

TA-35



*Risk Reduction & Environmental Stewardship Division*  
*Water Quality & Hydrology Group (RRES-WQH)*  
PO Box 1663, MS K497  
Los Alamos, New Mexico 87545  
(505) 667-7969/Fax: (505) 665-9344

Date: July 16, 2002  
Refer to: RRES-WQH: 02-273

TA-35

Mr. Curt Frischkorn  
Pollution Prevention Section  
Ground Water Quality Bureau  
New Mexico Environment Department  
P.O. Box 26110  
Santa Fe, New Mexico 87502

**SUBJECT: NOTICE OF INTENT TO DISCHARGE, HYDROGEOLOGIC WORKPLAN WELLS**

Dear Mr. Frischkorn:

At our July 11, 2002, meeting at your Santa Fe office (Attendees: Mike Saladen (RRES-WQH), Roy Bohn (RRES-R), Bob Beers (RRES-WQH), John Young (NMED-HWB), and Curt Frischkorn (NMED-GWQB)), we reviewed the Notice of Intent to Discharge (NOI) submitted by Los Alamos National Laboratory to your agency on August 2, 2001, for the Hydrogeologic Workplan Wells. In addition to our general review of the NOI, we discussed the Laboratory's immediate need to discharge approximately 50,000 gallons of containerized drilling fluid from Hydrogeologic Workplan Well R-14. I have addressed both of these topics below.

It was my understanding from our July 11<sup>th</sup> meeting that both you and Mr. Young were satisfied with the Laboratory's NOI for the Hydrogeologic Workplan Wells with the exception of the NOI Decision Tree (Figure 1.0). Per your request, attached is a revised NOI Decision Tree that incorporates a reference to applicable RCRA regulatory limits' into the decision process. In addition, it was also my understanding that your agency would not require a ground water discharge plan for the discharge of drilling fluid, development water, and purge water from Hydrogeologic Workplan Wells as long as all discharges were compliant with the terms and conditions of the NOI.

In addition to our general discussions about the Hydrogeologic Workplan NOI, we discussed the discharge of approximately 50,000 gallons of containerized drilling fluid produced during the drilling of Hydrogeologic Workplan Well R-14. Per your request, please find the following enclosed water quality data and Material Safety Data Sheets (MSDSs) for the drilling fluid produced from R-14.



**Water Quality Data.** Attachment 1.0 contains water quality data (metals, general chemistry, SVOA, VOA, perchlorate, nitrate, and tritium) for the approximately 50,000 gallons of containerized drilling fluid produced during the drilling of R-14. It should be noted that the data table titled, "ER Water Samples" contains analytical results from two samples, GW14-02-46382 and GW14-02-46383, submitted for metals analysis. These samples were collected from the upper and lower portion of the storage tanks, respectively. Both samples were filtered prior to analysis.

The approximately 50,000 gallons of containerized drilling fluid from R-14 is compliant with New Mexico Water Quality Control Commission (NM WQCC) Regulation 3103 ground water standards with the exception of the following three contaminants:

Contaminant	Max. Result (mg/L)	Min. Result (mg/L)	WQCC ground water standard (mg/L)
Al	42.0	7.69	5.0
Fe	9.25	1.51	1.0
Mn	0.36	0.13	0.2

With the exception of acetone, no VOA or SVOA compounds were detected in R-14 drilling fluids. Acetone, detected at 1.6 mg/L, is present as a byproduct of the drilling additives. No perchlorate or tritium were detected in the R-14 drilling fluid at concentrations greater than analytical laboratory's Method Detection Limits (MDLs). Nitrate/nitrite (as N) was detected at 0.56 mg/L.

**MSDS Information.** Attachment 2.0 contains Material Safety Data Sheets (MSDSs) for the drilling fluid additives used in the top 1068 feet of the R-14 borehole including the formulation quantities for each product.

The Laboratory requests your agency's permission to discharge the approximately 50,000 gallons of drilling fluid from R-14 in accordance with the August 2, 2001, NOI. Please call me at (505) 667-6969 or Roy Bohn of the Laboratory's Environmental Restoration Project (RRES-R) at (505) 665-5138 if additional information is required.

Sincerely,

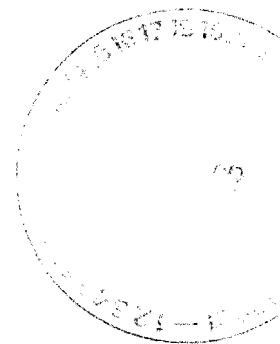


Bob Beers  
Water Quality & Hydrology Group

BB/am

Attachments: a/s

Cy: M. Leavitt, NMED/GWQB, Santa Fe, New Mexico, w/att.  
J. Davis, NMED/SWQB, Santa Fe, New Mexico, w/att.  
J. Bearzi, NMED/HWB, Santa Fe, New Mexico, w/att.  
J. Young, NMED/HWB, Santa Fe, New Mexico, w/att.  
J. Vozella, DOE/OLASO, w/att., MS A316  
G. Turner, DOE/OLASO, w/att., MS A316  
B. Stine, ADO, w/att., MS A104  
B. Ramsey, RRES-DO, w/o att., MS J591  
K. Hargis, RRES-DO, w/o att., MS J591  
D. Stavert, RRES-EP, w/att., MS J978  
S. Rae, RRES-WQH, w/att., MS K497  
C. Nylander, RRES-DO, w/att., MS K497  
D. Rogers, RRES-WQH, w/o att., MS K497  
M. Saladen, RRES-WQH, w/att., MS K497  
R. Bohn, RRES-R, w/att., MS M992  
D. McInroy, RRES-R, w/o att., MS M992  
RRES-WQH File, w/att., MS K497  
IM-5, w/att., MS A150



