATEGORIES (Check all that apply) 216
☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
300	440		

UNITS* (Check one item only) 221	DAYS ON SITE: 222
☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS * If EHS, amount must be in pounds.	365

STORAGE CONTAINER
☐ a. ABOVE GROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BUILDING ☒ d. STEEL DRUM ☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☐ g. CARBOY ☐ h. SILO ☐ i. FIBER DRUM ☐ j. BAG ☐ k. BOX ☐ l. CYLINDER ☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☐ o. TOTE BIN ☐ p. TANK WAGON ☐ q. RAIL CAR ☐ r. OTHER 223

STORAGE PRESSURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT 224

STORAGE TEMPERATURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC 225

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	100 226	Surfactant 227	☐ Yes ☒ No 228	9016-45-9 229
	230	231	☐ Yes ☐ No 232	233
3	234	235	☐ Yes ☐ No 236	237
4	238	239	☐ Yes ☐ No 240	241
5	242	243	☐ Yes ☐ No 244	245

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒MATERIAL ☐WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3
Mojave Solar Project LLC

FACILITY ID #	F	A	0	0	1	4	6	0	7	1	MAP# 203	GRID# 204
											1-A	

II. CHEMICAL INFORMATION

CHEMICAL NAME 205	TRADE SECRET ☐ Yes ☒ No 206
Acetone	If Subject to EPCRA, refer to instructions
COMMON NAME 207	EHS* ☐ Yes ☒ No 208
Acetone	
CAS# 67-64-1 209	*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only)	RADIOACTIVE	CURIES
☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE 211	☐ Yes ☒ No 212	213
PHYSICAL STATE (Check one item only)	LARGEST CONTAINER	
☐ a. SOLID ☒ b. LIQUID ☐ c. GAS 214	1 gallon 215	

FED HAZARD CATEGORIES (Check all that apply) 216
☒ a. FIRE ☒ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
1	5		

UNITS* (Check one item only) 221	DAYS ON SITE: 222
☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS * If EHS, amount must be in pounds.	365

STORAGE CONTAINER 223
☐ a. ABOVE GROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BUILDING ☒ d. STEEL DRUM ☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☐ g. CARBOY ☐ h. SILO ☐ i. FIBER DRUM ☐ j. BAG ☐ k. BOX ☐ l. CYLINDER ☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☐ o. TOTE BIN ☐ p. TANK WAGON ☐ q. RAIL CAR ☐ r. OTHER

STORAGE PRESSURE 224
☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225
☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1 100 226	Acetone 227	☐ Yes ☒ No 228	67-64-1 229
230	231	☐ Yes ☐ No 232	233
3 234	235	☐ Yes ☐ No 236	237
4 238	239	☐ Yes ☐ No 240	241
5 242	243	☐ Yes ☐ No 244	245

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3: Mojave Solar Project LLC

FACILITY ID #	F	A	0	0	1	4	6	0	7	1	MAP# 203	GRID# 204
											1-A	

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Argon	TRADE SECRET ☐ Yes ☒ No 206 (If Subject to EPCRA, refer to instructions)
COMMON NAME 207: Argon	EHS* ☐ Yes ☒ No 208
CAS# 7440-37-1 209	*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) 211: ☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE	RADIOACTIVE ☐ Yes ☒ No 212	CURIES 213
PHYSICAL STATE (Check one item only) 214: ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS	LARGEST CONTAINER 215: 55 gallon drum	

FED HAZARD CATEGORIES (Check all that apply) 216: ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
336 cu ft	336 cu ft		

UNITS* (Check one item only) 221: ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS (* If EHS, amount must be in pounds.)

DAYS ON SITE: 222: 365

STORAGE CONTAINER 223:
☐ a. ABOVE GROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BUILDING ☒ d. STEEL DRUM ☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☐ g. CARBOY ☐ h. SILO ☐ i. FIBER DRUM ☐ j. BAG ☐ k. BOX ☐ l. CYLINDER ☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☐ o. TOTE BIN ☐ p. TANK WAGON ☐ q. RAIL CAR ☐ r. OTHER

STORAGE PRESSURE 224: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	100 226	Argon 227	☐ Yes ☒ No 228	7440-37-1 229
	230	231	☐ Yes ☐ No 232	233
3	234	235	☐ Yes ☐ No 236	237
4	238	239	☐ Yes ☐ No 240	241
5	242	243	☐ Yes ☐ No 244	245

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3: Mojave Solar Project LLC

FACILITY ID #	F	A	0	0	1	4	6	0	7	1	MAP# 203	GRID# 204
											1-A	

II. CHEMICAL INFORMATION

CHEMICAL NAME 205	TRADE SECRET ☐ Yes ☒ No 206
ALUMINUM CHLORHYDROXIDE	If Subject to EPCRA, refer to instructions
COMMON NAME 207: Kalraid 1172	EHS* ☐ Yes ☒ No 208
CAS# 12042-91-0 209	*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) 211	RADIOACTIVE ☐ Yes ☒ No 212	CURIES 213
☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE		
PHYSICAL STATE (Check one item only) 214: ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS	LARGEST CONTAINER 215: 55 gallon drum	
FED HAZARD CATEGORIES (Check all that apply) 216: ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH		

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
15 gal	15 gal		

UNITS* (Check one item only) 221	DAYS ON SITE: 222
☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS * If EHS, amount must be in pounds.	365

STORAGE CONTAINER 223:
- ☐ a. ABOVE GROUND TANK
- ☐ b. UNDERGROUND TANK
- ☐ c. TANK INSIDE BUILDING
- ☒ d. STEEL DRUM
- ☐ e. PLASTIC/NONMETALLIC DRUM
- ☐ f. CAN
- ☐ g. CARBOY
- ☐ h. SILO
- ☐ i. FIBER DRUM
- ☐ j. BAG
- ☐ k. BOX
- ☐ l. CYLINDER
- ☐ m. GLASS BOTTLE
- ☐ n. PLASTIC BOTTLE
- ☐ o. TOTE BIN
- ☐ p. TANK WAGON
- ☐ q. RAIL CAR
- ☐ r. OTHER

STORAGE PRESSURE 224: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	100 226	Kalraid 1172 227	☐ Yes ☒ No 228	12042-91-0 229
	230	231	☐ Yes ☐ No 232	233
3	234	235	☐ Yes ☐ No 236	237
4	238	239	☐ Yes ☐ No 240	241
5	242	243	☐ Yes ☐ No 244	245

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3: Mojave Solar Project LLC

FACILITY ID # 1: F A 0 0 1 4 6 0 7 | MAP# 203: 1-A | GRID# 204:

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Caustic Soda 50%

TRADE SECRET ☐ Yes ☒ No 206 (If Subject to EPCRA, refer to instructions)

COMMON NAME 207: Caustic Soda 50%

EHS* ☐ Yes ☒ No 208

CAS# 209

MATERIAL	CAS#
Sodium Hydroxide	1310-73-2
Water	7732-18-5
Sodium Chloride	7647-14-5

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE 211 | RADIOACTIVE ☐ Yes ☒ No 212 | CURIES 213

PHYSICAL STATE (Check one item only) ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS 214 | LARGEST CONTAINER 55 gallon drum 215

FED HAZARD CATEGORIES (Check all that apply) ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH 216

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
<1000 gal	1000 gal		

UNITS* (Check one item only) ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS 221 (* If EHS, amount must be in pounds.) | DAYS ON SITE: 365 222

STORAGE CONTAINER 223

☐ a. ABOVE GROUND TANK	☐ e. PLASTIC/NONMETALLIC DRUM	☐ i. FIBER DRUM	☐ m. GLASS BOTTLE	☐ q. RAIL CAR
☐ b. UNDERGROUND TANK	☐ f. CAN	☐ j. BAG	☐ n. PLASTIC BOTTLE	☐ r. OTHER
☒ c. TANK INSIDE BUILDING	☐ g. CARBOY	☐ k. BOX	☐ o. TOTE BIN	
☐ d. STEEL DRUM	☐ h. SILO	☐ l. CYLINDER	☐ p. TANK WAGON	

STORAGE PRESSURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT 224

STORAGE TEMPERATURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC 225

%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1 48-52 226	Sodium Hydroxide 227	☐ Yes ☒ 228	1310-73-2 229
2 48-52 230	Water 231	☐ Yes ☐ No 232	7732-18-5 233
3 0-5 234	Sodium Chloride 235	☐ Yes ☐ No 236	7647-14-5 237
4 238	239	☐ Yes ☐ 240	241
5 242	243	☐ Yes ☐ 244	245

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3
Mojave Solar Project LLC

FACILITY ID # F A 0 0 1 4 6 0 7 1 | MAP# 203: 1-A | GRID# 204:

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Sodium Bisulfite 38%

TRADE SECRET ☐ Yes ☒ No 206
If Subject to EPCRA, refer to instructions

COMMON NAME 207: Sodium Bisulfite 38%

EHS* ☐ Yes ☒ No 208

CAS# 209

MATERIAL	CAS#
Water	7732-18-5
Sodium Bisulfite	7631-90-5

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE 211

RADIOACTIVE ☐ Yes ☒ No 212

CURIES 213

PHYSICAL STATE (Check one item only) ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS 214

LARGEST CONTAINER 55 gallon drum 215

FED HAZARD CATEGORIES (Check all that apply) 216
☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
<660 gal	660 gal		

UNITS* (Check one item only) ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS 221
* If EHS, amount must be in pounds.

DAYS ON SITE: 365 222

STORAGE CONTAINER 223
☐ a. ABOVE GROUND TANK ☐ b. UNDERGROUND TANK ☒ c. TANK INSIDE BUILDING ☐ d. STEEL DRUM ☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☐ g. CARBOY ☐ h. SILO ☐ i. FIBER DRUM ☐ j. BAG ☐ k. BOX ☐ l. CYLINDER ☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☐ o. TOTE BIN ☐ p. TANK WAGON ☐ q. RAIL CAR ☐ r. OTHER

STORAGE PRESSURE 224: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	27-42 226	Sodium Bisulfite 227	☐ Yes ☒ No 228	1310-73-2 229
2	58- 230	Water 231	☐ Yes ☐ No 232	7732-18-5 233
3	234	235	☐ Yes ☐ No 236	237
4	238	239	☐ Yes ☐ No 240	241
5	242	243	☐ Yes ☐ No 244	245

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3
Mojave Solar Project LLC

FACILITY ID # F A 0 0 1 4 6 0 7 1 | MAP# 203: 1-A | GRID# 204:

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Sodium Hypoclorite 12.5%
TRADE SECRET ☐ Yes ☒ No 206
If Subject to EPCRA, refer to instructions

COMMON NAME 207: Sodium Hypoclorite 12.5%
EHS* ☐ Yes ☒ No 208

CAS# 209

MATERIAL	CAS#
Water	7732-18-5
Sodium Hypochlorite	7681-52-9
Sodium Hydroxide	1310-73-2

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE 211
RADIOACTIVE ☐ Yes ☒ No 212
CURIES 213

PHYSICAL STATE (Check one item only) ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS 214
LARGEST CONTAINER 55 gallon drum 215

FED HAZARD CATEGORIES (Check all that apply) ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH 216

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
<660 gal	660 gal		

UNITS* (Check one item only) ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS 221
* If EHS, amount must be in pounds.
DAYS ON SITE: 365 222

STORAGE CONTAINER
☐ a. ABOVE GROUND TANK ☐ b. UNDERGROUND TANK ☒ c. TANK INSIDE BUILDING ☐ d. STEEL DRUM
☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☐ g. CARBOY ☐ h. SILO
☐ i. FIBER DRUM ☐ j. BAG ☐ k. BOX ☐ l. CYLINDER
☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☐ o. TOTE BIN ☐ p. TANK WAGON
☐ q. RAIL CAR ☐ r. OTHER 223

STORAGE PRESSURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT 224

STORAGE TEMPERATURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC 225

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	<16 226	Sodium Hypoclorite 227	☐ Yes ☒ No 228	1310-73-2 229
2	84- 230	Water 231	☐ Yes ☐ No 232	7732-18-5 233
3	<=1.75 234	Sodium Hydroxide 235	☐ Yes ☐ No 236	1310-73-2 237
4	238	239	☐ Yes ☐ No 240	241
5	242	243	☐ Yes ☐ No 244	245

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3: Mojave Solar Project LLC

FACILITY ID # 1: F A 0 0 1 4 6 0 7 | MAP# 203: 1-A | GRID# 204:

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Sulfuric Acid 50%

TRADE SECRET 206: ☐ Yes ☒ No (If Subject to EPCRA, refer to instructions)

COMMON NAME 207: Sulfuric Acid 50%

EHS* 208: No ☐ Yes ☒

CAS# 209:

MATERIAL	CAS#
Water	7732-18-5
Sulfuric Acid*	7664-93-9

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) 211: ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE

RADIOACTIVE 212: ☐ Yes ☒ No

CURIES 213:

PHYSICAL STATE (Check one item only) 214: ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS

LARGEST CONTAINER 215: 55 gallon drum

FED HAZARD CATEGORIES (Check all that apply) 216: ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
<500 gal	500 gal		

UNITS* (Check one item only) 221: ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS (* If EHS, amount must be in pounds.)

DAYS ON SITE: 222: 365

STORAGE CONTAINER 223:

☐ a. ABOVE GROUND TANK	☐ e. PLASTIC/NONMETALLIC DRUM	☐ i. FIBER DRUM	☐ m. GLASS BOTTLE	☐ q. RAIL CAR
☐ b. UNDERGROUND TANK	☐ f. CAN	☐ j. BAG	☐ n. PLASTIC BOTTLE	☐ r. OTHER
☒ c. TANK INSIDE BUILDING	☐ g. CARBOY	☐ k. BOX	☐ o. TOTE BIN	
☐ d. STEEL DRUM	☐ h. SILO	☐ l. CYLINDER	☐ p. TANK WAGON	

STORAGE PRESSURE 224: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	10-50 226	Sulfuric Acid 227	☐ Yes ☒ No 228	7664-93-9 229
2	50- 230	Water 231	☐ Yes ☐ No 232	7732-18-5 233
3	234	235	☐ Yes ☐ No 236	237
4	238	239	☐ Yes ☐ No 240	241
5	242	243	☐ Yes ☐ No 244	245

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒MATERIAL ☐WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3: Mojave Solar Project LLC

FACILITY ID # 1: F A 0 0 1 4 6 0 7

MAP# 203: 1-A

GRID# 204:

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: HYDROCHLORIC ACID

TRADE SECRET 206: ☐ Yes ☒ No
If Subject to EPCRA, refer to instructions

COMMON NAME 207: HYPERSPERSE MSI410

EHS* 208: ☐ Yes ☒ No

CAS# 209: 7647-01-0

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) WASTE 211: ☒ a. PURE ☐ b. MIXTURE ☐ c.

RADIOACTIVE 212: ☐ Yes ☒ No

CURIES 213:

PHYSICAL STATE (Check one item only) 214: ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS

LARGEST CONTAINER 215: 55 gallon drum

FED HAZARD CATEGORIES (Check all that apply) 216: ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
<500 gal	500 gal		

UNITS* (Check one item only) 221: ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS
* If EHS, amount must be in pounds.

DAYS ON SITE: 222: 365

STORAGE CONTAINER 223:
☐ a. ABOVE GROUND TANK ☐ b. UNDERGROUND TANK ☒ c. TANK INSIDE BUILDING ☐ d. STEEL DRUM ☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☐ g. CARBOY ☐ h. SILO ☐ i. FIBER DRUM ☐ j. BAG ☐ k. BOX ☐ l. CYLINDER ☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☐ o. TOTE BIN ☐ p. TANK WAGON ☐ q. RAIL CAR ☐ r. OTHER

STORAGE PRESSURE 224: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	100 226	HYDROCHLORIC ACID 227	☐ Yes ☒ No 228	7647-01-0 229
2	230	231	☐ Yes ☐ No 232	233
3	234	235	☐ Yes ☐ No 236	237
4	238	239	☐ Yes ☐ No 240	241
5	242	243	☐ Yes ☐ No 244	245

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3: Mojave Solar Project LLC

FACILITY ID #	F	A	0	0	1	4	6	0	7	1	MAP# 203: 1-A	GRID# 204:

II. CHEMICAL INFORMATION

CHEMICAL NAME 205	TRADE SECRET 206
Rust-oleum	☐ Yes ☒ No If Subject to EPCRA, refer to instructions
COMMON NAME 207: Rust-oleum	EHS* 208: ☐ Yes ☒ No
CAS# 209: Chemical Name / CAS No. — Zinc 7440-66-6; Toluene 108-88-3; Aluminum Flake 7429-90-5; Zinc Oxide 1314-13-2; Xylene 1330-20-7; Ethylbenzene 100-41-4	*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) 211	RADIOACTIVE 212	CURIES 213
☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE	☐ Yes ☒ No	

PHYSICAL STATE (Check one item only) 214	LARGEST CONTAINER 215
☐ a. SOLID ☒ b. LIQUID ☐ c. GAS	55 gallon drum

FED HAZARD CATEGORIES (Check all that apply) 216: ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
<500 gal	500 gal		

UNITS* (Check one item only) 221: ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS
* If EHS, amount must be in pounds.

DAYS ON SITE: 222: 365

STORAGE CONTAINER 223:
☐ a. ABOVE GROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BUILDING ☐ d. STEEL DRUM ☐ e. PLASTIC/NONMETALLIC DRUM ☒ f. CAN ☐ g. CARBOY ☐ h. SILO ☐ i. FIBER DRUM ☐ j. BAG ☐ k. BOX ☐ l. CYLINDER ☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☐ o. TOTE BIN ☐ p. TANK WAGON ☐ q. RAIL CAR ☐ r. OTHER

STORAGE PRESSURE 224: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	226	Zinc 227	☐ Yes ☒ No 228	7440-66-6 229
2	230	Toluene 231	☐ Yes ☐ No 232	108-88-3 233
3	234	Aluminum Flake 235	☐ Yes ☐ No 236	7429-90-5 237
4	238	Zinc Oxide 239	☐ Yes ☐ No 240	1314-13-2 241
5	242	Xylene 243	☐ Yes ☐ No 244	1330-20-7 245
6		Ethylbenzene	☐ Yes ☐ No 244	100-41-4

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3: Mojave Solar Project LLC

FACILITY ID # 1: F A 0 0 1 4 6 0 7

MAP# 203: 1-A

GRID# 204:

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Silicon

TRADE SECRET 206: ☐ Yes ☒ No
If Subject to EPCRA, refer to instructions

COMMON NAME 207: Silicon

EHS* 208: ☐ Yes ☒ No

CAS# 209: 7440-21-3

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) WASTE 211: ☐ a. PURE ☒ b. MIXTURE ☐ c.

RADIOACTIVE 212: ☐ Yes ☒ No

CURIES 213:

PHYSICAL STATE (Check one item only) 214: ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS

LARGEST CONTAINER 215: 55 gallon drum

FED HAZARD CATEGORIES (Check all that apply) 216: ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
36.7 lt	36.7 lt		

UNITS* (Check one item only) 221: ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS
* If EHS, amount must be in pounds.

DAYS ON SITE: 222: 365

STORAGE CONTAINER 223:
☐ a. ABOVE GROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BUILDING ☐ d. STEEL DRUM ☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☐ g. CARBOY ☐ h. SILO ☐ i. FIBER DRUM ☐ j. BAG ☒ k. BOX ☐ l. CYLINDER ☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☐ o. TOTE BIN ☐ p. TANK WAGON ☐ q. RAIL CAR ☐ r. OTHER

STORAGE PRESSURE 224: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	100 (226)	Silicon (227)	☐ Yes ☒ No (228)	7440-21-3 (229)
2	(230)	(231)	☐ Yes ☐ No (232)	(233)
3	(234)	(235)	☐ Yes ☐ No (236)	(237)
4	(238)	(239)	☐ Yes ☐ No (240)	(241)
5	(242)	(243)	☐ Yes ☐ No (244)	(245)

San Bernardino County Fire Department • Hazardous Materials Division
HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3: Mojave Solar Project LLC

FACILITY ID # 1: F A 0 0 1 4 6 0 7 | MAP# 203: 1-A | GRID# 204:

II. CHEMICAL INFORMATION

CHEMICAL NAME 205: SODIUM HYPOCHLORITE CMD

TRADE SECRET 206: ☐ Yes ☒ No
If Subject to EPCRA, refer to instructions

COMMON NAME 207: SODIUM HYPOCHLORITE CMD

EHS* 208: ☐ Yes ☒ No

CAS# 209:

Cas#	Chemical Name
7681-52-9	SODIUM HYPOCHLORITE Corrosive
1310-73-2	SODIUM HYDROXIDE Corrosive; toxic (by ingestion)

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) 211: ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE

RADIOACTIVE 212: ☐ Yes ☒ No

CURIES 213:

PHYSICAL STATE (Check one item only) 214: ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS

LARGEST CONTAINER 215:

FED HAZARD CATEGORIES (Check all that apply) 216: ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217	MAXIMUM DAILY AMOUNT 218	ANNUAL WASTE AMOUNT 219	STATE WASTE CODE 220
500 gal	500 gal		

UNITS* (Check one item only) 221: ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS
* If EHS, amount must be in pounds.

DAYS ON SITE: 222: 365

STORAGE CONTAINER 223:

☐ a. ABOVE GROUND TANK	☐ e. PLASTIC/NONMETALLIC DRUM	☐ i. FIBER DRUM	☐ m. GLASS BOTTLE	☐ q. RAIL CAR
☐ b. UNDERGROUND TANK	☐ f. CAN	☐ j. BAG	☐ n. PLASTIC BOTTLE	☐ r. OTHER
☒ c. TANK INSIDE BUILDING	☐ g. CARBOY	☐ k. BOX	☐ o. TOTE BIN	
☐ d. STEEL DRUM	☐ h. SILO	☐ l. CYLINDER	☐ p. TANK WAGON	

STORAGE PRESSURE 224: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	10-20 (226)	SODIUM HYPOCHLORITE (227)	☐ Yes ☒ No (228)	7681-52-9 (229)
2	1-5 (230)	SODIUM HYDROXIDE (231)	☐ Yes ☐ No (232)	1310-73-2 (233)
3	(234)	(235)	☐ Yes ☐ No (236)	(237)
4	(238)	(239)	☐ Yes ☐ No (240)	(241)
5	(242)	(243)	☐ Yes ☐ No (244)	(245)

CALIFORNIA ACCIDENTAL RELEASE PREVENTION PROGRAM (CalARP) REGISTRATION

FACILITY ID # F A 1

I. FACILITY / STATIONARY SOURCE IDENTIFICATION

STATIONARY SOURCE NAME 2203	PHONE 2204
STATIONARY SOURCE ADDRESS 2205	CITY 2206

II. OWNER/OPERATOR IDENTIFICATION

OWNER/OPERATOR NAME 2207	PHONE 2208		
MAILING ADDRESS 2209	CITY 2210	STATE 2211	ZIP CODE 2212

III. REGULATED SUBSTANCES LIST

A. Name of Each Regulated Substance: 2213	Percent by Weight 2214	Process Maximum Quantity (lbs.) 2215	CAS # 2216
1.			
2.			
3.			

B. Name of Each Regulated Substance in a Mixture: 2217	Percent by Weight 2218	Process Maximum Quantity (lbs.) 2219	CAS # 2220
1a. NOT APPLICABLE			
1b.			
1c.			
2a.			
2b.			
2c.			

NOTES (Conversion Factors, Calculation Notes, Mixture Information, etc. Note which substance or mixture the note applies to): 2223

IV. CERTIFICATION

I, as the owner or operator of the aforementioned business, hereby certify that the registration information provided above is true, accurate and complete to the best of my knowledge, based upon reasonable inquiry. I am fully aware that this certification, executed on the date indicated below, is made under penalty of perjury under the laws of the State of California.

	DATE 2224
NAME OF OWNER/OPERATOR 2225	TITLE OF OWNER/OPERATOR 2226

ABENGOA EPC

MOJAVE

Emergency Plan - Hazardous Material Management Plan (HMBP)

Title: Annex 02 Material Safety Data Sheets
Process: Hazardous Material Business Plan (HMBP)
Project: Mojave Solar Project

Document:	**PEM-0002-01 Annex 02**
Revision:	03
Date:	07/05/14

Prepared by:		
Manjunath Shivalingappa	Environmental Engineer	Electronic Signatures

Reviewed by:		
Efrain Perez	Quality & Environmental Manager	Electronic Signatures
Steven Pochmara	Permitting Manager	Electronic Signatures

Approved by:		
Nicolas Gallo	Project Sub Director	Electronic Signatures
Pablo Enrique Schenone Laborde	Project Director	Electronic Signatures

Revision Control Sheet

Rev.	Date	Cause for Revision	Prepared	Reviewed	Approved
00	6/21/13	Document Created	KIA		
01	03/15/14	Inventory Update	KIA		
02	04/30/14	Inventory Update	KIA		
03	07/05/14	- Format Changes - Inventory Update	MS	EFP	NGM-PES

Table of Contents

1. Chemical Material Safety Data Sheets

Sodium hypochlorite, 10-25% chlorine

MSDS Name Sodium hypochlorite, 10-25% chlorine
Catalog Numbers 1932, 1933
7681-52-9 Sodium hypochlorite 10-25%
231-668-3 Hazard Symbols: C Risk Phrases: 31 34

EMERGENCY OVERVIEW
Contact with acids liberates toxic gas. Causes burns.Light sensitive.
POTENTIAL HEALTH EFFECTS
Eye: Causes eye burns. Causes redness and pain.
Skin: Causes skin burns. Causes redness and pain.
Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea.
Causes gastrointestinal tract burns.
Inhalation: May cause severe irritation of the respiratory tract with sore throat, coughing, shortness of breath and delayed lung edema. Causes chemical burns to the respiratory tract.

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
Ingestion: Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.
Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.
Get medical aid.

General Information:
As in any fire, wear a self-contained breathing apparatus in pressure demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Substance is noncombustible.
Oxidizer. Greatly increases the burning rate of combustible materials.
Extinguishing Media:
Use water spray, dry chemical, carbon dioxide, or chemical foam.

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.

Handling: Do not breathe dust, vapor, mist, or gas. Do not get in eyes, on skin, or on clothing. Use only in a chemical fume hood.
Storage: Store in a tightly closed container. Store in a dry area. Keep refrigerated. (Store below 4°C/39°F.)

Engineering Controls
Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.
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: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Physical State: Clear liquid
Color: yellow

Odor: disagreeable odor - sweetish odor
pH: Not available
Vapor Pressure: 17.5 mm Hg @ 20 deg C
Viscosity: Not available
Boiling Point: Not available
Freezing/Melting Point: -16 deg C (3.20°F)
Autoignition Temperature: Not available
Flash Point: Not available
Explosion Limits: Lower: Not available
Explosion Limits: Upper: Not available
Decomposition Temperature: Not available
Solubility in water: Soluble
Specific Gravity/Density: 1.2090g/cm3
Molecular Formula: NaOCl
Molecular Weight: 74.44

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, light, combustible materials, temperatures above 40°C.
Incompatibilities Metals, reducing agents, strong acids, amines, ammonia, acids with Other Materials (organic, e.g. acetic acid, benzoic acid, formic acid, methanoic acid, oxalic acid), methanol, ammonium salts.
Hazardous Decomposition Products
Hydrogen chloride, chlorine, sodium oxide.
Hazardous Polymerization
Will not occur.

RTECS#: CAS# 7681-52-9: NH3486300
LD50/LC50: RTECS:
CAS# 7681-52-9: Draize test, rabbit, eye: 10 mg Moderate;
Draize test, rabbit, eye: 1.31 mg Mild;
Oral, mouse: LD50 = 5800 mg/kg;
.
Carcinogenicity: Sodium hypochlorite - IARC: Group 3 (not classifiable)
Other: See actual entry in RTECS for complete information.

Ecotoxicity Fish: Rainbow trout: 0.07 mg/l; 48h; .
Fish: Fathead Minnow: 5.9 mg/l; 96h; .

Dispose of in a manner consistent with federal, state, and local regulations.
Section 14 - Transport Information
HS Code 2828 90 00 **Storage class (VCI)** 8 B Non-flammable corrosive materials
GGVS Packing category
A **WGK** 2 (polluting substance)
Storage Store below +15ºC.
Domestic (Land, ADR.)

