

US EPA ARCHIVE DOCUMENT

**WESTERN ENVIRONMENTAL INC. AND WRT INDIO, LLC
ADMINISTRATIVE ORDER ON CONSENT
WORK PLAN**

EPA DOCKET NO. RCRA 7003-09-2011-0002

Prepared for

**WESTERN ENVIRONMENTAL INC.
And
WRT INDIO, LLC
62-150 GENE WELMAS DRIVE
MECCA, CALIFORNIA 92254**

And

**U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION IX
WASTE MANAGEMENT DIVISION
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TABLE OF CONTENTS

1.0	INTRODUCTION	1
1.1	Purpose	2
1.2	Objectives	2
1.3	Discussion of Technical Approach	3
1.4	Communication	4
1.5	EPA Oversight	4
1.6	Project Oversight	4
2.0	ODOR SCREENING, QUANTIFICATION AND REPORTING METHODOLOGY	5
2.1	Material Categories	5
2.1.1	Category 1 - Non Odorous	5
2.1.2	Category 2 - Potentially Odorous	5
2.1.3	Category 3 - Odorous	5
2.2	Odor Air Screening Methodology and Approach	6
2.2.1	Off-site Screening for Odor Producing Compounds Prior to Receipt of Materials	6
2.2.2	On-site Screening for Odor Producing Compounds	6
2.2.3	On-site Screening Using Direct Reading Instruments	7
2.2.4	Perimeter Air Sampling/Monitoring Following U.S. EPA and OSHA/NIOSH Air Sampling Methods	7
2.3	Odor Source Investigation and Reporting	8
3.0	PROJECT PLANS	9
3.1	Quality Assurance Project Plan (QAPP)	9
3.2	Health and Safety Plan (HASP)	10
3.3	Community Relations Plan	11
3.4	Odor Screening Sampling Plan	11
4.0	MITIGATIVE MEASURES AND ODOR CONTROL	13
4.1	Immediate Mitigative Measures Taken to Date	13
4.2	Mitigative Measures to Control Odorous Emissions of Operations	14
4.3	Mitigative Measures to Reduce Odorous Emissions	14
4.4	Mitigative Measures for Treatment Odorous Emissions	14
5.0	IMPLEMENTATION OF REFINED ODOR CONTROL PROGRAM	16
5.1	Short Term Measures	16
5.2	Feasibility Studies to Define Long Term Operational Controls	16
5.2.1	Performance Based Approval Criteria	16
5.2.2	Feasibility Studies to Control Odorous Emissions	17
5.2.3	Materials Accepted for Feasibility Studies at the WEI/WRT Facilities	17
5.2.4	Selection and Evaluation of Operational Controls to Mitigate Odor Impacts	18
5.3	Management of Odor Producing Materials During Storage and Treatment	18

US EPA ARCHIVE DOCUMENT

6.0	PROJECT SCHEDULE AND COST ESTIMATE	20
7.0	REPORTING OF RESULTS	21
7.1	Annual Report of Odor Screening and Mitigative Actions Taken	21
7.1.1	Introduction	21
7.1.2	Discussion of On-site, Perimeter and Background Monitoring	21
7.1.3	Discussion of Mitigative Actions Taken	21
7.1.4	Reporting of Odors and Odorous Materials	21
7.1.5	Summary and Conclusions	21

ATTACHMENTS

- Table 1: Odor Screening Protocol
- Appendix A: Waste Profile Forms
- Appendix B: Odor Screening Protocol
- Appendix C: Work Plan Schedule
- Appendix D: Odor Control Product Specification

US EPA ARCHIVE DOCUMENT

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1.0 INTRODUCTION

The USEPA Region IX Waste Management Division issued a Unilateral Administrative Order (UAO) on May 19, 2011 under Section 7003 of the Resource Conservation and Recovery Act, 42 U.S.C. Section 6900, et seq., as amended, to Western Environmental Inc. (WEI) and WRT Indio, LLC (WRT) based on EPA determination that WEI and WRT “have contributed or are contributing to the past or present handling, storage, treatment, transportation or disposal of solid waste that may present an imminent and substantial endangerment to health or the environment”. WEI and WRT operate facilities located at 62-150 Gene Welmas Drive, in Mecca, California on tribal land of the Cabazon Band of Mission Indians.

Based on information presented principally by the South Coast Air Quality Management District (SCAQMD) (a California state agency), EPA determined that operations at the facilities have created off-site odor impacts in the Mecca community. SCAQMD determined from analytical samples it collected that all air toxic gasses were below or within typical urban ranges. In a March 31, 2011 report SCAQMD found “. . . there have been no elevated levels of toxic pollutants detected in the community. However, there are still known health impacts resulting from exposure to strong and objectionable odors. . . .” See UAO at ¶ 21.

EPA issued the UAO after concluding that “The past and present handling, storage and treatment of certain defined categories of contaminated soils and the co-composted organic wastes may present an imminent and substantial endangerment to human health or the environment within the meaning of Section 7003(a) of RCRA, 42 U.S.C. § 6973(a). Emissions from the Site may have led to complaints by students and staff at the Saul Martinez Elementary School and others within the community in Mecca, California, and affected individuals have sought medical treatment following exposure. Respondents, as the operators of the Site, have contributed and are contributing to the handling, storage and treatment of solid wastes from which emissions are causing a potential endangerment.” See UAO at ¶ 25.

Pursuant to a directive from the Cabazon Band of Indians in February 2011, WEI/WRT WEI/WRT ceased receiving shipments of soy-whey waste and took steps to remove the oily water from the oil/water separation pond. Since the UAO was issued, WEI/WRT have undertaken an additional set of odor mitigation and control actions at the facility to address any existing odor sources, including:

- Suspension of all incoming shipments of odor producing wastes.
- Reduction of the height and size of existing storage piles.

- Increased frequency of water application (using spray truck) to control odor and PM emissions on-site.
- Hydroseeding of storage piles with grass mix to stabilize soils and reduce odor and PM emissions.
- Application of a polymer coating to select storage piles to reduce PM emissions.
- Applied soil cover to compost piles containing soy whey solids to reduce odor emissions

The work plan that follows is required by the UAO. Concurrently, EPA and WEI/WRT are negotiating an Administrative Order on Consent to supersede the UAO.

1.1 Purpose

In this WEI/WRT set out their approach to address potential off-site odor emissions from the facility, of which the primary components are :

- 1) A more robust program to identify potential odor-causing materials handled at the WEI/WRT facility which is already in the process of implementation;
- 2) The immediate application of mitigation measures to odor producing materials at the site; and,
- 3) A longer term effort to identify and implement for each type of odor producing material the most appropriate mitigative measures taking into consideration best management practices and site-specific conditions for the different materials handled at the facility.

1.2 Objectives

WEI/WRT intend to control off-site odor impacts through attainment of the following three main objectives:

Enhanced Controls for Odors From On-site Operations

To achieve this objective WEI/WRT has commenced the following steps :

1. Developed odor control measures that are specific to the odor producing potential of the existing on-site materials and operations and the incoming materials.
2. Defined the odor threshold concentrations of the individual odor producing chemicals.
3. Identified and implemented operational changes to the material treatment and handling processes at WEI/WRT to minimize off-site odor impacts.
4. Assessed the feasibility of implementing immediate facility-scale odor countermeasures to supplement the odor characterization program.

Enhanced Characterization of Odor Producing Chemicals in Materials

To achieve this objective WEI/WRT has taken the following actions:

5. Identified specific odor sources associated with the WEI/WRT operations and the odor producing chemicals in the materials that generate odors.
6. Defined quantitative thresholds for odor producing chemicals that will trigger enhanced controls.
7. Developed measurement methods and procedures to assess concentrations of odor producing chemicals for incoming materials and during the processing of materials.

Enhanced Monitoring and Controls for Odors Migrating Off-site

To achieve this objective, WEI/WRT intends to:

8. Establish property line action levels and implement testing methods for odor producing chemicals based on the material profiling and odor characterization.
9. Implement property line controls for odor producing chemicals

Additionally, WEI/WRT have begun to implement a program to enhance community understanding of their operations and odor minimizing measures.

1.3 Discussion of Technical Approach

To affect long term control, WEI/WRT has defined a three tiered system to characterize the odor producing potential of materials entering the facility as the primary control for off-site odor impacts. Odor characteristics of incoming and process materials will be quantified using readily available sampling and analytical methods to identify the chemical compounds suspected of causing odors, as discussed in Section 2.0 Odor Screening, Quantification and Reporting Methodology. The results of the sampling and analysis will be employed to development and implement control strategies that are specific to material type, chemical composition and chemical concentration.

Through regular monitoring of concentrations of chemicals known to produce odors at of acceptance and during processing will allow WEI/WRT to implement mitigative measures to reduce or eliminate odor potential. The monitoring will be performed in accordance with the Odor Screening, Quantification and Reporting Methodology presented in Section 2.0, and the project action limits set out there will serve as action levels to take additional steps to reduce or eliminate odor impacts.

As an adjunct to the controls provided by the odor characterization protocol, the facility will evaluate, select and implement physical and/or chemical odor controls based on analytical data and monitoring results. The process for evaluating odor controls and their effectiveness is presented in Section 4.0, Mitigative Measures. Mitigation measures implemented to date are detailed in Section 4.1.

Under this work plan, WEI/WRT has also developed methods and procedures for monitoring property line concentrations of the chemicals known to produce odors and off-site odor impacts. The methods include the use of direct reading instrumentation and long term ambient and grab samples for laboratory analysis. The monitoring will serve as the basis for confirming the potential exceedance of the project action levels beyond the property boundaries, which will serve as action levels for taking additional actions to reduce or eliminate off-site odor impacts.

1.4 Communication

The primary contacts for activities to be conducted pursuant to this work plan are the EPA Project Coordinator and the Cabazon Band of Mission Indians Compliance Manager:

Barry Cofer U.S. Environmental Protection Agency, Region IX Waste Management Division (WST-3) 75 Hawthorne Street San Francisco, California 94105 (415) 972-3303 cofer.barry@epa.gov	Becky Ross Compliance Manager Cabazon Band of Mission Indians 84-245 Indio Springs Pkwy Indio, CA 92203 brross@cabazonindians-nsn.gov
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1.5 EPA Oversight

EPA will provide oversight of the Respondents' activities throughout performance of the Work required under the AOC and this work plan. EPA will review deliverables to ensure that all Work correctly identifies and achieves the requirements of the AOC and this work plan. Notwithstanding any action by EPA, Respondents remain fully responsible for achieving the provisions and requirements of the AOC and this work plan. Nothing in the AOC, this work plan or any other submission, shall be deemed to constitute a warranty or representation of any kind by EPA that full performance of the work plan. Respondents' compliance with submissions approved by EPA does not foreclose EPA from seeking additional work to achieve the requirements of the AOC.

1.6 Project Oversight

The Project Coordinator for the site is Dr. George Bower of ESRA Consulting LLC. His contact information is as follows :

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2.0 ODOR SCREENING, QUANTIFICATION AND REPORTING METHODOLOGY

The procedure described in this work plan was developed to specifically address the screening of materials received at the Western Environmental, Inc. (WEI) Mecca, California and WRT Indio, LLC (WRT) facilities for the purpose of establishing a protocol for the handling and air characterization of materials that would minimize to the extent practicable the generation of nuisance odors on-site and at the downwind property site boundaries. Section 2.1 provides an introduction and a description of material categories. Section 2.2 discusses the specific air screening procedures WEI/WRT has proposed to identify and measure odorous compounds. Section 2.3 discusses WEI/WRT's procedures for investigating and reporting of odors. Table 1 attached summarizes the odor screening protocol for materials received at WEI/WRT facilities. Appendix B presents the screening protocol and form used to investigate and report potential odorous sources.