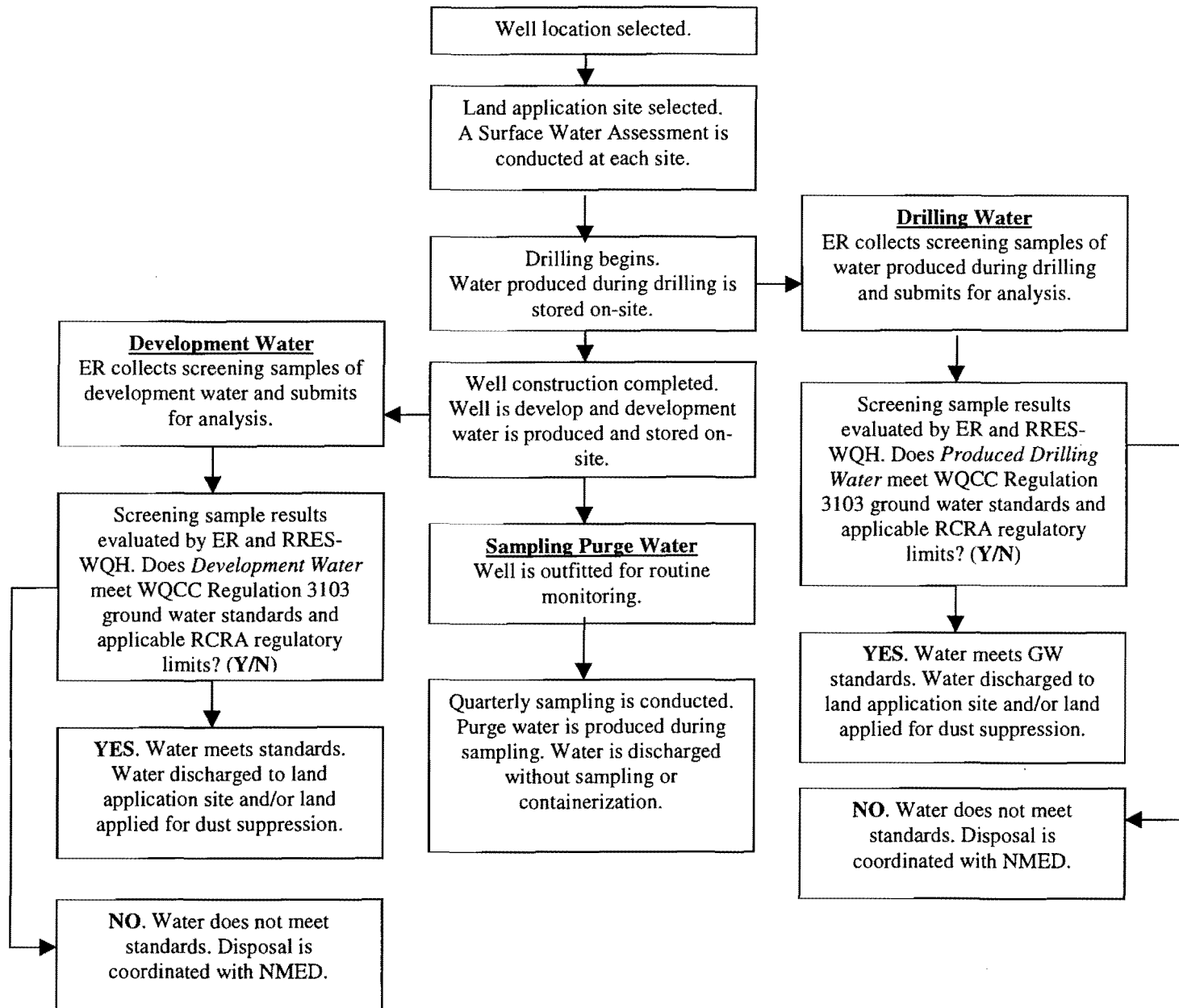


Figure 1.0. Workplan NOI Decision Tree



**HYDROGEOLOGIC WORKPLAN**  
**WELL R-14**

**CONTAINERIZED DRILLING FLUIDS**

**Contents:**

- 1. SCHEDULE OF DRILLING FLUID ADDITIVES**
- 2. MATERIAL SAFETY DATA SHEETS (MSDS)**

**HYDROGEOLOGIC WORKPLAN**  
**WELL R-14**

**CONTAINERIZED DRILLING FLUIDS**

**Contents:**

**ANALYTICAL REPORTS**

- GENERAL CHEMISTRY
  - METALS
  - PERCHLORATE
- NITRATE/NITRITE
  - TRITIUM
    - VOA
    - SVOA

**HYDROGEOLOGIC WORKPLAN**  
**WELL R-14**

**CONTAINERIZED DRILLING FLUIDS**

**Contents:**

**ANALYTICAL REPORTS**

- GENERAL CHEMISTRY
  - METALS
  - PERCHLORATE
- NITRATE/NITRITE
  - TRITIUM
    - VOA
    - SVOA

Hydrogeologic Workplan Well R-14  
 Water Quality Data-Drilling Fluid

ER

ER WATER SAMPLES

SAMPLE ID	DESCRIPTION	DATE MM/DD/YY	ER Req#	Ag	Al Std.D.		As Std.D.		B Std.D.		Ba
				ppm	ppm	+/-	ppm	+/-	ppm	+/-	ppm
GW14-02-46328	Frac tank mud sample, anions	06/21/02	889S	---	---	---	---	---	---	---	---
GW14-02-46382	Frac tank mud sample, metals	06/26/02	897S	<0.001	7.69	0.02	0.0081	0.0001	0.08	0.01	0.042
GW14-02-46383	Frac tank mud sample, metals	06/26/02	897S	<0.001	42.0	0.1	0.0069	0.0002	0.10	0.01	0.15



Hydrogeologic Workplan Well R-14  
 Water Quality Data-Drilling Fluid

ER

SAMPLE ID	Std.D. +/-	Be ppm	Br ppm	Ca ppm	Std.D. +/-	Cd ppm	Cl ppm	ClO3 ppm	ClO4 ppm	Co ppm	Std.D. +/-	Cr ppm	Std.D. +/-	Cs ppm
GW14-02-46328	---	---	0.27	---	---	---	5.59	<0.05	<0.01	---	---	---	---	---
GW14-02-46382	0.001	<0.001	---	12.9	0.1	<0.001	---	---	---	0.0022	0.0001	0.015	0.001	0.0017
GW14-02-46383	0.01	<0.001	---	29.6	0.2	<0.001	---	---	---	0.009	0.001	0.016	0.001	0.0012

Hydrogeologic Workplan Well R-14  
 Water Quality Data-Drilling Fluid

ER

SAMPLE ID	Std.D.		Cu Std.D.		F ppm	Fe Std.D.		Hg Std.D.		K Std.D.		Li Std.D.		Mg Std.D.		Mn ppm
	+/-		ppm	+/-		ppm	+/-	ppm	+/-	ppm	+/-	ppm	+/-	ppm	+/-	
GW14-02-46328	---		---	---	0.48	---	---	---	---	---	---	---	---	---	---	---
GW14-02-46382	0.0001		0.027	0.001	---	1.51	0.01	0.0020	0.0001	13.8	0.2	0.15	0.01	3.76	0.05	0.13
GW14-02-46383	0.0001		0.025	0.001	---	9.25	0.07	0.0008	0.0001	16.5	0.1	0.13	0.01	11.4	0.1	0.36

Hydrogeologic Workplan Well R-14  
 Water Quality Data-Drilling Fluid

ER

SAMPLE ID	Std.D.		Mo Std.D.		Na Std.D.		Ni Std.D.		NO2	NO3	Oxalate	Pb Std.D.		pH	PO4
	+/-		ppm	+/-	ppm	+/-	ppm	+/-	ppm	ppm	ppm	ppm	+/-	Lab	ppm
GW14-02-46328	---		---	---	---	---	---	---	1.64	0.27	<0.05	---	---	---	0.50
GW14-02-46382	0.01		0.13	0.01	285	2	0.008	0.001	---	---	---	0.0047	0.0001	6.73	---
GW14-02-46383	0.01		0.20	0.01	374	1	0.018	0.001	---	---	---	0.011	0.001	6.72	---

Hydrogeologic Workplan Well R-14  
 Water Quality Data-Drilling Fluid

ER

SAMPLE ID	Rb Std.D.		Sb Std.D.		Se Std.D.		Si Std.D.		Sn Std.D.		Sr Std.D.		Th Std.D.		Ti
	ppm	+/-	ppm	+/-	ppm	+/-	ppm	+/-	ppm	+/-	ppm	+/-	ppm	+/-	ppm
GW14-02-46328	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
GW14-02-46382	0.030	0.001	0.0040	0.0001	0.004	0.001	37.4	0.6	<0.001		0.16	0.01	0.014	0.001	0.092
GW14-02-46383	0.026	0.001	0.0031	0.0001	0.003	0.001	114	2	0.0031	0.0001	0.43	0.01	0.030	0.001	0.45

Hydrogeologic Workplan Well R-14  
 Water Quality Data-Drilling Fluid

ER

SAMPLE ID	Std.D.	Tl	U Std.D.		V std.D.		Zn Std.D.	
	+/-	ppm	ppm	+/-	ppm	+/-	ppm	+/-
GW14-02-46328	---	---	---	---	---	---	---	---
GW14-02-46382	0.001	<0.001	0.0059	0.0001	0.013	0.001	0.022	0.001
GW14-02-46383	0.01	<0.001	0.010	0.001	0.016	0.001	0.039	0.001

Ray

LOS ALAMOS NATIONAL LABORATORY

**Preliminary**

Client Sample ID: GW14-02-46382

Severn Trent Laboratories - Radiochemistry

Lab Sample ID: F2F260140-001  
Work Order: E3PPG  
Matrix: WATER

Date Collected: 06/21/02 0000  
Date Received: 06/26/02 0900

Parameter	Result	Qual	Total Uncert. (2 $\sigma$ +/-)	MDC	Prep Date	Analysis Date	Batch #	Yld %
TRITIUM (Distill) by EPA	906.0	MOD		pCi/L		906.0	MOD	
Tritium	20	U	140	230	07/08/02	07/08/02	2189221	

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.

Bold results are greater than the MDC

U Result is less than the sample detection limit.

# SEVERN TRENT LABORATORIES, INC.

## PRELIMINARY DATA SUMMARY

-----  
 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.  
 -----

Los Alamos National Laboratory PAGE 3

Lot #: F2F2G0137 Los Alamos Non-Rad Date Reported: 7/10/02  
Project Number: 888S

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
-----------	--------	--------------------	-------	----------------------

Client Sample ID: GW14-02-46328

Sample #: 001 Date Sampled: 06/21/02

Date Received: 06/26/02 Matrix: WATER

Volatile Organics by GC/MS

Reviewed

Dichlorodifluoromethane	ND	50	ug/L	SW846 8260B
Chloromethane	5.9 J	50	ug/L	SW846 8260B
Vinyl chloride	ND	50	ug/L	SW846 8260B
Bromomethane	ND	50	ug/L	SW846 8260B
Chloroethane	ND	50	ug/L	SW846 8260B
Trichlorofluoromethane	ND	50	ug/L	SW846 8260B
Trichlorotrifluoroethane	ND	25	ug/L	SW846 8260B
Acetone	1600 E	250	ug/L	SW846 8260B
1,1-Dichloroethene	ND	25	ug/L	SW846 8260B
Iodomethane	ND	25	ug/L	SW846 8260B
Methylene chloride	29	25	ug/L	SW846 8260B
Carbon disulfide	ND	25	ug/L	SW846 8260B
1,1-Dichloroethane	ND	25	ug/L	SW846 8260B
2-Butanone	ND	120	ug/L	SW846 8260B
2,2-Dichloropropane	ND	25	ug/L	SW846 8260B
1,2-Dichloroethene	ND	25	ug/L	SW846 8260B
(total)				
Chloroform	ND	25	ug/L	SW846 8260B
Bromochloromethane	ND	25	ug/L	SW846 8260B
1,1,1-Trichloroethane	ND	25	ug/L	SW846 8260B
1,1-Dichloropropene	ND	25	ug/L	SW846 8260B
Carbon tetrachloride	ND	25	ug/L	SW846 8260B
1,2-Dichloroethane	ND	25	ug/L	SW846 8260B
Benzene	ND	25	ug/L	SW846 8260B
Trichloroethene	ND	25	ug/L	SW846 8260B
1,2-Dichloropropane	ND	25	ug/L	SW846 8260B
Bromodichloromethane	ND	25	ug/L	SW846 8260B
Dibromomethane	ND	25	ug/L	SW846 8260B
4-Methyl-2-pentanone	ND	120	ug/L	SW846 8260B
cis-1,3-Dichloropropene	ND	25	ug/L	SW846 8260B
Toluene	ND	25	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	25	ug/L	SW846 8260B
2-Hexanone	ND	120	ug/L	SW846 8260B
1,3-Dichloropropane	ND	25	ug/L	SW846 8260B
Tetrachloroethene	ND	25	ug/L	SW846 8260B
Chlorodibromomethane	ND	25	ug/L	SW846 8260B
1,2-Dibromoethane	ND	25	ug/L	SW846 8260B

(Continued on next page)

# SEVERN TRENT LABORATORIES, INC.

## PRELIMINARY DATA SUMMARY

-----

The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.

