PROJECT REPORT

TO: ENVIRONMENTAL EVALUATION COMMITTEE **AGENDA DATE: October 26, 2023**

FROM: PLANNING & DEVELOPMENT SERVICES **AGENDA TIME 1:30 PM / No. 1**

PROJECT TYPE: Phoenix 1 LLC. - CUP #23-0013\IS #23-0013 SUPERVISOR DIST #4

039-080-004-000
039-080-005-000

LOCATION: 2300 Farr Road APN: 039-080-006-000

Brawley, CA 92227 PARCEL SIZE: +/- 432 acres total

GENERAL PLAN (existing) Agriculture GENERAL PLAN (proposed) N/A

ZONE (existing) A-2-R (General Ag/Rural Zone)\A-3 (Heavy Ag) ZONE (proposed) N/A

GENERAL PLAN FINDINGS ☒ CONSISTENT ☐ INCONSISTENT ☐ MAY BE/FINDINGS

PLANNING COMMISSION DECISION: HEARING DATE: _____

☐ APPROVED ☐ DENIED ☐ OTHER

PLANNING DIRECTORS DECISION: HEARING DATE: _____

☐ APPROVED ☐ DENIED ☐ OTHER

ENVIROMENTAL EVALUATION COMMITTEE DECISION: HEARING DATE: 10/26/2023

INITIAL STUDY: #23-0013

☐ NEGATIVE DECLARATION ☐ MITIGATED NEG. DECLARATION ☐ EIR

DEPARTMENTAL REPORTS / APPROVALS:

PUBLIC WORKS	☒ NONE	☐ ATTACHED
AG	☒ NONE	☐ ATTACHED
APCD	☐ NONE	☒ ATTACHED
E.H.S.	☒ NONE	☐ ATTACHED
FIRE / OES	☒ NONE	☐ ATTACHED
SHERIFF	☒ NONE	☐ ATTACHED
OTHER IID		

REQUESTED ACTION:

(See Attached)

Planning & Development Services
801 MAIN STREET, EL CENTRO, CA, 92243 442-265-1736
(Jim Minnick, Director)

EEC ORIGINAL PKG

☐ NEGATIVE DECLARATION
MITIGATED NEGATIVE DECLARATION

Initial Study & Environmental Analysis
For:

Initial Study #23-0013 for Conditional Use Permit #23-0013
Phoenix 1 LLC.

Prepared By:

COUNTY OF IMPERIAL
Planning & Development Services Department
801 Main Street
El Centro, CA 92243
(442) 265-1736
www.icpds.com

October 2023

TABLE OF CONTENTS

SECTION 1
INTRODUCTION

A. PURPOSE

This document is a ☐ policy-level, ☒ project level Initial Study for evaluation of potential environmental impacts resulting with the proposed Conditional Use Permit #23-0013 / Initial Study #23-0013 (Refer to Exhibit "A" & "B").

B. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) REQUIREMENTS AND THE IMPERIAL COUNTY'S GUIDELINES FOR IMPLEMENTING CEQA

As defined by Section 15063 of the State California Environmental Quality Act (CEQA) Guidelines and Section 7 of the County's "CEQA Regulations Guidelines for the Implementation of CEQA, as amended", an **Initial Study** is prepared primarily to provide the Lead Agency with information to use as the basis for determining whether an Environmental Impact Report (EIR), Negative Declaration, or Mitigated Negative Declaration would be appropriate for providing the necessary environmental documentation and clearance for any proposed project.

☐ According to Section 15065, an **EIR** is deemed appropriate for a particular proposal if the following conditions occur:

- The proposal has the potential to substantially degrade quality of the environment.
- The proposal has the potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals.
- The proposal has possible environmental effects that are individually limited but cumulatively considerable.
- The proposal could cause direct or indirect adverse effects on human beings.

☐ According to Section 15070(a), a **Negative Declaration** is deemed appropriate if the proposal would not result in any significant effect on the environment.

☒ According to Section 15070(b), a **Mitigated Negative Declaration** is deemed appropriate if it is determined that though a proposal could result in a significant effect, mitigation measures are available to reduce these significant effects to insignificant levels.

This Initial Study has determined that the proposed applications will not result in any potentially significant environmental impacts and therefore, a Negative Declaration is deemed as the appropriate document to provide necessary environmental evaluations and clearance as identified hereinafter.

This Initial Study and Negative Declaration are prepared in conformance with the California Environmental Quality Act of 1970, as amended (Public Resources Code, Section 21000 et. seq.); Section 15070 of the State & County of Imperial's Guidelines for Implementation of the California Environmental Quality Act of 1970, as amended (California Code of Regulations, Title 14, Chapter 3, Section 15000, et. seq.); applicable requirements of the County of Imperial; and the regulations, requirements, and procedures of any other responsible public agency or an agency with jurisdiction by law.

Pursuant to the County of Imperial Guidelines for Implementing CEQA, depending on the project scope, the County of Imperial Board of Supervisors, Planning Commission and/or Planning Director is designated the Lead Agency, in accordance with Section 15050 of the CEQA Guidelines. The Lead Agency is the public agency which has the

principal responsibility for approving the necessary environmental clearances and analyses for any project in the County.

C. INTENDED USES OF INITIAL STUDY AND NEGATIVE DECLARATION

This Initial Study and Negative Declaration are informational documents which are intended to inform County of Imperial decision makers, other responsible or interested agencies, and the general public of potential environmental effects of the proposed applications. The environmental review process has been established to enable public agencies to evaluate environmental consequences and to examine and implement methods of eliminating or reducing any potentially adverse impacts. While CEQA requires that consideration be given to avoiding environmental damage, the Lead Agency and other responsible public agencies must balance adverse environmental effects against other public objectives, including economic and social goals.

The Initial Study and Negative Declaration, prepared for the project will be circulated for a period of 20 days (*30-days if submitted to the State Clearinghouse for a project of area-wide significance*) for public and agency review and comments. At the conclusion, if comments are received, the County Planning & Development Services Department will prepare a document entitled "Responses to Comments" which will be forwarded to any commenting entity and be made part of the record within 10-days of any project consideration.

D. CONTENTS OF INITIAL STUDY & NEGATIVE DECLARATION

This Initial Study is organized to facilitate a basic understanding of the existing setting and environmental implications of the proposed applications.

SECTION 1

I. INTRODUCTION presents an introduction to the entire report. This section discusses the environmental process, scope of environmental review, and incorporation by reference documents.

SECTION 2

II. ENVIRONMENTAL CHECKLIST FORM contains the County's Environmental Checklist Form. The checklist form presents results of the environmental evaluation for the proposed applications and those issue areas that would have either a potentially significant impact, potentially significant unless mitigation incorporated, less than significant impact or no impact.

PROJECT SUMMARY, LOCATION AND EVIRONMENTAL SETTINGS describes the proposed project entitlements and required applications. A description of discretionary approvals and permits required for project implementation is also included. It also identifies the location of the project and a general description of the surrounding environmental settings.

ENVIRONMENTAL ANALYSIS evaluates each response provided in the environmental checklist form. Each response checked in the checklist form is discussed and supported with sufficient data and analysis as necessary. As appropriate, each response discussion describes and identifies specific impacts anticipated with project implementation.

SECTION 3

III. MANDATORY FINDINGS presents Mandatory Findings of Significance in accordance with Section 15065 of the CEQA Guidelines.

IV. PERSONS AND ORGANIZATIONS CONSULTED identifies those persons consulted and involved in

preparation of this Initial Study and Negative Declaration.

V. REFERENCES lists bibliographical materials used in preparation of this document.

VI. NEGATIVE DECLARATION – COUNTY OF IMPERIAL

VII. FINDINGS

SECTION 4

VIII. RESPONSE TO COMMENTS (IF ANY)

IX. MITIGATION MONITORING & REPORTING PROGRAM (MMRP) (IF ANY)

E. SCOPE OF ENVIRONMENTAL ANALYSIS

For evaluation of environmental impacts, each question from the Environmental Checklist Form is summarized and responses are provided according to the analysis undertaken as part of the Initial Study. Impacts and effects will be evaluated and quantified, when appropriate. To each question, there are four possible responses, including:

1. **No Impact:** A "No Impact" response is adequately supported if the impact simply does not apply to the proposed applications.

2. **Less Than Significant Impact:** The proposed applications will have the potential to impact the environment. These impacts, however, will be less than significant; no additional analysis is required.

3. **Potentially Significant Unless Mitigation Incorporated:** This applies where incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact".

4. **Potentially Significant Impact:** The proposed applications could have impacts that are considered significant. Additional analyses and possibly an EIR could be required to identify mitigation measures that could reduce these impacts to less than significant levels.

F. POLICY-LEVEL or PROJECT LEVEL ENVIRONMENTAL ANALYSIS

This Initial Study and Negative Declaration will be conducted under a ☐ policy-level, ☒ project level analysis. Regarding mitigation measures, it is not the intent of this document to "overlap" or restate conditions of approval that are commonly established for future known projects or the proposed applications. Additionally, those other standard requirements and regulations that any development must comply with, that are outside the County's jurisdiction, are also not considered mitigation measures and therefore, will not be identified in this document.

G. TIERED DOCUMENTS AND INCORPORATION BY REFERENCE

Information, findings, and conclusions contained in this document are based on incorporation by reference of tiered documentation, which are discussed in the following section.

1. Tiered Documents

As permitted in Section 15152(a) of the CEQA Guidelines, information and discussions from other documents can be included into this document. Tiering is defined as follows:

"Tiering refers to using the analysis of general matters contained in a broader EIR (such as the one prepared

for a general plan or policy statement) with later EIRs and negative declarations on narrower projects; incorporating by reference the general discussions from the broader EIR; and concentrating the later EIR or negative declaration solely on the issues specific to the later project."

Tiering also allows this document to comply with Section 15152(b) of the CEQA Guidelines, which discourages redundant analyses, as follows:

"Agencies are encouraged to tier the environmental analyses which they prepare for separate but related projects including the general plans, zoning changes, and development projects. This approach can eliminate repetitive discussion of the same issues and focus the later EIR or negative declaration on the actual issues ripe for decision at each level of environmental review. Tiering is appropriate when the sequence of analysis is from an EIR prepared for a general plan, policy or program to an EIR or negative declaration for another plan, policy, or program of lesser scope, or to a site-specific EIR or negative declaration."

Further, Section 15152(d) of the CEQA Guidelines states:

"Where an EIR has been prepared and certified for a program, plan, policy, or ordinance consistent with the requirements of this section, any lead agency for a later project pursuant to or consistent with the program, plan, policy, or ordinance should limit the EIR or negative declaration on the later project to effects which:

(1) Were not examined as significant effects on the environment in the prior EIR; or

(2) Are susceptible to substantial reduction or avoidance by the choice of specific revisions in the project, by the imposition of conditions, or other means."

2. Incorporation By Reference

Incorporation by reference is a procedure for reducing the size of EIRs/MND and is most appropriate for including long, descriptive, or technical materials that provide general background information, but do not contribute directly to the specific analysis of the project itself. This procedure is particularly useful when an EIR or Negative Declaration relies on a broadly-drafted EIR for its evaluation of cumulative impacts of related projects (*Las Virgenes Homeowners Federation v. County of Los Angeles* [1986, 177 Ca.3d 300]). If an EIR or Negative Declaration relies on information from a supporting study that is available to the public, the EIR or Negative Declaration cannot be deemed unsupported by evidence or analysis (*San Francisco Ecology Center v. City and County of San Francisco* [1975, 48 Ca.3d 584, 595]). This document incorporates by reference appropriate information from the "Final Environmental Impact Report and Environmental Assessment for the "County of Imperial General Plan EIR" prepared by Brian F. Mooney Associates in 1993 and updates.

When an EIR or Negative Declaration incorporates a document by reference, the incorporation must comply with Section 15150 of the CEQA Guidelines as follows:

- The incorporated document must be available to the public or be a matter of public record (CEQA Guidelines Section 15150[a]). The General Plan EIR and updates are available, along with this document, at the County of Imperial Planning & Development Services Department, 801 Main Street, El Centro, CA 92243 Ph. (442) 265-1736.

- This document must be available for inspection by the public at an office of the lead agency (CEQA Guidelines Section 15150[b]). These documents are available at the County of Imperial Planning & Development Services Department, 801 Main Street, El Centro, CA 92243 Ph. (442) 265-1736.

- These documents must summarize the portion of the document being incorporated by reference or briefly

describe information that cannot be summarized. Furthermore, these documents must describe the relationship between the incorporated information and the analysis in the tiered documents (CEQA Guidelines Section 15150[c]). As discussed above, the tiered EIRs address the entire project site and provide background and inventory information and data which apply to the project site. Incorporated information and/or data will be cited in the appropriate sections.

- These documents must include the State identification number of the incorporated documents (CEQA Guidelines Section 15150[d]). The State Clearinghouse Number for the County of Imperial General Plan EIR is SCH #93011023.

- The material to be incorporated in this document will include general background information (CEQA Guidelines Section 15150[f]). This has been previously discussed in this document.

II. Environmental Checklist

1. **Project Title**: Conditional Use Permit #23-0013 / Initial Study #23-0013 for Phoenix 1, LLC
2. **Lead Agency**: Imperial County Planning & Development Services Department
3. **Contact person and phone number**: Derek Newland, Planner III, (442)265-1736, ext. 1756
4. **Address**: 801 Main Street, El Centro CA, 92243
5. **E-mail**: dereknewland@co.imperial.ca.us
6. **Project location**: 2300 Farr Rd, Brawley, CA 92227
7. **Project sponsor's name and address**: Arnold Wolf; Phoenix 1, LLC
   4001 Kennett Pike, Suite 302, Wilmington, Delaware
8. **General Plan designation**: Agriculture
9. **Zoning**: A-2-R (General Agriculture/Rural Zone) and A-3 (Heavy Agriculture)
10. **Description of project**: The project consists of the reworking of two (2) existing previously permitted geothermal wells located on two (2) existing well pads and the laying of 8 inch pipe from one well to the other over actively disturbed farmland and existing roads. The project is temporary with the well work over period being proposed for two (2) weeks and the well testing period being proposed for twelve (12) weeks. The project will require the use of a drill rig, cement and pump trucks, water storage tanks, portable cooling tanks and temporary housing and working trailers. After the duration of the project all equipment will be removed from the site with monitoring equipment potentially being left behind in order to monitor well temperature.
11. **Surrounding land uses and setting**: The project is surrounded all sides by actively farmed agricultural fields, irrigation canals and drains, and sparsely inhabited with the nearest habitable structure over one (1) mile from either existing well pad.
12. **Other public agencies whose approval is required** (e.g., permits, financing approval, or participation agreement.): Imperial County Air Pollution Control District, IID, Imperial County Public Works

13. Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, is there a plan for consultation that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures regarding confidentially, etc.?

The AB 52 Notice of Opportunity to consult was mailed via certified mail to the Quechan Indian Tribal Governments and the Campo Band of Mission Indians on June 6, 2023 for their review and comment. No response was received from either.

Note: Conducting consultation early in the CEQA process allows tribal governments, lead agencies, and project proponents to discuss the level of environmental review, identify and address potential adverse impacts to tribal cultural resources, and reduce the potential for delay and conflict in the environmental review process. (See Public Resources Code, Section 21080.3.2). Information may also be available from the California Native American Heritage Commission's Sacred Lands File per Public Resources Code, Section 5097.96 and the California Historical Resources Information System administered by the California Office of Historic Preservation. Please also note that Public Resources Code, Section 21082.3 (c) contains provisions specific to confidentiality.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐	Aesthetics	☐	Agriculture and Forestry Resources	☐	Air Quality
☐	Biological Resources	☐	Cultural Resources	☐	Energy
☐	Geology /Soils	☐	Greenhouse Gas Emissions	☐	Hazards & Hazardous Materials
☐	Hydrology / Water Quality	☐	Land Use / Planning	☐	Mineral Resources
☐	Noise	☐	Population / Housing	☐	Public Services
☐	Recreation	☐	Transportation	☐	Tribal Cultural Resources
☐	Utilities/Service Systems	☐	Wildfire	☐	Mandatory Findings of Significance

ENVIRONMENTAL EVALUATION COMMITTEE (EEC) DETERMINATION

After Review of the Initial Study, the Environmental Evaluation Committee has:

☐ Found that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ Found that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ Found that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ Found that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ Found that although the proposed project could have a significant effect on the environment, ~~because~~ all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE DE MINIMIS IMPACT FINDING: ☒ Yes ☐ No

EEC VOTES	YES	NO	ABSENT
PUBLIC WORKS	☒	☐	☐
ENVIRONMENTAL HEALTH SVCS	☒	☐	☐
OFFICE EMERGENCY SERVICES	☒	☐	☐
APCD	☒	☐	☐
AG	☒	☐	☐
SHERIFF DEPARTMENT	☐	☐	☐
ICPDS	☒	☐	☐

For _____ 10-26-2023

Jim Minnick, Director of Planning/EEC Chairman — Date:

EEC ORIGINAL PKG

PROJECT SUMMARY

A. Project Location: The project site is located at 2300 Farr Rd, Brawley, CA 92227. The project parcels are identified as 039-080-004-000, 039-080-005-000 and 039-080-006-000. They are legally described as TR 43 EXC S 100 FT THEREOF T13S R16E 289.54 AC S.B.B.M. (APN 039-080-004-000), POR PAR 1 LLA#281 ALSO BEING N3/4 E2 NE4 SEC 20 T13S R16E 60AC S.B.B.M (APN 039-080-005-000), and POR PAR 3 LLA#281 ALSO BEING S4 E2 NE4 & POR SE4 SEC 20 T13S R16E 82.50 AC S.B.B.M. (039-080-006-000).

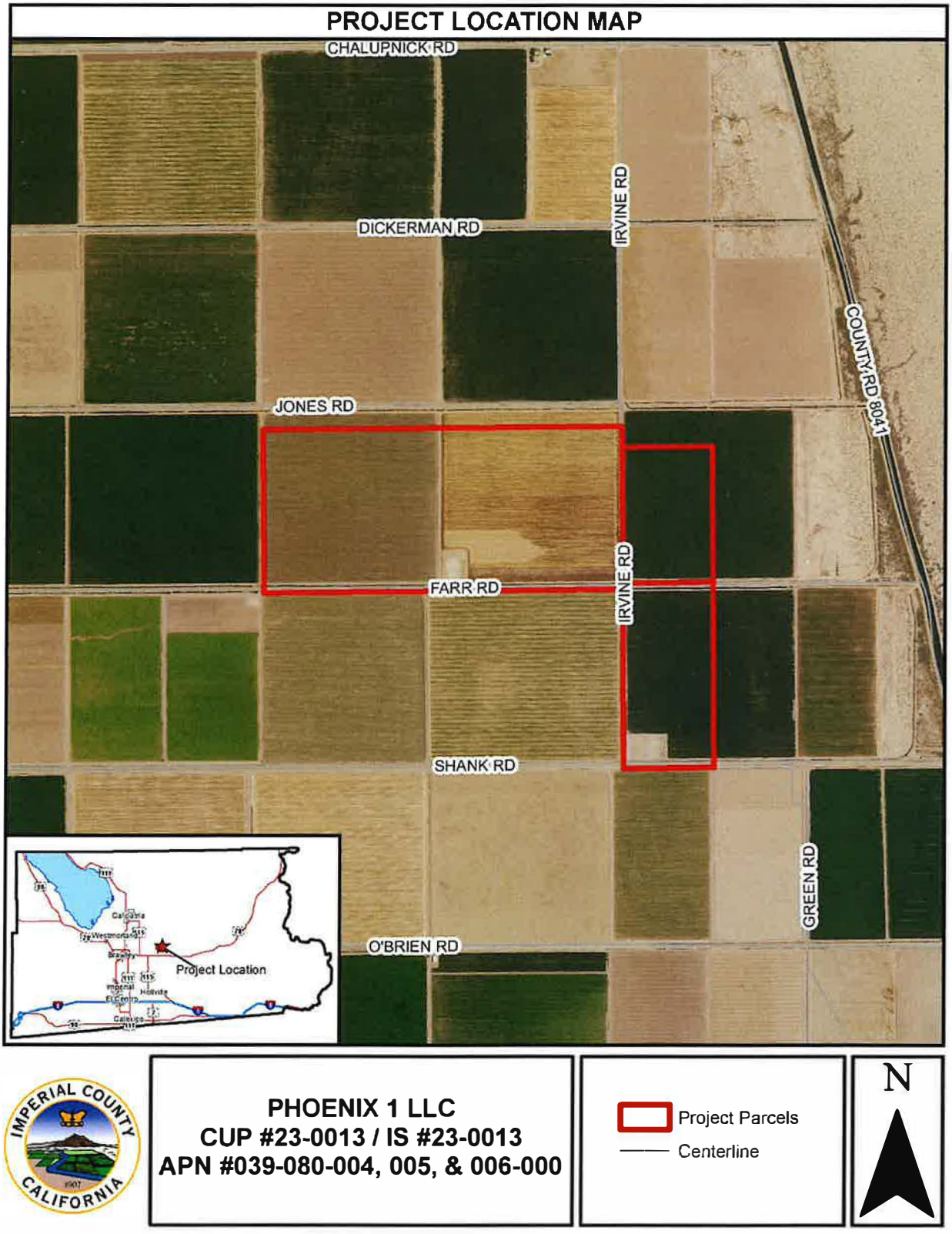
B. Project Summary: The project consists of the reworking of two (2) existing previously permitted geothermal wells located on two (2) existing well pads and the laying of 8 inch pipe from one well to the other over actively disturbed farmland and existing roads. The project is temporary with the well work over period being proposed for two (2) weeks and the well testing period being proposed for twelve (12) weeks. The project will require the use of a drill rig, cement and pump trucks, water storage tanks, portable cooling tanks and temporary housing and working trailers. After the duration of the project all equipment will be removed from the site with monitoring equipment potentially being left behind in order to monitor well temperature.

C. Environmental Setting: The proposed project is located on two (2) existing previously permitted well pads which are on two separate parcels (039-080-004 & 006-000). They will be connected by an 8-inch pipe that will be laid across actively disturbed farmland on all three parcels and across Farr Road and Irvine Road. Assessor's Parcels 039-080-004 & 005-000 are zoned A-2-R (General Agriculture/Rural Zone) and 039-080-006-000 is zoned A-3 (Heavy Agriculture). The surrounding lands are actively farmed agricultural fields with the nearest structures are over 1 mile away from either well pad.

D. Analysis: The proposed project consists of the reworking of two (2) existing previously permitted geothermal wells located on two (2) existing well pads and the laying of 8 inch pipe from one well to the other over actively disturbed farmland and existing roads. The project is located within the Agriculture designation within Imperial County's General Plan. The existing wells and well pads are an allowed use within both the A-2-R and -A-3 zone designations with an approved Conditional Use Permit per the Imperial County Land Use Ordinance, Sections 90508.02 and 90509.02, as is the proposed reworking and testing of the wells.

E. General Plan Consistency: The proposed project is located on land designated within the County's General Plan as "Agriculture" and could be found consistent with the General Plan as the existing wells and well pads are an allowed use within both the A-2-R and -A-3 zone designations with an approved Conditional Use Permit per the Imperial County Land Use Ordinance, Sections 90508.02 and 90509.02, as is the proposed reworking and testing of the wells.

Exhibit "A"
Vicinity Map



EEC ORIGINAL PKG

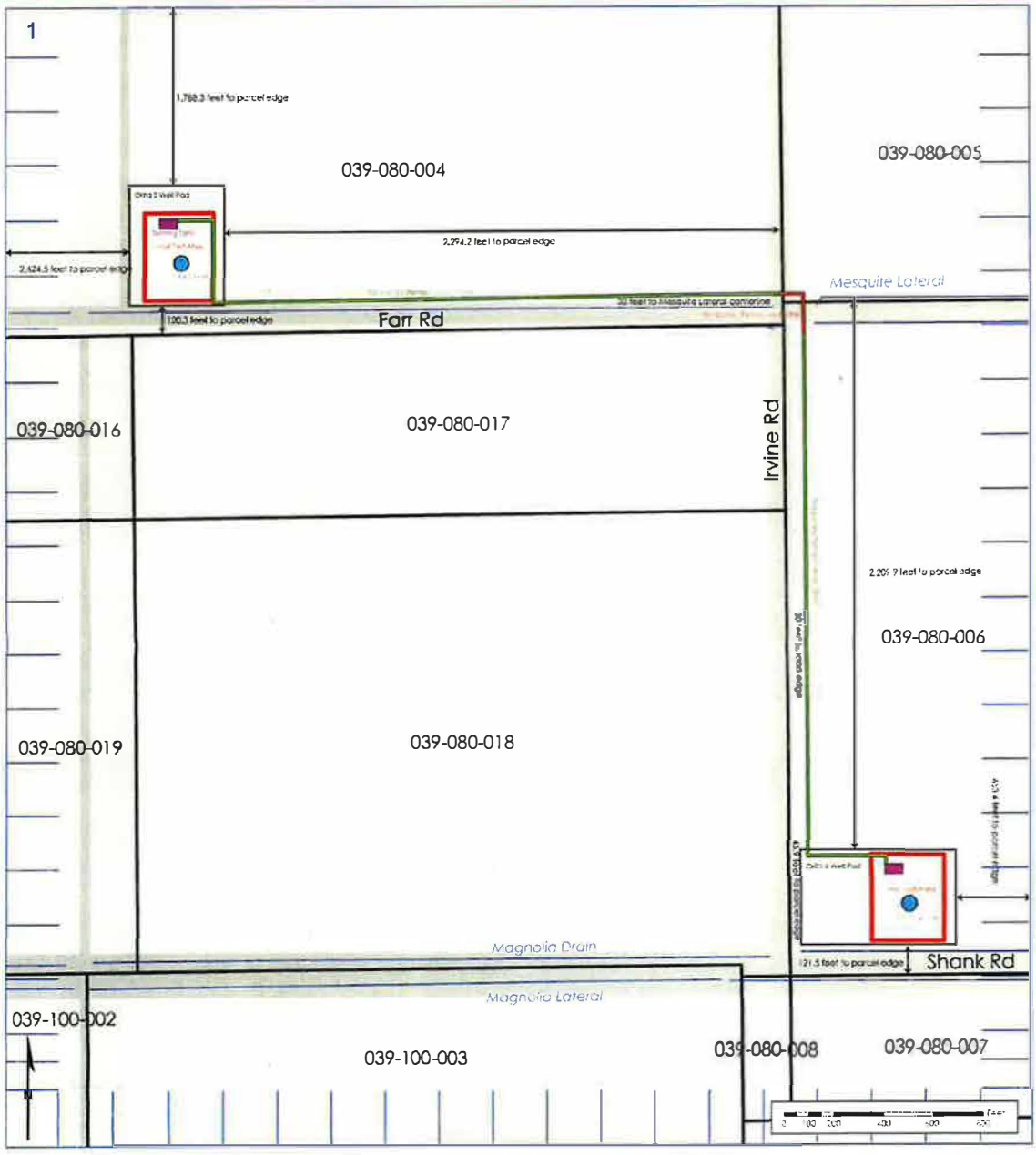
Exhibit "B"
Site Plan/Tract Map/etc.

SITE PLAN

I.C. PLANNING & DEVELOPMENT SERVICES DEPT
801 Main Street, El Centro, CA 92243 (760) 482-4236

READ INSTRUCTIONS ON THE BACK ! USE PEN TO DRAW – DO NOT USE PENCIL!

DRAW SITE LAYOUT PLAN TO SCALE & COMPLETE ALL NUMBERED SPACES !



DRAW SITE LAYOUT PLAN TO SCALE & COMPLETE ALL NUMBERED SPACES!

NAME OF APPLICANT		SIZE OF PARCEL
2 Phoenix 1 LLC	3 904-735-5304	4 APNs total approx 432 acre
PROJECT SITE ADDRESS		ASSESSORS PARCEL NO
5 n/a		6 039-080-004,039-080-005, 039-080-006

WHITE - OFFICE MASTER / YELLOW - ASSESSORS / PINK - APPLICANT

EEC ORIGINAL PKG

EVALUATION OF ENVIRONMENTAL IMPACTS:

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from "Earlier Analyses," as described in (5) below, may be cross-referenced).

5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:

   a) Earlier Analysis Used. Identify and state where they are available for review.
   b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
   c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9) The explanation of each issue should identify:

   a) the significance criteria or threshold, if any, used to evaluate each question; and
   b) the mitigation measure identified, if any, to reduce the impact to less than significance

	Potentially Significant Impact (PSI)	Less Than Significant with Mitigation Incorporated (LTWMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

I. *AESTHETICS*

Except as provided in Public Resources Code Section 21099, would the project:

a) Have a substantial adverse effect on a scenic vista or scenic highway? ☐ ☐ ☐ ☒

a) The project is not located near a scenic vista or scenic highway that has been identified as either a federal, state, or county scenic vista. Therefore, no impacts are expected.

b) Substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway? ☐ ☐ ☒ ☐

b) The project being proposed consists of reworking 2 existing geothermal testing wells located on existing well pads and pipeline being laid on actively farmed farmland for temporary flow and resource testing of the existing wells. No new construction or development is being proposed outside of the existing well pad areas, disturbed agriculture land or roadways. The project area does not have substantial scenic or visual resources. The surrounding area is sparsely populated and consists of majority agricultural fields with desert to the east. Due to the temporary nature of the well reworking and testing, and the project not being located near a state scenic highway, any impacts are expected to be less than significant.

c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surrounding? (Public views are those that are experienced from publicly accessible vantage point.) If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality? ☐ ☐ ☒ ☐

c) The equipment and vehicles including drilling rigs can be seen from Farr Rd., Irvine Rd., and Shank Dr. which have light traffic that is mostly agricultural in nature with large agricultural machines and agricultural workers commuting between works sites. The drilling rigs are anticipated to be on site for 2 weeks with other equipment remaining onsite for an additional anticipated 12-weeks for flow and resource testing that would not be out of place in an area with varying levels of farm equipment, buildings and homes scattered throughout the area. In addition, during the testing phase of the project steam plumes may be seen from the project site which is not an unusual site for the region. Due to the temporary nature of the project and lack of substantial scenic or visual resources any impacts are expected to be less than significant.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area? ☐ ☐ ☒ ☐

d) Well workover operations will run 24 hours a day and would require onsite lighting for the drill rig and other areas of the well pad for safety. All lighting sources will be required to be focused on the working area and shielded from directly shining out from the project site to prevent being able to directly see the light sources at substantial distances. The project is being proposed to run a total of 14 weeks on 2 well pad locations that are +/- 4,000 feet apart and will not be creating a permanent source of substantial light or glare that would adversely affect day or nighttime views in the area. Any impacts are expected to be less than significant.

II. *AGRICULTURE AND FOREST RESOURCES*

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. --Would the project:

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use? ☐ ☐ ☒ ☐

a) The project consists of reworking and testing 2 geothermal wells on 2 existing well pads with approximately 1 mile of 8-inch piping being temporarily laid out over private farmland and public road crossing over Farr Rd. and Irvine Rd. The project as proposed is temporary in nature and will not be permanently converting any farmland to non-agricultural use. Any impacts are considered less than significant.

	Potentially Significant Impact (PSI)	Less Than Significant with Mitigation Incorporated (LTWMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

b) Conflict with existing zoning for agricultural use, or a Williamson Act Contract? ☐ ☐ ☒ ☐

b) The project properties are zoned A-2-R (General Agriculture/Rural Zone) and A-3 (Heavy Agriculture) which allows for the existing geothermal test wells that are proposed to be reworked and tested with an approved Conditional Use Permit and there are no current/active Williamson Act Contracts in Imperial County. Therefore, the project will not conflict with existing zoning for agricultural use or Williamson Act Contracts and any impacts would be considered less than significant.

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))? ☐ ☐ ☐ ☒

c) The project properties are zoned A-2-R (General Agriculture/Rural Zone) and A-3 (Heavy Agriculture) which allows for the existing geothermal test wells that are proposed to be reworked and tested with an approved Conditional Use Permit. The project will not conflict with existing zoning for, or cause rezoning of, forest land, timberland or timberland zoned Timberland Production. No impacts are expected.

d) Result in the loss of forest land or conversion of forest land to non-forest use? ☐ ☐ ☐ ☒

d) The project is located on agricultural lands on existing well pads and is proposed as a temporary 14-week project. Therefore, no impacts are expected.

e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use? ☐ ☐ ☒ ☐

e) As stated in sections II-a and b, the project is located in lands zoned for agriculture and consists of reworking existing wells on existing well pads with the temporary running of an 8-inch pipe temporarily on over agriculture fields and roadways and will not result int eh permanent conversion agriculture or forest land to non-agriculture or forest use. Any impacts are expected to be less than significant.

III. *AIR QUALITY*

Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to the following determinations. Would the Project:

a) Conflict with or obstruct implementation of the applicable air quality plan? ☐ ☐ ☒ ☐

a) The project will be required by the Imperial County Air Pollution Control District (ICAPCD) to obtain an Authority to Construct permit per ICAPCD comment letter dated June 20, 2023[1], which would prevent any conflict with or obstruction of implementation of the applicable air quality plan. Any impacts would be considered less than significant.

b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard? ☐ ☐ ☒ ☐

b) The project will be required to obtain an Authority to Construct Permit as stated in section III-a above and will be required to comply with all rules and regulations as required by ICAPCD including Regulation VIII to control fugitive dust emissions. With compliance of ICAPCD rules and regulations and to due to the temporary nature of the project any impacts are expected to be less than significant.

c) Expose sensitive receptors to substantial pollutants concentrations? ☐ ☐ ☒ ☐

c) There are few sensitive receptors within the project area. The project is located in an area composed of predominately of agricultural fields with a few scattered homes and agricultural equipment storage yards located up to +/- 1 mile away from either existing well pads. With compliance with the ICAPCD rules and regulations as stated above it is expected that any impacts would be considered less than significant.

[1] Imperial County Air Pollution Control District comment letter dated June 20, 2023

	Potentially Significant Impact (PSI)	Less Than Significant with Mitigation Incorporated (LTWMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

d) Result in other emissions (such as those leading to odors adversely affecting a substantial number of people? ☐ ☐ ☒ ☐

d) The well workover and testing activities would result in emissions which will include NOx, carbon monoxide (CO), particulate matter (PM), and sulfur dioxide. The area is sparsely inhabited and compliance with the required ICAPCD Authority to Construct permit would mitigate the emissions of particulates and gasses. In addition, the project is temporary with a proposed 14-week period. Any impacts are anticipated to be less than significant.

IV. *BIOLOGICAL RESOURCES* *Would the project:*

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service? ☐ ☒ ☐ ☐

a) According to the Conservation and Open Space Element of the Imperial County General Plan[2] the project is within 2 miles of the flat-tailed horned lizard distribution model but not within the species management area. Additionally, the flat-tailed horned lizard prefers the desert habitat off to the east outside of the central agricultural area of the County.

The project however, is located in the burrowing owl distribution model. A Biological Survey Report dated August 16, 2023[3] identified 4 active burrowing owl burrows located around the Orita 4 well.

Mitigation measures per the survey letter include:

BIO-1: Avoiding project activities during the nesting season (February 1 – August 31) and conducting project activities as far from existing burrows as possible outside of the nesting season (September 1 – January 21).

BIO-2: A biologist will be required to be onsite to determine if the burrows are active during project activities and monitor the burrowing owls at burrows located at the well pads for signs of distress during equipment mobilization and the first day of well workover activities. Hay or straw bales may be installed between the burrows and project activities to reduce the potential for disturbance to owls from project activities. The biologist should monitor the burrowing owls weekly and if the biologist determines that the project does not cause disturbance or distress for owls, the monitoring may cease on approval from the County.

In addition to burrowing owl observation, should the onsite biologist observe any other protected species nesting (i.e.. Mourning doves, migratory birds etc.) the County would need to be notified before further action can be taken.

The project is a temporary action lasting 14 weeks as proposed. It is expected that observation and mitigation measures along with the temporary nature of the project would make any impacts less than significant.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service? ☐ ☐ ☒ ☐

b) The project is along canals and drains which have not been identified as a sensitive riparian habitat or sensitive natural community identified in local or regional plan, policies, regulations, or by the California Depart of Fish and Wildlife or U.S. Fish and Wildlife Service. Any impacts are expected to be less than significant.

c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? ☐ ☐ ☐ ☒

c) The project is not located near any state or federally protected wetlands. No impacts are expected.

d) Interfere substantially with the movement of any resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of ☐ ☐ ☒ ☐

[2] Imperial County General Plan: Conservation and Open Space Element
[3] Phoenix Orita 2 and Orita 4 Well Testing Activities-Survey Letter Report, Panorama Environment, Inc., August 16, 2023

	Potentially Significant Impact (PSI)	Less Than Significant with Mitigation Incorporated (LTWMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

native wildlife nursery sites?

d) The project location is subject to migratory birds. Per observation method and mitigation measures outlined in section IV-a above, any impacts would be expected to be less than significant.

e) Conflict with any local policies or ordinance protecting biological resource, such as a tree preservation policy or ordinance? ☐ ☐ ☒ ☐

e) The project complies with Imperial County's Title 9, Land Use Ordinance with an approved Conditional Use Permit and consists of existing geothermal test wells and well pads with piping being laid on disturbed land. Impacts are expected to be less than significant.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan? ☐ ☐ ☒ ☐

f) The project will not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or stat habitat conservation plan. The project is consistent with Imperial County's Title 9, Land Use Ordinance with an approved Conditional Use Permit consists of reworking existing geothermal test wells and well pads with piping being laid on disturbed land. Impacts are expected to be less than significant.

V. *CULTURAL RESOURCES Would the project:*

a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5? ☐ ☐ ☐ ☒

a) The project is not expected to cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5. The project is being conducted on existing, previously permitted geothermal test wells on existing well pads with piping being laid over actively disturbed farmland and roadways. Request for comments per AB-52 were sent to both the Campo Band of Mission Indians and Quechan Indian Tribe on June 06, 2023, and no comments were received from either. No impacts are expected.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5? ☐ ☐ ☐ ☒

b) The project is not expected to cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5. The project is being conducted on existing, previously permitted geothermal test wells on existing well pads with piping being laid over actively disturbed farmland and roadways. Request for comments per AB52 were sent to both the Campo Band of Mission Indians and Quechan Indian Tribe on June 6, 2023, and no comments were received from either. No impacts are expected.

c) Disturb any human remains, including those interred outside of dedicated cemeteries? ☐ ☐ ☐ ☒

c) The project is not expected to disturb any human remains, including those interred outside of dedicated cemeteries. The project is being conducted on existing, previously permitted geothermal test wells on existing well pads with piping being laid over actively disturbed farmland and roadways. Request for comments per AB-52 were sent to both the Campo Band of Mission Indians and Quechan Indian Tribe on June 6, 2023, and no comments were received from either. No impacts are expected.

VI. *ENERGY Would the project:*

a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation? ☐ ☐ ☒ ☐

a) The project as proposed is a temporary use consisting of well workover and testing actions over a proposed 14-week period. The project will require fuel to power equipment and a generator to provide power to the site during the well workover and testing phases of the project. There is no proposed permanent energy consumption and energy use related to project will cease once well testing is completed. Any impacts are expected to be less than significant.

	Potentially Significant Impact (PSI)	Less Than Significant with Mitigation Incorporated (LTWMI)	Less Than Significant Impact (LTSI)	No Impact (NI)
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐

b) The project will not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. The project is proposed for a temporary 14-week period and consists of geothermal well reworking of 2 wells on 2 existing well pads and the lay down of piping over actively disturbed agricultural land and roadways. Any impacts are expected to be less than significant.

VII. ***GEOLOGY AND SOILS Would the project:***

a) Directly or indirectly cause potential substantial adverse effects, including risk of loss, injury, or death involving: ☐ ☐ ☒ ☐

a) The project as proposed is a temporary project lasting 14 weeks and consists of reworking geothermal test wells located on existing well pads and the laying of pipes over roadways and actively disturbed agriculture fields. The project will have a drilling rig and support equipment with a few habitable structures that will require building permits and to comply with California Building Code. It is not anticipated that the project will directly or indirectly cause potential substantial adverse effect, including risk of loss, injury or death. Any impacts are expected to be less than significant.

1) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42? ☐ ☐ ☒ ☐

1) Imperial County is subject to earthquakes regardless of location. The project site is located +/- 9.3 miles northeast from the nearest fault zone per the California Geologic Survey Hazard Program: Alquist-Priolo Fault Hazard Zones map[4]. Any temporary structures will require building permits and comply with California Building Codes. Any impacts are expected to be less than significant.

2) Strong Seismic ground shaking? ☐ ☐ ☒ ☐

2) While temporary trailers are proposed on-site, they will require building permits and comply with the California Building Code. The majority of the people on the work site will be in a relatively open area with minimum risk from falling structures or equipment. Any impacts from strong seismic ground shaking are expected to be less than significant.

3) Seismic-related ground failure, including liquefaction and seiche/tsunami? ☐ ☐ ☒ ☐

3) The project will have few habitable temporary structures (manufactured office/homes) which will require building permits and comply with California Building Codes. In addition, the project is temporary with a proposed and primary work will be done on existing well-pads. While seismic-related ground failure, including liquefaction is a small possibility due the seismic susceptibility of the region Due to the temporary nature of the project and limited habitable structures any impacts are expected to be less than significant.

4) Landslides? ☐ ☐ ☐ ☒

4) The project is located in a flat area surrounded by agricultural fields and will not be subjected to potential landslides. No impacts are expected.

b) Result in substantial soil erosion or the loss of topsoil? ☐ ☐ ☒ ☐

b) The project consists of the reworking of 2 previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields. No new wells or disturbance of previously disturbed land is proposed. Movement of vehicles and temporary placement of equipment and manufactured offices/homes may include minor disturbance of previously disturbed but would not result in substantial soil erosion or the loss of topsoil. Any impacts are expected to be less than significant.

c) Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, and potentially result in on- or off-site landslides, lateral spreading, subsidence, liquefaction or collapse? ☐ ☐ ☒ ☐

c) The project consists of the reworking of 2 previously permitted geothermal testing wells located on existing well pads and

[4] California Geologic Survey Hazard Program: Alquist-Priolo Fault Hazard Zones

	Potentially Significant Impact (PSI)	Less Than Significant with Mitigation Incorporated (LTWMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

the laying of pipe across existing roadways and actively farmed agriculture fields. The existing well pads have not been altered or disturbed since the previously permitted drilling and testing project was conducted. The project consists of uninhabited equipment as well as manufactured office/homes that will require building permits and comply with the California Building Code. The existing pads are not located on a geologic unit or soil that is unstable or that would become unstable as a result of the temporary project and would not potentially result in on or off-site landslides, lateral spreading, subsidence, liquefaction or collapse. Any impacts are expected to be less than significant.

d) Be located on expansive soil, as defined in the latest Uniform Building Code, creating substantial direct or indirect risk to life or property? ☐ ☐ ☒ ☐

d) The project consists of the reworking of 2 previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields. The existing well pads have not been altered or disturbed since the previously permitted drilling and testing project was conducted. The project consists of uninhabited equipment as well as manufactured office/homes that will require building permits and to comply with the California Building Code which will be on-site temporarily for a proposed 14-week period. The existing well pads are not located on expansive soil and will not create substantial direct or indirect risk to life or property. Therefore, any impacts would be expected to be less than significant.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water? ☐ ☐ ☒ ☐

e) The project consists of the reworking of 2 previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. The existing well pads have not been altered or disturbed since the previously permitted drilling and testing project was conducted. The project consists of uninhabited equipment as well as manufactured office/homes that will require building permits and comply with the California Building Code. Portable sanitation facilities are proposed for management and removal of sanitation waste which is common in agricultural areas. While the potential for spillage exists, the effects would be at surface level are expected to be minor. Therefore, any impacts are expected to be less than significant.

f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? ☐ ☐ ☐ ☒

f) The project consists of the reworking of 2 previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. No new disturbance of undisturbed land is proposed. Therefore, the project is not expected to directly or indirectly destroy a unique paleontological resource or site, or unique geologic feature and no impacts are expected.

VIII. *GREENHOUSE GAS EMISSION* *Would the project:*

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? ☐ ☐ ☒ ☐

a) The well workover and testing activities would result in emissions which will include NOx, carbon monoxide (CO), particulate matter (PM), and sulfur dioxide. The project will be required to obtain an ICAPCD Authority to Construct permit a comply with all ICAPCD rules and regulations which would mitigate the emissions of greenhouse gasses. In addition, the project is temporary for a proposed 14-week period. Any impacts are anticipated to be less than significant.

b) Conflict with an applicable plan or policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases? ☐ ☐ ☒ ☐

b) The project will not conflict with any applicable plan or policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases. The project is temporary in nature and would be required to obtain an Authority to Construct permit from ICAPCD and comply with their rules and regulations. Any impacts are expected to be less than significant.