2.1 Material Categories

The procedure recognizes that there are three distinct categories of materials that are received at the WEI/WRT facilities which include Category 1- Non Odorous, Category 2 - Potentially Odorous and Category 3 - Odorous as described below:

2.1.1 Category 1 - Non Odorous

Waste Liquid: Hydrant water, brine water, non-contaminated liquid.

Solids Waste: Grout, fly ash, heavy metal soil without organics, scrap metal, clean plastic, clean wood, concrete, dried drilling muds, mature compost, non-contaminated soil of less than 500 mg/kg TPH, pesticide soil, soil with horse hair and oats, sand from casting molds, soil with high salinity, and sand blast media.

2.1.2 Category 2 - Potentially Odorous

Waste Liquid: Storm water, oily water, clarifier water, mop water, hydro blast water, parts wash water, drilling muds, tank bottoms, Class A biosolids, uniform waste water, cosmetic waste, sugar based syrups, used cooking oil, well monitoring water, and vehicle wash water.

Solid Waste: diesel and oil spill, filter cake from water filtration, filter cake from anodizing, UST soil, clarifier removal, soil cuttings, heavy metal soil with organics, green waste, construction demolition debris, absorbent, oily rags, cosmetic waste, spent carbon, and dredging material.

2.1.3 Category 3 - Odorous

Waste Liquid: Soy whey, waste waters with sulfates.

Solid Waste: Class B biosolids, immature compost, heavily contaminated hydrocarbon soil, rubbing alcohol, and fish gel.

2.2 Odor Air Screening Methodology and Approach

This section discusses the odor air screening methodology and approach for both off site and on-site monitoring of odors.

2.2.1 Off-site Screening for Odor Producing Compounds Prior to Receipt of Materials

Materials considered for receipt at WEI/WRT are to be characterized for odor by the generator using the WEI/WRT Generator Waste Profile Sheet for each discrete waste stream or other non-waste material. The material characterization will be reviewed by WEI/WRT and appropriate analysis prescribed for laboratory chemical characterization and confirmation of waste characteristics.

Category 1- Non Odorous materials include soils containing less than 500 mg/kg Total Petroleum Hydrocarbons (TPH), which may be managed as non-odor producing materials. Acceptance of all such materials shall be preceded by analysis for TPH using a California approved 8015B analytical method (SW846-8015) or equal state approved/certified laboratory. If the levels of odor producing compounds present exceed the project action levels for odor control listed in the QAPP, such soils will be rejected as non-odor producing material and will be managed as an odor producing material subject to mitigative measures set out in Section 4.0

Materials considered for receipt at WEI/WRT as Category 1- Non Odorous producing will also be tested using EPA Method SW846-8260 to identify potential odor producing Volatile Organic Compounds (VOC) that may be a component of the TPH analysis. If the material contains potential odor causing compounds identified by the incoming shipments it will be screened in accordance with the On-site Screening requirements as described below and any shipment that exceeds the project action level, will be rejected as a non-odor producing material(s) and will be managed as an odor producing material(s).

2.2.2 On-site Screening for Odor Producing Compounds

WEI/WRT will conduct air screening on-site using direct reading detection equipment (e.g. colorimetric detection tubes) and at the downwind perimeter boundaries to identify and further control nuisance odors from migrating off the site. Category 2 and Category 3 materials received will be screened as shown on Table 1 and with the detection tubes noted below using direct screening methods as the materials are received at the site. WEI/WRT will also conduct perimeter air sampling during full operation to demonstrate that odors are being controlled and are not being released at the downwind perimeter boundaries. A description of the air screening procedures and sampling equipment is provided below.

On-site screening for odors may also be supplemented with the use of a Miran Infrared Spectrometer which is capable of directly measuring (over 120 compounds) and reporting the air concentrations of the following odorous compounds:

- Acetone
- Ethylbenzene
- Diethylamine
- Hydrocarbons
- 2-Butanone [MEK]
- Methylamine
- Toluene,
- Sulfur Dioxide
- Xylenes

2.2.3 On-site Screening Using Direct Reading Instruments

Drager and Sensidyne detection tubes will be used to conduct rapid on-site screening of odors as noted below:

Compound	Drager/Sensidyne Tube	Other
Acetone	(Drager CH-22901) (Sensidyne 102SA)	
Amines	(Drager 81-01061) Diethyl and Trimethyl Amine (Sensidyne 222S) Dimethyl Amine (Sensidyne 227S) Ethyl Amine (Sensidyne 227S) Methyl Amine (Sensidyne 227S) Triethyl Amine (Sensidyne 213S)	
2-Butanone [MEK]	(Sensidyne 139U)	
Dimethyl Sulfide	(Drager 67-28451)	Tedlar Bag sample for Dimethyl
Dimethyl Sulfate	(Drager 67-18701)	Disulfide and Trimethyl Sulfide
Ethylbenzene	(Drager 67-28381) (Sensidyne 179S)	
Hydrogen Sulfide	(Drager 81-01461) (Sensidyne 120SB, 120U)	
Hydrogen Sulfide and Mercaptans	(Sensidyne 282S, 120SE)	
Mercaptans	(Drager 67-28981) Methyl Mercaptans (Sensidyne 130U) Tertiary Butylmercaptan (Drager 81-03071)	
Naphthalene	(Sensidyne 153U)	
Oil	(Drager 67-28371)	
Organic Gas	(Sensidyne 186, 186B)	
Petroleum Hydrocarbons	(Drager 81-01691)	
Sulfur Dioxide	(Sensidyne 103SE) (Drager 67-27101)	
Toluene	(Sensidyne 1124SB) (Drager 8101661)	
Xylenes	(Sensidyne 143SB) (Drager 67-33161)	

2.2.4 Perimeter Air Sampling/Monitoring Following U.S. EPA and OSHA/NIOSH Air Sampling Methods

WEI/WRT will conduct air sampling and monitoring at the downwind perimeter boundaries using U.S. EPA and OSHA/NIOSH air sampling and analysis methods as noted on Table 1. The

purpose of the perimeter air sampling and monitoring will be to quantify the concentrations of compounds with noted odors (see Table 1) that exist at the downwind perimeter locations when warranted. The sampling will be conducted consistent with EPA Air Methods TO-15 and/or TO17 (for TIC identification) during full operation of the facility. OSHA and NIOSH Air Sampling Methods may also be used for the collection and analysis of Dimethyl Sulfide, Amines and Mercaptans. The intent of the perimeter monitoring and analysis will be to verify the direct screening methods being applied on-site and that the odor mitigative measures taken are effective at controlling odors from traveling off-site.

Air sampling may also be conducted when and if a complaint is made that odors were observed at the downwind site perimeter boundary.

2.3 Odor Source Investigation and Reporting

WEI/WRT will conduct weekly odor source investigation and reporting of all Category 2 and 3 received materials. Should odors be reported or discovered during handling of a material on-site the reporting form contained in Appendix B will be used to document the findings of any odorous source material obtained from a Bill of Lading and/or hazardous waste manifest. The chemical waste reporting of this material will be attached to the report for subsequent follow up.

3.0 PROJECT PLANS

The section discusses the key project plans which directly support the planned work tasks. The Quality Assurance Project Plan (QAPP), Health and Safety Plan (HASP) and Community Relations Plan (CRP) are the key project plans discussed further in the sections below.

3.1 Quality Assurance Project Plan (QAPP)

EPA requires that environmental data used in decision making be supported by an approved Quality Assurance Project Plan (QAPP) to ensure accuracy in all data collection and analysis activities. The QAPP will be prepared to address project specific activities that will be accomplished during the conduct of the odor screening as well as the follow up mitigative measures. The QAPP is an important component of the EPA quality system and is referred to as the “blueprint” by which project work is implemented and assessed. EPA allows flexibility in the organization and content of a QAPP to address the specific needs of the project. The QAPP will include a discussion of the following general QAPP elements.

Section A – Project Management

The project team organization, task descriptions, and quality objectives will be presented in this section of the QAPP.

Section B – Measurements and Data Acquisition

There are a number of on-site and off-site screening methods which will be employed to characterize the odors both on and off site. The sampling methods, sample handling and chain of custody procedures, equipment and instrument calibration procedures, collection of quality control samples and analysis to be performed will all be presented in this section of the QAPP. This section will detail procedures specific to Category 1, 2, and 3 materials.

Section C – Assessment and Oversight

This section will present the methods employed to both assess and mitigate the odors observed on-site. A discussion of the response actions based on the assessment findings and required mitigative measures taken will also be presented in this section of the QAPP. The schedule and report format of results of periodic data quality assessments which will be reported to management will also be discussed in this section.

Section D – Data Validation and Usability

This section will present the criteria used to review, validate, accept, reject, and qualify data, in an objective and consistent manner. The process to be used for verifying and validating data will be presented including the chain-of custody for data throughout the life of the project or task. The process and/or procedures to be followed for resolving data issues and how the results are conveyed to end users will be presented in this section.

Quality Assurance Project Plan (QAPP)	
Section A – Project Management	
A1 Title and Approval Sheet	A6 Project/Task Description
A2 Table of Contents	A7 Quality Objectives and Criteria
A3 Distribution List	A8 Special Training/Certification
A4 Project/Task Organization	A9 Documents and Records
A5 Problem Definition/Background	
Section B – Measurements and Data Acquisition	
B1 Sampling Process Design, Inspection, and Maintenance	B6 Instrument/Equipment Testing
B2 Sampling Methods	B7 Instrument/Equipment Calibration and Frequency
B3 Sample Handling and Custody	B8 Inspection/Acceptance Requirements for Supplies and Consumables
B4 Analytical Methods	B9 Non-direct Measurements
B5 Quality Control	B10 Data Management
Section C – Assessment and Oversight	
C1 Assessment and Response Actions	C2 Reports to Management
Section D – Data Validation and Usability	
D1 Data Review, Verification, and Validation	D3 Reconciliation with User Requirements
D2 Verification and Validation Methods	

3.2 Health and Safety Plan (HASP)

The Occupational Health and Safety Administration (OSHA) requires under their HAZWOPER standard (29 CFR 1910.120) that a Health and Safety Plan (HASP) be prepared for work operations where employees may be exposed to hazardous waste. WEI, Inc. has an existing HASP which will be updated under this work plan to address potential exposure to odors, dusts and other airborne materials associated with the operations being performed as part of this work plan. The HASP will include specific health and safety recommendations for the work tasks to be performed under this work plan, specify the methods to monitor for the detection of odors, identify the required levels of protection, provide for a description of on-site hazards (e.g., physical, chemical and biological), describe required personal protective equipment, and necessary decontamination procedures if required.

3.3 Community Relations Plan

A Community Relations Plan (CRP) will be implemented to effectively address the concerns of the community regarding fugitive odors. WEI/WRT will prepare and implement a CRP to facilitate regular communications with local, state, and other Federal officials. The CRP will address community contact through telephone conversations, posting of information on a web site, written correspondence, and scheduled meetings. Information regarding WEI/WRTs' odorous site-related activities will be disseminated on a regular basis so that site specific information can be provided in both an accurate and timely manner to concerned Mecca, CA residents.

The CRP will serve to:

- Provide for a means to communicate site information to the general public and local community;
- Provide for a forum for the community to ask questions and receive answers to their questions;
- Provide an opportunity to communicate results of on-site and off-site odor screening and follow up mitigative actions taken;
- Provide contact information regarding a Point of Contact at WEI/WRT;
- Present information on planned site activities;
- Provide facts sheets; and
- Provide information on schedule community public meetings.