-----

Lot #: F2F260137	Los Alamos National Laboratory Los Alamos Non-Rad Project Number: 8889	Date Reported: 7/10/02	PAGE 4
------------------	--	------------------------	--------

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
-----------	--------	-----------------	-------	-------------------

Client Sample ID: GW14-02-46328

Sample #: 001 Date Sampled: 06/21/02

Date Received: 06/26/02 Matrix: WATER

**Volatile Organics by GC/MS**

Reviewed

Chlorobenzene	ND	25	ug/L	SW846 8260B
1,1,1,2-Tetrachloroethane	ND	25	ug/L	SW846 8260B
Ethylbenzene	ND	25	ug/L	SW846 8260B
Xylenes (total)	ND	25	ug/L	SW846 8260B
Styrene	ND	25	ug/L	SW846 8260B
Bromoform	ND	25	ug/L	SW846 8260B
Isopropylbenzene	ND	25	ug/L	SW846 8260B
1,1,2,2-Tetrachloroethane	ND	25	ug/L	SW846 8260B
1,2,3-Trichloropropane	ND	25	ug/L	SW846 8260B
n-Propylbenzene	ND	25	ug/L	SW846 8260B
trans-1,3-Dichloropropene	ND	25	ug/L	SW846 8260B
Bromobenzene	ND	25	ug/L	SW846 8260B
2-Chlorotoluene	ND	25	ug/L	SW846 8260B
1,3,5-Trimethylbenzene	ND	25	ug/L	SW846 8260B
4-Chlorotoluene	ND	25	ug/L	SW846 8260B
tert-Butylbenzene	ND	1200	ug/L	SW846 8260B
1,2,4-Trimethylbenzene	ND	25	ug/L	SW846 8260B
sec-Butylbenzene	ND	25	ug/L	SW846 8260B
p-Isopropyltoluene	ND	25	ug/L	SW846 8260B
1,3-Dichlorobenzene	ND	25	ug/L	SW846 8260B
1,4-Dichlorobenzene	ND	25	ug/L	SW846 8260B
n-Butylbenzene	ND	25	ug/L	SW846 8260B
1,2-Dichlorobenzene	ND	25	ug/L	SW846 8260B
1,2-Dibromo-3-chloro-propane	ND	25	ug/L	SW846 8260B

1 Estimated result. Result is less than RL.

2 Estimated result. Result concentration exceeds the calibration range.

**Semivolatile Organic Compounds by GC/MS**

In Review

3-Methylphenol & 4-Methylphenol	ND	20	ug/L	SW846 8270C
Pyridine	ND	20	ug/L	SW846 8270C
N-Nitrosodimethylamine	ND	20	ug/L	SW846 8270C
Phenol	ND	10	ug/L	SW846 8270C
Aniline	ND	20	ug/L	SW846 8270C
bis(2-Chloroethyl)-ether	ND	10	ug/L	SW846 8270C

(Continued on next page)



# SEVERN TRENT LABORATORIES, INC.

## PRELIMINARY DATA SUMMARY

-----  
 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.  
 -----

Los Alamos National Laboratory PAGE 5  
 Los Alamos Non-Rad Date Reported: 7/10/02  
 Project Number: 8885

Lot #: F2F26U137

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
-----------	--------	--------------------	-------	----------------------

Client Sample ID: GW14-02-46328

Sample #: 001 Date Sampled: 06/21/02

Date Received: 06/26/02 Matrix: WATER

Semivolatile Organic Compounds by GC/MS

In Review

2-Chlorophenol	ND	10	ug/L	SW846 8270C
1,3-Dichlorobenzene	ND	10	ug/L	SW846 8270C
1,4-Dichlorobenzene	ND	10	ug/L	SW846 8270C
Benzyl alcohol	ND	10	ug/L	SW846 8270C
1,2-Dichlorobenzene	ND	10	ug/L	SW846 8270C
2-Methylphenol	ND	10	ug/L	SW846 8270C
2,2'-oxybis(1-Chloropropane)	ND	10	ug/L	SW846 8270C
N-Nitrosodi-n-propyl-amine	ND	10	ug/L	SW846 8270C
Hexachloroethane	ND	10	ug/L	SW846 8270C
Nitrobenzene	ND	10	ug/L	SW846 8270C
Isophorone	ND	10	ug/L	SW846 8270C
2 Nitrophenol	ND	10	ug/L	SW846 8270C
2,4-Dimethylphenol	ND	10	ug/L	SW846 8270C
bis(2-Chloroethoxy)methane	ND	10	ug/L	SW846 8270C
Benzoic acid	ND	20	ug/L	SW846 8270C
2,4-Dichlorophenol	ND	10	ug/L	SW846 8270C
1,2,4-Trichlorobenzene	ND	10	ug/L	SW846 8270C
Naphthalene	ND	10	ug/L	SW846 8270C
4-Chloroaniline	ND	20	ug/L	SW846 8270C
Hexachlorobutadiene	ND	10	ug/L	SW846 8270C
4-Chloro-3-methylphenol	ND	20	ug/L	SW846 8270C
2-Methylnaphthalene	ND	10	ug/L	SW846 8270C
Hexachlorocyclopentadiene	ND	10	ug/L	SW846 8270C
2,4,6-Trichlorophenol	9.5 J	10	ug/L	SW846 8270C
2,4,5 Trichlorophenol	5.0 J	10	ug/L	SW846 8270C
2-Chloronaphthalene	ND	10	ug/L	SW846 8270C
2-Nitroaniline	ND	50	ug/L	SW846 8270C
Dimethyl phthalate	ND	10	ug/L	SW846 8270C
Acenaphthylene	110	10	ug/L	SW846 8270C
2,6-Dinitrotoluene	ND	10	ug/L	SW846 8270C
3-Nitroaniline	ND	50	ug/L	SW846 8270C

(Continued on next page)

**SEVERN TRENT LABORATORIES, INC.**  
**PRELIMINARY DATA SUMMARY**

-----  
 The results shown below may still require additional laboratory review and are subject to change. Actions taken based on these results are the responsibility of the data user.  
 -----

Los Alamos National Laboratory PAGE 6  
 Los Alamos Non-Rad Date Reported: 7/10/02  
 Project Number: 888S

Lot #: F2F260137

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
-----------	--------	--------------------	-------	----------------------

Client Sample ID: GW14-02-46328

Sample #: 001 Date Sampled: 06/21/02

Date Received: 06/26/02 Matrix: WATER

Semivolatile Organic Compounds by GC/MS

In Review

Acenaphthene	ND	10	ug/L	SW846 8270C
2,4-Dinitrophenol	ND	50	ug/L	SW846 8270C
4-Nitrophenol	ND	50	ug/L	SW846 8270C
Dibenzofuran	ND	10	ug/L	SW846 8270C
2,4-Dinitrotoluene	ND	10	ug/L	SW846 8270C
Diethyl phthalate	ND	10	ug/L	SW846 8270C
Fluorene	ND	10	ug/L	SW846 8270C
4-Chlorophenyl phenyl ether	ND	10	ug/L	SW846 8270C
4-Nitroaniline	ND	20	ug/L	SW846 8270C
4,6-Dinitro- 2-methylphenol	ND	50	ug/L	SW846 8270C
N-Nitrosodiphenylamine	ND	10	ug/L	SW846 8270C
Azobenzene	ND	20	ug/L	SW846 8270C
4-Bromophenyl phenyl ether	ND	10	ug/L	SW846 8270C
Hexachlorobenzene	ND	10	ug/L	SW846 8270C
Pentachlorophenol	ND	50	ug/L	SW846 8270C
Phenanthrene	ND	10	ug/L	SW846 8270C
Anthracene	ND	10	ug/L	SW846 8270C
Fluoranthene	ND	10	ug/L	SW846 8270C
Pyrene	ND	10	ug/L	SW846 8270C
Butyl benzyl phthalate	ND	10	ug/L	SW846 8270C
Benzo (a) anthracene	ND	10	ug/L	SW846 8270C
3,3'-Dichlorobenzidine	ND	20	ug/L	SW846 8270C
Chrysene	ND	10	ug/L	SW846 8270C
bis (2-Ethylhexyl) phthalate	7.7 J	10	ug/L	SW846 8270C
Di-n-butyl phthalate	ND	10	ug/L	SW846 8270C
Di-n-octyl phthalate	ND	10	ug/L	SW846 8270C
Benzo (b) fluoranthene	ND	10	ug/L	SW846 8270C
Benzo (k) fluoranthene	ND	10	ug/L	SW846 8270C
Benzo (a) pyrene	ND	10	ug/L	SW846 8270C
Indeno (1,2,3-cd) pyrene	ND	10	ug/L	SW846 8270C
Benzo (ghi) perylene	ND	10	ug/L	SW846 8270C
Dibenz (a, h) anthracene	ND	10	ug/L	SW846 8270C

(Continued on next page)

**HYDROGEOLOGIC WORKPLAN**  
**WELL R-14**

**CONTAINERIZED DRILLING FLUIDS**

**Contents:**

- 1. SCHEDULE OF DRILLING FLUID ADDITIVES**
- 2. MATERIAL SAFETY DATA SHEETS (MSDS)**

### **Baroid Drilling Fluid Additives Used in the Top 1068 ft of R-14 Borehole**

The following Baroid IDP products were used to drill the top 1068 ft of the R-14 borehole and are contained in the two 21,000 gal fractionation tanks currently onsite. These products constitute the Stiff Foam (AKA: Sticky Foam) used in this interval.