Proper Shipping Name: HYPOCHLORITE SOLUTION
Hazard Class: 8
Hazard Code: C9
UN No. : 1791
Packing Group: III
GGVS 8/C 9 III **GGVE** 8/C 9 III
ADR 8/C 9 III **RID** 8/C 9 III
International (Water, I.M.O.)

Proper Shipping Name: HYPOCHLORITE SOLUTION
Hazard Class: 8
Hazard Code: C9

UN No. : 1791
Packing Group: III
IMDG Code 8/III **UN number**
(transport by sea)
1791
International (Air, I.C.A.O.)

Proper Shipping Name: HYPOCHLORITE SOLUTION
Hazard Class: 8
Hazard Code: C9
UN No. : 1791
Packing Group: III
UN number
(transport by air)
1791 **CAO CARGO**
Packing
instructions
821
PAX Packing
instructions
819
Section 15 - Regulatory Information
European/International Regulations
WGK (Water Danger/Protection)
CAS# 7681-52-9: 2
Canada
CAS# 7681-52-9 is listed on Canada's DSL List
US Federal
European Labeling in Accordance with EC Directives
Hazard Symbols: C
Risk Phrases:
R 31 Contact with acids liberates toxic gas.
R 34 Causes burns.
Safety Phrases:
S 28A After contact with skin, wash immediately with plenty of water.
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 50A Do not mix with acids.
TSCA
CAS# 7681-52-9 is listed on the TSCA Inventory.
Section 16 - Additional Information
The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty, and assume no liability resulting from its use. Users should make their own inquiry to determine the suitability of the information for their particular purposes. In no way the company or any of it employees will be liable for any kind of damages, howsoever arising, even if the company has been advised of the possibility of such damages.
Date of issue 01.08.08

SODIUM BISULPHITE SOLUTION 35% P/V PRS

SODIUM BISULPHITE SOLUTION 35% P/V PRS
Material Safety Data Sheets (MSDS)
Revision date: 20/3/2008
Página 1 de 5
SODIUM BISULPHITE SOLUTION 35% P/V PRS MSDS (MATERIAL SAFETY DATA SHEETS)

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING.
1.1 Identification of the substance or preparation.
Name: SODIUM BISULPHITE SOLUTION 35% P/V PRS
Code: B1100

1.2 Use of the substance/preparation.

2. HAZARDS IDENTIFICATION.
Harmful if swallowed.
Contact with acids liberates toxic gas.

3. COMPOSITION OF/INFORMATION ABOUT THE COMPONENTS.
Substances presenting a health or environmental hazard within the meaning of Directive 67/548/EEC:
Index No CAS No. EC No Registration
number Name Concentrate % Symbols R phrases *

016-064-00-8 7631-90-5 231-548-0 sodium bisulphite
35% 25 - 50 % Xn R22 R31

* The complete text of the R phrases is given in section 16 of this Safety Data Sheet.
4. FIRST AID.
In case of doubt or when symptoms of feeling unwell persist, get medical attention. Never administer anything orally to persons who are unconscious.
Inhalation.
Take the victim into open air; keep them warm and calm. If breathing is irregular or stops, perform artificial respiration. Do not administer anything orally. If unconscious, place them in a suitable position and seek medical assistance.
Eye contact.
If wearing contact lenses, remove them. Wash eyes with plenty of clean and cool water for at least 10 minutes while pulling eyelids up, and seek medical assistance.
Skin contact.
Remove contaminated clothing. Wash skin vigorously with water and soap or a suitable skin cleaner. **NEVER** use solvents or thinners.
Ingestion.
If accidentally ingested, seek immediate medical attention. Keep calm. **NEVER** induce vomiting.
5. FIRE FIGHTING MEASURES.
Recommended extinguishing methods.
Extinguisher powder or CO2. In case of more serious fires, also alcohol-resistant foam and water spray. Do not use a direct stream of water to extinguish.
Special risks.
Fire can cause thick, black smoke. As a result of thermal decomposition, dangerous products can form: carbon monoxide, carbon dioxide. Exposure to combustion or decomposition products can be harmful to your health.
Fire protection equipment.
According to the size of the fire, it may be necessary to use protective suits against the heat, individual breathing equipment, gloves, protective goggles or facemasks, and gloves.
Other recommendations.
Use water to cool tanks, cisterns, or containers close to the heat source or fire. Take wind direction into account. Prevent the products used to fight the fire from going into drains, sewers, or waterways.

6. MEASURES TO TAKE IN CASE OF ACCIDENTAL SPILL.
Individual precautions.
Eliminate possible ignition points and ventilate the area. Avoid breathing fumes. For exposure control and individual protection measures, see section 8.
Cleaning methods.
Pick up the spill with non-combustible absorbent materials (soil, sand, vermiculite, diatomite, etc.). Pour the product and the absorbent in an appropriate container. The contaminated area should be immediately cleaned with an appropriate de-

contaminator. Pour the decontaminator on the remains in an opened container and let it act various days until no further reaction is produced. For later elimination of waste, follow the recommendations under section 13.
Environmental protection precautions.
Prevent the contamination of drains, surface or subterranean waters, and the ground. In case of large spills or if the product contaminates lakes, rivers, or sewers, inform the responsible authorities according to local legislation.

7. HANDLING AND STORAGE.
7.1 Handling.
The fumes are heavier than air and can spread across the ground. They can form explosive mixtures with air. Prevent the creation of flammable or explosive fume concentrations in the air; prevent fume concentrations above work exposure limits. The preparation must only be used in areas where all unprotected flames and other ignition points have been eliminated. Electrical equipment has to be protected according to applicable standards. The preparation can be electrostatically charged: always use earth grounds when transferring the product. Operators must use anti-static footwear and clothing, and floors must be conductors. Keep the container tightly closed and isolated from heat sources, sparks, and fire. Do not use tools that can cause sparks. Prevent the preparation from contacting the skin or eyes. Avoid the inhalation of fumes and mists that form when spraying. For personal protection, see section 8. Never use pressure to empty the containers. They are not pressure-resistant containers. In the application area, smoking, eating, and drinking must be prohibited. Follow legislation on occupational health and safety. Keep the product in containers made of a material identical to the original.

Revision date: 20/3/2008
Página 3 de 5
SODIUM BISULPHITE SOLUTION 35% P/V PRS MSDS (MATERIAL SAFETY DATA SHEETS)

7.2 Storage.
Store according to local legislation. Observe indications on the label. Store the containers between 5 and 35º C, in a dry and well-ventilated place, far from sources of heat and direct solar light. Keep far away from ignition points. Keep away from oxidising agents and from highly acidic or alkaline materials. Do not smoke. Prevent the entry of non-authorized persons. Once the containers are open, they must be carefully closed and placed vertically to prevent spills.

7.3 Specific use(s).

8. EXPOSURE CONTROL/PERSONAL PROTECTION.
8.1 Exposure limits.
Work exposure limit for:
Name
VLA-ED * VLA-EC *
ppm mg/m3 ppm mg/m3

* According to the list of Limit Environmental Professional Exposure Values adopted by the National Institute for Safety and Hygiene at Work for the year 2007.

8.2 Exposure controls
Measures of a technical nature: provide adequate ventilation, which can be achieved by using good local exhaustventilation and a good general exhaust system. If this were not enough to keep the particulate and fume concentrations of the solvent below the work exposure limit, suitable breathing equipment must be used. Breathing protection: when workers are subjected to concentrations above the exposure limit, they must use suitable and officially approved equipment. Use active carbon masks. Hand protection: for prolonged or repeated contact, use polyvinyl alcohol or nitrile rubber types of gloves. Protective creams can help to protect exposed areas of the skin. These creams must **NEVER** be applied once exposure has occurred. Eye protection: use protective goggles especially designed to protect against liquid splatters. Install emergency eyewashes near the use area. Skin protection: personnel must wear anti-static clothing made of natural fibre or synthetic fibres resistant to high temperatures. All body parts that have been in contact with the preparation must be washed.

9. PHYSICAL AND CHEMICAL PROPERTIES.
9.1. General information.
Aspect: Liquid with characteristic odour and colour
Smell:

9.2. Important health, safety and environmental information.
pH:
Boiling Point: ºC
Flash point: ºC
Inflammability (solid, gas):
Explosive properties:
Combustive properties:
Vapour pressure:

Relative density: gr/cm3
Solubility
Hydrosolubility:
Liposolubility:
Distribution coefficient (n-octanol/water):
Viscosity:
Vapour density:
Evaporation velocity:

10. STABILITY AND REACTIVITY.
Stable under the recommended handling and storage conditions (see section 7). In case of fire, dangerous decomposition products can be generated, such as carbon monoxide and dioxide and nitrogen fumes and oxides. Keep away from oxidising agents and from highly alkaline or acidic materials in order to prevent exothermic reactions.

11. TOXICOLOGICAL INFORMATION.
There are no tested data available on the product. Exposure to concentrations of solvent fumes above the work exposure limit can have negative effects (for example, irritation of the mucous membranes and respiratory system, adverse effects on the kidneys, liver, and the central nervous system). Among the symptoms are headaches, vertigo, fatigue, muscular weakness, drowsiness, and in extreme cases, unconsciousness. Repeated or prolonged contact with the preparation can cause the elimination of oil from the skin, giving rise to nonallergic contact dermatitis and absorption of the preparation through the skin. Splatters in the eyes can cause irritation and irreversible damage.

12. ECOLOGICAL INFORMATION.
There are no tested data available on the preparation. The product must not be allowed to go into sewers or waterways.
Prevent penetration into the ground. Prevent the emission of solvents into the atmosphere.

13. ELIMINATION CONSIDERATIONS.
Dumping into sewers or waterways is prohibited. Waste and empty containers must be handled and eliminated according to current, local/national legislation.

14. INFORMATION PERTAINING TO TRANSPORT.
Transport following ADR/TPC rules for highway transport, RID rules for railway, IMDG for sea, and ICAO/IATA for air transport.
Transport method
14.1 Land: Transport by road: ADR 2007, Transport by rail: RID
UN no.: 2693 Class: 8 Packaging group: III
Labels: 8 Hazard number: 80
Transport documentation: Consignment note and written instructions
14.2 Sea: Transport by ship: IMDG 33-06
UN no.: 2693 Class: 8
Packaging group: III Labels: 8
FEm – Emergency sheets (F – Fire, S - Spills): F-A,S-B
Sea pollutant (PP – Strong sea pollutant, P – Sea pollutant):
Transport documentation: Bill of lading
14.3 Air: Transport by plane: IATA/ICAO
UN no.: 2693 Class: 8 Packaging group: III
Labels: 8
Transport document: Airway bill

15. REGULATORY INFORMATION.

R22 Harmful if swallowed.
R31 Contact with acids liberates toxic gas.
S2 Keep out of the reach of children.
S25 Avoid contact with eyes.
S46 If swallowed, seek medical advice immediately and show this container or label.
Contains: sodium bisulphite 35%

16. OTHER INFORMATION.
Complete text of the R phrases that appear in section 3:
R22 Harmful if swallowed.
R31 Contact with acids liberates toxic gas.
The information given in this Safety Data Sheet has been drafted in accordance with REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006 concerning the Registration, Evaluation,

Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.

The information in this Safety Data Sheet on the Preparation is based on current knowledge and on current EC and national laws, as far as the working conditions of the users is beyond our knowledge and control. The product must not be used for purposes other than those that are specified without first having written instructions on how to handle. It is always the responsibility of the user to take the appropriate measures in order to comply with the requirements established by current legislation. The information contained in this Safety Sheet only states a description of the safety requirements for the preparation, and it must not be considered as a guarantee of its properties.

Sulfuric acid MSDS

Section 1: Chemical Product and Company Identification
Product Name: Sulfuric acid
Catalog Codes: SLS2539, SLS1741, SLS3166, SLS2371, SLS3793
CAS#: 7664-93-9
RTECS: WS5600000
TSCA: TSCA 8(b) inventory: Sulfuric acid
CI#: Not applicable.
Synonym: Oil of Vitriol; Sulfuric Acid
Chemical Name: Hydrogen sulfate
Chemical Formula: H2-SO4
Section 2: Composition and Information on Ingredients
Composition:
Name CAS # % by Weight
Sulfuric acid 7664-93-9 95 - 98
Toxicological Data on Ingredients: Sulfuric acid: ORAL (LD50): Acute: 2140 mg/kg [Rat.]. VAPOR (LC50): Acute: 510 mg/m
2 hours [Rat]. 320 mg/m 2 hours [Mouse].
Section 3: Hazards Identification
Potential Acute Health Effects:
Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant, corrosive), of ingestion, of inhalation. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.
Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified 1 (Proven for human.) by IARC, + (Proven.) by OSHA. Classified A2 (Suspected for human.) by ACGIH. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys, lungs, heart, cardiovascular system, upper respiratory tract, eyes, teeth. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged
Page. 2

contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.
Section 4: First Aid Measures
Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. 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. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.
Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.
Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may
be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or
corrosive. Seek immediate medical attention.
Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.
Serious Ingestion: Not available.

Section 5: Fire and Explosion Data
Flammability of the Product: Non-flammable.
Auto-Ignition Temperature: Not applicable.
Flash Points: Not applicable.
Flammable Limits: Not applicable.
Products of Combustion:
Products of combustion are not available since material is non-flammable. However, products of decompostion include fumes of oxides of sulfur. Will react with water or steam to produce toxic and corrosive fumes. Reacts with carbonates to generate carbon dioxide gas. Reacts with cyanides and sulfides to form poisonous hydrogen cyanide and hydrogen sulfide respectively.
Fire Hazards in Presence of Various Substances: Combustible materials
Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Slightly explosive in presence of oxidizing materials.
Fire Fighting Media and Instructions: Not applicable.
Special Remarks on Fire Hazards:
Metal acetylides (Monocesium and Monorubidium), and carbides ignite with concentrated sulfuric acid. White Phosphorous + boiling Sulfuric acid or its vapor ignites on contact. May ignite other combustible materials. May cause fire when sulfuric acid is mixed with Cyclopentadiene, cyclopentanone oxime, nitroaryl amines, hexalithium disilicide, phorphorous (III) oxide, and oxidizing agents such as chlorates, halogens, permanganates.

Special Remarks on Explosion Hazards:
Mixturesofsulfuricacidandanyofthefollowingcanexplode:
p-nitrotoluene,
pentasilver trihydroxydiaminophosphate, perchlorates, alcohols with strong hydrogen peroxide, ammonium tetraperoxychromate, mercuric nitrite, potassium chlorate, potassium permanganate with potassium chloride, carbides, nitro compounds, nitrates, carbides, phosphorous, iodides, picratres, fulminats, dienes, alcohols (when heated) Nitramide decomposes explosively on contact with concentrated sulfuric acid. 1,3,5-Trinitrosohexahydro-1,3,5-triazine + sulfuric acid causes explosive decompositon.
Section 6: Accidental Release Measures
Small Spill:
Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.
Large Spill:
Corrosive liquid. Poisonous liquid. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.
Section 7: Handling and Storage
Precautions:
Keep locked up.. Keep container dry. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, reducing agents, combustible materials, organic materials, metals, acids, alkalis, moisture. May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package.
Storage:
Hygroscopic. Reacts. violently with water. Keep container tightly closed. Keep container in a cool, well-ventilated area. Do not store above 23°C (73.4°F).
Section 8: Exposure Controls/Personal Protection
Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:
Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.
Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 1 STEL: 3 (mg/m3) [Australia] Inhalation TWA: 1 (mg/m3) from OSHA (PEL) [United States] Inhalation TWA: 1 STEL: 3
(mg/m3) from ACGIH (TLV) [United States] [1999] Inhalation TWA: 1 (mg/m3) from NIOSH [United States] Inhalation TWA: 1 (mg/m3) [United Kingdom (UK)]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties
Physical state and appearance: Liquid. (Thick oily liquid.)
Odor: Odorless, but has a choking odor when hot.
Taste: Marked acid taste. (Strong.)
Molecular Weight: 98.08 g/mole
Color: Colorless.
pH (1% soln/water): Acidic.
Boiling Point:
270°C (518°F) - 340 deg. C Decomposes at 340 deg. C
Melting Point: -35°C (-31°F) to 10.36 deg. C (93% to 100% purity)
Critical Temperature: Not available.
Specific Gravity: 1.84 (Water = 1)
Vapor Pressure: Not available.
Vapor Density: 3.4 (Air = 1)
Volatility: Not available.
Odor Threshold: Not available.
Water/Oil Dist. Coeff.: Not available.
Ionicity (in Water): Not available.
Dispersion Properties: See solubility in water.
Solubility:
Easily soluble in cold water. Sulfuric is soluble in water with liberation of much heat. Soluble in ethyl alcohol.
Section 10: Stability and Reactivity Data
Stability: The product is stable.
Instability Temperature: Not available.
Conditions of Instability:
Conditions to Avoid: Incompatible materials, excess heat, combustible material materials, organic materials, exposure to moist air or water, oxidizers, amines, bases. Always add the acid to water, never the reverse.
Incompatibility with various substances:
Reactive with oxidizing agents, reducing agents, combustible materials, organic materials, metals, acids, alkalis, moisture.
Corrosivity:
Extremely corrosive in presence of aluminum, of copper, of stainless steel(316). Highly corrosive in presence of stainless steel(304). Non-corrosive in presence of glass.
Special Remarks on Reactivity:
Hygroscopic. Strong oxidizer. Reacts violently with water and alcohol especially when water is added to the product. Incompatible (can react explosively or dangerously) with the following: ACETIC ACID, ACRYLIC ACID, AMMONIUM HYDROXIDE, CRESOL, CUMENE, DICHLOROETHYL ETHER, ETHYLENE CYANOHYDRIN, ETHYLENEIMINE, NITRIC ACID, 2-NITROPROPANE, PROPYLENE OXIDE, SULFOLANE, VINYLIDENE CHLORIDE, DIETHYLENE GLYCOL MONOMETHYL ETHER, ETHYL ACETATE, ETHYLENE CYANOHYDRIN, ETHYLENE GLYCOL MONOETHYL ETHER ACETATE, GLYOXAL, METHYL ETHYL KETONE, dehydrating agents, organic materials, moisture (water), Acetic anhydride, Acetone, cyanohydrin, Acetone+nitric acid, Acetone + potassium dichromate, Acetonitrile, Acrolein, Acrylonitrile, Acrylonitrile + water, Alcohols + hydrogen peroxide, ally compounds such as Allyl alcohol, and Allyl Chloride, 2-Aminoethanol, Ammonium hydroxide, Ammonium triperchromate, Aniline, Bromate + metals, Bromine pentafluoride, n-Butyraldehyde, Carbides, Cesium acetylene carbide, Chlorates, Cyclopentanone oxime, chlorinates, Chlorates + metals, Chlorine trifluoride, Chlorosulfonic acid, 2-cyano-4-nitrobenzenediazonium hydrogen sulfate, Cuprous nitride, p-chloronitrobenzene, 1,5-Dinitronaphthlene + sulfur, Diisobutylene, p-dimethylaminobenzaldehyde, 1,3-Diazidobenzene, Dimethylbenzylcarbinol + hydrogen peroxide, Epichlorohydrin, Ethyl alcohol + hydrogen peroxide, Ethylene diamine, Ethylene glycol and other glycols, Ethylenimine, Fulminates, hydrogen peroxide, Hydrochloric acid, Hydrofluoric acid, Iodine heptafluoride, Indane + nitric acid, Iron, Isoprene, Lithium silicide, Mercuric nitride, Mesityl oxide, Mercury nitride, Metals (powdered), Nitromethane, Nitric acid + glycerides, p-Nitrotoluene, Pentasilver trihydroxydiaminophosphate, Perchlorates, Perchloric acid, Permanganates + benzene, 1-Phenyl-2-methylpropyl alcohol + hydrogen peroxide, Phosphorus, Phosphorus isocyanate, Picrates, Potassium tert-butoxide, Potassium chlorate, Potassium Permanganate and other permanganates, halogens, amines, Potassium Permanganate + Potassium chloride, Potassium Permanganate + water, Propiolactone (beta)-, Pyridine, Rubidium aceteylene carbide, Silver permanganate, Sodium, Sodium carbonate, sodium hydroxide, Steel, styrene monomer, toluene + nitric acid, Vinyl acetate, Thalium (I) azidodithiocarbonate, Zinc chlorate, Zinc Iodide, azides, carbonates, cyanides, sulfides, sulfites, alkali hydrides, carboxylic acid anhydrides, nitriles, olefinic organics, aqueous acids, cyclopentadiene, cyano-alcohols, metal acetylides,

Hydrogen gas is generated by the action of the acid on most metals (i.e. lead, copper, tin, zinc, aluminum, etc.). Concentrated sulfuric acid oxidizes, dehydrates, or sulfonates most organic compounds.
Special Remarks on Corrosivity:
Non-corrosive to lead and mild steel, but dillute acid attacks most metals. Attacks many metals releasing hydrogen. Minor corrosive effect on bronze. No corrosion data on brass or zinc.
Polymerization: Will not occur.
Section 11: Toxicological Information
Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.
Toxicity to Animals:

WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 2140 mg/kg [Rat.]. Acute toxicity of the vapor (LC50): 320 mg/m3 2 hours [Mouse].

Chronic Effects on Humans:

CARCINOGENIC EFFECTS: Classified 1 (Proven for human.) by IARC, + (Proven.) by OSHA. Classified A2 (Suspected for human.) by ACGIH. May cause damage to the following organs: kidneys, lungs, heart, cardiovascular system, upper respiratory tract, eyes, teeth.

Other Toxic Effects on Humans:

Extremely hazardous in case of inhalation (lung corrosive). Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (corrosive), of ingestion, .

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:

Mutagenicity: Cytogenetic Analysis: Hamster, ovary = 4mmol/L Reproductive effects: May cause adverse reproductive effects based on animal data. Developmental abnormalities (musculoskeletal) in rabbits at a dose of 20 mg/m3 for 7 hrs.(RTECS) Teratogenecity: neither embryotoxic, fetoxic, nor teratogenetic in mice or rabbits at inhaled doses producing some maternal toxicity

Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects: Skin: Causes severe skin irritation and burns. Continued contact can cause tissue necrosis. Eye: Causes severe eye irritation and burns. May cause irreversible eye injury. Ingestion: Harmful if swallowed. May cause permanent damage to the digestive tract. Causes gastrointestial tract burns. May cause perforation of the stomach, GI bleeding, edema of the glottis, necrosis and scarring, and sudden circulatory collapse(similar to acute inhalation). It may also cause systemic toxicity with acidosis. Inhalation: May cause severe irritation of the respiratory tract and mucous membranes with sore throat, coughing, shortness of breath, and delayed lung edema. Causes chemical burns to the repiratory
tract. Inhalation may be fatal as a result of spasm, inflammation, edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema. Cause corrosive action on mucous membranes. May affect cardiovascular system (hypotension, depressed cardiac output, bradycardia). Circulatory collapse with clammy skin, weak and rapid pulse, shallow respiration, and scanty urine may follow. Circulatory shock is often the immediate cause of death. May also affect teeth(changes in teeth and supporting structures - erosion, discoloration). Chronic Potential Health Effects: Inhalation: Prolonged or repeated inhalation may affect behavior (muscle contraction or spasticity), urinary system (kidney damage), and cardiovascular system, heart (ischemic heart leisons), and respiratory system/lungs(pulmonary edema, lung damage), teeth (dental discoloration, erosion). Skin: Prolonged or repeated skin contact may cause dermatitis, an allergic skin reaction.

Section 12: Ecological Information

Ecotoxicity: Ecotoxicity in water (LC50): 49 mg/l 48 hours [bluegill/sunfish].

BOD5 and COD: Not available.

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Sulfuric acid may be placed in sealed container or absorbed in vermiculite, dry sand, earth, or a similar material. It may also be diluted and neutralized. Be sure to consult with local or regional authorities (waste regulators) prior to any disposal. Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Class 8: Corrosive material

Identification: : Sulfuric acid UNNA: 1830 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:

Illinois toxic substances disclosure to employee act: Sulfuric acid New York release reporting list: Sulfuric acid Rhode Island RTK hazardous substances: Sulfuric acid Pennsylvania RTK: Sulfuric acid Minnesota: Sulfuric acid Massachusetts RTK: Sulfuric acid New Jersey: Sulfuric acid California Director's List of Hazardous Substances (8 CCR 339): Sulfuric acid Tennessee RTK: Sulfuric acid TSCA 8(b) inventory: Sulfuric acid SARA 302/304/311/312 extremely hazardous substances: Sulfuric acid SARA 313 toxic chemical notification and release reporting: Sulfuric acid CERCLA: Hazardous substances.: Sulfuric acid: 1000 lbs. (453.6 kg)

Other Regulations:

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):

CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC). CLASS E: Corrosive liquid.