IX. *HAZARDS AND HAZARDOUS MATERIALS* *Would the project:*

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? ☐ ☐ ☒ ☐

a) The project consists of the reworking and testing of 2 previously permitted geothermal testing wells located on existing

well pads. During both the reworking and testing portion of the project there will be potentially hazardous and hazardous substances on-site for the use in the well clean out and testing phases. These materials will be used on-site and any unused material will be taken off-site at the end of the project. The project is located in an area that is predominately agriculture fields and is sparsely inhabited and is temporary project with a proposed 14-weeks of operation. The project will be required to comply with any rules, regulations or permits required by either the Imperial County Fire Department or Imperial County Environmental Health Division as well as to report the storage of the substances and their amounts to the Certified Unified Program Agencies (CUPA). It is expected that compliance with any required rules and regulations as well as the temporary nature of the operation, that the project will not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. Therefore, any impacts are expected to be less than significant.

b) Create a significant hazard to the public or the environment through reasonable foreseeable upset and accident conditions involving the release of hazardous materials into the environment? ☐ ☐ ☒ ☐

b) As stated above in IX-a, the project will have hazardous and potentially hazardous materials on-site with the project located in a sparsely inhabited area surrounded by predominately agricultural fields. While there is a chance of an accident on-site that may result in the release of hazardous materials, the effects would be expected to be limited and would not create a significant hazard to the public or the environment through reasonable foreseeable upset and accident conditions involving the release of hazardous materials into the environment. Therefore, any impacts are expected to be less than expected.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? ☐ ☐ ☒ ☐

c) The project is located in a sparsely inhabited area of the County which is predominately agricultural fields. The nearest school is Mulberry Elementary which is located +/- 4.7 miles northwest of the Orita 2 well pad which is the northern most existing well site of the project. Any impacts from unmitigated emissions of hazardous materials from the site due to unforeseen circumstances is expected to be less than significant.

d) Be located on a site, which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment? ☐ ☐ ☐ ☒

d) The project consists of existing previously permitted geothermal test wells located on existing well pads as well as the laying of pipe across existing roads and actively disturbed agricultural lands and are they are not located on a site which is included on a list of hazardous materials sites that would create a significant hazard to the public or the environment and no impacts are expected.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area? ☐ ☐ ☒ ☐

e) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. The project locations is sparsely inhabited and is not within an airport land use plan. The nearest airport is in the City of Brawley located +/- 9.6 miles to the west of the project and project is not expected to result in a safety hazard or excessive noise for people residing or working in the project area, any impacts are expected to be less than significant.

f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? ☐ ☐ ☒ ☐

f) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. The project will not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. Any impacts are expected to be less than significant.

g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires? ☐ ☐ ☒ ☐

g) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. There are no structures within ½ mile of either well pad and the surrounding lands are agricultural fields. There is a reasonable expectation that the project would not expose people or structures, either directly or indirectly, to a

	Potentially Significant Impact (PSI)	Less Than Significant with Mitigation Incorporated (LTWMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

significant risk loss, injury or death involving wildland fires and any impacts are expected to be less than significant.

X. ***HYDROLOGY AND WATER QUALITY*** ***Would the project:***

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality? ☐ ☐ ☒ ☐

a) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. The existing wells were permitted and drilled for the same use as the proposed project and the existing well pads were constructed to include a stormwater containment basin which will remain functional throughout the project. The project as proposed does not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality and any impacts would be expected to be less than significant.

b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin? ☐ ☐ ☒ ☐

b) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. The project does not propose nor intend to extract ground water, and there does not appear to an impact to ground water supplies. Any impacts would be considered less than significant.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: ☐ ☐ ☒ ☐

c) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. The project does not propose any new expansion of the well pads or new disturbance of land that would substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces. Any impacts would be considered less than significant.

(i) result in substantial erosion or siltation on- or off-site; ☐ ☐ ☒ ☐

(i) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. The project does not propose any expansion or change to the existing well pads nor does it propose any new disturbance of land that may result in substantial erosion or siltation on or off-site due to drainage. Any impacts would be expected to be less than significant.

(ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite; ☐ ☐ ☒ ☐

(ii) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. The project would not substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off-site. The existing wells pads were built with retention basins alongside the pads that will remain intact and functional during the duration of the project. Any impacts would be considered less than significant.

(iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or; ☐ ☐ ☒ ☐

(iii) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. While a potential for runoff water is possible due to the well reworking activities, the existing well pads have retention basins which would be utilized for that runoff. Therefore, it is not expected that the project will create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide

	Potentially Significant Impact (PSI)	Less Than Significant with Mitigation Incorporated (LTWMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

substantial additional sources of polluted runoff. Any impacts would be considered less than significant.

(iv) impede or redirect flood flows? ☐ ☐ ☒ ☐

(iv) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. The project does not propose any expansion of the well pads nor any new disturbance of land that could potentially impede or redirect flood flows. Any impacts would be considered less than significant.

d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation? ☐ ☐ ☒ ☐

d) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. The project is located in Zone X "areas determined to be outside the 0.2% annual chance floodplain" of the FEMA Flood Insurance Rate Map Panel No. 0600651075C[5] and is not in a tsunami or seiche zone. Therefore, the project would not be anticipated to risk release of pollutants due to project inundation. Any impacts would be expected to be considered less than significant.

e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan? ☐ ☐ ☐ ☒

e) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. The project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. No impacts are anticipated.

XI. *LAND USE AND PLANNING Would the project:*

a) Physically divide an established community? ☐ ☐ ☐ ☒

a) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. The project will not physically divide an established community, no impacts are expected.

b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect? ☐ ☐ ☐ ☒

b) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. The proposed project as well as the previously permitted project is an allowed use with an approved Conditional Use Permit and will not conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. No impacts are expected.

XII. *MINERAL RESOURCES Would the project:*

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state? ☐ ☐ ☐ ☒

a) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. The existing wells and well pads have a small footprint of just over +/- 2 acres each and have not and will not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state. No impacts are expected.

b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, ☐ ☐ ☐ ☒

[5] FEMA Flood Map Service Center

	Potentially Significant Impact (PSI)	Less Than Significant with Mitigation Incorporated (LTWMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

specific plan or other land use plan?

b) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. The existing wells and well pads have a small footprint of just over +/- 2 cares each and have not and will result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan. No impacts are expected.

XIII. ***NOISE*** ***Would the project result in:***

a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? ☐ ☒ ☐ ☐

a) The project may produce noise levels between 90-110 decibels. Title 9, Division 7: Noise Control and Abatement Ordinance, Section 90702.00 "Sound Level Limits" A-5) Manufacturing, all other Industrial, including Agricultural & Extraction Industry may not cause noise above a one hour average sound level of 70 decibels. Additionally, Title 9, Division 17: Renewable Energy Resources, Section 91703.01 "Drilling Standards", Subsection B "Noise Limitation", each operator shall limit drilling noise to a sound level equivalent to CNEL 65 dB(A). However, that sound limit may be exceeded by ten percent if the noise is intermittent and during daylight hours only.

In order to maintain acceptable average noise levels, noise mitigation measures are as follows:

NOI-1: If applicable, the project would be required to use mufflers on noise producing equipment that does not already have that equipment installed.

NOI-2: The well pads can erect haybales along the edges of the well pads on the sides to the closest property lines. On 039-080-004-000 this would be the southern boundary and 039-080-006-000 this would be the western and southern boundary.

While the area is sparsely inhabited there is still the possibility of excessive noise effecting agricultural workers in the area as well as potential wildlife. It is expected that adherence to Title 9, Division 7 and 17 along with the mitigation measures, would bring any noise impacts to less than significant.

b) Generation of excessive ground-borne vibration or ground-borne noise levels? ☐ ☐ ☒ ☐

b) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. During the well workover period the generation of ground-borne vibration and noise is possible but would be intermediate and not expected to be excessive. Any impacts would be anticipated to be less than significant.

c) For a project located within the vicinity of a private airstrip or an airport land use plan or where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels? ☐ ☐ ☒ ☐

c) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. The project location is sparsely inhabited and is not within an airport land use plan. The nearest airport is in the City of Brawley located +/- 9.6 miles to the west of the project and project is not expected to result in excessive noise for people residing or working in the project area, any impacts are expected to be less than significant.

XIV. ***POPULATION AND HOUSING*** ***Would the project:***

a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and business) or indirectly (for example, through extension of roads or other infrastructure)? ☐ ☐ ☐ ☒

a) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. Therefore, the project will not induce substantial unplanned population growth in an area, either directly

	Potentially Significant Impact (PSI)	Less Than Significant with Mitigation Incorporated (LTWMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

or indirectly and no impacts are expected.

b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere? ☐ ☐ ☐ ☒

b) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. The project area is sparsely inhabited and therefore, would not displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere. No impacts are expected.

XV. *PUBLIC SERVICES*

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: ☐ ☐ ☒ ☐

a) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. As the project is temporary in nature and no new expansion is proposed it is not expected that the project would result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or create the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services. Any impacts would be considered less than significant.

1) Fire Protection? ☐ ☐ ☒ ☐

1) As stated in XV-a, the project duration is for a temporary 14-week period and consists of reworking 2 existing previously permitted wells with pipe connecting the wells being laid out over existing roadways actively farmed agricultural fields. The Imperial County Fire Department was given the opportunity to comment on the project and a "no comments" comment letter dated June 28, 2023 was received. While fire protection services could potentially be required any impacts from the project would be considered less than significant.

2) Police Protection? ☐ ☐ ☒ ☐

2) As stated in XV-a, the project duration is for a temporary 14-week period and consists of reworking 2 existing previously permitted wells with pipe connecting the wells being laid out over existing roadways actively farmed agricultural fields. The Imperial County Sheriff's Office was given the opportunity to comment on the project and no comments were received. While police protection services could potentially be required any impacts are expected to be less than significant.

3) Schools? ☐ ☐ ☐ ☒

3) As stated in XV-a, the project duration is for a temporary 14-week period and consists of reworking 2 existing previously permitted wells with pipe connecting the wells being laid out over existing roadways actively farmed agricultural fields. There are no anticipated impacts to schools.

4) Parks? ☐ ☐ ☐ ☒

4) As stated in XV-a, the project duration is for a temporary 14-week period and consists of reworking 2 existing previously permitted wells with pipe connecting the wells being laid out over existing roadways actively farmed agricultural fields. There are no anticipated impacts to Parks.

5) Other Public Facilities? ☐ ☐ ☐ ☒

5) As stated in XV-a, the project duration is for a temporary 14-week period and consists of reworking 2 existing previously permitted wells with pipe connecting the wells being laid out over existing roadways actively farmed agricultural fields. Due to the temporary nature of the project and scope of work there no anticipated impacts to any other public facilities.

	Potentially Significant Impact (PSI)	Less Than Significant with Mitigation Incorporated (LTWMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

XVI. ***RECREATION***

a) Would the project increase the use of the existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? ☐ ☐ ☐ ☒

a) The project would not increase the use of the existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. Therefore, no impacts are anticipated.

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse effect on the environment? ☐ ☐ ☐ ☒

b) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks and does not include recreational facilities or require the construction or expansion of recreational facilities. Therefore, no impacts are anticipated.

XVII. ***TRANSPORTATION*** ***Would the project:***

a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities? ☐ ☐ ☐ ☒

a) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks and would not conflict with the Circulation and Scenic Highway Element of the Imperial County General Plan[6]. Therefore, no impacts are anticipated.

b) Would the project conflict or be inconsistent with the CEQA Guidelines section 15064.3, subdivision (b)? ☐ ☐ ☒ ☐

b) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. Equipment will be brought on-site initially but will not be traveling back and forth on roads during the 14 weeks of project operation and all other traffic would be passenger vehicles for workers in an area with light and infrequent traffic. Therefore, any impacts would be anticipated to be less than significant.

c) Substantially increases hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? ☐ ☐ ☒ ☐

c) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. No new expansion of the existing well pads is proposed and the area is sparsely inhabited with light, infrequent traffic. Additionally, heavy farming equipment is common in the area. Therefore, the project would not substantially increase hazards due to a geometric design feature or incompatible uses and any impacts would be anticipated to be less than significant.

d) Result in inadequate emergency access? ☐ ☐ ☒ ☐

d) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. The project is not proposing any expansion well pads and access to the sites are directly off Farr Rd.

[6] Imperial County General Plan: Circulation and Scenic Highway Element

	Potentially Significant Impact (PSI)	Less Than Significant with Mitigation Incorporated (LTWMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

and Shank Rd. Any impacts are expected to be less than significant.

XVIII. ***TRIBAL CULTURAL RESOURCES***

a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place or object with cultural value to a California Native American tribe, and that is: ☐ ☐ ☐ ☒

a) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. The project is not proposing any permanent expansion of the well pads or any other portion of the project area. Any digging or ground penetration will be done within the already existing wells. No impacts are expected.

(i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as define in Public Resources Code Section 5020.1(k), or ☐ ☐ ☐ ☒

(i) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. The project is not listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as define in Pubic Resources Code Section 5020.1(k). No permanent expansion or new land disturbance is proposed for the project. No impacts are expected.

0 (ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth is subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American Tribe. ☐ ☐ ☒ ☐

(ii) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. The project is not proposing any permanent expansion or new land disturbance. As stated earlier in V-a "Cultural Resources", a request for comments per AB52 were sent to both the Campo Band of Mission Indians and Quechan Indian Tribe on June 06, 2023, and no comments were received from either. Therefore, any impacts are expected to be less than significant.

XIX. ***UTILITIES AND SERVICE SYSTEMS*** ***Would the project:***

a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction of which could cause significant environmental effects? ☐ ☐ ☐ ☒

a) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. The project will be using temporary portable sanitation facilities and a generator for any needed power. The project will not require or result in the relocation or construction of new or expanded water, wastewater treatment, stormwater drainage, electric power, natural gas, telecommunications facilities. No impacts are expected.

b) Have sufficient water supplies available to serve the project from existing and reasonably foreseeable future development during normal, dry and multiple dry years? ☐ ☐ ☒ ☐

	Potentially Significant Impact (PSI)	Less Than Significant with Mitigation Incorporated (LTWMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

b) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. Project is proposing up to 50,000 gallons of water per day which may vary. Additional water may be required for road maintenance, well pad maintenance and fugitive dust control. Proposed water sources are the IID irrigation system along the properties or trucking in of the water. As the project is temporary in nature and the well work over portion being proposed for a 2-week period the project should have sufficient water supplies available. Any impacts are anticipated to be less than significant.

c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments? ☐ ☐ ☐ ☒

c) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. The project will be using temporary portable sanitation facilities and would not have an impact on any wastewater treatment provider.

d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals? ☐ ☐ ☒ ☐

d) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. Any solid waste would be required to be taken off site by the provider or require and solid waste removal contract from the site. The project is temporary in nature and is not expected to generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals. Any impacts would be expected to be less than significant.

e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste? ☐ ☐ ☒ ☐

e) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. The project would be required to comply with federal, state and local management and reduction statues and regulation related to solid waste which, due to the nature and duration of the project, is expected to be less than significant.

XX. *WILDFIRE*

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project:

a) Substantially impair an adopted emergency response plan or emergency evacuation plan? ☐ ☐ ☐ ☒

a) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. The project would not substantially impair an adopted emergency response plan or emergency evacuation plan. No impacts are anticipated.

b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire? ☐ ☐ ☐ ☒

b) The project is not located in an area at risk of wildfires and therefore would not expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. No impacts are anticipated.

c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment? ☐ ☐ ☐ ☒

c) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. The project is not located in an area at risk of wildfires and would not require the installation or maintenance of associated infrastructure that may exacerbate fire risk or that may result in temporary or ongoing impacts to

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the environment. No impacts are anticipated.

d)	Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☒

d) The project consists of the reworking of 2 existing previously permitted geothermal testing wells located on existing well pads and the laying of pipe across existing roadways and actively farmed agriculture fields for a temporary period of a proposed 14 weeks. The project is located in a sparsely inhabited and flat area that is not at risk of wildfires. There is no proposed expansion of the well pads or new disturbance of land that could cause drainage changes. No impacts are anticipated.

Note: Authority cited: Sections 21083 and 21083.05, Public Resources Code. Reference: Section 65088.4, Gov. Code; Sections 21080(c), 21080.1, 21080.3, 21083, 21083.05, 21083.3, 21093, 21094, 21095, and 21151, Public Resources Code; Sundstrom v. County of Mendocino,(1988) 202 Cal.App.3d 296; Leonoff v. Monterey Board of Supervisors, (1990) 222 Cal.App.3d 1337; Eureka Citizens for Responsible Govt. v. City of Eureka (2007) 147 Cal.App.4th 357; Protect the Historic Amador Waterways v. Amador Water Agency (2004) 116 Cal.App.4th at 1109; San Franciscans Upholding the Downtown Plan v. City and County of San Francisco (2002) 102 Cal.App.4th 656.

Revised 2009- CEQA
Revised 2011- ICPDS
Revised 2016 – ICPDS
Revised 2017 – ICPDS
Revised 2019 – ICPDS

	Potentially Significant Impact (PSI)	Less Than Significant with Mitigation Incorporated (LTWMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

SECTION 3
III. MANDATORY FINDINGS OF SIGNIFICANCE

The following are Mandatory Findings of Significance in accordance with Section 15065 of the CEQA Guidelines.

a)	**Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, eliminate tribal cultural resources or eliminate important examples of the major periods of California history or prehistory?**	☐	☑	☐	☐
b)	**Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)**	☐	☐	☑	☐
c)	**Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?**	☐	☑	☐	☐

IV. PERSONS AND ORGANIZATIONS CONSULTED

This section identifies those persons who prepared or contributed to preparation of this document. This section is prepared in accordance with Section 15129 of the CEQA Guidelines.

A. COUNTY OF IMPERIAL

- Jim Minnick, Director of Planning & Development Services
- Michael Abraham, AICP, Assistant Director of Planning & Development Services
- Diana Robinson, Planning Division Manager
- Derek Newland, Project Planner
- Imperial County Air Pollution Control District
- Department of Public Works
- Fire Department
- Ag Commissioner
- Environmental Health Services
- Sheriff's Office

B. OTHER AGENCIES/ORGANIZATIONS

- **Imperial Irrigation District**

(Written or oral comments received on the checklist prior to circulation)

V. REFERENCES

1. "County of Imperial General Plan EIR", prepared by Brian F. Mooney & Associates in 1993; and as Amended by County in 1996, 1998, 2001, 2003, 2006 & 2008, 2015, 2016.

2. Imperial County General Plan: Conservation and Open Space Element
https://www.icpds.com/planning/land-use-documents/general-plan/conservation-and-open-space-element

3. Phoenix Orita 2 and Orita 4 Well Testing Activities-Survey Letter Report, Panorama Environment, Inc., August 16, 2023

4. California Geologic Survey Hazard Program: Alquist-Priolo Fault Hazard Zones
https://gis.data.ca.gov/maps/ee92a5f9f4ee4ec5aa731d3245ed9f53/explore?location=32.538703%2C-110.920388%2C6.00

5. Imperial County General Plan: Circulation and Scenic Highway Element
https://www.icpds.com/planning/land-use-documents/general-plan/circulation-and-scenic-highways-element

6. FEMA Flood Map Service Center
https://msc.fema.gov/portal/

VI. NEGATIVE DECLARATION – County of Imperial

The following Negative Declaration is being circulated for public review in accordance with the California Environmental Quality Act Section 21091 and 21092 of the Public Resources Code.

Project Name: Phoenix 1, LLC.

Project Applicant: Arnold Wolf, Phoenix 1, LLC.

Project Location: 2300 Farr Rd., Brawley, CA 92227

Description of Project: The project consists of the reworking of two (2) existing previously permitted geothermal wells located on two (2) existing well pads and the laying of 8-inch pipe from one well to the other over actively disturbed farmland and existing roads. The project is temporary with the well work over period being proposed for two (2) weeks and the well testing period being proposed for twelve (12) weeks. The project will require the use of a drill rig, cement and pump trucks, water storage tanks, portable cooling tanks and temporary housing and working trailers. After the duration of the project all equipment will be removed from the site with monitoring equipment potentially being left behind in order to monitor well temperature.

VII. FINDINGS

This is to advise that the County of Imperial, acting as the lead agency, has conducted an Initial Study to determine if the project may have a significant effect on the environment and is proposing this Negative Declaration based upon the following findings:

☐ The Initial Study shows that there is no substantial evidence that the project may have a significant effect on the environment and a NEGATIVE DECLARATION will be prepared.

☑ The Initial Study identifies potentially significant effects but:

(1) Proposals made or agreed to by the applicant before this proposed Mitigated Negative Declaration was released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur.

(2) There is no substantial evidence before the agency that the project may have a significant effect on the environment.

(3) Mitigation measures are required to ensure all potentially significant impacts are reduced to levels of insignificance.

A MITIGATED NEGATIVE DECLARATION will be prepared.

If adopted, the Negative Declaration means that an Environmental Impact Report will not be required. Reasons to support this finding are included in the attached Initial Study. The project file and all related documents are available for review at the County of Imperial, Planning & Development Services Department, 801 Main Street, El Centro, CA 92243 (442) 265-1736.

NOTICE

The public is invited to comment on the proposed Negative Declaration during the review period.

10-26-2023 — Date of Determination

For — Jim Minnick, Director of Planning & Development Services

The Applicant hereby acknowledges and accepts the results of the Environmental Evaluation Committee (EEC) and hereby agrees to implement all Mitigation Measures, if applicable, as outlined in the MMRP.

Applicant Signature

10/26/2023 — Date

SECTION 4

VIII. RESPONSE TO COMMENTS

(ATTACH DOCUMENTS, IF ANY, HERE)

IX. MITIGATION MONITORING & REPORTING PROGRAM (MMRP)

(ATTACH DOCUMENTS, IF ANY, HERE)

PANORAMA
ENVIRONMENTAL, INC.

Attachment A: 2023 USFWS IPac Query for Study Area

717 Market Street, Suite 400 San Francisco, CA 94103 650-373-1200
www.panoramaenv.com

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Imperial County, California

Local office

Carlsbad Fish And Wildlife Office

(760) 431-9440
(760) 431-5901

2177 Salk Avenue - Suite 250

Carlsbad, CA 92008-7385

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Birds

NAME	STATUS
Yuma Ridgway's Rail Rallus obsoletus yumanensis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/3505	Endangered

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Bald & Golden Eagles

There are no documented cases of eagles being present at this location. However, if you believe eagles may be using your site, please reach out to the local Fish and Wildlife Service office.

Additional information can be found using the following links:

- Eagle Managment https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply). To see a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Mountain Plover Charadrius montanus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3638	Breeds elsewhere

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (▪)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (▪)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

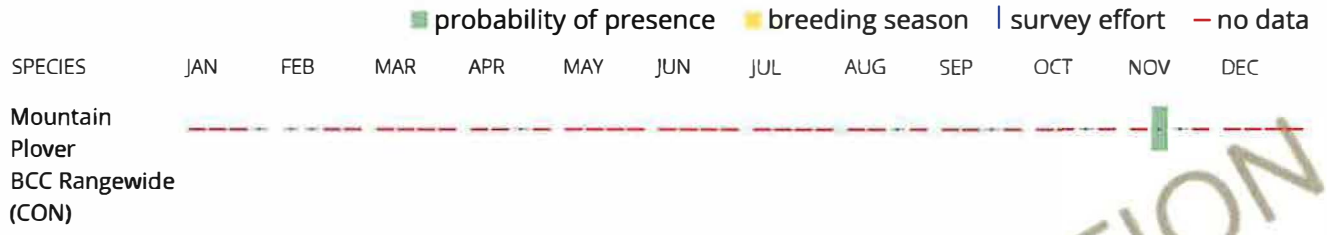
Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER POND

PUSCx

RIVERINE

R4SBCx

A full description for each wetland code can be found at the National Wetlands Inventory website

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

PANORAMA
ENVIRONMENTAL, INC.

Attachment B: Survey Photos

717 Market Street, Suite 400 San Francisco, CA 94103 650-373-1200
www.panoramaenv.com

ATTACHMENT B: SITE PHOTOS

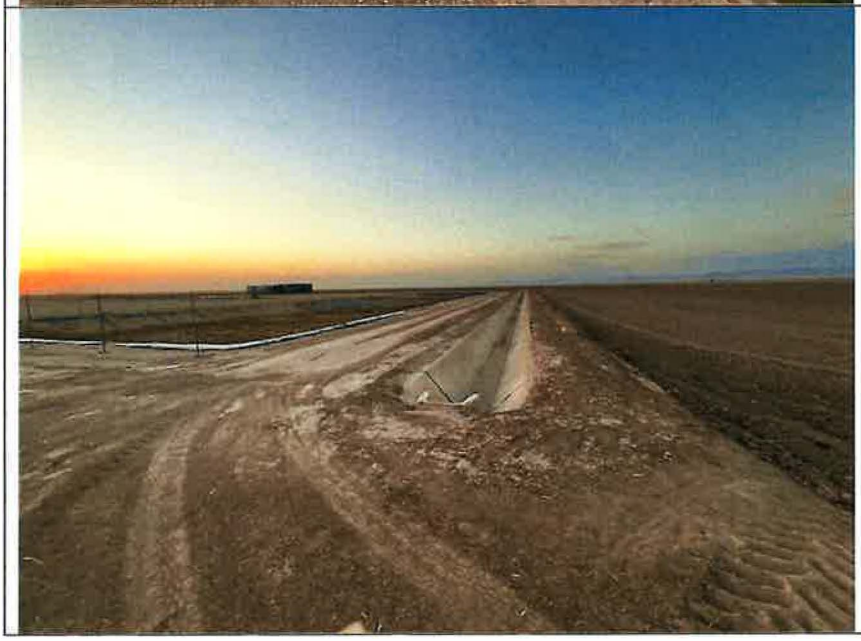
August 16, 2023

Photos from each of the photo locations identified in Figure 2 are presented below.

	Photo # 1 Burrowing owl observed at the Orita Well #4 pad.
	Photo #2 Burrows observed on the north bank of the Magnolia Drain.

ATTACHMENT B: SITE PHOTOS

August 16, 2023

	Photo #2 Magnolia Drain
	Photo # 3 Dry irrigation ditch

ATTACHMENT B: SITE PHOTOS

August 16, 2023

	Photo #4 Looking south down Irvine Road
	Photo # 5 Orita Well Pad #2

ATTACHMENT B: SITE PHOTOS

August 16, 2023

Photo #6
Orita Well Pad #2

Chemicals Planned onsite Orita 4 Cleanout

Drilling fluids:
AltaVert
Defoamer
Barite
PHPA
Resinex
Safe Scav
Sepiolite
Soda Ash
SP DMA
Super Sweep
TORKease
Xanthan Gum

Potential Acid job:
Ammonium chloride
hydrochloric acid
hydrofluoric acid

Chemicals planned onsite wells test (scale prevention, inhibitor)
Product name
NALCO® 7471 ANTIFOAM
NALCO® GEO901
NALCO® GEO912
GEO906
NALCO® GEO982

MATERIAL SAFETY DATA SHEET

AltaVert 102 **MSDS DATE:** 9/8/11

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: AltaVert 102

MANUFACTURER:
DIVISION:
ADDRESS:

EMERGENCY PHONE:
CHEMTREC PHONE:
OTHER CALLS:
FAX PHONE:

PRODUCT USE: Diverter Particles

2. HAZARDS IDENTIFICATION

Emergency Overview
OSHA Hazards No known OSHA hazards
HMIS Classification
Health Hazard: 1
Flammability: 0
Physical hazards: 0
NFPA Rating
Health Hazard: 1
Fire: 0
Reactivity Hazard: 0
Potential Health Effects
Inhalation May be harmful if inhaled. May cause respiratory tract irritation.
Skin May be harmful if absorbed through
Eyes May cause eye irritation.
Ingestion May be harmful if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms : 2-hydroxypropanoic acid, homopolymer
Formula : $(C_2H_2O_2)n$

Name	CAS-No.	Percent
2-hydroxypropanoic acid, homopolymer	26100-51-6	100%

4. FIRST AID MEASURES

If inhaled
If breathed in, move person into fresh air. If not breathing give artificial respiration
In case of skin contact
Wash off with soap and plenty of water.
In case of eye contact
Flush eyes with water as a precaution.
If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water.

5. FIREFIGHTING MEASURES

Flammable properties
Flash point no data available
Ignition temperature no data available
Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Special protective equipment for fire-fighters
Wear self contained breathing apparatus for fire fighting if necessary.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Avoid dust formation.
Environmental precautions
Do not let product enter drains.
Methods for cleaning up
Sweep up and shovel. Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

Handling
Provide appropriate exhaust ventilation at places where dust is formed. Normal measures for preventive fire protection.
Storage
Keep container tightly closed in a dry and well-ventilated place.
Store under inert gas. Moisture sensitive. Exposure to moisture.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Contains no substances with occupational exposure limit values.
Personal protective equipment
Respiratory protection
Respiratory protection is not required. Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN 143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).
Hand protection
For prolonged or repeated contact use protective gloves.
Eye protection
Safety glasses

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance
Form solid
Safety data
pH no data available

Melting point no data available
Boiling point no data available
Flash point no data available
Ignition temperature no data available
Lower explosion limit no data available
Upper explosion limit no data available
Water solubility no data available

10. STABILITY AND REACTIVITY

Storage stability
Stable under recommended storage conditions.
Materials to avoid
Strong oxidizing agents
Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides

11. TOXOLOGICAL INFORMATION

Acute toxicity
no data available
Irritation and corrosion
no data available
Sensitisation
no data available
Chronic exposure
IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
Potential Health Effects
Inhalation May be harmful if inhaled. May cause respiratory tract irritation.
Skin May be harmful if absorbed through skin. May cause skin irritation.
Eyes May cause eye irritation.
Ingestion May be harmful if swallowed.

12. ECOLOGICAL INFORMATION

Elimination information (persistence and degradability)
no data available
Ecotoxicity effects
no data available
Further information on ecology
no data available

13. DISPOSAL CONSIDERATIONS

Product
Observe all federal, state, and local environmental regulations.
Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
Not dangerous goods
IMDG
Not dangerous goods
IATA
Not dangerous goods

15. REGULATORY INFORMATION

OSHA Hazards
No known OSHA hazards
DSL Status
This product contains the following components listed on the Canadian NDSL list. All other components are on the Canadian DSL list.
Propanoic acid, 2-hydroxy-, homopolymer CAS-No. 26100-51-6
SARA 302 Components
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.
SARA 313 Components
SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.
SARA 311/312 Hazards
No SARA Hazards
Massachusetts Right To Know Components
No components are subject to the Massachusetts Right to Know Act.
Pennsylvania Right To Know Components
Propanoic acid, 2-hydroxy-, homopolymer CAS-No. 26100-51-6
New Jersey Right To Know Components
Propanoic acid, 2-hydroxy-, homopolymer CAS-No. 26100-51-6
California Prop. 65 Components
This product does not contain

15. OTHER INFORMATION

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The information contained hereinis provided in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.

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AMBER CHEMICAL INC.

SAFETY DATA SHEET

Transport Symbol	NFPA Rating (estimated)	GHS	Personal Protective Equipment
Not Regulated		Not Classified	

Section 1: Identification

Product Name:	**Amber Defoamer 7**
ACI SDS Number:	ACISDS0030
Synonyms:	Defoaming Agent
Company Name:	Amber Chemical Inc.
Address:	5201 Boylan Street Bakersfield, CA 93308
Phone:	(661) 325-2072
Emergency Contact:	CHEMTREC (Available 24 hours for chemical emergency, spill, leak, fire, exposure, or accident)
Emergency Number:	1-800-424-9300
Product Use:	User is responsible for ensuring that the product is suitable for their purpose.
Uses Advised Against:	No information available.
Date Revised:	June 2015

Section 2: Hazard(s) Identification

Not a dangerous substance according to Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

This chemical is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200).

GHS Classification: Not Hazardous

GHS Signal Word: N/A

GHS Label(s): N/A

Hazard Statements: N/A

Precautionary Statements: N/A

Precautions
May cause skin, eye, and respiratory tract irritation!

Avoid contact with eyes, skin and clothing.
Aerosol or mist may cause inflammatory condition.
Harmful if swallowed or inhaled
Wear chemical splash goggles, gloves, and protective clothing when handling.
Use only in a well ventilated area.
Use respiratory protection where mists or vapors may be generated.
Wash thoroughly after handling.
Do not take internally.
FOR INDUSTRIAL USE ONLY

Section 3: Composition/Information on Ingredients

Components	CAS#	Weight %	OSHA PEL's	ACGIH 2002-TLV's
Proprietary Ingredients	None	100	None Established	None Established

Synonyms: Defoaming agent.

Section 4: First Aid Measures

First Aid Measures
Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Skin Contact: Immediately wash thoroughly with soap and water for at least 15 minutes. Remove and isolate contaminated clothing and footwear. Wash clothing before reuse. Get medical attention if irritation should develop.

Eye Contact: Remove contact lenses, if applicable. Immediately flush with plenty of water for at least 20 minutes, holding eyelids apart to ensure flushing of the entire surface. Washing within one minute is essential to achieve maximum effectiveness. Seek immediate medical attention.

Ingestion: Do not induce vomiting. If vomiting should occur spontaneously, keep the airway clear. Get medical attention. Never give anything by mouth to an unconscious or convulsing person.

Most Important Symptoms and Effects, Both Acute and Delayed
Acute Overexposure: Possible eye, skin and respiratory tract irritation.

Chronic Overexposure: Prolonged exposure to mist or vapors may cause lung inflammatory condition. May aggravate existing skin, eye and lung conditions.

Aggravated Medical Conditions: May aggravate existing skin, eye and respiratory tract conditions.

Indication of any Immediate Medical Attention and Special Treatment Needed
Notes to Physician: Treat symptomatically.

Section 5: Fire Fighting Measures

Flash Point (°F/°C): >200°F/>93°C

Flash Point Method: PMCC

Auto ignition Temp. (°F): Not Determined

Flammable Limits in Air- Lower (%): Not Determined

Flammable Limits in Air- Upper (%): Not Determined

Extinguishing Media: Water fog, carbon dioxide, foam, dry chemical

Extinguishing Media Not Recommended: No information available.

Special Hazards Arising from the Substance or Mixture: Slippery, can cause falls if walked on.

Fire Fighting Procedures: Cool exposed containers with water spray after extinguishing fire.

Special Exposure Hazards: Use water spray to cool fire exposed surfaces.

Special Protective Equipment: Fire fighters should wear full protective clothing, including self-contained breathing equipment when fighting fires in enclosed areas.

Sensitivity to Mechanical Impact: None.

Sensitivity to Static Discharge: None.

Section 6: Accidental Release Measures

Personal Precautions: Wear suitable protective clothing and gloves.

Environmental Precautions: Do not permit solutions of product into sewers or waterways.

Methods for Containment: Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up: Clear spills immediately. Soak up small spills with inert absorbent material and place in a labeled waste container for disposal. Spills of solution are extremely slippery so all residue must be removed promptly. Provide adequate ventilation to spill area.

Section 7: Handling and Storage

Handling: Never eat, drink or smoke in work area. Keep container tightly closed when not in use. Avoid contact with eyes, skin and clothing. Personal protective equipment comprising: suitable protective gloves, safety goggles and protective clothing. Wash thoroughly after handling. Avoid breathing vapors, mists or gas. Use respiratory protection where mists or vapors may be generated. Use only in well-ventilated areas. Do not take internally. For industrial use only.

Storage: Use only in a well ventilated area. Product may congeal or stratify if cold. Warm to 122°F (50°C) and mix well before using.

Incompatible Products: Oxidizing agents.

Refer to Section 10 for Stability and Compatibility Information.

Section 8: Exposure Controls/Personal Protection

Exposure Guidelines: This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Components	CAS#	Weight %	OSHA PEL's	ACGIH 2002-TLV's
Proprietary Ingredients	None	100	None Established	None Established

Engineering Controls: Local exhaust ventilation as necessary to maintain exposures to within applicable limits. Please refer to the ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices," most recent edition, for details. If there are no applicable or established exposure limit requirements or guidelines, general ventilation should be sufficient.

Personal Protection

Respiratory Protection: NIOSH/MSHA approved respirator if necessary. Follow manufacturer's recommendations.

Hand Protection: Rubber gloves.

Skin/ Body Protection: Standard work clothing and work shoes.

Eye/ Face Protection: Chemical goggles and/or a face shield.

Other Personal Protection Data: Eyewash fountains and safety showers must be easily accessible.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety practice.

Section 9: Physical and Chemical Properties

Physical State	Liquid
Color	Yellow
Appearance	Clear to slightly hazy
Odor	Mild
Odor Threshold	No Information Available
pH	5.0 to 8.5 (10% in 10:6 IPA: Water)
Specific Gravity	0.986 Typical
Density @ 20°C	8.2 lb/gal Typical
Flash Point (°F/°C)	>200°F/>93°C
Flash Point Method	PMCC
Auto ignition Temp. (°F)	Not Determined
Flammability (Solid, Gas)	No Information Available
Flammable Limits in Air- Lower (%)	Not Determined
Flammable Limits in Air- Upper (%)	Not Determined
Boiling Point (°F/°C)	Not Determined
Melting Point Range (°F/°C)	Not Applicable
Freezing Point Range (°F/°C)	Not Applicable
Vapor Pressure	Not Applicable
Vapor Density (Air=1)	Not Applicable

Evaporation Rate	Not Determined
Solubility in Water	Soluble
Solubility in Other Solvents	No Information Available
VOCs (lbs/gallon)	0.00% (EPA 24)
Kinematic Viscosity	No Information Available
Viscosity, Dynamic (Centipoise) @ 20°C	260 SUS @ 100°F (38°C)
Molecular Weight	Not Determined
Partition Coefficient: n/octanol/water	No Information Available
Decomposition Temperature	No Information Available

Not all physical and chemical properties are displayed on this SDS, as not all information is relevant or available at this time.

Section 10: Stability and Reactivity

Reactivity: No data available.

Chemical Stability: Stable under normal conditions of handling, use and transportation.

Conditions to Avoid: None anticipated under normal handling conditions.

Materials to Avoid: Contact with oxidizing agents.

Hazardous Decomposition Products: Carbon Monoxide and Carbon Dioxide.

Hazardous Polymerization: Not anticipated under normal or recommended handling and storage conditions.

Additional Guidelines: None.

Section 11: Toxicological Information

Emergency Overview: Clear to slightly hazy yellow viscous liquid with a mild odor. May cause mild skin and eye irritation.

Hazard Information: May cause eye, skin and respiratory tract irritation.

Primary Routes of Exposure: Skin, eyes and respiratory tract

Potential Acute Effects

Ingestion: Considered slightly toxic to practically non-toxic.

Skin Contact: May cause mild irritation on prolonged contact.

Inhalation: Prolonged exposure to mist or vapor may cause lung inflammatory condition.

Eye Contact: May be slightly irritating.

Acute Toxicity- Product Information

Oral LD_{50}: > 5,000 mg/kg (Rat)

Dermal LD_{50}: > 5,000 mg/kg (Rabbit)

Inhalation LC_{50}: No information available

Acute Toxicity- Component Information
Component: Proprietary Ingredients

Weight %: 100%

Dermal LD_{50}: 13,340 mg/kg (Rabbit)

Information on Toxicological Effects
Symptoms: No information available.

Delayed and Immediate Effects as well as Chronic Effects from Short and Long- Term Exposure
Skin Corrosion/ Irritation: Mild skin irritation.

Serious Eye Damage/ Eye Irritation: Mild eye irritation.

Sensitization: No information available.

Germ Cell Mutagenicity: No information available.

Carcinogenicity: This product does not contain any components in concentrations greater than or equal to 0.1% that are listed as known or suspected carcinogens by NTP, IARC, ACGIH, or OSHA.

Reproductive Toxicity: No information available.

Specific Target Organ Toxicity- Single Exposure: No information available.

Specific Target Organ Toxicity- Repeated Exposure: No information available.

Aspiration Hazard: No information available.

Aggravated Conditions: May aggravate existing skin, eye and respiratory tract conditions

Acute Overexposure: Possible eye, skin and respiratory tract irritation.

Chronic Overexposure: Prolonged exposure to mist or vapors may cause lung inflammatory condition. May aggravate existing skin, eye and lung conditions.

The following values are calculated based on chapter 3.1 of the GHS document.
ATEmix (Oral): 9100 mg/kg

ATEmix (Dermal): 21136 mg/kg

Other Information: Conclusions are drawn from sources other than direct testing.

Section 12: Ecological Information

Mobility: Not Determined

Persistence: Not Determined

Bioaccumulative: Not Determined

Acute Fish Toxicity: Not Determined

Acute Crustaceans Toxicity: Not Determined

Acute Algae Toxicity: Not Determined
Chemical Fate Information: Not Determined
Biodegradation: BOD5:mg O2/mg: 0.0217
COD: mg O2/mg: 1.550
Biodegradable, %: 1.4

PBT and vPvB assessment: No information available.

Other Adverse Effects: No other ecological studies have been carried out on this product.

Section 13: Disposal Considerations

Disposal of Wastes: Dispose of product in an approved chemical waste landfill or incinerate in accordance with applicable federal, state and local regulations. Chemical additions, processing or otherwise altering this material may make waste management information presented in the SDS incomplete, inaccurate or otherwise inappropriate. ACI has provided the foregoing for information only; the person generating the waste is responsible for determining the waste classification and disposal method.

Contaminated Packaging: Since empty containers retain product residue, follow label warnings even after container is emptied.

RCRA: If discarded the unused product is not a RCRA Hazardous Waste.

To minimize exposure refer to Section 8.

Section 14: Transport Information

D.O.T.

D.O.T. Status:	Not Hazardous. Not Regulated.
Harmonized Tariff Number:	3402.13.2050

ICAO/IATA

Status:	Not Regulated.

IMDG

Status:	Not Regulated.
Flash Point (°F/°C):	>200°F/>93°C

Note: There are specific regulations in regards to transporting chemicals by water. Shipper is responsible for ensuring that they meet all of the requirements and follow the regulations for the chemical they are transporting.

Section 15: Regulatory Information

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

International Inventories
USA TSCA Inventory Status: All of the components of this product are listed on the US EPA TSCA Inventory, or exempt from listing.

Australian Chemical Inventory: All of the components of this product are listed on the Australian Chemical Inventory.

Canadian DSL: All of the components of this product are listed on the Canadian Domestic Substances List.

Canadian NDSL: None of the ingredients are on the inventory or exempt from listing.

Chinese Chemical Inventory: All components of this product are listed on the Chinese Chemical Inventory.

European- EINECS: All of the components of this product are listed on EINECS, or exempt from notification.

European- ELINCS: All of the components of this product are not listed on ELINCS.

Japanese Chemical Inventory: All of the components of this product are listed on the JPENCS Inventory.

South Korea KECL: All ingredients are on the inventory or exempt from listing.

Philippines PICCS: All ingredients are on the inventory or exempt from listing.

State and Federal Regulations
New Jersey Trade Secret Registry Number(s): 679485-5053P

CERCLA: 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.

CWA (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).

SARA 311/312 Hazard Categories
Acute Health Hazard: No
Chronic Health Hazard: No
Fire Hazard: No
Sudden Release of Pressure Hazard: No
Reactive Hazard: No

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.

California Prop 65: Warning! This product may contain traces of a substance known to the State of California to cause cancer.

U.S. State Right-to-Know Regulations: This product does not contain any substances regulated under applicable state right-to-know regulations.

Section 16: Other Information

Date Revised: June 2015

NFPA and HMIS Rating (estimated)

Health	1
Flammability	1
Instability	0

This information is intended solely for the use of individuals trained in the NFPA and HMIS hazard rating systems.

Sources of key data used to compile the Safety Data Sheet: regulations, databases, literature, and own test data.

Disclaimer: All statements, technical information and recommendations contained herein are, to the best of our knowledge, reliable and accurate. The information in this data sheet has been assembled by the manufacturer based on its own studies and on the work of others. However, no warranty is expressed or implied regarding the accuracy of this data or the results to be obtained from the use thereof, nor will any liability be assumed for damages resultant form the use of the material described. Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. The manufacturer shall not be liable (regardless of fault) to the vendee, the vendee's employees, or anyone for any direct, special or consequential damages arising out of, or in connection with, the accuracy, completeness, adequacy or furnishing of such information. It is offered solely for your consideration, investigation and verification. As a result, the customer shall be solely responsible for deciding whether said information is suitable and beneficial. Furthermore, vendee assumes the risk in his use of the material. We assume no legal responsibility whatsoever for any damage resulting from reliance upon this information since it is being furnished upon the condition that the person receiving it shall make his or her own determination of the suitability of the material described herein for a particular application or storage situation. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release, and is not to be considered a warranty or quality specification. The user should take the necessary steps to instruct employees, and to develop work practice procedures to ensure and maintain a safe work environment. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process unless specified in the text. Personal Protection rating to be supplied by user depending on use conditions. Since the use of this product is within the exclusive control of the user, it is the user's responsibility to determine the conditions of safe use. Such conditions must comply with all governmental regulations. This information is not intended as a license to operate under, or a recommendation to practice or infringe upon any patent of this company or others covering any process, compositions of matter or use. Neither this data sheet nor any statement contained herein grants or extends any license, express or implied, in connection with patents issued or pending which may be the property of the manufacturer or others.