3.4 Odor Screening Sampling Plan

An Odor Screening Sampling Plan (OSSP) will be prepared to describe the initial and ongoing sampling on-site, at the site perimeter and background sampling locations. The OSSP will cross reference the appropriate sections in the QAPP specific to sample quality assurance and quality control requirements. The OSSP will specifically address the air sampling to be performed under EPA Air Sampling Methods TO-15 for Volatile Organic Compounds and when required EPA Air Sampling Methods TO-17 for Tentatively Identified Compounds (TICs) when and if required. The OSSP will include a description of the following:

- A description of the existing sampling and analysis practice at the facility;
- The rationale for selection of the on-site sampling locations to further assess upwind, downwind and other locations on site where odor sources are present;
- The rationale for selection of the off-site and background sampling locations to assess impact at downgradient area schools, background conditions in ambient air and other area sources which are contributing to odor emissions;
- A figure showing the locations of all proposed on-site, site perimeter and area background sampling locations;
- The frequency at which the air samples will be collected;
- The duration over which the area samples will be collected; and

- Meteorological parameters that will be measured and collected to support assessment of wind direction, wind velocity, temperature, relative humidity and other parameters as required.

4.0 MITIGATIVE MEASURES AND ODOR CONTROL

WEI/WRT has taken immediate action to control on-site odor sources and intends to develop and implement a program of odor mitigation measures that can be applied to each category of odor producing material received and managed at the facilities. The approach to odor control, defined in this work plan, consist of:

- 1) The immediate application of odor mitigation measures to the existing operations;
- 2) The identification of potential odor causing materials managed at the WEI/WRT operations; and,
- 3) The refinement of administrative and operational controls to prevent unacceptable odor releases from future operations.

The overall program consists of the control of odorous emissions through profiling and testing during material acceptance; reduction in odor concentrations prior to acceptance on-site; and, treatment of odor producing chemicals or conditions that are likely to produce off-site impacts during material handling, storage or processing.

4.1 Immediate Mitigative Measures Taken to Date

The odor control program initiated by WEI/WRT identified potential odor sources and applicable mitigation measures for each odor producing material at the facility. WEI/WRT actions represent a series of odor control actions at the facility to address existing odor sources. Actions taken over the preceding 60 days include, but are not limited to:

- Termination of acceptance for materials with known odor producing potential.
- Covering of suspected odor sources with barriers materials, to reduce or prevent odor migration and formation.
- Hydroseeding of storage piles with **KUMA Corporation Hydroseal** grass mix to stabilize soils and reduce odor and PM emissions.
- Application of a polymer coating, such as **Envirotac II**, to select storage piles to reduce PM emissions.
- Reduction in the size and height of storage piles.
- Termination of oil/water separation operations and cleaning of storage areas and containers.
- Application of water using spray trucks to control odor and PM emissions.
- Development and implementation of incoming material odor monitoring protocol.
- Development of an odor monitoring protocol to respond to odor complaints and assess potential for off site odor impacts of operations.
- Use of water mists to control odors produced during operations.
- Termination of on-site operations to manage and treat materials when atmospheric conditions are favorable for off-site migration of odors.

Specifications, product information and MSDS's for select odor control products used at WEI/WRT are presented in Appendix D.

4.2 Mitigative Measures to Control Odorous Emissions of Operations

Continued control of odorous emissions during operations is accomplished by the profiling process, which will properly categorize the material for odor control purposes. The profile process is outlined in Table 1 and the testing/screening procedures are defined in Sections 2.2.1 and 2.2.2. Based on the profile, each material at the facilities has been classified as Category 1, Category 2 or Category 3.

Category 1 materials are those materials determine to have no or very low odor producing potential through quantitative data and thus, will not be subject to odor control mitigation measures. Category 1 materials may be used to either reduce or treat odorous emissions as described in Sections 4.3 and 4.4 below.

4.3 Mitigative Measures to Reduce Odorous Emissions

After profiling, materials that are classified as Category 2 or Category 3 will be evaluated based on chemical composition and physical characteristics for the suitability of odor reduction methods to control potential off site impacts. WEI/WRT will evaluate and implement (as applicable based on best management practices and on-site conditions/experience), subject to refinement, the following odor reduction techniques for use with materials managed at the facility:

- Blending of Category 2 and 3 materials with Category 1 materials to reduce chemical concentrations and odor potential.
- Covering of stockpiles of material with tarps, covers, spray coating (such as **Envirotac II** polymer and **KUMA Corporation Hydroseal**) or other barriers to reduce odor migration during storage or handling.
- Reduction in the size and height of storage piles.
- Neutralizing the pH of materials in which the odor producing chemical or physical condition can be altered through pH adjustment.
- Use of water mists, potentially with odor neutralizing agents such as **ODEX™ Odor Mitigating Agent**, to control odors produced during operations.
- Property line screening or barrier to affect odor dispersion and/or dilution.

In the event WEI/WRT evaluation determines, based on a materials chemical composition and physical characteristics it cannot mitigate the odors with identified odor reduction techniques, WEI/WRT will not accept those materials.

4.4 Mitigative Measures for Treatment Odorous Emissions

After profiling and acceptance of materials at the facility, and in the case of materials currently stored on-site, materials that are classified as Category 2 or Category 3 will be evaluated based on chemical composition and physical characteristics for the effectiveness of odor treatment methods to control potential off site impacts during storage, handling and processing. WEI/WRT will evaluate and implement (as applicable based on best management practices and on-site

conditions/experience) potential odor reduction techniques for use with materials entering the facility, to include but not limited to:

- Application of odor neutralizing chemicals or biologically active materials to degrade chemical compounds known to exhibit odors at levels sufficient to create off-site impacts.
- Application of water mist or water/chemical mist to degrade odor compounds and to prevent off-site migration of odors.
- Storage, handling and/or processing of odor producing materials in an enclosure designed to capture odorous emission with treatment of ventilation flows prior to release to the atmosphere.
- Thermal treatment of materials with high concentrations of odor producing compounds which can be effectively treated in a thermal oxidizer at temperatures below 1800°F may be considered for future operations.

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5.0 IMPLEMENTATION OF REFINED ODOR CONTROL PROGRAM

WEI/WRT have already implemented a series of short term measures to address community concerns regarding potential odor releases from the Site as discussed in Section 4.0 above. These measures are believed to have effectively mitigated odorous emissions associated with site operations.

This section of the work plan discusses the refinement and expansion of the short term measures that have been implemented at the facilities and proposes the evaluation and implementation of long term controls to ensure that the on-site operations do not result in odor releases. Long term measures include provisions for both immediate actions and longer term operational controls to ensure improvements in odor control over time. Long term controls are to be developed through feasibility studies structured to identify effective controls for each odor producing material. The short term and long term operational control to accomplish this program goal are discussed in further detail below.

5.1 Short Term Measures

WEI/WRT have already implemented short term measures over a period of 60 days to eliminate or control known and suspected odor sources at the facility. The effectiveness of the actions will be evaluated through data collection, where applicable, using the methods described in Section 2.0. Information on specific odor control products and equipment is presented in Appendix D.

5.2 Feasibility Studies to Define Long Term Operational Controls

Long term measures to control odorous emissions at the WEI/WRT operations may take the form of a combination of actions involving institutional, administrative and operational controls. WEI/WRT will design, evaluate and implement long term operational controls of odorous emissions through a program of feasibility studies to define best practices. The studies will document the effectiveness of controls for the materials currently processed at the facility and for each new material to be received. The outcome of the feasibility studies will be to select the most appropriate mitigative odor control measure(s) for a given waste profile.

5.2.1 Performance Based Approval Criteria

WEI/WRT intends to develop and implement performance-based approach for the acceptance and approval of each material category (Category 1, Category 2 and Category 3 as defined in Table 1) in which successful feasibility testing will serve to demonstrate and document the odorous characteristics of the received material as well as the selection of effective controls for conditions of approval and acceptance. For each material classified under the three (3) odor categories, the feasibility testing to be developed under this work plan will assess:

- Selection of the most appropriate material profile odor screening methods to accurately characterize the odor producing potential of the material proposed for acceptance;
- The adequacy of the current material profile laboratory analysis of the chemical and physical characteristics of the material;
- The method(s) for storage, handling, treatment and reuse which will effectively control odorous emissions; and,
- The viability of the end product as a material for use in the environment.

5.2.2 Feasibility Studies to Control Odorous Emissions

Available technologies that have been demonstrated as being effective in reducing odors will be initially considered in the feasibility studies. Tabulated criteria to assess and evaluate the most appropriate mitigative measure(s) for a given material profile will be developed as part of this effort. Test will be conducted on-site to observe and measure the effectiveness of the selected mitigative measure(s), applying the screening and analytical protocol described in Section 2.0. The primary objective of the feasibility study will be to select the most appropriate mitigative measure for a given material profile based on a review of product literature, material profiling analytical results, testing conducted on site, screening of odors and field observations on-site and if warranted at the perimeter boundaries. The feasibility study will also confirm the selection of analytical methods and monitoring procedures and potentially identify alternative control strategies.

5.2.3 Materials Accepted for Feasibility Studies at the WEI/WRT Facilities

The source materials that will be evaluated during the feasibility studies for potential odorous emissions and controls will be obtained from agricultural, industrial, municipal and other sources of non-hazardous waste or off-specification products. While not all possible source materials have been identified, potential materials for treatment and reuse consist of, but are not limited to the materials listed in Table 1 as attached.

Each candidate material for feasibility testing will be profiled by the generator and characterized and tested for material parameters and odor parameters prior to acceptance for delivery to the facility. The profile is employed to define laboratory analytical requirements and the potential for the material to contain unacceptable chemical or physical properties. The characterization will be based on generator knowledge, process information, waste generation information, site history, prior disposal information and approvals, MSDS or other specifications, and process research prepared by WEI/WRT. The source material characterization will address the associated risks with accepting, storing, mixing, and reusing the source material at the WEI/WRT facilities. A copy of the current waste profile form is attached as Appendix A.

The effectiveness and safety of the existing material acceptance, storage practices and management of source materials, as defined in the Operating Plan for the facility, will be evaluated based on waste constituents, potential chemical exposure routes and potential odorous emissions. WEI/WRT will not accept any source materials that are classified as a RCRA listed or characteristic hazardous waste.

5.2.4 Selection and Evaluation of Operational Controls to Mitigate Odor Impacts

During the feasibility study odor control measures for each material to be accepted will be selected based on the chemical and physical characterization described in Section 2.0 and 4.0 above, in conjunction with the proposed treatment methodology. The effectiveness of the mitigation will be monitored using the procedures to be developed under Section 2.1 On Site Odor Screening Procedure and documented.

Once control of potential odors from a specific type of material has been demonstrated as effective, future shipments of the material can be received based on the prior characterization, subject to generator certification that the material characteristics have not changed and continued monitoring results that indicate no unacceptable off site impact.

5.3 Management of Odor Producing Materials During Storage and Treatment

All materials that have been approved for acceptance at the WEI facility, in accordance with Section 2.2, will be received and stored in discrete piles. The storage piles will be segregated by general material/waste type and by odor category, as shown in the table below. Each pile will consist of materials that are identified by job number linked to the job file, which will contain the material profile sheet, laboratory analytical data and odor control requirements.

Table 2: Classification and Storage of Incoming Materials

CATEGORY 1 Non-Odor Producing Materials	CATEGORY 2 Potentially Odor Producing Materials	CATEGORY 3 Odor Producing Materials
STOCK PILE S1 Materials for Contaminant Stabilization	STOCK PILE S2 Potentially Odor Producing Materials for Contaminant Stabilization	STOCK PILE S3 Odor Producing Materials for Contaminant Stabilization
STOCK PILE P1 Non-Odor Producing Petroleum Contaminated Soils (<500 mg/kg)	STOCK PILE P2 Potentially Odor Producing Petroleum Contaminated Soils	STOCK PILE P3 Odor Producing Petroleum Contaminated Soils
STOCK PILE A1 Non-Odor Producing Soil Amendments (Non-Contaminated)	STOCK PILE A2 Potentially Odor Producing Soil Amendments (Non- Contaminated)	STOCK PILE A3 Odor Producing Soil Amendments (Non-Contaminated)

Existing soils on the site, described as legacy soils, will be maintained in separate storage piles. During the treatment process, legacy soils and the new materials received under the Work Plan, may be blended for treatment purposes. The treatment areas/piles will be numbered with discrete identifiers and the materials tracked by job number. The Monthly Recycling Report, which provides a mass balance for incoming and treated out going materials, will serve to track the volume of outgoing treated legacy soils, outgoing treated 'new' soils/materials, and incoming

‘new’ soils/materials. The treatment of legacy soils with a potential to produce off site odor impacts will continue until contaminants are reduced to a level suitable for off-site use consistent with applicable restrictions or WEI demonstrates to EPA's satisfaction that legacy soils lack odor potential.