DSCL (EEC):

R35- Causes severe burns. S2- Keep out of the reach of children. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S30- Never add water to this product. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

HMIS (U.S.A.):
Health Hazard: 3
Fire Hazard: 0
Reactivity: 2
Personal Protection:
National Fire Protection Association (U.S.A.):
Health: 3
Flammability: 0
Reactivity: 2
Specific hazard:
Protective Equipment:
Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.
Section 16: Other Information
References:
-Material safety data sheet emitted by: la Commission de la Santé et de la Sécurité du Travail du Québec. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987.
Other Special Considerations: Not available.
Created: 10/09/2005 11:58 PM
Last Updated: 06/09/2012 12:00 PM

Sodium Hydroxide, 50% MSDS

Section 1: Chemical Product and Company Identification
Product Name: Sodium Hydroxide, 50%
Catalog Codes: SLS3127, SLS4549
CAS#: Mixture.
RTECS: Not applicable.
TSCA: TSCA 8(b) inventory: Sodium hydroxide; Water
CI#: Not applicable.
Synonym: Sodium Hydroxide, 50% Solution
Chemical Name: Not applicable.
Chemical Formula: Not applicable.
Section 2: Composition and Information on Ingredients
Composition:
Name CAS # % by Weight
Sodium hydroxide 1310-73-2 50
Water 7732-18-5 50
Toxicological Data on Ingredients: Sodium hydroxide LD50: Not available. LC50: Not available.
Section 3: Hazards Identification
Potential Acute Health Effects:
Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant, corrosive), of ingestion, . Slightly hazardous in case of inhalation (lung sensitizer). Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.
Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to lungs. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.
Section 4: First Aid Measures
Eye Contact:
Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Get medical attention immediately. Finish by rinsing thoroughly with running water to avoid a possible infection.
Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.
Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.
Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.
Ingestion:
If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
Serious Ingestion: Not available.
Section 5: Fire and Explosion Data
Flammability of the Product: Non-flammable.
Auto-Ignition Temperature: Not applicable.
Flash Points: Not applicable.
Flammable Limits: Not applicable.
Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.
Explosion Hazards in Presence of Various Substances: Non-explosive in presence of open flames and sparks, of shocks.
Fire Fighting Media and Instructions: Not applicable.
Special Remarks on Fire Hazards: Not available.
Special Remarks on Explosion Hazards:
Sodium hydroxide reacts to form explosive products with ammonia + silver nitrate. Benzene extract of allyl benzene sulfonate prepared from allyl alcohol, and benzene sulfonyl chloride in presence of aquesous sodium hydroxide, under vacuum distillation, residue darkened and exploded. Sodium Hydroxde + impure tetrahydrofuran, which can contain peroxides, can cause serious explosions. Dry mixtures of sodium hydroxide and sodium tetrahydroborate liberate hydrogen explosively at 230-270 deg. C. Sodium Hydroxide reacts with sodium salt of trichlorophenol + methyl alcohol + trichlorobenzene + heat to cause an explosion. (Sodium hydroxide)
Section 6: Accidental Release Measures
Small Spill:
Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of acetic acid.
Large Spill:
Corrosive liquid. Poisonous liquid. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of acetic acid. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.
Section 7: Handling and Storage
Precautions:
Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, reducing agents, metals, acids, alkalis, moisture.
Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.
Section 8: Exposure Controls/Personal Protection
Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.
Personal Protection:
Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.
Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.
Exposure Limits:
Sodium hydroxide STEL: 2 (mg/m3) from ACGIH (TLV) [United States] TWA: 2 CEIL: 2 (mg/m3) from OSHA (PEL) [United States] CEIL: 2 (mg/m3) from NIOSHConsult local authorities for acceptable exposure limits.
Section 9: Physical and Chemical Properties
Physical state and appearance: Liquid.
Odor: Odorless.
Taste: Alkaline. Bitter. (Strong.)
Molecular Weight: Not applicable.
Color: Clear Colorless.
pH (1% soln/water): Basic.
Boiling Point: 140°C (284°F)
Melting Point: 12°C (53.6°F)
Critical Temperature: Not available.
Specific Gravity: 1.53 (Water = 1)
Vapor Pressure: The highest known value is 2.3 kPa (@ 20°C) (Water).
Vapor Density: The highest known value is 0.62 (Air = 1) (Water).
Volatility: Not available.
Odor Threshold: Not available.
Water/Oil Dist. Coeff.: Not available.
Ionicity (in Water): Not available.
Dispersion Properties: See solubility in water.
Solubility: Easily soluble in cold water.
Section 10: Stability and Reactivity Data
Stability: The product is stable.
Instability Temperature: Not available.
Conditions of Instability: Excess heat, incompatible materials, water/moisture

Incompatibility with various substances:
Reactive with oxidizing agents, reducing agents, metals, acids, alkalis. Slightly reactive with water
Corrosivity:
Extremely corrosive in presence of aluminum, brass. Corrosive in presence of copper, of stainless steel(304), of stainless steel(316). Non-corrosive in presence of glass.
Special Remarks on Reactivity:
Hygroscopic. Much heat is evolved when solid material is dissolved in water. Therefore cold water and caution must be used for this process. Generates considerable heat when a sodium hydroxide solution is mixed with an acid Sodium hydroxide solution and octanol + diborane during a work-up of a reaction mixture of oxime and diborane in tetrahyrofuran is very exothermic, a mild explosion being noted on one occassion. Reactive with water, acids (mineral, non-oxidizing, e.g. hydrochloric, hydrofluoric acid, muriatic acid, phosphoric), acids (mineral, oxidizing e.g. chromic acid, hypochlorous acid, nitric acid, sulfuric acid), acids (organic e.g. acetic acid, benzoic acid, formic acid, methanoic acid, oxalic acid), aldehydes (e.g. acetaldehyde, acrolein, chloral hydrate, foraldehyde), carbamates (e.g. carbanolate, carbofuran), esters (e.g. butyl acetate, ethyl acetate, propyl formate), halogenated organics (dibromoethane, hexachlorobenzene, methyl chloride, trichloroethylene), isocyanates (e.g. methyl isocyanate), ketones (acetone, acetophenone, MEK, MIBK), acid chlorides, strong bases, strong oxidizing agents, strong reducing agents, flammable liquids, powdered metals and metals (i.e aluminum, tin, zinc, hafnium, raney nickel), metals (alkali and alkaline e.g. cesium, potassium, sodium), metal compounds (toxic e.g. berylium, lead acetate, nickel carbonyl, tetraethyl lead), nitrides (e.g. potassium nitride, sodium nitride), nitriles (e.g. acetonitrile, methyl cyanide), nitro compounds (organic e.g. nitrobenzene, nitromethane), acetic anhydride, hydroquinone, chlorohydrin, chlorosulfonic acid, ethylene cyanohydrin, glyoxal, hydrosulfuric acid, oleum, propiolactone, acylonitrile, phorosous pentoxide, chloroethanol, chloroform-methanol, tetrahydroborate, cyanogen azide, 1,2,4,5 tetrachlorobenzene, cinnamaldehyde. Reacts with formaldehyde hydroxide to yield formic acid, and hydrogen. (Sodium hydroxide)
Special Remarks on Corrosivity: Very caustic to aluminum and other metals in presence of moisture.
Polymerization: Will not occur.
Section 11: Toxicological Information
Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation.
Toxicity to Animals:
LD50: Not available. LC50: Not available.
Chronic Effects on Humans: Not available.
Other Toxic Effects on Humans:
Extremely hazardous in case of inhalation (lung corrosive). Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (corrosive), of ingestion, .
Special Remarks on Toxicity to Animals: Not available.
Special Remarks on Chronic Effects on Humans: Investigation as a mutagen (cytogenetic analysis), but no data available. (Sodium hydroxide)
Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: May be harmful if absorbed through skin. Causes severe skin irritation and burns. May cause deep penetrating ulcers of the skin. Eyes: Causes severe eye irritation and burns. May cause chemical conjunctivitis and corneal damage. Inhalation: Harmful if inhaled. Causes severe irritation of the respiratory tract and mucous membranes with coughing, burns, breathing difficulty, and possible coma. Irritation may lead the chemical pneumonitis and pulmonary edema. Causes chemical burns to the respiratory tract and mucous membranes. Ingestion: May be fatal if swallowed. May cause severe and permanent damage to the digestive tract. Causes
Section 12: Ecological Information
Ecotoxicity: Not available.
BOD5 and COD: Not available.
Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.
Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.
Special Remarks on the Products of Biodegradation: Not available.
Section 13: Disposal Considerations
Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.
Section 14: Transport Information
DOT Classification: Class 8: Corrosive material
Identification: : Sodium hydroxide, solution (Sodium hydroxide) UNNA: UN1824 PG: II
Special Provisions for Transport: Not available.
Section 15: Other Regulatory Information
Federal and State Regulations:
Illinois toxic substances disclosure to employee act: Sodium hydroxide Illinois chemical safety act: Sodium hydroxide New York release reporting list: Sodium hydroxide Rhode Island RTK hazardous substances: Sodium hydroxide Pennsylvania RTK: Sodium hydroxide Minnesota: Sodium hydroxide Massachusetts RTK: Sodium hydroxide New Jersey: Sodium hydroxide Louisiana spill reporting: Sodium hydroxide TSCA 8(b) inventory: Sodium hydroxide; Water CERCLA: Hazardous substances.: Sodium hydroxide: 1000 lbs. (453.6 kg);
Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
Other Classifications:

WHMIS (Canada):
CLASS D-2A: Material causing other toxic effects (VERY TOXIC). CLASS E: Corrosive liquid.
DSCL (EEC):
HMIS (U.S.A.):
Health Hazard: 3
Fire Hazard: 0
Reactivity: 1
Personal Protection:
National Fire Protection Association (U.S.A.):
Health: 3
Flammability: 0
Reactivity: 1
Specific hazard:
Protective Equipment:
Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.
Section 16: Other Information
References: Not available.
Other Special Considerations: Not available.
Created: 10/09/2005 06:32 PM
Last Updated: 06/09/2012 12:00 PM

Ferric Chloride, 41 Be' (40% w/v) MSDS

Section 1: Chemical Product and Company Identification
Product Name: Ferric Chloride, 41 Be' (40% w/v)
Catalog Codes: SLF1105
CAS#: Mixture.
RTECS: Not applicable.
TSCA: TSCA 8(b) inventory: Ferric chloride; Water
CI#: Not available.
Synonym:
Chemical Name: Not applicable.
Chemical Formula: Not applicable.
Section 2: Composition and Information on Ingredients
Composition:
Name CAS # % by Weight
Ferric chloride 7705-08-0 40
Water 7732-18-5 60
Toxicological Data on Ingredients: Ferric chloride: ORAL (LD50): Acute: 900 mg/kg [Rat]. 1278 mg/kg [Mouse].
Section 3: Hazards Identification
Potential Acute Health Effects:
Extremely hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Very hazardous in case of skin contact (corrosive). Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.
Potential Chronic Health Effects:
Extremely hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Very hazardous in case of skin contact (corrosive). Non-sensitizer for skin. Non-permeator by skin. CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to lungs, mucous membranes. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated or prolonged inhalation of vapors may lead to chronic respiratory irritation.
Section 4: First Aid Measures
Eye Contact:
Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.
Skin Contact:
If the chemical got onto the clothed portion of the body, remove the contaminated clothes as quickly as possible, protecting your own hands and body. Place the victim under a deluge shower. If the chemical got on the victim's exposed skin, such as the hands : Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cold water may be used. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.
Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.
Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.
Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.
Ingestion:
Do not induce vomiting. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.
Serious Ingestion: Not available.
Section 5: Fire and Explosion Data
Flammability of the Product: Non-flammable.
Auto-Ignition Temperature: Not applicable.
Flash Points: Not applicable.
Flammable Limits: Not applicable.
Products of Combustion: Not available.
Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.
Fire Fighting Media and Instructions: Not applicable.
Special Remarks on Fire Hazards: Not available.
Special Remarks on Explosion Hazards: Not available.
Section 6: Accidental Release Measures
Small Spill:
Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.
Large Spill:
Corrosive liquid. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.
Section 7: Handling and Storage
Precautions:
Keep container dry. Do not ingest. Do not breathe gas/fumes/ vapour/spray. Never add water to this product In case of insufficient ventilation, wear suitable respiratory equipment If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes
Storage:
May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package. Corrosive materials should be stored in a separate safety storage cabinet or room.
Section 8: Exposure Controls/Personal Protection
Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection:
Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.
Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.
Exposure Limits:
Ferric chloride TWA: 1 CEIL: 2 (mg/m3)Consult local authorities for acceptable exposure limits.
Section 9: Physical and Chemical Properties
Physical state and appearance: Liquid.
Odor: Not available.
Taste: Not available.
Molecular Weight: Not applicable.
Color: Yellowish-brown. (Dark.)
pH (1% soln/water): Acidic.
Boiling Point: The lowest known value is 100°C (212°F) (Water).
Melting Point: Not available.
Critical Temperature: Not available.
Specific Gravity: 1.394 (Water = 1)
Vapor Pressure: The highest known value is 17.535 mm of Hg (@ 20°C) (Water).
Vapor Density: The highest known value is 0.62 (Air = 1) (Water).
Volatility: Not available.
Odor Threshold: Not available.
Water/Oil Dist. Coeff.: Not available.
Ionicity (in Water): Not available.
Dispersion Properties: See solubility in water.
Solubility: Easily soluble in cold water, hot water.
Section 10: Stability and Reactivity Data
Stability: The product is stable.
Instability Temperature: Not available.
Conditions of Instability: Not available.
Incompatibility with various substances: Not available.
Corrosivity:
Highly corrosive in presence of copper. Non-corrosive in presence of glass.
Special Remarks on Reactivity: Not available.
Special Remarks on Corrosivity: Not available.

Polymerization: No.
Section 11: Toxicological Information
Routes of Entry: Eye contact. Inhalation. Ingestion.
Toxicity to Animals: Acute oral toxicity (LD50): 2250 mg/kg (Rat) (Calculated value for the mixture).
Chronic Effects on Humans: The substance is toxic to lungs, mucous membranes.
Other Toxic Effects on Humans:
Extremely hazardous in case of skin contact (irritant), of ingestion, of inhalation. Very hazardous in case of skin contact (corrosive).
Special Remarks on Toxicity to Animals: Not available.
Special Remarks on Chronic Effects on Humans: Not available.
Special Remarks on other Toxic Effects on Humans: Not available.
Section 12: Ecological Information
Ecotoxicity: Not available.
BOD5 and COD: Not available.
Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.
Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.
Special Remarks on the Products of Biodegradation: Not available.
Section 13: Disposal Considerations
Waste Disposal:
Section 14: Transport Information
DOT Classification: CLASS 8: Corrosive liquid.
Identification: : Ferric chloride, Solution (Ferric chloride) : UN2582 PG: III
Special Provisions for Transport: Not available.
Section 15: Other Regulatory Information
Federal and State Regulations:
Pennsylvania RTK: Ferric chloride Massachusetts RTK: Ferric chloride TSCA 8(b) inventory: Ferric chloride; Water CERCLA: Hazardous substances.: Ferric chloride;
Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
Other Classifications:
WHMIS (Canada):
CLASS D-2A: Material causing other toxic effects (VERY TOXIC). CLASS E: Corrosive liquid.
DSCL (EEC): R35- Causes severe burns.
HMIS (U.S.A.):
Health Hazard: 3
Fire Hazard: 0
Reactivity: 0
Personal Protection:
National Fire Protection Association (U.S.A.):
Health: 3
Flammability: 0
Reactivity: 0
Specific hazard:
Protective Equipment:
Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.
Section 16: Other Information
References: Not available.
Other Special Considerations: Not available.
Created: 10/09/2005 05:32 PM
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Magnesium Sulfate Anhydrous MSDS

Section 1: Chemical Product and Company Identification
Product Name: Magnesium sulfate anhydrous
Catalog Codes: SLM2992, SLM2227
CAS#: 7487-88-9
RTECS: OM4500000
TSCA: TSCA 8(b) inventory: Magnesium sulfate anhydrous
CI#: Not available.
Synonym:
Chemical Formula: MgSO4
Contact Information:
Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396
US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**
Order Online: ScienceLab.com
CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300
International CHEMTREC, call: 1-703-527-3887
For non-emergency assistance, call: 1-281-441-4400
Section 2: Composition and Information on Ingredients
Composition:
Name CAS # % by Weight
Magnesium sulfate anhydrous 7487-88-9 100
Toxicological Data on Ingredients: Not applicable.
Section 3: Hazards Identification
Potential Acute Health Effects:
Hazardous in case of ingestion. Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of inhalation.
Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available. Repeated or prolonged exposure is not known to aggravate medical condition.
Section 4: First Aid Measures
Eye Contact: Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used.
Skin Contact:
After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cold water may be used. Cover the irritated skin with an emollient. If irritation persists, seek medical attention.
Serious Skin Contact: Not available.
Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.
Serious Inhalation: Not available.
Ingestion:
Do not induce vomiting. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.
Serious Ingestion: Not available.
Section 5: Fire and Explosion Data
Flammability of the Product: Non-flammable.
Auto-Ignition Temperature: Not applicable.
Flash Points: Not applicable.
Flammable Limits: Not applicable.
Products of Combustion: Not available.
Fire Hazards in Presence of Various Substances: Not applicable.
Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.
Fire Fighting Media and Instructions: Not applicable.
Special Remarks on Fire Hazards: Not available.
Special Remarks on Explosion Hazards: Not available.
Section 6: Accidental Release Measures
Small Spill:

Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:

Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

Section 7: Handling and Storage

Precautions: No specific safety phrase has been found applicable for this product.

Storage:

No specific storage is required. Use shelves or cabinets sturdy enough to bear the weight of the chemicals. Be sure that it is not necessary to strain to reach materials, and that shelves are not overloaded.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits: Not available.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid.

Odor: Not available.

Taste: Not available.

Molecular Weight: 120.38 g/mole

Color: Not available.

pH (1% soln/water): Not available.

Boiling Point: Not available.

Melting Point: Not available.

Critical Temperature: Not available.

Specific Gravity: Not available.

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility: Easily soluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Not available.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Ingestion.

Toxicity to Animals:

LD50: Not available. LC50: Not available.

Chronic Effects on Humans: Not available.

Other Toxic Effects on Humans:

Hazardous in case of ingestion. Slightly hazardous in case of skin contact (irritant), of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Human: passes through the placenta, excreted in maternal milk.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.
Toxicity of the Products of Biodegradation: The products of degradation are more toxic.
Special Remarks on the Products of Biodegradation: Not available.
Section 13: Disposal Considerations
Waste Disposal:
Section 14: Transport Information
DOT Classification: Not a DOT controlled material (United States).
Identification: Not applicable.
Special Provisions for Transport: Not applicable.
Section 15: Other Regulatory Information
Federal and State Regulations: TSCA 8(b) inventory: Magnesium sulfate anhydrous
Other Regulations: Not available..
Other Classifications:
WHMIS (Canada): Not controlled under WHMIS (Canada).
DSCL (EEC):
This product is not classified according to the EU regulations.
HMIS (U.S.A.):
Health Hazard: 1
Fire Hazard: 0
Reactivity: 0
Personal Protection: E
National Fire Protection Association (U.S.A.):
Health: 1
Flammability: 0
Reactivity: 0
Specific hazard:
Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Safety glasses.
Section 16: Other Information
References: Not available.
Other Special Considerations: Not available.
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Dihydroxyaluminum Sodium Carbonate MSDS

Section 1: Chemical Product and Company Identification
Product Name: Dihydroxyaluminum Sodium Carbonate
Catalog Codes: SLD2683
CAS#: 16482-55-6
RTECS: Not available.
TSCA: TSCA 8(b) inventory: No products were found.
CI#: Not available.
Synonym: Rolaids; Aluminum sodium carbonate hydroxide; Sodium aluminum, hydroxycarbonate; Aluminate(1-), (carbonato)dihydroxy-, sodium
Chemical Name: Dihydroxyaluminum Sodium Carbonate
Chemical Formula: NaAl(OH)2CO3
Section 2: Composition and Information on Ingredients
Composition:
Name CAS # % by Weight
Dihydroxyaluminum Sodium Carbonate 16482-55-6 100
Toxicological Data on Ingredients: Not applicable.
Section 3: Hazards Identification
Potential Acute Health Effects: Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, or inhalation.
Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified 4 (No evidence.) by NTP, None. by OSHA, None. by NIOSH. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. Repeated or prolonged exposure is not known to aggravate medical condition.
Section 4: First Aid Measures
Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.
Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.
Serious Skin Contact: Not available.
Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
Serious Inhalation: Not available.
Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.
Serious Ingestion: Not available.
Section 5: Fire and Explosion Data
Flammability of the Product: Non-flammable.
Auto-Ignition Temperature: Not applicable.
Flash Points: Not applicable.
Flammable Limits: Not applicable.
Products of Combustion: Not available.
Fire Hazards in Presence of Various Substances: Not applicable.
Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.
Fire Fighting Media and Instructions: Not applicable.
Special Remarks on Fire Hazards: Not available.
Special Remarks on Explosion Hazards: Not available.
Section 6: Accidental Release Measures
Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.
Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.
Section 7: Handling and Storage

Precautions: Do not breathe dust. Keep away from incompatibles such as acids.
Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.
Section 8: Exposure Controls/Personal Protection
Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.
Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.
Exposure Limits: Not available.
Section 9: Physical and Chemical Properties
Physical state and appearance: Solid. (Powdered solid.)
Odor: Not available.
Taste: Not available.
Molecular Weight: 144 g/mole
Color: White.
pH (1% soln/water): Not applicable.
Boiling Point: Not available.
Melting Point: Not available.
Critical Temperature: Not available.
Specific Gravity: 0.8 (Water = 1)
Vapor Pressure: Not applicable.
Vapor Density: Not available.
Volatility: Not available.
Odor Threshold: Not available.
Water/Oil Dist. Coeff.: Not available.
Ionicity (in Water): Not available.
Dispersion Properties: Is not dispersed in cold water, hot water.
Solubility: Insoluble in cold water, hot water.
Section 10: Stability and Reactivity Data
Stability: The product is stable.
Instability Temperature: Not available.
Conditions of Instability: Excess heat, incompatible materials
Incompatibility with various substances: Reactive with acids.
Corrosivity: Not available.
Special Remarks on Reactivity: Not available.
Special Remarks on Corrosivity: Not available.
Polymerization: Will not occur.
Section 11: Toxicological Information
Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.
Toxicity to Animals:
LD50: Not available. LC50: Not available.
Chronic Effects on Humans: CARCINOGENIC EFFECTS: Classified 4 (No evidence.) by NTP, None. by OSHA, None. By NIOSH.
Other Toxic Effects on Humans: Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.
Special Remarks on Toxicity to Animals: Not available.
Special Remarks on Chronic Effects on Humans: Not available.
Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: May cause skin irritation and dry skin. Eyes: Causes eye irritation. Inhalation: Excess inhalation may cause local irritation of the throat and respiratory tract. Ingestion: Low toxicity. Low hazard. Approved by FDA for use as an antacid.
Section 12: Ecological Information
Ecotoxicity: Not available.
BOD5 and COD: Not available.
Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.
Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.
Special Remarks on the Products of Biodegradation: Not available.
Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.
Section 14: Transport Information
DOT Classification: Not a DOT controlled material (United States).
Identification: Not applicable.
Special Provisions for Transport: Not applicable.
Section 15: Other Regulatory Information
Federal and State Regulations: No products were found.
Other Regulations: EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.
Other Classifications:
WHMIS (Canada): Not controlled under WHMIS (Canada).
DSCL (EEC):
This product is not classified according to the EU regulations. Not applicable.
HMIS (U.S.A.):
Health Hazard: 1
Fire Hazard: 0
Reactivity: 0
Personal Protection: E
National Fire Protection Association (U.S.A.):
Health: 1
Flammability: 0
Reactivity: 0
Specific hazard:
Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Safety glasses.
Section 16: Other Information
References: Not available.
Other Special Considerations: Not available.
Created: 10/10/2005 01:03 AM
Last Updated: 06/09/2012 12:00 PM

Hydrated lime

MATERIAL SAFETY DATA SHEET

(Prepared in accordance with Annex II of the REACH Regulation (EC) 1907/2006)

1: Identification of the substance / preparation and of the company / undertaking

1.1: Identification of the substance or preparation

Substance Name **Hydrated lime**

Synonyms

Slaked lime, Air slaked lime, Building lime, Fat lime, Chemical lime, Coarse Lime, Finishing lime, Mason's lime, Calcium dihydroxide, Calcium hydroxide, Calcium hydrate, Lime, Lime water, Bulk Hydrate, Hydrated Lime, Milk of Lime, Thick Lime Milk, Lime Putty, Bagged Hydrate, Hydrapure, White Rhino, White Rhino Hydrated Lime.

Please note that this list may not be exhaustive.

Chemical Name and Formula **Calcium dihydroxide – Ca(OH)2**

Trade Name **Hydrapure, White Rhino Hydrated Lime**

CAS N° 1305-62-0

EINECS N° 215-137-3

Molecular Weight 74,09

1.2: Use of the substance

Building material industry
Chemical industry
Agriculture
Biocidal use
Environmental protection (e.g. flue gas treatment, waste water treatment, sludge treatment)
Drinking water treatment
Feed, food and pharmaceutical industry
Civil engineering
Paper and paint industry
Glass industry

Hydrated Lime MSDS – Page 2/7

2: Hazard identification

2.1: Indication of hazard

Xi Irritant

2.2: Human health

Risk phrases

R37 Irritating to respiratory system
R38 Irritating to skin
R41 Risk of serious damage to eyes

Warning phrase

In contrast to the powder itself, the product, when diluted with water, can produce severe skin damage in humans, (alkaline burns), especially if prolonged skin contacts takes place.

3: Composition / information on ingredients

3.1: Composition

Calcium dihydroxide, and minor constituents of geological origin, varying from source to source.

4: First–aid measures

4.1: Eyes

Irrigate eyes immediately with plenty of water and seek medical advice.

4.2: Inhalation

Move source of dust or move person to fresh air.
Obtain medical attention immediately.

4.3: Ingestion

Wash mouth with water and drink copious quantities of water. Do not induce vomiting. Seek medical advice immediately.

4.4: Skin

Carefully and gently brush the contaminated body surfaces in order to remove all traces of product. Wash affected area immediately with plenty of water. Remove contaminated clothing. If necessary seek medical advice.

4.5: General advise

No known delayed effects. Consult a physician for all exposures except for minor instances.

5: Fire-fighting measures

5.1: Flammability

The substance is not flammable, and noncombustible.

it inhibits the spread of flame.
Hydrated Lime MSDS – Page 3/7
5.2: Extinguishing media
The product does not burn. Use a dry powder, foam
or CO2 type of fire extinguishers to fight the
surrounding fire.
5.3: Combustion products
When heated above 580°C, calcium hydroxide decomposes to produce calcium oxide (CaO) and water (H2O). Calcium oxide reacts with water and generates heat. This may cause risk to flammable material.
6: Accidental release measures
6.1: Personal precautions
Avoid contact with skin and eyes, keep dust levels to a minimum, and ensure that sufficient ventilation or suitable respiratory protective equipment is used (section 8).
6.2: Environmental precautions
Contain the spillage. Keep the material dry if possible. Cover area if possible to avoid unnecessary dust hazard. Avoid uncontrolled spills to watercourses and drains (pH rising). Any large spillage into watercourses must be alerted to the Environment Agency or other regulatory body.
6.3: Methods for cleaning up
Keep the material dry if possible. Pick up the product mechanically in a dry way. Use vacuum suction unit, or shovel into bags.
7: Handling and storage
7.1: Handling
7.1.1: Precautions for safe handling
Avoid contact with skin and eyes. Wear protective equipment (see section 8). Keep dust levels to a minimum. Minimize dust generation. Enclose dust sources, use exhaust ventilation (dust collector at handling points). Handling systems should preferably be enclosed. When handling bags usual precautions should be paid to the risks outlined in the Council Directive 90/269/EEC.
7.2: Storage
7.2.1: Precautions for safe storage
Store under dry conditions. Minimise contact with air and moisture. Bulk storage should be in purpose –designed silos. Keep away from acids, significant quantities of paper, straw, and nitro compounds. Keep out of reach of children. Do not use aluminium for transport or storage if there is a risk of contact with water.
Hydrated Lime MSDS – Page 4/7
8: Exposure controls / personal protection
8.1: Exposure limit values
8.1.1: CAS N° / EINECS N° 1305-62-0 / 215-137-3
8.1.2: Chemical name Calcium dihydroxide
8.1.3: Occupational exposure standard (OES) (OEL) 5mg/m3, (8hr TWA)
8.2: Exposure controls
8.2.1: Occupational exposure controls
Handling systems should preferably be enclosed or suitable ventilation installed to maintain atmospheric dust below the OES, if not wear suitable protective equipment.
8.2.1.1: Respiratory protection
Use appropriate respiratory protection against particles according to the risk level.
8.2.1.2: Hand protection
Use approved nitrile impregnated gloves having CE marks.
8.2.1.3: Eye protection
Tight fitting goggles with side shields, or wide vision
full goggles. Do not wear contact lenses when handling this product.
It is also advisable to have individualpocket eyewash.
8.2.1.4: Skin protection
Use clothing fully covering skin, full length pants, long sleeved overalls, with close fittings at openings.
Footwear resistant to caustics, and avoiding dust penetration.
8.2.1.5: General safety and hygiene measure Wear clean, dry personal protective equipment. Barrier cream can be used if necessary. If heavily exposed daily, employees must shower, and if necessary use a barrier cream to protect exposed skin, particularly neck, face and wrists.
8.2.2: Environmental exposure controls. All ventilation systems should be filtered before discharge to atmosphere.
9: Physical and chemical properties
9.1: General information
9.1.1: Appearance White or off white (beige) fine powder.
9.1.2: Odor Slight earthy odor.
9.2: Important health, safety and environmental information
pH 12,4 Ca(OH)2 saturated solution at 25°C
Solubility in water

1850 mg/l at 0°C
1650 mg/l at 20°C
770 mg/l at 100°C
Hydrated Lime MSDS – Page 5/7
9.3: Other information
Melting point Decomposition at 580°C, to form CaO and H2O
Boiling point Not applicable
Specific gravity 2,24 g/cm3 at 20°C
Bulk density 200 – 800 kg/m3 at 20°C
Vapour pressure Non volatile
Partition coefficient Not applicable
Flash point Not applicable
Flammability Not flammable
Explosive properties Not flammable
10: Stability and reactivity
10.1: Conditions to avoid
Minimise exposure to air and moisture to avoid degradation.
When heated above 580°C, calcium hydroxide decomposes to produce calcium oxide (CaO) and water (H2O): Ca(OH)2 □□CaO + H2O
10.2: Materials to avoid
Calcium hydroxide reacts with carbon dioxide to form Calcium carbonate:
Ca(OH)2 + CO2 □□CaCO3 + H2O Calcium hydroxide reacts with acids to form Calcium salts. Calcium hydroxide reacts with aluminium and brass in the presence of moisture,under formation (or release) of hydrogen gas: Ca(OH)2 + 2 Al + 6 H2O → Ca(Al (OH)4)2 + 3 H2
10.3: Additional remarks
Calcium dihydroxide absorbs carbon dioxide from air to form calcium carbonate, which is a common material in the nature.
11: Toxicological information
11.1: Acute effect
Eye contact Risk of serious damage to eyes. Inhalation Inhalation of dust causes discomfort to the upper respiratory tract. Irritant to the respiratory tract in high concentration of dust.
Ingestion: Calcium dihydroxide is not toxic, a large amount may cause irritation to the gastrointestinal tract. Skin contact Irritating to skin in the presence of moisture.
11.2: Long term exposure
Eye contact Risk of serious damage to eyes.
Inhalation: Prolonged and repeated inhalation of dust may affect the respiratory tract.