SDS no. PID938
Version 11
Revision date 17/Oct/2016
Supersedes date 23/Oct/2015

Safety Data Sheet
M-I BAR* (All Grades)

1. Identification

1.1 Product identifier

Product name M-I BAR* (All Grades)

Product code PID938

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended Use Drilling fluid additive. Weighting agent.

Uses advised against Consumer use

1.3 Details of the supplier of the safety data sheet

Supplier
M-I L.L.C.

P.O.Box 42842
Houston, TX 77242
www.miswaco.slb.com
Telephone: 1 281-561-1511

M-I SWACO, A Schlumberger Company
200 - 125, 9th Avenue SE
Calgary, Alberta T2G 0P6, Canada
Telephone: 1-780-962-8221

E-mail address sdsmi@slb.com

Prepared by
Global Regulatory Compliance - Chemicals (GRC - Chemicals)

1.4 Emergency Telephone Number

Emergency telephone (24 Hour) Australia +61 2801 44558, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, New Zealand +64 9929 1483, USA 001 281 561 1600

2. Hazards identification

2.1 Classification of the substance or mixture

GHS - Classification

Health hazards

Carcinogenicity	Category 1A
Specific target organ toxicity (repeated exposure)	Category 2

Environmental hazards	Not classified
Physical Hazards	Not classified

2.2 Label elements

Signal word
DANGER

Hazard statements
H350i - May cause cancer by inhalation
H373 - May cause damage to organs through prolonged or repeated exposure if inhaled

Precautionary statements
P201 - Obtain special instructions before use
P260 - Do not breathe dust/fume/gas/mist/vapors/spray
P281 - Use personal protective equipment as required
P308 + P313 - IF exposed or concerned: Get medical advice/ attention

Supplementary precautionary statements
P202 - Do not handle until all safety precautions have been read and understood
P314 - Get medical advice/attention if you feel unwell
P501 - Dispose of contents/ container to an approved waste disposal plant

Unknown acute toxicity 0% of the mixture consists of ingredient(s) of unknown toxicity.

3. Composition/Information on Ingredients

3.1 Substances

Component	CAS-No	Weight % - range
Crystalline silica (impurity)	14808-60-7	1-5

3.2 Mixtures

Not Applicable

Comments
Crystalline silica is the most widely occurring of all minerals. The most common form of silica is sand. The International Agency for Research on Cancer (IARC) has designated crystalline silica in the form of quartz or cristobalite a Group 1 (carcinogenic to humans). This designation was based on an increased risk of lung cancer among crystalline silica exposed workers. IARC did note that carcinogenicity of crystalline silica in humans was not detected in all industrial circumstances studied. Further, carcinogenicity of crystalline silica may be dependent on inherent characteristics of the crystalline silica or external factors affecting its biological activity or distribution of polymorphs. (IARC Vol. 68, 1997, p. 41). The National Toxicology Program (NTP) classifies crystalline silica as "reasonably anticipated to cause cancer in humans" (6th Annual Report on Carcinogens, 1991). Long term inhalation of crystalline silica can also result in the lung disease, silicosis. Symptoms of this disease include coughing and shortness of breath. (NJ HSFS, January 1996)

The exact percentage (concentration) of composition has been withheld as a trade secret

4. First aid measures

4.1 First-Aid Measures

Inhalation	Move to fresh air. If breathing is difficult, (trained personnel should) give oxygen. Get medical attention immediately if symptoms occur.
Ingestion	Drink 1 or 2 glasses of water. Never give anything by mouth to an unconscious person. Get medical attention if symptoms occur.
Skin contact	Wash skin thoroughly with soap and water. Remove contaminated clothing and launder before reuse. Get medical attention if irritation persists.
Eye contact	Promptly wash eyes with lots of water while lifting eye lids. Remove contact lenses. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

4.2 Most important symptoms and effects, both acute and delayed

Main symptoms

Inhalation	Please see Section 11. Toxicological Information for further information.
Ingestion	Please see Section 11. Toxicological Information for further information.
Skin contact	Please see Section 11. Toxicological Information for further information.
Eye contact	Please see Section 11. Toxicological Information for further information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician	Treat symptomatically

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media
Water Fog, Alcohol Foam, CO_2, Dry Chemical.

Extinguishing media which shall not be used for safety reasons
None known.

5.2 Special hazards arising from the substance or mixture

Unusual fire and explosion hazards
None known.

Hazardous combustion products
None under normal use conditions.

5.3 Advice for firefighters

Special protective equipment for fire-fighters
As in any fire, wear self-contained breathing apparatus and full protective gear.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Wear suitable protective equipment. Evacuate personnel to safe areas. Prevent further leakage or spillage if safe to do so. Avoid dust formation.

6.2 Environmental precautions

Do not allow material to contaminate ground water system.

Environmental exposure controls
No information available.

6.3 Methods and materials for containment and cleaning up

Methods for containment
Cover powder spill with plastic sheet or tarp to minimize spreading.

Methods for cleaning up
Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).

6.4 Reference to other sections

No information available.

7. Handling and storage

7.1 Precautions for safe handling

Handling
Do not handle until all safety precautions have been read and understood. Handle in accordance with good industrial hygiene and safety practice. Avoid breathing dust; if exposed to high dust concentration, leave area immediately. Avoid contact with skin, eyes and clothing.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/precautions Ensure adequate ventilation.

Storage precautions Follow safe warehousing practices regarding palletizing, banding, shrink-wrapping and/or stacking.

8. Exposure controls/personal protection

8.1 Control parameters

Component Information

Component	ACGIH TLV	OSHA PEL
Crystalline silica (impurity) 14808-60-7 (1-5)	0.025 mg/m³	total dust respirable fraction

Crystalline silica (impurity)
OSHA - Final PELs - Table Z-3 Mineral Dusts
(30)/(%SiO2 + 2) mg/m³ TWA, total dust; (250)/(%SiO2 + 5) mppcf TWA, respirable fraction; (10)/(%SiO2 + 2) mg/m³ TWA, respirable fraction

8.2 Exposure controls

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures to reduce exposure
Ensure adequate ventilation, especially in confined areas.

Personal protective equipment

Eye protection Tightly fitting safety goggles.
Hand protection Wear chemical resistant gloves such as nitrile or neoprene.

Respiratory protection	All respiratory protection equipment should be used within a comprehensive respiratory protection program that meets the requirements of 29 CFR 1910.134 (U.S. OSHA Respiratory Protection Standard) or local equivalent. Use NIOSH approved respirator with dust and mist protection (3M 8210). If dust concentration exceeds 5 times the exposure limit, wear an approved HEPA respirator
Skin and body protection	Wear suitable protective clothing, Eye wash and emergency shower must be available at the work place.
Hygiene measures	Wash hands before breaks and immediately after handling the product, Remove and wash contaminated clothing before re-use.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	Solid
Appearance	Opaque
Color	Tan - Gray
Odor	Odorless
Odor threshold	Not applicable

Property	Values	Remarks
pH	Not applicable	
pH @ dilution	No information available	
Melting/freezing point	No information available	
Boiling point/range	No information available	
Flash point	Not Applicable	
Evaporation rate (BuAc =1)	No information available	
Flammability (solid, gas)	Not Applicable	
Flammability Limits in Air		
Upper flammability limit	No information available	
Lower flammability limit	No information available	
Vapor pressure	No information available	
Vapor density	No information available	
Specific gravity	4.2	
Bulk density	No information available	
Water solubility	Insoluble in water	
Solubility in other solvents	No information available	
Autoignition temperature	No information available	
Decomposition temperature	No information available	
Kinematic viscosity	No information available	
Dynamic viscosity	No information available	
Log Pow	No information available	
Explosive properties	No information available	
Oxidizing properties	No information available	

9.2 Other information

Pour point	No information available
Molecular weight	No information available
VOC content(%)	No information available
Density	No information available

10. Stability and reactivity

10.1 Reactivity

No data available.

10.2 Chemical stability

Stable. Hazardous polymerization does not occur.

10.3 Possibility of Hazardous Reactions

Hazardous polymerization
Hazardous polymerization does not occur.

Hazardous Reactions
None known.

10.4 Conditions to avoid

Avoid dust formation.

10.5 Incompatible materials

No materials to be especially mentioned.

10.6 Hazardous decomposition products

See Section 5.2.

11. Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Inhalation — Inhalation of dust in high concentration may cause irritation of respiratory system. Harmful: danger of serious damage to health by prolonged exposure through inhalation. Repeated or prolonged inhalation of crystalline silica dust can cause delayed lung injury, and other diseases, including silicosis and lung cancer.

Eye contact — Dust contact with the eyes can lead to mechanical irritation.

Skin contact — Repeated exposure may cause skin dryness or cracking.

Ingestion — Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Toxicology data for the components

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Crystalline silica (impurity)	= 500 mg/kg (Rat)	No data available	No data available

Component	IARC Group 1 or 2	ACGIH - Carcinogens	OSHA listed carcinogens	NTP
Crystalline silica (impurity)	Group 1; Monograph 100C [2012] Group 1; Monograph 68 [1997] Monograph 100C [2012] (listed under Crystalline silica inhaled in the fonn of quartz or cristobalite from occupational sources); Monograph 68 [1997]	A2 Suspected Human Carcinogen	Present	Known Human Carcinogen

Sensitization — Not classified.

Mutagenic effects — No evidence of mutagenic properties.

Carcinogenicity — Contains a known or suspected carcinogen. Crystalline silica dust is listed by IARC in Group 1 as known to cause lung cancer in humans, if inhaled.

Reproductive toxicity	No evidence of toxicity to reproduction.
Developmental toxicity	Not known to cause birth defects or have a deleterious effect on a developing fetus.
Routes of exposure	Skin contact. Inhalation. Eye contact.
Routes of entry	Inhalation.
Specific target organ toxicity (single exposure)	Not classified
Specific target organ toxicity (repeated exposure)	Category 2.
Target organ effects	Respiratory system. Lungs.
Aspiration hazard	Not Applicable.

12. Ecological Information

12.1 Toxicity

Toxicity to algae
See component information below.

Toxicity to fish
See component information below.

Toxicity to daphnia and other aquatic invertebrates
See component information below.

Component	Toxicity to fish	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates
Crystalline silica (impurity)	No information available	No information available	No information available

12.2 Persistence and degradability

No product level data available.

12.3 Bioaccumulative potential

No product level data available.

12.4 Mobility in soil

No information available.

12.5 Results of PBT and vPvB assessment

This preparation contains no substance considered to be persistent, bioaccumulating nor toxic (PBT)
This preparation contains no substance considered to be very persistent nor very bioaccumulating (vPvB)

12.6 Other adverse effects.

None known.

13. Disposal considerations

13.1 Waste treatment methods

Disposal Method	Disposal should be made in accordance with federal, state and local regulations.
Contaminated packaging	Empty containers should be taken for local recycling, recovery or waste disposal.

14. Transport Information

14.1 UN Number

UN No. (DOT)	Not regulated
UN No. (TDG)	Not regulated
UN/ID No. (ADR/RID/ADN/ADG)	Not regulated
UN No. (IMDG)	Not regulated
UN No. (ICAO)	Not regulated

14.2 Proper shipping name

The product is not covered by international regulation on the transport of dangerous goods

14.3 Hazard class(es)

DOT Hazard class	Not regulated
TDG Hazard class	Not regulated
ADR/RID/ADN/ADG Hazard class	Not regulated
IMDG Hazard class	Not regulated
ICAO Hazard class/division	Not regulated

14.4 Packing group

DOT Packing group	Not regulated
TDG Packing group	Not regulated
ADR/RID/ADN/ADG Packing group	Not regulated
IMDG Packing group	Not regulated
ICAO Packing group	Not regulated

14.5 Environmental hazard

No

14.6 Special precautions

Not Applicable

15. Regulatory Information

International inventories

USA (TSCA)	Complies
Canada (DSL)	Complies
European Union (EINECS and ELINCS)	Complies
Philippines (PICCS)	Complies
Japan (ENCS)	Complies
China (IECSC)	Complies
Australia (AICS)	Complies
Korean (KECL)	Complies

EEC ORIGINAL PKG

New Zealand (NZIoC) Complies

U.S. Federal and State Regulations

SARA 311/312 Hazard Categories
Delayed (chronic) health hazard.

Component	SARA 302 / TPQs	SARA 313	CERCLA RQ
Crystalline silica (impurity)	N/A	N/A	N/A

State Comments
Proposition 65: This product contains chemical(s) considered by the State of California's Safe Drinking Water and Toxic Enforcement Act of 1986 to cause cancer and/or reproductive toxicity. See table under U.S. Federal and State Regulations for the specific chemicals.

16. Other Information

Supersedes date	23/Oct/2015
Revision date	17/Oct/2016
Version	11
The following sections have been revised:	2, 3, 5, 7. Handling and storage 10. STABILITY AND REACTIVITY 11, 16.

HMIS classification

Health	1*
Flammability	0
Physical hazard	0
PPE	E

N/A - Not Applicable, N/D - Not Determined.

*A mark of M-I L.L.C., a Schlumberger Company

Disclaimer
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NATIONAL OILWELL VARCO

Material Safety Data Sheet

PHPA L

I. PRODUCT AND COMPANY IDENTIFICATION

Product Name: PHPA L
Date Revised: 7/2010
Chemical Name: PARTIALLY HYDROLIZED POLYACRYLAMIDE
CAS#: NDA
Chemical Family: SODIUM ACRYLATE & ACRYLAMIDE
Chemical Formula: PROPRIETARY
Synonyms: DRILL P, PHPA

NFPA Properties: Health: 0 **Flammability: 1** **Reactivity: 0** **Contact: 1**

Supplier:

NOV FluidControl
4310 N Sam Houston Parkway East
Houston, Texas 77032 USA
Office: (713) 482-0500
Fax: (713) 482-0695
Company website: www.nov.com

Emergency Telephone Number:
CHEMTREC: 1-800-424-9300 or International +1-703-527-3887

II. HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

Hazardous Components	TWAPPM	TWA MG/M^3	TLV's (ACGIH) STEL PPM	STEL MG/M^3	CAS#	OTHER LIMITS	%
1.							
2.							
3.							

III. PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point °F: N/A
Specific Gravity: 0.8-1.0
Vapor Pressure: NDA
Percent Volatility: NDA
Vapor Density: N/A
Evaporation Rate: N/A
Solubility In Water: SOLUBLE
Melting Point °F: N/A

Color: WHITE
Odor: NONE
Appearance: VISCOUS LIQUID
pH:
Viscosity: N/A
Activity: 87-90 BY WT%
LC50: NDA
LD50: NDA

IV. FIRE & EXPLOSION HAZARD DATA

Extinguishing Agents: DRY CHEMICAL OR WATERSPRAY OR WATERFOG OR CO2 OR FOAM OR SAND & EARTH

Flash Point °F: N/A

Flammable Limits: N/A LEL: N/A UEL: N/A

Special Firefighting Procedures: FIREFIGHTERS SHOULD WEAR PROPER PROTECTIVE EQUIPMENT AND SELF-CONTAINED (POSITIVE PRESSURE IF AVAILABLE) BREATHING APPARATUS WITH FULL FACEPIECE.

Unusual Fire & Explosion Hazards: NONE

Toxic Gases Produced: CARBON MONOXIDE, CARBON DIOXIDE

V. HEALTH HAZARD DATA

Routes of Entry: Inhalation: YES Skin: YES Ingestion: YES

Effects of Overexposure: DUST MAY IRRITATE EYES OR SKIN.

Toxicological Properties: NDA

Chronic & Acute Effects of Overexposure: NDA

Carcinogenicity: NTP: NO IARC Monographs: NO OSHA Regulated: NO

Emergency First Aid Procedures

Eyes: IMMEDIATELY FLUSH WITH LARGE QUANTITIES OF WATER FOR AT LEAST 15 MINUTES AND CALL A PHYSICIAN.

Skin Contact: FLUSH WITH LARGE AMOUNTS OF SOAP & WATER FOR 15 MINUTES.

Inhalation: REMOVE TO FRESH AIR, IF BREATHING IS DIFFICULT, GIVE OXYGEN AND CALL A PHYSICIAN.

Ingestion: GIVE LARGE AMOUNTS OF WATER AND CALL A PHYSICIAN.

VI. REACTIVITY DATA

Stability: STABLE

Hazardous Polymerization: WILL NOT OCCUR

Hazardous Decomposition Products: CARBON MONOXIDE, CARBON DIOXIDE, OXIDES, SMOKE, FUMES

Conditions To Avoid:

Incompatibility and Materials to Avoid: NDA

VII. SPILL & DISPOSAL PROCEDURES

Steps To Be Taken in Case Material is Released or Spilled --- Procedures For Clean – Up: WEAR SUITABLE PROTECTIVE CLOTHING. SWEEP UP WITH CLEAN EQUIPMENT AND PLACE IN APPROPRIATE CONTAINER. HYDRATING THIS MATERIAL WILL PRODUCE AN EXTREMELY SLICK/SLIPPERY SURFACE.
Waste Disposal Method: DISPOSE OF IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.
Precautions To Be Taken In Handling & Storage: NONE

VIII. PROTECTIVE EQUIPMENT

Ventilation Type Required: MECHANICAL
Protective Gloves: RUBBER OR PLASTIC
Respiratory Protection: WEAR A NIOSH APPROVED MASK IF CONCENTRATION IS TO EXCEED TLV
Other Protective Equipment:
Comments:

IX. REGULATORY & TRANSPORTATION INFORMATION

US DOT Proper Shipping Name: "OIL – WELL TREATING COMPOUND"
US DOT Hazard Class:
ID Number:
Unregulated By DOT:
Special Transportation Note:
Labels Required:

DOT ID Number:
Freight Classification:
Regulated by DOT: NO

DISCLAIMER:
Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, NOV FluidControl, makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the person receiving this MSDS will make own determination as to its suitability for their intended purpose prior to use. Since the product is within the exclusive control of the user, it is the user's obligation to determine the conditions of safe use of this product. Such conditions should comply with all Federal Regulations concerning the Product. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER NATURE ARE MADE HERUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS.

For further information contact:

NOV FluidControl
4310 N Sam Houston Parkway East
Houston, Texas 77032 USA
Office: (713) 482-0500
Fax: (713) 482-0695
Company website: www.nov.com

MATERIAL SAFETY DATA SHEET
RESINEX

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

TRADE NAME: RESINEX

APPLICATIONS: Oil well drilling fluid additive.

EMERGENCY TELEPHONE: 281-561-1600

SUPPLIER: Supplied by a Business Unit of
M-I L.L.C.
P.O. Box 42842, Houston, Texas 77242-2842
See cover sheet for local supplier.

TELEPHONE: 281-561-1509
FAX: 281-561-7240

CONTACT PERSON: Sam Hoskin - Manager, Occupational Health

2. COMPOSITION, INFORMATION ON INGREDIENTS

INGREDIENT NAME:	CAS No.:	CONTENTS :	EPA RQ:	TPQ:
Silica, crystalline, quartz	14808-60-7	0-3 %		
Proprietary ingredients		97-100 %		

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

CAUTION! MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION. Avoid contact with eyes, skin and clothing. Avoid breathing airborne product. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

This product is a/an dark brown powder. May form explosive dust-air mixtures. Slippery when wet. Dike and contain spills. Keep out of sewers and waterways. No significant immediate hazards for emergency response personnel are known.

ACUTE EFFECTS:

HEALTH HAZARDS, GENERAL:

Particulates may cause mechanical irritation to the eyes, nose, throat and lungs. Particulate inhalation may lead to pulmonary fibrosis, chronic bronchitis, emphysema and bronchial asthma. Dermatitis and asthma may result from short contact periods.

INHALATION: May be irritating to the respiratory tract if inhaled.

INGESTION: May cause gastric distress, nausea and vomiting if ingested.

SKIN: May be irritating to the skin.

EYES: May be irritating to the eyes.

CHRONIC EFFECTS:

CARCINOGENICITY:

IARC: Not listed. OSHA: Not regulated. NTP: Not listed.

ATTENTION! CANCER HAZARD. CONTAINS CRYSTALLINE SILICA WHICH CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure.

IARC Monographs, Vol. 68, 1997, concludes that there is sufficient evidence that inhaled crystalline silica in the form of quartz or cristobalite from occupational sources causes cancer in humans. IARC classification Group 1.

ROUTE OF ENTRY:

Inhalation. Skin and/or eye contact.

TARGET ORGANS:

Respiratory system, lungs. Skin. Eyes.

4. FIRST AID MEASURES

GENERAL: Persons seeking medical attention should carry a copy of this MSDS with them.

INHALATION: Move the exposed person to fresh air at once. Perform artificial respiration if breathing has stopped. Get medical attention.

INGESTION: Drink a couple of glasses water or milk. Do NOT induce vomiting unless directed to do so by a physician. Never give anything by mouth to an unconscious person. Get medical attention.

SKIN: Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if any discomfort continues.

EYES: Promptly wash eyes with lots of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

5. FIRE FIGHTING MEASURES

AUTO IGNITION TEMP. (°F): N/D
FLAMMABILITY LIMIT - LOWER(%): N/D
FLAMMABILITY LIMIT - UPPER(%): N/D

EXTINGUISHING MEDIA:

Carbon dioxide (CO2). Dry chemicals. Foam. Water spray, fog or mist.

SPECIAL FIRE FIGHTING PROCEDURES:

No specific fire fighting procedure given.

UNUSUAL FIRE & EXPLOSION HAZARDS:

Dust in high concentrations may form explosive mixtures with air.

HAZARDOUS COMBUSTION PRODUCTS:

Irritating gases/vapors/fumes. Ammonia or amines. Oxides of: Carbon. and Sulfur.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:

Wear proper personal protective equipment (see MSDS Section 8).

SPILL CLEAN-UP PROCEDURES:

Avoid generating and spreading of dust. Shovel into dry containers. Cover and move the containers. Flush the area with water. Do not contaminate drainage or waterways. Repackage or recycle if possible.

7. HANDLING AND STORAGE

HANDLING PRECAUTIONS:
Avoid handling causing generation of dust. Wear full protective clothing for prolonged exposure and/or high concentrations. Eye wash and emergency shower must be available at the work place. Wash hands often and change clothing when needed. Provide good ventilation. Mechanical ventilation or local exhaust ventilation is required.

STORAGE PRECAUTIONS:
Store at moderate temperatures in dry, well ventilated area. Keep in original container.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

		OSHA PEL:		ACGIH TLV:		OTHER:		
INGREDIENT NAME:	**CAS No.:**	**TWA:**	**STEL:**	**TWA:**	**STEL:**	**TWA:**	**STEL:**	**UNITS:**
Silica, crystalline, quartz	14808-60-7	*		0.1				mg/m3 resp.dust

INGREDIENT COMMENTS:
* OSHA PELs for Mineral Dusts containing crystalline silica are 10 mg/m3 / (%SiO2+2) for quartz and 1/2 the calculated quartz value for cristobalite and tridymite.

PROTECTIVE EQUIPMENT:

ENGINEERING CONTROLS:
Use appropriate engineering controls such as, exhaust ventilation and process enclosure, to reduce air contamination and keep worker exposure below the applicable limits.

VENTILATION: Supply natural or mechanical ventilation adequate to exhaust airborne product and keep exposures below the applicable limits.

RESPIRATORS: Use at least a NIOSH-approved N95 half-mask disposable or reuseable particulate respirator. In work environments containing oil mist/aerosol use at least a NIOSH-approved P95 half-mask disposable or reuseable particulate respirator. For exposures exceeding 10 x PEL use a NIOSH-approved N100 Particulate Respirator.

PROTECTIVE GLOVES:
Use suitable protective gloves if risk of skin contact.

EYE PROTECTION:
Wear dust resistant safety goggles where there is danger of eye contact.

PROTECTIVE CLOTHING:
Wear appropriate clothing to prevent repeated or prolonged skin contact.

HYGIENIC WORK PRACTICES:
Wash promptly with soap and water if skin becomes contaminated. Change work clothing daily if there is any possibility of contamination.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE/PHYSICAL STATE: Powder, dust.
COLOR: Dark. Brown.
ODOR: Slight.
SOLUBILITY DESCRIPTION: Soluble in water.

DENSITY/SPECIFIC GRAVITY (g/ml):	1.65	TEMPERATURE (°F): 68
BULK DENSITY:	56 lb/ft3; 897 kg/m3	
VAPOR DENSITY (air=1):	N/A	
VAPOR PRESSURE:	N/A	TEMPERATURE (°F):
pH-VALUE, DILUTED SOLUTION:	~9.0	CONCENTRATION (%,M): 1%

10. STABILITY AND REACTIVITY

STABILITY: Normally stable.

CONDITIONS TO AVOID:
Avoid heat.

HAZARDOUS POLYMERIZATION:
Will not polymerize.

POLYMERIZATION DESCRIPTION:
Not relevant.

MATERIALS TO AVOID:
Strong acids. Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS:
High temperatures generate: Ammonia or amines.

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION:
No toxicological data is available for this product.

12. ECOLOGICAL INFORMATION

ACUTE AQUATIC TOXICITY:
This product is approved for use under the U.S. Environmental Protection Agency (EPA) Region IX (California) General NPDES Permit which regulates offshore discharges of drilling fluids. Contact M-I's Environmental Affairs Department for more information.
This product passes the mysid shrimp toxicity test required by the U.S. Environmental Protection Agency (EPA) Region VI (Gulf of Mexico) NPDES Permit, which regulates offshore discharge of drilling fluids, when tested in a standard drilling fluid. Contact M-I's Environmental Affairs Department for more information.

13. DISPOSAL CONSIDERATIONS

WASTE MANAGEMENT:
This product does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc, may render the resulting materials hazardous.
Empty containers retain residues. All labeled precautions must be observed.

DISPOSAL METHODS:
Recover and reclaim or recycle, if practical. Should this product become a waste, dispose of in a permitted industrial landfill. Ensure that containers are empty by RCRA criteria prior to disposal in a permitted industrial landfill.

14. TRANSPORT INFORMATION

PRODUCT RQ: N/A

U.S. DOT:
U.S. DOT CLASS: Not regulated.

CANADIAN TRANSPORT:
TDGR CLASS: Not regulated.

SEA TRANSPORT:
IMDG CLASS: Not regulated.

AIR TRANSPORT:
ICAO CLASS: Not regulated.

15. REGULATORY INFORMATION

REGULATORY STATUS OF INGREDIENTS:

NAME:	CAS No:	TSCA:	CERCLA:	SARA 302:	SARA 313:	DSL(CAN):
Silica, crystalline, quartz	14808-60-7	Yes	No	No	No	Yes
Proprietary ingredients		Yes	No	No	No	Yes

US FEDERAL REGULATIONS:
WASTE CLASSIFICATION: Not a hazardous waste by U.S. RCRA criteria. See Section 13.

REGULATORY STATUS: This Product or its components, if a mixture, is subject to following regulations (Not meant to be all inclusive - selected regulations represented):

SECTION 313: This product does not contain toxic chemical subject to the reporting requirements of Section 313 of Title III of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR Part 372.

SARA 311 Categories:
1: Immediate (Acute) Health Effects.
2. Delayed (Chronic) Health Effects.
The components of this product are listed on or are exempt from the following international chemical registries:
TSCA (U.S.)
EINECS (Europe)

STATE REGULATIONS:
STATE REGULATORY STATUS: This product or its components, if a mixture, is subject to following regulations (Not meant to be all inclusive - selected regulations represented):.
Pennsylvania Right-to-Know.
Illinois Right-to-Know.
New Jersey Right-to-Know.

PROPOSITION 65: This product contains the following chemical(s) considered by the State of California's Safe Drinking Water and Toxic Enforcement Act of 1986 as causing cancer or reproductive toxicity, and for which warnings are now required:
Silica, crystalline

CANADIAN REGULATIONS:

LABELS FOR SUPPLY:

REGULATORY STATUS: This Material Safety Data Sheet has been prepared in compilance with the Controled Product Regulations.

Canadian WHMIS Classification: D2A - Other Toxic Effects: Very Toxic Material

16. OTHER INFORMATION

NPCA HMIS HAZARD INDEX: * 1 Slight Hazard
FLAMMABILITY: 1 Slight Hazard
REACTIVITY: 0 Minimal Hazard
NPCA HMIS PERS. PROTECT. INDEX: E - Safety Glasses, Gloves, Dust Respirator

USER NOTES: N/A = Not applicable N/D = Not determined

INFORMATION SOURCES:

OSHA Permissible Exposure Limits, 29 CFR 1910, Subpart Z, Section 1910.1000, Air Contaminants.
ACGIH Threshold Limit Values and Biological Exposure Indices for Chemical Substances and Physical Agents (latest edition).
Sax's Dangerous Properties of Industrial Materials, 9th ed., Lewis, R.J. Sr., (ed.), VNR, New York, New York, (1997).
IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans, Silica, Some Silicates, Coal Dust, and para-Aramid Fibrils, Vol. 68, World Health Organization, Lyon, France, 1997.
Product information provided by the commercial vendor(s).

PREPARED BY: Sam Hoskin/bb

REVISION No./Repl. MSDS of: 2 / July 29, 1998

MSDS STATUS: Approved.

DATE: February 22, 1999

SAFETY DATA SHEET
SAFE-SCAV HS

1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

PRODUCT NAME	SAFE-SCAV HS
APPLICATION	Hydrogen sulphide scavenger.
SUPPLIER	M-I Drilling Fluids UK Ltd, Pocra Quay, Footdee, Aberdeen. AB11 5DQ T -44 (0)1224-584336 F -44 (0)1224-576119
EMERGENCY TELEPHONE	+44(0)208 762 8322

2 COMPOSITION/INFORMATION ON INGREDIENTS

Name	EC No.	CAS-No.	Content	Classification
HYDROXYALKYL TRIAZINE			60-100%	Xn;R20/21/22. Xi;R36/38.
WATER	231-791-2	7732-18-5	30-60%	-

The Full Text for all R-Phrases are Displayed in Section 16

COMPOSITION COMMENTS

This product is classified as harmful in accordance with the EU Directives.

3 HAZARDS IDENTIFICATION

Harmful by inhalation, in contact with skin and if swallowed.

Irritating to eyes and skin.

CLASSIFICATION Xn;R20/21/22. Xi;R36/38.

4 FIRST-AID MEASURES

INHALATION

Move the exposed person to fresh air at once. If respiratory problems, artificial respiration/oxygen. Get medical attention if any discomfort continues.

INGESTION

Do not induce vomiting. Rinse mouth thoroughly with water and give large amounts of milk or water to people not unconscious. Get medical attention if any discomfort continues.

SKIN CONTACT

Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention if any discomfort continues.

EYE CONTACT

Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention promptly if symptoms occur after washing.

5 FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA

Water spray, foam, dry powder or carbon dioxide.

SPECIAL FIRE FIGHTING PROCEDURES

Cool containers exposed to flames with water until well after the fire is out.

SPECIFIC HAZARDS

Fire or high temperatures create: Asphyxiating gases/vapours/fumes of: Carbon dioxide (CO_2). Carbon monoxide (CO). and Oxides of: Nitrogen.

PROTECTIVE MEASURES IN FIRE

Self contained breathing apparatus and full protective clothing must be worn in case of fire.

6 ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS
Wear proper personal protective equipment (see MSDS Section 8).
ENVIRONMENTAL PRECAUTIONS
Do not allow to enter drains, sewers or watercourses.
SPILL CLEAN UP METHODS
Stop leak if possible without risk. Absorb spillage with suitable absorbent material. Collect in containers and seal securely. Remove containers and flush area with water.

7 HANDLING AND STORAGE

USAGE PRECAUTIONS
Avoid spilling, skin and eye contact. Avoid inhalation of vapours. Do not use contact lenses.
STORAGE PRECAUTIONS
Store in tightly closed original container in a cool, dry well-ventilated place.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

INGREDIENT COMMENTS
No exposure limits noted for ingredient(s).
PROTECTIVE EQUIPMENT

ENGINEERING MEASURES
Provide adequate general and local exhaust ventilation.
RESPIRATORY EQUIPMENT
If ventilation is insufficient, suitable respiratory protection must be provided. Gas cartridge suitable for organic substances.
HAND PROTECTION
Use protective gloves made of: Neoprene, nitrile, polyethylene or PVC.
EYE PROTECTION
Wear splash-proof eye goggles to prevent any possibility of eye contact.
OTHER PROTECTION
Wear appropriate clothing to prevent repeated or prolonged skin contact. Provide eyewash station.

9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	Liquid		
COLOUR	Amber Yellow		
ODOUR	Amine.		
SOLUBILITY	Soluble in water		
MELTING POINT (°C)	< - 20	RELATIVE DENSITY	1.065 - 1.135 @ 16 °c
VISCOSITY	< 10 cSt @ 38 °c	FLASH POINT (°C)	> 100 PM Closed cup.
PARTITION COEFFICIENT (N-Octanol/Water)	- 1.5 to 0.2		

10 STABILITY AND REACTIVITY

STABILITY
Stable under normal temperature conditions.
HAZARDOUS POLYMERISATION
Will not polymerise.
MATERIALS TO AVOID
Strong oxidising substances.
HAZARDOUS DECOMPOSITION PRODUCTS
Fire or high temperatures create: Carbon dioxide (CO_2). Carbon monoxide (CO). and Oxides of: Nitrogen.

11 TOXICOLOGICAL INFORMATION

TOXIC DOSE 1 - LD 50 1620 mg/kg (oral rat)

INHALATION

Harmful by inhalation. In high concentrations, vapours are anaesthetic and may cause headache, fatigue, dizziness and central nervous system effects.

INGESTION

Harmful if swallowed. May cause gastric distress, nausea and vomiting if ingested.

SKIN CONTACT

Harmful in contact with skin. Liquid may irritate skin. Can cause a rash when short time exposure. Repeated and prolonged exposure can cause burns.

EYE CONTACT

Irritating to eyes. Contact with eyes may cause moderate to severe irritation.

12 ECOLOGICAL INFORMATION

ECOTOXICITY

Contact M-I Swaco's QHSE Department for ecological information.

13 DISPOSAL CONSIDERATIONS

DISPOSAL METHODS

Recover and reclaim or recycle, if practical. Dispose of waste and residues in accordance with local authority requirements.

14 TRANSPORT INFORMATION

GENERAL The product is not covered by international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID).

15 REGULATORY INFORMATION

LABELLING

Harmful

RISK PHRASES

R20/21/22	Harmful by inhalation, in contact with skin and if swallowed.
R36/38	Irritating to eyes and skin.

SAFETY PHRASES

S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S24/25	Avoid contact with skin and eyes.
S36/37	Wear suitable protective clothing and gloves.

UK REGULATORY REFERENCES

Chemicals (Hazard Information & Packaging) Regulations. The Control of Substances Hazardous to Health Regulations

EU DIRECTIVES

Dangerous Substance Directive 67/548/EEC. Dangerous Preparations Directive 1999/45/EEC.

GUIDANCE NOTES

Workplace Exposure Limits EH40.

16 OTHER INFORMATION

GENERAL INFORMATION

HMIS Health - 2 HMIS Flammability - 1 HMIS Physical Hazard - 0

INFORMATION SOURCES

Material Safety Data Sheet, Misc. manufacturers. Sax's Dangerous Properties of Industrial Materials, 10th ed., Lewis, R.J. Sr., (ed.).

REVISION COMMENTS

The following sections have been revised: 5, 8, 10, 12, 14, 15 and 16. Revised by Bill Cameron

ISSUED BY

Dr. Kirsty Walker

REVISION DATE 19-01-06

SAFE-SCAV HS

REV. NO./REPL. SDS GENERATED	2
SDS NO.	10345

RISK PHRASES IN FULL

R20/21/22	Harmful by inhalation, in contact with skin and if swallowed.
R36/38	Irritating to eyes and skin.

SAFE-SCAV HSW

SAFE-SCAV HSW hydrogen sulfide scavenger is brine soluble and remains soluble after reacting with H_2S. Based on an organic chemical in place of the typical zinc- or iron-base compound, it provides a solids-free solution to H_2S intrusion.*

Typical Physical Properties

Physical appearance	Liquid
Specific gravity	1.08 @ 60°F (16°C)
pH (5% solution in 75/25 isopropanol/water)	10.0-11.5
Solubility in water	Soluble
Flash point	125°F (51°C) (PMCC)
Pour point	-35°F (-37°C)

Applications

SAFE-SCAV HSW additive is designed specifically for brine-base fluid systems to remove H_2S.

Recommended treatment levels are 0.1 lb/bbl (1 gal/100 bbl) (0.29 kg/m³). Use higher concentrations where higher levels of H_2S exist in the mud to be treated. Under optimal conditions, each pound per barrel (2.85 kg/m³) of SAFE-SCAV HSW additive can consume about 0.1 lb (0.045 kg) of H_2S.

SAFE-SCAV HSW additive has been used successfully to treat water-base fluids where zinc cannot be used for environmental reasons.

Many hydrogen sulfide scavengers use inorganic chemicals to tie up H_2S. For example, zinc oxide additive is a partially soluble product which liberates zinc ion as a scavenger. Similarly, SV-120* which is essentially completely soluble, yields an active zinc component for sulfide removal. Both products irreversibly tie up the zinc as solid zinc sulfide:

$$H_2S + Zn^{2+} \rightarrow 2H^+ + ZnS \rightarrow \text{(solid precipitate)}$$

In many completion fluid applications, the resulting solid zinc sulfide is undesirable.

Another popular treatment for H_2S is to rely on high pH to neutralize the acidic hydrogen sulfide (also known as hydrosulfuric acid) and render it non-volatile.

$$H_2S + OH^- \rightarrow H_2O + HS^-$$

This can be done in a completely solids-free way, and any base can do it; however, treatment with base raises the pH of the fluid. Getting enough sodium hydroxide in solution to provide a large capacity for scrubbing requires a very high pH, approximately 12 to 13. Lime is somewhat better in this regard because it has limited solubility at high pH. This allows additional capacity to scrub H_2S to be built up in the system in the form of undissolved lime.

MI SWACO

Customer-focused, solutions-driven

Applications (continued)

Organic amines, such as ethanolamine, can also provide a high-pH sink for H_2S, while buffering the pH around 10. All these pH methods have a significant drawback in that the H_2S which is "scrubbed" will be immediately released if the pH is lowered. Carbon dioxide influx can lower the pH enough to release H_2S. Furthermore, while hydrogen sulfide is no longer being released, the corrosive effects are unabated, and in fact may even be enhanced at higher pH.

SAFE-SCAV HSW additive offers a solution to many of these scavenging problems in non-zinc brines. While nitrogen-base, the unique chemistry of SAFE-SCAV HSW additive results in an irreversible reaction with H_2S:

H_2S + SAFE-SCAV HSW -» SAFE-SCAV HSW-SH

Unlike the zinc or iron scrubbers, the final product is still brine- and water-soluble delivering solids-free sulfide scrubbing.

Advantages

- Chemically "ties up" the H_2S in an irreversible reaction preventing release if pH is dropped
- Is not zinc-base
- Completely water-soluble

Toxicity and Handling

Bioassay information is available upon request.

Handle as an industrial chemical, wearing protective equipment and observing the precautions described in the Material Safety Data Sheet (MSDS).

Packaging and Storage

SAFE-SCAV HSW additive is packaged in 5-gal (18.9-L) cans.

Store in a dry, well-ventilated area. Keep container closed. Keep away from heat, sparks and flames. Store away from incompatibles. Follow safe warehousing practices regarding palletizing, banding, shrink-wrapping and/or stacking.

No claim of personal safety is intended nor implied by the use of the name SAFE in this product. Personnel handling this material should read and follow all safety and handling procedures set forth on the Material Safety Data Sheet.

CPB 1941 0711 R2 (E)

P.O. Box 42842
Houston, Texas 77242-2842
Tel: 281-561-1300
Fax: 281-561-1441
www.miswaco.com
E-mail: questions@miswaco.com

SDS no. PID11903
Version 3
Revision date 24/Apr/2017
Supersedes date 18/Jan/2017

Safety Data Sheet
SAFE-SCAV* HSW

1. Identification

1.1 Product identifier

Product name SAFE-SCAV* HSW

Product code PID11903

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended Use Hydrogen Sulphide Scavenger.

Uses advised against Consumer use

1.3 Details of the supplier of the safety data sheet

Supplier
M-I L.L.C.
P.O.Box 42842
Houston, TX 77242
www.miswaco.slb.com
Telephone: 1 281-561-1511

Schlumberger Canada, Ltd.
200, 125 - 9th Avenue SE
Calgary, Alberta T2G 0P6, Canada
Telephone: 1-613-992-4624

E-mail address SDS@slb.com

Prepared by
Global Regulatory Compliance - Chemicals (GRC - Chemicals) , Bethicia Prasek

1.4 Emergency Telephone Number

Emergency telephone (24 Hour) Asia Pacific +65 3158 1074, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, USA +1 281 561 1600, Canada +1 800 579 7421, Argentina: +54 11 5984 3690, Brazil : 0800-720-8000 0800-777-2323 (WGRA)

2. Hazards identification

2.1 Classification of the substance or mixture

GHS - Classification

Health hazards

Acute toxicity - Oral	Category 4
Acute toxicity - Inhalation (Dusts/Mists)	Category 3
Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 1

Skin sensitization	Category 1
Specific target organ toxicity - Single exposure	Category 2 - (H371)
Specific target organ toxicity - Repeated exposure	Category 1

Environmental hazards Not classified

Physical Hazards

Flammable Liquids	Category 3

2.2 Label elements

Signal word
DANGER

Hazard statements
H302 - Harmful if swallowed
H315 - Causes skin irritation
H317 - May cause an allergic skin reaction
H318 - Causes serious eye damage
H331 - Toxic if inhaled
H371 - May cause damage to organs
H372 - Causes damage to organs through prolonged or repeated exposure
H226 - Flammable liquid and vapor

Precautionary statements
P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking
P260 - Do not breathe dust/fume/gas/mist/vapors/spray
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P304 + P340 - IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a POISON CENTER or doctor/ physician
P320 - Specific treatment is urgent (see supplemental first aid instructions on this label)
P370 + P378 - In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction

P240 - Ground/bond container and receiving equipment
P241 - Use explosion-proof electrical/ ventilating/ lighting/ equipment
P242 - Use only non-sparking tools
P243 - Take precautionary measures against static discharge
P264 - Wash face, hands and any exposed skin thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P272 - Contaminated work clothing should not be allowed out of the workplace
P273 - Avoid release to the environment
P301 + P312 - IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell
P330 - Rinse mouth
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
P303 + P361 + P353 - IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P309 + P311 - IF exposed or if you feel unwell: Call a POISON CENTER or doctor/ physician
P314 - Get medical advice/attention if you feel unwell

P332 + P313 - If skin irritation occurs: Get medical advice/attention
P333 + P313 - If skin irritation or rash occurs: Get medical advice/ attention
P337 + P313 - If eye irritation persists: Get medical advice/attention
P260 - Do not breathe dust/fume/gas/mist/vapors/spray
P362 - Take off contaminated clothing and wash before reuse
P363 - Wash contaminated clothing before reuse
P320 - Specific treatment is urgent (see supplemental first aid instructions on this label)
P284 - Wear respiratory protection
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a POISON CENTER or doctor/physician
P271 - Use only outdoors or in a well-ventilated area
P304 + P340 - IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing
P311 - Call a POISON CENTER or doctor/physician
P321 - Specific treatment (see supplemental first aid instructions on this label)
P233 - Keep container tightly closed
P403 + P235 - Store in a well-ventilated place. Keep cool
P501 - Dispose of contents/container in accordance with local regulations.

Unknown acute toxicity 0% of the mixture consists of ingredient(s) of unknown toxicity.

0 % of the mixture consists of ingredient(s) of unknown acute oral toxicity
0 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (dust/mist)

3. Composition/information on Ingredients

3.1 Substances

Not applicable

3.2 Mixtures

Chemical Name	CAS No	Weight-%
2,2',2''-(Hexahydro-1,3,5-Triazine-1,3,5-Triyl)Triethanol	4719-04-4	30 - 60
Methanol	67-56-1	5 - 10
2-aminoethanol	141-43-5	1 - 5

Comments
The product contains other ingredients which do not contribute to the overall classification. The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret

4. First aid measures

4.1 First-Aid Measures

Inhalation Move the exposed person to fresh air at once. If breathing is difficult, (trained personnel should) give oxygen. Seek medical attention at once.

