TVS Health and Safety Plan
Installation Restoration Program
Sediment Sampling for Nine Former Landfill Sites

Prepared for:

Tecom-Vinnell Services (TVS)
PWS 7 – Environmental Employees
Fort Monmouth, NJ 07703

Prepared by:

Tecom-Vinnell Services (TVS)
Industrial Hygiene and Safety Department
Building 286
Fort Monmouth, NJ 07703

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1.0 PERSONAL PROTECTIVE EQUIPMENT

1.1 Overview

This section provides guidance on the proper personal protective equipment to be worn during the sampling and equipment decontamination procedures described in the DPW Sediment Sampling Plan. The collection areas will be along shallow creek shorelines. These areas are muddy and wet and will require operations equipment to protect the employee's clothing from saturation with water and mud. Hands will need protection from cold creek water, chemicals and microbes that may be present in the area.

1.2 Sediment Sampling

During sediment sampling, it will be necessary to protect clothing from becoming saturated with water and mud. Rubber boots should be worn for all sampling activities in the creek areas. These boots can be rinsed clean and utilized each shift. This equipment is available for issue through PWS 7. Where splashing may occur, it will be necessary to utilize waterproof overalls. These will protect the legs and torso from contact with water and mud. Overalls/pants should be tucked into the boots to assure dryness. These too can be rinsed and utilized each shift and are available through PWS 7. Equipment should be inspected prior to use to assure it is in tact. Equipment in disrepair should be replaced immediately.

Gloves will be necessary to assure warmth of the fingers and hands. In addition, they must provide protection against chemical contamination, water/soil microbes and wetness. For this purpose, thin gauge nitrile or latex gloves may be worn for operations such as handling collection media and sediment samples. If warmth is needed for the hands, heavy gauge nitrile or PVC gloves may be worn over cloth gloves. Thin gauge gloves may be discarded after use. Heavy gauge gloves may be discarded when signs of wear are noticeable. Gloves are available in the IHS office, building 286.

1.3 Equipment Decontamination

During equipment decontamination, it will be necessary to protect the eyes from any chemical splashing. Chemical goggles should be worn during the procedure. In addition, chemical resistant gloves must be worn during open transfers of Alconox material. Nitrile or latex gloves are suitable for this operation. Goggles and gloves are available in the IHS office, building 286.

2.0 Hazard Communication

2.1 Overview

Employees performing operations related to sediment sampling will be made aware of the hazards associated with the operation – physical, chemical and potential biological hazards. This updating will be in compliance with the Occupational Safety and Health Administration Hazard Communication standard (29 CFR 1910. 1200). Information such as material safety data sheets (MSDS) and other reliable sources will be utilized to make sure that a thorough understanding of the chemicals which may be encountered, their hazards and personal protection has been achieved.

2.2 PCBs (health effect information)

Please see attached information published by the Environmental Protection Agency (EPA) entitled Health Effects of PCBs.

2.3 Alconox

Please see attached Material Safety Data Sheet information for this product.

3.0 Safe Operating Procedures

3.1 Overview

Performance of sediment sampling often takes employees into remote areas or areas that are less populated. These areas are also populated with mud, water and vegetation. As a result, procedures facilitating timely response in case of emergency are needed. In addition, it is necessary to highlight proper hygiene procedures to prevent dermal contact with contaminants.

3.2 Emergency Reporting

Two employees will be required during sediment sampling procedures. One employee will be needed in order to perform the sampling process. The additional employee will need to be posted for observation nearby. This individual will need to carry a radio at all times, in case of emergency. The two employees should be within view of each other at all times. If an emergency requiring medical attention should arise, a call for assistance should be made on the radio. Channel 3 (if available) or Bravo Base must be contacted in order to request medical attention or report any other emergency.

3.3 Hygiene Procedures

Employees handling chemicals/sediment samples are encouraged to thoroughly wash their hands before eating or smoking. Disposable gloves should be placed in plastic bags that may be sealed and discarded after use.

4.0 List of Contacts for Health and Safety Plan

Charles Goebel – Industrial Hygiene and Safety – 532-1706
Chandra Jennings – Industrial Hygiene and Safety – 532-3834
Bruce Wadlington – Industrial Hygiene and Safety – 532- 5523
John Wierzbowski – Industrial Hygiene and Safety – 532-9523

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 202-483-7616

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

ALCONOX(tm)

MSDS Number: A2052 --- *Effective Date: 12/08/96*

1. Product Identification

Synonyms: Alkyl Aryl Sulfonates
CAS No.: Not applicable.
Molecular Weight: Not applicable.
Chemical Formula: Not applicable.
Product Codes: A461

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Alconox(tm)	N/A	90 - 100%	Yes

3. Hazards Identification

Emergency Overview

WARNING! CAUSES IRRITATION.