Skin contact
In case of prolonged skin contact, product may cause serious damage to skin in combination with moisture.
Hydrated Lime MSDS – Page 6/7
12: Ecological information
12.1: Ecotoxicity
12.1.1: Acute/Prolonged toxicity to fish
On Gambusia affinis LC50 = 160 mg/l for 96 hours, the substance is non-toxic, because LC50-value is > 100 mg/l.
12.1.2: Acute/Prolonged toxicity to aquatic invertebrates
No test data
12.1.3: Acute/Prolonged toxicity to aquatic plants
No test data
12.1.4: Toxicity to micro-organisms e.g. bacteria
At high concentration, through the rise of pH, calcium dihydroxide is used for disinfection of sewage sludges.
12.1.5: Chronic toxicity to aquatic organisms No data
12.1.6: Toxicity to soil dwelling organisms No data
12.1.7: Toxicity to terrestrial plants
No data, but calcium dihydroxide is used as a fertilizer.
12.1.8: General effect
Acute pH-effect. Although this product is useful to correct water acidity, an excess of more than 1 g/l may be harmful to aquatic life. pH-value of > 12 will rapidly decrease as result of dilution and carbonation.

12.2: Mobility
Calcium dihydroxide reacts and/or carbon dioxide to form calcium carbonate, which is sparingly soluble, and so presents a low mobility in most ground. Moreover this product is used as fertilisers.
12.3: Persistence and degradability
Not relevant for inorganic substances.
12.4: Bioaccumulative potential
Not relevant for inorganic substances.
13: Disposal considerations
Disposal should be in accordance with local and national legislation.
14: Transport information
14.1: Transport consideration
14.1.1: Classification Not classified as hazardous for transport.
14.1.2: ADR (Road) Not subject to identification
14.1.3: RID (Rail) Not subject to identification
14.1.4: IMDG / GGVSea (Sea) Not subject to identification
14.1.5:IATA-DGR / ICTAO-TI(Air) Not subject to identification
14.2: Special precaution
Avoid any release of dust during transportation, by using tight tanks.
Hydrated Lime MSDS – Page 7/7
15: Regulatory information
15.1: Labeling according to EEC-directives
15.1.1: Symbol and classification of the substance according to Directive 67/548/EEC
Xi Irritant
15.1.2: Restriction of marketing and employment
None
15.1.3: National regulations Water endangering class 1 (Germany)
16: Other information
16.1: Risk phrases
R37 Irritating to respiratory system
R38 Irritating to skin
R41 Risk of serious damage to eyes
16.2: Safety phrases
S2 Keep out of reach of children
S25 Avoid contact with eyes
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S37 Wear suitable gloves
S39 Wear eye/face protection
16.3: Further information
This safety data sheet supplements the technical use instructions without replacing them. The information contained therein is based on the state of our knowledge regarding the product, at the mentioned date. They are provided in good faith. It does not exempt the user from knowing and applying all texts regulating his activity. It will be his sole responsibility to take all necessary precautions when using the product.
16.4: Guidance and references
Data sheet prepared in accordance with:
Annex II of the REACH Regulation (EC) 1907/2006.
References:
1. Council Directive 90/269/EEC
2. Booklet L64 - Safety Signs and Signals. The Health and Safety (Safety Signs and Signals) Regulations 1996 - Guidance on Regulations (HSE) - ISBN 0 7176 0870 0
3. IUCLID Dataset –2000
4. The Merck Index (Ed. Merck & Co, Rahway, USA)
16.5: Revision
The additions or modifications are announced in italic.The present version is a renewed version, in order to be in accordance with the Annex II of the REACH Regulation (EC) 1907/2006. Version November 2008
End of the safety data sheet

Carbon Dioxide

Material Safety Data Sheet

Section 1. Chemical product

Carbon Dioxide 124-38-9 100 **ACGIH TLV (United States, 9/2004).**
STEL: 54000 mg/m3 15 minute(s). Form: All forms
STEL: 30000 ppm 15 minute(s). Form: All forms
TWA: 9000 mg/m 3 8 hour(s). Form: All forms
TWA: 5000 ppm 8 hour(s). Form: All forms
NIOSH REL (United States, 6/2001).
STEL: 54000 mg/m3 15 minute(s). Form: All forms
STEL: 30000 ppm 15 minute(s). Form: All forms
TWA: 9000 mg/m 3 10 hour(s). Form: All forms
TWA: 5000 ppm 10 hour(s). Form: All forms
OSHA PEL (United States, 6/1993).
TWA: 9000 mg/m 3 8 hour(s). Form: All forms
TWA: 5000 ppm 8 hour(s). Form: All forms

Section 2. Composition, Information on Ingredients

Name CAS number % Volume Exposure limits
Inhalation,Dermal,Eyes
Emergency overview

Section 3. Hazards identification

Routes of entry
Potential acute health effects
Moderately irritating to the respiratory system.
Moderately irritating to the eyes.
Ingestion is not a normal route of exposure for gases
Moderately irritating to the skin.

Physical state Gas.
Warning!
CONTENTS UNDER PRESSURE.
CAUSES DAMAGE TO THE FOLLOWING ORGANS: LUNGS, CARDIOVASCULAR SYSTEM, SKIN, EYES, CENTRAL NERVOUS SYSTEM, EYE, LENS OR CORNEA.
MAY CAUSE RESPIRATORY TRACT, EYE AND SKIN IRRITATION.
Avoid contact with skin and clothing. Avoid breathing gas. Do not puncture or incinerate container. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling.
Contact with rapidly expanding gas, liquid, or solid can cause frostbite.
Build 1.1 ***Page: 1/6***
Carbon Dioxide
See toxicological Information (section 11)
CARCINOGENIC EFFECTS: Not available.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
Medical conditions aggravated by overexposure
Acute or chronic respiratory conditions may be aggravated by overexposure to this gas.
Potential chronic health effects
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention if symptoms appear. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately. In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse.
Get medical attention. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Section 4. First aid measures

Eye contact

Skin contact
Inhalation
Ingestion
No action shall be taken involving any personal risk or without suitable training.If fumes are still suspected to be present, the rescuer should wear an appropriate mask or a self-contained breathing apparatus.It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
Frostbite : Try to warm up the frozen tissues and seek medical attention.
Non-flammable.
Use an extinguishing agent suitable for surrounding fires.

Section 5. Fire fighting measures

Flammability of the product
Fire fighting media and instructions
If involved in fire, shut off flow immediately if it can be done without risk. Apply water from a safe distance to cool container and protect surrounding area. No specific hazard.
Special protective equipment for fire-fighters
Fire fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full facepiece operated in positive pressure mode. Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment (Section 8). Shut off gas supply if this can be done safely.
Isolate area until gas has dispersed.
Environmental precautions

Section 6. Accidental release measures

: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.
Personal precautions :
Keep container tightly closed. Keep container in a cool, well-ventilated area. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).
Avoid contact with eyes, skin and clothing. Keep container closed. Use only with adequate ventilation. Do not puncture or incinerate container. Wash thoroughly after handling. High pressure gas. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement. Never allow any unprotected part of the body to touch uninsulated pipes or vessels that contain cryogenic liquids. Prevent entrapment of liquid in closed systems or piping without pressure relief devices. Some materials may become brittle at low temperatures and will easily fracture.

Section 7. Handling and storage

Handling
Storage
Build 1.1 ***Page: 2/6***
Carbon Dioxide
Use only with adequate ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits.

Section 8. Exposure Controls, Personal Protection

Engineering controls
Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary.Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Personal protection
Eyes
Skin
Respiratory
Consult local authorities for acceptable exposure limits.
Personal protection in case of a large spill

: A self-contained breathing apparatus should be used to avoid inhalation of the product. Chemical-resistant, impervious gloves or gauntlets complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Hands :

The applicable standards are (US) 29 CFR 1910.134 and (Canada) Z94.4-93
When working with cryogenic liquids, wear a full face shield.
Insulated gloves suitable for low temperatures
-78.55°C (-109.4°F)
Sublimation temperature: -78.5°C (-109.3°F)
1.53 (Air = 1)
830 psig
30.9°C (87.6°F)
44.01 g/mole

Boiling/condensation point

Melting/freezing point

Not available.

Section 9. Physical and chemical properties

Molecular weight

Critical temperature

Vapor pressure

Vapor density

Physical chemical comments

Molecular formula CO_2

Specific Volume (ft^3/lb) : 8.77193

Gas Density (lb/ft^3) : 0.114

The product is stable.

Section 10. Stability and reactivity

Stability and reactivity :

Section 11. Toxicological information

Specific effects

Carcinogenic effects No known significant effects or critical hazards.

Mutagenic effects No known significant effects or critical hazards.

Reproduction toxicity No known significant effects or critical hazards.

No specific information is available in our database regarding the other toxic effects of this material for humans.
Causes damage to the following organs: lungs, cardiovascular system, skin, eyes, central nervous system (CNS), eye, lens or cornea.

Chronic effects on humans

Other toxic effects on humans

Toxicity data

IDLH : 40000 ppm

These products are carbon oxides (CO, CO_2).
The product itself and its products of degradation are not toxic.

Section 12. Ecological information

Toxicity of the products of biodegradation

Products of degradation :

Environmental fate : Not available.

Environmental hazards : No known significant effects or critical hazards.

Toxicity to the environment : Not available.

Section 13. Disposal considerations

Product removed from the cylinder must be disposed of in accordance with appropriate Federal, State, local regulation.Return cylinders with residual product to Airgas, Inc.Do not dispose of locally.

Section 14. Transport information

2.2 **Limited quantity**
Yes.
Packaging instruction
Passenger Aircraft Quantity limitation: 75 kg
Cargo Aircraft Quantity limitation: 150 kg
DOT Classification
TDG Classification 2.2

CARBON DIOXIDE
Carbon dioxide,
refrigerated liquid
UN1013
UN2187
CARBON DIOXIDE
Carbon dioxide,
refrigerated liquid
Regulatory information
UN number Proper shipping name
Class Packing group Label Additional information
UN1013
UN2187
Explosive Limit and Limited Quantity Index 0.125
Passenger Carrying Road or Rail Index 75
Mexico Classification
UN1013
UN2187
CARBON DIOXIDE
Carbon dioxide, refrigerated liquid
Not applicable (gas).

Section 15. Regulatory information

U.S. Federal regulations
Pennsylvania RTK: Carbon Dioxide: (generic environmental hazard)
Massachusetts RTK: Carbon Dioxide
New Jersey: Carbon Dioxide
TSCA 8(b) inventory: Carbon Dioxide
Clean Water Act (CWA) 307: No products were found.
Clean Water Act (CWA) 311: No products were found.
Clean air act (CAA) 112 accidental release prevention: No products were found.
Clean air act (CAA) 112 regulated flammable substances: No products were found.
Clean air act (CAA) 112 regulated toxic substances: No products were found.
State regulations
CEPA DSL: Carbon Dioxide
WHMIS (Canada) Class A: Compressed gas.
SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: Carbon Dioxide
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Carbon Dioxide: Sudden Release of Pressure, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard
Canada
United States

Section 16. Other information

Reactivity
Personal protection
CONTENTS UNDER PRESSURE.
CAUSES DAMAGE TO THE FOLLOWING ORGANS: LUNGS, CARDIOVASCULAR SYSTEM, SKIN, EYES, CENTRAL NERVOUS SYSTEM, EYE, LENS OR CORNEA.
MAY CAUSE RESPIRATORY TRACT, EYE AND SKIN IRRITATION.

CORTROL OS5607

1 Identification

Identification of substance or preparation
CORTROL OS5607
Product Application Area
Water based dissolved oxygen scavenger/metal passivator.
Company/Undertaking Identification
GE Betz, Inc.
4636 Somerton Road
Trevose, PA 19053
T 215 355-3300, F 215 953 5524
Emergency Telephone
(800) 877-1940
Prepared by Product Stewardship Group: T 215-355-3300 Prepared on: 25-MAY-2011

2 Hazard(s) identification

****
EMERGENCY OVERVIEW
CAUTION
May cause slight irritation to the skin. May cause slight irritation to the eyes. Mists/aerosols may cause irritation to upper respiratory tract.
DOT hazard is not applicable
Odor: Slight; Appearance: Colorless To Light Yellow, Liquid
Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, foam or water
****
POTENTIAL HEALTH EFFECTS
ACUTE SKIN EFFECTS:
Primary route of exposure; May cause slight irritation to the skin.
ACUTE EYE EFFECTS:
May cause slight irritation to the eyes.
ACUTE RESPIRATORY EFFECTS:
Mists/aerosols may cause irritation to upper respiratory tract.
Substance or Preparation: CORTROL OS5607 Page 1
INGESTION EFFECTS:
May cause gastrointestinal irritation.
TARGET ORGANS:
No evidence of potential chronic effects.
MEDICAL CONDITIONS AGGRAVATED:
Not known.
SYMPTOMS OF EXPOSURE:
May cause redness or itching of skin.

3 Composition / information on ingredients

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.
HAZARDOUS INGREDIENTS:
Cas# Chemical Name Range(w/w%)
497-18-7 CARBONIC DIHYDRAZIDE 5-10
Exothermic hydrolysis to hydrazine can occur with high temperature; also occurs by contact with mineral acids, oxidizers, or low grade metals;
irritant (skin and eyes)
Aviod contact with low grade metals (LCS, AL, Cu), mineral acids and oxidizers to avoid accelerated actives degradation.
Do not mix with other chemicals. Feed independently to system.

4 First-aid measures

SKIN CONTACT:
Wash thoroughly with soap and water. Remove contaminated clothing. Get medical attention if irritation develops or persists.
EYE CONTACT:
Remove contact lenses. Hold eyelids apart. Immediately flush eyes with plenty of low-pressure water for at least 15 minutes. Get medical attention if irritation persists after flushing.
INHALATION:
If nasal, throat or lung irritation develops - remove to fresh air and get medical attention.
INGESTION:
Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 2-8 fluid ounces (60-240 mL) of milk or water.
NOTES TO PHYSICIANS:
No special instructions

5 Fire-fighting measures

Substance or Preparation: CORTROL OS5607 Page 2
FIRE FIGHTING INSTRUCTIONS:
Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).
EXTINGUISHING MEDIA:
dry chemical, carbon dioxide, foam or water
HAZARDOUS DECOMPOSITION PRODUCTS:
oxides of carbon and nitrogen
FLASH POINT:
> 200F > 93C P-M(CC)

6 Accidental release measures

PROTECTION AND SPILL CONTAINMENT:
Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Flush area with water. Wet area may be slippery. Spread sand/grit.
DISPOSAL INSTRUCTIONS:
Water contaminated with this product may be sent to a sanitary sewer treatment facility,in accordance with any local agreement,a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7 Handling and storage

HANDLING:
Contact with oxidizers, peroxide and metal oxide may result in a violent reaction. Contamination with low pH products and low grade metal accelerate decomposition to hydrazine.
STORAGE:
Keep containers closed when not in use. Store in a manner that minimizes potential contamination. Store only in vented containers. Protect from freezing. Shelf life 180 days.

8 Exposure controls / personal protection

EXPOSURE LIMITS
CHEMICAL NAME
CARBONIC DIHYDRAZIDE
PEL (OSHA): LIMITS HAVE NOT BEEN ESTABLISHED BY US OSHA.
TLV (ACGIH): LIMITS HAVE NOT BEEN ESTABLISHED BY ACGIH.
ENGINEERING CONTROLS:
adequate ventilation
PERSONAL PROTECTIVE EQUIPMENT:
Use protective equipment in accordance with 29CFR 1910 Subpart I
RESPIRATORY PROTECTION:
A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.
USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.
If air-purifying respirator use is appropriate, use a respirator with ammonia/methylamine cartridges.
SKIN PROTECTION:
rubber, viton or neoprene gloves -- Wash off after each use.
Substance or Preparation: CORTROL OS5607 Page 3

Replace as necessary.
EYE PROTECTION:
splash proof chemical goggles

9 Physical and chemical properties

Spec. Grav.(70F,21C) 1.021 Vapor Pressure (mmHG) ~ 18.0
Freeze Point (F) 32 Vapor Density (air=1) < 1.00
Freeze Point (C) 0
Viscosity(cps 70F,21C) 9 % Solubility (water) 100.0
Odor Slight
Appearance Colorless To Light Yellow
Physical State Liquid
Flash Point P-M(CC) > 200F > 93C
pH As Is (approx.) 8.0
Evaporation Rate (Ether=1) < 1.00
Percent VOC: 0.0
NA = not applicable ND = not determined

10 Stability and reactivity

CHEMICAL STABILITY:
Stable under normal storage conditions.
POSSIBILITY OF HAZARDOUS REACTIONS:
Contact with water reactive compounds may cause fire or explosion.
INCOMPATIBILITIES:
May react with strong oxidizers.
DECOMPOSITION PRODUCTS:
oxides of carbon and nitrogen

11 Toxicological information

Oral LD50 RAT: >2,000 mg/kg
NOTE - Value is for testing of similar material.
Dermal LD50 RABBIT: >2,000 mg/kg
NOTE - Value is for testing of similar material.
Skin Irritation Score RABBIT: 0.23
NOTE - Value is for testing of similar material.
Eye Irritation Score RABBIT: 0.33
NOTE - Value is for testing of similar material.

12 Ecological information

Substance or Preparation: CORTROL OS5607 Page 4
AQUATIC TOXICOLOGY
Ceriodaphnia 48 Hour Static Renewal Bioassay
LC50= 160; 10% Mortality= 96 mg/L
Daphnia magna 48 Hour Static Renewal Bioassay
LC50= 850; No Effect Level= 190 mg/L
Fathead Minnow 96 Hour Static Renewal Bioassay
LC50= 260; 5% Mortality= 96 mg/L
BIODEGRADATION
No Data Available.

13 Disposal considerations

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
Not applicable.
Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14 Transport information

Transportation Hazard: Not Applicable
DOT: Not Regulated
DOT EMERGENCY RESPONSE GUIDE #: Not applicable
Note: Some containers may be DOT exempt, please check BOL for exact container classification
IATA: Not Regulated
IMDG: Not Regulated

15 Regulatory information

TSCA:
All components of this product are included on or are in compliance with the U.S. TSCA regulations.
CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):
No regulated constituent present at OSHA thresholds
NSF Registered and/or meets USDA (according to 1998 Guidelines):
Registration number: Not Registered
SARA SECTION 312 HAZARD CLASS:
Immediate(acute)
SARA SECTION 302 CHEMICALS:
No regulated constituent present at OSHA thresholds
SARA SECTION 313 CHEMICALS:
No regulated constituent present at OSHA thresholds
CALIFORNIA REGULATORY INFORMATION
CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65):
This product contains one or more ingredients at trace levels known to the state of California to cause cancer and reproductive toxicity.
Substance or Preparation: CORTROL OS5607 Page 5
MICHIGAN REGULATORY INFORMATION
No regulated constituent present at OSHA thresholds

16 Other information

HMIS vII CODE TRANSLATION
Health 1 Slight Hazard
Fire 1 Slight Hazard
Reactivity 0 Minimal Hazard
Special NONE No special Hazard
(1) Protective Equipment B Goggles,Gloves
(1) refer to section 8 of MSDS for additional protective equipment recommendations.

FLOGARD MS6209

1 Identification

Identification of substance or preparation
FLOGARD MS6209
Product Application Area
Water-based corrosion inhibitor.
Company/Undertaking Identification
GE Betz, Inc.
4636 Somerton Road
Trevose, PA 19053
T 215 355-3300, F 215 953 5524
Emergency Telephone
(800) 877-1940
Prepared by Product Stewardship Group: T 215-355-3300 Prepared on: 03-OCT-2011

2 Hazard(s) identification

****
EMERGENCY OVERVIEW
DANGER
Corrosive to skin. Corrosive to the eyes. Mists/aerosols cause irritation to the upper respiratory tract.
DOT hazard: Corrosive to skin/steel
Odor: Slight; Appearance: Colorless To Yellow, Liquid
Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media: dry chemical/CO2/foam or water--slippery condition; use sand/grit.
****
POTENTIAL HEALTH EFFECTS
ACUTE SKIN EFFECTS:
Primary route of exposure; Corrosive to skin.
ACUTE EYE EFFECTS:
Corrosive to the eyes.
ACUTE RESPIRATORY EFFECTS:
Mists/aerosols cause irritation to the upper respiratory tract.
INGESTION EFFECTS:
Substance or Preparation: FLOGARD MS6209 Page 1
May cause severe irritation or burning of mouth, throat, and gastrointestinal tract with severe chest and abdominal pain, nausea, vomiting, diarrhea, lethargy and collapse. Possible death when ingested in very large doses.
TARGET ORGANS:
Prolonged or repeated exposures may cause tissue necrosis.
MEDICAL CONDITIONS AGGRAVATED:
Not known.
SYMPTOMS OF EXPOSURE:
Causes severe irritation, burns or tissue ulceration with subsequent scarring.

3 Composition / information on ingredients

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.
HAZARDOUS INGREDIENTS:
Cas# Chemical Name Range(w/w%)
13598-37-3 PHOSPHORIC ACID, ZINC SALT (2:1) 40-70
Irritant
7664-38-2 PHOSPHORIC ACID 15-40
Corrosive

4 First-aid measures

SKIN CONTACT:
URGENT! Wash thoroughly with soap and water. Remove contaminated clothing. Get immediate medical attention. Thoroughly wash clothing

before reuse.
EYE CONTACT:
URGENT! Immediately flush eyes with plenty of low-pressure water for at least 20 minutes while removing contact lenses. Hold eyelids apart. Get immediate medical attention.
INHALATION:
Remove to fresh air. If breathing is difficult, give oxygen. If breathing has stopped, give artificial respiration. Get immediate medical attention.
INGESTION:
Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Rinse mouth with plenty of water. Dilute contents of stomach using 4-10 fluid ounces (120-300 mL) of milk or water.
NOTES TO PHYSICIANS:
Material is corrosive. It may not be advisable to induce vomiting. Possible mucosal damage may contraindicate the use of gastric lavage.
Substance or Preparation: FLOGARD MS6209 Page 2

5 Fire-fighting measures

FIRE FIGHTING INSTRUCTIONS:
Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).
EXTINGUISHING MEDIA:
dry chemical/CO2/foam or water--slippery condition; use sand/grit.
HAZARDOUS DECOMPOSITION PRODUCTS:
oxides of phosphorus
FLASH POINT:
> 200F > 93C P-M(CC)
MISCELLANEOUS:
Corrosive to skin/steel
UN 1805;Emergency Response Guide #154

6 Accidental release measures

PROTECTION AND SPILL CONTAINMENT:
Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Flush area with water. Wet area may be slippery. Spread sand/grit.
DISPOSAL INSTRUCTIONS:
Water contaminated with this product may be sent to a sanitary sewer treatment facility,in accordance with any local agreement,a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7 Handling and storage

HANDLING:
Acidic. Corrosive(Skin/eyes). Do not mix with alkaline material.
STORAGE:
Keep containers closed when not in use. Preferably stored between 40-100F (5-38C).

8 Exposure controls / personal protection

EXPOSURE LIMITS
CHEMICAL NAME
PHOSPHORIC ACID, ZINC SALT (2:1)
PEL (OSHA): LIMITS HAVE NOT BEEN ESTABLISHED BY US OSHA.
TLV (ACGIH): LIMITS HAVE NOT BEEN ESTABLISHED BY ACGIH.
PHOSPHORIC ACID
PEL (OSHA): 1 MG/M3
TLV (ACGIH): TWA = 1 MG/M3; STEL = 3 MG/M3
MISC: NIOSH REL = 1 MG/M3; NIOSH STEL = 3 MG/M3; NIOSH IDLH = 1000 MG/M3
ENGINEERING CONTROLS:
Adequate ventilation to maintain air contaminants below exposure limits.
PERSONAL PROTECTIVE EQUIPMENT:

Use protective equipment in accordance with 29CFR 1910 Subpart I
Substance or Preparation: FLOGARD MS6209 Page 3

RESPIRATORY PROTECTION:
A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE. USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.
If air-purifying respirator use is appropriate, use any ofthe following particulate respirators: N95, N99, N100, R95,R99, R100, P95, P99 or P100.

SKIN PROTECTION:
gauntlet-type rubber, butyl or neoprene gloves, chemical resistant apron -- Wash off after each use. Replace as necessary.

EYE PROTECTION:
splash proof chemical goggles, face shield

9 Physical and chemical properties

Spec. Grav.(70F,21C) 1.711 Vapor Pressure (mmHG) ~ 15.0
Freeze Point (F) < -30 Vapor Density (air=1) < 1.00
Freeze Point (C) < -34
Viscosity(cps 70F,21C) 70 % Solubility (water) 100.0
Odor Slight
Appearance Colorless To Yellow
Physical State Liquid
Flash Point P-M(CC) > 200F > 93C
pH As Is (approx.) < 1.0
Evaporation Rate (Ether=1) < 1.00
Percent VOC: 0.0

NA = not applicable ND = not determined

10 Stability and reactivity

CHEMICAL STABILITY:
Stable under normal storage conditions.

POSSIBILITY OF HAZARDOUS REACTIONS:
Contact with strong bases may cause a violent reaction releasing heat.

INCOMPATIBILITIES:
May react with bases or strong oxidizers.

DECOMPOSITION PRODUCTS:
oxides of phosphorus

11 Toxicological information

Oral LD50 RAT: 2830 mg/kg
NOTE - Calculated value according to GHS additivity formula
Dermal LD50 RABBIT: 3890 mg/kg
NOTE - Calculated value according to GHS additivity formula
Skin Irritation Score RABBIT: CORROSIVE
NOTE - EPA Category I
Eye Irritation Score RABBIT: CORROSIVE
NOTE - Estimated value
Substance or Preparation: FLOGARD MS6209 Page 4

12 Ecological information

AQUATIC TOXICOLOGY
Ceriodaphnia 48 Hour Static Renewal Bioassay
LC50= 1.5; No Effect Level= .63 mg/L
Ceriodaphnia 7 Day Static Renewal Bioassay
IC25 = 1.9 mg/L
Daphnia magna 48 Hour Static Renewal Bioassay
LC50= 12; No Effect Level= 1.5 mg/L
Fathead Minnow 7 Day Static Renewal Bioassay
IC25 = 5 mg/L
Fathead Minnow 96 Hour Static Renewal Bioassay
LC50= 14; No Effect Level= 2.5 mg/L
Rainbow Trout 96 Hour Static Renewal Bioassay
LC50= 4.9; No Effect Level= 1.6 mg/L

BIODEGRADATION
Product contains only inorganics that are not subject to typical biological degradation. Assimilation by microbes may occur in

waste treatment or the environment.

13 Disposal considerations

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
D002=Corrosive (pH,steel); D006=Cadmium; D008=Lead.
Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14 Transport information

Transportation Hazard: Corrosive to skin/steel
DOT: PHOSPHORIC ACID SOLUTION
8, UN 1805, PG III, RQ
DOT EMERGENCY RESPONSE GUIDE #: 154
Note: Some containers may be DOT exempt, please check BOL for exact container classification
IATA: PHOSPHORIC ACID SOLUTION
8, UN 1805, PG III
IMDG: PHOSPHORIC ACID SOLUTION
8, UN 1805, PG III

15 Regulatory information

TSCA:
All components of this product are included on or are in compliance with the U.S. TSCA regulations.
CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):
1,962 gallons due to PHOSPHORIC ACID;
FOOD AND DRUG ADMINISTRATION:
Substance or Preparation: FLOGARD MS6209 Page 5
21 CFR 176.170 (components of paper and paperboard in contact with aqueous and fatty foods)
NSF Registered and/or meets USDA (according to 1998 Guidelines):
Registration number: 140901
Category Code(s):
SARA SECTION 312 HAZARD CLASS:
Immediate(acute);Delayed(Chronic)
SARA SECTION 302 CHEMICALS:
No regulated constituent present at OSHA thresholds
SARA SECTION 313 CHEMICALS:
CAS# CHEMICAL NAME RANGE
13598-37-3 PHOSPHORIC ACID, ZINC SALT (2:1) 41.0-50.0%
CALIFORNIA REGULATORY INFORMATION
CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65):
This product contains one or more ingredients at trace levels known to the state of California to cause cancer and reproductive toxicity.
MICHIGAN REGULATORY INFORMATION
No regulated constituent present at OSHA thresholds

16 Other information

HMIS vII CODE TRANSLATION
Health 3 Serious Hazard
Fire 0 Minimal Hazard
Reactivity 0 Minimal Hazard
Special CORR DOT corrosive
(1) Protective Equipment D Goggles,Face Shield,Gloves,Apron
(1) refer to section 8 of MSDS for additional protective equipment recommendations.