1. Water (municipal supply)
2. Attack Foam (surfactant)  
-Formulation: 0.5-1% by volume
3. Aquagel Gold Seal (bentonite)  
-Formulation: 15-25 lbs/100 gal
4. Liqui-Trol (cellulose polymer, filtration control additive)  
-Formulation: 1.5-2.5 lbs/100 gal
5. Soda Ash (carbonate water conditioner)  
-Formulation: 0.5-1.0 lbs/100 gal
6. SDI Defoamer (silicone), applied at discharge  
-Total of 371 gal applied to total volume collected in tanks and cuttings pit

# MATERIAL SAFETY DATA SHEET



**ATTACK-FOAM™**

00886 1.00 US EA 10.03.1999 MSDS\_US

---

## 1. PRODUCT AND COMPANY IDENTIFICATION

---

<b>Product Code</b>	00886
<b>Trade Name</b>	ATTACK-FOAM™
<b>Generic Description</b>	LIQUID SURFACTANT BLEND
<b>Manufacturer/Supplier</b>	Baird
<b>Address</b>	P.O. Box 1675 Houston, TX 77261
<b>Phone Number</b>	(281) 871-5900
<b>Emergency Phone Number</b>	(281) 871-5900
<b>Chemtrec Number</b>	(800) 424-9300
<b>MSDS first issued</b>	10 March 1999
<b>MSDS data revised</b>	

---

## 2. COMPOSITION/INFORMATION ON THE COMPONENTS

---

### Hazardous Components in Preparation for US

<b>Component Name</b>	<b>Codes</b>	<b>Concentration</b>
HEXYLENE GLYCOL	107-41-5	20.00%

---

## 3. HAZARD IDENTIFICATION

---

<b>Routes of Entry</b>	- Eye contact - Ingestion - Inhalation - Skin contact
<b>Carcinogenic Status</b>	Not considered carcinogenic by NTP, IARC, and OSHA.
<b>Target Organs</b>	- Eye - Lung - Skin
<b>Health Effects - Eyes</b>	Liquid, mist or vapor may cause slight transient irritation.
<b>Health Effects - Skin</b>	Material will cause irritation. Repeated or prolonged contact may produce defatting of the skin leading to irritation and dermatitis.
<b>Health Effects - Ingestion</b>	A large dose may have the following effects: - irritation of mouth, throat and digestive tract
<b>Health Effects - Inhalation</b>	Exposure to vapor may have the following effects: - irritation of nose, throat and respiratory tract

---

## 4. FIRST AID MEASURES

---

<b>First Aid - Eyes</b>	Immediately flood the eye with plenty of water for at least 15 minutes, holding the eye open. Obtain medical attention immediately.
-------------------------	---

# MATERIAL SAFETY DATA SHEET



**ATTACK-FOAM™**

00886 1.00 US EA 10.03.1999 MSDS\_US

---

## 4. FIRST AID MEASURES

---

<b>First Aid - Skin</b>	Wash skin thoroughly with soap and water. Contaminated clothing should be washed or dry-cleaned before re-use.
<b>First Aid - Ingestion</b>	Wash out mouth with water. Induce vomiting. Obtain medical attention immediately.
<b>First Aid - Inhalation</b>	Remove from exposure. If there is difficulty in breathing, give oxygen. If breathing stops or shows signs of failing, give artificial respiration. Obtain medical attention.
<b>Advice to Physicians</b>	Treat symptomatically.

---

## 5. FIRE FIGHTING MEASURES

---

<b>Extinguishing Media</b>	Keep containers and surroundings cool with water spray. Use water spray, foam, dry chemical or carbon dioxide.
<b>Special Hazards of Product</b>	Not determined.
<b>Protective Equipment for Fire-Fighting</b>	Wear full protective clothing and self-contained breathing apparatus.

---

## 6. ACCIDENTAL RELEASE MEASURES

---

<b>Spill Procedures</b>	Contain and absorb using earth, sand or other inert material. Transfer into suitable containers for recovery or disposal.
<b>Personal Precautions</b>	Wear appropriate protective clothing. Wear respiratory protection.
<b>Environmental Precautions</b>	No specific measures necessary.

---

## 7. HANDLING AND STORAGE

---

<b>Handling</b>	Use in well ventilated area. Avoid inhaling vapor. Avoid contact with eyes, skin and clothing. Keep container tightly closed when not in use.
<b>Storage</b>	Store away from sources of heat or ignition. Storage area should be: - cool - dry - well ventilated - out of direct sunlight - away from incompatible materials

---

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

---

<b>Occupational Exposure Standards</b>	
<b>HEXYLENE GLYCOL</b>	UK EH40: OES 25ppm (125mg/m <sup>3</sup> ) 8h TWA. UK EH40: OES 25ppm (125mg/m <sup>3</sup> ) 15min TWA. ACGIH: TLV 25ppm

# MATERIAL SAFETY DATA SHEET



**ATTACK-FOAM™**

00886 1.00 US EA 10.03.1999 MSDS\_US

---

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

---

ACGIH: TLV 121mg/m<sup>3</sup>  
Ceiling limit.

<b>Engineering Control Measures</b>	Exposure to this material may be controlled in a number of ways. The measures appropriate for a particular worksite depend on how the material is used and on the potential for exposure.
<b>Respiratory Protection</b>	Respiratory protection if there is a risk of exposure to high vapor concentrations.
<b>Hand Protection</b>	Chemical resistant gloves
<b>Eye Protection</b>	Chemical goggles.
<b>Body Protection</b>	Wear: - long sleeves
<b>Protection During Application</b>	During application, adequate ventilation must be provided.

---

## 9. PHYSICAL AND CHEMICAL PROPERTIES

---

<b>Physical State</b>	Liquid
<b>Color</b>	Light Amber
<b>Odor</b>	Faint
<b>pH</b>	Range between 7 to 9.
<b>Specific Gravity</b>	1.04
<b>Flash Point (PMCC) (°C/F)</b>	>94/>200
<b>Density</b>	8.6 lb/gal
<b>Solubility in Water</b>	Completely soluble

---

## 10. STABILITY AND REACTIVITY

---

<b>Stability</b>	Stable under normal conditions.
<b>Conditions to Avoid</b>	- High temperatures
<b>Materials to Avoid</b>	- Strong bases - Strong oxidizers
<b>Hazardous Polymerization</b>	Will not occur.
<b>Hazardous Decomposition Products</b>	Incomplete combustion will generate: - oxides of carbon - short chain hydrocarbons - ammonia - oxides of sulfur - oxides of nitrogen

---

## 11. TOXICOLOGICAL INFORMATION

---

<b>Acute Toxicity</b>	Acute toxic effects are unlikely to occur in practice because of the warning provided by irritant effects.
-----------------------	--

# MATERIAL SAFETY DATA SHEET



**ATTACK-FOAM™**

00886 1.00 US EA 10.03.1999 MSDS\_US

---

## 12. ECOLOGICAL INFORMATION

---

<b>Mobility</b>	No relevant studies identified.
<b>Persistence/Degradability</b>	No relevant studies identified.
<b>Bio-accumulation</b>	No relevant studies identified.
<b>Ecotoxicity</b>	No relevant studies identified.

---

## 13. DISPOSAL

---

<b>Product Disposal</b>	Dispose of in accordance with all applicable local and national regulations.
<b>Container Disposal</b>	Labels should not be removed from containers until they have been cleaned. Dispose of containers with care. Containers should be cleaned by appropriate methods and then re-used or disposed of by landfill or incineration as appropriate. Contaminated containers must not be re-used. Do not cut, puncture or weld on or near to the container.

---

## 14. TRANSPORT INFORMATION

---

<b>DOT CFR 172.101 Data</b>	Not Regulated
<b>UN Proper Shipping Name</b>	Not Regulated
<b>UN Class</b>	Not Regulated
<b>UN Number</b>	None.