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6.0 PROJECT SCHEDULE AND COST ESTIMATE

The work plan for the control of odorous emissions has been structured into a schedule of action consisting of:

- Coordination with USEPA
- Odor Control Program Design
- Development and Implementation of Feasibility Assessments
- Operational Implementation of Controls
- Assessment and Reporting of Program Effectiveness

A proposed time line schedule is presented in Figure 1.

A cost estimate for the project, prepared in accordance with Section VI.1. Cost Estimates, of the AOC, within thirty (30) days after the Effective Date of the AOC.

7.0 REPORTING OF RESULTS

The section will present a detailed summary and supporting documentation for the results of the odor screening and mitigative actions taken as discussed in Sections 2.0 through 5.0 above.

7.1 Annual Report of Odor Screening and Mitigative Actions Taken

An annual report will be prepared to discuss the results of the work done to date on the WEI/WRT site to address odor control, with information organized in the following sections.

7.1.1 Introduction

The section will provide an introduction the actions that have been taken over the past year to address the control of off-site odor impact through both odor screening and associated mitigative measures applied to the handling, storage and treatment activities at the facilities.

7.1.2 Discussion of On-site, Perimeter and Background Monitoring

The monitoring to be performed by WEI/WRT will be discussed in the QAPP as noted in Section 3.1 and will involved collecting sampling data on-site, at upwind and downwind site perimeter locations and background samples from the Mecca, CA area. The perimeter and background sampling will be conducted periodically as warranted by Site conditions considering the prevalence of odors detected at the site boundaries.

7.1.3 Discussion of Mitigative Actions Taken

Mitigative measure investigated, assessed and implemented by WEI/WRT over the prior year will be discussed in this section of the report. The quantitative and qualitative comparison of the effectiveness of various alternatives will be detailed. The mitigative measures that will be assessed as alternatives involve a variety of odor control techniques as discussed in Section 4.0; including the application of dust suppressants/surfactants, hydroseeding and the application of liquid foaming agents applied to the material stockpiles to suppress odor.

7.1.4 Reporting of Odors and Odorous Materials

Appendix B contains a form that will be use by WEI/WRT to document odor investigations and report on odorous sources on site.

7.1.5 Summary and Conclusions

The final section of the report will present the summary findings of the work done to date to screen materials arriving on-site, analytical testing and results of on-site odor air sampling, and perimeter air sampling and area background sampling of odors. The conclusion of the Mitigative Measures Feasibility Study conducted in Section 4.0 above will also be presented based on a

discussion of applicable or relevant and appropriate requirements (ARARs) and a cost benefit analysis of alternatives evaluated to reduce odor emissions. A discussion of the mitigative measures taken to date to reduce and control odor emissions will also be provided. Recommendation for further work if warranted will also be discussed.

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APPENDIX A
WASTE PROFILE FORM

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GENERATOR WASTE PROFILE SHEET _____
 Profile Number _____ initial

(Please carefully read instructions before completing this form. Please Print in Ink or Type)

1. Billing Information

1. Billing Party Name:
2. Mailing Address:
3. Contact:
4. Phone:
5. Fax:

2. Generator Information

1. Generator Name:			
2. Generator Site Address:			
3. City:	Country:	State:	Zip:
4. Generator US EPA Identification Number:		SIC Code No.	
5. Generator Mailing Address (if Different):			
6. City:	Country:	State:	Zip:
7. Generator Contact Name:			
8. Phone Number:		9. Fax Number:	

3. Waste Properties and Composition

10. (A) Process Generating Waste:
10. (B) Is the waste US EPA HAZARDOUS WASTE (40 CFR Part 261)?
11. (a) Waste Name:
11. (b) US DOT Proper Shipping Name:

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12. Physical State	<input type="checkbox"/> Solid <input type="checkbox"/> Semi-Solid <input type="checkbox"/> Powder <input type="checkbox"/> Liquid <input type="checkbox"/> Other
13. Method of Shipment	<input type="checkbox"/> Bulk <input type="checkbox"/> Drum <input type="checkbox"/> Bagged <input type="checkbox"/> Other Explain
14: Estimated Volume:	Cubic Yards Tons _____ Drums _____
15: Special Handling Instructions:	

4. Sampling information

Type of Sample: <input type="checkbox"/> Grab Sample <input type="checkbox"/> Composite Sample <input type="checkbox"/> Generator Knowledge

16: Sampling Source (drum, stockpile, pond):	16 (a) Date Sampled :
16 (b): Sampler's Name & Company:	<input type="checkbox"/> No Sample Required

5. Odor Characterization – Please check the appropriate smell description of the profiled waste

<input type="checkbox"/> Aromatic (gasoline)	<input type="checkbox"/> Oil	<input type="checkbox"/> Sulfur (musty & acrid, like matches, skunk)
<input type="checkbox"/> Naphthalene (tar, creosote, mothballs)	<input type="checkbox"/> Toluene (burnt odor, mothballs)	<input type="checkbox"/> Ethyl benzene (oily)
<input type="checkbox"/> Hydrogen Sulfide (rotten eggs)	<input type="checkbox"/> Dimethyl Trisulfide (rotten vegetables)	
<input type="checkbox"/> m-xylene (sweet odor)	<input type="checkbox"/> Amines (fishy, putrid odors)	<input type="checkbox"/> Sewage (sewery, manure)
<input type="checkbox"/> Mercaptans (rotten odor)	<input type="checkbox"/> 2-Butanone [MEK] (sweet)	<input type="checkbox"/> Other _____

6. Characteristic Components

COLOR:	ODOR:	FREE LIQUIDS %:	% SOLIDS	pH:	Flash Point:	Phenol ppm:
Does this waste contain regulated concentrations of listed hazardous wastes defined by § 40 CFR 261.31.261.32.261.33 including RCRA F Listed Solvents				Yes or No		
Does this waste contain any dioxins?				Yes or No		
Is this a regulated Toxic Material as defined by State or Federal Regulations				Yes or No		
Does this waste exhibit <u>any</u> characteristics of Radioactivity as defined by State or Federal Regulations?				Yes or No		
Does this waste contain any Infectious or Medical Waste as defined by State or Federal Regulations?				Yes or No		

Payment on this project is due net 30 days, unless agreed otherwise in writing. Client/generator will be responsible for all the collection fees and late payment charges. WEI reserves the right to test all inbound loads for possible odor before acceptance.

Generator Certification

I hereby certify that all information submitted in this and all attached documents contain true and accurate descriptions of the waste. Any sample submitted is representative as defined in 40 CFR 261 – Appendix 1 or by using an equivalent method. All relevant information regarding known or suspected hazards in possession of the generator has been disclosed. I authorize Western Environmental, Inc. to obtain a sample from any waste shipment for purposes of identifying the waste or recertification. If this certification is made by a broker, the undersigned signs as authorized agent of the generator and has confirmed the information contained in the Profile Sheet from information provided by the generator and additional information as it has determined to be reasonably necessary.

Signature

Printed (or typed) name and title

Date

APPENDIX B
ODOR SCREENING PROTOCOL

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APPENDIX B – SCREENING PROTOCOL FOR CALIFORNIA HAZARDOUS AND NON-HAZARDOUS WASTE MATERIALS RECEIVED AT WESTERN ENVIRONMENTAL, INC. FACILITY MECCA, CALIFORNIA

1.0 INTRODUCTION:

The procedure described in this attachment was developed to establish a protocol for the handling and air characterization of materials received at the Western Environmental, Inc. (WEI) Mecca, California facility that would minimize to the extent possible the generation of nuisance odors onsite and at the downwind property site boundaries. Section 1.0 provides an introduction and a description of waste categories. Section 2.0 discusses the specific air screening procedures WEI has proposed to identify and measure odorous compounds. Section 3.0 discussed WEI's procedures for investigating and reporting of odors. Section 4.0 discusses measures that WEI is evaluating to further reduce and control odorous operations onsite.

The procedure recognizes that there are three distinct categories of wastes that are received at the WEI Mecca, CA Facility which include Category 1- Non Odorous, Category 2 - Potentially Odorous and Category 3 – Odorous. The methods proposed to assess and further evaluate these waste categories are further described below:

Category 1 - Non Odorous:

Waste Liquid: Hydrant water, brine water, non-contaminated liquid.

Solids Waste: Grout, fly ash, heavy metal soil without organics, scrap metal, clean plastic, clean wood, concrete, dried drilling muds, mature compost, non-contaminated soil, pesticide soil, soil with horse hair and oats, sand from casting molds, soil with high salinity, and sand blast media.

Category 2 - Potentially Odorous:

Waste Liquid: Storm water, oily water, clarifier water, mop water, hydro blast water, parts wash water, drilling muds, tank bottoms, uniform waste water, cosmetic waste, sugar based syrups, used cooking oil, well monitoring water, and vehicle wash water.

Solid Waste: diesel and oil spill, filter cake from water filtration, filter cake from anodizing, UST soil, clarifier removal, Class A biosolids, soil cuttings, heavy metal soil with organics, green waste, construction demolition debris, absorbent, oily rags, cosmetic waste, spent carbon, and dredging material.

Category 3 - Odorous:

Waste Liquid: Soy whey, waste waters with sulfates.

Solid Waste: Class B biosolids, immature compost, heavily contaminated hydrocarbon soil, rubbing alcohol, and fish gel.

2.0 ODOR AIR SCREENING METHODOLOGY AND APPROACH

This section describes the methodology proposed by WEI to monitor for and control the emissions of odorous compounds.

Off-site Screening for Odor Producing Compounds:

Materials considered for receipt at WEI are to be characterized for odor by the generator using the WEI Generator Waste Profile Sheet for each discrete waste stream or other non-waste material. The waste material characterization will be reviewed by WEI and appropriate analysis prescribed for laboratory chemical characterization and confirmation of waste characteristics.

Category 1- Non Odorous materials include soils containing less than 500 mg/kg TPH, which may be managed as non-odor producing materials. Acceptance of all such materials shall be preceded by analysis for Total Petroleum Hydrocarbons (TPH) using a California approved 8015B analytical method (SW846-8015) or equal state approved/certified laboratory.

Materials considered for receipt at WEI as Category 1- Non Odorous producing will also be tested using EPA Method SW846-8260 to identify potential odor producing VOC compounds that may be a component of the TPH analysis. If the material contains potential odor causing compounds identified by the incoming shipments it will be screened in accordance with the On-site Screening requirements as described below and any shipment that exceeds the project action limit will be rejected as a non-odorous producing material(s) and will be managed as an odor producing material(s).

On-site Screening for Odor Producing Compounds:

For Category 2 and Category 3 materials, WEI will conduct air screening onsite using direct reading detection equipment (e.g. colorimetric detection tubes) and at the downwind perimeter boundaries to identify and further control nuisance odors from migrating off the site. Category 2 and Category 3 materials received will be screened as shown on Table 1 and with the detection tubes noted below using direct screening methods as the materials are received at the site. WEI will also conduct perimeter air sampling during full operation to demonstrate that odors are being controlled and are not being released at the downwind perimeter boundaries. A description of the air screening procedures and sampling equipment is provided below.