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

Health Rating: 1 - Slight

Flammability Rating: 0 - None
Reactivity Rating: 1 - Slight
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT
Storage Color Code: Orange (General Storage)

Potential Health Effects

Inhalation:
None identified.

Ingestion:
May be harmful.

Skin Contact:
Irritation.

Eye Contact:
Irritation.

Chronic Exposure:
No information found.

Aggravation of Pre-existing Conditions:
No information found.

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4. First Aid Measures

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Prompt action is essential.

Ingestion:
Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes.

Eye Contact:
In case of eye contact, immediately flush with plenty of water for at least 15 minutes.

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5. Fire Fighting Measures

Fire:
Not expected to be a fire hazard.

Explosion:
None identified.

Fire Extinguishing Media:
Use extinguishing media appropriate for surrounding fire.

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

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6. Accidental Release Measures

Wear self-contained breathing apparatus and full protective clothing. With clean shovel, carefully place material into clean, dry container and cover; remove from area. Flush spill area with water.

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7. Handling and Storage

Keep container tightly closed. Suitable for any general chemical storage area. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

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8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
None established.

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

Personal Respirators (NIOSH Approved):
For conditions of use where exposure to the substance is apparent, consult an industrial hygienist. For emergencies, or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators

do not protect workers in oxygen-deficient atmospheres.

Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:
Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

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9. Physical and Chemical Properties

Appearance:
White Powder.

Odor:
No information found.

Solubility:
Appreciable (>10%)

Specific Gravity:
0.00

pH:
No information found.

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

Boiling Point:
No information found.

Melting Point:
No information found.

Vapor Density (Air=1):
Not applicable.

Vapor Pressure (mm Hg):
Not applicable.

Evaporation Rate (BuAc=1):
No information found.

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10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:
No information found.

Hazardous Polymerization:
Will not occur.

Incompatibilities:
No information found.

Conditions to Avoid:
No information found.

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11. Toxicological Information

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Alconox(tm)	No	No	None

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12. Ecological Information

Environmental Fate:
No information found.

Environmental Toxicity:
No information found.

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13. Disposal Considerations

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

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14. Transport Information

Not regulated.

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15. Regulatory Information

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

Ingredient	TSCA	EC	Japan	Australia
Alconox(tm)	Yes	No	No	No

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

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Alconox(tm)	No	No	Yes	No

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

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Alconox(tm)	No	No	No	No

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

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Alconox(tm)	No	No	No

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

Australian Hazchem Code: No information found.
Poison Schedule: No information found.

WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

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16. Other Information

Label Hazard Warning:
WARNING! CAUSES IRRITATION.

Label Precautions:
Keep in tightly closed container. Wash thoroughly after handling.

Label First Aid:
In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse.

Product Use:
Laboratory Reagent. Research and Development Use Only.

Revision Information:
Pure. New 16 section MSDS format, all sections have been revised.

Disclaimer:
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EPA United States Environmental Protection Agency

Office of Pollution Prevent and Toxics

HEALTH EFFECTS OF PCBs

PCBs have been demonstrated to cause a variety of adverse health effects. PCBs have beer shown to cause cancer in animals. PCBs have also been shown to cause a number of seriou noncancer health effects in animals, including effects on the immune system, reproductive sy nervous system, and endocrine system. Studies in humans provide supportive evidence for p carcinogenic and non-carcinogenic effects of PCBs. The different health effects of PCBs may interrelated, as alterations in one system may have significant implications for the other syste the body. The potential health effects of PCB exposure are discussed in greater detail below.

Cancer Effects | Non-Cancerous Effects

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Cancer

EPA uses a weight-of-evidence approach in evaluating the potential carcinogenicity of environmental contaminants. EPA's approach permits evaluation of the complete carcinogeni database, and allows the results of individual studies to be viewed in the context of all of the c available studies. Studies in animals provide conclusive evidence that PCBs cause cancer. S in humans raise further concerns regarding the potential carcinogenicity of PCBs. Taken toge the data strongly suggest that PCBs are probable human carcinogens.

