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Clayton
ENVIRONMENTAL
CONSULTANTS

Health and Safety Plan
for
Tank Removal
at
1528 Webster Street
Alameda, California

Clayton Project No. 47667.01
July 15, 1993

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1.0 INTRODUCTION

This Health and Safety Plan describes the procedures that shall be implemented to safeguard the health and safety of employees engaged in field work at the 1528 Webster Street property in Alameda, California.

This Health and Safety Plan complies with the applicable federal, state, and local health requirements including the California Occupational Safety and Health Administration's (Cal-OSHA) requirements, Title 8, California Code of Regulations, Section 5192 (8 CCR 5192) and the federal OSHA requirements, Title 29, Code of Federal Regulations, Section 1910.1200 (29 CFR 1910.1200).

The observance and practice of health and safety procedures and applicable federal, state, and local regulations are mandatory for all personnel and visitors. In the event of conflicting requirements, the procedures that provide the highest degree of required personal protection shall be implemented.

A copy of the site health and safety plan shall be kept on site and made available for inspection and review by employees, clients, agency personnel, and other visitors.

2.0 EMERGENCY TELEPHONE NUMBERS AND STANDARD PROCEDURE

When a person is injured, the Site Safety Officer (SSO) or other qualified personnel must (1) take charge, (2) provide necessary decontamination, (3) administer first aid, and (4) arrange for medical assistance. If a serious injury or life-threatening condition exists, CALL AN AMBULANCE (DIAL 911).

| | |
|-----------------|------------------------|
| EMERGENCY | 911* |
| FIRE | 911* or (510) 748-4602 |
| AMBULANCE | 911* or (510) 523-4357 |
| POLICE | 911* or (510) 748-4508 |

* When using a cellular phone, you must use the full telephone number of the emergency service, as dialing 911 will not connect you with the appropriate emergency services.

2.1 LOCATION OF NEAREST HOSPITAL

Hospital: Alameda Hospital
Address: 2070 Clinton Avenue
Alameda, California

Phone: (510) 523-4357 (emergency)
(510) 522-3700 (main)

A map of the hospital location is attached in Appendix A.

3.0 KEY PERSONNEL AND TELEPHONE NUMBERS

The people primarily responsible for site safety are the Project Manager, the Project Health and Safety Officer, and the Site Safety Officer (SSO).

Project Supervisor: Mike Holbrook
Telephone Number: (510) 426-2616

Project Health & Safety Officer: Pamela Han Silkwood
Telephone Number: (510) 426-2624

Project Site Safety Officer: Mike Holbrook
Telephone Number: (510) 426-2600

Roles and responsibilities of the key personnel are included in Appendix B.

4.0 SITE HISTORY

Clayton conducted a file review at various city and county government agencies to ascertain the presence of an underground storage tank (UST) at the subject property. According to the files available, one 500-gallon diesel UST was installed at the subject property in 1916.

5.0 FIELD ACTIVITIES

The Health and Safety Plan is prepared for the removal of the 500-gallon diesel UST and associated site characterization. The tasks necessary to accomplish these goals are as follows:

- Sample contents of the tank
- Excavate, remove, decommission, and dispose of the tank
- Collect four soil and one groundwater samples

6.0 CHEMICAL HAZARDS

Clayton believes that middle distillate diesel is in the UST. The concerned constituents of the diesel fuel includes aromatic hydrocarbons such as benzene, toluene, ethylbenzene, and xylenes (BTEX) and polynuclear aromatics (PNAs) such as naphthalene, anthracene, and phenanthrene. A summary of the health affects to humans from exposure to these compounds is shown in Appendix C.

The aromatic hydrocarbons are primarily absorbed in the workplace by inhalation. Inhalation may lead to dizziness, excitement, drowsiness, and lack of coordination. Benzene has been identified as a carcinogen.

PNAs are generally associated with incomplete combustion of organic materials. These compounds are generally absorbed via skin contact in the workplace. Some PNAs have been identified as carcinogens.

6.1 EYE AND SKIN EXPOSURE TO CHEMICALS

Many chemicals and substances are irritants to eyes and skin. In case of exposure:

- Remove contaminated clothing and shoes.
- Flush affected areas with plenty of water.
- IF IN EYE, hold eyelids open and flush with plenty of water.
- If irritation or discomfort continues, call for medical aid immediately.

6.2 INTERNAL EXPOSURE TO CHEMICALS

Chemicals can be harmful if swallowed. In case of exposure:

- Call for medical aid.
- If victim is CONSCIOUS have victim drink water or milk.