Ingestion Rinse mouth. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Seek medical attention at once.

Skin contact Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Seek medical attention.

Eye contact Promptly wash eyes with lots of water while lifting eye lids. Remove contact lenses.

Continue to rinse for at least 15 minutes. Seek immediate medical attention/advice.

4.2 Most important symptoms and effects, both acute and delayed

General advice — The severity of the symptoms described will vary dependant of the concentration and the length of exposure. If adverse symptoms develop, the casualty should be transferred to hospital as soon as possible.

Main symptoms

Inhalation — Please see Section 11. Toxicological Information for further information.

Ingestion — Please see Section 11. Toxicological Information for further information.

Skin contact — Please see Section 11. Toxicological Information for further information.

Eye contact — Please see Section 11. Toxicological Information for further information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician

Treat symptomatically
Keep victim under observation
Ethanol may inhibit methanol metabolism

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media
Water Fog, Alcohol Foam, CO_2, Dry Chemical.

Extinguishing media which must not be used for safety reasons
Do not use a solid water stream as it may scatter and spread fire.

5.2 Special hazards arising from the substance or mixture

Unusual fire and explosion hazards
Flammable liquid. Vapors may form explosive mixtures with air. Vapors may travel considerable distance to source of ignition and flash back. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks). Heating of containers may cause pressure rise, with risk of bursting.

Hazardous combustion products
When heated strongly or burned, oxides of carbon, nitrogen oxides, ammonia and harmful organic chemical fumes are released.

5.3 Advice for firefighters

Special protective equipment for fire-fighters
As in any fire, wear self-contained breathing apparatus and full protective gear.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Extinguish all ignition sources. Avoid sparks, flames, heat and smoking. Evacuate personnel to safe areas. Avoid contact with the skin and the eyes. Do not breathe vapors or spray mist. Use personal protective equipment. If spilled, take caution, as material can cause surfaces to become very slippery.

6.2 Environmental precautions

Do not allow spilled material to enter sewers, storm drains or surface waters.

Environmental exposure controls
The product should not be allowed to enter drains, water courses or the soil. Avoid release to the environment. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and material for containment and cleaning up

Methods for containment
Prevent further leakage or spillage if safe to do so. Dike to collect large liquid spills.

Methods for cleaning up
Contain and collect spillage with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local/national regulations (see Section 13). Use clean non-sparking tools to collect absorbed material. Use non-sparking tools and equipment. Take precautionary measures against static discharges. Ground and bond containers when transferring material.

6.4 Reference to other sections

No information available.

7. Handling and storage

7.1 Precautions for safe handling

Handling
Do not handle until all safety precautions have been read and understood. Handle in accordance with good industrial hygiene and safety practice. Keep away from heat, sparks and open flame. No smoking. Avoid breathing vapors or mists. Avoid contact with skin, eyes and clothing. Take precautionary measures against static discharges. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Prevent splashing and leaking of product.

Hygiene measures
When using do not smoke, eat or drink. Wash hands and face before breaks and immediately after handling the product. Remove contaminated clothing.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/precautions Ensure adequate ventilation. Use spark-proof tools and explosion-proof equipment.

Storage precautions Follow safe warehousing practices regarding palletizing, banding, shrink-wrapping and/or stacking. Keep away from open flames, hot surfaces and sources of ignition. Keep containers tightly closed in a dry, cool and well-ventilated place. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded

Packaging materials Use specially constructed containers only.

8. Exposure controls/personal protection

8.1 Control parameters

Exposure limits **Formaldehyde is not present as a substance. It is formed during decomposition.**

Chemical Name	ACGIH TLV	OSHA PEL
2,2',2''-(Hexahydro-1,3,5-Triazine-1,3,5-Triyl)Triethanol	Not determined	Not determined
Methanol	200 ppm	200 ppm TWA

		260 mg/m³ TWA
2-aminoethanol	3 ppm	3 ppm TWA 6 mg/m³ TWA

8.2 Exposure controls

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures to reduce exposure
Ensure adequate ventilation. Provide mechanical general and/or local exhaust ventilation to prevent release of vapor or mist into work environment.

Personal protective equipment

Eye protection	Tightly fitting safety goggles.
Hand protection	Use protective gloves made of: Nitrile Neoprene Be aware that liquid may penetrate the gloves. Frequent change is advisable.
Respiratory Protection	All respiratory protection equipment should be used within a comprehensive respiratory protection program that meets the requirements of 29 CFR 1910.134 (U.S. OSHA Respiratory Protection Standard) or local equivalent.If exposed to airborne mist/aerosol of this product, use an organic vapor cartridge with a P-95 pre-filter attached. In work environments containing oil mist/aerosol, use an organic vapor cartridge with a P-95 pre-filter attached.If exposed to vapors from this product, use a NIOSH/MSHA-approved respirator with an organic vapor cartridge.
Skin and body protection	Wear suitable protective clothing, Eye wash and emergency shower must be available at the work place.
Hygiene measures	Wash hands before eating, drinking or smoking, Remove and wash contaminated clothing before re-use.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	Liquid
Appearance	Transparent
Color	Light yellow
Odor	Amine
Odor threshold	Not applicable

Property	Values	Remarks
pH	No information available	
pH @ dilution	10 - 11.5	(5% IPA/H20)
Melting / freezing point	No information available	
Boiling point/range	No information available	
Flash point	52 °C / 125.6 °F	Closed cup
Evaporation rate (BuAc =1)	No information available	
Flammability (solid, gas)	Not applicable	
Flammability Limit in Air		
Upper flammability limit	No information available	
Lower flammability limit	No information available	
Vapor pressure	63.7 mmHg	@ 37.8 °C
Vapor density	>1	(Air = 1.0)
Specific gravity	No information available	
Bulk density	No information available	

Water solubility	Soluble in water	
Solubility in other solvents	No information available	
Autoignition temperature	No information available	
Decomposition temperature	No information available	
Kinematic viscosity	14-16 cPs	@ 16 °C
Dynamic viscosity	No information available	
log Pow	Not determined	
Explosive properties	Not applicable	
Oxidizing properties	None known.	

9.2 Other information

Pour point	-37°C (-34.6°F)
Molecular weight	No information available
VOC content(%)	None
Density	No information available

10. Stability and reactivity

10.1 Reactivity

FLAMMABLE LIQUID AND VAPOR.

10.2 Chemical stability

Stable under normal temperature conditions and recommended use.

10.3 Possibility of Hazardous Reactions

Hazardous polymerization
Hazardous polymerization does not occur.

10.4 Conditions to avoid

Take precautionary measures against static charges. Avoid heat, flames and other sources of ignition.

10.5 Incompatible materials

Strong oxidizing agents. Acids.

10.6 Hazardous decomposition products

See Section 5.2.

11. Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product information	This product may contain or release trace amounts of formaldehyde. The International Agency for Research on Cancer (IARC) has classified formaldehyde as a Group 1carcinogen (limited evidence in humans, sufficient evidence in animals). Exposure to formaldehyde has been linked to adverse reproductive effects in some human and animal studies. In other reproductive studies, however, no adverse effects were noted. (Meditext). Formaldehyde may also cause skin sensitisation (allergic reaction).
Inhalation	Toxic if inhaled.

Eye contact Causes serious eye damage. Inhalation, ingestion, or skin absorbtion of methanol can cause blindness.

Skin contact Causes skin irritation. May cause an allergic skin reaction. Components of the product may be absorbed into the body through the skin.

Ingestion Harmful if swallowed.

Toxicology data for the components

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
2,2',2"-(Hexahydro-1,3,5-Triazine-1,3,5-Triyl)Triethanol	= 763 mg/kg (Rat)	> 2 g/kg (Rat)	No data available
Methanol	= 6200 mg/kg (Rat)	= 15800 mg/kg (Rabbit)	= 22500 ppm (Rat) 8 h = 64000 ppm (Rat) 4 h
2-aminoethanol	= 1720 mg/kg (Rat)	= 1000 mg/kg (Rabbit) = 1 mL/kg (Rabbit)	No data available

Chemical Name	IARC Group 1 or 2	ACGIH - Carcinogens	OSHA listed carcinogens	NTP
2,2',2"-(Hexahydro-1,3,5-Triazine-1,3,5-Triyl)Triethanol	No data available	No data available	No data available	No data available
Methanol	No data available	No data available	No data available	No data available
2-aminoethanol	No data available	No data available	No data available	No data available

Sensitization May cause sensitization by skin contact.

Mutagenic effects This substance has no evidence of mutagenic properties.

Carcinogenicity Formaldehyde is listed by IARC in Group 1 as carcinogenic to humans.

Reproductive toxicity This product does not contain any known or suspected reproductive hazards.

Developmental toxicity Component substance is listed on California Proposition 65 as a developmental hazard.

Routes of exposure Inhalation. Ingestion. Skin contact. Eye contact.

Routes of entry Inhalation. Ingestion. Skin absorption.

Specific target organ toxicity - Single exposure Category 2

Specific target organ toxicity - Repeated exposure Category 1.

Target organ effects Respiratory system. Eyes. Central nervous system. Lungs.

Aspiration hazard Not classified.

12. Ecological information

12.1 Toxicity

Toxicity to algae
See component information below.

Toxicity to fish
See component information below.

Toxicity to daphnia and other aquatic invertebrates
See component information below.

Chemical Name	Toxicity to fish	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates
2,2',2"-(Hexahydro-1,3,5-Triazine-1, 3.5-Triyl)Triethanol	No information available	No information available	No information available
Methanol	18 - 20 mL/L LC50 Oncorhynchus mykiss 96 h 19500 - 20700 mg/L LC50 Oncorhynchus mykiss 96 h 13500 - 17600 mg/L LC50 Lepomis macrochirus 96 h > 100 mg/L LC50 Pimephales promelas 96 h = 28200 mg/L LC50 Pimephales promelas 96 h	EC50= 22000 mg/l - Duration h: 96 - Notes: Literature data.	EC50> 10000 mg/l - Duration h: 48 - Notes: Literature data.
2-aminoethanol	114 - 196 mg/L LC50 Oncorhynchus mykiss 96 h = 227 mg/L LC50 Pimephales promelas 96 h = 3684 mg/L LC50 Brachydanio rerio 96 h 300 - 1000 mg/L LC50 Lepomis macrochirus 96 h > 200 mg/L LC50 Oncorhynchus mykiss 96 h	= 15 mg/L EC50 Desmodesmus subspicatus 72 h	= 65 mg/L EC50 Daphnia magna 48 h

12.2 Persistence and degradability

No product level data available.

12.3 Bioaccumulative potential

Does not bioaccumulate.

log Pow
-1.5 - 0.2

12.4 Mobility in soil

Soluble in water.

12.5 Results of PBT and vPvB assessment

This preparation contains no substance considered to be persistent, bioaccumulating nor toxic (PBT)
This preparation contains no substance considered to be very persistent nor very bioaccumulating (vPvB)

12.6 Other adverse effects.

None known.

13. Disposal considerations

13.1 Waste treatment methods

Disposal Method Disposal should be made in accordance with federal, state and local regulations.

Contaminated packaging Do not re-use empty containers. Do not burn, or use a cutting torch on, the empty drum.

Empty containers may contain flammable or explosive vapors. Empty containers should be taken for local recycling, recovery or waste disposal. Dispose of in accordance with local regulations.

14. Transport information

14.1. UN number

UN No. (DOT)	UN2929
UN No. (TDG)	UN2929
UN/ID No. (ADR/RID/ADN/ADG)	UN2929
UN No. (IMDG)	UN2929
UN No. (ICAO)	UN2929

14.2. UN proper shipping name

Toxic liquids, flammable, organic, n.o.s., (2, 2',2"-(hexahydro-1,3,5-triazine-1,3,5-triyl)triethanol, methyl alcohol),

14.3 Hazard class(es)

DOT Hazard class	6.1 (3)
TDG Hazard class	6.1 (3)
ADR/RID/ADN/ADG Hazard class	6.1 (3)
IMDG Hazard class	6.1 (3)
ICAO Hazard class/division	6.1 (3)

14.4 Packing group

DOT Packing group	PG II
TDG Packing group	PG II
ADR/RID/ADN/ADG Packing group	PG II
IMDG Packing group	PG II
ICAO Packing group	PG II

14.5 Environmental hazard

Marine pollutant No

14.6 Special precautions

Not applicable

14.7 Transport in bulk according to Annex I/II of MARPOL 73/78 and the IBC Code

Please contact MISDS@slb.com for info regarding transport in Bulk.

15. Regulatory information

International inventories

USA (TSCA)	Complies
Canada (DSL)	Complies
European Union (EINECS and ELINCS)	Complies
Philippines (PICCS)	Complies
Japan (ENCS)	Complies
China (IECSC)	Complies
Australia (AICS)	Complies
Korean (KECL)	Complies
New Zealand (NZIoC)	Complies

U.S. Federal and State Regulations

SARA 311/312 Hazard Categories
Immediate (acute) health hazard. Fire hazard.

Chemical Name	SARA 302 / TPQs	SARA 313	CERCLA RQ
2,2',2"-(Hexahydro-1,3,5-Triazine-1,3,5-Triyl) Triethanol	N/A	N/A	N/A
Methanol	N/A	1.0 %	5000 lb final RQ 2270 kg final RQ
2-aminoethanol	N/A	N/A	N/A

State Comments
Proposition 65: This product contains chemical(s) considered by the State of California's Safe Drinking Water and Toxic Enforcement Act of 1986 to cause cancer and/or reproductive toxicity. See table under U.S. Federal and State Regulations for the specific chemicals.

Methanol
developmental toxicity

Canadian Classification

This Safety Data Sheet has been prepared in compliance with the Hazardous Products Regulations.

HMIRA Registration Number: 11098 **Filing Date:** 31/Jan/2017

16. Other information

Supersedes date	18/Jan/2017
Revision date	24/Apr/2017
Version	3
This SDS has been revised in the following section(s)	1, 3, 14, 16. Updated according to WHMIS 2015.
HMIS classification	
Health	3*
Flammability	2
Physical hazard	0
PPE	X

N/A - Not Applicable, N/D - Not Determined.

*A mark of M-I L.L.C., a Schlumberger Company

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SAFETY DATA SHEET

Version 6.3
Revision Date 03/26/2022
Print Date 07/29/2023

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Sepiolite

Product Number : 70253
Brand : Aldrich
CAS-No. : 63800-37-3

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Not a hazardous substance or mixture.

2.2 GHS Label elements, including precautionary statements

Not a hazardous substance or mixture.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Formula : $Mg_2H_2(SiO_3)3.xH_2O$
CAS-No. : 63800-37-3
EC-No. : 264-465-3

No components need to be disclosed according to the applicable regulations.

SECTION 4: First aid measures

4.1 Description of first-aid measures

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration.

In case of skin contact
Wash off with soap and plenty of water.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

5.2 Special hazards arising from the substance or mixture
Magnesium oxide
silicon oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
The product itself does not burn.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Avoid dust formation. Avoid breathing vapors, mist or gas.
For personal protection see section 8.

6.2 Environmental precautions
No special environmental precautions required.

6.3 Methods and materials for containment and cleaning up
Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on protection against fire and explosion
Provide appropriate exhaust ventilation at places where dust is formed.

Hygiene measures
General industrial hygiene practice.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
Keep container tightly closed in a dry and well-ventilated place.

Keep in a dry place.

Storage class
Storage class (TRGS 510): 13: Non Combustible Solids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters
Contains no substances with occupational exposure limit values.

8.2 Exposure controls

Appropriate engineering controls
General industrial hygiene practice.

Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection
Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Respiratory protection is not required. Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN 143) dust masks. Use

respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
No special environmental precautions required.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: powder Color: light brown
b)	Odor	No data available
c)	Odor Threshold	No data available
d)	pH	8.0 - 9.0 at 100 g/l at 25 °C (77 °F)
e)	Melting point/freezing point	1,200 °C (2,192 °F) - Decomposes on heating.
f)	Initial boiling point and boiling range	No data available
g)	Flash point	()Not applicable
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapor pressure	No data available
l)	Vapor density	No data available
m)	Density	2.000 - 2.300 g/cm3 at 20 °C (68 °F)
	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Autoignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
Oral: No data available
Inhalation: No data available
Dermal: No data available
No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC: 3 - Group 3: Not classifiable as to its carcinogenicity to humans (Sepiolite)

ACGIH: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

11.2 Additional Information

No data available

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish	LC50 - Carassius auratus (goldfish) - > 14,000 mg/l - 96 h
Toxicity to algae	IC50 - Chlorella vulgaris (Fresh water algae) - > 300 mg/l - 96 h

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Endocrine disrupting properties
No data available

12.7 Other adverse effects
No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging
Dispose of as unused product.

SECTION 14: Transport information

DOT (US)
Not dangerous goods

IMDG
Not dangerous goods

IATA
Not dangerous goods

Further information
Not classified as dangerous in the meaning of transport regulations.

SECTION 15: Regulatory information

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
No SARA Hazards

Massachusetts Right To Know Components
No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components

Sepiolite	CAS-No. 63800-37-3	Revision Date

New Jersey Right To Know Components

Sepiolite	CAS-No. 63800-37-3	Revision Date

California Prop. 65 Components
This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

SECTION 16: Other information

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.3 Revision Date: 03/26/2022 Print Date: 07/29/2023

SAFETY DATA SHEET

1. Identification

Product identifier **Soda Ash-Dense**

Other means of identification

Product Number 1902200

Recommended use Not available.

Recommended restrictions None known.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer

Company name Thatcher Company, Inc.

Address 1905 Fortune Road
Salt Lake City, UT 84104
United States

Telephone General Assistance 8-5 (801) 972-4587

E-mail Not available.

Emergency phone number Chemtrec (CCN 22106) (800) 424-9300

2. Hazard(s) identification

Physical hazards Not classified.

Health hazards Serious eye damage/eye irritation Category 2

Environmental hazards Not classified.

OSHA defined hazards Not classified.

Label elements

Signal word Warning

Hazard statement Causes serious eye irritation.

Precautionary statement

Prevention Wash thoroughly after handling. Wear eye/face protection.

Response If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

Storage Not available.

Disposal Not available.

Hazard(s) not otherwise classified (HNOC) None known.

Supplemental information None.

3. Composition/information on ingredients

Substances

Chemical name	Common name and synonyms	CAS number	%
Sodium Carbonate		497-19-8	100

*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. First-aid measures

Inhalation Move to fresh air. Call a physician if symptoms develop or persist.

Skin contact Wash off with soap and water. Get medical attention if irritation develops and persists.

Eye contact	Do not rub eyes. Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.
Ingestion	Rinse mouth. Get medical attention if symptoms occur.
Most important symptoms/effects, acute and delayed	Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Dusts may irritate the respiratory tract, skin and eyes.
Indication of immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.
General information	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media	Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.
Specific hazards arising from the chemical	Not applicable.
Special protective equipment and precautions for firefighters	Wear suitable protective equipment.
Fire fighting equipment/instructions	Use water spray to cool unopened containers.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	Stop the flow of material, if this is without risk. Absorb in vermiculite, dry sand or earth and place into containers. Collect dust using a vacuum cleaner equipped with HEPA filter. Large Spills: Wet down with water and dike for later disposal. Shovel the material into waste container. Avoid the generation of dusts during clean-up. Following product recovery, flush area with water. Small Spills: Sweep up or vacuum up spillage and collect in suitable container for disposal. Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.
Environmental precautions	Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling	Minimize dust generation and accumulation. Provide appropriate exhaust ventilation at places where dust is formed. Avoid contact with eyes. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.
Conditions for safe storage, including any incompatibilities	Store in original tightly closed container. Store in a well-ventilated place. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits	No exposure limits noted for ingredient(s).
Biological limit values	No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls	Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. If material is ground, cut, or used in any operation which may generate dusts, use appropriate local exhaust ventilation to keep exposures below the recommended exposure limits. Provide eyewash station.

Individual protection measures, such as personal protective equipment

Eye/face protection	Wear safety glasses with side shields (or goggles).
Skin protection	
Hand protection	Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier.
Other	Wear suitable protective clothing.
Respiratory protection	Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance	
Physical state	Solid.
Form	Powder.
Color	Not available.
Odor	Not available.
Odor threshold	Not available.
pH	Not available.
Melting point/freezing point	1563.8 °F (851 °C)
Initial boiling point and boiling range	Not available.
Flash point	Not available.
Evaporation rate	Not available.
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	< 0.0000001 kPa at 25 °C
Vapor density	Not available.
Relative density	Not available.
Solubility(ies)	
Solubility (water)	Not available.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	752 °F (400 °C)
Viscosity	Not available.
Other information	
Explosive properties	Not explosive.
Molecular formula	Na2CO3

Molecular weight	105.99 g/mol
Oxidizing properties	Not oxidizing.

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
Conditions to avoid	Contact with incompatible materials.
Incompatible materials	None known.
Hazardous decomposition products	No hazardous decomposition products are known.

11. Toxicological information

Information on likely routes of exposure

Inhalation	Dust may irritate respiratory system.
Skin contact	Dust or powder may irritate the skin.
Eye contact	Causes serious eye irritation.
Ingestion	Health injuries are not known or expected under normal use.
Symptoms related to the physical, chemical and toxicological characteristics	Severe eye irritation. Dusts may irritate the respiratory tract, skin and eyes. Symptoms may include stinging, tearing, redness, swelling, and blurred vision.

Information on toxicological effects

Acute toxicity

Product	Species	Test Results
Soda Ash-Dense (CAS 497-19-8)		
Acute		
Inhalation		
LC50	Guinea pig	0.8 mg/l, 2 Hours
	Mouse	1.2 mg/l, 2 Hours
	Rat	2.3 mg/l, 2 Hours
Oral		
LD50	Rat	4090 mg/kg

* Estimates for product may be based on additional component data not shown.

Skin corrosion/irritation	Health injuries are not known or expected under normal use.
Serious eye damage/eye irritation	Causes serious eye irritation.
Respiratory or skin sensitization	
Respiratory sensitization	Not a respiratory sensitizer.
Skin sensitization	This product is not expected to cause skin sensitization.
Germ cell mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Carcinogenicity	This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

Reproductive toxicity	This product is not expected to cause reproductive or developmental effects.
Specific target organ toxicity - single exposure	Not classified.
Specific target organ toxicity - repeated exposure	Not classified.
Aspiration hazard	Not an aspiration hazard.

12. Ecological information

Ecotoxicity The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Product		Species	Test Results
Sodium Carbonate (CAS 497-19-8)			
Aquatic			
Crustacea	EC50	Water flea (Ceriodaphnia dubia)	156.6 - 298.9 mg/l, 48 hours
Fish	LC50	Bluegill (Lepomis macrochirus)	300 mg/l, 96 hours

* Estimates for product may be based on additional component data not shown.

Persistence and degradability No data is available on the degradability of this product.

Bioaccumulative potential No data available.

Mobility in soil No data available.

Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

SARA 304 Emergency release notification

Not regulated.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes
Delayed Hazard - No
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical Yes

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.

US state regulations

US. California Controlled Substances. CA Department of Justice (California Health and Safety Code Section 11100)

Not listed.

US. Massachusetts RTK - Substance List

Not regulated.

US. New Jersey Worker and Community Right-to-Know Act

Not regulated.

US. Pennsylvania RTK - Hazardous Substances

Not regulated.

US. Pennsylvania Worker and Community Right-to-Know Law

Not listed.

US. Rhode Island RTK

Not regulated.

US. California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

International Inventories

Country(s) or region	Inventory name	On Inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date 10-15-2015

Version # 01

NFPA ratings Health: 2
Flammability: 0
Instability: 0

NFPA ratings

Disclaimer

Thatcher Company cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.

SAFETY DATA SHEET

1. Identification

Product identifier **Soda Ash-Dense**

Other means of identification

Product Number 1902200

Recommended use Not available.

Recommended restrictions None known.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer

Company name Thatcher Company, Inc.

Address 1905 Fortune Road
Salt Lake City, UT 84104
United States

Telephone General Assistance 8-5 (801) 972-4587

E-mail Not available.

Emergency phone number Chemtrec (CCN 22106) (800) 424-9300

2. Hazard(s) identification

Physical hazards Not classified.

Health hazards Serious eye damage/eye irritation Category 2

Environmental hazards Not classified.

OSHA defined hazards Not classified.

Label elements

Signal word Warning

Hazard statement Causes serious eye irritation.

Precautionary statement

Prevention Wash thoroughly after handling. Wear eye/face protection.

Response If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

Storage Not available.

Disposal Not available.

Hazard(s) not otherwise classified (HNOC) None known.

Supplemental information None.

3. Composition/information on ingredients

Substances

Chemical name	Common name and synonyms	CAS number	%
Sodium Carbonate		497-19-8	100

*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. First-aid measures

Inhalation Move to fresh air. Call a physician if symptoms develop or persist.

Skin contact Wash off with soap and water. Get medical attention if irritation develops and persists.

Eye contact	Do not rub eyes. Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.
Ingestion	Rinse mouth. Get medical attention if symptoms occur.
Most important symptoms/effects, acute and delayed	Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Dusts may irritate the respiratory tract, skin and eyes.
Indication of immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.
General information	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media	Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.
Specific hazards arising from the chemical	Not applicable.
Special protective equipment and precautions for firefighters	Wear suitable protective equipment.
Fire fighting equipment/instructions	Use water spray to cool unopened containers.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	Stop the flow of material, if this is without risk. Absorb in vermiculite, dry sand or earth and place into containers. Collect dust using a vacuum cleaner equipped with HEPA filter. Large Spills: Wet down with water and dike for later disposal. Shovel the material into waste container. Avoid the generation of dusts during clean-up. Following product recovery, flush area with water. Small Spills: Sweep up or vacuum up spillage and collect in suitable container for disposal. Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.
Environmental precautions	Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling	Minimize dust generation and accumulation. Provide appropriate exhaust ventilation at places where dust is formed. Avoid contact with eyes. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.
Conditions for safe storage, including any incompatibilities	Store in original tightly closed container. Store in a well-ventilated place. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits	No exposure limits noted for ingredient(s).
Biological limit values	No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls	Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. If material is ground, cut, or used in any operation which may generate dusts, use appropriate local exhaust ventilation to keep exposures below the recommended exposure limits. Provide eyewash station.

Individual protection measures, such as personal protective equipment

Eye/face protection	Wear safety glasses with side shields (or goggles).
Skin protection	
Hand protection	Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier.
Other	Wear suitable protective clothing.
Respiratory protection	Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance	
Physical state	Solid.
Form	Powder.
Color	Not available.
Odor	Not available.
Odor threshold	Not available.
pH	Not available.
Melting point/freezing point	1563.8 °F (851 °C)
Initial boiling point and boiling range	Not available.
Flash point	Not available.
Evaporation rate	Not available.
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	< 0.0000001 kPa at 25 °C
Vapor density	Not available.
Relative density	Not available.
Solubility(ies)	
Solubility (water)	Not available.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	752 °F (400 °C)
Viscosity	Not available.
Other information	
Explosive properties	Not explosive.
Molecular formula	Na2CO3

Molecular weight	105.99 g/mol
Oxidizing properties	Not oxidizing.

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
Conditions to avoid	Contact with incompatible materials.
Incompatible materials	None known.
Hazardous decomposition products	No hazardous decomposition products are known.

11. Toxicological information

Information on likely routes of exposure

Inhalation	Dust may irritate respiratory system.
Skin contact	Dust or powder may irritate the skin.
Eye contact	Causes serious eye irritation.
Ingestion	Health injuries are not known or expected under normal use.
Symptoms related to the physical, chemical and toxicological characteristics	Severe eye irritation. Dusts may irritate the respiratory tract, skin and eyes. Symptoms may include stinging, tearing, redness, swelling, and blurred vision.

Information on toxicological effects

Acute toxicity

Product	Species	Test Results
Soda Ash-Dense (CAS 497-19-8)		
Acute		
Inhalation		
LC50	Guinea pig	0.8 mg/l, 2 Hours
	Mouse	1.2 mg/l, 2 Hours
	Rat	2.3 mg/l, 2 Hours
Oral		
LD50	Rat	4090 mg/kg

* Estimates for product may be based on additional component data not shown.

Skin corrosion/irritation	Health injuries are not known or expected under normal use.
Serious eye damage/eye irritation	Causes serious eye irritation.
Respiratory or skin sensitization	
Respiratory sensitization	Not a respiratory sensitizer.
Skin sensitization	This product is not expected to cause skin sensitization.
Germ cell mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Carcinogenicity	This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

Reproductive toxicity	This product is not expected to cause reproductive or developmental effects.
Specific target organ toxicity - single exposure	Not classified.
Specific target organ toxicity - repeated exposure	Not classified.
Aspiration hazard	Not an aspiration hazard.

12. Ecological information

Ecotoxicity The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Product		Species	Test Results
Sodium Carbonate (CAS 497-19-8)			
Aquatic			
Crustacea	EC50	Water flea (Cerlodaphnia dubia)	156.6 - 298.9 mg/l, 48 hours
Fish	LC50	Bluegill (Lepomis macrochirus)	300 mg/l, 96 hours

* Estimates for product may be based on additional component data not shown.

Persistence and degradability No data is available on the degradability of this product.

Bioaccumulative potential No data available.

Mobility in soil No data available.

Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

SARA 304 Emergency release notification

Not regulated.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes
Delayed Hazard - No
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical Yes

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.

US state regulations

US. California Controlled Substances. CA Department of Justice (California Health and Safety Code Section 11100)

Not listed.

US. Massachusetts RTK - Substance List

Not regulated.

US. New Jersey Worker and Community Right-to-Know Act

Not regulated.

US. Pennsylvania RTK - Hazardous Substances

Not regulated.

US. Pennsylvania Worker and Community Right-to-Know Law

Not listed.

US. Rhode Island RTK

Not regulated.

US. California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

International Inventories

Country(s) or region	Inventory name	On Inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date 10-15-2015

Version # 01

NFPA ratings Health: 2
Flammability: 0
Instability: 0

NFPA ratings

Disclaimer

Thatcher Company cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.

AMBER CHEMICAL INC.

SAFETY DATA SHEET

Transport Symbol	NFPA Rating (estimated)	GHS	Personal Protective Equipment
Not Regulated		Not Classified	

Section 1: Identification

Product Name:	**SP DMA**
ACI SDS Number:	ACISDS0067
Company Name:	Amber Chemical Inc.
Address:	5201 Boylan Street Bakersfield, CA 93308
Phone:	(661) 325-2072
Emergency Contact:	CHEMTREC (Available 24 hours for chemical emergency, spill, leak, fire, exposure, or accident)
Emergency Number:	1-800-424-9300
Product Use:	Processing aid for industrial applications.
Date Revised:	April 2015

Section 2: Hazard(s) Identification

OSHA Regulatory Status: This material is not considered hazardous in accordance with OSHA 29 CFR 1910.1200.

Potential Health Effects: None. See Section 11 for more information.

Potential Physical/ Chemical Effects: Aqueous solutions or powders that become wet render surfaces extremely slippery.

Section 3: Composition/Information on Ingredients

Chemical Identification: Anionic water-soluble polymer.

Regulated Components: None.

Section 4: First Aid Measures

Inhalation: Move to fresh air.

Skin Contact: Wash with water and soap as a precaution. Get medical attention if irritation develops and persists.

Eye Contact: Rinse thoroughly with plenty of water, also under the eyelids. Get medical attention.

Ingestion: Rinse mouth with water. Do not induce vomiting.

Refer to Section 11 for Toxicological Information.

Section 5: Fire Fighting Measures

Suitable Extinguishing Media: Water, water spray, foam, dry powder, or carbon dioxide.

Unsuitable Extinguishing Media: None.

Precautions: Aqueous solutions or powders that become wet render surfaces extremely slippery.

Special Protective Equipment for Firefighters: No special protective equipment required.

Specific Methods: Keep personnel removed and upwind of fire.

Specific Hazards: In the event of fire the following can be released: Nitrogen Oxides. Carbon Oxides.

Flash Point (°C): Not applicable

Auto-ignition Temperature (°C): Not applicable.

Section 6: Accidental Release Measures

Personal Precautions: No special precautions required. The product when wet renders surfaces extremely slippery.

Environmental Precautions: As with all chemical products, do not flush into surface water.

Methods for Cleaning Up: Do not flush with water. Clean up promptly by sweeping or vacuum. Keep in suitable and closed containers for disposal. After cleaning, flush away traces with water.

Section 7: Handling and Storage

Handling: Avoid contact with skin and eyes. Avoid dust formation. Do not breathe dust. Wash hands before breaks and at the end of workday.

Storage: Keep in a dry, cool and well- ventilated place. The recommended storage temperature is 5-30°C

Technical measures/ Precautions: No special precautions required.

Incompatible Products: Strong oxidizing agents. Acids.

Technical measures/ Storage Conditions: No special storage conditions required.

Section 8: Exposure Controls/Personal Protection

Occupational Exposure Limits: None.

Engineering Measures: Use local exhaust if dusting occurs. Natural ventilation is adequate in absence of dusts.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal Protective Equipment

Respiratory Protection: Dust safety masks are recommended where concentration of total dust is more than 10 mg/m3.

Hand Protection: PVC or other plastic material gloves.

Eye Protection: Safety glasses with side-shields. Do not wear contact lenses where this product is used.

Skin and Body Protection: Chemical resistant apron or protective suit if splashing or repeated contact with solution is likely.

Section 9: Physical and Chemical Properties

Form	Granular Solid
Color	White
Odor	None
pH	4-9 @ 5 g/L
Melting point/range (°C)	>150°C
Flash Point (°C)	Not applicable
Boiling Point (°C)	Not applicable
Autoignition Temperature (°C)	Not applicable
Vapor Pressure (mm Hg)	Not applicable
Approx. Bulk Density	0.2-0.9
Viscosity (mPa.s)	See Technical Bulletin
Water Solubility	Completely Soluble
LogPow	<0

Not all physical and chemical properties are displayed on this SDS, as not all information is relevant or available at this time.

Section 10: Stability and Reactivity

Stability: Stable. Hazardous polymerization does not occur.

Materials to Avoid: Strong oxidizing agents. Strong acids. Oxidizing agents may cause exothermic reactions.

Hazardous Decomposition Products: Thermal decomposition may produce: nitrogen oxides (NOx), carbon oxides (COx).

Section 11: Toxicological Information

Acute Toxicity
LD_{50}/ Oral/ Rat > 5000 mg/kg (estimated)
LD_{50}/ Dermal/ Rat >5000 mg/kg (estimated)

Inhalation: The product is not expected to be toxic by inhalation.

Skin Irritant: The product is not expected to e irritating to skin and mucous membranes.

Eye Irritant: Not irritating.

Respiratory System Irritant: Not a respiratory irritant.

Sensitization: Not sensitizing.

Reproductive Effects: Not toxic for reproduction.

Mutagenicity: Not mutagenic.

Carcinogenicity: Not carcinogenic.

IARC: Not listed.

Chronic Toxicity: No chronic effects.

Section 12: Ecological Information

Aquatic Toxicity

Toxicity to Fish: LC50/ Fish/ 96 hours > 100 mg/L (estimated)

Toxicity to Daphnia: EC50/ Daphnia/ 48 hours > 100 mg/L (estimated)

Toxicity to Algae: IC50/ Algae/ 72 hours > 100 mg/L (estimated)

Environmental Fate

Persistence and Degradability: Not readily biodegradable

Hydrolysis: Does not hydrolyse.

Bioaccumulation: Does not bioaccumulate.

LogPow: <0

LogKow: Not determined.

Section 13: Disposal Considerations

Disposal: Dispose of in accordance with local, state and federal regulations.

Container: Rinse empty containers with water and use the rinse water to prepare the working solution. Can be landfilled or incinerated, when in compliance with local, state and federal regulations.

Disposal can occur only in properly permitted facilities. Refer to regional, state, provincial and local health, safety and pollution laws for any additional requirements, as these may be different from Federal laws and regulations. If in doubt, contact appropriate agencies. Chemical additions, processing or otherwise altering this material may make waste management information presented in the SDS incomplete, inaccurate or otherwise inappropriate. ACI has provided the foregoing for information only; the person generating the waste is responsible for determining the waste classification and disposal method.

To minimize exposure refer to Section 8.

Section 14: Transport Information

DOT: Not classified as dangerous in the meaning of DOT regulations.

IMDG/IMO: Not classified as dangerous in the meaning of IMO/IMDG regulations.

ICAO/IATA: Not classified as dangerous in the meaning of ICAO/IATA regulations.

Note: There are specific regulations in regards to transporting chemicals by water. Shipper is responsible for ensuring that they meet all of the requirements and follow the regulations for the chemical they are transporting.

Section 15: Regulatory Information

US SARA Reporting Requirements: None.

RCRA Status: Not RCRA hazardous.

SARA (Section 311/312) Hazard Class: Not concerned.

California Proposition 65 Information: Warning! This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm, Acrylamide.

International Inventories

USA (TSCA): All components of this product are either listed on the inventory or are exempt from listing.

Canada (DSL): All components of this product are either listed on the inventory or are exempt from listing.

China (IECSC): All components of this product are either listed on the inventory or are exempt from listing.

European Union (REACH): All components of this product have been registered or pre-registered with the European Chemicals Agency or are exempt from registration.

Australia (AICS): All components of this product are either listed on the inventory or are exempt from listing.

Japan (ENCS): All components of this product are either listed on the inventory or are exempt from listing.

Korea (ECL): All components of this product are either listed on the inventory or are exempt from listing.

Philippines (PICCS): All components of this product are either listed on the inventory or are exempt from listing.

Section 16: Other Information

Date Revised: April 2015

NFPA Rating (estimated)

Health	1
Flammability	1
Instability	0

HMIS Rating (estimated)

Health	1
Flammability	1
Instability	0
PPE Code	B

This information is intended solely for the use of individuals trained in the NFPA and HMIS hazard rating systems.

Disclaimer: All statements, technical information and recommendations contained herein are, to the best of our knowledge, reliable and accurate. The information in this data sheet has been assembled by the manufacturer based on its own studies and on the work of others. However, no warranty is expressed or implied regarding the accuracy of this data or the results to be obtained from the use thereof, nor will any liability be assumed for damages resultant form the use of the material described. Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. The manufacturer shall not be liable (regardless of fault) to the vendee, the vendee's employees, or anyone for any direct, special or consequential damages arising out of, or in connection with, the accuracy, completeness, adequacy or furnishing of such information. It is offered solely for your consideration, investigation and verification. As a result, the customer shall be solely responsible for deciding whether said information is suitable and beneficial. Furthermore, vendee assumes the risk in his use of the material. We assume no legal responsibility whatsoever for any damage resulting from reliance upon this information since it is being furnished upon the condition that the person receiving it shall make his or her own determination of the suitability of the material described herein for a particular application or storage situation. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release, and is not to be considered a warranty or quality specification. The user should take the necessary steps to instruct employees, and to develop work practice procedures to ensure and maintain a safe work environment. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process unless specified in the text. Personal Protection rating to be supplied by user depending on use conditions. Since the use of this product is within the exclusive control of the user, it is the user's responsibility to determine the conditions of safe use. Such conditions must comply with all governmental regulations. This information is not intended as a license to operate under, or a recommendation to practice or infringe upon any patent of this company or others covering any process, compositions of matter or use. Neither this data sheet nor any statement contained herein grants or extends any license, express or implied, in connection with patents issued or pending which may be the property of the manufacturer or others.

Safety Data Sheet

Super-Sweep

Version 4 Revision Date 1/27/16

1. *Product and Company Identification*

Name of Product:

Super-Sweep

Recommended use:

Hole Cleaning Agent

Producer:

Forta Corporation
100 Forta Drive
Grove City, PA 16127
1-800-245-0306

Emergency Number:

1-800-245-0306
724-458-5221

2. *Hazard(s) Identification:*

Hazard Classification:

Not Classified

Label Elements:

Hazard Symbol:	No Symbol
Signal Word:	No Signal Word
Hazard Statement:	NONE
Precautionary Statement:	NONE

HMIS (United States)	
Health	*1*
Flammability	*0*
Reactivity	*0*
PPE	

3. *Composition/Information on Ingredients*

Super-Sweep

Version 4 Revision Date 1/27/16

Name	*CAS#*	*% by Weight*
Polypropylene	9003-07-0	> 60.0

4. *First Aid Measures*

Inhalation:

Leave area to breathe fresh air.

Skin Contact:

No known applicable information.

Eye Contact:

Flush with water for 15 minutes. If irritation persists, get medical attention.

Ingestion:

Not applicable under normal conditions of use.

5. *Fire Fighting Measures*

Flash Point:

600°F, 316°C

Flash Point Method:

NONE

Autoignition Temperature:

NONE

Burning Rate:

NONE

Fire and Explosion Hazard:

None

Firefighting Equipment:

Use dry chemicals, CO^2, foam.

Hazardous Products of Combustion:

Carbon monoxide and other organics when burning.

6. *Accidental Release Measures*

Small Spill or Leak:

NONE

Large Spill or Leak:

NONE

7. Handling and Storage

Handling Precautions:

NONE

Storage Requirements:

No specific storage is required, use any dry container.

8. Exposure Controls/Personal Protection

Engineering Measures:

Not required under normal conditions of use.

Protective Equipment

Respirators-Wear NIOSH/MSHA approved dust respirator when the fiber concentration exceeds the exposure limits indicated on the MSDS. Wear a type C full face supplied air respirator when the fiber concentration exceeds 50 fibers/cc.

Protective Gloves- Impervious gloves.

Eye Protection- Glasses or Goggles

Protective Clothing-NONE

Exposure Guidelines/Other

Chemical Name	CAS Number	Regulation	Limit	Form
Polyproptlyene	9003-07-0	ACGIH TWA ACGIH TWA OSHA PEL OSHA PEL OSHA TWA OSHA TWA	3mg/m^3 10mg/m^3 15mg/m^3 5mg/m^3 15mg/m^3 5mg/m^3	Respirable particles Inhalable particles Total dust Respirable fraction Total dust Respirable fraction

9. Physical and Chemical Properties

Appearance:

White Fiber

Physical State:

Solid

Boiling Point:

NONE

Odor:

Odorless

Freezing/Melting Point:

NONE

pH:

NONE

Solubility:

NONE

Specific Gravity:

1.3

10. Stability and Reactivity

Stability:

This product is stable

Conditions to avoid:

None

Materials to avoid (Incompatibility):

Strong acids. Oxidizing agents.

11. Toxicological Information

Toxicity to Animals:

This product has not been tested for animal effects. This product is not expected to be toxic to animals.

Toxicity to Humans:

This product has not been tested for human effects. This product is not expected to be toxic to humans.

12. Ecological Information

Ecotoxicity:

Not expected to be ecotoxic.

BOD5 and COD:

NONE

Biodegradable / OECD:

NONE

Mobility:

NONE

Toxicity of the Products of Biodegradation:

NONE

Special Remarks on the Products of Biodegradation:

NONE

13. Disposal Considerations

Not classified as hazardous waste. Dispose of in accordance with Federal, State and local regulations.

14. Transport Information

Restrictions:

NONE

DOT Requirements:

Not a DOT controlled material. (USA)

ADR Requirements:

Not an ADR controlled material. (Europe)

IMDG Requirements:

Not an IMDG controlled material.

IATA requirements:

Not an IATA controlled material.

Marine Pollutant:

Not a marine pollutant.

15. Regulatory Information

U.S. Federal Regulations

Chemical (& CAS Number)	SARA 302 (EHS) Rq	SARA 304 (EHS) Rq	SARA 313 de minimis	CERCLA Rq	CAA 112(r) TQ	RCRA Code
NONE						

All quantities in pounds

State Regulations

Chemical (& CAS Number)	CA Prop 65	MA RTK	MN RTK	NJ RTK	PA RTK RI RTK	
9003-07-0				x		
9003-07-0					x	

International Regulations

Water Hazard Class (WGK)

NWG

DSL (Canada):

None

EINECS:

None

WHMIS:

Not classified as hazardous.

HTS/Schedule B

5503.40.0000

16. Other Information

Prepared by:

Forta Corporation.

Telephone:

1-800-245-0306

Website:

www. Super-Sweep.com

Super-Sweep

FORTA®

Version 4 Revision Date 1/27/16

The information and recommendations contained in this Material Safety Data sheet have been compiled from sources believed to be reliable and to represent the most reasonable current opinion on the subject when the MSDS was prepared. No warranty, guarantee or representation is made as to the correctness or sufficiency of the information. The user of this product must decide what safety measures are necessary to safely use this product, either alone or in combination with other products, and determine its environmental regulatory compliance obligations under any applicable federal or state laws.