1 Identification

Identification of substance or preparation
GENGARD GN8004
Product Application Area

Corrosion inhibitor

Company/Undertaking Identification

GE Betz, Inc.
4636 Somerton Road
Trevose, PA 19053
T 215 355-3300, F 215 953 5524

Emergency Telephone

(800) 877-1940

Prepared by Product Stewardship Group: T 215-355-3300 Prepared on: 30-MAR-2012

2 Hazard(s) identification

****

EMERGENCY OVERVIEW

CAUTION

May cause slight irritation to the skin. May cause slight irritation to the eyes. Not expected to cause respiratory tract irritation.
DOT hazard is not applicable
Odor: Mild; Appearance: Amber, Liquid
Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, foam or water

****

POTENTIAL HEALTH EFFECTS

ACUTE SKIN EFFECTS:

Primary route of exposure: May cause slight irritation to the skin.

ACUTE EYE EFFECTS:

May cause slight irritation to the eyes.

ACUTE RESPIRATORY EFFECTS:

Not expected to cause respiratory tract irritation.
Substance or Preparation: GENGARD GN8004 Page 1

INGESTION EFFECTS:

May cause gastrointestinal irritation with possible nausea, vomiting, abdominal discomfort and diarrhea.

TARGET ORGANS:

Repeated skin contact may cause sensitization.

MEDICAL CONDITIONS AGGRAVATED:

Not known.

SYMPTOMS OF EXPOSURE:

May cause redness or itching of skin.

3 Composition / information on ingredients

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

HAZARDOUS INGREDIENTS:

This product is not hazardous as defined by OSHA regulations.
No component is considered to be a carcinogen by the National Toxicology Program, the International Agency for Research on Cancer, or the Occupational Safety and Health Administration at OSHA thresholds for carcinogens.

4 First-aid measures

SKIN CONTACT:

Wash thoroughly with soap and water. Remove contaminated clothing. Get medical attention if irritation develops or persists.

EYE CONTACT:

Remove contact lenses. Hold eyelids apart. Immediately flush eyes with plenty of low-pressure water for at least 15 minutes. Get medical attention if irritation persists after flushing.

INHALATION:

If nasal, throat or lung irritation develops - remove to fresh air and get medical attention.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 2-8 fluid ounces (60-240 mL) of milk or water.

NOTES TO PHYSICIANS:
No special instructions

5 Fire-fighting measures

Substance or Preparation: GENGARD GN8004 Page 2

FIRE FIGHTING INSTRUCTIONS:
Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

EXTINGUISHING MEDIA:
dry chemical, carbon dioxide, foam or water

HAZARDOUS DECOMPOSITION PRODUCTS:
oxides of carbon

FLASH POINT:
> 213F > 101C P-M(CC)

6 Accidental release measures

PROTECTION AND SPILL CONTAINMENT:
Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Flush area with water. Wet area may be slippery. Spread sand/grit.

DISPOSAL INSTRUCTIONS:
Water contaminated with this product may be sent to a sanitary sewer treatment facility,in accordance with any local agreement,a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7 Handling and storage

HANDLING:
Normal chemical handling.

STORAGE:
Keep containers closed when not in use. Store in cool ventilated location. Store away from oxidizers. Shelf life 360 days.

8 Exposure controls / personal protection

EXPOSURE LIMITS
This product is not hazardous as defined by OSHA regulations.

ENGINEERING CONTROLS:
adequate ventilation

PERSONAL PROTECTIVE EQUIPMENT:
Use protective equipment in accordance with 29CFR 1910 Subpart I

RESPIRATORY PROTECTION:
A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.
USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.
If air-purifying respirator use is appropriate, use any of the following particulate respirators: N95, N99, N100, R95, R99, R100, P95, P99 or P100.

SKIN PROTECTION:
rubber, butyl, viton or neoprene gloves -- Wash off after each use. Replace as necessary.

EYE PROTECTION:
splash proof chemical goggles
Substance or Preparation: GENGARD GN8004 Page 3

9 Physical and chemical properties

Spec. Grav.(70F,21C) 1.134 Vapor Pressure (mmHG) ~ 18.0
Freeze Point (F) 25 Vapor Density (air=1) < 1.00
Freeze Point (C) -4
Viscosity(cps 70F,21C) 44 % Solubility (water) 100.0
Odor Mild
Appearance Amber

Physical State Liquid
Flash Point P-M(CC) > 213F > 101C
pH As Is (approx.) 5.0
Evaporation Rate (Ether=1) < 1.00
Percent VOC: 0.0
NA = not applicable ND = not determined

10 Stability and reactivity

CHEMICAL STABILITY:
Stable under normal storage conditions.
POSSIBILITY OF HAZARDOUS REACTIONS:
Contact with water reactive compounds may cause fire or explosion.
INCOMPATIBILITIES:
May react with strong oxidizers.
DECOMPOSITION PRODUCTS:
oxides of carbon

11 Toxicological information

Oral LD50 RAT: >5000 mg/kg
NOTE - Calculated value according to GHS additivity formula
Dermal LD50 RABBIT: >5000 mg/kg
NOTE - Calculated value according to GHS additivity formula

12 Ecological information

AQUATIC TOXICOLOGY
Ceriodaphnia 48 Hour Static Acute Bioassay
LC50= 1707.6; No Effect Level= 1250 mg/L
Daphnia magna 48 Hour Static Acute Bioassay
LC50= 3677; No Effect Level= 2500 mg/L
Fathead Minnow 96 Hour Static Acute Bioassay
LC50= 2367; No Effect Level= 1250 mg/L
Rainbow Trout 96 Hour Static Acute Bioassay
LC50= 1894; No Effect Level= 1250 mg/L
BIODEGRADATION
BOD-28 (mg/g): 24
BOD-5 (mg/g): 0
COD (mg/g): 385
TOC (mg/g): 109

13 Disposal considerations

Substance or Preparation: GENGARD GN8004 Page 4
If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
Not applicable.
Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14 Transport information

Transportation Hazard: Not Applicable
DOT: Not Regulated
DOT EMERGENCY RESPONSE GUIDE #: Not applicable
Note: Some containers may be DOT exempt, please check BOL for exact container classification
IATA: Not Regulated
IMDG: Not Regulated

15 Regulatory information

TSCA:
All components of this product are included on or are in compliance with the U.S. TSCA regulations.
CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):
No regulated constituent present at OSHA thresholds
NSF Registered and/or meets USDA (according to 1998 Guidelines):
Registration number: Not Registered
SARA SECTION 312 HAZARD CLASS:
Delayed(Chronic)

SARA SECTION 302 CHEMICALS:
No regulated constituent present at OSHA thresholds
SARA SECTION 313 CHEMICALS:
No regulated constituent present at OSHA thresholds
CALIFORNIA REGULATORY INFORMATION
CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65):
This product contains one or more ingredients at trace levels known to the state of California to cause cancer.
MICHIGAN REGULATORY INFORMATION
No regulated constituent present at OSHA thresholds

16 Other information

HMIS vII CODE TRANSLATION
Health 1 Slight Hazard
Fire 1 Slight Hazard
Reactivity 0 Minimal Hazard
Special NONE No special Hazard
(1) Protective Equipment B Goggles,Gloves
Substance or Preparation: GENGARD GN8004 Page 5
(1) refer to section 8 of MSDS for additional protective equipment recommendations.

OPTISPERSE HP3100

1 Identification

Identification of substance or preparation
OPTISPERSE HP3100
Product Application Area
Water based internal boiler treatment chemical.
Company/Undertaking Identification
GE Betz, Inc.
4636 Somerton Road
Trevose, PA 19053
T 215 355-3300, F 215 953 5524
Emergency Telephone
(800) 877-1940
Prepared by Product Stewardship Group: T 215-355-3300 Prepared on: 03-FEB-2012

2 Hazard(s) identification

****
EMERGENCY OVERVIEW
DANGER
Corrosive to skin. Corrosive to the eyes. Mists/aerosols may cause irritation to upper respiratory tract.
DOT hazard: Corrosive to skin
Odor: None; Appearance: Colorless To Light Yellow, Liquid
Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, foam or water
****
POTENTIAL HEALTH EFFECTS
ACUTE SKIN EFFECTS:
Primary route of exposure; Corrosive to skin.
ACUTE EYE EFFECTS:
Corrosive to the eyes.
ACUTE RESPIRATORY EFFECTS:
Mists/aerosols may cause irritation to upper respiratory tract.
INGESTION EFFECTS:
Substance or Preparation: OPTISPERSE HP3100 Page 1
May cause gastrointestinal irritation.
TARGET ORGANS:
No evidence of potential chronic effects.
MEDICAL CONDITIONS AGGRAVATED:
Not known.
SYMPTOMS OF EXPOSURE:
May cause redness or itching of skin, irritation, and/or tearing of eyes (direct contact).

3 Composition / information on ingredients

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.
HAZARDOUS INGREDIENTS:
Cas# Chemical Name Range(w/w%)
1310-73-2 SODIUM HYDROXIDE 3-7
Corrosive; toxic (by ingestion)

4 First-aid measures

SKIN CONTACT:
URGENT! Wash thoroughly with soap and water. Remove contaminated clothing. Get immediate medical attention. Thoroughly wash clothing before reuse.
EYE CONTACT:
URGENT! Immediately flush eyes with plenty of low-pressure water for at least 20 minutes while removing contact lenses. Hold eyelids apart. Get immediate medical attention.

INHALATION:
If nasal, throat or lung irritation develops - remove to fresh air and get medical attention.
INGESTION:
Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 2-8 fluid ounces (60-240 mL) of milk or water.
NOTES TO PHYSICIANS:
No special instructions

5 Fire-fighting measures

FIRE FIGHTING INSTRUCTIONS:
Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).
EXTINGUISHING MEDIA:
dry chemical, carbon dioxide, foam or water
HAZARDOUS DECOMPOSITION PRODUCTS:
oxides of phosphorus
Substance or Preparation: OPTISPERSE HP3100 Page 2
FLASH POINT:
> 200F > 93C P-M(CC)
MISCELLANEOUS:
Corrosive to skin
UN 3266;Emergency Response Guide #154

6 Accidental release measures

PROTECTION AND SPILL CONTAINMENT:
Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Flush area with water. Wet area may be slippery. Spread sand/grit.
DISPOSAL INSTRUCTIONS:
Water contaminated with this product may be sent to a sanitary sewer treatment facility,in accordance with any local agreement,a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7 Handling and storage

HANDLING:
Alkaline. Corrosive(Eyes). Do not mix with acidic material.
STORAGE:
Shelf life = 180 days. Keep containers closed when not in use. Protect from freezing. If frozen, thaw and mix completely prior to use. Store below 100F (38C).

8 Exposure controls / personal protection

EXPOSURE LIMITS
CHEMICAL NAME
SODIUM HYDROXIDE
PEL (OSHA): 2 MG/M3
TLV (ACGIH): TWA (Ceiling) = 2 MG/M3
ENGINEERING CONTROLS:
Adequate ventilation to maintain air contaminants below exposure limits.
PERSONAL PROTECTIVE EQUIPMENT:
Use protective equipment in accordance with 29CFR 1910 Subpart I
RESPIRATORY PROTECTION:
A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.
USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.
If air-purifying respirator use is appropriate, use any of the following particulate respirators: N95, N99, N100, R95, R99, R100, P95, P99 or P100.
SKIN PROTECTION:
gauntlet-type rubber, butyl or neoprene gloves, chemical

resistant apron -- Wash off after each use. Replace as necessary.
EYE PROTECTION:
splash proof chemical goggles, face shield
Substance or Preparation: OPTISPERSE HP3100 Page 3

9 Physical and chemical properties

Spec. Grav.(70F,21C) 1.113 Vapor Pressure (mmHG) ~ 18.0
Freeze Point (F) 21 Vapor Density (air=1) < 1.00
Freeze Point (C) -6
Viscosity(cps 70F,21C) 12 % Solubility (water) 100.0
Odor None
Appearance Colorless To Light Yellow
Physical State Liquid
Flash Point P-M(CC) > 200F > 93C
pH As Is (approx.) > 13.0
Evaporation Rate (Ether=1) < 1.00
Percent VOC: 0.0
NA = not applicable ND = not determined

10 Stability and reactivity

CHEMICAL STABILITY:
Stable under normal storage conditions.
POSSIBILITY OF HAZARDOUS REACTIONS:
Contact with strong acids may cause a violent reaction releasing heat.
INCOMPATIBILITIES:
May react with acids or strong oxidizers.
DECOMPOSITION PRODUCTS:
oxides of phosphorus

11 Toxicological information

Oral LD50 RAT: 2800 mg/kg
NOTE - Calculated value according to GHS additivity formula
Dermal LD50 RABBIT: >5000 mg/kg
NOTE - Calculated value according to GHS additivity formula

12 Ecological information

AQUATIC TOXICOLOGY
Daphnia magna 48 Hour Static Renewal Bioassay (pH adjusted)
LC50= 3300; No Effect Level= 1250 mg/L
Fathead Minnow 96 Hour Static Renewal Bioassay (pH adjusted)
LC50= 5020; No Effect Level= 2750 mg/L
BIODEGRADATION
Product contains only inorganics that are not subject to typical biological degradation. Assimilation by microbes may occur in waste treatment or the environment.

13 Disposal considerations

Substance or Preparation: OPTISPERSE HP3100 Page 4
If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
D002=Corrosive(pH).
Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14 Transport information

Transportation Hazard: Corrosive to skin
DOT: CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.(SODIUM HYDROXIDE SOLUTION) 8, UN3266, PG III, RQ DOT EMERGENCY RESPONSE GUIDE #: 154
Note: Some containers may be DOT exempt, please check BOL for exact container classification IATA: CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.(SODIUM HYDROXIDE SOLUTION) 8, UN3266, PG III
IMDG: CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.(SODIUM HYDROXIDE SOLUTION)8, UN3266, PG III

15 Regulatory information

TSCA:
All components of this product are included on or are in compliance with the U.S. TSCA regulations.
CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):
2,158 gallons due to SODIUM HYDROXIDE;
FOOD AND DRUG ADMINISTRATION:
ALL ingredients in this product are authorized in 21CFR173.310 for use as boiler water additives where the steam may contact food.
NSF Registered and/or meets USDA (according to 1998 Guidelines):
Registration number: Not Registered
This product is composed of ingredients previously approved by USDA to meet the G6 classification and may be used in boilers or steamlines where the steam produced may contact edible products.
SARA SECTION 312 HAZARD CLASS:
Immediate(acute)
SARA SECTION 302 CHEMICALS:
No regulated constituent present at OSHA thresholds
SARA SECTION 313 CHEMICALS:
No regulated constituent present at OSHA thresholds
CALIFORNIA REGULATORY INFORMATION
CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65):
No regulated constituents present
MICHIGAN REGULATORY INFORMATION
No regulated constituent present at OSHA thresholds
Substance or Preparation: OPTISPERSE HP3100 Page 5
16 Other information
Fire 0 Minimal Hazard
Reactivity 0 Minimal Hazard
Special CORR DOT corrosive
(1)
HMIS vII CODE TRANSLATION
Health 3 Serious Hazard
Protective Equipment D Goggles,Face Shield,Gloves,Apron
(1) refer to section 8 of MSDS for additional protective equipment recommendations.

SPECTRUS BD1500

1 Identification

Identification of substance or preparation
SPECTRUS BD1500
Product Application Area
Water-based deposit control agent.
Company/Undertaking Identification
GE Betz, Inc.
4636 Somerton Road
Trevose, PA 19053
T 215 355-3300, F 215 953 5524
Emergency Telephone
(800) 877-1940
Prepared by Product Stewardship Group: T 215-355-3300 Prepared on: 27-MAY-2011

2 Hazard(s) identification

****
EMERGENCY OVERVIEW
CAUTION
May cause slight irritation to the skin. May cause moderate irritation to the eyes. Mists/aerosols may cause irritation to upper respiratory tract.
DOT hazard is not applicable
Odor: Slight; Appearance: Colorless, Liquid
Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, foam or water
****
POTENTIAL HEALTH EFFECTS
ACUTE SKIN EFFECTS:
Primary route of exposure; May cause slight irritation to the skin.
ACUTE EYE EFFECTS:
May cause moderate irritation to the eyes.
ACUTE RESPIRATORY EFFECTS:
Mists/aerosols may cause irritation to upper respiratory tract.
Substance or Preparation: SPECTRUS BD1500 Page 1
INGESTION EFFECTS:
May cause slight gastrointestinal irritation.
TARGET ORGANS:
No evidence of potential chronic effects.
MEDICAL CONDITIONS AGGRAVATED:
Not known.
SYMPTOMS OF EXPOSURE:
May cause redness or itching of skin.

3 Composition / information on ingredients

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.
HAZARDOUS INGREDIENTS:
This product is not hazardous as defined by OSHA regulations.
No component is considered to be a carcinogen by the National Toxicology Program, the International Agency for Research on Cancer, or the Occupational Safety and Health Administration at OSHA thresholds for carcinogens.

4 First-aid measures

SKIN CONTACT:
Wash thoroughly with soap and water. Remove contaminated clothing. Get medical attention if irritation develops or persists.
EYE CONTACT:
Remove contact lenses. Hold eyelids apart. Immediately flush eyes with plenty of low-pressure water for at least 15 minutes. Get

immediate medical attention.
INHALATION:
If nasal, throat or lung irritation develops - remove to fresh air and get medical attention.
INGESTION:
Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 2-8 fluid ounces (60-240 mL) of milk or water.
NOTES TO PHYSICIANS:
No special instructions

5 Fire-fighting measures

Substance or Preparation: SPECTRUS BD1500 Page 2
FIRE FIGHTING INSTRUCTIONS:
Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).
EXTINGUISHING MEDIA:
dry chemical, carbon dioxide, foam or water
HAZARDOUS DECOMPOSITION PRODUCTS:
oxides of carbon
FLASH POINT:
> 200F > 93C SETA(CC)

6 Accidental release measures

PROTECTION AND SPILL CONTAINMENT:
Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Flush area with water. Wet area may be slippery. Spread sand/grit.
DISPOSAL INSTRUCTIONS:
Water contaminated with this product may be sent to a sanitary sewer treatment facility,in accordance with any local agreement,a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7 Handling and storage

HANDLING:
Alkaline. Do not mix with acidic material.
STORAGE:
Keep containers closed when not in use. Reasonable and safe chemical storage. Store away from acids.

8 Exposure controls / personal protection

EXPOSURE LIMITS
This product is not hazardous as defined by OSHA regulations.
ENGINEERING CONTROLS:
adequate ventilation
PERSONAL PROTECTIVE EQUIPMENT:
Use protective equipment in accordance with 29CFR 1910 Subpart I
RESPIRATORY PROTECTION:
A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.
USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.
If air-purifying respirator use is appropriate, use any of the following particulate respirators: N95, N99, N100, R95, R99, R100, P95, P99 or P100.
SKIN PROTECTION:
rubber, butyl or viton gloves -- Wash off after each use. Replace as necessary.
EYE PROTECTION:
splash proof chemical goggles
Substance or Preparation: SPECTRUS BD1500 Page 3

9 Physical and chemical properties

Spec. Grav.(70F,21C) 1.020 Vapor Pressure (mmHG) ~ 18.0

Freeze Point (F) 31 Vapor Density (air=1) < 1.00
Freeze Point (C) -1
Viscosity(cps 70F,21C) 30 % Solubility (water) 100.0
Odor Slight
Appearance Colorless
Physical State Liquid
Flash Point SETA(CC) > 200F > 93C
pH As Is (approx.) 12.5
Evaporation Rate (Ether=1) < 1.00
Percent VOC: 0.0
NA = not applicable ND = not determined

10 Stability and reactivity

CHEMICAL STABILITY:
Stable under normal storage conditions.
POSSIBILITY OF HAZARDOUS REACTIONS:
Contact with strong acids may cause a violent reaction releasing heat. Contact with water reactive compounds may cause fire or explosion.
INCOMPATIBILITIES:
May react with strong oxidizers.
DECOMPOSITION PRODUCTS:
Oxides of carbon

11 Toxicological information

Oral LD50 RAT: >5000 mg/kg
NOTE - Calculated value according to GHS additivity formula
Dermal LD50 RABBIT: >5000 mg/kg
NOTE - Calculated value according to GHS additivity formula

12 Ecological information

AQUATIC TOXICOLOGY
Ceriodaphnia 48 Hour Static Renewal Bioassay
LC50 Greater Than= 3000 mg/L
Ceriodaphnia 7 Day Static Renewal Bioassay
IC25 = 652 mg/L
Daphnia magna 48 Hour Static Acute Bioassay
0% Mortality= 2000 mg/L
Fathead Minnow 7 Day Static Renewal Bioassay
IC25 = 3000; LC50 Greater Than= 3000 mg/L
Fathead Minnow 96 Hour Static Bioassay with 48-Hour Renewal
0% Mortality= 2000 mg/L
Menidia beryllina (Silversides) 96 Hour Static Acute Bioassay
0% Mortality= 5000 mg/L
Mysid Shrimp 96 Hour Static Acute Bioassay
25% Mortality= 5000; No Effect Level= 2500 mg/L
Rainbow Trout 96 Hour Static Renewal Bioassay
Substance or Preparation: SPECTRUS BD1500 Page 4
No Effect Level= 3000 mg/L
No Data Available.
BIODEGRADATION
BOD-28 (mg/g): 5
BOD-5 (mg/g): 4
COD (mg/g): 341
TOC (mg/g): 80

13 Disposal considerations

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
D002=Corrosive(pH).
Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14 Transport information

Transportation Hazard: Not Applicable
DOT: Not Regulated

DOT EMERGENCY RESPONSE GUIDE #: Not applicable
Note: Some containers may be DOT exempt, please check BOL for exact container classification
IATA: Not Regulated
IMDG: Not Regulated

15 Regulatory information

TSCA:
All components of this product are included on or are in compliance with the U.S. TSCA regulations.
CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):
No regulated constituent present at OSHA thresholds
FOOD AND DRUG ADMINISTRATION:
21 CFR 176.170 (components of paper and paperboard in contact with aqueous and fatty foods)
NSF Registered and/or meets USDA (according to 1998 Guidelines):
Registration number: 141059
Category Code(s): G5 Cooling and retort water treatment products - all food processing areas G7 Boiler treatment products - all food processing areas/nonfood contact
SARA SECTION 312 HAZARD CLASS:
Product is non-hazardous under Section 311/312
SARA SECTION 302 CHEMICALS:
No regulated constituent present at OSHA thresholds
SARA SECTION 313 CHEMICALS:
No regulated constituent present at OSHA thresholds
CALIFORNIA REGULATORY INFORMATION
Substance or Preparation: SPECTRUS BD1500 Page 5
CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65):
This product contains one or more ingredients at trace levels known to the state of California to cause cancer and reproductive toxicity.
MICHIGAN REGULATORY INFORMATION
No regulated constituent present at OSHA thresholds

16 Other information

HMIS vII CODE TRANSLATION
Health 1 Slight Hazard
Fire 0 Minimal Hazard
Reactivity 0 Minimal Hazard
Special ALK pH above 12.0
(1) Protective Equipment B Goggles,Gloves
(1) refer to section 8 of MSDS for additional protective equipment recommendations.

SPECTRUS DT1404

1 Identification

Identification of substance or preparation
SPECTRUS DT1404
Product Application Area
Chemical cleaning compound.
Company/Undertaking Identification
GE Betz, Inc.
4636 Somerton Road
Trevose, PA 19053
T 215 355-3300, F 215 953 5524
Emergency Telephone
(800) 877-1940
Prepared by Product Stewardship Group: T 215-355-3300 Prepared on: 17-FEB-2012

2 Hazard(s) identification

****
EMERGENCY OVERVIEW
CAUTION
May cause slight irritation to the skin. May cause slight irritation to the eyes. Dusts or mists are irritating to mucous membranes. Repeated exposure may result in respiratory sensitization.
DOT hazard: Corrosive to steel
Odor: Mild; Appearance: Colorless To Yellow, Liquid
Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, foam or water
****
POTENTIAL HEALTH EFFECTS
ACUTE SKIN EFFECTS:
Primary route of exposure; May cause slight irritation to the skin.
ACUTE EYE EFFECTS:
May cause slight irritation to the eyes.
ACUTE RESPIRATORY EFFECTS:
Dusts or mists are irritating to mucous membranes. Repeated
Substance or Preparation: SPECTRUS DT1404 Page 1
exposure may result in respiratory sensitization.
INGESTION EFFECTS:
May cause gastrointestinal irritation. Very large doses may cause diarrhea, depression, colic and death. May also cause severe allergic reactions in sensitive individuals.
TARGET ORGANS:
Prolonged or repeated exposures may cause primary irritant dermatitis, skin sensitization, and/or allergic respiratory reactions.
MEDICAL CONDITIONS AGGRAVATED:
Asthma.
SYMPTOMS OF EXPOSURE:
Inhalation may cause eye, nose, throat and lung irritation and possible respiratory sensitization or asthma. Skin contact may cause moderate irritation to severe burns and sensitization.

3 Composition / information on ingredients

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.
HAZARDOUS INGREDIENTS:
Cas# Chemical Name Range(w/w%)
7631-90-5 SODIUM BISULFITE 30-60
may generate SO2 IARC=3 (carcinogen status not classifiable)

4 First-aid measures

SKIN CONTACT:
Wash thoroughly with soap and water. Remove contaminated clothing. Thoroughly wash clothing before reuse. Immediately contact a physician.
EYE CONTACT:
Remove contact lenses. Hold eyelids apart. Immediately flush eyes with plenty of low-pressure water for at least 15 minutes. Get immediate medical attention.
INHALATION:
If nasal, throat or lung irritation develops - remove to fresh air and get medical attention.
INGESTION:
Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 2-8 fluid ounces (60-240 mL) of milk or water.
NOTES TO PHYSICIANS:
No special instructions
Substance or Preparation: SPECTRUS DT1404 Page 2

5 Fire-fighting measures

FIRE FIGHTING INSTRUCTIONS:
Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).
EXTINGUISHING MEDIA:
dry chemical, carbon dioxide, foam or water
HAZARDOUS DECOMPOSITION PRODUCTS:
oxides of sulfur
FLASH POINT:
> 200F > 93C P-M(CC)
MISCELLANEOUS:
Corrosive to steel
UN 2693;Emergency Response Guide #154

6 Accidental release measures

PROTECTION AND SPILL CONTAINMENT:
Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Flush area with water. Wet area may be slippery. Spread sand/grit.
DISPOSAL INSTRUCTIONS:
Water contaminated with this product may be sent to a sanitary sewer treatment facility,in accordance with any local agreement,a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7 Handling and storage

HANDLING:
Vent carefully before opening. Sulfur dioxide can be formed during the normal use and handling of this product.
STORAGE:
Keep containers closed when not in use. Protect from freezing. If frozen, thaw and mix completely prior to use. Shelf life 270 days.

8 Exposure controls / personal protection

EXPOSURE LIMITS
CHEMICAL NAME
SODIUM BISULFITE
PEL (OSHA): LIMITS HAVE NOT BEEN ESTABLISHED BY US OSHA.
TLV (ACGIH): TWA = 5 MG/M3; A4
ENGINEERING CONTROLS:
Adequate ventilation to maintain air contaminants below exposure limits.
PERSONAL PROTECTIVE EQUIPMENT:
Use protective equipment in accordance with 29CFR 1910 Subpart I
RESPIRATORY PROTECTION:

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.
USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED
Substance or Preparation: SPECTRUS DT1404 Page 3
WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.
If air-purifying respirator use is appropriate, use a respirator with acid gas cartridges and any of the following particulate respirators: N95, N99, N100, R95, R99, R100, P95, P99 or P100.