---

## 15. REGULATORY INFORMATION

---

<b>TSCA Listed</b>	Yes.
<b>MA Right To Know Law</b>	Listed.
<b>NJ Right to Know Law</b>	Listed
<b>California Proposition 65</b>	This product does not contain materials which the State of California has found to cause cancer, birth defects or other reproductive harm.
<b>SARA Title III Sect. 302 (EHS)</b>	Not listed.
<b>SARA Title III Sect. 311/312 Categorization</b>	Immediate (Acute) Health Hazard
<b>SARA Title III Sect. 313</b>	This product does not contain a chemical which is listed in Section 313 at or above de minimis concentrations.



# MATERIAL SAFETY DATA SHEET



**ATTACK-FOAM™**

00886 1.00 US EA 10.03.1999 MSDS\_US

---

## 16. OTHER INFORMATION

---

**NFPA Ratings**

NFPA Code for Health 1  
NFPA Code for Flammability 1  
NFPA Code for Reactivity 0

**Abbreviations**

® Registered trademark of Halliburton Energy Services Inc.  
(TM) Trademark of Halliburton Energy Services  
N/A: Denotes no applicable information found or available  
CAS#: Chemical Abstracts Service Number  
ACGIH: American Conference of Governmental Industrial Hygienists  
OSHA: Occupational Safety and Health Administration  
TLV: Threshold Limit Value  
PEL: Permissible Exposure Limit  
STEL: Short Term Exposure Limit  
NTP: National Toxicology Program  
IARC: International Agency for Research on Cancer  
R: Risk  
S: Safety  
LC50: Lethal Concentration 50%  
LD50: Lethal Dose 50%  
BOD: Biological Oxygen Demand  
KoC: Soil Organic Carbon Partition Coefficient  
Environmental Services

**Prepared By:**

All information recommendations and suggestions herein concerning our product are based on tests and data believed to be reliable, however, it is the user's responsibility to determine the safety, toxicity and suitability for his own use of the product described herein. Since the actual use by others is beyond our control, no guarantees, expressed or implied, is made by Baroid as to the effects of such use, the results to be obtained, or the safety and toxicity of the product nor does Baroid assume any liability arising from the use, by others, of the product referred to herein. Nor is the information herein to be construed as absolutely complete since additional information may be necessary or desirable when particular or exceptional conditions or circumstances exist or because of applicable laws or government regulations.

## MATERIAL SAFETY DATA SHEET

### SODA ASH

Revision Date: 06/28/2001

#### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Product Trade Name:** SODA ASH  
**Synonyms:** None  
**Chemical Family:** Carbonate  
**Application:** Buffer

**Manufacturer/Supplier**  
Halliburton Energy Services  
P.O. Box 1431  
Duncan, Oklahoma 73536-0431

Emergency Telephone: (800) 666-9260 or (713) 676-3000

**Prepared By**  
Product Stewardship  
Telephone: 1-580-251-4335

#### 2. COMPOSITION/INFORMATION ON INGREDIENTS

<u>Substance</u>	<u>Weight Percent (%)</u>	<u>ACGIH TLV-TWA</u>	<u>OSHA PEL-TWA</u>
Sodium carbonate 497-19-8	60 - 100%	Not applicable	Not applicable

#### 3. HAZARDS IDENTIFICATION

**Hazard Overview**  
May cause eye, skin, and respiratory irritation.

#### 4. FIRST AID MEASURES

**Inhalation**  
If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes

**Skin**

Wash with soap and water. Get medical attention if irritation persists.

**Eyes**

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

**Ingestion**

Do not induce vomiting. Slowly dilute with 1-2 glasses of water or milk and seek medical attention. Never give anything by mouth to an unconscious person.

**Notes to Physician**

Not Applicable

**5. FIRE FIGHTING MEASURES**

Flash Point/Range (F):	Not Determined
Flash Point/Range (C):	Not Determined
Flash Point Method:	Not Determined
Autoignition Temperature (F):	Not Determined
Autoignition Temperature (C):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Lower (oz./ft <sup>3</sup> ):	Not applicable
Flammability Limits in Air - Upper (%):	Not Determined
Flammability Limits in Air - Upper (oz./ft <sup>3</sup> ):	Not applicable

**Fire Extinguishing Media**

Water fog, carbon dioxide, foam, dry chemical.

**Special Exposure Hazards**

Decomposition in fire may produce toxic gases.

**Special Protective Equipment for Fire-Fighters**

Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

**NFPA Ratings:**

Health 2, Flammability 0, Reactivity 0

**HMIS Ratings:**

Flammability 0, Reactivity 0, Health 2

**6. ACCIDENTAL RELEASE MEASURES****Personal Precautionary Measures**

Use appropriate protective equipment. Avoid creating and breathing dust.

**Environmental Precautionary Measures**

Prevent from entering sewers, waterways or low areas.

**Procedure for Cleaning/Absorption**

Scoop up and remove.

**7. HANDLING AND STORAGE**

**Handling Precautions**

Avoid contact with eyes, skin, or clothing. Avoid creating or inhaling dust.

**Storage Information**

Store away from acids. Store in a cool, dry location.

<b>8. EXPOSURE CONTROLS/PERSONAL PROTECTION</b>
---

**Engineering Controls**

Use in a well ventilated area. Localized ventilation should be used to control dust levels.

**Respiratory Protection**

Dust/mist respirator. (95%)

**Hand Protection**

Normal work gloves.

**Skin Protection**

Normal work coveralls.

**Eye Protection**

Dust proof goggles.

**Other Precautions**

Eyewash fountains and safety showers must be easily accessible.

<b>9. PHYSICAL AND CHEMICAL PROPERTIES</b>
--

<b>Physical State:</b>	Solid
<b>Color:</b>	White
<b>Odor:</b>	Odorless
<b>pH:</b>	11.4
<b>Specific Gravity @ 20 C (Water=1):</b>	2.5
<b>Density @ 20 C (lbs./gallon):</b>	Not Determined
<b>Bulk Density @ 20 C (lbs/ft3):</b>	53.8
<b>Boiling Point/Range (F):</b>	Not Determined
<b>Boiling Point/Range (C):</b>	Not Determined
<b>Freezing Point/Range (F):</b>	Not Determined
<b>Freezing Point/Range (C):</b>	Not Determined
<b>Vapor Pressure @ 20 C (mmHg):</b>	Not Determined
<b>Vapor Density (Air=1):</b>	Not Determined
<b>Percent Volatiles:</b>	Not Determined
<b>Evaporation Rate (Butyl Acetate=1):</b>	Not Determined
<b>Solubility in Water (g/100ml):</b>	Soluble
<b>Solubility in Solvents (g/100ml):</b>	Not Determined
<b>Solubility in Sea Water (g/100ml):</b>	Soluble
<b>VOCs (lbs./gallon):</b>	Not Determined
<b>Viscosity, Dynamic @ 20 C (centipoise):</b>	Not Determined
<b>Viscosity, Kinematic @ 20 C (centistokes):</b>	Not Determined
<b>Partition Coefficient/n-Octanol/Water:</b>	Not Determined
<b>Molecular Weight (g/mole):</b>	105.99

## 10. STABILITY AND REACTIVITY

**Stability Data:** Stable

**Hazardous Polymerization:** Will Not Occur

**Conditions to Avoid**

None anticipated

**Incompatibility (Materials to Avoid)**

Strong acids.

**Hazardous Decomposition Products**

Carbon monoxide and carbon dioxide.

**Additional Guidelines**

Not Applicable

## 11. TOXICOLOGICAL INFORMATION

**Principle Route of Exposure**

Eye or skin contact, inhalation.

**Inhalation**

May cause respiratory irritation.

**Skin Contact**

Prolonged or repeated contact may cause skin irritation.

**Eye Contact**

May cause eye irritation.

**Ingestion**

Irritation of the mouth, throat, and stomach.

**Aggravated Medical Conditions**

None known.

**Chronic Effects/Carcinogenicity**

No data available to indicate product or components present at greater than 1% are chronic health hazards.

**Other Information**

None known.

**Toxicity Tests**

**Oral Toxicity:** LD50: 4220 mg/kg (Rat)

**Dermal Toxicity:** Not determined

**Inhalation Toxicity:** Not determined

**Primary Irritation Effect:** Not determined

**Carcinogenicity**

Not determined

**Genotoxicity:** Not determined

**Reproductive/Developmental**

**Toxicity:** Not determined

## 12. ECOLOGICAL INFORMATION

**Mobility (Water/Soil/Air)**

Not determined

**Persistence/Degradability**

Not applicable

**Bio-accumulation**

Not Determined

**Ecotoxicological Information**

**Acute Fish Toxicity:**

TLM24: 385 mg/l (Lepomis macrochirus)

**Acute Crustaceans Toxicity:**

Not determined

**Acute Algae Toxicity:**

Not determined

**Chemical Fate Information**

Not determined

**Other Information**

Not applicable

## 13. DISPOSAL CONSIDERATIONS

**Disposal Method**

Bury in a licensed landfill according to federal, state, and local regulations.

**Contaminated Packaging**

Follow all applicable national or local regulations.