SAFETY DATA SHEET

1. Identification Product

TORKease Drilling Lubricant

Company name	**DSC Incorporated**
Address	**P.O. Box 3472 Bend, Oregon 97707**
Telephone	**281-932-8290**
E-mail	**info@TORKease.com**
Contact person	**Barbara Tuttle**

Emergency phone number 800-424-9300 CHEMTREC

2. Hazard(s) identification

Physical hazards	**Not classified**
Health hazards	**Not Classified**
OSHA defined hazards	**Not classified**
Label elements	
Hazard symbol	None
Signal word	**None**
Hazard statement	**This mixture does not meet the criteria for classification**
Precautionary statement	
Prevention	Observe good industrial hygiene practices
Response	Was hands after handling
Storage	Store away from incompatible.
Disposal	Dispose of waste and residues in accordance with local requirments.
Hazard(s) not otherwise classified (HNOC)	**None known**
Supplemental information	Not applicable

3. Composition/information on ingredients

TORKease is a proprietary trade secret blend of complex separates. All components of TORKease are well below the DE Minims allowable which the EPA has established as a non-toxic and nonhazardous

Composition comments	All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

Inhalation	Dust: Move to fresh air. Call a physician if symptoms develop or persist. Solid: No specific first aid measures noted.
Skin contact	Wash off with soap and water. Get medical attention if irritation develops and persists.
Eye contact	Rinse with water. Get medical attention if irritation develops and persists.
Ingestion	Rinse mouth. Get medical attention if symptoms occur.
Most important symptoms/effects, acute and delayed	Direct contact with eyes may cause temporary irritation.
Indication of immediate medical attention and special treatment needed	Treat symptomatically.
General information	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media	Carbon dioxide, dry chemical or water.
Unsuitable extinguishing media	None.
Specific hazards arising from the chemical	None known.
Special protective equipment and precautions for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Fire-fighting equipment/instructions	Use water spray to cool unopened containers.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	No special precautions are necessary beyond normal good hygiene practices. See Section 8 of the SDS for additional personal protection advice when handling this product.
Methods and materials for containment and cleaning up	Sweep up and place into a proper container for disposal. Small quantities may be flushed to drains with plenty of water. Solid material: Pick up mechanically.
Environmental precautions	No special environmental precautions required.

7. Handling and storage

Precautions for safe handling	Observe good industrial hygiene practices. Wash hands after contact.
Conditions for safe storage, including any incompatibilities	Keep away from moisture.

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value	Form

Biological limit values	No biological exposure limits noted for the ingredient(s).
Appropriate engineering controls	Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Individual protection measures, such as personal protective equipment

Eye/face protection	Wear safety glasses with side shields (or goggles).
Skin protection	
Hand protection	Gloves are not required.

Other	Wear appropriate chemical resistant clothing.
Respiratory protection	Wear a NIOSH-approved (or equivalent) respirator as needed.
Thermal hazards	Not applicable.
General hygiene considerations	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking.

9. Physical and chemical properties

Appearance	
Physical state	Solid./Liquid 2 forms
Form	Solid (flake) / Liquid Blend in water
Color	**Light blue**
Odor	Characteristic.
Odor threshold	Not available.
pH	9.5 – 10.0
Melting point/freezing point	125°F/32°F TORKease Concentrate is not harmed by freezing
Initial boiling point and boiling range	Liquid 212°F+
Flash point	Not applicable
Evaporation rate	Not available.
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not applicable
Flammability limit - upper (%)	Not applicable
Vapor pressure	Not available.
Vapor density	Not available.
Relative density	1.04 @ 25°C
Solubility(ies)	
Solubility (water)	100 % Completely soluble
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not applicable
Decomposition temperature	Not available.
Viscosity	Not applicable
Other information	
Flammability	Not applicable

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Stable.
Possibility of hazardous reactions	Hazardous polymerization will not occur.
Conditions to avoid	None.
Incompatible materials	None.
Hazardous decomposition products	None.

11. Toxicological information

Information on likely routes of exposure

Ingestion	May cause discomfort if swallowed.
Inhalation	Inhalation of dusts may cause respiratory irritation. Solid bars: No adverse effects due to inhalation are expected.

Skin contact	Prolonged skin contact may cause temporary irritation.
Eye contact	Direct contact with eyes may cause temporary irritation.
Symptoms related to the physical, chemical and toxicological characteristics	Direct contact with eyes may cause temporary irritation. Exposure may cause temporary irritation, redness, or discomfort.

Information on toxicological effects

Acute toxicity

Components	Species	Test Results

Skin corrosion/irritation	Prolonged skin contact may cause temporary irritation.
Serious eye damage/eye irritation	Direct contact with eyes may cause temporary irritation.
Respiratory or skin sensitization	
Respiratory sensitization	Not classified.
Skin sensitization	This product is not expected to cause skin sensitization.
Germ cell mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Carcinogenicity	This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.
Reproductive toxicity	This product is not expected to cause reproductive or developmental effects.
Specific target organ toxicity - single exposure	Not classified.
Specific target organ toxicity - repeated exposure	Not classified.
Aspiration hazard	Due to the physical form of the product it is not an aspiration hazard.
Further information	None known.

12. Ecological information

Ecotoxicity The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Components	Species	Test Results

Persistence and degradability	No data is available on the degradability of this product.
Bioaccumulative potential	No data available for this product.
Mobility in soil	The product is soluble in water.
Other adverse effects	None known.

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site.

Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable.

15. Regulatory information

US federal regulations

This product is not hazardous according to OSHA 29CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Immediate Hazard - No
Delayed Hazard - No
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical	No

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA)	Not regulated.

US state regulations

Not regulated.

US. Rhode Island RTK

Not regulated.

US. California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Not listed.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date 07-01-2015-

Revision date

Version #

Disclaimer

CPKelco
A HUBER COMPANY

Material Safety Data Sheet

Revision Date 19/Feb/2007 **Revision Number** 0.1

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	KELGUM® 87
Product Use	Food
Chemical Name	Xanthan Gum blend
Company	CP Kelco A Huber Company 8355 Aero Drive San Diego, CA 92123 USA
Telephone	1 800 535 2687 (Main Number-Americas) +1 858 292 4900 or 1 800 535 2656 (8a-5p PST weekdays)
Fax	+1 312 554 7810
Emergency Telephone Number	CHEMTREC: 1 800 424 9300 or International +1 703 527 3887
Email	customer.request@cpkelco.com
Internet	www.cpkelco.com

2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance	white to tan
Physical State	powder
Odor	odorless
D.O.T. Hazard Classification	Non-hazardous material
OSHA Regulatory Status	OSHA Hazard: Warning: Combustible dust. Ensure appropriate electrical classification and avoidance of ignition sources in dusty environments. Handle in a manner consistent with good industrial hygiene practices--avoid creating or inhaling aerosols of this or any other material. Warning: Contains guar: May cause allergic respiratory reaction.
Slip Hazard	Slip hazard when spilled material becomes wet.

Potential Health Effects

Principle Routes of Exposure	Inhalation. Skin contact.
Acute Effects	
Eyes	Dry powder may cause foreign body irritation in some individuals.
Skin	Prolonged contact with the dry powder may cause drying or chapping.
Inhalation	Hygroscopic properties of the gum can form a paste or gel in the airway Inhalation of dust may cause respiratory tract irritation Excessive inhalation of dust may cause coughing and sneezing
Ingestion	Not toxic if swallowed (less than a mouthful) based on available information.
Additional toxicology information	Refer to Section 11
Potential Environmental Effects	Refer to Section 12 for Ecological Information Refer to Section 13 for Disposal Considerations

3. COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT(S)	CAS Number
Guar gum	9000-30-0
Xanthan gum	11138-66-2

4. FIRST AID MEASURES

General Advice
Remove material from eyes, skin and clothing.
In case of doubt or when symptoms persist, seek medical attention.
Wash heavily contaminated clothing before reuse.

Eye contact
Hold eyelids apart and flush eyes with a steady, gentle stream of water for several minutes. If eye irritation persists, seek medical attention.

Skin contact
Wash off with soap and plenty of water.

Inhalation
Move to fresh air. If symptoms persist, call a physician. If not breathing, give artificial respiration.

Ingestion
No significant adverse health effects are expected to develop if only small amounts (less than a mouthful) are swallowed.

5. FIRE-FIGHTING MEASURES

General Advice
Treat as "Class A" fire. Product will burn when in contact with a flame. Self extinguishes when ignition source is removed. Tends to smoulder.

Suitable Extinguishing Media
Water. Dry chemical. Carbon dioxide (CO2).

Hazardous Combustion Products
carbon dioxide
carbon monoxide

Specific Hazards
Can contain sufficient fines to cause a combustible dust explosion
Do not breath smoke, gases or vapors generated

Special Protective Equipment for Firefighters
As in any fire, wear self-contained breathing apparatus (SCBA) pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

NFPA	Health	1	Flammability	1	Instability	0
HMIS	Health	1	Flammability	1	Physical Hazard (Reactivity)	0

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions

Wet material on walking surfaces will be extremely slippery.
Avoid dust formation.
In case of exposure to high levels of airborne dust, wear a personal respirator in compliance with national legislation.

Methods for Cleaning up

Use vacuum equipment designed specifically for combustible dust. Take precautionary measures against static discharges. The use of water wash down is not recommended unless the spilled material is aleady wet. Disposal information - Refer to Section 13.

Other information

Reportable quantities - Refer to Section 15.

7. HANDLING AND STORAGE

Handling

Avoid dust formation. Provide appropriate exhaust ventilation in places where dust is formed. In case of insufficient ventilation, wear suitable respiratory equipment.
Avoid conditions that generate airborne dust in handling, transfer and clean up.
Product may form combustible dust-air mixtures.
Keep away from heat, flame sparks and other ignition sources.
Avoid emptying package in or near flammable vapors. Static charges may cause flash fire.
Remove material from eyes, skin and clothing.

Storage

Avoid storing near incompatible materials (Refer to Section 10).
Refer to Product Data Sheet for "Storage Conditions/Shelf Life" information.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Limits

COMPONENT(S)	OSHA PEL	ACGIH TLV
Guar gum	15 mg/m³ (total dust) 8-hr TWA 5 mg/m³ (respirable) 8-hr TWA	Not established
Xanthan gum	15 mg/m³ (total dust) 8-hr TWA 5 mg/m³ (respirable) 8-hr TWA	Not established

Dust: OSHA has not established specific exposure limits for this material. However, OSHA has established limits for particulates not otherwise regulated (PNOR) which are the least stringent exposure limits applicable to dusts.

Engineering Controls — Ventilation: Provide natural or mechanical ventilation to control exposure levels below airborne exposure limits in this section. The use of local mechanical exhaust ventilation is preferred at sources of air contamination such as open process equipment.

Personal Protective Equipment

Respiratory Protection — Avoid breathing dust. Use NIOSH/MSHA approved respiratory protection equipment when airborne exposures exceeds established guidelines. Consult the respirator manufacturer to determine appropriate type equipment for a given application. Observe respirator use limitations specified by NIOSH or the manufacturer.

Hand Protection — Gloves are recommended if extended exposure is anticipated.

Eye Protection — This product does not cause significant eye irritation or eye toxicity requiring special protection. Where there is significant potential for eye contact, wear chemical goggles and have eye flushing equipment available.

Skin and Body Protection — Although this product does not present a significant skin concern, minimize skin contamination by following good industrial practice.

Hygiene Measures — Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	white to tan
Physical State	powder
Odor	odorless
pH	Approximately neutral (as 1% solution)
Flash point	Not applicable
Water solubility	Soluble. Forms viscous solutions.

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

Stability — Stable under recommended storage conditions. Hazardous polymerization does not occur.

Conditions to Avoid — Avoid dust formation

Materials to Avoid — Strong oxidizing agents

Hazardous Decomposition Products — Thermal decomposition products:
carbon monoxide
carbon dioxide

11. TOXICOLOGICAL INFORMATION

General
The dry powder may cause foreign body irritation in some individuals. Prolonged contact with the dry powder may cause drying or chapping of the skin. Excessive inhalation of dust may be annoying and can mechanically impede respiration. Due to the hygroscopic properties, they can form a paste or gel in the airway.

Data from laboratory studies conducted by CP Kelco and/or from the scientific literature on components are summarized below.

Guar gum

LD50 Oral	7,060 mg/kg rat
Carcinogenicity	Not listed as a carcinogen by NTP. Not regulated as a carcinogen by OSHA. Not evaluated by IARC.
Reported Human Effects	Reported to cause respiratory sensitization in susceptible individuals after prolonged use

Xanthan gum

LD50 Oral	>5,000 mg/kg rat
Chronic Effects	No adverse effects observed in long-term feeding studies with rats (up to 1,000 mg/kg/day)
Allergy	No skin allergy observed in guinea pig following repeated skin exposure
Irritation	Non-irritating Skin (rabbit) Non-Irritating Eye (rabbit)
Reproductive Effects	No adverse effects were observed in a 3-generation reproduction study with rats (up to 500 mg/kg/day)

12. ECOLOGICAL INFORMATION

Ecotoxicity	Contains no substances known to be hazardous to the environment or not degradable in waste water treatment plants.

Xanthan gum

96-Hour LC50	Rainbow trout: 490 mg/L. Mysid shrimp: > 500,000 ppm suspended particulate phase using 2 lb./bbl. xanthan gum in a standard drilling mud.
48-Hour EC50	Daphnia magna: 980 mg/L.

Persistence / Degradability	This product is biodegradable.
Bioaccumulative Potential	Inherently biodegradable.

Xanthan gum

BOD	BOD = ~200 mg O2/gram
COD	COD = ~1600 mg O2/gram

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method Dispose in accordance with local, state and national regulations. Liquids may be sewered in accordance with local, state, and national regulations if care is taken to avoid pluggage or blockage of sewer systems recognizing that these materials are intended to increase viscosity and form gels. Dry or wet solid material can be landfilled in accordance with local, state, and national regulations. As a carbohydrate, this material is readily biodegradable, when at low concentrations, in a biological wastewater treatment plant.

14. TRANSPORT INFORMATION

General Information The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

D.O.T. Hazard Classification	Non-hazardous material
TDG	Not hazardous
IMO / IMDG	Not hazardous
ICAO / IATA	Not hazardous
RID/ADR	Not hazardous

15. REGULATORY INFORMATION

International Inventories

Component(s) of the product are on the following Inventory lists:

- TSCA
- Canada (DSL)
- Europe (EINECS/ELINCS)
- Japan

Regulatory and Compendial Status:

- Guar gum (E412): Food Chemicals Codex, 21 CFR § 184.1339 (USA), Canadian Food and Drug Law (Item G.3, Table IV)
- Xanthan gum (E415): Food Chemicals Codex; 21 CFR 172.695 (USA); Canadian Food and Drug Law (Item X.1, Table IV)
- FAO/JECFA
- The purity criteria in the current EC Directives
- 1829/2003/EC
- Japan's Specifications and Standards for Food Additives

Regulatory Restrictions

For information on approved use of this product, or products in which this product is an ingredient, in other countries/regions not specified herein, please contact CP Kelco Regulatory Affairs.

Harmonized Tariff Code 3913.90

USA

Federal Regulations

SARA Sections 302/304 313; CERCLA RQ:

Note: If no components are listed below, this product is not subject to these referenced SARA and CERCLA regulations.

State Regulations

California Safe Drinking Water and Toxic Enforcement Act (Proposition 65)

This product is not known to contain a chemical at a level that is expected to pose significant risk under anticipated use conditions.

Canada

WHMIS

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

Not a controlled product

16. OTHER INFORMATION

Prepared By

CP Kelco Regulatory Affairs
email: regulatory.affairs@cpkelco.com
tel: 1-858-467-4503
fax:1-858-467-6505
Cheryl A. Van Dyne

Reason for Version Revised in entirety

16. OTHER INFORMATION

Disclaimer

The information contained in this Safety Data Sheet to the best of CP Kelco's knowledge and belief as of the date indicated is believed to be accurate and reliable. However, no representation, warranty or guarantee is implied or expressed regarding the accuracy, reliability or completeness of this information or the use of the product. Nothing contained herein should be construed as a recommendation to use this product in conflict with National or local regulations or existing patents covering any material or its use.

END OF SAFETY DATA SHEET

Material Safety Data Sheet
Ammonium chloride

ACC# 01170

Section 1 - Chemical Product and Company Identification

MSDS Name: Ammonium chloride
Catalog Numbers: AC123340000, AC123340010, AC123340250, AC199970000, AC199970010, AC199975000, AC393180000, AC393180010, AC393180050, AC393182500, AC423280000, AC423280010, AC423285000, A649-3, A649-500, A661-10, A661-3, A661-500, A687-10, A687-100, A687-212, A687-500
Synonyms: Ammonium Chloratum; Ammonium Chloridum; Ammonium Muriate; Sal Ammonia; Salmiac.
Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100
Emergency Number: 201-796-7100
For CHEMTREC assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
12125-02-9	Ammonium chloride	>99	235-186-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless or white crystalline powder.
Warning! Harmful if swallowed. Causes eye irritation. Hygroscopic (absorbs moisture from the air).
Target Organs: Gastrointestinal system, eyes.

Potential Health Effects

Eye: Causes eye irritation.
Skin: May cause skin irritation. May be harmful if absorbed through the skin.
Ingestion: Harmful if swallowed. May cause irritation of the digestive tract. May cause systemic toxicity with acidosis.
Inhalation: If heated, dust or fume may cause respiratory tract irritation. May be harmful if inhaled. Ammonium chloride fume may cause an asthma-like allergy. Future exposure may cause asthma attacks with shortness of breath, wheezing, coughing, and/or chest tightness.
Chronic: Prolonged or repeated skin contact may cause dermatitis.

Section 4 - First Aid Measures

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. Immediately flush skin with plenty of water for at least 15 minutes while removing

contaminated clothing and shoes.
Ingestion: Do not induce vomiting. Get medical aid immediately. Call a poison control center.
Inhalation: Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Substance is noncombustible.
Extinguishing Media: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.
Flash Point: Not available.
Autoignition Temperature: Not available.
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions. Provide ventilation. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale.
Storage: Store in a cool, dry place. Store in a tightly closed container.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ammonium chloride	10 mg/m3 TWA (fume); 20 mg/m3 STEL (fume)	10 mg/m3 TWA (fume)	none listed

OSHA Vacated PELs: Ammonium chloride: 10 mg/m3 TWA
Personal Protective Equipment
Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
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.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder
Appearance: colorless or white
Odor: odorless
pH: 5.0 (10% sol at 25C)
Vapor Pressure: 1 mm Hg @ 160.4C
Vapor Density: Not available.
Evaporation Rate: Negligible.
Viscosity: Not available.
Boiling Point: 520 deg C
Freezing/Melting Point:328 deg C
Decomposition Temperature: Not available.
Solubility: 39.6% at 176F.
Specific Gravity/Density:1.53 (Water=1)
Molecular Formula:NH4Cl
Molecular Weight:53.49

Section 10 - Stability and Reactivity

Chemical Stability: Hygroscopic: absorbs moisture or water from the air.
Conditions to Avoid: Incompatible materials, excess heat, exposure to moist air or water.
Incompatibilities with Other Materials: Acids, bases, silver salts, bromine trifluoride, nitrates, potassium chlorates, carbonates, bromine pentafluoride, lead salts.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, ammonia and hydrochloric acid fumes.
Hazardous Polymerization: May occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 12125-02-9: BP4550000; BP4570000
LD50/LC50:
CAS# 12125-02-9:
Draize test, rabbit, eye: 500 mg/24H Mild;
Draize test, rabbit, eye: 100 mg Severe;
Oral, mouse: LD50 = 1300 mg/kg;
Oral, rat: LD50 = 1650 mg/kg;

Carcinogenicity:
CAS# 12125-02-9: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: Mutagenic effects have occurred in experimental animals.
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.
Environmental: No information available.
Physical: No information available.
Other: Do not empty into drains.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not Regulated	Not Regulated
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 12125-02-9 is listed on the TSCA inventory.
Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
CERCLA Hazardous Substances and corresponding RQs
CAS# 12125-02-9: 5000 lb final RQ; 2270 kg final RQ
SARA Section 302 Extremely Hazardous Substances
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 12125-02-9: immediate, delayed.
Section 313 No chemicals are reportable under Section 313.
Clean Air Act:
This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.
Clean Water Act:
CAS# 12125-02-9 is listed as a Hazardous Substance under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.
OSHA:
None of the chemicals in this product are considered highly hazardous by OSHA.
STATE
CAS# 12125-02-9 can be found on the following state right to know lists: California, New Jersey, Pennsylvania,

Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 22 Harmful if swallowed.
R 36 Irritating to eyes.

Safety Phrases:

S 22 Do not breathe dust.
S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 12125-02-9: 1

Canada - DSL/NDSL

CAS# 12125-02-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 12125-02-9 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 6/15/1999
Revision #11 Date: 2/11/2008

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Safety Data Sheet
(HYDROCHLORIC ACID 15% ACTIVE)

1 – PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME:..... HYDROCHLORIC ACID 15% ACTIVE
CHEMICAL NAME/
CLASS/SYNONYMS:..... Chlorohydric acid, hydrogen chloride, hydrochloric acid
PRODUCT NUMBER:..... HYDROCHLORIC ACID 15% ACTIVE
UN/NA NUMBER:..... 1789
CHEMICAL FAMILY:..... Acid, Inorganic
CAS NUMBER:..... Not applicable for mixtures.
FORMULA:..... $HCL-H_2O$

COMPANY:..... **JMN Specialties, Inc.**
1100 Victory Drive – Westwego, Louisiana USA 70094
Phone (504) 341-3749, Fax (504) 341-5868
www.jmnspecialties.com
EMERGENCY PHONE:..... CALL CHEMTEL: Toll Free US & Canada: (800) 255-3924, Outside USA +01-813-248-0585.
DATE PREPARED:..... February 28, 2019

2 – HAZARDS IDENTIFICATION

GHS HAZARD CLASSIFICATION:

Physical Hazards
Flammable Liquids:..... . No hazard statement
Health Hazards
Acute Toxicity (Oral):..... . Category 4 - Harmful if swallowed, in contact with skin, inhaled
Skin Corrosion/Irritation:..... . Category 1A - Causes severe skin burns and eye damage
Serious Eye Damage/Irritation: Catagory 1 - Causes severe eye damage
Aspiration Hazard:..... . Catagory 1 - May be fatal if swallowed and enters airways

WARNING LABEL ITEMS INCLUDING PRECAUTIONARY STATEMENTS:

Pictograms:

SIGNAL WORD:..... DANGER!

GHS HAZARD AND PRECAUTIONARY STATEMENTS:

H312 H332: Harmful in contact with skin or if inhaled

P101+102+103: If medical advice is needed, have product container or label at hand. Keep out of the reach of children. Read label before use.
P202+270+280+281: Do not handle until all safety precautions have been read and understood. Do not eat, drink or smoke when using this product. Wear protective gloves/protective clothing/eye protection/face protection. Use personal protective equipment as required.

P301+330+331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
P305+351+338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing

P501: Dispose of contents/container: Treatment, storage, transportation and disposal must be in accordance with Federal, State/Provincial and Local Regulations. Regulations may vary in different locations. Characterization and compliance with applicable laws are the responsibility solely of the generator. 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.

TOTAL VOC's: 0%

3 – COMPOSITION / INFORMATION ON INGREDIENTS

HAZARDOUS INGREDIENT	PERCENT	CAS NUMBER
Hydrochloric Acid (Muriatic Acid)	14.5 - 15.5	7647-01-0

4 – FIRST-AID MEASURES

BREATHING (INHALATION): Remove from exposure area to fresh air immediately. If breathing has stopped, perform artificial resuscitation. Keep person warm and at rest. Treat symptomatically and supportively. Seek medical attention immediately. Qualified medical personnel should consider administering oxygen.

SWALLOWING (INGESTION): Give large amounts of fresh water or milk immediately. Do not give anything by mouth if person is unconscious or otherwise unable to swallow. If vomiting occurs, keep head below hips to prevent aspiration. Treat symptomatically and supportively. Seek medical attention immediately.

EYES: ..... Flush eye with copious quantities of water. If persistent irritation occurs, obtain medical attention. If liquid Muriatic Acid or solutions containing Muriatic Acid get into the eyes, flush eyes immediately with a directed stream of water for at least 30 minutes while forcibly holding eyelids apart to ensure complete irrigation of all eye and lid tissue. **GET MEDICAL ATTENTION IMMEDIATELY.** Contact lenses should not be worn when working with this chemical.

SKIN (DERMAL):..... Remove contaminated clothing and wash affected skin with soap and water. If persistent irritation occurs, obtain medical attention. When using high pressure equipment, injection of product under the skin can occur. If high pressure injuries occur, the casualty should be sent immediately to a hospital. Do not wait for symptoms to develop.

NOTE TO PHYSICIAN: ..... All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

5 – FIRE-FIGHTING MEASURES

GENERAL FIRE HAZARDS: .... Emergency responders in the danger area should wear bunker gear and self-contained breathing apparatus for fires beyond the incipient stage (29CFR 1910.156). In addition, wear other appropriate protective equipment as conditions warrant (see Section 8). Contact with water may generate heat. Isolate damage area, keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Move undamaged containers from danger area if it can be done with minimal risk. Fires involving small amounts of combustibles may be smothered with suitable dry chemicals. Use water on combustibles burning but avoid using water directly on acid as it results in evolution of heat and causes splattering.

AUTOIGNITION TEMP: No Data Available

EXTINGUISHING MEDIA: ..... Fires involving small amount of combustibles may be smothered with suitable dry chemical, soda ash, lime, sand or CO2. Use water on combustibles burning in vicinity of this material but use care as water applied directly to this acid result in evolution of heat and causes splattering.

SPECIAL FIRE FIGHTING PROCEDURES: ..... Muriatic Acid at a high concentration can cause very serious damage upon contact. It burns the cornea and can lead to permanent blindness if splashed onto eyes. Spilled product on ground may be slippery. Accordingly, safety precautions should be strictly observed when handling or cleaning it when spilled as the result of a fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS: ..... Containers may explode from internal pressure if confined to fire. Cool with water spray.

6 – ACCIDENTAL RELEASE MEASURES

SPILL PROCEDURES: ..... Wear appropriate personal protective equipment before approaching spill site. For small spills, dilute with water to sewer if allowed by local and state regulations. If unable to wash product with water, absorb with inert material (sand or other approved material) and dispose of in accordance with applicable regulations.

WASTE DISPOSAL: ..... Treatment, storage, transportation and disposal must be in accordance with Federal, State/Provincial and Local Regulations. Regulations may vary in different locations. Characterization and compliance with applicable laws are the responsibility solely of the generator. 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.

RCRA STATUS: ..... If discarded in its purchased form, this product is considered a RCRA hazardous waste. It is the responsibility of the product user to determine at the time of disposal, whether a material containing the product should be classified as a hazardous waste. (40CFR261.20-24).

7 – HANDLING and STORAGE

STORAGE: Keep in a tightly closed container, stored in a cool, dry, ventilated area below 44°C (110°F). Protect against physical damage. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product. Drum must not be washed out or used for other purposes.

HANDLING: Avoid contact with eyes, skin and clothing. Do not inhale vapors and fumes. Wash thoroughly after handling. Use only with adequate ventilation. Do not take internally. For industrial use only.

8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS

HAZARDOUS INGREDIENT	PEL	TLV-TWA
Hydrochloric Acid (Muriatic Acid)	2 ppm	5 ppm

EXPOSURE CONTROLS: Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

RESPIRATORY PROTECTION: If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. In the United States of America, if respirators are used, a program should be instituted to assure compliance with OSHA Standard 63 FR 1152, January 8, 1998. Respirator type: Air-purifying respirator with an appropriate, government approved (where applicable), air-purifying filter, cartridge or canister. Contact health and safety professional or manufacturer for specific information. Self-Contained Breathing Apparatus may be required for use in confined or enclosed spaces.

PROTECTIVE CLOTHING: **Eye/face protection:** Wear chemical goggles; face shield (if splashing is possible). **Skin protection:** Chemical resistant, impermeable gloves. Gloves should be tested to determine suitability for prolonged contact. Use of impervious apron or chemical suit and chemical resistant boots are recommended.

ADDITIONAL MEASURES: ..... Avoid contact with the skin and avoid breathing vapors. Do not eat, drink, or smoke in work area. Wash hands before eating, drinking, or using restroom. Do NOT place food, coffee or other drinks in the area where dusting or splashing of solutions is possible. Handle in accordance with good industrial hygiene and safety practice. Wash thoroughly with soap and water after handling and before eating, drinking, or using tobacco. Safety shower and eye wash should be available close to work areas.

9 – PHYSICAL / CHEMICAL PROPERITES

BOILING POINT: 220°F (104.4°C)
FREEZING POINT: < 0°F (< -17°C)
FLASHPOINT:..... Non-flammable
UPPER FLAME LIMIT (%): ..... NA
LOWER FLAME LIMIT (%): ... NA
VAPOR PRESSURE:..... 0.01 mmHg to 200 mmHg @ 68°F(20°C)
VAPOR DENSITY (AIR=1):..... ND
SPECIFIC GRAVITY: 1.0745
pH: ..... < 1
SOLUBILITY IN WATER:..... 100%
VOLATILITY
INCLUDING WATER: ..... 8.61 pounds per gallon
MOLECULAR WEIGHT: ..... 36.46 g/mol for HCL, 18.00 g/mol for H_2O
EVAPORATION RATE:..... < 1
PHYSICAL STATE: ..... Liquid
COLOR:..... Clear Yellow / Amber
ODOR:..... Bland, Acidic

10 – STABILITY and REACTIVITY

STABILITY:..... Stable
HAZARDOUS DECOMP.:..... Will not occur
INCOMPATIBILITY:..... Incompatible with bases. Amines. Acid anhydrides. Metals. Organic compounds. Sulfides.
HAZARDOUS REACTIONS: .... Muriatic Acid may react vigorously, violently or explosively with many organic and inorganic chemicals.

11 – TOXICOLOGICAL INFORMATION

Muriatic Acid has produced no genetic changes in standard tests using bacterial cells.

THRESHOLD LIMIT VALUE:.. 2 ppm
OSHA PEL:..... 2 ppm
LISTED CARCINOGEN:..... Hydrochloric Acid (Muriatic Acid) has produced no genetic changes in standard tests using bacterial cells.
MEDICAL CONDITION
AGGRAVATED:..... Overexposure to Muriatic Acid mist may cause lung damage and aggravate pulmonary conditions. Contact of Muriatic Acid with skin may aggravate diseases such as eczema and contact dermatitis.

INFORMATION ON ACUTE TOXICOLOGICAL EFFECTS

ORAL

Product: ..... Corrosive. Causes serious burns of the mouth or perforation of the esophagus or stomach. May be fatal if swallowed.

DERMAL

Product: ..... Corrosive. Splashes on the skin will cause skin burns. Direct contact can be severely irritating to the skin and may result in redness, swelling, burns and possibe severe skin damage.

INHALATION

Product: ..... Corrosive. May be harmful or fatal if inhaled. May cause severe irritation and burns of the nose, throat and respiratory tract.

REPEATED DOSE TOXICITY

Product: ..... Hydrochloric Acid (Muriatic Acid) has produced no genetic changes in standard tests using bacterial cells. No data on other effects on Humans.

SKIN CORROSION / IRRITATION

Product: ..... The results of single exposure tests indicate that these concentrations of Hydrochloric Acid (Muriatic Acid) are slightly toxic after skin application. Following a 24-hour exposure, irreversible eye and skin damage occurred at all tested concentrations of Hydrochloric Acid (Muriatic Acid).

SERIOUS EYE DAMAGE / IRRITATION

Product: ..... Corrosive. Direct contact with the liquid or exposure to vapors or mists may cause stinging, tearing, redness, swelling, corneal damage and irreversible eye damage. Splashes in the eyes will cause severe burns. Contact lenses should not be worn when working with this chemical.

RESPIRATORY OR SKIN SENSITIZATION

Product: ..... Repeated exposure of workers to the mist causes chronic conjunctivitis, tracheobronchitis, stomatitis, and dermatitis.

MUTAGENCITY

IN VITRO

Product: ..... No Data Available

IN VIVO

Product: ..... No Data Available

Specified Substance(s)	**Information as provided by manufacturer**
Hydrochloric Acid (Muriatic Acid)	No Data Available

CARCINOGENICITY

Product: ..... NOT a suspected Human carcinogen.

REPODUCTIVE TOXICITY

Product: ..... Based on the available test, not expected to cause adverse effects on reproduction.

SPECIFIC TARGET ORGAN TOXICITY – SINGLE EXPOSURE

Product: **GENERAL:** This product contains acids that are corrosive and can cause severe and painful burns on contact with any part of the body or if taken internally. The mucous membranes of the eyes and the upper respiratory tract are especially susceptible to these irritating effects. **INHALATION:** Inhalation of excessive concentrations of mist or vapor can cause severe irritation of the upper respiratory tract, resulting in coughing, burning of the throat, and a choking sensation. If inhaled deeply, edema of the lungs may occur. **EYES:** Contact with this product, either in gas or in solution, can cause severe irritation and painful burns of the eyes and eyelids. The acid MUST be removed quickly with thorough irrigation with water or there may be prolonged or permanent visual impairment or total loss of sight. **SKIN:** Concentrated solutions are destructive to clothing and on contact with skin, can cause severe burns unless promptly washed off. **INGESTION:** This product, when swallowed, can cause severe burns of the mucous membranes of the mouth, esophagus and stomach.

SPECIFIC TARGET ORGAN TOXICITY – REPEATED EXPOSURE

Product: ..... The effects of long-term, low-level exposures to this product have not been determined. Safe handling of this material on a long-term basis should emphasize the avoidance of all effects from repetitive acute exposure. This product may aggravate existing eye, skin, and respiratory conditions.

ASPIRATION HAZARD

Product: ..... Droplets of the product aspirated into the lungs through ingestion or vomiting may cause chemical pneumonia.

OTHER ADVERSE EFFECTS

Product: ..... No data available

12 – ECOLOGICAL INFORMATION

ACUTE TOXICITY

FISH

Product: ..... Western mosquitofish (Gambusia affinis) 282 mg/l, 96 hours.

AQUATIC INVERTEBRATES

Product: ..... 48hr EC50 (Daphnia magna): >100 mg/L (based on similar products / components)

CHRONIC TOXICITY

FISH

Product: ..... NOEC/NOEL > 100 mg/l. (based on similar products / components)

AQUATIC INVERTEBRATES

Product: ..... NOEC/NOEL > 100 mg/l. (based on similar products / components)

TOXICITY TO AQUATIC PLANTS

Product: ..... The product may affect the acidity or alkalinity (pH-factor) in water with risk of harmful effects to aquatic plants.

PERSISTENCE AND DEGRADABILITY

BIODEGRADATION

Product: ..... The methods for determining the biological degradability are not applicable to predominately inorganic substances.

BIOLOGICAL OXYGEN DEMAND

Product: ..... No data available

CHEMICAL OXYGEN DEMAND

Product: ..... No data available

BOD / COD RATIO

Product: ..... No data available

BIOACCUMULATIVE POTENTIAL

Product: ..... No specific bioaccumulation test data was located in a search of the available scientific literature. It was reported in the literature that acidity of this material may be reduced readily in natural waters.

MOBILITY IN SOIL

Product: ..... Hydrochloric Acid (Muriatic Acid) (solution) is soluble in water and has high mobility in soil. During transport through the soil, Hydrochloric Acid (Muriatic Acid) (solution) may dissolve some of the soil material; in particular, the carbonate based materials. The acid will be neutralized to some degree, however, significant amounts of acid are expected to remain for transport down towards the ground water table. Upon reaching the ground water table, the acid will continue to move, now in the direction of the ground water flow. Lime addition may be required to rectify low pH resulting from Hydrochloric Acid (Muriatic Acid) (solution) spillages.

RESULTS OF PBT AND mPvB ASSESSMENT

Product: ..... Not fulfilling PBT (persistent/bioaccumulative/toxic) criteria. Not fulfilling vPvB (very persistent, very bioaccumulative) criteria.

OTHER ADVERSE EFFECTS

Product: ..... No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13 –DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: ..... Treatment, storage, transportation and disposal must be in accordance with Federal, State/Provincial and Local Regulations. Regulations may vary in different locations. Characterization and compliance with applicable laws are the responsibility solely of the generator. 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.

RCRA STATUS: ..... If discarded in its purchased form, this product is considered a RCRA hazardous waste. It is the responsibility of the product user to determine at the time of disposal, whether a material containing the product should be classified as a hazardous waste. (40CFR261.20-24).

14 – TRANSPORTATION INFORMATION

Important Note: Shipping descriptions may vary based on mode of transport, quantities, package size, and/or origin and destination. Consult your company's Hazardous Materials/Dangerous Goods expert for information specific to your situation.

UN/NA NUMBER: 1789
PROPER SHIPPING NAME: ..... Hydrochloric Acid
HAZARD CLASS: 8
PACKAGING GROUP : II
LETTER: ..... C (Corrosive substances)

ENVIRONMENTAL HAZARD: Because of modern treatment methods or method of use of this product, only an insignificant amount of the ingredients reaches the environment. That amount is at such levels as to typically not cause any adverse effects.

REPORTABLE QUANTITY: ..... Based on Hydrochloric Acid (Muriatic Acid) (CAS# 7647-01-0) in mixture; 10,000 pounds (4535.924 kilograms)

15 - REGULATIONS

This Safety Data Sheet conforms to ANSI Z400.5, and to the format requirements and the International Chemical Safety Cards of the Global Harmonizing System. This SDS complies with 29 CFR 1910.1200 (HAZARD COMMUNICATION STANDARD). **IMPORTANT:** Read this SDS before handling & disposing of this product. Pass this information on to employees, customers, & users of this product.

EPA SRA Title III Chemical Listings:

TSCA STATUS:..... This product is listed on the TSCA inventory. If this product is a blend, all ingredients in the product are listed on the TSCA Inventory List. Any impurities present in this product are exempt from listing.

SECTION 302:..... Based on Hydrochloric Acid (Muriatic Acid) (CAS# 7647-01-0) in mixture; 10,000 pounds (4535.924 kilograms), Threshold Planning Quantity (TPQ)

SECTION 304:..... Based on Hydrochloric Acid (Muriatic Acid) (CAS# 7647-01-0) in mixture; 10,000 pounds (4535.924 kilograms), Threshold Planning Quantity (TPQ)

SECTION 312:..... Yes

SARA SECTION 313:..... This material contains Hydrochloric Acid (CAS# 7647-01-0), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

ACUTE:..... Yes

CHRONIC: ..... Yes

FIRE: ..... No

PRESSURE:..... No

REACTIVE:..... No

CLEAN WATER ACT: ..... Yes

IMDG – International Marine Dangerous Goods Code
UN1789, Hydrochloric Acid, Solution, 8, C, PGII. EmS F-A, S-B. Static Accumulator: No.

IATA
UN1789, Hydrochloric Acid, Solution, 8, C, PGII.

DEA Chemical Trafficking Act:.. No

16 – OTHER INFORMATION

HMIS*

HEALTH	3
FLAMMABILITY	0
REACTIVITY	0
PERSONAL PROTECTION	J

HMIS®HAZARD INDEX: 0=Minimal Hazard, 1=Slight Hazard, 2=Moderate Hazard, 3=Serious Hazard, 4=Severe Hazard.
HMIS® rating involves data interpretations that may vary from company to company. They are intended only for rapid, general identification of the magnitude of the specific hazard. To deal adequately with the safe handling of this material, all the information contained in this SDS and product label must be considered.

ND = No Data, NA = Not Applicable/Not Available, ≤ = Less than or equal to, ≥ = Greater than or equal to

REVISION STATEMENT: Changes have been made throughout this Safety Data Sheet (SDS). Please read the entire document. Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and The Globally Harmonized System of Classification and Labeling of Chemicals (GHS) by the Company Health and Risk Assessment Unit.

DISCLAIMER:
Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, the Company makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving this Safety Data Sheet (SDS) will make their own determination as to its suitability for their intended purposes prior to use. Since the product is within the exclusive control of the user, it is the user's obligation to determine the conditions of safe use of this product. Such conditions should comply with all Federal and State Regulations concerning the Product. It must be recognized that the physical and chemical properties of any product may not be fully understood and that new, possibly hazardous products may arise from reactions between chemicals. The information given in this data sheet is based on our present knowledge and shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship. **NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS.**

*****This is the last page of this SDS*****

Material Safety Data Sheet
HYDROFLUORIC ACID

Print Date: September 2011

SECTION 1 – Chemical Product and Company Identification

MSDS Name: HYDROFLUORIC ACID **MSDS Preparation Date:** 09-2011, Supersedes 07-2008, 02-2007, 02-2004, 02-2001 & 02-98

Synonyms: Fluohydric acid, fluoric acid, hydrofluoric acid solution.
Chemical Names: DE Fluorwasserstoffsäure; ES Fluoruro de hidrógeno; FR Acide fluorhydrique; IT Acido fluoridrico; NL Fluorwaterstofzuur.
UN / NA Number(s): UN1790
Formula: HF
Molecular Wt: 20.01

Product Numbers: S010501, S020502, S010501-SSND13, S010501-SSNW03, S010501-SSNW04, S010501-SSNW61, S010501-SSNX43, S020502-SSNF07, S020502-SSNF08, S020502-SSNP01, S020502-SSNP02, S020502-SSNP03, S020502-SSNP04, S020502-SSNP05, S020502-SSNP06, S040501-SSND12, S040501-SSND13, S040501-SSND14

Supplier: Seastar Chemicals Inc, 10005 McDonald Park Road, Sidney, BC V8L 5Y2 CANADA
Tel: (250) 655-5880, **Fax:** (250) 655-5888

CANUTEC (CAN): **(613)-996-6666**

SECTION 2 – Composition/Information on Ingredients

Chemical Name	*Percent*	*CAS #*	*EINECS/ELINCS*
Hydrofluoric acid	47-51%	7664-39-3	231-634-8
Water	Balance	7732-18-5	231-791-2

SECTION 3 – Hazards Identification

EMERGENCY OVERVIEW

Appearance: Colourless liquid with a pungent, irritating, penetrating odour. Concentrations above 40% fume in air. Will not bum. Cylinders or tanks may rupture and explode if heated. Highly reactive. Contact with metals, such as iron or steel, slowly releases flammable and potentially explosive hydrogen gas. VERY TOXIC. May be fatal if inhaled, absorbed through the skin or swallowed. CORROSIVE to the nose, throat and respiratory tract. Causes lung injury-effects may be delayed. CORROSIVE to the eyes and skin. Causes severe bums. May cause blindness and permanent scarring. Absorbed fluoride can cause metabolic imbalances with irregular heartbeat, nausea, dizziness, vomiting and seizures. Long-term exposure may cause skeletal fluorosis (weakened bone structure).
Target Organs: Lungs, teeth, eyes, skin, bone, mucous membranes.

Potential Health Effects

Primary Route(s) of Entry: Inhalation and ingestion. Skin contact. Eye contact. Skin absorption.
Effects of Acute Exposure: May be fatal by ingestion, inhalation or skin absorption. Corrosive. Acute effects may be delayed.
LD50/LC50: CAS# 7732-18-3: Oral, rat: LD50 = >90 mL/kg. CAS# 7664-39-3: Inhalation, mouse: LC50 = 342 ppm/1H. Inhalation, rat: LC50 = 1276 ppm/1H.
Eyes: Direct contact with hydrofluoric acid can cause severe and irreversible corrosive injury with possible corneal scarring and blindness. The acid penetrates to deep tissue layers and causes severe corrosive injury. The gas can dissolve in the moisture on the surface, forming corrosive hydrofluoric acid. Irritation has been reported with exposure to concentrations as low as 0.24 ppm for 1 hour.
Skin: May be fatal if absorbed through skin and penetration may continue for several days. Hydrofluoric acid is extremely corrosive and can cause very deep and excruciatingly painful burns and tissue loss. Bums from concentrated solutions (greater than 50%) are felt immediately and tissue destruction is readily apparent. Weaker solutions (20-50%) result in burns that are apparent after several hours. Burns from solutions of less than 20% may take up to 24 hours to become apparent. Weak solutions (less than 7%) penetrate deeply before causing tissue damage and surface involvement may be minimal. Burns are swollen, hot and painful, then develop white or yellowish areas and blistering, with deep ulceration and destruction of tissue, which tends to heal slowly. The severity of the burns and absorption of the acid (with liquefaction necrosis of soft tissue and decalcification and corrosion of the bone) have resulted in permanent scarring, disability and death.
Ingestion: May be fatal if swallowed. Hydrofluoric acid is corrosive and can cause severe burning of the mouth, throat and stomach. Perforation of the digestive system may occur. Systemic fluoride toxicity has occurred following ingestion. Symptoms such as nausea, vomiting, abdominal pain, reduced heartbeat and blood pressure, shortness of breath have been reported. In some cases, death occurred in less than one hour following ingestion. Ingestion is not a typical route of occupational exposure.