PCBs are one of the most widely studied environmental contaminants, and many studies in a and human populations have been performed to assess the potential carcinogenicity of PCBs EPA's first assessment of PCB carcinogenicity was completed in 1987. At that time, data wer limited to Aroclor 1260. In 1996, EPA completed a reassessment of PCB carcinogenicity at th direction of Congress. In addition to Aroclor 1260, new studies provided data on Aroclors 101 1242, and 1254. EPA's cancer reassessment reflected the Agency's commitment to the use c best science in evaluating health effects of PCBs. EPA's cancer reassessment was peer revi by 15 experts on PCBs, including scientists from government, academia and industry. The pe reviewers agreed with EPA's conclusion that PCBs are probable human carcinogens.

The cancer reassessment determined that PCBs are probable human carcinogens, based on following information:

There is clear evidence that PCBs cause cancer in animals. EPA reviewed all of the available literature on the carcinogenicity of PCBs in animals as an important first step in the cancer reassessment. An industry scientist commented that "all significant studies have been review

are fairly represented in the document". The literature presents overwhelming evidence that F cause cancer in animals. An industry-sponsored peer-reviewed rat study, characterized as th standard study" by one peer reviewer, demonstrated that every commercial PCB mixture test caused cancer. The new studies reviewed in the PCB reassessment allowed EPA to develop accurate potency estimates than previously available for PCBs. The reassessment provided I with sufficient information to develop a range of potency estimates for different PCB mixtures on the incidence of liver cancer and in consideration of the mobility of PCBs in the environme

The reassessment resulted in a slightly decreased cancer potency estimate for Aroclor 1260 to the 1987 estimate due to the use of additional dose-response information for PCB mixtures refinements in risk assessment techniques (e.g., use of a different animal-to-human scaling fa for dose). The reassessment concluded that the types of PCBs likely to be bioaccumulated in and bound to sediments are the most carcinogenic PCB mixtures.

In addition to the animal studies, a number of epidemiological studies of workers exposed to I have been performed. Results of human studies raise concerns for the potential carcinogenic PCBs. Studies of PCB workers found increases in rare liver cancers and malignant melanom presence of cancer in the same target organ (liver) following exposures to PCBs both in anim in humans and the finding of liver cancers and malignant melanomas across multiple human s adds weight to the conclusion that PCBs are probable human carcinogens.

Some of the studies in humans have not demonstrated an association between exposures to and disease. However, epidemiological studies share common methodologic limitations that c affect their ability to discern important health effects (or define them as statistically significant when they are present. Often, the number of individuals in a study is too small for an effect to revealed, or there are difficulties in determining actual exposure levels, or there are multiple confounding factors (factors that tend to co-occur with PCB exposure, including smoking, drir alcohol, and exposure to other chemicals in the workplace). Epidemiological studies may not to detect small increases in cancer over background unless the cancer rate following contami exposure is very high or the exposure produces an very unusual type of cancer. However, stu that do not demonstrate an association between exposure to PCBs and disease should not b characterized as negative studies. These studies are most appropriately viewed as inconclus Limited studies that produce inconclusive findings for cancer in humans do not mean that PC safe.

It is very important to note that the composition of PCB mixtures changes following their relea the environment. The types of PCBs that tend to bioaccumulate in fish and other animals and sediments happen to be the most carcinogenic components of PCB mixtures. As a result, pe who ingest PCB-contaminated fish or other animal products and contact PCB-contaminated sediment may be exposed to PCB mixtures that are even more toxic than the PCB mixtures contacted by workers and released into the environment.

EPA's peer reviewed cancer reassessment concluded that PCBs are probable human carcin EPA is not alone in its conclusions regarding PCBs. The International Agency for Research o Cancer has declared PCBs to be probably carcinogenic to humans. The National Toxicology Program has stated that it is reasonable to conclude that PCBs are carcinogenic in humans. National Institute for Occupational Safety and Health has determined that PCBs are a potenti occupational carcinogen.

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Effects Other than Cancer

EPA evaluates all of the available data in determining the potential noncarcinogenic toxicity o environmental contaminants, including PCBs. Extensive study has been conducted in animal including non-human primates using environmentally relevant doses. EPA has found clear ev that PCBs have significant toxic effects in animals, including effects on the immune system, t reproductive system, the nervous system and the endocrine system. The body's regulation of these systems is complex and interrelated. As a result, it is not surprising that PCBs can exer multitude of serious adverse health effects. A discussion of the potential noncancer health eff PCBs is presented below.