Onsite screening for odors may also be supplemented with the use of a Miran Infrared Spectrometer which is capable of directly measuring (over 120 compounds) and reporting the air concentrations of the following odorous compounds:

Acetone	Ethylbenzene;
Diethylamine	Hydrocarbons;
2-Butanone [MEK]	Methylamine;
Toluene	Sulfur Dioxide
Xylenes	

Onsite Screening Using Direct Reading Instruments:

Drager and Sensidyne detection tubes will be used to conduct rapid onsite screening of odors as noted below:

Compound	Drager/Sensidyne Tube	Other
Acetone	(Drager CH-22901) (Sensidyne 102SA)	
Amines	(Drager 81-01061) Diethyl and Trimethyl Amine (Sensidyne 222S) Dimethyl Amine (Sensidyne 227S) Ethyl Amine (Sensidyne 227S) Methyl Amine (Sensidyne 227S) Triethyl Amine (Sensidyne 213S)	
2-Butanone [MEK]	(Sensidyne 139U)	
Dimethyl Sulfide	(Drager 67-28451)	Tedlar Bag sample for Dimethyl
Dimethyl Sulfate	(Drager 67-18701)	Disulfide and Trimethyl Sulfide
Ethylbenzene	(Drager 67-28381) (Sensidyne 179S)	
Hydrogen Sulfide	(Drager 81-01461) (Sensidyne 120SB, 120U)	
Hydrogen Sulfide and Mercaptans	(Sensidyne 282S, 120SE)	
Mercaptans	(Drager 67-28981) Methyl Mercaptans (Sensidyne 130U) Tertiary Butylmercaptan (Drager 81-03071)	
Naphthalene	(Sensidyne 153U)	
Oil	(Drager 67-28371)	
Organic Gas	(Sensidyne 186, 186B)	
Petroleum Hydrocarbons	(Drager 81-01691)	
Sulfur Dioxide	(Sensidyne 103SE) (Drager 67-27101)	
Toluene	(Sensidyne 1124SB) (Drager 8101661)	
Xylenes	(Sensidyne 143SB) (Drager 67-33161)	

Perimeter Air Sampling/Monitoring Following U.S. EPA and OSHA/NIOSH Air Sampling Methods:

WEI will conduct air sampling and monitoring at the downwind perimeter boundaries using U.S. EPA and OSHA/NIOSH air sampling and analysis methods as noted on Table 1. The purpose of the perimeter air sampling and monitoring will be to quantify the concentrations of compounds with noted odors (see Table 1) that exist at the downwind perimeter locations when warranted. The sampling will be conducted consistent with EPA Air Methods TO-15 and/or TO17 (for TIC identification) during full operation of the facility. OSHA and NIOSH Air Sampling Methods may also be used for the collection and analysis of Dimethyl Sulfide, Amines and Mercaptans. The intent of the perimeter monitoring and analysis will be to verify the direct screening methods

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being applied onsite and that the odor mitigative measures taken are effective at controlling odors from traveling offsite.

Air sampling may also be conducted when and if a complaint is made that odors were observed at the downwind site perimeter boundary.

3.0 ODOR SOURCE INVESTIGATION AND REPORTING

WEI will conduct weekly odor source investigation and reporting of all Category 1 and 2 received materials. Should odors be reported or discovered during handling of a material onsite the following Table 1 report will be used to document the findings of any odorous source material obtained from a Bill of Lading and/or hazardous waste manifest. The chemical waste reporting of this material will be attached to the Table 1 report for subsequent follow up.

4.0 ODOR SOURCE CONTROL MEASURES

Once the odorous sources are identified as discussed in Sections 1-3 above WEL will initiate measures to control these odors, considering the following options/alternatives:

- The use of onsite roll-offs or containers with retractable covers or tops to store odorous materials;
- Application and/or spraying of hydroseeding;
- Covering of odorous materials with tarps/polyethylene;
- Land farming techniques for soil bioremediation as opposed to soil mounds with the use of covers or other barriers to mitigate odor releases;
- Construction of an enclosure with air flow directed into the enclosure (via a blower) to contain odorous material with low odor thresholds as shown on Table 1;
- Construction of an enclosure with air flow directed into the enclosure using a blower with odor treatment (via carbon adsorption or thermal destruction) to contain odorous material with low odor thresholds as shown on Table 1;
- Installation of portable storage structures (e.g., aluminum supports with plastic top and sidewalls or row covers); and
- Application of chemical additives or surface coverings to reduce the migration of vapors/gases.
- Blending of Category 2 and 3 materials with non-odor producing materials to reduce moisture, limit organic content, modify pH or other wise mitigate odor producing potential.

WEI is currently investigating the feasibility of a number of additional mitigation measures to further reduce and control odor emission onsite, and the foregoing list may be supplemented.

Table 2 – Odor Source Investigation and Reporting

Name of Individual Completing Report (Print):

Job Title of Individual Completing Report:

Date of Report:

Site/Perimeter Location where Odor was First Observed:

Category 2 or 3 Material Received From (e.g., list Company/Business):

Date Material Was Received:

Description of Odor:

Actions Taken to Mitigate Odor:

Waste Profile Attached: (Yes) or (No):

Signature:

Date:

Additional Descriptions/Location Sketch/Action Taken:

[Empty space for additional descriptions, location sketches, or actions taken.]

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Table 1 - Odor Screening Protocol for California Hazardous and Nonhazardous Waste Materials
Received at Western Environmental, Inc. Facility, Mecca, California

July 27, 2011

Category Description	Odor Character ₁	Odor Threshold ₁ ppm	Compounds with Odors in Waste Category (OSHA PEL/ACGIH TWA) ₂	Onsite Direct Air Screening Methods	Site Perimeter Air Screening Methods
<p>Category 1- Non Odorous:</p> <p>Waste Liquid: Hydrant water, brine water, non-contaminated liquid.</p> <p>Solids Waste: Grout, fly ash, heavy metal soil without organics, scrap metal, clean plastic, clean wood, concrete, dried drilling muds, <i>mature compost</i>, non-contaminated soil, <i>pesticide soil</i>, soil with horse hair and oats, sand from casting molds, soil with high salinity, and sand blast media.</p>	<ul style="list-style-type: none"> - Possibly light sulfur odors (musty and acrid, like matches, skunk) - Possibly light Hydrogen Sulfide odors (rotten eggs) - Possibly light Dimethyl Trisulfide (rotten vegetables odor) 	<p>2.7 ppm</p> <p>0.0094 ppm</p> <p>0.03 ppm</p>	<ul style="list-style-type: none"> - Sulfur Compounds (Dimethyl disulfide, Dimethyl trisulfide, Dimethyl sulfide [10 ppm]) - Hydrogen Sulfide (10/20 ppm) 	Not Required (Screening Addressed by other Methods)	Not Required (Screening Addressed by other Methods)
<p>Category 2 - Potential Odor:</p> <p>Waste Liquid: Storm water, <i>oily water, clarifier water, mop water, hydro blast water, Class A biosolids, parts wash water, drilling muds, tank bottoms</i>, uniform waste water, <i>cosmetic waste, sugar based syrups, used cooking oil</i>, well monitoring water, and vehicle wash water.</p> <p>Solid Waste: <i>diesel and oil spill, filter cake from water filtration, filter cake from anodizing, UST soil, clarifier removal, soil cuttings</i>, heavy metal soil with <i>organics</i>, green waste, construction demolition debris, <i>absorbent, oily rags, cosmetic waste, spent carbon</i>, and <i>dredging material</i>.</p>	<ul style="list-style-type: none"> - Hydrogen Sulfide (rotten eggs) - Sulfur odors (musty and acrid, like matches, skunk) - Oily odor - Naphthalene (tar, creosote, mothballs) - Toluene (burnt odor, moth balls) - Ethyl benzene (oily) - Acetone (sweet fruity odor) - m-xylene (sweet odor) - 2-Butanone [MEK] (sweet) - Mercaptans (rotten odor) 	<p>0.0094 ppm</p> <p>2.7 ppm</p> <p>0.1 ppm</p> <p>0.038 ppm</p> <p>1.6 ppm</p> <p>3 ppm</p> <p>62 ppm</p> <p>20 ppm</p> <p>16 ppm</p> <p>0.004 ppm</p>	<ul style="list-style-type: none"> - Acetone (500/2,000 ppm) - Naphthalene (10 ppm) - Ethylbenzene (100 ppm) - Toluene (20/200 ppm) - m-xylene (100 ppm) - Methyl and Ethyl Mercaptans, n-Butyl Mercaptan, Isobutyl Mercaptan - Hydrogen Sulfide (10/20 ppm) - Sulfur Compounds (Dimethyl disulfide, Dimethyl trisulfide, Dimethyl sulfide [10 ppm]) - Amines (Trimethyl Amine, Dimethyl Amine [5/10 ppm], Methyl Amine) - Butyl Acetate (150 ppm) 	<ul style="list-style-type: none"> - Drager Tubes - Portable Miran Infrared Spectrometer - Portable Gas Chromatograph 	<ul style="list-style-type: none"> - Summa Canisters with EPA Air Method TO-15 and TO-17 (TIC)

Table 1 - Odor Screening Protocol for California Hazardous and Nonhazardous Waste Materials
Received at Western Environmental, Inc. Facility, Mecca, California

July 27, 2011

Category Description	Odor Character ₁	Odor Threshold ₁ ppm	Compounds with Odors in Waste Category (OSHA PEL/ACGIH TWA) ₂	Onsite Direct Air Screening Methods	Site Perimeter Air Screening Methods
<p>Category 3 - Odorous:</p> <p>Waste Liquid: <i>Soy whey</i>, waste waters with <i>sulfates</i>.</p> <p>Solid Waste: <i>Class B biosolids, immature compost, heavily contaminated hydrocarbon soil, rubbing alcohol, and fish gel.</i></p>	<ul style="list-style-type: none"> - Aromatic odors (gasoline odor) - Oil odor, - Sulfur odors (musty and acrid, like matches, skunk) - Naphthalene (tar, creosote, mothballs) - Toluene (burnt odor, moth balls) - Ethyl benzene (oily) - Hydrogen Sulfide (rotten eggs) - Dimethyl Trisulfide (rotten vegetables) - m-xylene (sweet odor) - Amines (fishy, putrid odors) - Sewerage (sewery, manure) - Mercaptans (rotten odor) 	<ul style="list-style-type: none"> 0.1 ppm 0.1 ppm 2.7 ppm 0.038 ppm 1.6 ppm 3 ppm 0.0094 ppm 0.03 ppm 20 ppm 0.004 ppm 	<ul style="list-style-type: none"> - Naphthalene (10 ppm) - Ethylbenzene (100 ppm) - Toluene (20/200 ppm) - m-xylene (100 ppm) - Methyl and Ethyl Mercaptans (0.5 ppm), n-Butyl Mercaptan, Isobutyl Mercaptan - Hydrogen Sulfide (10/20 ppm) - Sulfur Compounds (Dimethyl disulfide, Dimethyl trisulfide, Dimethyl sulfide [10 ppm]) - Amines (Trimethyl Amine, Dimethyl Amine [5/10 ppm], Methyl Amine [5/10 ppm]) - Sewerage (Skatole, Indole) 	<ul style="list-style-type: none"> - Drager and Sensidyne Colorimetric Detection Tubes (Amines, Dimethyl Amine, Ethyl Amine, Dimethyl Sulphide, Hydrogen Sulfide, Mercaptan, Tertiary Butylmercaptan, Oil, Petroleum Hydrocarbons, Toluene, Sulfur Dioxide, Ethylbenzene, Xylenes) - Portable Miran Infrared Spectrometer - Portable Gas Chromatograph - Portable Meteorological Station with Wind Direction and Velocity <p>Confirmation Analysis Off Site:</p> <ul style="list-style-type: none"> - Grab Sample by Small Summa Canister (Analysis by TO-15) 	<ul style="list-style-type: none"> - Summa Canisters by EPA Air Method TO-15 and TO-17 (TIC) - Dimethyl Sulfide (OSHA CIM) - Amines (NIOSH Aliphatic 2010, Aromatic 2002) - Mercaptans (NIOSH 2542)

Note: (1) American Industrial Hygiene Association, Odor Thresholds for Chemicals with Established Occupational Health Standards, 1989.

ppm = parts per million **bold italics** = indicates a likely odorous source material

(2) OSHA PEL/ACGIH TWA = indicates Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit (PEL) and American Conference of Governmental Industrial Hygienists (ACGIH) Time Weight Average (TWA)

APPENDIX C
WORK PLAN SCHEDULE

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APPENDIX D
ODOR CONTROL PRODUCT SPECIFICATION

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Section C.1

ODEX™ Application Methods - Mobile Emissions Control

The Mobile Emissions Control (MEC) Unit creates a focused "cloud" of ODEX solution that envelopes and suppresses odors, dust, and VOC emissions. This approach is very effective when tackling persistent malodors released during waste excavation. The directed ODEX spray/mist has been proven to suppress a variety of emissions, including odors, hazardous emissions, and dust, while adding little moisture to the wastes.