## 14. TRANSPORT INFORMATION

**Land Transportation**

DOT

Not restricted

Canadian TDG

Not restricted

ADR

Not restricted

### **Air Transportation**

ICAO/IATA

Not restricted

### **Sea Transportation**

IMDG

Not restricted

### **Other Shipping Information**

Labels: None

## **15. REGULATORY INFORMATION**

### **US Regulations**

#### **US TSCA Inventory**

All components listed on inventory.

#### **EPA SARA Title III Extremely Hazardous Substances**

Not applicable

#### **EPA SARA (311,312) Hazard Class**

Acute Health Hazard

#### **EPA SARA (313) Chemicals**

This product does not contain a toxic chemical for routine annual "Toxic Chemical Release Reporting" under Section 313 (40 CFR 372).

#### **EPA CERCLA/Superfund Reportable Spill Quantity For This Product**

Not applicable.

#### **EPA RCRA Hazardous Waste Classification**

If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.

#### **California Proposition 65**

All components listed do not apply to the California Proposition 65 Regulation.

**PA Right-to-Know Law**

Does not apply.

**NJ Right-to-Know Law**

Does not apply.

**PA Right-to-Know Law**

Does not apply.

**Canadian Regulations**

**Canadian DSL Inventory**

All components listed on inventory.

**WHMIS Hazard Class**

Non-Controlled

**16. OTHER INFORMATION**

**The following sections have been revised since the last issue of this MSDS**

Not applicable

**Additional Information**

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Product Stewardship at 1-580-251-4335.

**Disclaimer Statement**

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

**\*\*\*END OF MSDS\*\*\***



## MATERIAL SAFETY DATA SHEET

### AQUAGEL® GOLD SEAL

Revision Date: 01/02/2002

#### 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

##### Statement of Hazardous Nature

Not classified as hazardous according to criteria of WorkSafe

##### Manufacturer/Supplier

Halliburton/Baroid Australia Pty. Ltd.  
53-55 Bannister Road  
Canning Vale  
WA 6155  
Australia

ACN Number: 000 708 510  
Telephone Number: (08) 9455 8300  
Emergency Telephone Number: 1800 039 008  
Fax Number: (08) 9455 5300

##### Identification of Substances or Preparation

<b>Product Trade Name:</b>	AQUAGEL® GOLD SEAL
<b>Synonyms:</b>	None
<b>Chemical Family:</b>	Mineral
<b>Dangerous Goods Class:</b>	None
<b>Subsidiary Risk:</b>	None
<b>Hazchem Code:</b>	None
<b>Poisons Schedule:</b>	None
<b>Application:</b>	Viscosifier

**Prepared By**  
Product Stewardship  
Telephone: 1-580-251-4335

#### 2. COMPOSITION/INFORMATION ON INGREDIENTS

<u>Substance</u>	<u>Weight Percent (%)</u>	<u>Australia NOHSC</u>	<u>ACGIH TLV-TWA</u>
Crystalline silica, cristobalite 14464-46-1	< 0.1%	Not determined	0.05 mg/m3
Crystalline silica, tridymite 15468-32-3	< 0.1%	Not determined	0.05 mg/m3
Bentonite 1302-78-9	60 - 100%	Not determined	Not established
Crystalline silica, quartz 14808-60-7	1 - 5%	Not determined	0.05 mg/m3
<b>Total to 100%</b>			

### 3. HAZARDS IDENTIFICATION

#### Hazard Overview

#### CAUTION! - ACUTE HEALTH HAZARD

May cause eye and respiratory irritation.

#### DANGER! - CHRONIC HEALTH HAZARD

Breathing crystalline silica can cause lung disease, including silicosis and lung cancer. Crystalline silica has also been associated with scleroderma and kidney disease.

This product contains quartz, cristobalite, and tridymite which may become airborne without a visible cloud. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposures below recommended exposure limits. Wear a NIOSH-specified respirator or equivalent when using this product. Review the Material Safety Data Sheet (MSDS) for this product, which has been provided to your employer.

#### Hazard Ratings

**Flammability:** 0  
**Toxicity:** 0  
**Body Contact:** 0  
**Reactivity:** 0  
**Chronic:** 4

Scale: Min/Nil=0 Low=1 Moderate=2 High=3 Extreme=4

### 4. FIRST AID MEASURES

#### Inhalation

If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

#### Skin

Wash with soap and water. Get medical attention if irritation persists.

#### Eyes

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

**Ingestion**

Under normal conditions, first aid procedures are not required.

**Notes to Physician**

Treat symptomatically.

**5. FIRE FIGHTING MEASURES****Suitable Extinguishing Media**

All standard fire fighting media

**Unsuitable Extinguishing Media**

None known.

**Special Exposure Hazards**

Not applicable.

**Special Protective Equipment for Fire-Fighters**

Not applicable.

**6. ACCIDENTAL RELEASE MEASURES****Personal Precautionary Measures**

Use appropriate protective equipment. Avoid creating and breathing dust.

**Environmental Precautionary Measures**

None known.

**Procedure for Cleaning/Absorption**

Collect using dustless method and hold for appropriate disposal. Consider possible toxic or fire hazards associated with contaminating substances and use appropriate methods for collection, storage and disposal.

**7. HANDLING AND STORAGE****Handling Precautions**

This product contains quartz, cristobalite, and tridymite which may become airborne without a visible cloud. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposure below recommended exposure limits. Wear a NIOSH-specified respirator or equivalent when using this product. Material is slippery when wet.

**Storage Information**

Use good housekeeping in storage and work areas to prevent accumulation of dust. Close container when not in use. Do not reuse empty container.

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION****Engineering Controls**

Use approved industrial ventilation and local exhaust as required to maintain exposures below applicable exposure limits listed in Section 2.

**Respiratory Protection**

Wear a NIOSH specified respirator or equivalent when using this product.

#### Hand Protection

Normal work gloves.

#### Skin Protection

Wear clothing appropriate for the work environment. Dusty clothing should be laundered before reuse. Use precautionary measures to avoid creating dust when removing or laundering clothing.

#### Eye Protection

Wear safety glasses or goggles to protect against exposure.

#### Other Precautions

None known.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid
Color:	Light brown
Odor:	Odorless
pH:	Not Determined
Specific Gravity @ 20 C (Water=1):	2.65
Density @ 20 C (kg/l):	Not Determined
Bulk Density @ 20 C (kg/M3):	Not Determined
Boiling Point/Range (C):	Not Determined
Freezing Point/Range (C):	Not Determined
Flash Point/Range (C):	Not Determined
Flash Point Method:	Not Determined
Autoignition Temperature (C):	Not Determined
Flammability Limits in Air - Lower (g/l):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (g/l):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined
Vapor Pressure @ 20 C (mmHg):	Not Determined
Vapor Density (Air=1):	Not Determined
Percent Volatiles:	Not Determined
Evaporation Rate (Butyl Acetate=1):	Not Determined
Solubility in Water (g/100ml):	Insoluble
Solubility in Solvents (g/100ml):	Not Determined
VOCs (g/l):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistrokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined
Decomposition Temperature (C):	Not Determined

## 10. STABILITY AND REACTIVITY

Stability Data: Stable

Hazardous Polymerization: Will Not Occur

**Conditions to Avoid**

None anticipated

**Incompatibility (Materials to Avoid)**

Hydrofluoric acid.

**Hazardous Decomposition Products**

Amorphous silica may transform at elevated temperatures to tridymite (870 C) or cristobalite (1470 C).

**Additional Guidelines**

Not Applicable

**11. TOXICOLOGICAL INFORMATION****Principle Route of Exposure**

Eye or skin contact, inhalation.

**Inhalation**

Inhaled crystalline silica in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (IARC, Group 1). There is sufficient evidence in experimental animals for the carcinogenicity of tridymite (IARC, Group 2A).

Breathing silica dust may cause irritation of the nose, throat, and respiratory passages. Breathing silica dust may not cause noticeable injury or illness even though permanent lung damage may be occurring. Inhalation of dust may also have serious chronic health effects (See "Chronic Effects/Carcinogenicity" subsection below).

**Skin Contact**

May cause mechanical skin irritation.

**Eye Contact**

May cause eye irritation.

**Ingestion**

None known

**Aggravated Medical Conditions**

Individuals with respiratory disease, including but not limited to asthma and bronchitis, or subject to eye irritation, should not be exposed to quartz dust.

**Chronic Effects/Carcinogenicity**

**Silicosis:** Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling, and sometimes-fatal lung disease called silicosis. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness, and reduced pulmonary function. This disease is exacerbated by smoking. Individuals with silicosis are predisposed to develop tuberculosis.

**Cancer Status:** The International Agency for Research on Cancer (IARC) has determined that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources can cause lung cancer in humans (Group 1 - carcinogenic to humans) and has determined that there is sufficient evidence in experimental animals for the carcinogenicity of tridymite (Group 2 - possible carcinogen to humans). Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (June 1997) in conjunction with the use of these minerals. The National Toxicology Program classifies respirable crystalline silica as "Known to be a human carcinogen". Refer to the 9th Report on Carcinogens (2000). The American Conference of Governmental Industrial Hygienists (ACGIH) classifies crystalline silica, quartz, as a suspected human carcinogen (A2).