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Endocrine Effects / Other Effects

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Immune Effects

The immune system is critical for fighting infections, and diseases of the immune system hav serious potential implications for the health of humans and animals. The immune effects of P exposure have been studied in Rhesus monkeys and other animals. It is important to note tha immune systems of Rhesus monkeys and humans are very similar. Studies in monkeys and animals have revealed a number of serious effects on the immune system following exposure PCBs, including a significant decrease in size of the thymus gland (which is critical to the imm system) in infant monkeys, reductions in the response of the immune system following a chal with sheep red blood cells (a standard laboratory test that determines the ability of an animal mount a primary antibody response and develop protective immunity), and decreased resista Epstein-Barr virus and other infections in PCB-exposed animals. Individuals with diseases of immune system may be more susceptible to pneumonia and viral infections. The animal studi were not able to identify a level of PCB exposure that did not cause effects on the immune sy

In humans, a recent study found that individuals infected with Epstein-Barr virus had a greate association of increased exposures to PCBs with increasing risk of non-Hodgkins lymphoma those who had no Epstein-Barr infection. This finding is consistent with increases in infection Epstein Barr virus in animals exposed to PCBs. Since PCBs suppress the immune system ar immune system suppression has been demonstrated as a risk factor for non-Hodgkin's lymph suppression of the immune system is a possible mechanism for PCB-induced cancer. Immun effects were also noted in humans who experienced exposure to rice oil contaminated with P dibenzofurans and dioxins.

Taken together, the studies in animals and humans suggest that PCBs may have serious pot effects on the immune systems of exposed individuals.

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Reproductive Effects

Reproductive effects of PCBs have been studied in a variety of animal species, including Rhe monkeys, rats, mice and mink. Rhesus monkeys are generally regarded as the best laborato species for predicting adverse reproductive effects in humans. Potentially serious effects on t reproductive system were seen in monkeys and a number of other animal species following exposures to PCB mixtures. Most significantly, PCB exposures were found to reduce the birt weight, conception rates and live birth rates of monkeys and other species and PCB exposur reduced sperm counts in rats. Effects in monkeys were long-lasting and were observed long the dosing with PCBs occurred.

Studies of reproductive effects have also been carried out in human populations exposed to F Children born to women who worked with PCBs in factories showed decreased birth weight a significant decrease in gestational age with increasing exposures to PCBs. Studies in fishing populations believed to have high exposures to PCBs also suggest similar decreases. This s effect was seen in multiple species of animals exposed to PCBs, and suggests that reproduc effects may be important in humans following exposures to PCBs.

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Neurological Effects

Proper development of the nervous system is critical for early learning and can have potentia significant implications for the health of individuals throughout their lifetimes. Effects of PCBs nervous system development have been studied in monkeys and a variety of other animal sp Newborn monkeys exposed to PCBs showed persistent and significant deficits in neurologica development, including visual recognition, short-term memory and learning. Some of these st were conducted using the types of PCBs most commonly found in human breast milk.

Studies in humans have suggested effects similar to those observed in monkeys exposed to including learning deficits and changes in activity associated with exposures to PCBs. The sir in effects observed in humans and animals provide additional support for the potential neurobehavioral effects of PCBs.

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Endocrine Effects

There has been significant discussion and research on the effects of environmental contamin the endocrine system ("endocrine disruption"). While the significance of endocrine disruption widespread issue in humans and animals is a subject of ongoing study, PCBs have been demonstrated to exert effects on thyroid hormone levels in animals and humans. Thyroid hor levels are critical for normal growth and development, and alterations in thyroid hormone leve have significant implications.

It has been shown that PCBs decrease thyroid hormone levels in rodents, and that these dec have resulted in developmental deficits in the animals, including deficits in hearing. PCB expc have also been associated with changes in thyroid hormone levels in infants in studies condu

the Netherlands and Japan. Additional research will be required to determine the significance these effects in the human population.

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Other Noncancer Effects

A variety of other noncancer effects of PCBs have been reported in animals and humans, inc dermal and ocular effects in monkeys and humans, and liver toxicity in rodents. Elevations in pressure, serum triglyceride, and serum cholesterol have also been reported with increasing levels of PCBs in humans.

In summary, PCBs have been demonstrated to cause a variety of serious health effects. PCE been shown to cause cancer and a number of serious noncancer health effects in animals, in effects on the immune system, reproductive system, nervous system, and endocrine system. Studies in humans provide supportive evidence for the potential carcinogenicity and non-carcinogenic effects of PCBs. The different health effects of PCBs may be interrelated, as alterations in one system may have significant implications for the other regulatory systems o body.

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PCB Programs
URL: http://www.epa.gov/pcb/effects.htm
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