KUMA uses MECs in the immediate are of excavation, as well as in truck loading areas. Each unit includes one or more high pressure spray devices, manually directed at the contaminated soil malodor source, to resolve odor problems in the following manner:

- Directing the odor abating spray at the excavation (point-of-release of odor molecules), enhances the odds of physical contact between ODEX solution and the malodor agents. Neutralization occurs on contact, and due to the sheer number of odor molecules densely concentrated at the excavation area, a focused blast of ODEX solution has the ability to abate a major portion of the problem odors before they have a chance to migrate. The MEC provides very effective control at the odor source.
- In warmer work settings, the smaller atomized drops released from the sprayer evaporate before reaching the ground. This causes a localized cooling effect, making air in the excavation heavier than surrounding air, and thereby, less able to migrate out of the pit to surrounding areas.
- Because only part of the spray evaporates, the remainder contacts the surface of the contaminated soil. At the contact interface, two things happen: 1) the relative permeability of the soil to odor vapor is lessened, thereby hindering emissions, and 2) the ODEX solution neutralizes contaminants on the soil surface.

Equipment Description. KUMA utilizes several variations of the MEC-- some truck mounted, trailer mounted, with and without a generator, with and without a holding tank, depending on power and water availability. The basic MEC consists of a high-pressure electric pumping system, two 5 micron filter cartridges, a proportional injector (for measured dilution of ODEX with water), NEMA 4x electrical box, 250 feet of ½" high-pressure hose and a manually directed spray wand. Our MECs are designed for compatibility with ODEX Odor Mitigating Agents.

Utility Requirements. Necessary utilities provided by the Customer include: a) adequate quantities of potable water (up to 25 gpm, per MEC utilized), and sufficient diesel fuel or compatible electricity and hook-ups, per the unit(s) selected.

Labor Requirements. One full-time person per unit is needed to utilize the MEC.

Attachments: Photos of 2001 Model Mobile Emissions Control™ Unit
 Photos of MEC™ in Use



KUMA Mobile Emission Control Unit

The Mobile Emission Control Unit (MEC) consists of a diesel engine, high-pressure pump, 1000 gallon tank and chemical injector. These components are mounted on a steel frame and can be packed in an 8' x 8' x 8' space. Each MEC has a discharge manifold used to connect four ¾" high-pressure hoses. Kuma's rental fleet includes both electric and diesel powered MECs with pump sizes ranging from 12 gpm to 40 gpm. All MEC's have pressure regulators pre-set at 2000 psi, and adjustable from 1000 psi to 3000 psi. Kuma's MEC-40D can do the work of more than five (5) standard pressure washers.

Kuma Corporation

Hazardous Waste Labor

Emeryville, CA Redevelopment Project: Fall '99

Dust, odors and VOCs are most likely to become airborne while the contaminated material is being agitated. By placing a trained technician in the exclusion zone, we are able to ensure that Odex is always in the air suppressing odors during the two most odorous operations: excavating the material and transferring it to trucks.

Our Technicians are HazWoper certified and all participate in an annual medical monitoring program. And no job is too difficult. Before this project was over, our Technicians were working in supplied air, positioned over the excavation in a 60' man-lift and working during the middle of the night.



Left: Having a technician on the ground is extremely valuable in controlling dust, odors, and VOC emissions during excavation. Here, our technician is applying Odex to suppress sulphur-based odors during excavation.

Right: Because he is on the ground and mobile, our technician is able to turn around and spray Odex while the material is being dumped into a loader. Monitoring data collected at the downwind boundary of the exclusion zone showed a 99% reduction in emissions from the exposed soil source.





Section C.2

ODEX™ Application Methods - Mitigating Mist System

It is sometimes necessary to surround the excavation area with a mitigating mist system, continuously operating while waste is managed. The atomized mist is generally released 15 feet or more above the ground surface from tubing equipped with small nozzles. The tubing can be strung from portable bird poles, or is attached to security fencing, if available. A typical set-up consists of a central pump capable of delivering a metered ODEX solution through a system of flexible tubing and nozzles.

As odors naturally migrate from the excavation area outward, they encounter the ODEX mist particles before reaching the established boundary. When the odor molecules and mist meet, the smaller odor particles adhere to the surface of the mist, where dilute ODEX acts to neutralize and/or oxidize odor components. The water in the mist droplet then evaporates as it falls downward. In this manner, odor migration from the established boundary is minimized. Typically, mist generation is started 15 minutes or so prior to beginning the day's clean-up activities, and continues until after work has ceased and all wastes are covered.

Equipment Description. The Mitigating Mist modules are available in a variety of sizes, depending on the extent of the site and the density of the mist desired. Based on site conditions (size of the excavation area, stockpiles, climate, malodor constituents, proximity to sensitive receptors, etc.), KUMA can determine an appropriate system.

KUMA's Mitigating Mist systems are designed for compatibility with ODEX Odor Mitigating Agent. A standard module and line set-up includes a pump system (with water filters and electrical controls), and ODEX-compatible pump, seals, and parts.

Utility Requirements. Operation of the misting network requires large quantities of potable water, continuously supplied, and either diesel fuel, or conveniently available electric power.

Labor Requirements. A substantial initial effort is needed to set-up the misting system. This includes placing poles as necessary to establish the boundaries, or using existing fencing for supporting the misting lines. The pumps are typically set up in the general vicinity of water and/or power supplies, then connected to the misting line network. Once the network is set-up, it generally remains in-place from day to day, only requiring start-up, regular checking, maintenance, and refueling.

Attachment: Photos of Mitigating Mist in Use

ODEX™ Application Methods – Standard Mitigating Misting System

The most common method of application is to atomize ODEX™ in droplets approximately 10 microns in diameter. At this size the droplets have a combined surface area of up to 2.2 acres per cubic foot of air space, making it virtually impossible for an odorous compound to pass through the ODEX barrier.

The misting line is black synthetic tubing, 1/2" diameter, with push-lock tees supporting mist nozzles. The nozzles are plastic, with incorporated filters, attached to brass adapters that fit snugly into the push-lock tee. The entire system is flushable, and individual tees and nozzles are replaceable and repairable. Brass nozzle adapters are reusable.

A picture of the standard misting line and nozzle configuration is shown below.



A typical installation is shown in the picture below:



A very dilute ODEX solution is shown atomized around the perimeter of a large Superfund site to eliminate odors. HydroSeal was also used. During the 13 months KUMA was on site, there were no odor-induced shutdowns.



Section B

ODEX™ Odor Mitigating Agent

Product Description. ODEX Odor Mitigating Agent, a product used to safely neutralize malodors in dozens of applications during the last two decades, and having the following characteristics:

- Made from food grade flavorings and additives.
- Completely biodegradable, non-toxic, non-flammable, and water soluble.
- Effective in neutralizing malodors, even when diluted with water at 1,000:1.
- Cost-effective, at only 3 cents per gallon in typical use concentrations.
- Safe for human exposure, as determined by independent laboratory tests.
- Non-toxic to fathead minnows when tested by an independent laboratory in accord with State Definitive Testing Procedures, California Code of Regulations, Title 22.
- Does not contain constituents considered hazardous according to the Federal Hazard Communication Standard (29 CFR 1910.1200).
- Contains no volatile organic compounds (VOCs) as determined by EPA Method 8260.
- Is not an Insecticide, Fungicide, or Rodenticide, per the USEPA.
- Has compound authorization in accord with USDA guidelines.
- Has been used on numerous occasions with approval of the USEPA.
- Complies with the Toxic Substances Control Act.

ODEX Safety Testing. ODEX has been thoroughly tested by independent laboratories, and found safe for human exposure, though safe work practices should be employed whenever using ODEX or other industrial products. Personal protective equipment is often worn to protect against project hazards, but use of ODEX does not warrant special PPE. Test conducted in accord with protocols and guidelines established by the Consumer Product Safety Commission and Federal Hazardous Substance Act, the toxicology laboratory determined that ODEX is:

- **Not an eye irritant**
- **Not a primary dermal irritant**
- **Not toxic by oral ingestion**
- **Not toxic by dermal application**
- **Not toxic by inhalation**
- **Not a skin sensitizer**

ODEX is safely distributed in its most concentrated form, minimizing shipping costs. Product is typically shipped in 55 gallon containers having a gross weight of 485 pounds, with each gallon of ODEX making up to 1,000 gallons of odor mitigating solution. ODEX usage has no effect on dewatering and/or water treatment processes, as the small amount of solution needed is not significant. Kuma's MECs and Mitigating Mist systems have been specially designed for compatibility with ODEX.

Attachments: ODEX Non-hazardous Material Safety Data Sheet
Acute Toxicology Profile for ODEX
Acute Bioassay Report for ODEX
Analytical Report for ODEX, EPA Method 8260 (VOCs)

Material Safety Data Sheet		U.S. Department of Labor	
May be used to comply with OSHA's Hazard Communication Standard 29 CFR 1910.1200. Standard must be consulted for specific requirements.		Occupational Safety and Health Administration (Non-Mandatory Form) Form Approved OMB No. 1218-0072	
Identity (As used on Label and List): ODEX CA-1000		Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.	
SECTION I: Manufacturer / Emergency Contact			
Manufacturer: KUMA Corporation 19114 Halcon Crest Court Grass Valley, CA 95949-9052		Emergency Telephone Number: (530) 268-7070 Information Telephone Number: (530) 268-7070	
Distributor: KUMA Corporation		Date Prepared/ Last Revised: January 1, 1999	
SECTION II: Hazardous Ingredients / Identity Information			
Hazardous Components (Specific Chemical Identity: Common Name(s)):			
OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
N/A	N/A		
All constituents are not considered hazardous according to the Federal Hazard Communication Standard (29 CFR 1910.1200).			
SECTION III: Physical / Chemical Characteristics			
Boiling Point:	212° F	Specific Gravity (H ₂ O = 1):	0.99
Vapor Pressure (mm Hg):	1	Melting Point:	N/A
Vapor Density (Air = 1):	Approximately as water	Solubility in Water:	Soluble
pH:	4.5 - 6.5	Evaporation Rate (H ₂ O = 1):	1
Appearance:	Milky Liquid	Odor:	Citrus/Almond
SECTION IV: Fire and Explosion Hazard Data			
Flash Point (Method Used): Will not burn.			
Flammable Limits: Non-flammable.			
Lower Explosive Limit (LEL): N/A		Upper Explosive Limit (UEL): N/A	
Extinguishing Media: N/A			
Special Fire Fighting Procedures: None.			
Unusual Fire and Explosion Hazards: None.			