There is some evidence that breathing respirable crystalline silica or the disease silicosis is associated with an increased incidence of significant disease endpoints such as scleroderma (an immune system disorder manifested by scarring of the

lungs, skin, and other internal organs) and kidney disease.

#### **Other Information**

For further information consult "Adverse Effects of Crystalline Silica Exposure" published by the American Thoracic Society Medical Section of the American Lung Association, American Journal of Respiratory and Critical Care Medicine, Volume 155, pages 761-768 (1997).

#### **Toxicity Tests**

**Oral Toxicity:** Not determined

**Dermal Toxicity:** Not determined

**Inhalation Toxicity:** Not determined

**Primary Irritation Effect:** Not determined

#### **Carcinogenicity**

Refer to IARC Monograph 68. Silica, Some Silicates and Organic Fibres (June 1997).

**Genotoxicity:** Not determined

**Reproductive/Developmental Toxicity:** Not determined

## **12. ECOLOGICAL INFORMATION**

#### **Mobility (Water/Soil/Air)**

Not determined

#### **Persistence/Degradability**

Not determined

#### **Bio-accumulation**

Not Determined

#### **Ecotoxicological Information**

##### **Acute Fish Toxicity:**

Not determined

##### **Acute Crustaceans Toxicity:**

Not determined

##### **Acute Algae Toxicity:**

Not determined

#### **Chemical Fate Information**

Not determined

#### **Other Information**

Not applicable

## **13. DISPOSAL CONSIDERATIONS**

#### **Disposal Method**

Bury in a licensed landfill according to federal, state, and local regulations.

**Contaminated Packaging**

Follow all applicable national or local regulations.

**14. TRANSPORT INFORMATION**

**Land Transportation**

**ADR**

Not restricted

**Air Transportation**

**ICAO/IATA**

Not restricted

**Sea Transportation**

**IMDG**

Not restricted

**Other Shipping Information**

**Proper Shipping Name:** Not restricted

**Dangerous Goods Class:** None

**Subsidiary Risk:** None

**EPG:** Not determined

**IERG:** Not determined

**Labels:** None

**15. REGULATORY INFORMATION**

**Chemical Inventories**

**Australian AICS Inventory**

Not Determined

**US TSCA Inventory**

All components listed on inventory.

**EINECS Inventory**

This product, and all its components, complies with EINECS

**Classification**

Crystalline silica is not classified as a carcinogen in EU Council Directives 67/548/EEC and 88/379/EEC.

**Risk Phrases**

None

**Safety Phrases**

None

**16. OTHER INFORMATION**

The following sections have been revised since the last issue of this MSDS

Not applicable

**Contact**

**Australian Poisons Information Centre**

24 Hour Service: - 13 11 26

Police or Fire Brigade: - 000 (exchange): - 1100

**New Zealand Poisons Information System**

Deunedin: -(03) 479 1200 (Normal Hours)

-(03) 474 0999 (Emergency)

**Additional Information**

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Product Stewardship at 1-580-251-4335.

**Disclaimer Statement**

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

**\*\*\*END OF MSDS\*\*\***





# MATERIAL SAFETY DATA SHEET

LIQUI-TROL (TM)

Revision Date: 18/09/2000

## 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

### Statement of Hazardous Nature

Hazardous according to criteria of WorkSafe

### Manufacturer/Supplier

Halliburton Australia Pty. Ltd.  
53-55 Bannister Road  
Canning Vale  
WA 6155  
Australia

ACN Number: 1233325  
Telephone Number: (08) 9455 8300  
Emergency Telephone Number: 1800 039 008  
Fax Number: (08) 9455 5300

### Identification of Substances or Preparation

<b>Product Trade Name:</b>	LIQUI-TROL (TM)
<b>Synonyms:</b>	None
<b>Chemical Family:</b>	Blend
<b>Dangerous Goods Class:</b>	None
<b>Subsidiary Risk:</b>	None
<b>Hazchem Code:</b>	None
<b>Poisons Schedule:</b>	None

**Prepared By**  
Product Stewardship  
Telephone: 1-580-251-4335

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

<u>Substance</u>	<u>Weight Percent (%)</u>		
Hydrotreated light petroleum distillate 64742-47-8	30 - 60%	Not determined	Not established

Total to 100%

### 3. HAZARDS IDENTIFICATION

#### Hazard Overview

May cause eye, skin, and respiratory irritation. May cause headache, dizziness, and other central nervous system effects. May be harmful if swallowed. Combustible.

#### Hazard Ratings

Flammability:	1
Toxicity:	0
Body Contact:	1
Reactivity:	0
Chronic:	0

Scale: Min/Nil=0 Low=1 Moderate=2 High=3 Extreme=4

### 4. FIRST AID MEASURES

#### Inhalation

If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult give oxygen. Get medical attention.

#### Skin

In case of contact, immediately flush skin with plenty of soap and water for at least 15 minutes. Get medical attention.

#### Eyes

In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention immediately after flushing.

#### Ingestion

Get medical attention! If vomiting occurs, keep head lower than hips to prevent aspiration.

#### Notes to Physician

Not Applicable

### 5. FIRE FIGHTING MEASURES

#### Suitable Extinguishing Media

Water fog, carbon dioxide, foam, dry chemical.

#### Unsuitable Extinguishing Media

None known.

**Special Exposure Hazards**

Decomposition in fire may produce toxic gases.

**Special Protective Equipment for Fire-Fighters**

Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

**6. ACCIDENTAL RELEASE MEASURES****Personal Precautionary Measures**

Use appropriate protective equipment.

**Environmental Precautionary Measures**

Prevent from entering sewers, waterways or low areas.

**Procedure for Cleaning/Absorption**

Isolate spill and stop leak where safe. Remove ignition sources and work with non-sparking tools. Contain spill with sand or other inert materials. Scoop up and remove.

**7. HANDLING AND STORAGE****Handling Precautions**

Avoid contact with eyes, skin, or clothing. Avoid breathing vapors. Wash hands after use. Launder contaminated clothing before reuse.

**Storage Information**

Store away from oxidizers. Keep from heat, sparks, and open flames. Keep container closed when not in use. Product has a shelf life of 6 months

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION****Engineering Controls**

A well ventilated area to control dust levels. Local exhaust ventilation should be used in areas without good cross ventilation.

**Respiratory Protection**

Organic vapor respirator with a dust/mist filter. In high concentrations, supplied air respirator or a self-contained breathing apparatus.

**Hand Protection**

Impervious rubber gloves.

**Skin Protection**

Rubber apron.

**Eye Protection**

Chemical goggles; also wear a face shield if splashing hazard exists.

**Other Precautions**

Eyewash fountains and safety showers must be easily accessible.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

Physical State:	Liquid
Color:	Off white
Odor:	Mild hydrocarbon
pH:	Not Determined
Specific Gravity @ 20 C (Water=1):	0.97
Density @ 20 C (kg/l):	0.97
Bulk Density @ 20 C (kg/M3):	Not Determined
Boiling Point/Range (C):	455
Freezing Point/Range (C):	Not Determined
Flash Point/Range (C):	85
Flash Point Method:	PMCC
Autoignition Temperature (C):	Not Determined
Flammability Limits in Air - Lower (g/l):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (g/l):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined
Vapor Pressure @ 20 C (mmHg):	Not Determined
Vapor Density (Air=1):	Not Determined
Percent Volatiles:	Not Determined
Evaporation Rate (Butyl Acetate=1):	< 1
Solubility in Water (g/100ml):	Insoluble
Solubility in Solvents (g/100ml):	Not Determined
VOCs (g/l):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistrokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined
Decomposition Temperature (C):	Not Determined

## 10. STABILITY AND REACTIVITY

Stability Data: Stable

Hazardous Polymerization: Will Not Occur

### Conditions to Avoid

Keep away from heat, sparks and flame.

### Incompatibility (Materials to Avoid)

Not determined.

### Hazardous Decomposition Products

Hydrocarbons. Carbon monoxide and carbon dioxide.

### Additional Guidelines

Not Applicable

## 11. TOXICOLOGICAL INFORMATION

### Principle Route of Exposure

Eye or skin contact, inhalation.

**Inhalation**

May cause respiratory irritation. May cause central nervous system depression including headache, dizziness, drowsiness, incoordination, slowed reaction time, slurred speech, giddiness and unconsciousness.

**Skin Contact**

May cause skin irritation.

**Eye Contact**

May cause severe eye irritation.

**Ingestion**

Aspiration into the lungs may cause chemical pneumonitis including coughing, difficulty breathing, wheezing, coughing up blood and pneumonia, which can be fatal. May cause central nervous system depression including headache, dizziness, drowsiness, muscular weakness, incoordination, slowed reaction time, fatigue blurred vision, slurred speech, giddiness, tremors and convulsions.

**Aggravated Medical Conditions**

Lung disorders.

**Chronic Effects/Carcinogenicity**

No data available to indicate product or components present at greater than 1% are chronic health hazards.

**Other Information**

None known.