Inhalation: May be fatal if inhaled. Low concentrations (a few ppm) can cause irritation of the nose, throat, eyes and respiratory tract. Higher concentrations can cause severe burns to the throat, airways and lungs. Fluid accumulation in the lungs and irregular heartbeat has led to deaths within hours following inhalation and, in some cases, concurrent skin contact with unknown concentrations of HF.
Within 24-48 hours, the victim may experience a rapidly worsening difficulty in breathing, accompanied by coughing. These symptoms are due to the development of a life-threatening accumulation of fluid in the lungs (pulmonary edema). Severe short-term exposures may result in long- lasting effects such as shortness of breath and pulmonary emphysema (larger than normal air spaces in the lungs which decrease lung efficiency).
Effects of Chronic Exposure: Absorbed fluoride can cause metabolic imbalances with irregular heartbeat, central nervous system depression, seizures, and deaths. Long-term exposure may cause osteofluorosis (weakened bone structure), skin disorders, and respiratory, liver and kidney effects. To the best of our knowledge, the chronic toxicity of this substance has not been fully investigated.

SECTION 4 – First Aid Measures

FIRST AID PROCEDURES SHOULD BE ESTABLISHED PRIOR TO USE. DO NOT HANDLE UNTIL ALL SAFETY PRECAUTIONS HAVE BEEN READ AND UNDERSTOOD. SEEK MEDICAL ATTENTION FOR ALL EXPOSURES.

Eyes: Avoid direct contact. Wear chemical protective gloves if necessary. Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 15-20 minutes, while holding the eyelid(s) open. If a contact lens is present, DO NOT delay irrigation or attempt to remove the lens. Take care not to rinse contaminated water into the unaffected eye. DO NOT use benzalkonium chloride (Zephiran®) for eye contact. If sterile 1% calcium gluconate is available, limit water flushing to 5 minutes. Then, use the 1% calcium gluconate solution to repeatedly rinse the eye(s). Immediately transport victim to an emergency care facility. Continue flushing with water, neutral saline or 1% calcium gluconate during transport, if at all possible.

Skin: Avoid direct contact. Wear chemical protective clothing, if necessary. As quickly as possible, remove contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Immediately flush with lukewarm, gently flowing water. Limit flushing with water to 5 minutes if 0.13% benzalkonium chloride (Zephiran®) solution or 2.5% calcium gluconate gel is available. If these treatments are not available, continue flushing until medical treatment is available. A certain quantity of either prepared solution or the calcium gluconate gel be kept on hand at all times. Solutions should be replaced annually if not previously used.

BENZALKONIUM CHLORIDE: Begin soaking the affected area in iced 0.13% benzalkonium chloride (Zephiran®) solution. Use ice cubes, not shaved ice, to prevent frostbite. If immersion is not practical, towels should be soaked with iced 0.13% benzalkonium chloride (Zephiran®) solutions and used as compresses for the burned area. Compresses should be changed every 2-4 minutes. Benzalkonium chloride (Zephiran®) soaks or compresses should be continued until medical attention is available.

CALCIUM GLUCONATE GEL: Wearing chemical protective gloves, start massaging 2.5% calcium gluconate gel into the burn site. Apply gel frequently and massage continuously until medical attention is available. Quickly transport victim to an emergency care facility. Double bag, seal, label and leave contaminated clothing, shoes and leather goods at the scene for safe disposal.

Ingestion: NEVER give anything by mouth if victim is rapidly losing consciousness, is unconscious or is convulsing. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. If vomiting occurs naturally, have victim rinse mouth with water again. Quickly transport victim to an emergency care facility.

Inhalation: Remove source of contamination or move victim to fresh air. If breathing is difficult, trained personnel should administer oxygen and 2.5% calcium gluconate, preferably with a doctor's advice. DO NOT allow victim to move about unnecessarily. Symptoms of pulmonary edema can be delayed up to 48 hours after exposure. If breathing has stopped, trained personnel should begin artificial respiration (AR) or, if the heart has stopped, cardiopulmonary resuscitation (CPR) or automated external defibrillation (AED) immediately. Quickly transport victim to an emergency care facility.

Notes to Physician: Due to delayed and persistent symptoms, observe patient closely for 48 hours. Prompt action is essential in all cases of contact and first aid procedures must be followed if any contact is suspected. Consult a doctor and/or the nearest Poison Control Centre for ALL EXPOSURES. Some first aid procedures recommended above require advanced first aid training. Protocols for undertaking advanced procedures must be developed in consultation with a doctor and routinely reviewed. All first aid procedures should be periodically reviewed by a doctor familiar with the material and its conditions of use in the workplace.

Antidote: Always have calcium gluconate gel on hand. The use of infilitration therapy and intraarterial therapy for hydrofluoric acid burns resulting from concentrations greater than 20% should be made by qualified medical personnel. Calcium gluconate may be administered intravenously slowly to bind to the fluoride ion. This administration needs to be monitored under the supervision of a physician.

SECTION 5 – Fire Fighting Measures

General Information: Hydrofluoric acid is not flammable. However, if it is involved in a fire, extremely corrosive and very toxic hydrogen fluoride gas or fumes may be released into the air. Contact with metals, such as iron or steel, slowly releases extremely flammable and potentially explosive hydrogen gas. A large amount of heat is generated when highly concentrated hydrofluoric acid solutions are diluted with water. Closed containers may rupture violently and suddenly release large amounts of product when exposed to fire or excessive heat for a sufficient period of time. Firefighters should wear a positive pressure self-contained respirator (SCBA) and full-body encapsulating chemical protective suit.

Extinguishing Media: Use extinguishing agents compatible with acid and appropriate for fire surrounding hydrofluoric acid containers. The extinguishing medium used depends on the concentration of the acid. Water spray or fog may be used where concentrations below 60% are present. Higher concentrations may react violently with water and a dry agent, e.g. dry chemical powder is recommended. Use water spray to keep fire exposed containers cool.
Auto-ignition Temperature: Not available.
Flash Point: Not available.
NFPA Rating: Health 4; Flammability 0; Reactivity 1.
Explosion Limits: Lower: Not available. Upper: Not available.

SECTION 6 – Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8. Restrict access to area until completion of clean-up. Remove or isolate flammable and combustible materials. Ensure clean-up is conducted by trained personnel only.
Spills/Leaks: Absolutely no unprotected contact with spilled material. Stop leak if without risk. Keep materials which can burn away from spilled material. Use water spray to knock down gas. Do not get water inside vessels. Dike corrosive water solutions to prevent entry into waterways, sewers or confined spaces.
Steps to be taken in case material is released or spilled: Contain spill with absorbent material which does not react with spilled material and cautiously dilute with large excess of water. Neutralize carefully with soda ash or lime. Material will fume during neutralization; approach from upwind. Provide good ventilation. Contaminated absorbent material will pose the same hazards as the spilled product. LARGE SPILLS: Evacuate area. Contact fire and emergency services and supplier for advice.
Waste disposal method: According to all applicable regulations. Avoid runoff.

SECTION 7 – Handling and Storage

Handling: This material is a VERY TOXIC (INHALATION and SKIN CONTACT HAZARD), CORROSIVE liquid. Never work alone with this chemical. Another person should be in view at all times and be equipped and trained to rescue. In case of leaks or spills, escape-type respiratory protective equipment should be available in the work area. If hydrofluoric acid is released, immediately evacuate the area.
Ensure that emergency eyewash and showers are in the immediate vicinity of work involving hydrofluoric acid. Prior to working with hydrofluoric acid, ensure that appropriate first aid procedures are established and supplies are readily accessible to trained personnel. Be aware of typical signs and symptoms of poisoning and first aid procedures. Any signs of illness should be reported immediately to supervisory personnel. Seek medical attention for all exposures even if an exposure did not seem excessive. Symptoms of a severe exposure can be delayed.
Closed handling systems should be used. Avoid generating vapours or mists. Prevent the release of vapours/mist into workplace air. Keep away from combustible materials. Protect from accidental contact with water. Do not use with incompatible materials. See Section 10 for more information. Keep containers tightly closed when not in use. Never return contaminated material to its original container. Never add water to a corrosive. Always add corrosives to COLD water. When mixing with water, cautiously and slowly stir small amounts of acid into water. Assume that empty containers contain residues which are hazardous.
Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Do not store in metal or glass containers. Do not store in direct sunlight. Keep tightly closed. Empty container may contain hazardous residue. Do not add any other material to the container. Do not wash down the drain. Do not get in eyes, on skin, or on clothing. Wash well after use. Handle in accordance with good storage and handling practices. Do not allow smoking or food consumption while handling. Store in approved containers only.
Storage Code: White.

SECTION 8 – Exposure Control/Personal Protection

Engineering Controls: Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.
Exposure Limits:

Chemical Name	*ACGIH*	*NIOSH*	*OSHA*
Hydrofluoric acid	As F, skin: 0.5 ppm TWA; 2 ppm Ceiling	As F: 3 ppm TWA (2.5 mg/m³ TWA); 6 ppm STEL (5 mg/m³ STEL); 30 ppm IDLH	3 ppm TWA
Water	None listed.	None listed.	None listed.

OSHA Vacated PELs Hydrofluoric acid, as F: 3 ppm TWA

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133. Wear face shield.

Skin: Wear appropriate protective neoprene gloves to prevent skin exposure. Wear acid-resistant jacket, trousers and boots sufficient to protect skin.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respiratory Protection: Wear appropriate OSHA/MSHA approved chemical cartridge respirator regulations found in 29CFR 1910.134. If more than TLV, do not breathe vapour. Wear self-contained breathing apparatus. Always use an NIOSH-approved respirator when necessary.
Ventilation: Use only in a chemical fume hood. Adequate ventilation to maintain vapour/dust below TLV.
Other Protective Equipment: Make eye bath and emergency shower available.

SECTION 9 – Physical and Chemical Properties

Physical State: Liquid
Appearance: Clear, colourless
Odour: Strong odour
pH: Weak acid
Vapour Pressure: Varies with concentration; 50% (w/w): 1.64 kPa (12.4 mm Hg) at 20 °C (calculated).
Vapour Density: 1.86 at 25 °C (air = 1) (HF gas)
Evaporation Rate: Varies with concentration
Viscosity: No information available.
Boiling Point: Varies with concentration; 48% (w/w): 108.7 °C (227.7 °F); 38.2% (w/w): 112.2 °C (234 °F)
Freezing/Melting Point: Varies with concentration; 48% (w/w): -37 °C (-34.6 °F)
Decomposition Temperature: No information available.
Solubility: Soluble in water in all proportions. Soluble in ethanol; slightly soluble in diethyl ether, benzene, toluene, xylene and tetralin.
Specific Gravity/Density: 50% (w/w): 1.18 at 20 °C (water = 1).
Molecular Formula: HF
Molecular Weight: 20.0054

SECTION 10 – Stability and Reactivity

Chemical Stability: Normally stable.
Conditions to Avoid: Incompatible materials, metals, high temperatures.
Incompatibilities with Other Materials: Substance is incompatible with over 35 specific chemicals. Please refer to the NFPA Fire Protection Guide for specifics. Heat. Glass, concrete and other silicon-bearing materials will yield silicon tetrafluoride. Pressure build-up from this process has been known to blow up glass containers. Carbonates, sulphides, and cyanides will yield toxic gases such as carbon dioxide, hydrogen sulphide and hydrogen cyanide. Alkalis, some oxides, fluorine and other water-reactive materials will cause strong exothermic reactions that can be violent. Reacts with most common metals to produce hydrogen. Corrosive to many materials, including leather, rubber and many organics.
Hazardous Decomposition Products: Fluoride fumes.
Hazardous Polymerization: Tends to associate by means of hydrogen bonds to form polymers in both liquid and gaseous states. This polymerization is not hazardous.

SECTION 11 – Toxicological Information

RTECS: CAS# 7732-18-5: ZC0110000. CAS# 7664-39-3: MW7875000.
LD50/LC50: CAS# 7732-18-3: Oral, rat: LD50 = >90 mL/kg. CAS# 7664-39-3: Inhalation, mouse: LC50 = 342 ppm/1H. Inhalation, rat: LC50 = 1276 ppm/1H.
Carcinogenicity: CAS# 7732-18-5: Not listed as a carcinogen by ACGIH, IARC, NIOSH, NTP, OSHA, or CA Prop 65. CAS# 7664-39-3: ACGIH: Not listed. California: Not listed. NIOSH: Not listed. NTP: Not listed. OSHA: Not listed. IARC: [present] (when used in drinking water) (listed as 'FLUORIDES, INORGANIC').
Epidemiology: Standard Draize test: Eye, human – 50 mg, severe reaction.
Teratogenicity: Embryo or fetus: death, Inhalation-rat TCLo = 4980 µg/m³/4H (1-22 D preg).
Reproductive: Fertility: post- and pre-implantation mortality, Inhalation-rat TCLo=470 µg/m³/4H.
Mutagenicity: DNA Damage: *D. Melanogaster* – Inhalation 1300 ppb/6W. Sex Chromosome Loss/Non-disjunction: *D. Melanogaster* – Inhalation 2900 ppb.
Neurotoxicity: No information available.

SECTION 12 – Ecological Information

Ecotoxicity: Fish (fresh water) 60 ppm lethal (time period not specified).
Environmental: No information reported.
Physical: No information available.
Other: None.

SECTION 13 – Disposal Considerations

Dispose of in a manner consistent with federal, provincial/state/territorial, and local regulations.
RCRA D-Maximum Concentration of Contaminants: None of the components are on this list.
RCRA D Series – Chronic Toxicity Reference Levels: None of the components are on this list.
RCRA F Series Wastes: None of the components are on this list.

RCRA P Series Wastes: None of the components are on this list.
RCRA U Series Wastes: CAS# 7664-39-3: waste number U134 (Corrosive waste, Toxic waste).
RCRA Substances Banned from Land Disposal: CAS# 7664-39-3 is banned from land disposal according to RCRA.

SECTION 14 – Transport Information

CANADIAN TRANSPORTATION OF DANGEROUS GOODS (TDG) SHIPPING INFORMATION

Shipping Name and Description: HYDROFLUORIC ACID, solution, with not more than 60 per cent hydrofluoric acid
UN Number: UN1790 **Class:** 8, 6.1 **Packing Group/Category:** II
Special Provisions: --- **Marine Pollutant:** --- **Passenger Carrying Road/Railway Vehicle Index:** 1 kg or L

NOTE: This information incorporates the Transportation of Dangerous Goods Regulations SOR/2001-286, effective October 14, 2009.

US DEPARTMENT OF TRANSPORT (DOT) HAZARDOUS MATERIALS SHIPPING INFORMATION (49 CFR)

Shipping Name and Description: HYDROFLUORIC ACID, with not more than 60 percent strength
Identification Number: UN1790 **Hazard Class or Division:** 8 **Packing Group:** II

NOTE: This information was taken from the US Code of Federal Regulations Title 49 - Transportation and is effective July 1, 2009.

IATA (1 January – 31 December 2010)

UN/ID No. A	Proper Shipping Name / Description B	Class or Div. (Sub Risk) C	Hazard Label(s) D	PG E	Passenger and Cargo Aircraft		Cargo Aircraft Only		S.P. See 4.4 M
					Pkg Inst I	Max Net Qty/Pkg J	Pkg Inst K	Max/Net Qty/Pkg L	
1790	**Hydrofluoric acid** 60% or less strength	8 (6.1)	Corrosive & Toxic	II	809	1 L	813	30 L	

NOTE: Consult IATA DG Regulations for the most recent information, abbreviations and reference marks.

SECTION 15 – Regulatory Information

US OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200)

OSHA Hazard Communication Evaluation: Meets criteria for hazardous material, as defined by 29 CFR 1910.1200.

US Federal

TSCA: CAS# 7732-18-5 is listed on the TSCA Inventory. CAS# 7664-39-3 is listed on the TSCA Inventory.
Health and Safety Reporting List: None of the components are on this list.
Chemical Test Rules: None of the components are on this list.
TSCA Section 12b: None of the components are on this list.
TSCA Significant New Use Rule (SNUR): None of the components are on this list.
CERCLA Reportable Quantities (RQ): CAS# 7664-39-3: final RQ = 100 pounds (45.4 kg).
SARA Threshold Planning Quantities (TPQ): CAS# 7664-39-3: TPQ = 100 pounds.
SARA Hazard Categories: CAS# 7664-39-3: Acute, chronic.
SARA Section 313: This material contains Hydrofluoric acid (CAS# 7664-39-3, 48-50%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.
Clean Air Act – Hazardous Air Pollutants (HAPs): CAS# 7664-39-3 is listed as a hazardous air pollutant (HAP).
Clean Air Act – Class 1 Ozone Depletors: None of the components are on this list.
Clean Air Act – Class 2 Ozone Depletors: None of the components are on this list.
Clean Water Act – Hazardous Substances: CAS# 7664-39-3 is listed as a Hazardous Substance under the CWA.
Clean Water Act – Priority Pollutants: None of the components are on this list.
Clean Water Act – Toxic Pollutants: None of the components are on this list.
OSHA – Highly Hazardous: CAS #7664-39-3 is considered highly hazardous by OSHA.

US State

State Right to Know: Hydrofluoric acid can be found on the following state Right-to-Know lists: California, New Jersey (RTK# 3759), Florida, Pennsylvania, Minnesota, Massachusetts (10 lbs RQ).
California Prop 65: No information available.
California No Significant Risk Level: No information available.

CANADIAN WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

CCOHS WHMIS Classification:
D1A - Poisonous and infectious material - immediate and serious effects – Very toxic
D2A - Poisonous and infectious material - Other effects - Very toxic
E - Corrosive material
NOTE: The WHMIS Classification of D2A (chronic toxicity) for this chemical is currently under review.

WHMIS Health Effects Criteria Met by this Chemical: D1A - Acute lethality - very toxic - immediate, D1B - TDG class 6.1 packing group unknown - toxic - immediate, D2A - Chronic toxicity - very toxic - other, E - Corrosive to skin, E - TDG class 8 - corrosive substance
WHMIS Ingredient Disclosure List: Included for disclosure at 1% or greater.

Detailed WHMIS Classification According to Criteria:

Class A - Compressed Gas: Does not meet criteria.

Class B - Flammable and Combustible Material: Does not meet criteria. Not combustible (does not burn).

Class C - Oxidizing Material: Does not meet criteria.

Class D - Poisonous and Infectious Material. Division 1 - Immediate and Serious Toxic Effects: Meets criteria for "Very toxic material".

Acute Lethality: "Very toxic". LC50 (mouse): 170 ppm (4- hour exposure); cited as 342 ppm (1-hour exposure); LD50 (oral, mouse): less than 40 mg/kg (cited as less than 2 mq/kg; at 40 mg/kg all animals (numbers not reported) died within 2 hours).

Transportation of Dangerous Goods (TDG): "Toxic"; class 6.1, packing group unknown.

Class D - Poisonous and Infectious Material. Division 2 - Other Toxic Effects: Meets criteria for "Very toxic material". See detailed evaluation below.

Chronic Health Effects: "Very toxic". Severe lung, liver and kidney damage and deaths observed in animals exposed to low concentrations (e.g. 30 ppm for 5 weeks produced complete mortality). Low concentrations cause fluorosis in humans.

Carcinogenicity: Does not meet criteria. Not included in standard reference lists.

Teratogenicity and Embryotoxicity: Insufficient information. There are insufficient details to evaluate the one animal study located.

Reproductive Toxicity: Insufficient information.

Mutagenicity: Insufficient information. The only available in vivo study is weak and inconclusive.

Respiratory Tract Sensitization: Does not meet criteria. Not reported as a human respiratory sensitizer.

Skin Irritation: Corrosive materials are not also classified as irritants.

Eye Irritation: Corrosive materials are not also classified as irritants.

Skin Sensitization: Does not meet criteria. Not reported as a skin sensitizer.

Class E - Corrosive Material: Meets criteria.

TDG Class 8. Corrosive to skin, carbon steel alloy 1020 and aluminum alloy 3003 at 55 °C (131 °F). No information on the corrosivity to aluminum alloy 7075-T6 was located.

Class F - Dangerously Reactive Material: Does not meet criteria.

Canadian DSL/NDSL: CAS# 7732-18-5 is listed on Canada's DSL/NDSL List. CAS# 7664-39-3 is listed on Canada's DSL/NDSL List.

EUROPEAN UNION (EU) CLASSIFICATION AND LABELLING INFORMATION

EU Index#: 009-003-00-1

EU Classification:
Acute toxicity, Oral – Category 2
Acute toxicity, Dermal – Category 1
Acute toxicity, Inhalation – Category 2
Skin corrosion – Category 1A
Corrosive to metals – Category 1

EU Signal Word: Danger

EU Pictograms:

EU Hazard Statements:

H300: Fatal if swallowed.
H310: Fatal in contact with skin.
H330: Fatal if inhaled.
H314: Causes severe skin burns and eye damage.
H290: May be corrosive to metals.

EU Precautionary Statements:

P234: Keep only in original container.
P260: Do not breathe dust/fume/gas/mist/vapours/spray.
P262: Do not get in eyes, on skin, or on clothing.
P264: Wash thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P271: Use only outdoors or in a well-ventilated area.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P284: Wear respiratory protection.
P301+P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P302+P350: IF ON SKIN: Gently wash with plenty of soap and water.
P303+P361+P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310: Immediately call a POISON CENTER or doctor/physician.
P320: Specific treatment is urgent (see Section 4 for first aid instructions in case of skin exposure).
P321: Specific treatment (see P310).
P330: Rinse mouth.
P361: Remove/Take off immediately all contaminated clothing.
P363: Wash contaminated clothing before reuse.
P390: Absorb spillage to prevent material damage.
P403+P233: Store in a well-ventilated place. Keep container tightly closed.
P405: Store locked up.
P406: Store in corrosion resistant container with a resistant inner liner.
P501: Dispose of contents/container according to federal, regional and local government requirements.

Exposure Limits: (listed under FLUORIDES, as F) OES-United Kingdom: TWA 2.5 mg/m^3, STEL 3 ppm (2.5 mg/m^3).

SECTION 16 – Other Information

The statements contained herein are offered for informational purposes only and are based upon technical data. Seastar Chemicals Inc believes them to be accurate but does not purport to be all-inclusive. The above-stated product is intended for use only by persons having the necessary technical skills and facilities for handling the product at their discretion and risk. Since conditions and manner of use are outside our control, we (Seastar Chemicals Inc) make no warranty of merchantability or any such warranty, express or implied with respect to information and we assume no liability resulting from the above product or its use. Users should make their own investigations to determine suitability of information and product for their particular purposes.

NALCO Water
An Ecolab Company

SAFETY DATA SHEET

NALCO® GEO982

Section: 1. PRODUCT AND COMPANY IDENTIFICATION

Product name	:	NALCO® GEO982
Other means of identification	:	Not applicable.
Restrictions on use	:	Refer to available product literature or ask your local Sales Representative for restrictions on use and dose limits.
Company	:	Nalco Company 1601 W. Diehl Road Naperville, Illinois 60563-1198 USA TEL: (630)305-1000
Emergency telephone number	:	(800) 424-9300 (24 Hours) CHEMTREC
Issuing date	:	11/27/2017

Section: 2. HAZARDS IDENTIFICATION

GHS Classification

Not a hazardous substance or mixture.

GHS Label element

Precautionary Statements	:	**Prevention:** Wash hands thoroughly after handling. **Response:** Get medical advice/ attention if you feel unwell. **Storage:** Store in accordance with local regulations.
Other hazards	:	None known.

Section: 3. COMPOSITION/INFORMATION ON INGREDIENTS

No hazardous ingredients

Section: 4. FIRST AID MEASURES

In case of eye contact	:	Rinse with plenty of water. Get medical attention if symptoms occur.
In case of skin contact	:	Wash off with soap and plenty of water. Get medical attention if symptoms occur.
If swallowed	:	Rinse mouth. Get medical attention if symptoms occur.
If inhaled	:	Get medical attention if symptoms occur.
Protection of first-aiders	:	In event of emergency assess the danger before taking action. Do not put yourself at risk of injury. If in doubt, contact emergency responders. Use personal protective equipment as required.

Notes to physician	:	Treat symptomatically.
Most important symptoms and effects, both acute and delayed	:	See Section 11 for more detailed information on health effects and symptoms.

Section: 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media	:	None known.
Specific hazards during firefighting	:	Not flammable or combustible.
Hazardous combustion products	:	Decomposition products may include the following materials: Carbon oxides nitrogen oxides (NOx) Sulphur oxides Oxides of phosphorus
Special protective equipment for firefighters	:	Use personal protective equipment.
Specific extinguishing methods	:	Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

Section: 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Refer to protective measures listed in sections 7 and 8.
Environmental precautions	:	No special environmental precautions required.
Methods and materials for containment and cleaning up	:	Stop leak if safe to do so. Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Flush away traces with water.

Section: 7. HANDLING AND STORAGE

Advice on safe handling	:	For personal protection see section 8. Wash hands after handling.
Conditions for safe storage	:	Keep out of reach of children. Keep container tightly closed. Store in suitable labelled containers.
Suitable material	:	Keep in properly labelled containers.
Unsuitable material	:	not determined

Section: 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

Engineering measures	:	Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Personal protective equipment

Eye protection	:	Safety glasses
Hand protection	:	Wear protective gloves. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.
Skin protection	:	Wear suitable protective clothing.
Respiratory protection	:	No personal respiratory protective equipment normally required.
Hygiene measures	:	Wash hands before breaks and immediately after handling the product.

Section: 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Liquid
Colour	:	pale, yellow-orange
Odour	:	not significant
Flash point	:	> 93.3 °C
pH	:	3.80, (25.0 °C)
Odour Threshold	:	no data available
Melting point/freezing point	:	no data available
Initial boiling point and boiling range	:	no data available
Evaporation rate	:	no data available
Flammability (solid, gas)	:	no data available
Upper explosion limit	:	no data available
Lower explosion limit	:	no data available
Vapour pressure	:	no data available
Relative vapour density	:	no data available
Relative density	:	1.068, (25 °C),
Density	:	no data available
Water solubility	:	Complete
Solubility in other solvents	:	no data available
Partition coefficient: n-octanol/water	:	no data available

Auto-ignition temperature	:	no data available
Thermal decomposition	:	no data available
Viscosity, dynamic	:	194.0 mPa.s (19 °C)
Viscosity, kinematic	:	no data available
Molecular weight	:	no data available
VOC	:	no data available

Section: 10. STABILITY AND REACTIVITY

Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	No dangerous reaction known under conditions of normal use.
Conditions to avoid	:	None known.
Incompatible materials	:	Strong oxidizing agents
Hazardous decomposition products	:	Decomposition products may include the following materials: Carbon oxides nitrogen oxides (NOx) Sulphur oxides Oxides of phosphorus

Section: 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure	:	Inhalation, Eye contact, Skin contact

Potential Health Effects

Eyes	:	Health injuries are not known or expected under normal use.
Skin	:	Health injuries are not known or expected under normal use.
Ingestion	:	Health injuries are not known or expected under normal use.
Inhalation	:	Health injuries are not known or expected under normal use.
Chronic Exposure	:	Health injuries are not known or expected under normal use.

Experience with human exposure

Eye contact	:	No symptoms known or expected.
Skin contact	:	No symptoms known or expected.
Ingestion	:	No symptoms known or expected.
Inhalation	:	No symptoms known or expected.

Toxicity

Product

Acute oral toxicity	:	no data available
Acute inhalation toxicity	:	no data available
Acute dermal toxicity	:	no data available
Skin corrosion/irritation	:	no data available
Serious eye damage/eye irritation	:	no data available
Respiratory or skin sensitization	:	no data available
Carcinogenicity	:	no data available
Reproductive effects	:	no data available
Germ cell mutagenicity	:	no data available
Teratogenicity	:	no data available
STOT - single exposure	:	no data available
STOT - repeated exposure	:	no data available
Aspiration toxicity	:	no data available

Section: 12. ECOLOGICAL INFORMATION

Ecotoxicity

Environmental Effects : This product has no known ecotoxicological effects.

Persistence and degradability

no data available

Mobility

no data available

Bioaccumulative potential

no data available

Other information

no data available

Section: 13. DISPOSAL CONSIDERATIONS

Disposal methods : Where possible recycling is preferred to disposal or incineration. If recycling is not practicable, dispose of in compliance with local regulations. Dispose of wastes in an approved waste disposal facility.

Disposal considerations : Dispose of as unused product. Empty containers should be

taken to an approved waste handling site for recycling or disposal. Do not re-use empty containers.

Section: 14. TRANSPORT INFORMATION

The shipper/consignor/sender is responsible to ensure that the packaging, labeling, and markings are in compliance with the selected mode of transport.

Land transport (DOT)

Proper shipping name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

Air transport (IATA)

Proper shipping name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

Sea transport (IMDG/IMO)

Proper shipping name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

Section: 15. REGULATORY INFORMATION

TSCA list : No substances are subject to a Significant New Use Rule.
No substances are subject to TSCA 12(b) export notification requirements.

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : No SARA Hazards

SARA 302 : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

California Prop 65

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

INTERNATIONAL CHEMICAL CONTROL LAWS :

United States TSCA Inventory

On TSCA Inventory

Australia. Industrial Chemical (Notification and Assessment) Act

On the inventory, or in compliance with the inventory

New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand

On the inventory, or in compliance with the inventory

Japan. ENCS - Existing and New Chemical Substances Inventory
not determined

Korea. Korean Existing Chemicals Inventory (KECI)
not determined

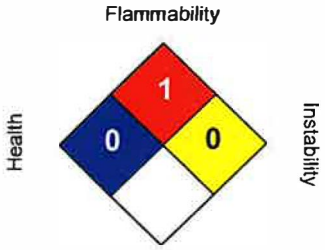
Philippines Inventory of Chemicals and Chemical Substances (PICCS)
not determined

China Inventory of Existing Chemical Substances
On the inventory, or in compliance with the inventory

Taiwan Chemical Substance Inventory
not determined

Section: 16. OTHER INFORMATION

NFPA:



HMIS III:

HEALTH	0
FLAMMABILITY	1
PHYSICAL HAZARD	0

0 = not significant, 1 =Slight,
2 = Moderate, 3 = High
4 = Extreme, * = Chronic

Revision Date	:	11/27/2017
Version Number	:	1.0
Prepared By	:	Regulatory Affairs

REVISED INFORMATION: Significant changes to regulatory or health information for this revision is indicated by a bar in the left-hand margin of the SDS.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.
For additional copies of an SDS visit www.nalco.com and request access.

NALCO Water
An Ecolab Company

SAFETY DATA SHEET

NALCO® 7471 ANTIFOAM

Section: 1. PRODUCT AND COMPANY IDENTIFICATION

Product name	:	NALCO® 7471 ANTIFOAM
Other means of identification	:	Not applicable.
Recommended use	:	ANTIFOAM
Restrictions on use	:	Refer to available product literature or ask your local Sales Representative for restrictions on use and dose limits.
Company	:	Nalco Company 1601 W. Diehl Road Naperville, Illinois 60563-1198 USA TEL: (630) 305-1000
Emergency telephone number	:	(800) 424-9300 (24 Hours) CHEMTREC
Issuing date	:	08/23/2021

Section: 2. HAZARDS IDENTIFICATION

GHS Classification

Skin irritation	:	Category 2
Eye irritation	:	Category 2A

GHS Label element

Hazard pictograms :

Signal Word	:	Warning
Hazard Statements	:	Causes skin irritation. Causes serious eye irritation.
Precautionary Statements	:	**Prevention:** Wear protective gloves/ eye protection/ face protection. **Response:** IF ON SKIN: Wash with plenty of soap and water. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Other hazards	:	None known.

Section: 3. COMPOSITION/INFORMATION ON INGREDIENTS

Pure substance/mixture	:	Mixture

Chemical Name	CAS-No.	Concentration: (%)

Fatty Alkyl Polyglycol	Proprietary	10 - 30
Sulfuric Acid	7664-93-9	0.1 - 1

Section: 4. FIRST AID MEASURES

In case of eye contact	:	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention.
In case of skin contact	:	Wash off immediately with plenty of water for at least 15 minutes. Use a mild soap if available. Get medical attention if irritation develops and persists.
If swallowed	:	Rinse mouth. Get medical attention if symptoms occur.
If inhaled	:	Get medical attention if symptoms occur.
Protection of first-aiders	:	In event of emergency assess the danger before taking action. Do not put yourself at risk of injury. If in doubt, contact emergency responders. Use personal protective equipment as required.
Notes to physician	:	Treat symptomatically.
Most important symptoms and effects, both acute and delayed	:	See Section 11 for more detailed information on health effects and symptoms.

Section: 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media	:	None known.
Specific hazards during firefighting	:	Not flammable or combustible.
Hazardous combustion products	:	Decomposition products may include the following materials: Carbon oxides
Special protective equipment for firefighters	:	Use personal protective equipment.
Specific extinguishing methods	:	Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. In the event of fire and/or explosion do not breathe fumes.

Section: 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Ensure clean-up is conducted by trained personnel only. Refer to protective measures listed in sections 7 and 8.

Environmental precautions	:	Do not allow contact with soil, surface or ground water.
Methods and materials for containment and cleaning up	:	Stop leak if safe to do so. Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Flush away traces with water.

Section: 7. HANDLING AND STORAGE

Advice on safe handling	:	Avoid contact with skin and eyes. Wash hands thoroughly after handling. Use only with adequate ventilation.
Conditions for safe storage	:	Keep out of reach of children. Keep container tightly closed. Store in suitable labelled containers.
Suitable material	:	The following compatibility data is suggested based on similar product data and/or industry experience: Stainless Steel 304, Stainless Steel 316L, CPVC (rigid), HDPE (high density polyethylene), Nylon, Polypropylene, PTFE, PVC, Polyvinylidene difluoride, Perfluoroelastomer, Fluoroelastomer, Buna-N, Nitrile, Epoxy phenolic resin, 100% phenolic resin liner, Shipping and long term storage compatibility with construction materials can vary; we therefore recommend that compatibility is tested prior to use.
Unsuitable material	:	The following compatibility data is suggested based on similar product data and/or industry experience: Brass, Mild steel, Neoprene, EPDM

Section: 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Form of exposure	Permissible concentration	Basis
Sulfuric Acid	7664-93-9	TWA (Thoracic particulate matter)	0.2 mg/m3	ACGIH
		TWA	1 mg/m3	NIOSH REL
		TWA	1 mg/m3	OSHA Z1

Engineering measures	:	Effective exhaust ventilation system. Maintain air concentrations below occupational exposure standards.

Personal protective equipment

Eye protection	:	Safety glasses with side-shields
Hand protection	:	Wear the following personal protective equipment: butyl-rubber Nitrile rubber Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.
Skin protection	:	Wear suitable protective clothing.

Respiratory protection	:	When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.
Hygiene measures	:	Handle in accordance with good industrial hygiene and safety practice. Remove and wash contaminated clothing before re-use. Wash face, hands and any exposed skin thoroughly after handling.

The Personal Protective Equipment (PPE) recommendations provided above have been made in good faith based on typical expected conditions of use. PPE selection should always be completed in conjunction with a proper risk assessment and in accordance with a PPE management program.

Section: 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Liquid
Colour	:	Clear to slightly hazy light yellow to amber
Odour	:	Organic
Flash point	:	176.7 °C, Method: ASTM D 93, Pensky-Martens closed cup
pH	:	no data available
Odour Threshold	:	no data available
Melting point/freezing point	:	no data available
Initial boiling point and boiling range	:	no data available
Evaporation rate	:	no data available
Flammability (solid, gas)	:	Not applicable.
Upper explosion limit	:	no data available
Lower explosion limit	:	no data available
Vapour pressure	:	no data available
Relative vapour density	:	no data available
Relative density	:	0.97 - 1.00, (25 °C),
Density	:	0.97 g/cm3 , 8.06 lb/gal
Water solubility	:	dispersible
Solubility in other solvents	:	no data available
Partition coefficient: n-octanol/water	:	no data available
Auto-ignition temperature	:	no data available
Thermal decomposition	:	no data available
Viscosity, dynamic	:	90 mPa.s (16 °C), estimated
Viscosity, kinematic	:	no data available
Molecular weight	:	no data available
VOC	:	0 %, 0 g/l, EPA Method 24

Section: 10. STABILITY AND REACTIVITY

Reactivity	:	No dangerous reaction known under conditions of normal use.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	No dangerous reaction known under conditions of normal use.
Conditions to avoid	:	None known.
Incompatible materials	:	Contact with strong oxidizers (e.g. chlorine, peroxides, chromates, nitric acid, perchlorate, concentrated oxygen, permanganate) may generate heat, fires, explosions and/or toxic vapors.
Hazardous decomposition products	:	In case of fire, hazardous decomposition products may be produced such as: Carbon oxides

Section: 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure	:	Inhalation, Eye contact, Skin contact

Potential Health Effects

Eyes	:	Causes serious eye irritation.
Skin	:	Causes skin irritation.
Ingestion	:	Health injuries are not known or expected under normal use.
Inhalation	:	Health injuries are not known or expected under normal use.
Chronic Exposure	:	May cause cancer by inhalation.

Experience with human exposure

Eye contact	:	Redness, Pain, Irritation
Skin contact	:	Redness, Irritation
Ingestion	:	No symptoms known or expected.
Inhalation	:	No symptoms known or expected.

Toxicity

Product

Acute oral toxicity	:	no data available
Acute inhalation toxicity	:	no data available
Acute dermal toxicity	:	no data available
Skin corrosion/irritation	:	Species: Rabbit

		Result: 1.4 Method: Draize Test Test substance: Product
Serious eye damage/eye irritation	:	Species: rabbit Result: 5.7 Method: Draize Test Test substance: Product
Respiratory or skin sensitization	:	no data available
Carcinogenicity	:	no data available
Reproductive effects	:	no data available
Germ cell mutagenicity	:	no data available
Teratogenicity	:	no data available
STOT - single exposure	:	no data available
STOT - repeated exposure	:	no data available
Aspiration toxicity	:	no data available

Components

Acute oral toxicity	:	Fatty Alkyl Polyglycol LD50 rat: > 6,400 mg/kg

Section: 12. ECOLOGICAL INFORMATION

Toxicity

Environmental Effects	:	This product has no known ecotoxicological effects.

Product

Toxicity to fish	:	LC50 Fathead Minnow: 199 mg/l Exposure time: 96 hrs Test substance: Product LC50 Rainbow Trout: 235 mg/l Exposure time: 96 hrs Test substance: Product NOEC Fathead Minnow: 150 mg/l Exposure time: 96 hrs Test substance: Product NOEC Rainbow Trout: 158 mg/l Exposure time: 96 hrs Test substance: Product
Toxicity to daphnia and other aquatic invertebrates	:	LC50 Daphnia magna: 289 mg/l Exposure time: 48 hrs Test substance: Product

Persistence and degradability

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

Chemical Oxygen Demand (COD): 2,200,000 mg/l

Biochemical Oxygen Demand (BOD):

Incubation Period	Value	Test Descriptor
5 d	700,000 mg/l	

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	:	<5%
Water	:	<5%
Soil	:	> 90%

The portion in water is expected to float on the surface.

Bioaccumulative potential

Component substances have a low potential to bioconcentrate.

Other information

no data available

Section: 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.

Disposal methods	:	Where possible recycling is preferred to disposal or incineration. If recycling is not practicable, dispose of in compliance with local regulations. Dispose of wastes in an approved waste disposal facility.
Disposal considerations	:	Dispose of as unused product. Empty containers should be taken to an approved waste handling site for recycling or disposal. Do not re-use empty containers.

Section: 14. TRANSPORT INFORMATION

The shipper/consignor/sender is responsible to ensure that the packaging, labeling, and markings are in compliance with the selected mode of transport.

Land transport (DOT)

Proper shipping name	:	PRODUCT IS NOT REGULATED DURING TRANSPORTATION

Air transport (IATA)

Proper shipping name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

Sea transport (IMDG/IMO)

Proper shipping name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

Section: 15. REGULATORY INFORMATION

TSCA list : No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

This product does not contain a RQ substance, or this product contains a substance with a RQ, however the calculated RQ exceeds the reasonably attainable upper limit.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : Skin corrosion or irritation
Serious eye damage or eye irritation

SARA 302 : This material does not contain any components with a section 302 EHS TPQ.

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

California Prop. 65

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

INTERNATIONAL CHEMICAL CONTROL LAWS :

United States TSCA Inventory

On or in compliance with the active portion of the TSCA inventory

Australia. Australian Industrial Chemicals Introduction Scheme (AICIS)

All substances in this product comply with the Australian Industrial Chemicals Introduction Scheme (AICIS)

Canadian Domestic Substances List (DSL)

The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

Japan. ENCS - Existing and New Chemical Substances Inventory

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. Korean Existing Chemicals Inventory (KECI)

All substances in this product comply with the Chemical Control Act (CCA) and are listed on the Existing Chemicals List (ECL)

Philippines Inventory of Chemicals and Chemical Substances (PICCS)
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).

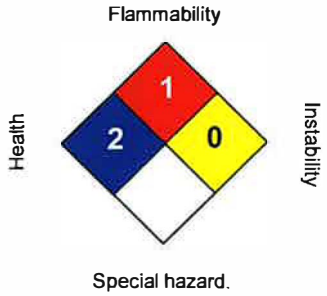
China Inventory of Existing Chemical Substances
All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on or exempt from the Inventory of Existing Chemical Substances China (IECSC).

New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA 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.

Taiwan Chemical Substance Inventory
All substances in this product comply with the Taiwan Existing Chemical Substances Inventory (ECSI).

Section: 16. OTHER INFORMATION

NFPA:



HMIS III:

HEALTH	2
FLAMMABILITY	1
PHYSICAL HAZARD	0

0 = not significant, 1 = Slight,
2 = Moderate, 3 = High
4 = Extreme, * = Chronic

Revision Date	:	08/23/2021
Version Number	:	1.3
Prepared By	:	Regulatory Affairs

REVISED INFORMATION: Significant changes to regulatory or health information for this revision is indicated by a bar in the left-hand margin of the SDS.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.
For additional copies of an SDS visit www.nalco.com and request access.

NALCO Water
An Ecolab Company

SAFETY DATA SHEET

NALCO® GEO901

Section: 1. PRODUCT AND COMPANY IDENTIFICATION

Product name	:	NALCO® GEO901
Other means of identification	:	Not applicable.
Restrictions on use	:	Refer to available product literature or ask your local Sales Representative for restrictions on use and dose limits.
Company	:	Nalco Company 1601 W. Diehl Road Naperville, Illinois 60563-1198 USA TEL: (630) 305-1000
Emergency telephone number	:	(800) 424-9300 (24 Hours) CHEMTREC
Issuing date	:	10/09/2019

Section: 2. HAZARDS IDENTIFICATION

GHS Classification

Serious eye damage	:	Category 1
Specific target organ toxicity - repeated exposure	:	Category 2 (Kidney)

GHS Label element

Hazard pictograms :

Signal Word	:	Danger
Hazard Statements	:	Causes serious eye damage. May cause damage to organs (Kidney) through prolonged or repeated exposure.
Precautionary Statements	:	**Prevention:** Do not breathe dust/fume/gas/mist/vapours/spray. Wear eye protection/face protection. **Response:** IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/ physician. Get medical advice/ attention if you feel unwell. **Disposal:** Dispose of contents/ container to an approved waste disposal plant.
Other hazards	:	None known.

Section: 3. COMPOSITION/INFORMATION ON INGREDIENTS

Pure substance/mixture	:	Mixture
		Mixture

Chemical Name	CAS-No.	Concentration: (%)
Amine Triphosphate	Proprietary	30 - 60
Sodium Phosphate, Tribasic	7601-54-9	10 - 30
Ethylene Glycol	107-21-1	1 - 5

Section: 4. FIRST AID MEASURES

In case of eye contact	:	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.
In case of skin contact	:	Wash off with soap and plenty of water. Get medical attention if symptoms occur.
If swallowed	:	Rinse mouth. Get medical attention if symptoms occur.
If inhaled	:	Remove to fresh air. Treat symptomatically. Get medical attention if symptoms occur.
Protection of first-aiders	:	In event of emergency assess the danger before taking action. Do not put yourself at risk of injury. If in doubt, contact emergency responders. Use personal protective equipment as required.
Notes to physician	:	Treat symptomatically.
Most important symptoms and effects, both acute and delayed	:	See Section 11 for more detailed information on health effects and symptoms.

Section: 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media	:	None known.
Specific hazards during firefighting	:	Not flammable or combustible.
Hazardous combustion products	:	Decomposition products may include the following materials: Carbon oxides nitrogen oxides (NOx) Oxides of phosphorus metal oxides
Special protective equipment for firefighters	:	Use personal protective equipment.
Specific extinguishing methods	:	Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. In the event of fire and/or explosion do not breathe fumes.