US EPA ARCHIVE DOCUMENT

SECTION V: Reactivity Data

Stability: Stable.	Conditions to Avoid (Stability): Storage at temperatures below freezing, and above 100°F.
Incompatibility (Materials to Avoid): Strong oxidizing agents.	
Hazardous Decomposition or By-products: None known.	
Hazardous Polymerization: Will not occur.	Conditions to Avoid (Polymerization): None known.

SECTION VI: Health Hazard Data

Route(s) of Entry:	Inhalation? Yes	Ingestion? Avoid	Skin? Eyes
Health Hazard (Acute and Chronic): None known.			
Carcinogenicity:	NTP? No	IARC Monographs? No	OSHA Regulated? No
Signs and Symptoms of Overexposure: None known.	Medical Condition Aggravated by Exposure: Allergies to flavoring ingredients.		
Emergency First Aid Procedures: In case of eye contact, flush thoroughly with tepid water for 15 minutes. Seek medical attention. In case of respiratory irritation/allergic reaction, move to fresh air. Aid breathing if necessary. Seek medical attention. If ingested, dilute with water. Do not induce vomiting. Do not give fluids if victim is unconscious or having convulsions. Seek immediate medical attention.			

SECTION VII: Precautions for Safe Handling and Use

Steps to be Taken in Case Material is Released or Spilled: Contain, absorb, and collect spilled liquid. Dispose all wastes legally. Rinse spill surface with large quantities of water.
Waste Disposal Method: Dispose of wastes in legal and proper manner. Product is biodegradable and non-hazardous.
Precautions to be Taken in Handling and Storing: Product storage below 32 °F may cause layering.
Other Precautions: Excessive pressure may result if containerized liquid stored near heat source.

SECTION VIII: Control Measures

Respiratory Protection (Specify Type): None required.	Eye Protection: Chemical goggles or safety glasses.
Ventilation: Good ventilation.	Protective Gloves: Not required.
Other Protective Clothing or Equipment: None required.	
Work/ Hygienic Practices: Standard hygienic practices. Avoid splashing and spilling. Before eating, wash hands thoroughly.	

Information presented herein has been compiled from sources considered dependable, is accurate and reliable to the best of KUMA's knowledge and belief, but is not guaranteed to be so. Nothing herein is to be construed as recommending any practice or product in violation of any patent, law, or regulation. The user is responsible to determine suitability of any material for specific purpose, and to adopt necessary safety precautions. KUMA makes no warranty as to results obtained using any material. Unless KUMA directly controls conditions of use, it must necessarily disclaim all liability with respect to use of any material supplied.

MATERIAL SAFETY DATA SHEET**ACTIVATOR 90**

FOR CHEMICAL EMERGENCY, SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT, CALL CHEMTREC - DAY OR NIGHT 1-800-424-9300

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**FORMULATED FOR:**

LOVELAND PRODUCTS, INC.
P.O. Box 1286 • Greeley, CO 80632-1286

24-Hour Emergency Phone: 1-800-424-9300
Medical Emergencies: 1-800-301-7976
U.S. Coast Guard National Response Center: 1-800-424-8802

PRODUCT NAME: ACTIVATOR 90
CHEMICAL NAME: Mixture of Alkyl Polyoxyethylene Ether, free fatty acids and water
CHEMICAL FAMILY: Surfactant
CALIF. REG. NO.: 34704-50034
WASH. REG. NO.: 34704-04001
MSDS Number: ACT90-06-LPI

MSDS Revisions: Section 16

Date Of Issue: 12/13/06

Supersedes: 07/20/04

2. HAZARDS IDENTIFICATION SUMMARY

KEEP OUT OF REACH OF CHILDREN. CAUTION – Liquid causes eye injury

This product is an amber colored liquid with a fatty odor. Avoid contact with eyes, skin, or clothing. Harmful if swallowed.

3. COMPOSITION, INFORMATION ON INGREDIENTS

<u>Chemical Ingredients:</u>	<u>Percentage by Weight:</u>	<u>CAS No.</u>	<u>TLV (Units)</u>
Alkyl Polyoxyethylene ether and free fatty acids	90.00	Mixture	none established
Other Ingredients	10.00		

4. FIRST AID MEASURES

If in Eyes: Flush with plenty of water for at least 15 minutes, then get medical attention.
If on Skin: Remove contaminated clothing. Wash with soap and water. Get medical attention if irritation persists.
If Swallowed: Call a physician immediately. Induce vomiting promptly.
If Inhaled: Move victim to fresh air; apply artificial respiration if necessary.

5. FIRE FIGHTING MEASURES

FLASH POINT (°F/Test Method): >230°F / >110°C
FLAMMABLE LIMITS (LFL & UFL): Not established
EXTINGUISHING MEDIA: Water fog, alcohol foam, dry chemical or carbon dioxide (CO₂) to extinguish flames.
HAZARDOUS COMBUSTION PRODUCTS: None known.
SPECIAL FIRE FIGHTING PROCEDURES: Use water spray to cool containers exposed to fire. Spilled material creates extremely slippery conditions, use caution. Wear self-contained breathing apparatus and full protective gear.
UNUSUAL FIRE AND EXPLOSION HAZARDS: Petroleum hydrocarbon component is combustible. Vapors or fumes will ignite and flashback.

6. ACCIDENTAL RELEASE MEASURES**STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:**

Wear appropriate personal protective equipment (refer to Section 8) when responding to spills. Shut off source of leak if safe to do so. Dike and contain spill. Soak up residue with absorbent such as clay, sand or other suitable material and dispose of properly. Flush area with water to remove trace residue. Contain runoff from residue flush and dispose of properly. Place in container for proper disposal. Check local, state and federal regulations for proper disposal.

CAUTION: Keep spills and cleaning runoff out of municipal sewers and open bodies of water.

7. HANDLING AND STORAGE

HANDLING: Wear impervious gloves when handling. Keep away from heat, sparks, and flames while in use. Wash with soap and water before eating, drinking, smoking, applying cosmetics, or using toilet facilities. Keep away from children, feed and foodstuffs, fertilizers and seed.
STORAGE: Store in a cool, dry place. Store in original container. Keep tightly closed. Do not reuse empty container. Keep out of reach of children. Do not contaminate water, food or feed by storage or disposal.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS: Not required.
RESPIRATORY PROTECTION: Wear a NIOSH approved respirator if necessary.
EYE PROTECTION: Chemical goggles or shielded safety glasses.
SKIN PROTECTION: Wear protective clothing. Wear impervious rubber or chemical-resistant gloves.

For product

OSHA PEL 8 hr TWA
not established

ACGIH TLV-TWA
not established

MATERIAL SAFETY DATA SHEET

ACTIVATOR 90

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: Amber colored liquid with a fatty odor
SPECIFIC GRAVITY (Water = 1): 1.001 g/ml
VAPOR PRESSURE: Not established
PERCENT VOLATILE (by volume): 85.0%
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 specification items.

BULK DENSITY: 8.35 lbs/gal.
BOILING POINT: 101.2°C/215°F
EVAPORATION RATE: Not established

SOLUBILITY: Soluble
pH: 6.0 (neat)

10. STABILITY AND REACTIVITY

STABILITY: Stable
CONDITIONS TO AVOID: None known.
INCOMPATIBILITY: Avoid contact with strong oxidizers, strong acids and bases at high temperatures.
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon Monoxide from burning.
HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL INFORMATION

Acute Oral LD₅₀ (rat): 3870-5000 mg/kg
Eye Irritation (rabbit): Mild to moderate irritant
Inhalation LC₅₀ (rat): 1.42 mg/L (4 HR)
Carcinogenic Potential: None listed by OSHA, NTP, IARC, and ACGIH as a carcinogen

Acute Dermal LD₅₀ (rabbit): >2000 mg/kg
Skin Irritation (rabbit): Minor irritant
Skin Sensitization (guinea pig): Not a sensitizer.

12. ECOLOGICAL INFORMATION**Aquatic Acute Toxicity:**

Guppy: 96 HR LC₅₀ 12.7 mg/L – 96 HR No Effect: 5.8 mg/L – **Daphnia Magna:** 24 HR EC₅₀ 5.2 mg/L – 24 HR No Effect 1 mg/L.

13. DISPOSAL CONSIDERATIONS

Do not reuse product containers. Plastic Jugs: Triple rinse (or equivalent), adding rinse water to spray tank, then offer for recycling at an ACRC site (go to <http://www.acrecycle.org/> for locations) or by reconditioning, or puncture and dispose of in a sanitary landfill or by other procedures approved by state and local authorities. Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility. Do not contaminate water, food or feed by storage or disposal.

14. TRANSPORT INFORMATION

DOT Shipping Description: NOT REGULATED BY USDOT.
Freight Classification: ADHESIVES, ADJUVANTS, SPREADERS OR STICKERS (NMFC 4610; CLASS: LTL 60, TL 35)
Consult appropriate ICAO/IATA and IMDG regulations for shipment requirements in the Air and Maritime shipping modes.

15. REGULATORY INFORMATION

NFPA & HMIS Hazard Ratings:		NFPA		HMIS
		1 Health	0 Least	1 Health
		0 Flammability	1 Slight	0 Flammability
		0 Instability	2 Moderate	0 Reactivity
			3 High	H PPE
			4 Severe	

SARA Hazard Notification/Reporting

SARA Title III Hazard Category: Immediate Y Fire N Sudden Release of Pressure N
 Delayed N Reactive N

Reportable Quantity (RQ) under U.S. CERCLA: Not listed

SARA, Title III, Section 313: Not listed

RCRA Waste Code: Not listed

CA Proposition 65: Not listed

MATERIAL SAFETY DATA SHEET

ACTIVATOR 90

16. OTHER

MSDS STATUS: Revised Disclaimer

PREPARED BY: Registrations and Regulatory Affairs

REVIEWED BY: Environmental/ Regulatory Services

Disclaimer and Limitation of Liability: This data sheet was developed from information on the constituent materials identified herein and does not relate to the use of such materials in combination with any other material or process. No warranty is expressed or implied with respect to the completeness or ongoing accuracy of the information contained in this data sheet, and LOVELAND PRODUCTS, INC. disclaims all liability for reliance on such information. This data sheet is not a guarantee of safety. Users are responsible for ensuring that they have all current information necessary to safely use the product described by this data sheet for their specific purpose.

Material Safety Data Sheet		U.S. Department of Labor	
May be used to comply with OSHA's Hazard Communication Standard 29 CFR 1910.1200. Standard must be consulted for specific requirements.		Occupational Safety and Health Administration (Non-Mandatory Form) Form Approved OMB No. 1218-0072	
Identity (As used on Label and List): HydroSeal Fibers		Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.	
SECTION I: Manufacturer / Emergency Contact			
Manufacturer: KUMA Corporation 19114 Halcon Crest Court Grass Valley, CA 95949-9052		Emergency Telephone Number: (530) 268-7070	
		Information Telephone Number: (530) 268-7070	
Distributor: KUMA Corporation		Date Prepared/Last Revised: January 1, 1999	
SECTION II: Hazardous Ingredients / Identity Information			
Hazardous Components (Specific Chemical Identity: Common Name(s)):			
OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
N/A	N/A		
Ingredients: Cellulose material, water, dye.			
All constituents are <u>not</u> considered hazardous according to the Federal Hazard Communication Standard (29 CFR 1910.1200).			
SECTION III: Physical / Chemical Characteristics			
General Description: Compressed cellulose mass. Tan in color. Green if non-hazardous dye included. When removed from packaging, avoid breaking into small, airborne particles.			
Boiling Point:	Solid N/A	Specific Gravity (H ₂ O = 1):	Solid N/A
Vapor Pressure (mm Hg):	Solid N/A	Melting Point:	Solid N/A
Vapor Density (Air = 1):	Solid N/A	Solubility in Water:	Will Disperse
pH:	Solid N/A	Evaporation Rate (Butyl Acetate = 1):	Solid N/A
Appearance:	Fibrous Mass	Odor:	No odor
SECTION IV: Fire and Explosion Hazard Data			
Flash Point (Method Used): Solid N/A		Flammable Limits: Organic cellulose material. Will burn if exposed to flame.	
Lower Explosive Limit (LEL): Solid N/A		Upper Explosive Limit (UEL): Solid N/A	
Extinguishing Media: Carbon dioxide, Water			
Special Fire Fighting Procedures: None.			
Unusual Fire and Explosion Hazards: None.			