**Toxicity Tests**

**Oral Toxicity:** Not determined

**Dermal Toxicity:** Not determined

**Inhalation Toxicity:** Not determined

**Primary Irritation Effect:** Not determined

**Carcinogenicity**

Not determined

**Genotoxicity:** Not determined

**Reproductive/Developmental**

**Toxicity:** Not determined

**12. ECOLOGICAL INFORMATION**

**Mobility (Water/Soil/Air)**

Not determined

**Persistence/Degradability**

Slowly biodegradable

**Bio-accumulation**

Not Determined

**Ecotoxicological Information**

**Acute Fish Toxicity:**

Not determined

**Acute Crustaceans Toxicity:**

Not determined

**Acute Algae Toxicity:**

Not determined

**Chemical Fate Information**

Not determined

**Other Information**

Not applicable

**13. DISPOSAL CONSIDERATIONS**

**Disposal Method**

Not determined

**Contaminated Packaging**

If empty container retains product residues, all label precautions must be observed. Store away from ignition sources. Transport with all closures in place. Return for reuse or disposal according to national or local regulations.

**14. TRANSPORT INFORMATION**

**Land Transportation**

**ADR**

Not restricted

**Air Transportation**

**ICAO/IATA**

Not restricted

**Sea Transportation**

**IMDG**

Not restricted

**Other Shipping Information**

<b>Proper Shipping Name:</b>	Not restricted
<b>Dangerous Goods Class:</b>	Not determined
<b>Subsidiary Risk:</b>	Not determined
<b>EPG:</b>	Not determined
<b>IERG:</b>	Not determined
<b>Labels:</b>	Combustible

**15. REGULATORY INFORMATION**

## Chemical Inventories

### Australian AICS Inventory

Not Determined

### US TSCA Inventory

All components listed on inventory.

### EINECS Inventory

This product, and all its components, complies with EINECS

### Classification

Xi - Irritant.

:FILESXI.GIF in section SYMHEA is not a valid filename

### Risk Phrases

R22 Harmful if swallowed.

R23 Toxic by inhalation.

R36/37/38 Irritating to eyes, respiratory system and skin.

### Safety Phrases

S2 Keep out of reach of children.

S16 Keep away from sources of ignition - No Smoking.

S24/25 Avoid contact with skin and eyes.

## 16. OTHER INFORMATION

The following sections have been revised since the last issue of this MSDS

Not applicable

### Contact

#### Australian Poisons Information Centre

24 Hour Service: - 13 11 26

Police or Fire Brigade: - 000 (exchange): - 1100

#### New Zealand Poisons Information System

Deunedin: -(03) 479 1200 (Normal Hours)

-(03) 474 0999 (Emergency)

### Additional Information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Product Stewardship at 1-580-251-4335.

**Disclaimer Statement**

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

\*\*\*END OF MSDS\*\*\*



## Safety Data Sheet (93/112/EC)

SDI®

Revision Date: 28/03/2001

### 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

#### Identification of Substances or Preparation

Product Trade Name: SDI®  
Synonyms: None  
Chemical Family: Blend  
Application: Defoamer

#### Company Undertaking Identification

Baroid Limited  
Devron Facility, Howemoss Place  
Kirkhill Industrial Estate  
Dyce  
Aberdeen, AB21 0GS  
United Kingdom

Emergency Phone Number: +44 01224 776600 or +1 713 676 3000

#### Prepared By

Product Stewardship  
Telephone: 1-580-251-4335

### 2. COMPOSITION/INFORMATION ON INGREDIENTS

<u>Substance</u>	<u>Weight Percent (%)</u>	<u>UK OEL/MEL</u>	<u>Germany MAK/TRK</u>	<u>Netherlands MAC</u>	<u>EEC Classification</u>
Silicone defoamer	10 - 30%	Not applicable	Not applicable	Not applicable	Not applicable

### 3. HAZARDS IDENTIFICATION

#### Hazard Overview

May cause eye irritation.

## 4. FIRST AID MEASURES

### Inhalation

- Under normal conditions, first aid procedures are not required.

### Skin

Under normal conditions, first aid procedures are not required.

### Eyes

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

### Ingestion

Under normal conditions, first aid procedures are not required.

### Notes to Physician

Not Applicable

## 5. FIRE FIGHTING MEASURES

### Suitable Extinguishing Media

Water fog, carbon dioxide, foam, dry chemical.

### Unsuitable Extinguishing Media

None known.

### Special Exposure Hazards

Use water spray to cool fire exposed surfaces.

### Special Protective Equipment for Fire-Fighters

Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

## 6. ACCIDENTAL RELEASE MEASURES

### Personal Precautionary Measures

Use appropriate protective equipment.

### Environmental Precautionary Measures

None known.

### Procedure for Cleaning/Absorption

Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Scoop up and remove.

## 7. HANDLING AND STORAGE

### Handling Precautions

Avoid contact with eyes, skin, or clothing.

### Storage Information

Store away from oxidizers.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Engineering Controls

- Use in a well ventilated area.

### Respiratory Protection

Not normally necessary.

### Hand Protection

Normal work gloves.

### Skin Protection

Normal work coveralls.

### Eye Protection

Wear safety glasses or goggles to protect against exposure.

### Other Precautions

None known.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid	
Color:	Off white	
Odor:	Mild	
pH:	Not Determined	
Specific Gravity @ 20 C (Water=1):	1.0	
Density @ 20 C (kg/l):	1	
Bulk Density @ 20 C (kg/M3):	Not Determined	
Boiling Point/Range (C):	100	
Freezing Point/Range (C):	0	
Flash Point/Range (C):	Not Determined	Min: > 100
Flash Point Method:	CC	
Autoignition Temperature (C):	Not Determined	
Flammability Limits in Air - Lower (g/l):	Not Determined	
Flammability Limits in Air - Lower (%):	Not Determined	
Flammability Limits in Air - Upper (g/l):	Not Determined	
Flammability Limits in Air - Upper (%):	Not Determined	
Vapor Pressure @ 20 C (mmHg):	Not Determined	
Vapor Density (Air=1):	Not Determined	
Percent Volatiles:	Not Determined	
Evaporation Rate (Butyl Acetate=1):	Not Determined	
Solubility in Water (g/100ml):	Not Determined	
Solubility in Solvents (g/100ml):	Not Determined	
VOCs (g/l):	Not Determined	
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined	
Viscosity, Kinematic @ 20 C (centistokes):	2500	
Partition Coefficient/n-Octanol/Water:	Not Determined	
Molecular Weight (g/mole):	Not Determined	
Decomposition Temperature (C):	Not Determined	

## 10. STABILITY AND REACTIVITY

**Stability Data:** Stable

**Hazardous Polymerization:** Will Not Occur

**Conditions to Avoid**

None known.

**Incompatibility (Materials to Avoid)**

Not determined.

**Hazardous Decomposition Products**

Carbon monoxide and carbon dioxide.

**Additional Guidelines**

Not Applicable

**11. TOXICOLOGICAL INFORMATION**

**Principle Route of Exposure**

Eye or skin contact, inhalation.

**Inhalation**

None known.

**Skin Contact**

None known.

**Eye Contact**

May cause mild eye irritation.

**Ingestion**

None known

**Aggravated Medical Conditions**

None known.

**Chronic Effects/Carcinogenicity**

No data available to indicate product or components present at greater than 1% are chronic health hazards.

**Other Information**

None known.

**Toxicity Tests**

**Oral Toxicity:** Not determined

**Dermal Toxicity:** Not determined

**Inhalation Toxicity:** Not determined

**Primary Irritation Effect:** Not determined

**Carcinogenicity**

Not determined

**Genotoxicity:**

Not determined

**Reproductive/Developmental**

**Toxicity:**

Not determined

**12. ECOLOGICAL INFORMATION**

**Mobility (Water/Soil/Air)**

Not determined

**Persistence/Degradability**

Not determined

**Bio-accumulation**

Not Determined

**Ecotoxicological Information**

**Acute Fish Toxicity:**

Not determined

**Acute Crustaceans Toxicity:**

TLM96: > 1,000,000 mg/l (Mysidopsis bahia) SPP @ 1 ppb

**Acute Algae Toxicity:**

Not determined

**Chemical Fate Information**

Not determined

**Other Information**

Not applicable

**13. DISPOSAL CONSIDERATIONS**

**Disposal Method**

Not determined

**Contaminated Packaging**

If empty container retains product residues, all label precautions must be observed. Transport with all closures in place. Return for reuse or disposal according to national or local regulations.

**14. TRANSPORT INFORMATION**

**Land Transportation**

**ADR**

Not restricted

**Air Transportation**

ICAO/IATA  
Not restricted

## Sea Transportation

IMDG  
Not restricted

### Other Shipping Information

Labels: None

## 15. REGULATORY INFORMATION

### EC Supply labeling Requirements

This product is not subject to the labeling requirements of EC Directives 67/548/EEC and 88/379/EEC as amended.

### Classification

Not Classified

### Risk Phrases

None

### Safety Phrases

None

### EINECS Inventory

This product does not comply with EINECS

### Germany, Water Endangering Classes (WGK)

WGK 0: Generally not water endangering.

## 16. OTHER INFORMATION

### The following sections have been revised since the last issue of this MSDS

Not applicable

### Additional Information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Product Stewardship at 1-580-251-4335.

### Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

\*\*\*END OF MSDS\*\*\*