Section: 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Avoid inhalation, ingestion and contact with skin and eyes. When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Ensure clean-up is conducted by trained personnel only. Refer to protective measures listed in sections 7 and 8.
Environmental precautions	:	Do not allow contact with soil, surface or ground water.
Methods and materials for containment and cleaning up	:	Stop leak if safe to do so. Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Flush away traces with water.

Section: 7. HANDLING AND STORAGE

Advice on safe handling	:	Do not breathe dust/fume/gas/mist/vapours/spray. Do not get in eyes, on skin, or on clothing. Wash hands thoroughly after handling. Use only with adequate ventilation.
Conditions for safe storage	:	Keep out of reach of children. Keep container tightly closed. Store in suitable labelled containers.
Suitable material	:	The following compatibility data is suggested based on similar product data and/or industry experience: Stainless Steel 304, Stainless Steel 316L, EPDM, HDPE (high density polyethylene), Neoprene, Nitrile, Perfluoroelastomer, PTFE, MDPE, Fluoroelastomer The following compatibility data is suggested based on similar product data and/or industry experience: Shipping and long term storage compatibility with construction materials can vary; we therefore recommend that compatibility is tested prior to use.
Unsuitable material	:	The following compatibility data is suggested based on similar product data and/or industry experience: Carbon steelThe following compatibility data is suggested based on similar product data and/or industry experience:

Section: 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Form of exposure	Permissible concentration	Basis
Sodium Phosphate, Tribasic	7601-54-9	STEL	5 mg/m3	AIHA WEEL
Ethylene Glycol	107-21-1	TWA (Vapour.)	25 ppm	ACGIH
		STEL (Vapour.)	50 ppm	ACGIH
		STEL (Inhalable fraction, Aerosol only)	10 mg/m3	ACGIH

Engineering measures : Good general ventilation should be sufficient to control worker exposure to

airborne contaminants.

Personal protective equipment

Eye protection	:	Safety goggles Face-shield
Hand protection	:	Wear the following personal protective equipment: Impervious gloves, resistant to chemicals. Nitrile rubber butyl-rubber Neoprene gloves Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.
Skin protection	:	Wear suitable protective clothing.
Respiratory protection	:	Use local exhaust ventilation or other engineering controls as necessary to control airborne mist and vapor. Where concentrations in air may exceed the limits given in this section or when significant mists, vapors, aerosols are generated, an approved air purifying respirator equipped with suitable filter cartridges is recommended. Multi-purpose combination filter: Combined particulates and organic vapour type In event of emergency or planned entry into unknown concentrations, a positive pressure, full-facepiece SCBA or supplied-air respirator should be used. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection.
Hygiene measures	:	Handle in accordance with good industrial hygiene and safety practice. Remove and wash contaminated clothing before re-use. Wash face, hands and any exposed skin thoroughly after handling. Provide suitable facilities for quick drenching or flushing of the eyes and body in case of contact or splash hazard.

Section: 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Liquid
Colour	:	colourless
Odour	:	Mild
Flash point	:	105 °C, Method: ASTM D 3278, Tag closed cup
pH	:	3.5 - 5.5,(10 %), (25 °C)
Odour Threshold	:	no data available
Melting point/freezing point	:	no data available
Initial boiling point and boiling range	:	no data available
Evaporation rate	:	no data available
Flammability (solid, gas)	:	Not applicable.
Upper explosion limit	:	no data available
Lower explosion limit	:	no data available

Vapour pressure	:	24 mm Hg, (25 °C),
Relative vapour density	:	no data available
Relative density	:	1.42, (20 °C),
Density	:	1.4 g/cm3 , 11.7 lb/gal
Water solubility	:	completely soluble
Solubility in other solvents	:	no data available
Partition coefficient: n-octanol/water	:	no data available
Auto-ignition temperature	:	no data available
Thermal decomposition	:	no data available
Viscosity, dynamic	:	no data available
Viscosity, kinematic	:	250 mm2/s (20 °C)
Molecular weight	:	no data available
VOC	:	3 %

Section: 10. STABILITY AND REACTIVITY

Reactivity	:	No dangerous reaction known under conditions of normal use.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	No dangerous reaction known under conditions of normal use.
Conditions to avoid	:	None known.
Incompatible materials	:	None known.
Hazardous decomposition products	:	In case of fire, hazardous decomposition products may be produced such as: Carbon oxides nitrogen oxides (NOx) Oxides of phosphorus metal oxides

Section: 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure	:	Inhalation, Eye contact, Skin contact

Potential Health Effects

Eyes	:	Causes serious eye damage.
Skin	:	Health injuries are not known or expected under normal use.
Ingestion	:	Health injuries are not known or expected under normal use.

Inhalation	:	Health injuries are not known or expected under normal use.
Chronic Exposure	:	Health injuries are not known or expected under normal use.

Experience with human exposure

Eye contact	:	Redness, Pain, Corrosion
Skin contact	:	No symptoms known or expected.
Ingestion	:	No symptoms known or expected.
Inhalation	:	No symptoms known or expected.

Toxicity

Product

Acute oral toxicity	:	Acute toxicity estimate: > 5,000 mg/kg
Acute inhalation toxicity	:	no data available
Acute dermal toxicity	:	Acute toxicity estimate: > 5,000 mg/kg
Skin corrosion/irritation	:	no data available
Serious eye damage/eye irritation	:	no data available
Respiratory or skin sensitization	:	no data available
Carcinogenicity	:	no data available
Reproductive effects	:	no data available
Germ cell mutagenicity	:	no data available
Teratogenicity	:	no data available
STOT - single exposure	:	no data available
STOT - repeated exposure	:	May cause damage to organs through prolonged or repeated exposure.
Aspiration toxicity	:	no data available

Section: 12. ECOLOGICAL INFORMATION

Ecotoxicity

Environmental Effects	:	This product has no known ecotoxicological effects.

Product

Toxicity to fish	:	LC50 Lepomis macrochirus (Bluegill sunfish): > 1,000 mg/l Exposure time: 96 hrs Test substance: Product LC50 Oncorhynchus mykiss (rainbow trout): > 1,000 mg/l Exposure time: 96 hrs Test substance: Product

NOEC Lepomis macrochirus (Bluegill sunfish): 1,000 mg/l
Exposure time: 96 hrs
Test substance: Product

NOEC Oncorhynchus mykiss (rainbow trout): 1,000 mg/l
Exposure time: 96 hrs
Test substance: Product

NOEC Turbot: 1,831 mg/l
Exposure time: 96 h
Test substance: Product

LC50 Turbot: > 1,831 mg/l
Exposure time: 96 h
Test substance: Product

Toxicity to daphnia and other aquatic invertebrates : LC50 Daphnia magna (Water flea): > 2,000 mg/l
Exposure time: 48 hrs
Test substance: Product

NOEC Daphnia magna (Water flea): 2,000 mg/l
Exposure time: 48 hrs
Test substance: Product

LC50 Acartia tonsa: 426 mg/l
Exposure time: 48 h
Test substance: Product

Components

Toxicity to algae : Amine Triphosphate
EC50 : 550 mg/l
Exposure time: 72 h

Ethylene Glycol
EC50 : 6,500 mg/l
Exposure time: 96 h

Components

Toxicity to bacteria : Ethylene Glycol
> 1,995 mg/l

Components

Toxicity to fish (Chronic toxicity) : Ethylene Glycol
NOEC: 15,380 mg/l
Exposure time: 7 d

Components

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : Ethylene Glycol
NOEC: 8,590 mg/l
Exposure time: 7 d

Persistence and degradability

The organic portion of this preparation is expected to be inherently 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	:	<5%
Water	:	30 - 50%
Soil	:	50 - 70%

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

Bioaccumulative potential

This preparation or material is not expected to bioaccumulate.

Other information

no data available

Section: 13. DISPOSAL CONSIDERATIONS

The information presented only applies to the material as supplied. The classification or waste code may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated at the time of disposal to determine the proper waste identification and disposal methods in compliance with applicable regulations.

Disposal methods	:	Where possible recycling is preferred to disposal or incineration. If recycling is not practicable, dispose of in compliance with local regulations. Dispose of wastes in an approved waste disposal facility.
Disposal considerations	:	Dispose of as unused product. Empty containers should be taken to an approved waste handling site for recycling or disposal. Do not re-use empty containers.

Section: 14. TRANSPORT INFORMATION

The shipper/consignor/sender is responsible to ensure that the packaging, labeling, and markings are in compliance with the selected mode of transport.

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

Land transport (DOT)

For packages less than or equal to 119 Gallons:

Proper shipping name	:	PRODUCT IS NOT REGULATED DURING TRANSPORTATION

For packages greater than 119 Gallons:

Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
Technical name(s)	:	Sodium Phosphate, Tribasic
UN/ID No.	:	UN 3082
Transport hazard class(es)	:	9
Packing group	:	III
Reportable Quantity (per package)	:	31,250 lbs
RQ Component	:	Sodium Phosphate, Tribasic

Air transport (IATA)

Proper shipping name	:	PRODUCT IS NOT REGULATED DURING TRANSPORTATION

Sea transport (IMDG/IMO)

Proper shipping name	:	PRODUCT IS NOT REGULATED DURING TRANSPORTATION

Section: 15. REGULATORY INFORMATION

TSCA list : No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Sodium Phosphate, Tribasic	7601-54-9	5000	31250

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : Serious eye damage or eye irritation
Specific target organ toxicity (single or repeated exposure)

SARA 302 : This material does not contain any components with a section 302 EHS TPQ.

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

Ethylene Glycol 107-21-1 1 - 5 %

California Prop. 65

⚠ **WARNING:** Reproductive Harm - www.P65Warnings.ca.gov

Ethylene Glycol 107-21-1

INTERNATIONAL CHEMICAL CONTROL LAWS :

United States TSCA Inventory
On or in compliance with the active portion of the TSCA inventory

Canadian Domestic Substances List (DSL)
The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

Australia. Industrial Chemical (Notification and Assessment) Act
On the inventory, or in compliance with the inventory

Japan. ENCS - Existing and New Chemical Substances Inventory
On the inventory, or in compliance with the inventory

New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA 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.

Korea. Korean Existing Chemicals Inventory (KECI)
On the inventory, or in compliance with the inventory

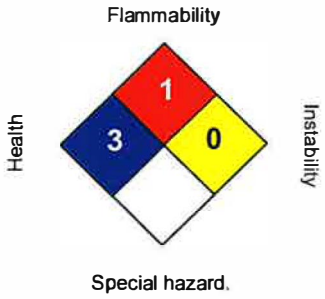
Philippines Inventory of Chemicals and Chemical Substances (PICCS)
On the inventory, or in compliance with the inventory

China Inventory of Existing Chemical Substances
On the inventory, or in compliance with the inventory

Taiwan Chemical Substance Inventory
On the inventory, or in compliance with the inventory

Section: 16. OTHER INFORMATION

NFPA:



HMIS III:

HEALTH	3*
FLAMMABILITY	1
PHYSICAL HAZARD	0

0 = not significant, 1 = Slight,
2 = Moderate, 3 = High
4 = Extreme, * = Chronic

Revision Date	:	10/09/2019
Version Number	:	1.5
Prepared By	:	Regulatory Affairs

REVISED INFORMATION: Significant changes to regulatory or health information for this revision is indicated by a bar in the left-hand margin of the SDS.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.
For additional copies of an SDS visit www.nalco.com and request access.

NALCO Water
An Ecolab Company

SAFETY DATA SHEET

GEO906

Section: 1. PRODUCT AND COMPANY IDENTIFICATION

Product name	:	GEO906
Other means of identification	:	Not applicable.
Recommended use	:	GEOTHERMAL TREATMENT
Restrictions on use	:	Refer to available product literature or ask your local Sales Representative for restrictions on use and dose limits.
Company	:	Nalco Company 1601 W. Diehl Road Naperville, Illinois 60563-1198 USA TEL: (630)305-1000
Emergency telephone number	:	(800) 424-9300 (24 Hours) CHEMTREC
Issuing date	:	06/27/2017

Section: 2. HAZARDS IDENTIFICATION

GHS Classification

Not a hazardous substance or mixture.

GHS Label element

Precautionary Statements	:	**Prevention:** Wash hands thoroughly after handling. **Response:** Get medical advice/ attention if you feel unwell. **Storage:** Store in accordance with local regulations.
Other hazards	:	None known.

Section: 3. COMPOSITION/INFORMATION ON INGREDIENTS

No hazardous ingredients

Section: 4. FIRST AID MEASURES

In case of eye contact	:	Rinse with plenty of water. Get medical attention if symptoms occur.
In case of skin contact	:	Wash off with soap and plenty of water. Get medical attention if symptoms occur.
If swallowed	:	Rinse mouth. Get medical attention if symptoms occur.
If inhaled	:	Get medical attention if symptoms occur.
Protection of first-aiders	:	In event of emergency assess the danger before taking action. Do not put

		yourself at risk of injury. If in doubt, contact emergency responders. Use personal protective equipment as required.
Notes to physician	:	Treat symptomatically.
Most important symptoms and effects, both acute and delayed	:	See Section 11 for more detailed information on health effects and symptoms.

Section: 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media	:	None known.
Specific hazards during firefighting	:	Not flammable or combustible.
Hazardous combustion products	:	Decomposition products may include the following materials: Carbon oxides nitrogen oxides (NOx) Sulphur oxides Oxides of phosphorus
Special protective equipment for firefighters	:	Use personal protective equipment.
Specific extinguishing methods	:	Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

Section: 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Refer to protective measures listed in sections 7 and 8.
Environmental precautions	:	No special environmental precautions required.
Methods and materials for containment and cleaning up	:	Stop leak if safe to do so. Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Flush away traces with water.

Section: 7. HANDLING AND STORAGE

Advice on safe handling	:	For personal protection see section 8. Wash hands after handling.
Conditions for safe storage	:	Keep out of reach of children. Keep container tightly closed. Store in suitable labelled containers.

Suitable material	:	The following compatibility data is suggested based on similar product data and/or industry experience: HDPE (high density polyethylene), Stainless Steel 304, Compatibility with Plastic Materials can vary; we therefore recommend that compatibility is tested prior to use.
Unsuitable material	:	not determined

Section: 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

Engineering measures	:	Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Personal protective equipment

Eye protection	:	Safety glasses
Hand protection	:	Wear protective gloves. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.
Skin protection	:	Wear suitable protective clothing.
Respiratory protection	:	No personal respiratory protective equipment normally required.
Hygiene measures	:	Wash hands before breaks and immediately after handling the product.

Section: 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Liquid
Colour	:	light yellow
Odour	:	no data available
Flash point	:	> 93.3 °C, Estimated
pH	:	4.2 - 5.2,(100 %), (25 °C)
Odour Threshold	:	no data available
Melting point/freezing point	:	no data available
Initial boiling point and boiling range	:	no data available
Evaporation rate	:	no data available
Flammability (solid, gas)	:	no data available
Upper explosion limit	:	no data available
Lower explosion limit	:	no data available
Vapour pressure	:	no data available
Relative vapour density	:	no data available
Relative density	:	1.17 - 1.21, (25 °C),

Density	:	9.7 - 10.1 lb/gal
Water solubility	:	completely soluble
Solubility in other solvents	:	no data available
Partition coefficient: n-octanol/water	:	no data available
Auto-ignition temperature	:	no data available
Thermal decomposition	:	no data available
Viscosity, dynamic	:	16 mPa.s (4.4 °C)
Viscosity, kinematic	:	no data available
Molecular weight	:	no data available
VOC	:	no data available

Section: 10. STABILITY AND REACTIVITY

Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	No dangerous reaction known under conditions of normal use.
Conditions to avoid	:	None known.
Incompatible materials	:	Oxidizing agents
Hazardous decomposition products	:	Decomposition products may include the following materials: Carbon oxides nitrogen oxides (NOx) Sulphur oxides Oxides of phosphorus

Section: 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure	:	Inhalation, Eye contact, Skin contact

Potential Health Effects

Eyes	:	Health injuries are not known or expected under normal use.
Skin	:	Health injuries are not known or expected under normal use.
Ingestion	:	Health injuries are not known or expected under normal use.
Inhalation	:	Health injuries are not known or expected under normal use.
Chronic Exposure	:	Health injuries are not known or expected under normal use.

Experience with human exposure

Eye contact	:	No symptoms known or expected.

No symptoms known or expected.

Skin contact	:	No symptoms known or expected.
Ingestion	:	No symptoms known or expected.
Inhalation	:	No symptoms known or expected.

Toxicity

Product

Acute oral toxicity	:	Acute toxicity estimate: > 5,000 mg/kg
Acute inhalation toxicity	:	no data available
Acute dermal toxicity	:	no data available
Skin corrosion/irritation	:	no data available
Serious eye damage/eye irritation	:	no data available
Respiratory or skin sensitization	:	no data available
Carcinogenicity	:	no data available
Reproductive effects	:	no data available
Germ cell mutagenicity	:	no data available
Teratogenicity	:	no data available
STOT - single exposure	:	no data available
STOT - repeated exposure	:	no data available
Aspiration toxicity	:	no data available

Section: 12. ECOLOGICAL INFORMATION

Ecotoxicity

Environmental Effects	:	This product has no known ecotoxicological effects.

Product

Toxicity to fish	:	LC50 Pimephales promelas (fathead minnow): > 10,000 mg/l Exposure time: 96 hrs Test substance: Product Test Type: Static NOEC Pimephales promelas (fathead minnow): 10,000 mg/l Exposure time: 96 hrs Test substance: Product Test Type: Static
Toxicity to daphnia and other aquatic invertebrates	:	LC50 Daphnia magna (Water flea): > 1,000 mg/l Exposure time: 48 hrs Test substance: Product

LC50 Ceriodaphnia dubia: 3,536 mg/l
Exposure time: 48 hrs
Test substance: Product
Test Type: Static

NOEC Ceriodaphnia dubia: 2,500 mg/l
Exposure time: 48 hrs
Test substance: Product
Test Type: Static

Toxicity to fish (Chronic toxicity) : EC25 / IC25: 5,540 mg/l
Exposure time: 7 Days
Species: Fathead Minnow
Test substance: Product

LOEC: 2,500 mg/l
Exposure time: 7 Days
Species: Fathead Minnow
Test substance: Product

NOEC: 1,250 mg/l
Exposure time: 7 Days
Species: Fathead Minnow
Test substance: Product

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : LOEC: 250 mg/l
Exposure time: 7 Days
Species: Ceriodaphnia dubia
Test substance: Product
Test Type: 3 Brood

EC25 / IC25: 173 mg/l
Exposure time: 7 Days
Species: Ceriodaphnia dubia
Test substance: Product
Test Type: 3 Brood

NOEC: 125 mg/l
Exposure time: 7 Days
Species: Ceriodaphnia dubia
Test substance: Product
Test Type: 3 Brood

Persistence and degradability

Chemical Oxygen Demand (COD): 500,000 mg/l

Biochemical Oxygen Demand (BOD):

Incubation Period	Value	Test Descriptor
5 d	329 mg/l	Product

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	:	<5%
Water	:	10 - 30%
Soil	:	50 - 70%

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

Bioaccumulative potential

This preparation or material is not expected to bioaccumulate.

Other information

no data available

Section: 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.

Disposal methods	:	Where possible recycling is preferred to disposal or incineration. If recycling is not practicable, dispose of in compliance with local regulations. Dispose of wastes in an approved waste disposal facility.
Disposal considerations	:	Dispose of as unused product. Empty containers should be taken to an approved waste handling site for recycling or disposal. Do not re-use empty containers.

Section: 14. TRANSPORT INFORMATION

The shipper/consignor/sender is responsible to ensure that the packaging, labeling, and markings are in compliance with the selected mode of transport.

Land transport (DOT)

Proper shipping name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

Air transport (IATA)

Proper shipping name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

Sea transport (IMDG/IMO)

Proper shipping name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

Section: 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity
This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity
This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards	:	No SARA Hazards
SARA 302	:	No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.
SARA 313	:	This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

California Prop 65
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

INTERNATIONAL CHEMICAL CONTROL LAWS :

United States TSCA Inventory
The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

Australia. Industrial Chemical (Notification and Assessment) Act
All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).

Canadian Domestic Substances List (DSL)
The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

Japan. ENCS - Existing and New Chemical Substances Inventory
This product contains substance(s) which are not in compliance with the Law Regulating the Manufacture and Importation Of Chemical Substances and are not listed on the Existing and New Chemical Substances list (ENCS).

Korea. Korean Existing Chemicals Inventory (KECI)
This product contains substance(s) which are not in compliance with the Chemical Control Act (CCA) and may require additional review.

Philippines Inventory of Chemicals and Chemical Substances (PICCS)
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).

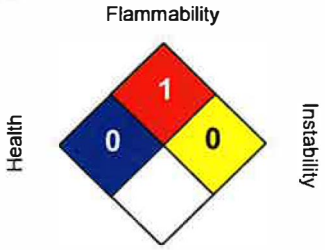
China Inventory of Existing Chemical Substances
All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on or exempt from the Inventory of Existing Chemical Substances China (IECSC).

New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA 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.

Taiwan Chemical Substance Inventory
All substances in this product comply with the Taiwan Existing Chemical Substances Inventory (ECSI).

Section: 16. OTHER INFORMATION

NFPA:



HMIS III:

HEALTH	0
FLAMMABILITY	1
PHYSICAL HAZARD	0

0 = not significant, 1 =Slight,
2 = Moderate, 3 = High
4 = Extreme, * = Chronic

Revision Date	:	06/27/2017
Version Number	:	1.1
Prepared By	:	Regulatory Affairs

REVISED INFORMATION: Significant changes to regulatory or health information for this revision is indicated by a bar in the left-hand margin of the SDS.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.
For additional copies of an SDS visit www.nalco.com and request access.

NALCO Water
An Ecolab Company

SAFETY DATA SHEET

NALCO® GEO912

Section: 1. PRODUCT AND COMPANY IDENTIFICATION

Product name	:	NALCO® GEO912
Other means of identification	:	Not applicable.
Recommended use	:	GEOTHERMAL TREATMENT
Restrictions on use	:	Refer to available product literature or ask your local Sales Representative for restrictions on use and dose limits.
Company	:	Nalco Company 1601 W. Diehl Road Naperville, Illinois 60563-1198 USA TEL: (630) 305-1000
Emergency telephone number	:	(800) 424-9300 (24 Hours) CHEMTREC
Issuing date	:	12/13/2021

Section: 2. HAZARDS IDENTIFICATION

GHS Classification

Not a hazardous substance or mixture.

GHS Label element

Precautionary Statements : **Prevention:**
Wash hands thoroughly after handling.
Response:
Get medical advice/ attention if you feel unwell.
Storage:
Store in accordance with local regulations.

Other hazards : None known.

Section: 3. COMPOSITION/INFORMATION ON INGREDIENTS

Pure substance/mixture : Mixture

No hazardous ingredients

Section: 4. FIRST AID MEASURES

In case of eye contact	:	Rinse with plenty of water. Get medical attention if symptoms occur.
In case of skin contact	:	Wash off with soap and plenty of water. Get medical attention if symptoms occur.
If swallowed	:	Rinse mouth. Get medical attention if symptoms occur.
If inhaled	:	Get medical attention if symptoms occur.

Protection of first-aiders	:	In event of emergency assess the danger before taking action. Do not put yourself at risk of injury. If in doubt, contact emergency responders. Use personal protective equipment as required.
Notes to physician	:	Treat symptomatically.
Most important symptoms and effects, both acute and delayed	:	See Section 11 for more detailed information on health effects and symptoms.

Section: 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media	:	None known.
Specific hazards during firefighting	:	Not flammable or combustible.
Hazardous combustion products	:	Decomposition products may include the following materials: Carbon oxides nitrogen oxides (NOx) Sulphur oxides
Special protective equipment for firefighters	:	Use personal protective equipment.
Specific extinguishing methods	:	Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

Section: 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Refer to protective measures listed in sections 7 and 8.
Environmental precautions	:	No special environmental precautions required.
Methods and materials for containment and cleaning up	:	Stop leak if safe to do so. Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Flush away traces with water.

Section: 7. HANDLING AND STORAGE

Advice on safe handling	:	For personal protection see section 8. Wash hands after handling.
Conditions for safe storage	:	Keep out of reach of children. Keep container tightly closed. Store in suitable labelled containers.

Suitable material	:	Keep in properly labelled containers.
Unsuitable material	:	not determined

Section: 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

Engineering measures	:	Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Personal protective equipment

Eye protection	:	Safety glasses
Hand protection	:	Wear protective gloves. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.
Skin protection	:	Wear suitable protective clothing.
Respiratory protection	:	No personal respiratory protective equipment normally required.
Hygiene measures	:	Wash hands before breaks and immediately after handling the product.

The Personal Protective Equipment (PPE) recommendations provided above have been made in good faith based on typical expected conditions of use. PPE selection should always be completed in conjunction with a proper risk assessment and in accordance with a PPE management program.

Section: 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	liquid
Colour	:	clear light yellow
Odour	:	none
Flash point	:	> 93.3 °C
pH	:	3.78, (25 °C)
Odour Threshold	:	no data available
Melting point/freezing point	:	no data available
Initial boiling point and boiling range	:	no data available
Evaporation rate	:	no data available
Flammability (solid, gas)	:	Not applicable.
Upper explosion limit	:	no data available
Lower explosion limit	:	no data available
Vapour pressure	:	no data available
Relative vapour density	:	no data available

Relative density	:	1.098, (25 °C),
Density	:	no data available
Water solubility	:	Complete
Solubility in other solvents	:	no data available
Partition coefficient: n-octanol/water	:	no data available
Auto-ignition temperature	:	no data available
Thermal decomposition	:	no data available
Viscosity, dynamic	:	no data available
Viscosity, kinematic	:	no data available
Molecular weight	:	no data available
VOC	:	no data available

Section: 10. STABILITY AND REACTIVITY

Reactivity	:	No dangerous reaction known under conditions of normal use.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	No dangerous reaction known under conditions of normal use.
Conditions to avoid	:	None known.
Incompatible materials	:	None known.
Hazardous decomposition products	:	In case of fire, hazardous decomposition products may be produced such as: Carbon oxides nitrogen oxides (NOx) Sulphur oxides

Section: 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure	:	Inhalation, Eye contact, Skin contact

Potential Health Effects

Eyes	:	Health injuries are not known or expected under normal use.
Skin	:	Health injuries are not known or expected under normal use.
Ingestion	:	Health injuries are not known or expected under normal use.
Inhalation	:	Health injuries are not known or expected under normal use.
Chronic Exposure	:	Health injuries are not known or expected under normal use.

Experience with human exposure

Eye contact	:	No symptoms known or expected.
Skin contact	:	No symptoms known or expected.
Ingestion	:	No symptoms known or expected.
Inhalation	:	No symptoms known or expected.

Toxicity

Product

Acute oral toxicity	:	no data available
Acute inhalation toxicity	:	no data available
Acute dermal toxicity	:	no data available
Skin corrosion/irritation	:	no data available
Serious eye damage/eye irritation	:	no data available
Respiratory or skin sensitization	:	no data available
Carcinogenicity	:	no data available
Reproductive effects	:	no data available
Germ cell mutagenicity	:	no data available
Teratogenicity	:	no data available
STOT - single exposure	:	no data available
STOT - repeated exposure	:	no data available
Aspiration toxicity	:	no data available

Section: 12. ECOLOGICAL INFORMATION

Toxicity

Environmental Effects : This product has no known ecotoxicological effects.

Persistence and degradability

no data available

Mobility

no data available

Bioaccumulative potential

no data available

Other information

no data available

Section: 13. DISPOSAL CONSIDERATIONS

Disposal methods	:	Where possible recycling is preferred to disposal or incineration. If recycling is not practicable, dispose of in compliance with local regulations. Dispose of wastes in an approved waste disposal facility.
Disposal considerations	:	Dispose of as unused product. Empty containers should be taken to an approved waste handling site for recycling or disposal. Do not re-use empty containers.

Section: 14. TRANSPORT INFORMATION

The shipper/consignor/sender is responsible to ensure that the packaging, labeling, and markings are in compliance with the selected mode of transport.

Land transport (DOT)

Proper shipping name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

Air transport (IATA)

Proper shipping name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

Sea transport (IMDG/IMO)

Proper shipping name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

Section: 15. REGULATORY INFORMATION

TSCA list : No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

This product does not contain a RQ substance, or this product contains a substance with a RQ, however the calculated RQ exceeds the reasonably attainable upper limit.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : No SARA Hazards

SARA 302 : This material does not contain any components with a section 302 EHS TPQ.

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

California Prop. 65
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

INTERNATIONAL CHEMICAL CONTROL LAWS :

United States TSCA Inventory
On or in compliance with the active portion of the TSCA inventory

Australia. Australian Industrial Chemicals Introduction Scheme (AICIS)
On the inventory, or in compliance with the inventory.

Japan. ENCS - Existing and New Chemical Substances Inventory
not determined

Korea. Korean Existing Chemicals Inventory (KECI)
not determined

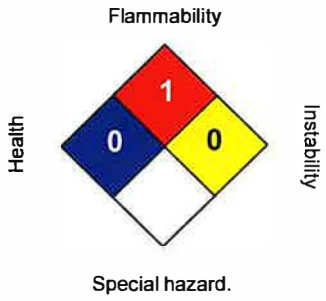
Philippines Inventory of Chemicals and Chemical Substances (PICCS)
not determined

China Inventory of Existing Chemical Substances
On the inventory, or in compliance with the inventory.

Taiwan Chemical Substance Inventory
not determined

Section: 16. OTHER INFORMATION

NFPA:



HMIS III:

HEALTH	0
FLAMMABILITY	1
PHYSICAL HAZARD	0

0 = not significant, 1 = Slight,
2 = Moderate, 3 = High
4 = Extreme, * = Chronic

Revision Date	:	12/13/2021
Version Number	:	1.1
Prepared By	:	Regulatory Affairs

REVISED INFORMATION: Significant changes to regulatory or health information for this revision is indicated by a bar in the left-hand margin of the SDS.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use,

processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.
For additional copies of an SDS visit www.nalco.com and request access.

COMMENTS

150 SOUTH NINTH STREET
EL CENTRO, CA 92243-2850

TELEPHONE: (442) 265-1800
FAX: (442) 265-1799

AIR POLLUTION CONTROL DISTRICT

June 20, 2023

RECEIVED
JUN 20 2023
IMPERIAL COUNTY
PLANNING & DEVELOPMENT SERVICES

Jim Minnick
Planning & Development Services Director
801 Main Street
El Centro, CA 92243

SUBJECT: Conditional Use Permit (CUP) 23-0013 Phoenix 1, LLC test wells

Dear Mr. Minnick:

The Imperial County Air Pollution Control District (Air District) appreciates the opportunity to review and comment on the Conditional Use Permit (CUP) #23-0013 application submitted by Phoenix 1, LLC for the sole purpose of taking the existing wells at Orita 2 and Orita 4 for the testing of resource properties for potential future development.

The Air District after careful review had concluded that the sites Orita 2 and Oritia 4 along with any modifications require an Air District Permit. Please have the applicant submit an application for an Authority to Construct to the Air District.

For your convenience the Air District's rules and regulations can be accessed online at https://apcd.imperialcounty.org/rules-and-regulations. Should you have any questions or concerns please feel free to contact the Air District for assistance at (442) 265-1800.

Respectfully,

Monica N Soucier
APC Division Manager

Valerie Grijalva

From: Ana L Gomez
Sent: Friday, June 9, 2023 4:02 PM
To: Derek Newland
Cc: ICPDSCommentLetters; Margo Sanchez; Nicolas Berg
Subject: CUP23-0013 No comments

Good afternoon,

At the moment, the Ag Dept. does not have any comments on this project for applicant Phoenix 1 LLC

Thank you,

Ana Gomez
Agricultural Biologist/Standards Specialist
Special Projects Division
Imperial County Agricultural Commissioner
Sealer of Weights and Measures
(442) 265-1500
analgomez@co.imperial.ca.us

Laryssa Alvarado

From: Andrew Loper
Sent: Wednesday, June 28, 2023 7:40 AM
To: Laryssa Alvarado
Cc: Michael Abraham; Diana Robinson; Derek Newland; Aimee Trujillo; John Robb; Kamika Mitchell; Melina Rizo; Rosa Soto; Valerie Grijalva; Robert Malek
Subject: RE: Request for Comments- CUP23-0013 Phoenix I LLC

Good Morning
Imperial County Fire Department has no comments at this time for CUP #23-0013.

Imperial County Fire Department reserves the right to comment and request additional requirements pertaining to this project regarding fire and life safety measures, California Building and Fire Code, and National Fire Protection Association standards at a later time as we see necessary.

Andrew Loper
Imperial County Fire Department
Lieutenant/Fire Prevention Specialist
2514 La Brucherie Road, Imperial CA 92251
Office: 442-265-3021
Cell: 760-604-1828

From: Laryssa Alvarado <laryssaalvarado@co.imperial.ca.us>
Sent: Tuesday, June 6, 2023 9:24 AM
To: Rachel Garewal <RachelGarewal@co.imperial.ca.us>; Sandra Mendivil <SandraMendivil@co.imperial.ca.us>; Jolene Dessert <JoleneDessert@co.imperial.ca.us>; Margo Sanchez <MargoSanchez@co.imperial.ca.us>; Ana L Gomez <analgomez@co.imperial.ca.us>; Belen Leon <BelenLeon@co.imperial.ca.us>; Monica Soucier <MonicaSoucier@co.imperial.ca.us>; Jesus Ramirez <JesusRamirez@co.imperial.ca.us>; Ryan Kelley <RyanKelley@co.imperial.ca.us>; Rosa Lopez <RosaLopez@co.imperial.ca.us>; Vanessa Ramirez <VanessaRamirez@co.imperial.ca.us>; Jeff Lamoure <JeffLamoure@co.imperial.ca.us>; Alphonso Andrade <AlphonsoAndrade@co.imperial.ca.us>; Jorge Perez <JorgePerez@co.imperial.ca.us>; Mario Salinas <MarioSalinas@co.imperial.ca.us>; Salvador Flores <SalvadorFlores@co.imperial.ca.us>; Robert Malek <RobertMalek@co.imperial.ca.us>; Andrew Loper <AndrewLoper@co.imperial.ca.us>; Guillermo Mendoza <GuillermoMendoza@co.imperial.ca.us>; John Gay <JohnGay@co.imperial.ca.us>; Ryan Kelley <rkelley@icso.org>; Robert Benavidez <RBenavidez@icso.org>; Fred Miramontes <fmiramontes@icso.org>; Donald Vargas - IID <DVargas@IID.com>; marcuscuero@campo-nsn.gov; jmesa@campo-nsn.gov; historicpreservation@quechantribe.com; tribalsecretary@quechantribe.com
Cc: Michael Abraham <MichaelAbraham@co.imperial.ca.us>; Diana Robinson <DianaRobinson@co.imperial.ca.us>; Derek Newland <DerekNewland@co.imperial.ca.us>; Aimee Trujillo <aimeetrujillo@co.imperial.ca.us>; John Robb <JohnRobb@co.imperial.ca.us>; Kamika Mitchell <kamikamitchell@co.imperial.ca.us>; Laryssa Alvarado <laryssaalvarado@co.imperial.ca.us>; Melina Rizo <melinarizo@co.imperial.ca.us>; Rosa Soto <RosaSoto@co.imperial.ca.us>; Valerie Grijalva <ValerieGrijalva@co.imperial.ca.us>
Subject: Request for Comments- CUP23-0013 Phoenix I LLC

Good morning,

Please see attached Request for Comments packet for APN's **039-080-004,039-080-005,039-080-006** [2300 Farr Road, Brawley, CA] **Phoenix I LLC**

IID

www.iid.com

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June 20, 2023

Mr. Derek Newland
Planner II
Planning & Development Services Department
County of Imperial
801 Main Street
El Centro, CA 92243

SUBJECT: Phoenix 1, LLC Geothermal Test Well Regeneration Pilot Project

Dear Mr. Newland:

On June 5, 2023 the Imperial Irrigation District received from the Imperial County Planning & Development Services Dept., a request for agency comments on the Phoenix 1, LLC test well regeneration pilot project. The applicant proposes to rework (repair, re-drill and/or clean out) two (2) previously approved geothermal wells to conduct flow testing and determine their commercial reserves for ultimate development. The well sites are located at 2300 Farr Road, Brawley, CA (APNs 039-080-004, - 005-000 & -006-000).

The IID has reviewed the application and has the following comments:

1. IID water facilities that may be impacted include the include the Magnolia Lateral, Mesquite Lateral, Mesquite Lateral Drain, and Magnolia Drain.

2. To insure there are no impacts to IID water facilities, the project's plans are to be submitted to IID Water Department Engineering Services Section for review prior to final project design. For more information, applicant should contact IID WDES Section at (760) 339-9265.

3. The applicant is required to apply for a temporary water account for construction water as well as apply for an encroachment permit. For additional information regarding construction water the applicant contact IID's Water Department North End Division at (760) 482-9900.

4. The applicant may not use IID's canal or drain banks to access the future geothermal development site. Any abandonment of easements or facilities will be approved by IID based on systems (Irrigation, Drainage, Power, etc.) needs.

5. On page iii of Imperial County's Request for Review and Comments document, in the *Water Requirements and Sources* Section, the fourth sentence states "... or, if feasible, a temporary pipeline from the irrigation canal or lateral, or tail water sump, would be used to deliver water". If the applicant requests to install a temporary pipeline within IID's facilities an encroachment permit will be required.

6. The applicant will be required to provide and bear all costs associated with acquisition of rights of way, easements, and infrastructure relocations deemed necessary to accommodate street or road improvements imposed by the county or municipality.

7. Any construction or operation on IID property or within its existing and proposed right of way or easements including but not limited to: surface improvements such as proposed new streets, driveways, parking lots, landscape; and all water, sewer, storm water, or any other above ground or underground utilities; will require an encroachment permit, or encroachment agreement

(depending on the circumstances). A copy of the IID encroachment permit application and instructions for its completion are available at the website https://www.iid.com/about-iid/department-directory/real-estate. The district Real Estate Section should be contacted at (760) 339-9239 for additional information regarding encroachment.

8. In addition to IID's recorded easements, IID claims, at a minimum, a prescriptive right of way to the toe of slope of all existing canals and drains. Where space is limited and depending upon the specifics of adjacent modifications, the IID may claim additional secondary easements/prescriptive rights of ways to ensure operation and maintenance of IID's facilities can be maintained and are not impacted and if impacted mitigated. Thus, IID should be consulted prior to the installation of any facilities adjacent to IID's facilities. Certain conditions may be placed on adjacent facilities to mitigate or avoid impacts to IID's facilities.

9. Any new, relocated, modified or reconstructed IID facilities required for and by the project (which can include but is not limited to electrical utility substations, electrical transmission and distribution lines, water deliveries, canals, drains, etc.) need to be included as part of the project's California Environmental Quality Act and/or National Environmental Policy Act documentation, environmental impact analysis and mitigation. Failure to do so will result in postponement of any construction and/or modification of IID facilities until such time as the environmental documentation is amended and environmental impacts are fully analyzed. Any and all mitigation necessary as a result of the construction, relocation and/or upgrade of IID facilities is the responsibility of the project proponent.

Should you have any questions, please do not hesitate to contact me at 760-482-3609 or at dvargas@iid.com. Thank you for the opportunity to comment on this matter.

Respectfully,

Donald Vargas
Compliance Administrator II

Sergio Quiroz – Interim General Manager
Mike Pacheco – Manager, Water Dept.
Jamie Asbury – Manager, Energy Dept.
Matthew H Smelser – Deputy Mgr. Energy Dept.
Daryl Buckley – Mgr. of Distribution Srvcs. & Maint. Oprtns., Energy Dept.
Geoffrey Holbrook – General Counsel
Michael P. Kemp – Superintendent General, Fleet Services and Reg. & Environ. Compliance
Laura Cervantes. – Supervisor, Real Estate
Jessica Humes – Environmental Project Mgr. Sr., Water Dept.

COUNTY OF IMPERIAL

DEPARTMENT OF PUBLIC WORKS

155 S. 11th Street
El Centro, CA 92243

Tel: (442) 265-1818
Fax: (442) 265-1858

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Public Works works for the Public

ICDPW

October 12, 2023

Mr. Jim Minnick, Director
Planning & Development Services Department
801 Main Street
El Centro, CA 92243

Attention: Derek Newland, Planner II

SUBJECT: CUP 23-0013 for Phoenix 1, LLC
Located on 2300 Farr Rd, Brawley, CA 92227
APN 039-080-004, 005 & 006

Dear Mr. Minnick:

This letter is in response to your submittal received by this department on June 6, 2023 for the above mentioned project. The applicant is proposing to rework two (2) existing formerly permitted geothermal test wells on two (2) existing well pads for temporary testing.

Department staff has reviewed the package information and the following comments shall be Conditions of Approval:

1. An Imperial County encroachment permit for the work within the County road right of ways of Farr Road and Irvine Road. Minimum crossing standards are found at the County's design guidelines manual at the following web address: https://publicworks.imperialcounty.org/forms-and-guidelines/.

2. If the piping proposed along Farr Road and Irvine Road is temporary, is it proposed to be removed or to remain in place? Typically the County does not allow any facilities to be abandoned in place, due to long term future conflicts with underground facilities.

3. The proposed pipeline route, above and/or underground needs a formal review process through either plan check or encroachment permit before any approvals can be committed to. This includes proposed routing outside County road right of way, existing or future.

4. Landowner permissions and/or easements will be required for placement of private facilities in private lands. Consideration of existing underground tile drain lines in the private farmland should be coordinated with the respective landowners. Any modified tile drain lines in IIDs Mesquite Drain requires separate coordination with the IID.

5. From the schematic drawing, it appears the pipeline along Farr Road is north of the IID's Mesquite lateral. If this is the case, then the location of the proposed above grade pipeline is not a conflict with potential traffic on Farr Road. Rather, concurrent coordination with the

EEC ORIGINAL PKG

IID will also be needed to consider the crossing from east side of Irvine, to the northwest past Farr Road.

6. IID will have their own IID encroachment permit process and should be contacted separately for work within their right of way along the Mesquite lateral and drains.

Should you have any questions, please do not hesitate to contact this office. Thank you for the opportunity to review and comment on this project.

Respectfully,

By:

David Dale, PE, PLS
Assistant Public Works Director, County Surveyor

APPLICATION

EEC ORIGINAL PKG

Mr. Jim Minnick, Director

April 21, 2023

County of Imperial
Planning & Development Services Department
801 Main Street
El Centro, CA 92243

Re: Phoenix 1 LLC. Orita Wells Conditional Use Permit Application

Dear Mr. Minnick:

Phoenix 1 LLC, a wholly owned subsidiary of Phoenix Lithium (Phoenix), is submitting the enclosed Conditional Use Permit (CUP) application for workover and testing of two existing geothermal wells on two existing well pads located approximately 11 miles east of the city of Brawley, north of Highway 78 and immediately west of the East Highline Canal. The enclosed CUP application package includes the following contents in printed and electronic formats:

1. CUP Application Form for the proposed activities (3 copies)
2. A Project Description, including environmental protection measures to avoid or reduce environmental impacts (3 copies)
3. A completed Imperial County Planning & Development Services Department (ICPDSD) Notice to Applicant form (3 copies)
4. A completed ICPDSD General Indemnification form (3 copies)
5. Signed Owner's Affidavit (3 copies)
6. Phoenix's check in the amount of $3,500, in payment of the CUP application deposit

We believe the project qualifies for a categorical exemption from environmental review under the California Environmental Quality Act (CEQA). As described in the attached Project Description, the project meets the definition of a Class 2 and common sense exemption. Phoenix hopes to begin well workover activities in May 2023 and would be happy to meet with ICPDSD staff to further discuss the project to support your review of our CUP application.