US EPA ARCHIVE DOCUMENT

SECTION V: Reactivity Data

Stability: Stable.	Conditions to Avoid (Stability): Material is organic and combustible. Avoid extreme heat and open flame.
Incompatibility (Materials to Avoid): None known.	
Hazardous Decomposition or By-products: Thermal decomposition may produce carbon monoxide and carbon dioxide.	
Hazardous Polymerization: Will not occur.	Conditions to Avoid (Polymerization): N/A

SECTION VI: Health Hazard Data

Route(s) of Entry:	Inhalation? Yes	Ingestion? Avoid	Skin? Eyes
Health Hazard (Acute and Chronic): None known.			
Carcinogenicity:	NTP? No	IARC Monographs? No	OSHA Regulated? No
Signs and Symptoms of Overexposure: None known.	Medical Condition Aggravated by Exposure: Allergies to cellulose or dye.		
Emergency First Aid Procedures: In case of eye contact, flush thoroughly with tepid water for 15 minutes. Seek medical attention. In case of respiratory irritation/allergic reaction, move to fresh air. Aid breathing if necessary. Seek medical attention. If ingested, dilute with water. Do not induce vomiting. Do not give fluids if victim is unconscious or having convulsions. Seek immediate medical attention.			

SECTION VII: Precautions for Safe Handling and Use

Steps to be taken in Case Material is Released or Spilled: Collect excess material, sweep area. Dispose of wastes in legal and proper manner.
Waste Disposal Method: Dispose of in legal and proper manner. Product is biodegradable and non-hazardous.
Precautions to be Taken in Handling and Storing: Store in dry area, in enclosed containers or packages. Store away from open flame or heat source. Material is combustible.
Other Precautions: None known.

SECTION VIII: Control Measures

Respiratory Protection (Specify Type): Not normally needed. Avoid creating dust.	Eye Protection: Goggles recommended.
Ventilation: Good ventilation, local exhaust.	Protective Gloves: Not required.
Other Protective Clothing or Equipment: None required.	
Work / Hygienic Practices: Standard hygienic practices. Before eating, wash hands thoroughly, remove excess product from clothing.	

Information presented herein has been compiled from sources considered dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Nothing herein is to be construed as recommending any practice or product in violation of any patent, law, or regulation. The user is responsible to determine the suitability of any material for specific purpose, and to adopt necessary safety precautions. We make no warranty as to results obtained using any material. Unless conditions of use are under our direct control, we must necessarily disclaim all liability with respect to use of any material we supply.

Material Safety Data Sheet

U.S. Department of Labor

May be used to comply with
OSHA's Hazard Communication Standard
29 CFR 1910.1200. Standard must be
consulted for specific requirements.

Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

Identity (As used on Label and List):
ODEX Zap-TPH

Note: Blank spaces are not permitted. If any item
is not applicable, or no information is available,
the space must be marked to indicate that.

SECTION I: Manufacturer / Emergency Contact

Manufacturer:
KUMA Corporation
19114 Halcon Crest Court
Grass Valley, CA 95949-9052

Emergency Telephone Number:
(530) 268-7070

Information Telephone Number:
(530) 268-7070

Distributor:
KUMA Corporation

Date Prepared/Last Revised:
August 29, 2000

SECTION II: Hazardous Ingredients / Identity Information

Hazardous Components (Specific Chemical Identity: Common Name(s)):			
OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
N/A	N/A		
All constituents are not considered hazardous according to the Federal Hazard Communication Standard (29 CFR 1910.1200).			

SECTION III: Physical / Chemical Characteristics

Boiling Point:	212° F	Specific Gravity (H ₂ O =1):	0.99
Vapor Pressure (mm Hg):	1	Melting Point:	N/A
Vapor Density (Air = 1):	Approximately as water	Solubility in Water:	Soluble
pH:	4.5 - 6.5	Evaporation Rate (H ₂ O = 1):	1
Appearance:	Milky Liquid	Odor:	Slight Citrus-Pine

SECTION IV: Fire and Explosion Hazard Data

Flash Point (Method Used): Will not burn.	
Flammable Limits: Non-flammable.	
Lower Explosive Limit (LEL): N/A	Upper Explosive Limit (UEL): N/A
Extinguishing Media: N/A	
Special Fire Fighting Procedures: None.	
Unusual Fire and Explosion Hazards: None.	

US EPA ARCHIVE DOCUMENT

SECTION V: Reactivity Data

Stability: Stable.	Conditions to Avoid (Stability): Storage at temperatures below freezing, and above 100°F.
Incompatibility (Materials to Avoid): Strong oxidizing agents.	
Hazardous Decomposition or By-products: None known.	
Hazardous Polymerization: Will not occur.	Conditions to Avoid (Polymerization): None known.

SECTION VI: Health Hazard Data

Route(s) of Entry:	Inhalation? Yes	Ingestion? Avoid	Skin? Eyes
Health Hazard (Acute and Chronic): None known.			
Carcinogenicity:	NTP? No	IARC Monographs? No	OSHA Regulated? No
Signs and Symptoms of Overexposure: None known.	Medical Condition Aggravated by Exposure: None known.		
Emergency First Aid Procedures: In case of eye contact, flush thoroughly with tepid water for 15 minutes. Seek medical attention. In case of respiratory irritation/allergic reaction, move to fresh air. Aid breathing if necessary. Seek medical attention. If ingested, dilute with water. Do not induce vomiting. Do not give fluids if victim is unconscious or having convulsions. Seek immediate medical attention.			

SECTION VII: Precautions for Safe Handling and Use

Steps to be Taken in Case Material is Released or Spilled: Contain, absorb, and collect spilled liquid. Dispose of wastes in a legal manner. Rinse spill surface with large quantities of water.
Waste Disposal Method: Dispose of wastes in legal and proper manner. Product is biodegradable and non-hazardous.
Precautions to be Taken in Handling and Storing: For longest shelf life, avoid storing below 32°F, or above 100°F.
Other Precautions: Store away from heat source or flame. Excessive pressure in container may result.

SECTION VIII: Control Measures

Respiratory Protection (Specify Type): None required.	Eye Protection: Chemical goggles or safety glasses.
Ventilation: Good ventilation.	Protective Gloves: Not required.
Other Protective Clothing or Equipment: None required.	
Work/ Hygienic Practices: Standard hygienic practices. Avoid splashing and spilling. Before eating, wash hands thoroughly.	

Information presented herein has been compiled from sources considered dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Nothing herein is to be construed as a recommending any practice or product in violation of any patent, law, or regulation. The user is responsible to determine the suitability of any material for specific purpose, and to adopt necessary safety precautions. We make no warranty as to results obtained using any material. Unless conditions of use are under our direct control, we must necessarily disclaim all liability with respect to use of any material we supply.

<p>Material Safety Data Sheet</p> <p>May be used to comply with OSHA's Hazard Communication Standard 29 CFR 1910.1200. Standard must be consulted for specific requirements.</p>	<p>U.S. Department of Labor</p> <p>Occupational Safety and Health Administration (Non-Mandatory Form) Form Approved OMB No. 1218-0072</p>
<p>Identity (As used on Label and List): Kuma T-200</p>	<p>Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.</p>

SECTION I: Manufacturer / Emergency Contact

<p>Manufacturer: KUMA Corporation 19114 Halcon Crest Court Grass Valley, CA 95949-9052</p>	<p>Emergency Telephone Number: (530) 268-7070</p> <p>Information Telephone Number: (530) 268-7070</p>
<p>Distributor: KUMA Corporation</p>	<p>Date Prepared/ Last Revised: January 1, 1999</p>

SECTION II: Hazardous Ingredients / Identity Information

Hazardous Components (Specific Chemical Identity: Common Name(s)):			
OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
N/A	N/A		
All constituents are not considered hazardous according to the Federal Hazard Communication Standard (29 CFR 1910.1200).			

SECTION III: Physical / Chemical Characteristics

General Description: Finely milled organic binder. Similar to bread flour.			
Boiling Point:	Solid N/A	Specific Gravity (H ₂ O = 1):	Solid N/A
Vapor Pressure (mm Hg):	Solid N/A	Melting Point:	Decomposes
Vapor Density (Air = 1):	Solid N/A	Solubility in Water:	Soluble
pH:	Solid N/A	Evaporation Rate (Butyl Acetate = 1):	Solid N/A
Appearance:	Powder, cream color	Odor:	Beans

SECTION IV: Fire and Explosion Hazard Data

Flash Point (Method Used): Solid N/A		
Flammable Limits: Will combust.	Lower Explosive Limit (LEL): 0.04 oz/cf. Similar to flour or grain dust.	Upper Explosive Limit (UEL): Not determined.
Extinguishing Media: Carbon dioxide, Chemical foam, Water		
Special Fire Fighting Procedures: Self contained breathing apparatus to avoid smoke.		
Unusual Fire and Explosion Hazards: Fine organic powder has the potential to form explosive mixture with air. Keep away from open flame and sparks. Use preventive measures standard for handling fine organic materials. Avoid creating dust.		

US EPA ARCHIVE DOCUMENT

SECTION V: Reactivity Data

Stability: Stable.	Conditions to Avoid (Stability): Ignition sources, water contact.
Incompatibility (Materials to Avoid): Strong oxidizers.	
Hazardous Decomposition or By-products: None.	
Hazardous Polymerization: Will not occur.	Conditions to Avoid (Polymerization): None.

SECTION VI: Health Hazard Data

Route(s) of Entry:	Inhalation? Yes	Ingestion? Avoid	Skin? Eyes
Health Hazard (Acute and Chronic): None known.			
Carcinogenicity:	NTP? No	IARC Monographs? No	OSHA Regulated? No
Signs and Symptoms of Overexposure: None known.		Medical Condition Aggravated by Exposure: May cause respiratory or eye irritation and/or allergic response	
Emergency First Aid Procedures: In case of eye contact, flush thoroughly with tepid water for 15 minutes. Seek medical attention. In case of respiratory irritation/allergic reaction, move to fresh air. Aid breathing if necessary. Seek medical attention. May cause dryness of skin. Wash with soap and water. Apply suitable skin lotion. Seek medical attention if symptoms persist.			

SECTION VII: Precautions for Safe Handling and Use

Steps to be taken in Case Material is Released or Spilled: Collect excess material and thoroughly sweep area. Mop or flush residue with warm water. Test area and repeat if necessary. Dispose of all waste materials in a legal and proper manner.
Waste Disposal Method: Dispose of waste materials in a legal and proper manner. Product is biodegradable and non-hazardous.
Precautions to be Taken in Handling and Storing: Store in closed container or packaging to prevent moisture pick-up. Store in dry area, away from open flame or heat source.
Other Precautions: Material is VERY slippery when wet.

SECTION VIII: Control Measures

Respiratory Protection (Specify Type): Dust mask or respirator capable of removing fine dust particles.	Eye Protection: Chemical goggles.
Ventilation: Good ventilation. Remove or recover airborne dust.	Protective Gloves: Rubber or plastic.
Other Protective Clothing or Equipment: None required.	
Work / Hygienic Practices: Avoid creating excessive dust. Avoid spillage, as material becomes VERY slippery when wet, and readily takes up water. Use standard hygienic practices. Before eating, wash hands thoroughly, remove excess product from clothing.	

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