6.3 PERMISSIBLE EXPOSURE LIMITS

Toxic Atmosphere is any atmosphere having a toxic contaminant exceeding the legally established Permissible Exposure Limit (PEL) and Short-Term Exposure Limit (STEL) as defined in 29 CFR 1910.1000 or the Threshold Limit Value (TLV) established by the American Conference of Governmental Industrial Hygienists (1991-92). The PEL/TLV shall not be exceeded during an 8-hour workshift of a 40-hour workweek, and STEL's shall not be exceeded for 15 minute TWA exposure at any time during the workday unless respiratory protection is provided and worn. The following lists the PEL/TLV for suspect compounds identified on the site. Benzene, toluene, ethylbenzene, and xylenes represent the toxic constituents of diesel.

Table 1
Permissible Exposure Limit (PEL)/Threshold Limit Value (TLV)

| CHEMICAL | PEL/TLV | STEL |
|--------------|---------|---------|
| Benzene | 1 ppm | 5 ppm |
| Toluene | 100 ppm | 150 ppm |
| Ethylbenzene | 100 ppm | 125 ppm |
| Xylenes | 100 ppm | 150 ppm |
| Naphthalene | 10 ppm | 15 ppm |

ppm=parts per million

- * Because benzene has the lowest PEL and STEL values, benzene shall be used as the indicator chemical during sampling.

6.4 AIR MONITORING WITH PID

A photoionization detector (PID) will be used onsite to monitor for total ionizable compounds in the air, particularly in the areas of sampling. Because the PID measures the total ionizable compounds, action levels have been established specifically for PID readings at the site:

| <u>PID Levels</u> | <u>Required PPE</u> |
|---|--|
| Background level of 5 ppm or less | No action required |
| A sustained reading between 5 and 25 | Level C: full-face respirators with organic vapor cartridges |
| A sustained reading of greater than 25 | Level B: supplied air or SCBA |
| Any instantaneous reading above 500 ppm | Level A: SCBA |

6.5 PERSONAL PROTECTIVE EQUIPMENT (PPE)

The following table summarizes the required personal protection equipment (PPE) during specific field activities:

Table 2
Required Personal Protective Equipment (PPE)

| Field Activity | Required PPE |
|--|---|
| Tank Removal and Soil and Groundwater Sampling | Level C: Tyveks, hard hat, chemical resistant steel-toed boots, inner and outer gloves, eye protection, ear plugs (if necessary) |

Half-face respirator with organic vapor cartridges shall be worn if PID measurements show concentrations at or above 5 ppm above background level.

6.6 WORK ZONES AND SECURITY MEASURES

The Work Restricted Zone: No persons will be allowed entry within the work restriction zone (which encompasses the contamination and decontamination zones) unless they are in compliance with OSHA training and Site Health and Safety Plan requirements.

The Decontamination Station Zone will be set up to minimize the transfer of harmful materials into the support zone.

The Support Zone: The Support Zone is located at the exit from the decontamination area. Smoking is allowed in the Support Zone in an area 50 feet from the work restricted zone.

All visitors are restricted to the support zone area. The visitors will receive an initial briefing of the site conditions by the SSO.

6.7 PERSONNEL DECONTAMINATION

When leaving the work restricted zone, all personnel will decontaminate at the decontamination station. Decontamination will consist of the following basic steps:

- Step 1- Wash and rinse boots in Alconox™ and water
- Step 2- Remove outer gloves; discard into waste container
- Step 3- Remove outer garment (Tyveks, Saranex™, etc.); discard into waste container
- Step 4- Remove hard hat, wash, rinse, and hang to dry
- Step 6- Remove respirator
- Step 5- Remove inner gloves; discard into waste container
- Step 7- Wash hands, neck, and face.
- Step 8- At the end of the shift, wash respirator thoroughly in wash solution, germicidal rinse, clean rinse, and hang to dry.

6.8 EQUIPMENT DECONTAMINATION

Clayton personnel will decontaminate sampling equipment such as bailers, hand augers, and trowels. During soil and groundwater sampling, decontamination of sampling equipment (bailers, split-spoons, hand augers, and trowels) will be conducted in the following order:

- (1) Washing and scrubbing with non-phosphate detergent
- (2) Rinsing with water
- (3) Second rinsing with deionized water
- (4) Air drying

7.0 PHYSICAL HAZARDS

The following subsections describe possible health and safety hazards associated with work activities at the site.

7.1 ELECTRICAL HAZARDS

Overhead power lines, underground power cables, and electrical equipment may pose shock, electrocution, or fire if contacted or severed during site activities.

Operations adjacent to overhead lines are prohibited unless one of the following conditions is satisfied:

- Lockout/tagout procedure. The main electrical switches is in a locked "off" position for any electrically operated equipment or electrical lines. Deenergized equipment or circuits are tagged attached at all points where such equipment or circuits can be energized.