SKIN PROTECTION:
rubber, butyl, viton or neoprene gloves -- Wash off after each use. Replace as necessary.

EYE PROTECTION:
splash proof chemical goggles

9 Physical and chemical properties

Spec. Grav.(70F,21C) 1.360 Vapor Pressure (mmHG) ~ 18.0
Freeze Point (F) 27 Vapor Density (air=1) < 1.00
Freeze Point (C) -3
Viscosity(cps 70F,21C) 20 % Solubility (water) 100.0
Odor Mild
Appearance Colorless To Yellow
Physical State Liquid
Flash Point P-M(CC) > 200F > 93C
pH As Is (approx.) 3.8
Evaporation Rate (Ether=1) < 1.00
Percent VOC: 0.0

NA = not applicable ND = not determined

10 Stability and reactivity

CHEMICAL STABILITY:
Stable under normal storage conditions.

POSSIBILITY OF HAZARDOUS REACTIONS:
No known hazardous reactions.

INCOMPATIBILITIES:
May react with strong oxidizers and amines.

DECOMPOSITION PRODUCTS:
oxides of sulfur

11 Toxicological information

Oral LD50 RAT: 2,000 mg/kg
Dermal LD50 RABBIT: >2,000 mg/kg
NOTE - Estimated value

12 Ecological information

AQUATIC TOXICOLOGY
Daphnia magna 48 Hour Static Renewal Bioassay
LC50= 175; No Effect Level= 125 mg/L
Fathead Minnow 96 Hour Static Renewal Bioassay
LC50= 175; No Effect Level= 125 mg/L
Rainbow Trout 96 Hour Static Renewal Bioassay (pH adjusted)
Substance or Preparation: SPECTRUS DT1404 Page 4
LC50= 330; No Effect Level= 125 mg/L

BIODEGRADATION
Product contains only inorganics that are not subject to typical biological degradation. Assimilation by microbes may occur in waste treatment or the environment.

13 Disposal considerations

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
D002=Corrosive(steel).
Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14 Transport information

Transportation Hazard: Corrosive to steel
DOT: BISULFITES, AQUEOUS SOLUTIONS, N.O.S.(SODIUM BISULFITE SOLUTION)
8, UN2693, PG III, RQ
DOT EMERGENCY RESPONSE GUIDE #: 154
Note: Some containers may be DOT exempt, please check BOL for exact container classification
IATA: BISULPHITES, AQUEOUS SOLUTIONS, N.O.S.(SODIUM BISULFITE SOLUTION)
8, UN2693, PG III
IMDG: BISULPHITES, AQUEOUS SOLUTION, N.O.S.(SODIUM BISULPHITE SOLUTION)
8, UN2693, PG III

15 Regulatory information

TSCA:
All components of this product are included on or are in compliance with the U.S. TSCA regulations.
CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):
1,104 gallons due to SODIUM BISULFITE;
NSF Registered and/or meets USDA (according to 1998 Guidelines):
Registration number: Not Registered
SARA SECTION 312 HAZARD CLASS:
Immediate(acute);Delayed(Chronic)
SARA SECTION 302 CHEMICALS:
No regulated constituent present at OSHA thresholds
SARA SECTION 313 CHEMICALS:
No regulated constituent present at OSHA thresholds
CALIFORNIA REGULATORY INFORMATION
CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65):
No regulated constituents present
Substance or Preparation: SPECTRUS DT1404 Page 5
MICHIGAN REGULATORY INFORMATION
No regulated constituent present at OSHA thresholds

16 Other information

HMIS vII CODE TRANSLATION
Health 1 Slight Hazard
Fire 0 Minimal Hazard
Reactivity 0 Minimal Hazard
Special NONE No special Hazard
(1) Protective Equipment B Goggles,Gloves
(1) refer to section 8 of MSDS for additional protective equipment recommendations.
CHANGE LOG
EFFECTIVE

STEAMATE NA1324

1 Identification

Identification of substance or preparation
STEAMATE NA1324
Product Application Area
Steam condensate treatment.
Company/Undertaking Identification
GE Betz, Inc.
4636 Somerton Road
Trevose, PA 19053
T 215 355-3300, F 215 953 5524
Emergency Telephone
(800) 877-1940
Prepared by Product Stewardship Group: T 215-355-3300 Prepared on: 30-NOV-2011

2 Hazard(s) identification

****
EMERGENCY OVERVIEW
DANGER
Corrosive. Absorbed by skin. Corrosive to the eyes. Vapors, gases, mists and/or aerosols cause irritation to the upper respiratory tract.
DOT hazard: Corrosive to skin
Odor: Strong Ammonia; Appearance: Colorless, Liquid
Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, foam or water
****
POTENTIAL HEALTH EFFECTS
ACUTE SKIN EFFECTS:
Primary route of exposure; Corrosive. Absorbed by skin.
ACUTE EYE EFFECTS:
Corrosive to the eyes.
ACUTE RESPIRATORY EFFECTS:
Primary route of exposure;Vapors, gases, mists and/or aerosols cause irritation to the upper respiratory tract.
Substance or Preparation: STEAMATE NA1324 Page 1
INGESTION EFFECTS:
May cause severe irritation or burning of mouth, throat, and gastrointestinal tract with severe chest and abdominal pain, nausea, vomiting, diarrhea, lethargy and collapse. Possible death when ingested in very large doses.
TARGET ORGANS:
Prolonged or exposures may cause primary irritant dermatitis, tissue necrosis, and/or toxicity to the liver and kidney.
MEDICAL CONDITIONS AGGRAVATED:
Pre-existing skin disorders and chronic respiratory disease.
SYMPTOMS OF EXPOSURE:
Symptoms range from headache, eye irritation, chest pain, nausea and vomiting to severe coughing, difficulty in breathing, pulmonary edema and production of pink frothy sputum.

3 Composition / information on ingredients

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.
HAZARDOUS INGREDIENTS:
Cas# Chemical Name Range(w/w%)
1336-21-6 AMMONIUM HYDROXIDE 30-60
Corrosive; toxic (by ingestion)
141-43-5 MONOETHANOLAMINE 3-7
Combustible; corrosive; irritant; CNS depressant; may cause liver and kidney toxicity; fetotoxic and

developmental toxin in laboratory animals

4 First-aid measures

SKIN CONTACT:
URGENT! Wash thoroughly with soap and water. Remove contaminated clothing. Get immediate medical attention. Thoroughly wash clothing before reuse.
EYE CONTACT:
URGENT! Immediately flush eyes with plenty of low-pressure water for at least 20 minutes while removing contact lenses. Hold eyelids apart. Get immediate medical attention.
INHALATION:
If nasal, throat or lung irritation develops - remove to fresh air and get medical attention.
INGESTION:
Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Rinse mouth with plenty of water. Dilute contents of stomach using 4-10 fluid ounces (120-300 mL) of milk or water.
Substance or Preparation: STEAMATE NA1324 Page 2
NOTES TO PHYSICIANS:
Material is corrosive. It may not be advisable to induce vomiting. Possible mucosal damage may contraindicate the use of gastric lavage.

5 Fire-fighting measures

FIRE FIGHTING INSTRUCTIONS:
Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).
EXTINGUISHING MEDIA:
dry chemical, carbon dioxide, foam or water
HAZARDOUS DECOMPOSITION PRODUCTS:
oxides of carbon and nitrogen, ammonia and volatile amines
FLASH POINT:
> 213F > 101C P-M(CC)
MISCELLANEOUS:
Corrosive to skin
UN 2672;Emergency Response Guide #154

6 Accidental release measures

PROTECTION AND SPILL CONTAINMENT:
Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Flush area with water. Wet area may be slippery. Spread sand/grit.
DISPOSAL INSTRUCTIONS:
Water contaminated with this product may be sent to a sanitary sewer treatment facility,in accordance with any local agreement,a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7 Handling and storage

HANDLING:
Alkaline. Corrosive(Skin/eyes). Do not mix with acidic material.
STORAGE:
Keep containers closed when not in use. Store in cool, well ventilated area. Protect from freezing. If frozen, thaw completely and mix thoroughly prior to use. Store away from acids.

8 Exposure controls / personal protection

EXPOSURE LIMITS
CHEMICAL NAME
AMMONIUM HYDROXIDE
PEL (OSHA): 50 PPM(35PPM-STEL)
TLV (ACGIH): 25 PPM(35PPM-STEL)
MONOETHANOLAMINE
PEL (OSHA): 3 PPM (6 MG/M3)
TLV (ACGIH): TWA = 3 PPM; STEL = 6 PPM
MISC: NIOSH REL = 3 PPM (8 MG/M3); NIOSH STEL = 6 PPM (15 MG/M3); NIOSH IDLH = 30 PPM
Substance or Preparation: STEAMATE NA1324 Page 3
ENGINEERING CONTROLS:
Adequate ventilation to maintain air contaminants below exposure

limits.
PERSONAL PROTECTIVE EQUIPMENT:
Use protective equipment in accordance with 29CFR 1910 Subpart I
RESPIRATORY PROTECTION:
A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE. USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.
If air-purifying respirator use is appropriate, use a respirator with ammonia/methylamine cartridges.
SKIN PROTECTION:
gauntlet-type butyl or neoprene gloves, chemical resistant apron -- Wash off after each use. Replace as necessary.
EYE PROTECTION:
splash proof chemical goggles, face shield

9 Physical and chemical properties

Spec. Grav.(70F,21C) 0.936 Vapor Pressure (mmHG) ~ 240.0
Freeze Point (F) -24 Vapor Density (air=1) < 1.00
Freeze Point (C) -31
Viscosity(cps 70F,21C) 6 % Solubility (water) 100.0
Odor Strong Ammonia
Appearance Colorless
Physical State Liquid
Flash Point P-M(CC) > 213F > 101C
pH As Is (approx.) 13.0
Evaporation Rate (Ether=1) < 1.00
Percent VOC: 4.0
NA = not applicable ND = not determined

10 Stability and reactivity

CHEMICAL STABILITY:
Stable under normal storage conditions.
POSSIBILITY OF HAZARDOUS REACTIONS:
Contact with strong acids may cause a violent reaction releasing heat.
INCOMPATIBILITIES:
May react with acids.
DECOMPOSITION PRODUCTS:
oxides of carbon and nitrogen, ammonia and volatile amines

11 Toxicological information

Oral LD50 RAT: 960 mg/kg
NOTE - Calculated value according to GHS additivity formula
Dermal LD50 RABBIT: >5000 mg/kg
NOTE - Calculated value according to GHS additivity formula
Substance or Preparation: STEAMATE NA1324 Page 4

12 Ecological information

AQUATIC TOXICOLOGY
Daphnia magna 48 Hour Static Acute Bioassay (Estimated)
LC50= 277; 100% Mortality= 165 mg/L
Fathead Minnow 96 Hour Static Acute Bioassay (Estimated)
LC50= 120; No Effect Level= 86 mg/L
BIODEGRADATION
BOD-28 (mg/g): 27
BOD-5 (mg/g): 28
COD (mg/g): 62
TOC (mg/g): 17

13 Disposal considerations

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is : D002=Corrosive(pH). Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14 Transport information

Transportation Hazard: Corrosive to skin
DOT: AMMONIA SOLUTION
8, UN2672, PG III, RQ

DOT EMERGENCY RESPONSE GUIDE #: 154
Note: Some containers may be DOT exempt, please check BOL for exact container classification
IATA: AMMONIA SOLUTION
8, UN2672, PG III
IMDG: AMMONIA SOLUTION
8, UN2672, PG III

15 Regulatory information

TSCA:
All components of this product are included on or are in compliance with the U.S. TSCA regulations.
CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):
363 gallons due to AMMONIUM HYDROXIDE;
NSF Registered and/or meets USDA (according to 1998 Guidelines):
Registration number: Not Registered
SARA SECTION 312 HAZARD CLASS:
Immediate(acute);Delayed(Chronic)
SARA SECTION 302 CHEMICALS:
No regulated constituent present at OSHA thresholds
SARA SECTION 313 CHEMICALS:
CAS# CHEMICAL NAME RANGE
1336-21-6 AMMONIUM HYDROXIDE 31.0-40.0%
CALIFORNIA REGULATORY INFORMATION
Substance or Preparation: STEAMATE NA1324 Page 5
CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65):
This product contains one or more ingredients at trace levels known to the state of California to cause cancer and reproductive toxicity.
MICHIGAN REGULATORY INFORMATION
No regulated constituent present at OSHA thresholds

16 Other information

HMIS vII CODE TRANSLATION
Health 3 Serious Hazard
Fire 0 Minimal Hazard
Reactivity 0 Minimal Hazard
Special CORR DOT corrosive
(1) Protective Equipment D Goggles,Face Shield,Gloves,Apron
(1) refer to section 8 of MSDS for additional protective equipment recommendations.

THERMINOL® VP1 Heat transfer fluid

Material Safety Data Sheet
Product name: THERMINOL® VP1 Heat transfer fluid
Reference Number: 000000000211 Date: 05/18/2012
Company Information:
United States: Canada:
Solutia Inc. Solutia Canada Inc.
575 Maryville Center Drive, P.O. Box 66760 7475 Boul Newman Suite 301
St. Louis, MO 63166-6760 LaSalle, QC H8N 1X3
Emergency telephone: Chemtrec: 1-800-424-9300 Emergency telephone: CANUTEC: 1-613-996-6666
International Emergency telephone: Chemtrec: 703-527-3887
Non-Emergency telephone: 1-314-674-6661
Non-Emergency telephone: 1-314-674-6661
Mexico: Brazil:
Solutia MEXICO, S. DE R.L. DE C.V. Solutia Brazil Ltd.
Prol. Paseo de la Reforma 2654 Local 501, Piso-5
Avenue Carlos Marcondes, 1200 CEP: 12241-420-São José dos Campos/SP-Brazil
Col. Lomas Altas 11950 Mexico, D.F.
Emergency telephone: SETIQ: (in Mexico) 01-800-002-1400
Non-Emergency telephone: (in Mexico) 01-55-5259-6800
Emergency telephone: 55 12 3932 7100 (PABX)
Non-Emergency telephone: 55 11 3365 1800 (PABX)

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
Form: liquid
Color: clear to colorless
Odor: characteristic
WARNING STATEMENTS
WARNING!
Causes eye irritation
Causes skin irritation
Causes respiratory tract irritation
Contains material which can cause liver and nerve damage
POTENTIAL HEALTH EFFECTS
Product name: THERMINOL® VP1 Heat transfer fluid Page 2 / 8
Solutia Inc. Material Safety Data Sheet Date: 05/18/2012
Reference Number: 000000000211 Version 5.4/E
Likely routes of exposure:
eye and skin contact
inhalation
Eye contact: Highly irritating to eyes. Skin contact: Highly irritating to skin. Prolonged or repeated skin contact may result in irritant dermatitis. Inhalation: Severely irritating if inhaled. No more than slightly toxic if inhaled. Significant adverse health effects are not expected to develop under normal conditions of exposure. Ingestion: No more than slightly toxic if swallowed. Significant adverse health effects are not expected to develop if only small amounts (less than a mouthful) are swallowed.
Signs and symptoms of overexposure: headache fatigue nausea/vomiting indigestion abdominal pain tremors
Target organs/systems: May cause liver damage. May cause nerve damage. Refer to Section 11 for toxicological information.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components CAS No. Average range
Units
diphenyl ether 101-84-8 73.5 % biphenyl 92-52-4 26.5 %

4. FIRST AID MEASURES

If in eyes: Immediately flush with plenty of water for at least 15 minutes.
If easy to do, remove any contact lenses.
Get medical attention.
Remove material from skin and clothing.
If on skin: Immediately flush the area with plenty of water.
Remove contaminated clothing.
Wash skin gently with soap as soon as it is available.
Get medical attention.
Wash clothing before reuse.
If inhaled: Remove patient to fresh air.
If not breathing, give artificial respiration.

If breathing is difficult give oxygen.
Remove material from eyes, skin and clothing.
Product name: THERMINOL® VP1 Heat transfer fluid Page 3 / 8
Solutia Inc. Material Safety Data Sheet Date: 05/18/2012
Reference Number: 000000000211 Version 5.4/E
If swallowed: Immediate first aid is not likely to be required.
A physician or Poison Control Center can be contacted for advice.
Wash heavily contaminated clothing before reuse.

5. FIRE FIGHTING MEASURES

Fire point:
127 C
Hazardous products of combustion:
carbon monoxide (CO); carbon dioxide; hydrocarbons
Extinguishing media:
Water spray, foam, dry chemical, or carbon dioxide
Unusual fire and explosion hazards:
None known
Fire fighting equipment:
Firefighters, and others exposed, wear self-contained breathing apparatus.
Equipment should be thoroughly decontaminated after use.
Miscellaneous advice: This product is not classified as a fire-resistant heat transfer fluid.
Precautions to avoid sources of ignitions should be taken.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions:
Use personal protection recommended in section 8.
Environmental
precautions:
Keep out of drains and water courses.
Methods for cleaning up:
Contain large spills with dikes and transfer the material to appropriate containers for
reclamation or disposal. Absorb remaining material or small spills with an inert material
and then place in a chemical waste container. Flush spill area with water.
Refer to Section 13 for disposal information and Sections 14 and 15 for reportable quantity information.

7. HANDLING AND STORAGE

Handling
Avoid contact with eyes, skin and clothing.
Avoid breathing vapor or mist.
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.
Precautions against ignitions and fire should be taken with this product.
Heat transfer fluids are intended for INDIRECT heating purposes ONLY.
This product has not been approved for food grade use. Emptied containers retain vapor and product residue. Observe all recommended safety precautions until container is cleaned, reconditioned or destroyed. Do not cut, drill, grind or weld on or near this container. The reuse of this material's container for non industrial purposes is prohibited and any reuse must be in consideration of the data provided in this material safety data sheet. Storage
General: Stable under normal conditions of handling and storage.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Product name: THERMINOL® VP1 Heat transfer fluid Page 4 / 8
Solutia Inc. Material Safety Data Sheet Date: 05/18/2012
Reference Number: 000000000211 Version 5.4/E
Airborne exposure limits: (ml/m3 = ppm)
THERMINOL® VP1
No specific occupational exposure limit has been established.
biphenyl
ACGIH TLV: 0.2 ml/m3 ; mist ; 8-hr TWA
OSHA PEL: 0.2 ml/m3 ; 1.0 mg/m3 ; ; 8-hr TWA
Mexican OEL: 0.2 ml/m3 ; 1.5 mg/m3 ; ; 8-hr TWA
Mexican OEL: 0.6 ml/m3 ; 4 mg/m3 ; ; 15-min STEL
diphenyl ether
ACGIH TLV: 1 ml/m3 ; ; 8-hr TWA
ACGIH TLV: 2 ml/m3 ; ; 15-min STEL
OSHA PEL: 1 ml/m3 ; 7 mg/m3 ; ; 8-hr TWA
Mexican OEL: 1 ml/m3 ; 7 mg/m3 ; ; 8-hr TWA

Mexican OEL: 2 ml/m3 ; 14 mg/m3 ; ; 15-min STEL
Eye protection: Wear safety goggles. Have eye flushing equipment available. Hand protection: Wear chemical resistant gloves. Consult the glove/clothing manufacturer to determine the appropriate type glove/clothing for a given application. See Solutia Glove Facts for permeation data. Body protection: Wear suitable protective clothing. Consult the glove/clothing manufacturer to determine the appropriate type glove/clothing for a given application. Wear full protective clothing if exposed to splashes. Wash contaminated skin promptly. Launder contaminated clothing and clean protective equipment before reuse. Wash thoroughly after handling. Have safety shower available at locations where skin contact can occur. Respiratory protection: Avoid breathing vapour or mist. Use approved respiratory protection equipment (full face piece recommended) when airborne exposure limits are exceeded. If used, full facepiece replaces the need for face shield and/or chemical goggles. Consult the respirator manufacturer to determine the appropriate type of equipment for a given application. Observe respirator use limitations specified by the manufacturer. Ventilation: Provide natural or mechanical ventilation to control exposure levels below airborne exposure limits. If practical, use local mechanical exhaust ventilation at sources of air contamination such as processing equipment. Components referred to herein may be regulated by specific Canadian provincial legislation. Please refer to exposure limits legislated for the province in which the substance will be used.

9. PHYSICAL AND CHEMICAL PROPERTIES

Flash point: 110 C Pensky-Martens closed tester
124 C Cleveland Open Cup
Product name: THERMINOL® VP1 Heat transfer fluid Page 5 / 8
Solutia Inc. Material Safety Data Sheet Date: 05/18/2012
Reference Number: 000000000211 Version 5.4/E
Autoignition temperature: 612 C ASTM D-2155
Density: 1.06 g/cm3 @ 25 C
Boiling point : 257 C
Crystallising point : 12 C
Water solubility: ~25 mg/l
NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

10. STABILITY AND REACTIVITY

Conditions to avoid: All sources of ignition.
Materials to avoid: Contact with strong oxidizing agents.
Hazardous reactions: Hazardous polymerization does not occur.
Hazardous decomposition
products:
None known;

11. TOXICOLOGICAL INFORMATION

This product has been tested for toxicity. Results from Solutia sponsored studies or from the available public literature are described below.
Acute animal toxicity data
Oral: LD50 , rat, 2,050 mg/kg , No more than slightly toxic
Dermal: LD50 , rabbit, > 5,010 mg/kg , Practically nontoxic after skin application in animal studies.
Inhalation: LC50 , rat, 2.66 mg/l , 4 h, Toxic based on animal inhalation exposure studies.
Skin irritation: rabbit , Slightly irritating to skin., 24 h
Repeat dose toxicity: rat, , inhalation, 13 weeks, , Produced effects on body weight, serum enzymes and/or organ weights in repeat dose studies.
Repeat dose toxicity: rat, , gavage, 26 weeks, , Produced effects on body weight, serum enzymes and/or organ weights in repeat dose studies. Effects only observed at very high dose levels. Target organs affected kidneys, liver, spleen. Repeat dose toxicity: rat, , diet, subchronic, , Repeated oral exposure produced liver and kidney changes in animal models. Target organs affected liver, kidneys Developmental toxicity: rat, gavage, , No effects on offspring observed in laboratory animals in the presence of maternal toxicity. Product name: THERMINOL® VP1 Heat transfer fluid Page 6.
Solutia Inc. Material Safety Data Sheet Date: 05/18/2012
Reference Number: 000000000211 Version 5.4/E
Mutagenicity: No genetic effects were observed in standard tests using bacterial and animal cells.
Components Data from Solutia studies and/or the available scientific literature on the components of this material which have been identified as hazardous chemicals under the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200) or the Canadian Hazardous Products Act are discussed below. Biphenyl Chronic exposure has been reported to cause headache, fatigue, nausea, indigestion, abdominal pain, tremor, central and peripheral nerve damage and liver injury. Slightly toxic following oral administration.
Practically nontoxic after skin application in animal studies.
Practically non irritating to skin (rabbit).
Slightly irritating to eyes (rabbit). No mortality or signs of toxicity at the highest level achievable.
Irritating to respiratory system in animal models. Produced effects on body weight, serum enzymes and/or organ weights in repeat dose studies.

Produced no dermal sensitization (guinea pigs). No effects on offspring observed in laboratory animals in the presence of maternal toxicity.
No genetic effects were observed in standard tests using bacterial and animal cells.
diphenyl ether. Predictive patch testing on human volunteers did not produce irritation or sensitization.
Slightly toxic following oral administration.
Practically nontoxic after skin application in animal studies.
Slightly irritating to eyes (rabbit).
Slightly irritating to skin (rabbit).
Repeated exposure produced respiratory tract irritation in animal models.
Repeated exposure produced eye irritation in animal models.
No genetic effects were observed in standard tests using bacterial and animal cells.

12. ECOLOGICAL INFORMATION

Environmental Toxicity Invertebrates 48 h, EC50 Water flea (Daphnia magna) 2.4 mg/l Fish: 96 h, LC50 Rainbow trout (Oncorhynchus mykiss) 7.6 mg/l 96 h, LC50 Fathead minnow (Pimephales promelas) 24 mg/l
Algae: 96 h, EC50 Algae (Selenastrum capricornutum) 1.3 mg/l Biodegradation Modified SCAS (OECD 302A) Primary degradation 99 %

13. DISPOSAL CONSIDERATIONS

US EPA RCRA Status: This material when discarded may be a hazardous waste as that term is defined by the Resource Conservation and Recovery Act (RCRA), 40 CFR 261.24, due to its toxicity characteristic. This material should be analyzed in accordance with Method 1311 for the compound(s) below.
US EPA RCRA D018 Compound/Characteristic: BENZENE
Product name: THERMINOL® VP1 Heat transfer fluid Page 7 / 8
Solutia Inc. Material Safety Data Sheet Date: 05/18/2012
Reference Number: 000000000211 Version 5.4/E
hazardous waste number:
Disposal considerations:
Incineration
Miscellaneous advice:
This product meets the criteria for a synthetic used oil under the U.S. EPA Standards for the Management of Used Oil (40 CFR 279). Those standards govern recycling and disposal in lieu of 40 CFR 260 -272 of the Federal hazardous waste program in states that have adopted these used oil regulations. Consult your attorney or appropriate regulatory official to be sure these standards have been adopted in your state. Recycle or burn in accordance with the applicable standards. Solutia operates a used fluid return program for certain fluids under these used oil standards. Contact your Sales Representative for details. This product should not be dumped, spilled, rinsed or washed into sewers or public waterways.

14. TRANSPORT INFORMATION

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.
US DOT
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
biphenyl
Hazard Class: 9
Hazard Identification number: UN3082
Packing Group: Packing Group III
Transport label: Class 9
Special provisions: This material meets the definition of a marine pollutant. Other: Applies ONLY to containers with an RQ or for shipments in bulk via water transportation. Canadian TDG Other: Not regulated for transport. Reportable Quantity/Limit US DOT RQ 100 lb *biphenyl* Package size containing reportable amount: 377 lb
ICAO/IATA Class Other: See DOT Information

15. REGULATORY INFORMATION

All components are in compliance with the following inventories:
U.S. TSCA, EU EINECS, Canadian DSL, Australian AICS, Korean, Japanese ENCS, Phillipine PICCS, Chinese
Canadian WHMIS classification:
D2(A) - Materials Causing Other Toxic Effects
D2(B) - Materials Causing Other Toxic Effects
SARA Hazard Notification:
Hazard Categories Under Title III
Rules (40 CFR 370):
Immediate
Delayed
Product name: THERMINOL® VP1 Heat transfer fluid Page 8 / 8

Solutia Inc. Material Safety Data Sheet Date: 05/18/2012
Reference Number: 000000000211 Version 5.4/E
Section 302 Extremely Hazardous
Substances:
Not applicable
Section 313 Toxic Chemical(s):
biphenyl
CERCLA Reportable Quantity:
100 lbs biphenyl
For this/these chemicals, release of more than the Reportable Quantity to the environment in a 24 hour period requires notification to the National Response Center (800-424-8802 or 202-426-2675).This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulation and the MSDS contains all the information required by the Canadian Controlled Products Regulation. Refer to Section 11 for OSHA/HPA Hazardous Chemical(s) and Section 13 for RCRA classification. Safety data sheet also created in accordance with Brazilian law NBR 14725

16. OTHER INFORMATION

Product use: Heat transferring agents
Reason for revision: Routine review and update
Health Fire Reactivity Additional Information
Suggested NFPA Rating 2 1 0
Suggested HMIS Rating: 2 1 0 G
Prepared by the Solutia Hazard Communication Group. Please consult Solutia @ 314-674-6661 if further information is needed.
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Material Safety Data Sheet

Section 1. Chemical product and company identification

Hydrogen

Supplier
1-866-734-3438
Synonym : Dihydrogen; o-Hydrogen; p-Hydrogen; Molecular hydrogen; H2; UN 1049; UN 1966; Liquid hydrogen
Emergency overview

Section 2. Hazards identification

Routes of entry
Potential acute health effects
Acts as a simple asphyxiant.
Contact with rapidly expanding gas may cause burns or frostbite. Contact with cryogenic liquid can cause frostbite and cryogenic burns.
Ingestion is not a normal route of exposure for gases Contact with cryogenic liquid can cause frostbite and cryogenic burns.
Contact with rapidly expanding gas may cause burns or frostbite. Contact with cryogenic liquid can cause frostbite and cryogenic burns.
Eyes
Skin
Inhalation
Ingestion
Physical state Gas or Liquid.
See toxicological information (Section 11)
WARNING!
GAS:
CONTENTS UNDER PRESURE.
Extremely flammable
Do not puncture or incinerate container.
Can cause rapid suffocation.
May cause severe frostbite.
LIQUID:
Extremely flammable
Extremely cold liquid and gas under pressure.
Can cause rapid suffocation.
May cause severe frostbite.
Do not puncture or incinerate container. May cause target organ damage, based on animal data.