Sincerely,

Arnold J. Wolf

Arnold Wolf
Director, Project Execution
Phoenix Lithium LLC
aw@phoenixlithium.com
(904) 735-5304

cc: Nicholas Wakim/CEO

CONDITIONAL USE PERMIT

I.C. PLANNING & DEVELOPMENT SERVICES DEPT.
801 Main Street, El Centro, CA 92243 (760) 482-4236

- APPLICANT MUST COMPLETE ALL NUMBERED (black) SPACES – Please type or print -

1.	PROPERTY OWNER'S NAME J. Emanuelli Geothermal, LLC	EMAIL ADDRESS Don Emanuelli (demauelli@yahoo.com)	
2.	MAILING ADDRESS (Street / P O Box, City, State) 220 W. Main St. Brawley CA	ZIP CODE 92227	PHONE NUMBER 760-344-1104
3.	APPLICANT'S NAME Phoenix 1 LLC	EMAIL ADDRESS Arnold Wolf (aw@phoenixlithium.com)	
4.	MAILING ADDRESS (Street / P O Box, City State) 4001 Kennett Pike, Suite 302, Wilmington Delaware	ZIP CODE 19807	PHONE NUMBER 904-735-5304
4.	ENGINEER'S NAME CA. LICENSE NO. n/a	EMAIL ADDRESS n/a	
5.	MAILING ADDRESS (Street / P O Box, City, State) n/a	ZIP CODE n/a	PHONE NUMBER n/a

6. ASSESSOR'S PARCEL NO. 039-080-004, 039-080-005, 039-080-006	SIZE OF PROPERTY (in acres or square feet) APNs total approx 432 acre	ZONING (existing) A2R/A3
7. PROPERTY (site) ADDRESS n/a		
8. GENERAL LOCATION (i.e. city, town, cross street) 11 miles East of the city of Brawley		
9. LEGAL DESCRIPTION APN 039-080-004: Tract 43, except the south 100 feet thereof Township 13 South, Range 16 East, San Bernardino Meridian (289.5 acres) APN 039-080-006: S1/4 E1/4 NE 1/4 and E1/2 SE1/4 of Section 20, Township 13 S, Range 16 E, San Bernardino Meridian, lying north of the centerline of the Magnolia Canal Canal (82.5 acres) APN 039-080-005: N 3/4 E1/2 NE1/4 of Section 20, Township 13 S, Range 16 E, San Bernardino Meridian (60 acres)		

PLEASE PROVIDE CLEAR & CONCISE INFORMATION (ATTACH SEPARATE SHEET IF NEEDED)

10. DESCRIBE PROPOSED USE OF PROPERTY (list and describe in detail)
Well testing production and injection. See attached project description.

11. DESCRIBE CURRENT USE OF PROPERTY Existing well pads and sumps are not in current use. Surrounded by agriculture use/

12. DESCRIBE PROPOSED SEWER SYSTEM n/a

13. DESCRIBE PROPOSED WATER SYSTEM n/a

14. DESCRIBE PROPOSED FIRE PROTECTION SYSTEM n/a

15. IS PROPOSED USE A BUSINESS? ☐ Yes ☒ No	IF YES, HOW MANY EMPLOYEES WILL BE AT THIS SITE?

I / WE THE LEGAL OWNER (S) OF THE ABOVE PROPERTY CERTIFY THAT THE INFORMATION SHOWN OR STATED HEREIN IS TRUE AND CORRECT

Don Emanuelli — 4/21/2023
Print Name — Date
Signature

Print Name — Date
Signature

REQUIRED SUPPORT DOCUMENTS

A. SITE PLAN
B. FEE
C. OTHER
D. OTHER

APPLICATION RECEIVED BY		DATE	
APPLICATION DEEMED COMPLETE BY		DATE	
APPLICATION REJECTED BY		DATE	
TENTATIVE HEARING BY		DATE	
FINAL ACTION ☐ APPROVED ☐ DENIED		DATE	

REVIEW / APPROVAL BY OTHER DEPARTMENTS
☐ P W
☐ E H S
☐ A P C
☐ D E S
☐
☐

CUP # 23-0013

EEC ORIGINAL PKG

Project Description

Introduction

Phoenix 1 LLC, a wholly owned subsidiary of Phoenix Lithium (Phoenix), a minerals developer, is proposing to conduct flow testing, circulating brine between two existing geothermal wells: Orita 2 and Orita 4. Testing activities would be located within existing well pads with disposal to portable tanks and then reinjected. The flow testing will enable Phoenix to determine the stability of brine characteristics over time, draw brine samples for analysis and, ultimately, prove commercial reserves for ultimate development. This Conditional Use Permit (CUP) application includes activities necessary to conduct well testing only. No permanent installations or ongoing activities are proposed.

Geothermal wells Orita 2 and Orita 4 were drilled and tested in 2010 and 2011 under Imperial County Conditional Use Permit (CUP) #G-09-0002. The CUP covered well drilling and testing activities at six well sites across the Ram Power Incorporated lease area. Phoenix's proposed testing activities are consistent with the well testing activities that the County previously approved under CUP #G-09-0002; however, the current proposed activities involve only two existing wells for well workover (repair, redrill and/or clean out as/if needed), testing, and monitoring.

Project Location

The project is located in Imperial County within the East Brawley Known Geothermal Resource Area (KGRA). Each well location is identified in Table 1 below.

Table 1 Location of Existing Orita Wells 2 and 4

Well Name	Location	Assessor Parcel Number
Orita 2-API 025-94187	NW¼, Section 20, TBS, RI6E, SBB&M	039-080-004
Orita 4- API 025-91490	SE¼, Section 20, TBS, R16E, SBB&M	039-080-006

Current Use of the Project Site and Adjacent Areas

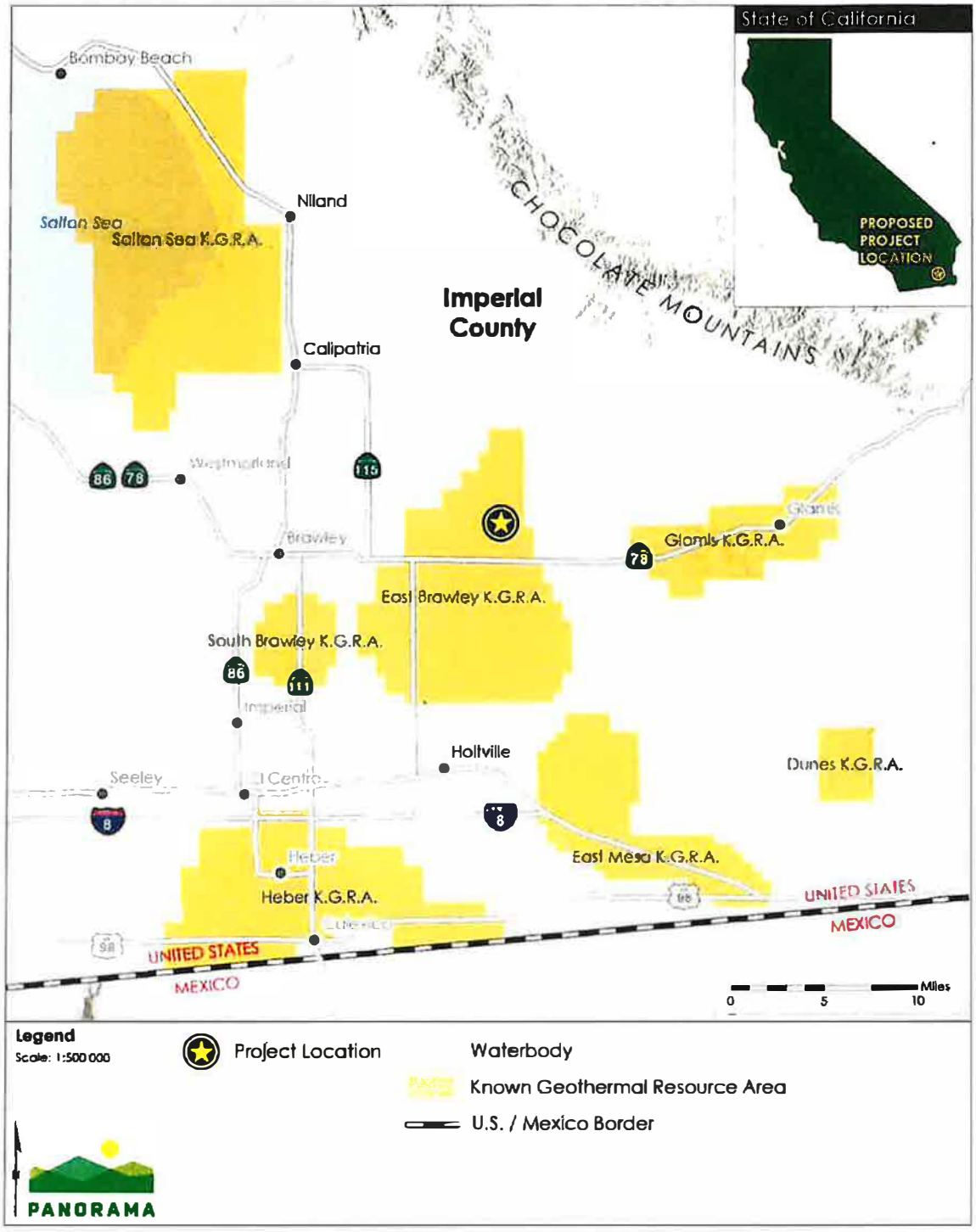
The project site includes the existing wells and well pads at Orita 2 and Orita 4 that were previously constructed under CUP#G-09-0002. The existing wells are located on existing well pads adjacent to active agricultural fields. The project site also includes private farm roads and crosses two unpaved public roads, Farr Road and Irvine Road. Adjacent land uses also include IID irrigation laterals and drains that parallel Farr Road (e.g., IID's Mesquite Lateral) and Irvine Road (unnamed IID drainage), though the project will not encroach on IID irrigation laterals and drains.

Exploration Well Program

The purpose of the proposed project is to test properties of the "resource" within the East Brawley KGRA at Orita 2 and 4 geothermal wells to evaluate use of the wells for future development.

Testing at the existing well sites is planned to explore a specific geophysical or geologic target. Project activities would include minor repair of existing access roads, workover of two existing exploration wells, flow-testing each well into above ground storage tanks, through pipeline to the adjacent well and reinjected into the deep reservoir. The plan includes continued monitoring of well pressure and other data in each well following the completion of well workover and flow-testing.

Figure 1 Project Location



Site Access

Primary highway access to the project area will be from State Highway 115 to Farr Road, then eastwards to the proposed well sites, or from State Highway 78 to Butters Road, then northwards to Shank Road and the proposed well sites. Existing points of ingress/egress will be utilized during well workover and testing activities. No new access from public roads or irrigation lateral or drain crossings are proposed. Encroachment permits for ingress/egress and irrigation lateral or drain crossings, if necessary, will be obtained from the Imperial Irrigation District as required.

Existing farm access roads will be utilized to access the existing well pads at Orita 2 and 4. The access roads will be maintained, as needed, to safely accommodate the traffic required for the well workover and testing activities, and to reduce fugitive dust. The existing well sites have been selected to minimize surface disturbance, reduce the potential for adverse environmental effects, and make the best use of existing access within the limitation of testing the targeted geothermal resource.

Proposed Well Testing Activities

Site and Well Preparation Activities

No new well pads will be constructed because the project will use existing wells located on existing well pads. Maintenance of the existing well pads may be required depending on the conditions at the time of drill rig mobilization. Pad maintenance activities, if necessary, would include minor clearing and earthwork, drainage, and other improvements necessary for efficient and safe operation. All work will be limited to the existing well pad. Each well pad would be prepared to provide a level pad for the drill rig and a graded surface for the support equipment. Runoff from undisturbed areas around the existing well pads will not be modified by current activities. All machinery, drilling platforms, and oil and fuel storage will be in areas tributary to the well cellar in order to prevent the movement of stormwater from these areas off of the well pad.

Water Requirements and Sources

Water required for well workover could be 50,000 gallons per day, and will vary dependent on downhole conditions and particular operations. Water requirements for road maintenance, well pad maintenance, and fugitive dust control will average less. Water necessary for these activities will be obtained either from local IID irrigation canals or laterals in conformance with IID construction water acquisition requirements or from field tail water. Water will either be picked up from the source and delivered to each well pad by a water truck which will be capable of carrying approximately 4,000 gallons per load or, if feasible, a temporary pipeline from the irrigation canal or lateral, or tail water sump, would be used to deliver water to the well pad during pad maintenance or well workover. Any temporary water pipeline will be laid on the surface immediately adjacent to the access road to the site.

Well Workover and Testing

The well workover will be completed at Orita 2 and Orita 4 to ensure that the wells can be safely flow tested, the goal of this project is to flow test the wells and confirm the characteristics of the reservoir to determine if the resource is commercially viable.

Well Workover

Well workover activities will be completed at each well as determined necessary to repair any casing damage, remove scale and any other blockages in existing wells that may inhibit flow to/from the deep reservoir. Work to reestablish the well could include a sidetrack and recompletion. Any change to the well construction will require CalGEM approval. Equipment will be mobilized to the well pad and positioned within each respective pad (in sequence). Equipment anticipated to be used for the well workover include:

- Drill rig (tier 3, diesel powered)
- Water storage tanks
- Generator
- Portable cooling tanks
- Cement and pump trucks
- Temporary housing and working trailers
- Portable sanitation facilities

A drill rig will be positioned over the existing well. Drilling fluid will be circulated through the well, returned to surface, cooled and recirculated during operations. Depending on the condition of the existing well casing, repair of the well casing may be required. Well workover activities may include mechanical cleaning with a drill bit within the casing and perforated liner, removal of fill from bottom of well, downhole well logging, running cementing new casing, and/or sidetrack from existing wellbore and recompletion. All well workover activities would be confined to each pad, with collection and proper disposal of any solids removed from the wellbore (sumpless operations).

The well workover process is anticipated to last 2 weeks. Following workover, each well will be shut in at the well head, the drilling rig and equipment will be removed, and site prepared for flow testing.

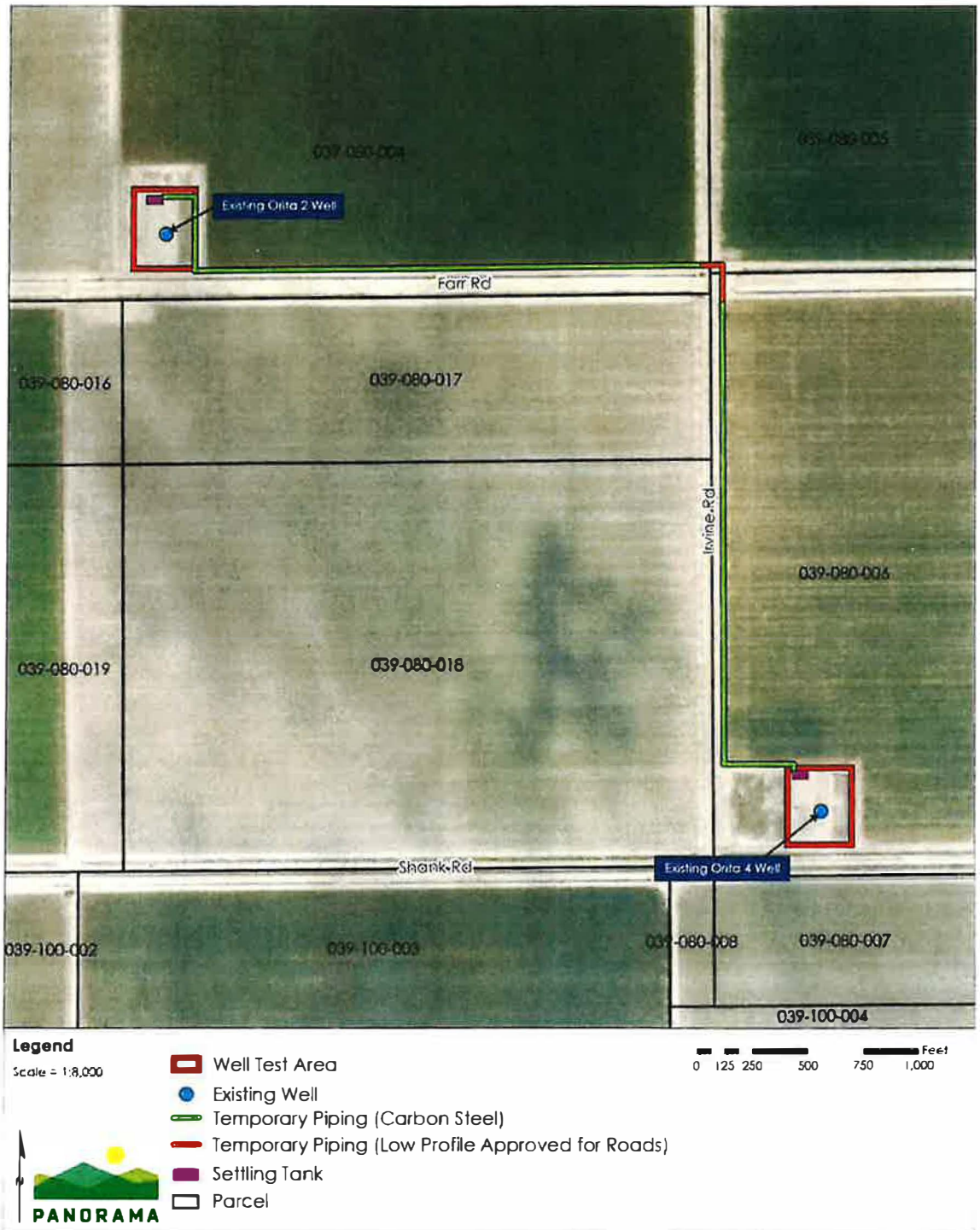
Well Testing

Each well will be tested by flowing the geothermal well fluid through test facilities, with the produced geothermal fluid transported via temporary pipelines between Orita 2 and Orita 4. Geothermal fluid will be monitored for temperatures, pressures, flow rates, chemistry and other parameters. Steam from the geothermal fluid will be allowed to discharge to the atmosphere. Produced fluid from the flow test will be pumped into portable cooling tanks and then back into a non-flowing well.

An "injectivity" test may be conducted by monitoring flow rates and pressures while injecting the produced fluid from one well into the other via the temporary transfer piping. Downhole logging will be performed during the well tests minimally for pressure temperature and flowrates.

Approximately 1 mile of temporary transfer piping will be installed between Orita 2 and Orita 4, along Farr Road and Irvine Road, as shown in Figure 2, below. The piping will be routed above ground, including the road crossing at the intersection of Irvine Road and Farr Road. With the exception of the road crossing, piping will be routed on private land. In the case of the road crossing, piping will be approved by Imperial County Department of Public Works (ICDPW) and designed to allow traffic to drive over the piping by installing ramps or similar structures to protect the pipe. Piping will not extend over, under, or encroach upon an open-top IID canal. The pipeline will generally include three segments:

Figure 2 Proposed Temporary Pipeline Alignment



Note: Temporary pipe location across the Farr Road/Irvine Road intersection is preliminary; exact placement of the temporary piping will occur as approved by all applicable permits and approvals.

- Orita 2 Well Pad to Irvine Road – The pipeline will consist of approximately 8-inch-diameter carbon steel pipe and will be located on private land north of and paralleling the IID Mesquite Lateral between the Orita 2 well pad and Irvine Road.
- Farr Road and Irvine Road Intersection – The pipeline will transition to an approximately 8-inch-diameter low-profile pipeline that has been approved by the ICDPW for temporary use within the County right-of-way.
- Farr Road to Orita 4 Well Pad – The pipeline will consist of approximately 8-inch-diameter carbon steel pipe and will be located on private land east of and paralleling Irvine Road between the Orita 4 well pad and Farr Road.

All engineering, materials and installation methods associated with the piping will comply with existing geothermal transfer piping standards and best practice guidelines. Internal piping pressure is anticipated to be above 60 pounds per square inch (psi). Adjustments to the pipeline location and material will be made to accommodate regulatory requirements or recommendations from ICDPW, if needed.

Following testing activities, the well will be shut in. Temperature profiles of the wellbore may be measured during the shut in period.

Equipment associated with well testing includes:

- Coiled tubing unit run in hole to lift and start well flowing (1 day)
- Tanks for flashing the fluid to take measurements for the flow tests
- Pipelines with pressure, temperature, chemical sampling ports, and flow measurement instruments; this equipment will be moved from one well to the other for the second test
- Storage and settling tanks to bring flow into pipeline between pads, each pad will have a bank of tanks for the duration of activities
- Pumps to assist with fluid movement between pads and injection

Equipment used for well testing will be confined to the well test area at each well pad, with the major components moved from one well location to the other for the second test. Temporary piping between wells would be limited to private land to the extent feasible. Encroachment permits would be obtained from ICDPW and IID as necessary for any activities that encroach on existing County or IID right-of-way.

The duration of flow testing is anticipated to be no longer than 12 weeks. Following completion of the well testing, all of the well workover and testing equipment would be removed from the site.

Post-Testing

The surface facilities remaining on the site consists of several valves (mastervalve and side entry valves) on top of the surface casing; which will be chained and locked and surrounded by an approximately 12-foot by 12-foot by 6-foot high fence to prevent unauthorized access and vandalism. Pressure and temperature sensors may be installed in the hole or at surface at fixed depths to monitor any changes in these parameters over time. Temperature profile of the well may also be run following tests to monitor well recovery. The wells will likely continue to be monitored while separate and future approvals for any potential commercial operations are being processed. This monitoring may be continued indefinitely.

If a well is judged to not have commercial potential, it may continue to be monitored, or it may be abandoned in conformance with the well abandonment requirements of California Geologic Energy Management Division (CalGEM).

Well Site Reclamation and Well Abandonment

After well workover and testing operations are completed on each well, the liquids from the portable tanks will either be pumped back down the well or disposed of in accordance with the requirements of the CRWQCB or Imperial County Public Health Department, as applicable.

The solid contents, typically consisting of non-hazardous, non-toxic drilling mud and rock cuttings, will be removed and disposed of in a waste disposal facility authorized by the CRWQCB or other applicable authority to receive and dispose of these materials.

Abandonment of a geothermal well in conformance with the well abandonment requirements of CalGEM involves plugging the well bore and casing with clean drilling mud and cement sufficient to ensure that fluids will not move across the well bore and casing into different aquifers. The well head (and any other equipment) is removed and the casing cut off at least 6 feet below ground surface. Following abandonment of the well, the well site is either reclaimed or left for use by the landowner, if requested by the landowner.

Environmental Protection Measures

The measures identified in this section are intended to prevent all unacceptable impacts from occurring as a result of the proposed well workover and testing operations.

Fire Prevention: Well sites, construction sites, and access roads will be cleared of all vegetation. The cleared areas will be maintained during workover and testing operations. Fire extinguishers will be available around the drilling rig and on well pad sites. Water that is used for drilling will also be available for firefighting.

Personnel will be allowed to smoke only in designated areas.

Surface and Ground Water Quality Protection: Phoenix will submit encroachment permit applications to the IID for activities that may occur in IID rights-of-way, and will comply with the IID permit conditions to protect roads, irrigation channels, and water delivery facilities in the area. Required permits would be obtained from the IID for any pad maintenance or well workover/drilling water to be produced from IID canals.

The well site locations have been selected to minimize the potential for surface water pollution from runoff during pad maintenance, well workover, and testing.

Cemented concentric steel casing prevents surface water and ground water pollution from produced fluids.

Only water-based non-toxic, non-hazardous drilling mud will be utilized during well workover/drilling operations. Waste drilling mud and drill cuttings will be stored in portable tanks or similar portable containment and removed from the site.

The existing geothermal wells will be inspected and repaired as necessary to ensure they are appropriately cased and cemented to prevent interzonal migrations of fluids and reduce the possibility

of blowouts. Based on the results of wells previously drilled in the Project area, no over-pressured or gas-rich zones are expected to be encountered.

Prevention of Soil Erosion: No cut or till slopes are anticipated to be required because the well pads have already been developed. If fill is needed in the maintenance of well pads or access roads, it will be provided. Runoff will be channeled to energy dissipaters as necessary to minimize erosion. In addition, the Project will adopt relevant CRWQCB best management practices if necessary to further prevent soil erosion.

Air Quality Protection: Applications will be submitted to the Imperial County Air Pollution Control District (ICAPCD) for an Authority to Construct permit for the geothermal well workover activities, testing activities, and generator use. The Project will comply with the ICAPCD permit conditions of approval to limit emissions from the Project activities.

Fugitive dust generation during pad maintenance and use of on-site private roads and the well sites will be minimized by watering as necessary. To further reduce fugitive dust emissions, vehicle traffic on private roads and well sites will be kept below 15 miles per hour. The Project will comply with any requirements concerning emissions of air pollutants from well-drilling/workover equipment and non-condensable gases from the geothermal fluid during flow testing.

Prevention of Noise: To abate noise pollution, mufflers will be utilized on engine-driven equipment during pad maintenance and well workover operations.

Protection of Public Health and Safety: In addition to the emergency contingency plans, public health and safety will be protected through instructions to work crews and contractors regarding compliance with regulations.

Protection of Fish, Wildlife, and Botanical Resources: Direct impacts to wildlife habitat and botanical resources will be minimized by clearing only within boundaries of the existing well pads and access roads. Fish habitat will be protected through prevention of erosion.

If well workover and testing occurs during the bird nesting season (February 15 – August 31), then a preconstruction nesting bird survey would be conducted by a qualified biologist. If an active nest is observed in the project area, the qualified biologist will employ appropriate procedures for nest avoidance and monitoring to ensure that project activities do not disturb the nest. If nesting birds show signs of distress during well workover and testing activities, the biologist will halt all work at the well pad. Work will not recommence in the area of the active nest until nesting activities have ceased and the young have fledged the nest. Phoenix will coordinate with the United States Fish and Wildlife Service and the CDFW, as applicable, for any preparation, implementation and monitoring activities deemed necessary for the protection of any identified biological resources in the area (i.e., nesting birds).

Waste Disposal: Solid waste materials (trash) and construction waste will be deposited at an authorized landfill by a disposal contractor.

Portable chemical sanitary facilities will be used by all personnel. These facilities will be maintained by a local contractor.

Environmental Monitoring: During well workover and testing activities, regular, routine visual inspections of the well pads and access roads will be conducted by Project personnel to quickly detect

and correct any problems that could lead to adverse environmental effects. The drilling fluid and any cuttings produced during workover will be monitored by visual inspection and chemical analyses by the drilling personnel, the well site geologist, and the contract mud engineer to detect any problems which may be occurring downhole. An Environmental Specialist will monitor and inspect the operations, as necessary, during the course of the Project.

California Environmental Quality Act

A CEQA Class 2 (Replacement of Reconstruction) exemption allows for replacement or reconstruction of existing structures and facilities where the new structure will be located on the same site as the structure replaced and will have substantially the same purpose and capacity as the structure replaced (CEQA Guidelines 15302).

Construction of well pads and access roads, well drilling, and well testing at Orita 2 and Orita 4 was previously authorized under CUP #G-09-0002. The project has been designed to use existing wells and well pads for the proposed testing activities. Proposed well testing activities would be located on the same site as the original well pad, testing would be completed using the existing well, and the purpose of the activity is consistent with the purpose and capacity of the wells authorized by CUP #G-09-0002. The proposed activities appear to meet the definition of a CEQA Class 2 exemption. The proposed activities are not anticipated to result in significant impacts as described in Table 2 below.

Table 2 Assessment of Environmental Impacts from the Proposed Project

Resource Area	Impact Assessment
Aesthetics	Equipment will be visible during well workover and testing activities. Views of large equipment are not uncommon in the East Brawley KGRA because of active farming operations and geothermal well drilling and testing that occurs in the KGRA. Equipment will be consistent with the type of equipment and duration of use previously authorized under CUP #G-09-0002.
Agriculture and Forestry	Well workover and testing will occur on existing well pads using existing wells. No ground disturbing activities are proposed in areas that have not been previously disturbed. Temporary piping would be installed adjacent to agricultural fields but will not conflict with ongoing agricultural activities. Temporary piping would be removed after testing is complete. Workover and testing activities will not impede agricultural operations in adjacent fields.
Air Quality/Greenhouse Gases	Well workover and testing will occur on existing well pads using existing wells. Well pad and access road maintenance, if necessary, may generate dust. Fugitive dust will be minimized by watering as necessary. To further reduce fugitive dust emissions, vehicle traffic on private unpaved roads and well sites will be kept below 15 miles per hour. The Project will comply with any requirements concerning emissions of air pollutants from well-drilling/workover equipment and non-condensable gases from the geothermal fluid during flow testing. Well workover and testing activities would result in emissions include NOx, carbon monoxide (CO), particulate matter (PM), and sulfur dioxide. Activities would be short-term lasting approximately two weeks for well workover and up to 12 weeks for well

	testing activities. Emissions will be similar to emissions authorized under CUP #G-09-0002.
Biological Resources	Well workover and testing will occur on existing well pads using existing wells. No ground disturbing activities are proposed in areas that have not been previously disturbed. No direct impacts to special-status species will occur. Project activities have the potential to generate noise levels that may disturb wildlife, including migratory birds. If well workover and testing occurs during the bird nesting season (February 15 – August 31), then a preconstruction nesting bird survey would be conducted by a qualified biologist. If an active nest is observed in the project area, the qualified biologist will employ appropriate procedures for nest avoidance and monitoring to ensure that project activities do not disturb the nest. Project activities would be postponed, if necessary, to avoid impacts on nesting birds.
Cultural Resources/Tribal Cultural Resources	Well workover and testing will be conducted on existing well pads that were previously permitted and constructed for the same use. No ground disturbing activities are proposed in areas that have not been previously disturbed. No impacts to cultural resources are anticipated.
Energy	The project will require energy resources including fuel to power equipment used for well workover and testing. A generator will be used to provide power to the site during the workover and testing phases of the project. No permanent energy consumption is proposed. Energy use related to the project will cease after well testing. Equipment will be consistent with the type of equipment and duration of use previously authorized under CUP #G-09-0002.
Geology, Minerals, Soils, and Paleontology	The well testing will be conducted on existing well pads that were previously permitted and constructed for the same use. Well workover and testing activities will not require drilling new wells or disturbance of previously undisturbed areas. The existing well pads are flat and not susceptible to landslides. Proposed activities could include minor disturbance of previously disturbed areas but will not result the loss of topsoil or induce erosion at the site.
Hazards and Hazardous Materials	Project activities will require the limited transport and temporary use of materials deemed to be hazardous, including unleaded gasoline, diesel fuel, oil, lubricants (i.e., motor oil, transmission fluid, and hydraulic fluid), solvents, adhesives, and paint materials. However, any potentially hazardous materials used or found onsite during construction will be handled in accordance with state and federal regulations regarding the transport, use, and storage of hazardous materials.
Hydrology and Water Quality	The well testing will be conducted on existing well pads that were previously designed and permitted for the same use. Well pads were previously constructed to include a stormwater containment basin, which will remain functional throughout project activities. The project will not alter drainage patterns and no surface waters will be affected by well workover and testing activities.

Land Use and Planning	The well testing will be conducted on existing well pads that were previously permitted for the same use. Adjacent land uses includes active agricultural fields. Proposed activities will not conflict with existing or planned land use or zoning.
Noise	Well workover and testing is anticipated to generate noise level between 90-110 decibels. Noise would be generated at the well pads, which are over 1000 feet away from the nearest residence. Noise generated at the well pad would attenuate substantially before reaching residences and will not cause excessive noise levels. Project noise has the potential to generate noise levels that may disturb wildlife, including migratory birds. Impacts to nesting birds from noise are addressed above under the environmental assessment for Biological Resources.
Population and Housing	No residential structures exist on the existing well pads. Labor for well workover and testing activities will be hired from the local workforce. No impact on population and housing will occur.
Public Services	The project includes well workover activities that will last approximately 2 weeks (per well) and testing activities that will last approximately 12 weeks (non continuous). Given the short duration of project activities, demand for police and fire protection services is not anticipated to increase as a result of the project. No impact on schools, hospitals, libraries, and other public services is anticipated.
Recreation	No recreation facilities exist near the project site. The project would not impact recreation.
Transportation	The project will not impede traffic on local roadways. Temporary piping will cross the intersection of Farr Road and Irvine Road and will be designed to allow traffic to drive over the pipes. All necessary encroachment permits will be obtained prior to commencement of project activities.
Utilities	The project will not require utility connections and will not impact existing utilities.

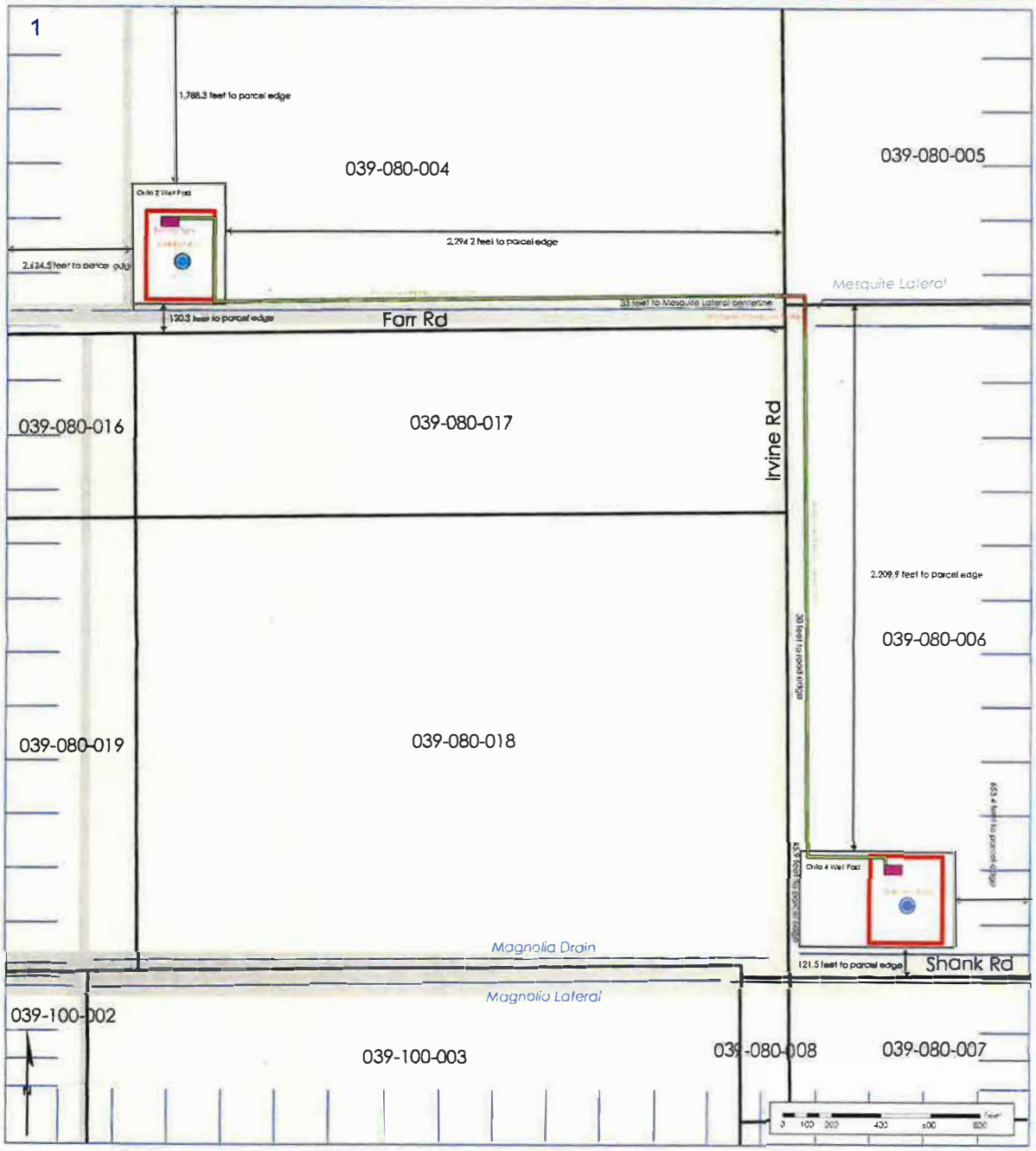
The project also meets the definition of the CEQA common sense exemption (CEQA Guidelines 15061(b)(3)). Table 2 identifies potential impacts from the proposed project activities. The project will have no significant effect on the environment; therefore, the common sense exemption applies.

SITE PLAN

I.C. PLANNING & DEVELOPMENT SERVICES DEPT
801 Main Street, El Centro, CA 92243 (760) 482-4236

READ INSTRUCTIONS ON THE BACK ! USE PEN TO DRAW – DO NOT USE PENCIL!

DRAW SITE LAYOUT PLAN TO SCALE & COMPLETE ALL NUMBERED SPACES !



DRAW SITE LAYOUT PLAN TO SCALE & COMPLETE ALL NUMBERED SPACES!

NAME OF APPLICANT	APPLICANT PHONE NO	SIZE OF PARCEL
2 Phoenix 1 LLC	3 904-735-5304	4 APNs total approx 432 acre

PROJECT SITE ADDRESS	ASSESSOR'S PARCEL NO
5 n/a	6 039-080-004,039-080-005, 039-080-006

WHITE - OFFICE MASTER / YELLOW - ASSESSORS / PINK - APPLICANT

EEC ORIGINAL PKG

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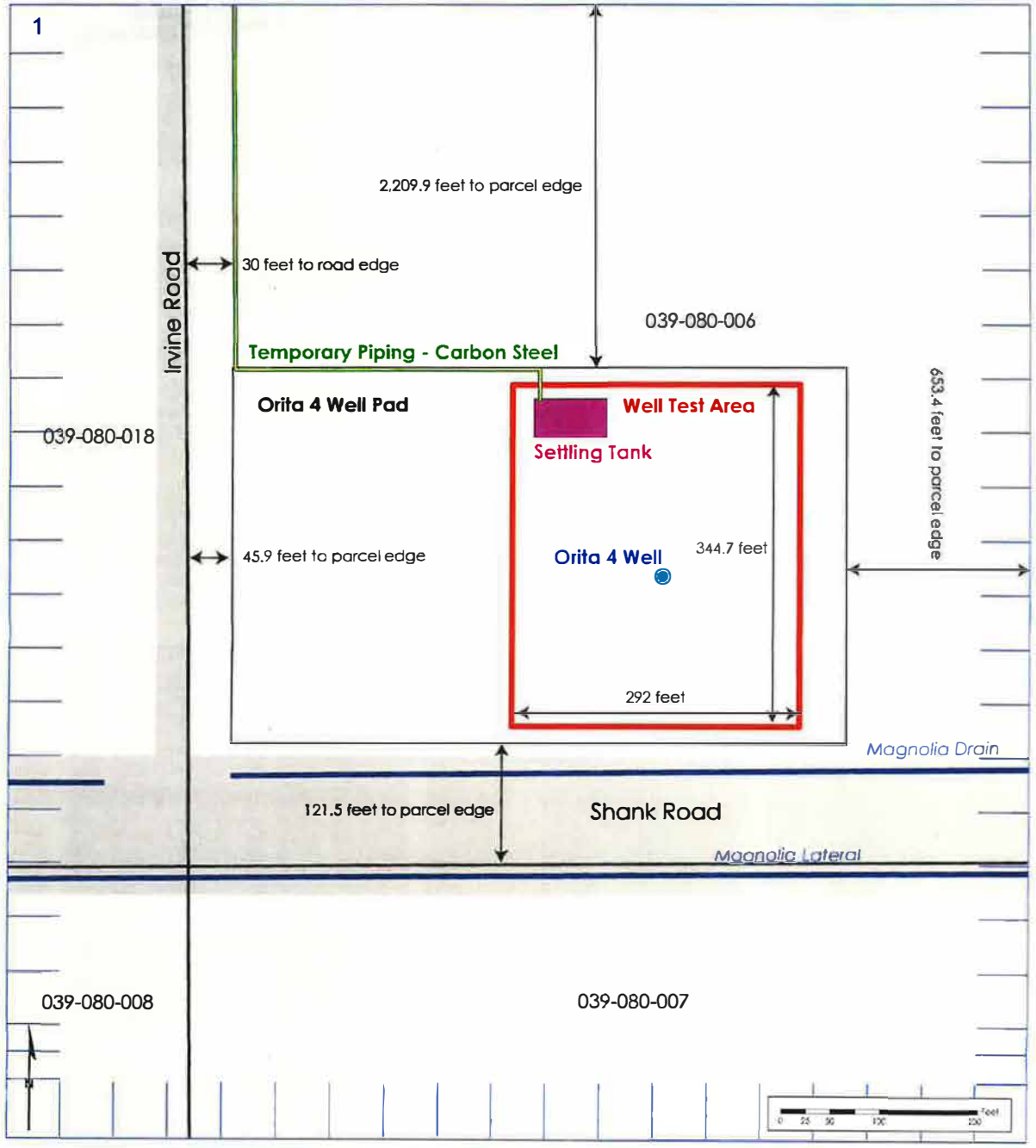

NAME OF APPLICANT	APPLICANT PHONE NO	SIZE OF PARCEL
2 Phoenix 1 LLC	3 904-735-5304	4 82.5 acres

PROJECT SITE ADDRESS	ASSESSORS PARCEL NO
5 n/a	6 039-080-006

WHITE - OFFICE MASTER / YELLOW - ASSESSORS / PINK - APPLICANT

EEC ORIGINAL PKG

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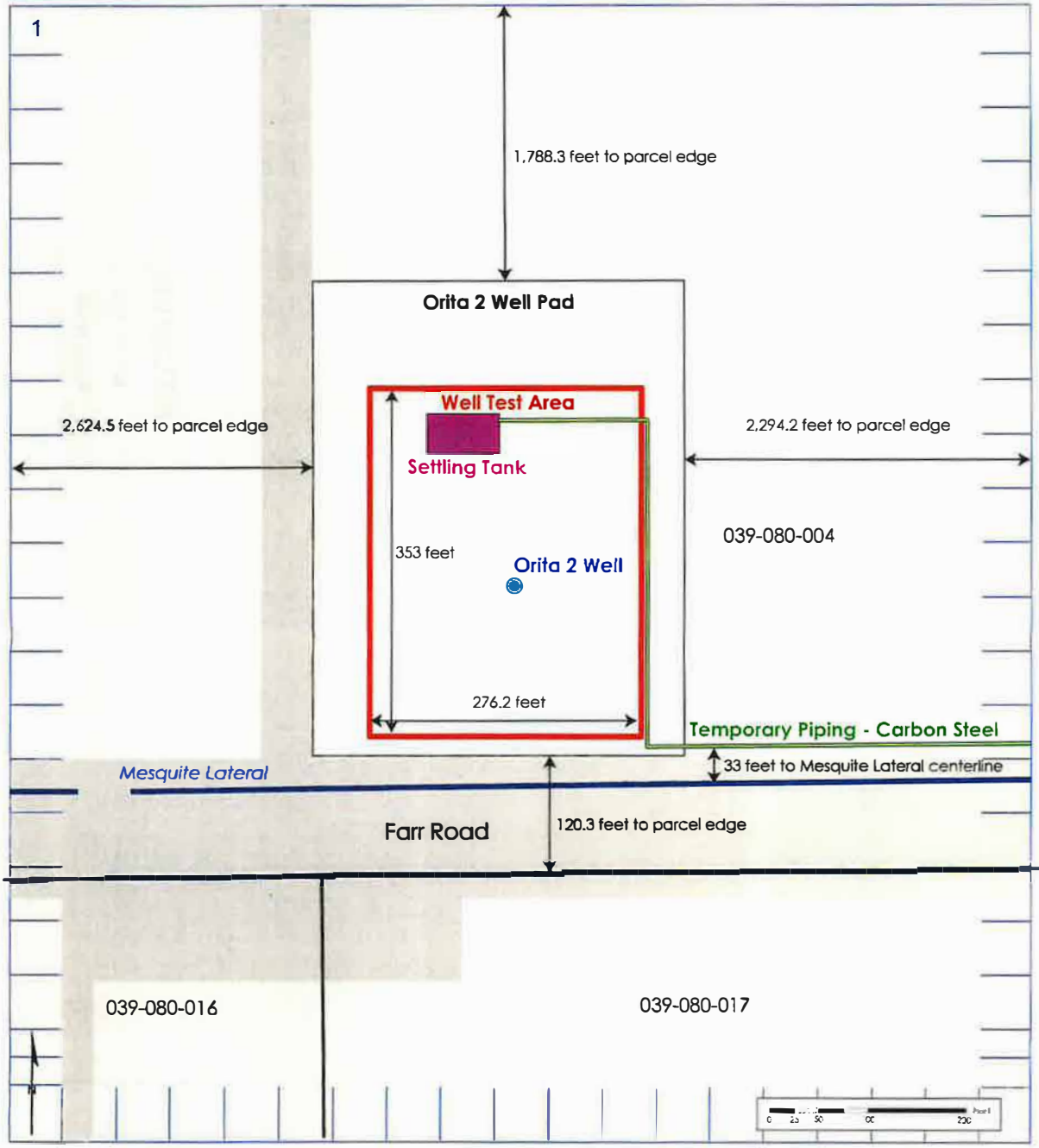

NAME OF APPLICANT 2 Phoenix 1 LLC	APPLICANT PHONE NO 3 904-735-5304	SIZE OF PARCEL 4 289.5 acres
PROJECT SITE ADDRESS 5 n/a	ASSESSORS PARCEL NO 6 039-080-004	

WHITE - OFFICE MASTER / YELLOW - ASSESSORS / PINK - APPLICANT

EEC ORIGINAL PKG