Medical conditions aggravated by overexposure
Pre-existing disorders involving any target organs mentioned in this MSDS as being at

risk may be aggravated by over-exposure to this product.
:
Contact with rapidly expanding gases or liquids can cause frostbite.
Target organs : May cause damage to the following organs: lungs.
Potential chronic health effects
Chronic effects : May cause target organ damage, based on animal data.
Target organs : May cause damage to the following organs: lungs.
Build 1.1 *Page: 1/6*
Hydrogen
Hydrogen 1333-74-0 100 Oxygen Depletion [Asphyxiant]
Section 3. Composition, Information on Ingredients
Name CAS number % Volume Exposure limits
As this product is a gas, refer to the inhalation section.
Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.
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. Clean shoes thoroughly before reuse. Get medical attention immediately.
Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
Section 4. First aid measures
Eye contact
Skin contact
Inhalation
Ingestion
No action shall be taken involving any personal risk or without suitable training.If it is suspected that fumes are still present,
the rescuer should wear an appropriate mask or self-contained breathing apparatus.It may be dangerous to the person
providing aid to give mouth-to-mouth resuscitation.
Frostbite : Try to warm up the frozen tissues and seek medical attention.
500 to 571°C (932 to 1059.8°F)
Flammable.
No specific data.
Lower: 4% Upper: 76%
Use an extinguishing agent suitable for the surrounding fire.
Extremely flammable in the presence of the following materials or conditions: oxidizing materials.
Section 5. Fire-fighting measures
Flammability of the product
Auto-ignition temperature
Flammable limits
Products of combustion
Fire hazards in the presence of various substances

Fire-fighting media and
instructions
Apply water from a safe distance to cool container and protect surrounding area. If involved in fire, shut off flow immediately if it can be done without risk.
Contains gas under pressure. In a fire or if heated, a pressure increase will occur and the container may burst or explode.
Special protective
equipment for fire-fighters
Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment (section 8). Shut off gas supply if this can be done safely. Isolate area until gas has dispersed.
Immediately contact emergency personnel. Stop leak if without risk. Note: see section 1 for emergency contact information and section 13 for waste disposal.
Environmental precautions
Section 6. Accidental release measures
: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.
Personal precautions :
Methods for cleaning up :
High pressure gas. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.
Never allow any unprotected part of the body to touch uninsulated pipes or vessels that contain cryogenic liquids. Prevent entrapment of liquid in closed systems or piping without pressure relief devices. Some materials may become brittle at low temperatures and will easily fracture.
Section 7. Handling and storage
Handling :
Build 1.1 *Page: 2/6*
Hydrogen
Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).
For additional information concerning storage and handling refer to Compressed Gas Association pamphlets P-1 Safe Handling of Compressed Gases in Containers and P-12 Safe Handling of Cryogenic Liquids available from the Compressed Gas Association, Inc.
Storage :
Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.
hydrogen Oxygen Depletion [Asphyxiant]
Section 8. Exposure controls/personal protection
Engineering controls
Product name

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
\
Personal protection
Eyes
Skin
Respiratory
Consult local authorities for acceptable exposure limits.

Personal protection in case of a large spill
Self-contained breathing apparatus (SCBA) should be used to avoid inhalation of the product.
Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Hands :
The applicable standards are (US) 29 CFR 1910.134 and (Canada) Z94.4-93
When working with cryogenic liquids, wear a full face shield.
Insulated gloves suitable for low temperatures
-253°C (-423.4°F)
-259.15°C (-434.5°F)
0.07 (Air = 1) Liquid Density@BP: 4.43 lb/ft3 (70.96 kg/m3)
-240.15°C (-400.3°F)
2.02 g/mole
Boiling/condensation point
Melting/freezing point
Section 9. Physical and chemical properties
Molecular weight
Critical temperature
Vapor density
Molecular formula H2
Specific Volume (ft 3/lb) : 191.9386
Gas Density (lb/ft 3) : 0.00521
The product is stable.
Extremely reactive or incompatible with the following materials: oxidizing materials.
Under normal conditions of storage and use, hazardous polymerization will not occur.
Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Section 10. Stability and reactivity
Stability and reactivity

Incompatibility with various substances
Hazardous decomposition products
Hazardous polymerization

Section 11. Toxicological information
Specific effects
Carcinogenic effects No known significant effects or critical hazards.
Mutagenic effects No known significant effects or critical hazards.
Reproduction toxicity No known significant effects or critical hazards.
No specific information is available in our database regarding the other toxic effects of this material to humans.
Chronic effects on humans May cause damage to the following organs: lungs.
Other toxic effects on humans
Toxicity data
Section 12. Ecological information
Environmental fate : Not available.
Environmental hazards : No known significant effects or critical hazards.
Toxicity to the environment : Not available.
Aquatic ecotoxicity
Not available.
Section 13. Disposal considerations
Product removed from the cylinder must be disposed of in accordance with appropriate Federal, State, local regulation.Return cylinders with residual product to Airgas, Inc.Do not dispose of locally.
Section 14. Transport information
2.1 Limited quantity Yes.
Packaging instruction
Passenger aircraft Quantity limitation: Forbidden.
Cargo aircraft Quantity limitation: 150 kg
DOT Classification
TDG Classification 2.1
HYDROGEN, COMPRESSED Hydrogen, refrigerated liquid
UN1049 UN1966
HYDROGEN, COMPRESSED Hydrogen, refrigerated liquid
Regulatory information
UN number Proper shipping name
Class Packing group Label Additional
Information UN1049 UN1966
Explosive Limit and Limited Quantity
Index
0.125
ERAP Index
3000
Passenger Carrying Ship Index Forbidden
Not applicable (gas).
Not applicable (gas).
Passenger

Carrying Road or Rail Index Forbidden
Mexico Classification
UN1049
UN1966
HYDROGEN,
COMPRESSED
Hydrogen,
refrigerated liquid
2.1 Not applicable (gas). -
"Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product."
Section 15. Regulatory information
U.S. Federal regulations
.Class B-1: Flammable gas.
SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: hydrogen
SARA 311/312 MSDS distribution - chemical inventory - hazard identification:
hydrogen: Fire hazard, Sudden release of pressure
Canada
United States
Hydrogen
Clean Air Act (CAA) 112 accidental release prevention - Flammable Substances:
Section 16. Other information
3
4
0
0
4
Health 3
Special
Instability
Flammability
Health
Fire hazard
Reactivity
Personal protection
GAS:
CONTENTS UNDER PRESURE.
Extremely flammable
Do not puncture or incinerate container.
Can cause rapid suffocation.
May cause severe frostbite.
LIQUID:
Extremely flammable
Extremely cold liquid and gas under pressure.
Can cause rapid suffocation.
May cause severe frostbite.

Label requirements : Class A: Compressed gas.
Class B-1: Flammable gas.
United States Canada
0
4
0
National Fire Protection Association (U.S.A.)
0
4
0
Health
Flammability
Physical hazards

Material Safety Data Sheet

NITROGEN, GAS

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name NITROGEN, GAS
Product Code(s) G-7, 1018
UN-Number UN1066
Recommended Use Compressed gas.
Synonyms LASER Nitrogen, LASER Nitrogen Ultra, Nitrogen, compressed
Supplier Address* Linde Gas North America LLC - Linde Merchant Production Inc. - Linde LLC
575 Mountain Ave.
Murray Hill, NJ 07974
Phone: 908-464-8100
www.lindeus.com
Linde Gas Puerto Rico, Inc.
Las Palmas Village
Road No. 869, Street No. 7
Catano, Puerto Rico 00962
Phone: 787-641-7445
www.pr.lindegas.com
Linde Canada Limited
5860 Chedworth Way
Mississauga, Ontario L5R 0A2
Phone: 905-501-1700
www.lindecanada.com

* May include subsidiaries or affiliate companies/divisions.
For additional product information contact your local customer service.
Chemical Emergency Phone Number Chemtrec: 1-800-424-9300 for US/ 703-527-3887 outside US

2. HAZARDS IDENTIFICATION

OSHA Regulatory Status This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR
1910.1200).
Potential Health Effects
WARNING!

Emergency Overview

Simple asphyxiant
Contents under pressure
Keep at temperatures below 52°C / 125°F
Appearance Colorless **Physical State** Compressed gas. **Odor** Odorless

Principle Routes of Exposure Inhalation.
Acute Toxicity
Chronic Effects None known
Aggravated Medical Conditions None known.
Environmental Hazard See Section 12 for additional Ecological Information.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name CAS-No Volume % Chemical Formula
Nitrogen 7727-37-9 >99 N_2

4. FIRST AID MEASURES

Eye Contact None required for gas. If frostbite is suspected, flush eyes with cool water for 15 minutes and obtain immediate medical attention.
Skin Contact None required for gas. For dermal contact or suspected frostbite, remove contaminated clothing and flush affected areas with lukewarm water. DO NOT USE HOT WATER. A physican should see the patient promptly if contact with the product has resulted in blistering of the dermal surface or in deep tissue freezing.
Inhalation PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF INHALATION OVEREXPOSURE. RESCUE
PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS. Conscious inhalation victims should be assisted to an uncontaminated area and inhale fresh air. If breathing is difficult, administer oxygen. Unconscious persons should be moved to an uncontaminated area and, as necessary, given artificial resuscitation and supplemental oxygen. Treatment should be symptomatic and supportive.
Ingestion None under normal use. Get medical attention if symptoms occur.
Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Inhalation
Skin This product is a gas at room temperature. Contact with liquid may cause frostbite.
Simple asphyxiant. May cause suffocation by displacing the oxygen in the air. Exposure to oxygen-deficient atmosphere (<19.5%) may cause dizziness, drowsiness, nausea, vomiting, excess salivation, diminished mental alertness, loss of consciousness and death. Exposure to atmospheres containing 8-10% or less oxygen will bring about unconsciousness without warning and so quickly that the individuals cannot help or protect themselves. Lack of sufficient oxygen may cause serious injury or death.
Skin Absorption Hazard No known hazard in contact with skin.
Ingestion Not an expected route of exposure.

Eyes This product is a gas at room temperature. Contact with liquid may cause frostbite.
NITROGEN, GAS , Material Safety Data Sheet **,** Revision Date 24-Sep-2013 **,** Page 3 / 8

Flammable Properties Not flammable.
Suitable Extinguishing Media Use extinguishing measures that are appropriate to local circumstances and the surrounding
environment.
Explosion Data
Sensitivity to Mechanical Impact None
Sensitivity to Static Discharge None
Specific Hazards Arising from the Chemical
Cylinders may rupture under extreme heat. Continue to cool fire exposed cylinders until flames are extinguished. Damaged cylinders should be handled only by specialists.
Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions Ensure adequate ventilation. Evacuate personnel to safe areas. Use personal protective equipment.
Monitor oxygen level.
Environmental Precautions Prevent spreading of vapors through sewers, ventilation systems and confined areas.
Methods for Containment Stop the flow of gas or remove cylinder to outdoor location if this can be done without risk. If leak is
in container or container valve, contact the appropriate emergency telephone number in Section 1 or call your closest Linde location.
Methods for Cleaning Up Return cylinder to Linde or an authorized distributor.

7. HANDLING AND STORAGE

Handling Use only in ventilated areas. Never attempt to lift a cylinder by its valve protection cap. Protect cylinders from physical damage; do not drag, roll, slide or drop. When moving cylinders, even for short distance, use a cart designed to transport cylinders. Use equipment rated for cylinder pressure. Use backflow preventive device in piping. Never insert an object (e.g. wrench, screwdriver, pry bar,etc.) into valve cap openings. Doing so may damage valve, causing leak to occur.
Use an adjustable strap wrench to remove over-tight or rusted caps. Close valve after each use and when empty. If user experiences any difficulty operating cylinder valve discontinue use and contact supplier.
Never put cylinders into trunks of cars or unventilated areas of passenger vehicles. Never attempt to refill a compressed gas cylinder without the owner's written consent. Never strike an arc on a compressed gas cylinder or make a cylinder a part of an electrical circuit.
For additional recommendations consult Compressed Gas Association's (CGA) Safety Bulletin SB-2, Oxygen-Deficient Atmospheres.
For additional handling recommendations, consult Compressed Gas Association's pamphlets P-1, G-10.1, P-8.1, P-8.2, P-9, P-16, P-18, and Safety Bulletin SB-2.
NITROGEN, GAS , Material Safety Data Sheet **,** Revision Date 24-Sep-2013 **,** Page 4 / 8

Storage Protect from physical damage. Cylinders should be stored upright with valve protection cap in place and firmly secured to prevent falling. Store in cool, dry, well-ventilated area of non-combustible construction away from heavily trafficked areas and emergency exits. Keep at temperatures below 52°C / 125°F. Full and empty cylinders should be segregrated. Use a "first in-first out" inventory system to prevent full cylinders from being stored for excessive periods of time. Always store and

handle compressed gas cylinders in accordance with Compressed Gas Association, pamphlet CGA-P1, Safe Handling of Compressed Gases in Containers.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines This product does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.
Engineering Measures Showers. Eyewash stations. Ventilation systems. Local exhaust ventilation to prevent accumulation
of high concentrations and maintain air-oxygen levels at or above 19.5%.
Ventilation Ensure adequate ventilation, especially in confined areas.
Personal Protective Equipment
Eye/Face Protection If splashes are likely to occur, wear: Goggles. Face-shield.
Skin and Body Protection Wear cold insulating gloves when handling liquid. Work gloves and safety shoes are recommended
when handling cylinders.
Respiratory Protection
General Use No special protective equipment required.
Emergency Use Use positive pressure airline respirator with escape cylinder or self contained breathing apparatus for oxygen-deficient atmospheres (<19.5%).
Hygiene Measures Wear suitable gloves and eye/face protection.

10. STABILITY AND REACTIVITY

9. PHYSICAL AND CHEMICAL PROPERTIES

-195.8 °C / -320.4 °F
Appearance
Freezing Point -209.9 °C / -345.9 °F **Molecular Weight** 28.01
Odor Threshold
Water Solubility Very slight
No information available
Evaporation Rate No information available
Colorless.
Vapor Pressure No data available. **Vapor Density** 0.97 (air = 1)
Physical State
Gas Density 0.072 lb/ft³ (1.153 kg/m³) (@
21.1°C)
Compressed gas
VOC Content (%) Not applicable.
Specific Vol.@21.1°C & 1 atm 13.8 ft³/lb (0.867 m³/kg) **Critical Pressure** 492.9 psia (3399 kPa abs)
Flash Point No information available. **Autoignition Temperature** No information available.
Odor
Decomposition Temperature No information available.
Odorless.
Boiling Point/Boiling Range
Lower Not applicable
Upper Not applicable
Flammability Limits in Air
NITROGEN, GAS , Material Safety Data Sheet **,** Revision Date 24-Sep-2013 **,** Page 5 / 8

Stability Stable.
Incompatible Products None known.
Conditions to Avoid None known.
Hazardous Decomposition Products None known.
Hazardous Polymerization Hazardous polymerization does not occur.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity
LD50 Oral: No information available.
LD50 Dermal: No information available.
LC50 Inhalation: No information available.
Inhalation Product is a simple asphyxiant.
Repeated Dose Toxicity No information available.
Chronic Toxicity
Chronic Toxicity None known.
Carcinogenicity Contains no ingredient listed as a carcinogen.
Irritation No information available.
Sensitization No information available.
Reproductive Toxicity No information available.
Developmental Toxicity Oxygen deficiency during pregnancy has produced developmental abnormalities in humans and
experimental animals.
Synergistic Materials None known.
Target Organ Effects None known.

12. ECOLOGICAL INFORMATION

Ecotoxicity
The environmental impact of this product has not been fully investigated.
Ozone depletion potential; ODP; (R-11 = 1): Does not contain ozone depleting chemical (40 CFR Part 82).
NITROGEN, GAS , Material Safety Data Sheet **,** Revision Date 24-Sep-2013 **,** Page 6 / 8

13. DISPOSAL CONSIDERATIONS

Waste Disposal Methods Do not attempt to dispose of residual waste or unused quantities. Return in the shipping container
PROPERLY LABELED WITH ANY VALVE OUTLET PLUGS OR CAPS SECURED AND VALVE PROTECTION CAP IN PLACE to Linde for proper disposal.

14. TRANSPORT INFORMATION

DOT
Proper shipping name Nitrogen, compressed
Hazard Class 2.2
Subsidiary Class None
UN-Number UN1066
Description UN1066,Nitrogen, compressed,2.2
Emergency Response Guide Number 121
TDG
Proper Shipping Name Nitrogen, compressed
Hazard Class 2.2
UN-Number UN1066
Description UN1066,NITROGEN, COMPRESSED,2.2
MEX
Proper Shipping Name Nitrogen, compressed
Hazard Class 2.2
UN-Number UN1066
Description UN1066, Nitrogen, compressed,2.2
IATA
UN-Number UN1066
Proper Shipping Name Nitrogen, compressed
Hazard Class 2.2
ERG Code 2L
Description UN1066,Nitrogen, compressed,2.2

Maximum Quantity for Passenger 75 kg
Maximum Quantity for Cargo Only 150 kg
Limited Quantity No information available.
IMDG/IMO
Proper Shipping Name Nitrogen, compressed
Hazard Class 2.2
UN-Number UN1066
EmS No. F-C, S-V
Description UN1066, Nitrogen, compressed,2.2
ADR
Proper Shipping Name Nitrogen, compressed
Hazard Class 2.2
UN-Number UN1066
Classification Code 1A
NITROGEN, GAS , Material Safety Data Sheet **,** Revision Date 24-Sep-2013 **,** Page 7 / 8

Description UN1066, Nitrogen, compressed,2.2

15. REGULATORY INFORMATION

International Inventories
Legend
U.S. Federal Regulations
SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any
chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.
SARA 311/312 Hazard Categories
Acute Health Hazard No
Chronic Health Hazard No
Fire Hazard No
Sudden Release of Pressure Hazard Yes
Reactive Hazard No
Clean Water Act
This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).
Risk and Process Safety Management Programs
This material, as supplied, does not contain any regulated substances with specified thresholds under 40 CFR Part 68.
This product does not contain any substances regulated as Highly Hazardous Chemicals pursuant to the 29 CFR Part 1910.110.
Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61)
This product does not contain any substances regulated as hazardous air pollutants (HAPS) under Section 112 of the Clean Air Act
Amendments of 1990.
CERCLA/SARA
This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental
Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR
355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.
U.S. State Regulations
California Proposition 65

This product does not contain any Proposition 65 chemicals.
EINECS/ELINCS
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
Complies
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances
TSCA Complies
DSL Complies
NITROGEN, GAS , Material Safety Data Sheet **,** Revision Date 24-Sep-2013 **,** Page 8 / 8

U.S. State Right-to-Know Regulations
Chemical Name Massachusetts New Jersey Pennsylvania Illinois Rhode Island
Nitrogen X X X - X
International Regulations
Canada
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS
contains all the information required by the CPR.
WHMIS Hazard Class
A Compressed gases
Prepared By Product Stewardship
23 British American Blvd.
Latham, NY 12110
1-800-572-6501
Issuing Date 05-Mar-2010
Revision Date 24-Sep-2013
Revision Number 2
Revision Note Not applicable.
Note: Ratings were assigned in accordance with Compressed Gas Association (CGA) guidelines as published in CGA Pamphlet P-19-2009,
CGA Recommended Hazard Ratings for Compressed Gases, 3rd Edition.
General Disclaimer
For terms and conditions, including limitation of liability, please refer to the purchase agreement in effect between Linde LLC, Linde Merchant
Production, Inc. or Linde Gas North America LLC (or any of their affiliates and subsidiaries) and the purchaser.
DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES
Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the
accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user's
intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their
particular purpose(s).
End of Safety Data Sheet
Personal Protection -
NFPA Physical and Chemical
Hazards Simple asphyxiant
Health Hazard 0
HMIS Health Hazard 0
Flammability 0
Flammability 0 **Physical Hazard** 3
Stability 0

Material Safety Data Sheet
MSDS Revision Date: 12/17/2007
Page 1 of 7

BRENNTAG

1. Product Identification

Product Identity: Ammonium Hydroxide Solutions (10%-30%)
Molecular Weight: 35.05 (NH4OH)
Chemical Formula: NH4OH + H2O

Technical Information: 270-830-1200
Emergency Number: 800-424-9300
(CHEMTREC)

Synonyms: Aqua Ammonia greater than 10% and less than 30%; Aqua ammonia 15.8 to 26°Be.(all grades)

Distributed By Brenntag

Brenntag Great Lakes LLC.
4420 N. Harley Davidson Ave
Wauwatosa, WI 53225

Brenntag Mid-South Inc.
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Brenntag Northeast, Inc.
81 West Huller Lane
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Brenntag Southeast, Inc.
2000 East Pettigrew Street
Durham, NC 27703

Brenntag Southwest, Inc.
610 Fisher Road
Longview, TX 75604

Brenntag Pacific, Inc.
10747 Patterson Place
Santa Fe Springs, CA 90670

2. Hazards Identification

Emergency Overview

DANGER!
POISON! DANGER! CORROSIVE, ALKALINE SOLUTION. CAUSES BURNS TO ANY AREA OF CONTACT. HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN.

Potential Health Effects

Inhalation:

Exposure by inhalation can cause irritation of the nose, throat, and mucous membranes. Exposure to high concentrations of ammonia vapor (above approximately 2500ppm) is life threatening, causing severe damage to the respiratory tract and resulting in bronchitis Chemical pneumonitis, and pulmonary edema, which can be fatal. Chronic exposure to ammonia can cause respiratory irritation and damage

Skin Contact:

Skin contact can result in severe irritation, blister formation and burns; contact with the liquid results in cryogenic burns as well.

Eye Contact:

Eye contact with ammonia vapor is severely irritating, and exposure of the eyes to ammonium hydroxide can result in serious damage and may cause permanent eye injury and blindness. Tearing or edema may occur.

3. Composition/Information on Ingredients

CAS#	Chemical Name	Percent by Weight
1336-21-6	Ammonium Hydroxide	10-30%
7732-18-5	Water	70-90

4. First Aid Measures

Inhalation:

If a person breathes in chemical, remove exposed person promptly to fresh air. If breathing has stopped, perform artificial respiration. Oxygen should be provided for a person having difficulty breathing (but only administered by an authorized individual) until the person is able to breath easily by themselves. Keep the affected person warm and at rest. Get medical attention as soon as possible.

.

Ingestion:

If conscious, give large amounts of water. DO NOT induce vomiting. Get medical attention immediately. If vomiting occurs spontaneously, keep head below hips. May drink orange juice or diluted vinger (1: 4) to counteract ammonia.

Skin Contact:

Promptly wash the contaminated skin using soap or mild detergent and water. If chemical, or solution containing chemical, soaks through clothing, remove the clothing promptly and wash the skin using soap or mild detergent and water. Medical attention should be given as soon as possible for all burns, regardless of how minor they seem.

Eye Contact:

Flush eyes with large amounts of water, lifting the upper and lower lids at periodic intervals to insure contact of water with all accessible tissue of the eyes and lids. Medical attention should be given as soon as possible, preferably an eye specialist.

5. Fire Fighting Measures

Go to Section 9 for Flammable Properties.

Fire:

Not considered to be a fire hazard. The mixture will not burn, but escaping ammonia gas can burn in the range of 16-25% in air.
LEL / UEL = 15 – 28%

Explosion:

Not considered to be an explosion hazard. When heated, will give off ammonia gas. Ammonia increases the fire hazards from other combustible materials, including oil. Flammable limits are broadened by increasing temperature. Ammonia vapor in the rate of 16 - 25% in air can explode on contact with ignition sources. Closed containers exposed to extreme heat may build up pressure and rupture violently. Combustion of released ammonia may form nitrogen oxides.

Fire Extinguishing Media:

Use any means suitable for extinguishing surrounding fire. Water spray or fog may be used for escaping ammonia gas and to cool ammonia containers.

Special Considerations:

Firefighters should avoid all bodily contact; wear full protective clothing and self-contained breathing apparatus in positive pressure mode. When this product is heated to combustion it will release ammonia which could form nitrogen oxides.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment. Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate fumes. Use copious amounts of water spray or fog to absorb the evolved gas. Stay upwind when containers are threatened. Contain spill and runoff from entering drains, sewers, and water systems by utilizing methods such as diking, containment, and absorption. 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.

7. Handling and Storage

Keep containers tightly closed. Store in a cool, dry place. Use only with adequate ventilation, dust mask or self-contained breathing apparatus. Protective clothing should always be worn. Avoid contact with eyes, skin, and clothing. Keep container closed when not in use. Avoid breathing mist. Do not get on skin, clothing, or in eyes. Wash off with water. Do not take internally. Open container slowly in case of pressure build-up. Ammonia hydroxide will react exothermically with acid.

8. Exposure Controls/Personal Protection

OSHA Permissible Exposure Limit (PEL): 35 ppm (STEL)

ACGIH Threshold Limit Value (TLV): 25 PPM (TLV) 35 PPM (STEL)

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 and engineering controls are not feasible, a full-face piece particulate respirator (NIOSH type NI00 filters) may be worn for 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-face piece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Impervious rubber or neoprene gloves should be worn. Protective, impervious clothing should be worn in presence to prevent contact with skin (coveralls, boots, etc.).

Eye Protection:

Splash-proof goggles and full face shield should be worn when there is danger of splash from solution containing chemical. Protection against splash or mist from solution containing chemical with 8-inch minimum face shield is recommended. Eye protection should be worn in presence of solution containing chemical, at all times. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:	Clear colorless liquid
Odor:	strong pungent (ammonia) odor
Physical State:	liquid
PH of water solutions:	13+
Melting Point:	N/A
Boiling Point:	27.8 - 59.5℃ (82-139F)
Flash Point:	N/A
Upper Explosive Limit:	N/A
Lower Explosive Limit:	N/A
Vapor Pressure:	(60F) 420 – 475 FOR 29.7% NH3
Vapor Density:	0.596
Specific Gravity:	*0.89-0.96*
Solubility in Water:	100% Soluble in Water

10. Stability and Reactivity

Chemical Stability: Stable under normal conditions of use and storage.

Conditions to Avoid: Heat, exposure to high temperature should be minimized. This material should avoid direct sunlight.

Incompatible Materials: Contact with strong acids and alkalis, chlorine bleach, halogems, strong hydroxide, iron, reactive metals, mercury, gold, silver and strong oxidizers.

Hazardous Decomposition Products: Hydrogen and nitrogen gases. Gaseous ammonia upon heating.

11. Toxicological Information

LD50 Inhalation Rat: 2000 ppm/4hr
LD50 Oral Rat: 350 mg/kg
LD50 Oral mouse: 4837mg/kg

Acute: POISON! DANGER! CORROSIVE, ALKALINE SOLUTION. CAUSES BURNS TO ANY AREA OF CONTACT. HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN.

Exposure by inhalation can cause irritation of the nose, throat, and mucous membranes.
Exposure to high concentrations of ammonia vapor (above approximately 2500ppm) is life threatening, causing severe damage to the respiratory tract and resulting in bronchitis
Chemical pneumonitis, and pulmonary edema, which can be fatal
Chronic exposure to ammonia can cause respiratory irritation and damage
Ingestion of ammonium hydroxide burns the mouth, throat, and gastrointestinal tract and can lead to severe abdominal pain, nausea, vomiting, and collapse. Ingestion of as little as 3-4 ml of ammonium hydroxide may be fatal.
Skin contact can result in severe irritation and burns; contact with the liquid results in cryogenic burns as well.
Eye contact with ammonia vapor is severely irritating, and exposure of the eyes to ammonium hydroxide can result in serious damage and may cause permanent eye injury and blindness.

Chronic: Ingestion of as little as 3-4 ml of ammonia hydroxide may be fatal. Investigated as a tumorigen and mutagen.

12. Ecological Information

ENVIRONMENTAL FATE: No data found

ENVIRONMENTAL TOXICITY: LC50 Daphnia magna 0.66 mg/l/48 hr 22℃; LC50 Perch 0.29 mg/l/7days/un-ionized NH3; LC50 Salmon gairdnerli 8 ug/ml NH3/24 hr

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal 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

US DOT (ground)
Proper Shipping Name: Ammonia Solution
Hazard Class: 8
UN/NA: UN2672
Packing Group: III
Marine Pollutant: No
RQ Amount: 1,000 lbs

IMDG (water)
Proper Shipping Name: Ammonia Solution

Hazard Class: 8
UN/NA: UN2672
Packing Group: III
Marine Pollutant: No
RQ Amount: 1,000 lbs

15. Regulatory Information

SARA 302	SARA 304	SARA 313	CERCLA	TSCA Inventory
Not Listed	Not Listed	Not Listed	Listed 1,000lbs	Yes

California Proposition 65
Not Listed

16. Other Information

This MSDS is provided as an information resource only. It should not be taken as a warranty or representation for which Brenntag assumes legal liability. While Brenntag believes the information contained herein is accurate and compiled from sources believed to be reliable, it is the responsibility of the user to investigate and verify its identity. The buyer assumes all responsibility for using and handling the product in accordance with applicable federal, state, and local regulations.

Distributed By Brenntag

Brenntag Great Lakes LLC.
4420 N. Harley Davidson Ave
Wauwatosa, WI 53225

Brenntag Mid-South Inc.
1405 Hwy 136 W
Henderson, KY 42420

Brenntag Northeast, Inc.
81 West Huller Lane
Reading, PA 19605

Brenntag Southeast, Inc.
2000 East Pettigrew Street
Durham, NC 27703

Brenntag Southwest, Inc.
610 Fisher Road
Longview, TX 75604

Brenntag Pacific, Inc.
10747 Patterson Place
Santa Fe Springs, CA
90670

SOLUTION-SPECIFIC PHYSICAL DATA

	20.5° Baume	25° Baume	26° Baume
AMMONIA %	18.5-19.5%	26.5-27.5%	29.0-29.9%
WATER %	81.5-80.5%	73.5-72.5%	71.0-70.1%
SPECIFIC GRAVITY	0.9341-09276 @60F	0.9061-9032@60F	0.8974-0.8960@60F
BOILING POINT	124°F@14.7psis	88°F @14.7psis	84.9°F @14.7psis
VAPOR PRESSURE	3.9 psis @ 60°F	6.9 @ 60°F	9.1 @ 60°F
APPROX. FREEZING POINT	-32°F	-89°F	-110°F

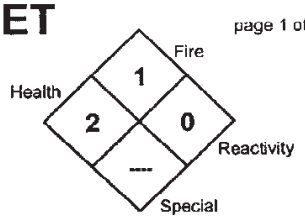
MATERIAL SAFETY DATA SHEET

BRENNTAG

Brenntag MSDS #:	BPI-00180
MSDS Revision/Issue Date:	07/26/07
Supercedes Revision Date:	New

NFPA 704 DESIGNATION
HAZARD RATING

4=Extreme
3=High
2=Moderate
1=Slight
0=Insignificant



1. CHEMICAL PRODUCT IDENTIFICATION & COMPANY IDENTIFICATION

PRODUCT IDENTIFIER: Citric Acid 50% Solution (All Grades)

GENERAL USE: Used as an acidulant in beverages, to adjust the pH of foods, as synergistic antioxidant in processing cheese, as a foam inhibitor, and as a sequestering agent to remove trace metals.

PRODUCT DESCRIPTION: An aqueous solution of an aliphatic acid. Synonyms include: beta-hydroxytricarboxylic acid, and 2-hydroxy-1,2,3-propanetricarboxylic acid.

INFORMATION PROVIDED BY:
Brenntag Pacific, Inc.
5700 N.W. Front Avenue
Portland, OR 97210

For MSDS call: PHONE: 503-242-0200

EMERGENCY PHONE NUMBERS

BRENNTAG:	503-699-7055
CHEMTREC:	800-424-9300
CANUTEC:	613-996-6666

2. COMPOSITION & INFORMATION ON INGREDIENTS

COMPONENT	CAS #	OSHA HAZARD	WT %	ACGIH TLV(TWA)	ACGIH STEL	OSHA PEL(TWA)	OSHA STEL
Citric Acid	77-92-9	Severe Eye & Respiratory Irritant; Skin Irritant	50 ± 2	None	None	None	None

NDA = No Data Available N/A = Not Applicable

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: A clear, colorless to light yellow, strongly acidic liquid having no characteristic odor. This product can cause severe irritation or burns to the eyes. It may cause moderate to severe irritation to the skin and respiratory tract.

POTENTIAL HEALTH EFFECTS

INHALATION: Inhalation of mists or aerosols may cause severe irritation to the nose, mouth, throat, mucous membranes and lungs. Symptoms of exposure may include sneezing, coughing, chest discomfort or pain and shortness of breath. Inhalation of high mist concentrations may result in permanent lung damage.

EYE CONTACT: Exposure to the mists or liquid can cause severe eye irritation. Symptoms of exposure may include tearing, redness, swelling and a painful burning sensation. Corneal damage with impairment of vision may result from direct contact with the liquid, unless promptly treated.

SKIN CONTACT: Exposure to the mists or liquid may cause moderate to severe skin irritation. Symptoms of exposure may include redness, swelling, a stinging sensation and/or pain. No published reports indicate this product is absorbed through the skin.

INGESTION: Ingestion may cause moderate to severe irritation to the mouth, throat and the entire gastrointestinal tract, including the stomach and intestines, characterized by nausea, vomiting, diarrhea, abdominal pain, possible bleeding and/or tissue ulceration.

CHRONIC: The chronic health effects of exposure to this product are expected to be the same as for acute exposure.

4. FIRST AID MEASURES

INHALATION: If inhaled, immediately move to fresh air. If not breathing, give artificial respiration. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; use the Holger Nielsen method (back pressure-arm lift) or proper respiratory device. If breathing is difficult, give oxygen. Call a physician.

EYE CONTACT: In case of contact, immediately flush eyes with plenty of clean running water for at least 15 minutes, lifting the upper and lower lids occasionally. Remove contact lenses, if worn. Get medical attention immediately.

SKIN CONTACT: In case of contact, immediately flush skin with plenty of clean running water for at least 15 minutes, while removing contaminated clothing and shoes. Then wash with soap and water. If burn or irritation occurs, call a physician.

INGESTION: If swallowed, DO NOT induce vomiting. Get medical attention immediately. If victim is fully conscious, give plenty of water to drink. Never give anything by mouth to an unconscious person.

NOTE TO PHYSICIANS: Treat exposure symptomatically.

5. FIRE FIGHTING MEASURES

Flashpoint and Method: This product does not flash.

Flammable Limits (in air, % by volume) **Lower:** Not applicable **Upper:** Not applicable

Autoignition Temperature: Not applicable

GENERAL HAZARD: This product is an aqueous solution of a non-volatile organic acid having no characteristic odor. The Uniform Fire Code health hazard classification for this product is: **Irritant**. When in contact with some soft metals (i.e. Aluminum), this product can corrode the metal, liberating flammable / explosive Hydrogen gas. This product may produce hazardous mists or hazardous decomposition products.

FIRE FIGHTING INSTRUCTIONS: **EXTINGUISHING MEDIA:** Water fog, CO_2 foam or dry chemicals. Use the extinguishing media that is appropriate to the surrounding fire.

FIRE FIGHTING EQUIPMENT: Fire fighters should wear full protective equipment, including self-contained breathing apparatus.

HAZARDOUS COMBUSTION PRODUCTS: When heated to dryness and decomposition, it emits toxic carbon monoxide and carbon dioxide plus dense, irritating smoke.

6. ACCIDENTAL RELEASE MEASURES

LAND SPILL: Wearing recommended protective equipment and clothing, dike spill using soil, sand or compatible commercial absorbent. Pick up bulk of liquid using pumps or vacuum truck or absorb liquid in sand or commercial absorbent. Place in approved containers for recovery, disposal or satellite accumulation. Neutralize the acidity using soda ash, lime or a suitable agent appropriate for neutralizing acidic liquids. Flush the spill area with water; collect rinsates for disposal or sewer, as appropriate.

WATER SPILL: Wear recommended protective equipment and clothing if contact with hazardous material can occur. Stop or divert water flow. Dike contaminated water and remove for disposal and/or treatment. As appropriate, notify all downstream users of possible contamination.

7. HANDLING AND STORAGE

STORAGE TEMPERATURE: Ambient **STORAGE PRESSURE:** Ambient

GENERAL: Store in a cool, dry, well-ventilated area away from incompatible materials and products. Avoid getting this product in eyes, on skin or on clothing. Wear the recommended personnel protective equipment. Avoid breathing mists or aerosols. Use with adequate ventilation. Keep the container tightly closed when not in use. Wash thoroughly after handling this product.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

CONTROL MEASURES: Use a local or general, mechanical exhaust ventilation system capable of maintaining mist levels, in the work area, below any level, which may be irritating.

RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

RESPIRATOR: If use causes an irritating mist, wear a NIOSH-approved respirator equipped with a good mist / particulate cartridge or supplied air.

EYES: Wear chemical goggles (recommended by ANSI Z87.1-1979).

GLOVES: Wear Nitrile, Neoprene, Butyl Rubber, Viton or Natural Rubber gloves.

CLOTHING & EQUIPMENT: Wear a Nitrile, Neoprene, Butyl Rubber or Natural Rubber apron when handling this product. An eye wash station and safety shower should be available in the work area.

FOOTWEAR: Wear Nitrile, Neoprene, Butyl Rubber or Natural Rubber boots, if contact is likely.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear, colorless to light yellow	**Bulk Density (pounds/ft³):**	Not applicable
Physical State:	Liquid	**Vapor Pressure:**	No data available
Odor:	No characteristic	**Vapor Density (air=1):**	No data available
Odor Threshold:	No data available	**Evaporation Rate (n-Butyl Acetate=1):**	No data available
Molecular Formula:	$C_6H_8O_7$ (in water)	**VOC Content:**	Not applicable
Molecular Weight:	192.14 (in water)	**% Volatile:**	Approximately 50
Boiling Point:	Approximately 104° C. (219° F.)	**Solubility in H_2O:**	Complete
Freezing/Melting Point:	Less than 0° C. (32° F.)	**Octanol/Water Partition Coefficient:**	No data available
Specific Gravity:	Approximately 1.22 @ 20° C.	**pH (as is):**	1.5 – 2.0
Density (pounds/gallon):	Approximately 10.2	**pH (1% solution):**	2.0 – 2.5

10. STABILITY AND REACTIVITY

GENERAL: This product is stable and hazardous polymerization will not occur.

CONDITIONS TO AVOID: Hot storage.

INCOMPATIBLE MATERIAL: Strong oxidizers, caustics & alkali, chlorine releasers, sulfides, sulfites, cyanides, Aluminum, Magnesium, Zinc and alloys of these metals.

HAZARDOUS DECOMPOSITION PRODUCTS: When heated to dryness and decomposition, it emits toxic oxides of carbon plus dense, irritating smoke.

SENSITIVITY TO MECHANICAL IMPACT: This product is not sensitive to mechanical impact.

SENSITIVITY TO STATIC DISCHARGE: This product is not sensitive to static discharge.

PRODUCT IDENTIFIER: **Citric Acid 50% Solution (All Grades)**

11. TOXICOLOGICAL INFORMATION

Components:	Citric Acid
Eye Contact:	Rabbit: 750 ug/24 Hours; Severe
Skin Contact:	Rabbit: 500 mg/24 Hours; Moderate
Oral Rat LD_{50}:	3 gm/kg
Dermal Rabbit LD_{50}:	No data available
Inhalation Rat LC_{50}:	No data available
Human Data:	No data available
Other Toxicological Data:	Intravenous Mouse LD_{50}: 42 mg/kg
Carcinogenicity:	No data available
Teratogenicity:	No data available
Mutagenicity:	No data available
Synergistic Products:	None reported
Target Organs:	Eyes, Skin, Mucous membranes, Lungs & Teeth
Medical Conditions Aggravated By Exposure:	Skin or Respiratory disorders

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE:

The environmental fate of this product is expected to be: **Land:** biodegradation with some leaching into the groundwater. **Water:** biodegradation. **Air:** not expected to volatilize due to low vapor pressure. This product is not expected to bioaccumulate.

ENVIRONMENTAL CONSIDERATIONS:

The aquatic toxicity of this product has not been determined. However the aquatic toxicity of pure Citric Acid is: Goldfish LD_0: 625 mg/liter, longtime exposure in hard water. Goldfish LD_{100}: 894 mg/liter, longtime exposure in hard water.

13. DISPOSAL CONSIDERATIONS

RCRA 40 CFR 261 CLASSIFICATON: Corrosive Waste

U.S. EPA WASTE NUMBER/DESCRIPTION: D002

If this product is disposed of as shipped, it meets the criteria of a hazardous waste as defined under 40 CFR 261 due to its corrosivity. If this product becomes a waste, it will be a hazardous waste which is subject to the Land Disposal Restrictions under 40 CFR 268 and must be managed accordingly. As a hazardous liquid waste, it must be disposed of in accordance with local, state and federal regulations in a permitted hazardous waste treatment, storage and disposal facility.

14. TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME: **Not Restricted (See Other Shipping Information)**

Hazard Class: Not applicable **UN Number:** Not applicable **Packing Group:** Not applicable

Primary Label: None Required **Subsidiary Label(s):** None Required

Primary/Subsidiary Placards: None Required

DOT Reportable Quantity (RQ): Not listed **RQ for Product:** Not applicable

Marine Pollutant: No

2004 North American Emergency Response Guidebook No.: **Not applicable (in U.S.); 154 (Outside U.S.)**

TDG PROPER SHIPPING NAME: **CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.** (Contains Citric Acid)

Hazard Class: 8 **UN Number:** UN3265 **Packing Group:** III

Primary Label: Corrosive **Subsidiary Label(s):** None Required

Primary/Subsidiary Placards: Corrosive

TDG Reportable Quantity (RQ): # At least 5 kg or 5 liters.

TDG Schedule XII: Not listed

Regulated Limit (RL): ## Not listed **RL for Product:** Not applicable

Other Shipping Information: DOT exception taken for materials only corrosive to Aluminum and mild steel; 49 CFR 173.154 (d) (1) and (2), when shipped by ground.

Canadian Transportation of Dangerous Goods Regulations (TDGR), Part IX, Table I, Quantities or levels for Immediate Reporting: releases of reportable quantities, RQ, that meet the definition of a "dangerous occurrence" (a threat to life, health, property, or the environment) must be reported to the appropriate authorities as outlined in TDGR 9.13(1) and 9.14(1).

Reporting to Environment Canada is required for any releases exceeding the regulated limits, RL, of 9.2 materials (primary or secondary). The regulated limits are found in Schedule XIII of the TDGR.

PRODUCT IDENTIFIER: **Citric Acid 50% Solution (All Grades)**

15. REGULATORY INFORMATION

COMPONENTS: Citric Acid

OSHA Target Organs: Eyes, Skin, Mucous membranes, Lungs & Teeth

Carcinogenic Potential:

- **Regulated by OSHA:** No
- **Listed on NTP Report:** No
- **Listed by IARC:** No
- IARC Group: Not applicable
- **ACGIH Appendix A:** Not listed
- A1 Confirmed Human: Not applicable
- A2 Suspected Human: Not applicable

U.S. EPA Requirements

Release Reporting

CERCLA (40 CFR 302)

- **Listed Substance:** Not listed
- Reportable Quantity: Not applicable
- Category: Not applicable
- RCRA Waste No.: Not applicable
- **Unlisted Substance:** Yes
- Reportable Quantity: 100 pounds
- Characteristic: Corrosivity
- RCRA Waste No.: D002

SARA TITLE III

Section 302 & 303 (40 CFR 355):

- **Listed Substance:** Not listed
- Reportable Quantity: Not applicable
- Planning Threshold: Not applicable

Section 311 & 312 (40 CFR 370):

- Hazard Categories (product): **Fire: N** **Sudden Release of Pressure: N** **Reactive: N** **Acute Health: Y** **Chronic Health: N**
- Planning threshold: 10,000 pounds

Section 313 (40 CFR 372):

- **Listed Toxic Chemical:** Not listed
- Reporting Threshold: Not applicable

U.S. TSCA Status

- **Listed** (40 CFR 710): Yes

State Regulations

State of California: Safe Drinking Water and Toxins Enforcement Act, 1986 (Proposition 65):

- Carcinogen: No
- Reproductive Toxin: No

Other Regulations

- **State Right To Know Laws:** None known

Canadian Regulations

Product Information:

- Controlled Product: **Yes**
- WHMIS Hazard Symbols: **Corrosive Material**
- WHMIS Class & Division: **E**

Ingredient Information:

- IDL Substance: Yes
- DSL or NDSL Lists: DSL

PRODUCT IDENTIFIER: **Citric Acid 50% Solution (All Grades)**

16. OTHER INFORMATION

EPA Registration number: Not applicable

Approved Product Uses: Not applicable

Special Notes:

This product does not contain any material, which the State of California has found to cause cancer and/or birth defects or other reproductive harm.

Special Instructions:

When making solutions, always add this product to water with adequate mixing to ensure a uniform solution.

Do not mix this product with strong caustic or alkaline solutions as violent boiling or spattering may result.

Do not add Citric Acid 50% Solution to hypochlorite bleaches, chlorine sanitizers or chlorinated cleaners as this liberates toxic, corrosive Chlorine gas.

MSDS Revision Information: Information Revised This Issue Date: **New MSDS format with additional information.**

Form Revision made 2/03/06

MSDS Distributed by: Brenntag Pacific, Inc.

NW Environmental Department

Phone: 503-242-0200 FAX: 503-412-3390

Prepared By:	Edward Doheny	Date Prepared:	July 26, 2007

This Material Safety Data Sheet is provided as an information resource only. It should not be taken as a warranty or representation for which Brenntag Pacific, Inc. assumes legal responsibility. While Brenntag Pacific, Inc. believes the information contained herein is accurate and compiled from sources believed to be reliable, it is the responsibility of the user to investigate and verify its validity. The buyer assumes all responsibility of using and handling the product in accordance with applicable federal, state, and local regulations.

Monday, October 28, 2013

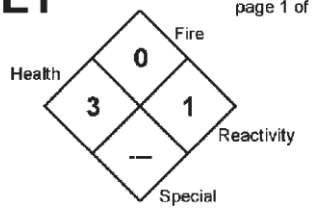
MATERIAL SAFETY DATA SHEET

BRENNTAG

Brenntag MSDS #:	BPI-00182
MSDS Revision/Issue Date:	07/31/07
Supercedes Revision Date:	New

NFPA 704 DESIGNATION
HAZARD RATING

4=Extreme
3=High
2=Moderate
1=Slight
0=Insignificant



1. CHEMICAL PRODUCT IDENTIFICATION & COMPANY IDENTIFICATION

PRODUCT IDENTIFIER: **Sodium Hydroxide 50% Solution (All Grades)**

GENERAL USE: Used in industry to neutralize acids; to precipitate alkaloids; in metal finishing; in cleaners; and to precipitate most metals (as hydroxides) from aqueous solutions.

PRODUCT DESCRIPTION: An aqueous solution of Sodium Hydroxide. Synonyms for Sodium Hydroxide include: caustic soda, lye soda, sodium hydrate and white caustic.

INFORMATION PROVIDED BY:
Brenntag Pacific, Inc.
5700 N.W. Front Avenue
Portland, OR 97210

For MSDS call: **PHONE: 503-242-0200**

EMERGENCY PHONE NUMBERS

BRENNTAG:	503-699-7055
CHEMTREC:	800-424-9300
CANUTEC:	613-996-6666

2. COMPOSITION & INFORMATION ON INGREDIENTS

				ACGIH		OSHA	
COMPONENT	CAS #	OSHA HAZARD	WT %	$TLV_{(TWA)}$	STEL	$PEL_{(TWA)}$	STEL
Sodium Hydroxide	1310-73-2	Corrosive; Lung Toxin	50 ± 1	None Ceiling: 2 mg/m^3	None	2 mg/m^3	None

NDA = No Data Available N/A = Not Applicable

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: A clear to slightly turbid, colorless liquid having no characteristic odor. The mists and liquid are corrosive to all tissues contacted. Inhalation of mists may cause permanent lung damage. This material reacts with water to release a large amount of heat and can react violently with acids and other substances. **The NIOSH I.D.L.H. for Sodium Hydroxide is: 10 mg/m^3.**

POTENTIAL HEALTH EFFECTS

INHALATION: Inhalation of mists or an aerosol can cause severe irritation or burns to the nose, mouth, throat, mucous membranes and lungs. Symptoms of exposure can include coughing, sneezing, choking, shortness of breath, chest pain and impairment of lung function. Inhalation of a high mist concentration may result in permanent lung damage.

EYE CONTACT: Exposure to the mists or liquid can cause severe eye irritation and/or burns. Symptoms of exposure can include tearing redness, swelling, pain and possible mucous discharge. Exposure may cause corneal damage and/or visual impairment even when prompt treatment is provided.

SKIN CONTACT: Exposure to the mists or liquid can cause severe skin irritation and/or burns. Symptoms of exposure may include redness, swelling, pain and possible ulceration. Prolonged skin exposure to this material may cause destruction of the dermis with impairment of the skin, at site of contact, to regenerate. No published data indicates this material is absorbed through the skin.

INGESTION: Ingestion can cause severe irritation and/or burns to the entire gastrointestinal tract, including the stomach and intestines characterized by nausea, vomiting, abdominal pain, bleeding, tissue ulceration and possible diarrhea.

CHRONIC: The chronic health effects of exposure to this material are expected to be the same as for acute exposure.

4. FIRST AID MEASURES

INHALATION: If inhaled, immediately move to fresh air. If not breathing, give artificial respiration. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; use the Holger Nielsen method (back pressure-arm lift) or proper respiratory device. If breathing is difficult, give oxygen. Call a physician.

EYE CONTACT: In case of contact, immediately flush eyes with plenty of clean running water for at least 15 minutes, lifting the upper and lower lids occasionally. Remove contact lenses, if worn. Get medical attention immediately.

SKIN CONTACT: In case of contact, immediately flush skin with plenty of clean running water for at least 15 minutes, while removing contaminated clothing and shoes. If burn or irritation occurs, call a physician.

INGESTION: If swallowed, DO NOT induce vomiting. Get medical attention immediately. If victim is fully conscious, give plenty of water to drink. Never give anything by mouth to an unconscious person.

NOTE TO PHYSICIANS: Sodium Hydroxide has a relatively low oral toxicity, but it can be corrosive to the eyes, skin and mucous membranes. If ingested, consideration should be given to careful endoscopy as stomach or esophageal burns, perforations or strictures may occur. Careful gastric lavage with an endotracheal tube in place should be considered. Treat exposure symptomatically.

5. FIRE FIGHTING MEASURES

Flashpoint and Method: This material does not flash.

Flammable Limits (in air, % by volume) **Lower:** Not applicable **Upper:** Not applicable

Autoignition Temperature: Not applicable

GENERAL HAZARD: The Uniform Fire Code physical hazard classification for this material is: **Water Reactive, Class I.** Direct contact with water causes an exothermic reaction (generation of heat). The Uniform Fire Code health hazard classification for this material is: **Corrosive (Alkaline).** This material may generate flammable / explosive Hydrogen gas on contact with some soft metals (i.e. Aluminum). This material may produce hazardous decomposition products.

FIRE FIGHTING INSTRUCTIONS: **EXTINGUISHING MEDIA:** Foam, CO_2 or dry chemicals.
If water must be used and it can contact this material, it is best to use a water flood technique.

FIRE FIGHTING EQUIPMENT: Fire fighters should wear full protective equipment, including self-contained breathing apparatus.

HAZARDOUS COMBUSTION PRODUCTS: When heated to dryness and decomposition, it emits toxic sodium oxide.

6. ACCIDENTAL RELEASE MEASURES	
LAND SPILL:	Wearing recommended protective equipment and clothing, dike the spill and pick up the bulk of liquid using pumps or a vacuum truck, or absorb the liquid in sand or a commercial absorbent. Place in approved containers for recovery, disposal, or satellite accumulation. Neutralize the alkalinity, of the remaining liquid, using a dilute acid solution appropriate for neutralizing alkaline liquids. Liberally cover the spill area with sodium bicarbonate. Flush the spill area with water; collect the rinsates for disposal or sewer, as appropriate.
WATER SPILL:	Wear recommended protective equipment and clothing if contact with hazardous material can occur. Stop or divert water flow. Dike contaminated water and remove for disposal and/or treatment. As appropriate, notify all downstream users of possible contamination.

7. HANDLING AND STORAGE

STORAGE TEMPERATURE: Ambient **STORAGE PRESSURE:** Ambient

GENERAL: Store in a cool, dry, well-ventilated area away from incompatible materials and products. Do not get this material in eyes, on skin or on clothing. Wear recommended personnel protective equipment. Do not breathe mists or aerosols. Use only with adequate ventilation. Do not take internally. Keep the container tightly closed when not in use. Wash thoroughly after handling.

This material is corrosive to Aluminum, Magnesium, Tin, Zinc and alloys containing these metals, and it will react violently with these metals in powder form.

Considerable heat is generated when this material is mixed with water. Never add water to this material. Always add this material slowly, with constant stirring, to the surface of cool (40 – 50° F.) water. If this material is added too rapidly, or without stirring, and becomes concentrated at the bottom of the mixing vessel, excessive heat may be generated, resulting in dangerous boiling and spattering, and a possible immediate and violent eruption of a highly caustic solution.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

CONTROL MEASURES: Use a local or general, mechanical exhaust ventilation system capable of maintaining emissions, in the work area, below the OSHA-PEL or ACGIH Ceiling level.

RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

RESPIRATOR: For exposure above the OSHA-PEL or ACGIH-TLV, wear a NIOSH-approved full facepiece or half mask air-purifying cartridge respirator equipped with a good particulate filter cartridge or supplied air. For exposure to Sodium Hydroxide above 10 mg/m^3, wear a supplied air respirator or a self-contained breathing apparatus (SCBA) operated in the positive pressure mode.

EYES: Wear chemical goggles (recommended by ANSI Z87.1-1979), unless a full facepiece respirator is worn.

GLOVES: Wear Neoprene, Nitrile, Butyl Rubber or Natural Rubber gloves.

CLOTHING & EQUIPMENT: Wear a Neoprene, Nitrile, Butyl Rubber or Natural Rubber apron, or full protective clothing when handling this material. An eye wash station and safety shower should be available in the work area.

FOOTWEAR: Wear Neoprene, Nitrile, Butyl Rubber or Natural Rubber boots.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear to slightly turbid, colorless	**Bulk Density (pounds/ft^3):**	Not applicable
Physical State:	Liquid	**Vapor Pressure:**	13 mm Hg @ 60° F.
Odor:	No characteristic	**Vapor Density (air=1):**	No data available
Odor Threshold:	No data available	**Evaporation Rate (n-Butyl Acetate=1):**	No data available
Molecular Formula:	NaOH (in water)	**VOC Content:**	Nil
Molecular Weight:	40.00 (in water)	**% Volatile:**	49 – 51
Boiling Point:	Approximately 142.2° C. (288° F.)	**Solubility in H_2O:**	Complete
Freezing/Melting Point:	Approximately 12.2° C. (54° F.)	**Octanol/Water Partition Coefficient:**	No data available
Specific Gravity:	Approximately 1.525 @ 20° C.	**pH (as is):**	14.0
Density (pounds/gallon):	Approximately 12.72	**pH (1% solution):**	13.0 to 14.0