- Equipment or any part, does not have the capability of coming within the following minimum clearance for energized overhead lines, or the equipment has been positioned and blocked to assure the part, including cables, cannot come within the following minimum clearances:

Table 3
High Voltage Protection - Minimum Clearance

| POWER LINES NOMINAL SYSTEM (kilovolts) | MINIMUM REQUIRED CLEARANCE |
|---|----------------------------|
| 50 or under | 10 feet (3.05 meters) |
| 69 | 12 feet (3.66 meters) |
| 115-161 | 15 feet (4.57 meters) |
| 230-285 | 20 feet (6.10 meters) |
| 345 | 25 feet (7.62 meters) |
| 500 | 35 feet (10.67 meter) |

All underground utilities in the vicinity of the tank will be marked prior to removal activities. Extreme care will be taken in the installation of the boreholes to ensure that no utility lines exist at that location.

If an underground utility line is encountered or damaged during the work:

- Stop all activities immediately and clear the area.
- Stop all engines and mechanical and electrical equipment.
- Call US ALERT (1-800-642-2444) immediately.

7.2 FLAMMABILITY AND COMBUSTIBILITY HAZARD

Flammable or combustible vapors are likely to be present in the work area. The concentration of vapors in excavations, or work areas may reach the flammable (explosive) range. Precautions must be taken to: (1) eliminate all potential sources of ignition from the area (for example, smoking materials, nonexplosion-proof electrical, and internal combustion equipment) and (2) prevent the accumulation of vapors at ground level. Fire extinguisher (2A:10B:C) will be located on heavy equipment and in chemical use and storage areas.

An explosion hazard shall be assumed to exist where chemical concentrations in air exceed their respective lower explosive limits (LEL). All open flame and spark-producing equipment within the vapor hazard area will be shut down.

The SSO will use the GasTech Hydrocarbon Surveyor™ or an equivalent model to measure concentration of combustible gas or vapor in air simultaneously with measurement of oxygen and detection of oxygen deficiency. An alarm will sound and all work must stop if the meters read any of the following: (1) 10% LEL, (2) 200 ppm, (3) 19.5% oxygen level (falling), or (4) 25% oxygen level (rising).

The following presents the LEL for BTEX and naphthalene suspected at the site:

Table 4
Lower Explosive Limits (LEL)

| CHEMICAL | LEL |
|--------------|------|
| Benzene | 1.3% |
| Toluene | 1.2% |
| Ethylbenzene | 1.0% |
| Xylenes | 1.0% |
| Naphthalene | 0.9% |

7.3 NOISE HAZARD

Drilling equipment used onsite may startle, annoy or distract workers and interfere with communication. According to the Occupational Safety and Health Standards, hearing protection shall be provided and worn when sound levels exceed 85 decibels (dBA) when measured on the A scale of a standard sound-level meter at slow response in accordance with ANSI S1.4.

The SSO will determine if any employee's sound-level exposure has exceeded 85 dBA. The observations, or calculations which indicate that employee sound-level exposure may be above 85 dBA, including:

- Any employee exposure measurements which may have been taken;
- Any employee complaints which may be attributable to high sound levels;
- Any difficulties in understanding normal conversation in the workplace when the speaker and the listener face each other at a distance of 2 feet.

7.4 LIFTING HEAVY OBJECTS

To prevent back injury resulting from lifting heavy objects:

- Bend your knees
- Lift with your legs not your back
- Keep your feet centered under you
- Keep the load close to your body

8.0 EMERGENCY RESPONSE PLAN

A plan specifying the emergency routes will be prepared before the start of site activities. These routes will be familiarized to all personnel who will be conducting field work. All work will be stopped during an emergency situation and all personnel evacuated from the danger area until the Project Manager judges it to be safe for work to resume.

The SSO will familiarize the site personnel with the methods to communicate with the local fire department, police, paramedics, hospital facilities, and poison control centers. Local emergency service transportation will be provided to all personnel as needed.

If an emergency involving actual or suspected personal injury occurs, the steps shall be followed:

- Remove the exposed or injured person(s) from immediate danger.
- Decontaminate the person(s).
- Render first aid if necessary.
- Obtain paramedic services or ambulance transport to local hospital. This procedure will be followed even if there is no visible injury.

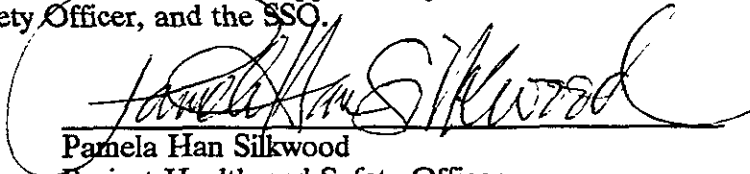
9.0 ACCIDENT REPORTING

All accidents are reportable. All accidents or injuries must be reported immediately to the Project Health and Safety Officer. The Project Supervisor and the Health and Safety Officer shall investigate all onsite accidents, determining the direct causes, indirect causes and arriving at proper corrective action.

10.0 APPROVALS

This health and safety plan have been reviewed and approved by the Project Supervisor, the Health and Safety Officer, and the SSO.

This plan was prepared by:



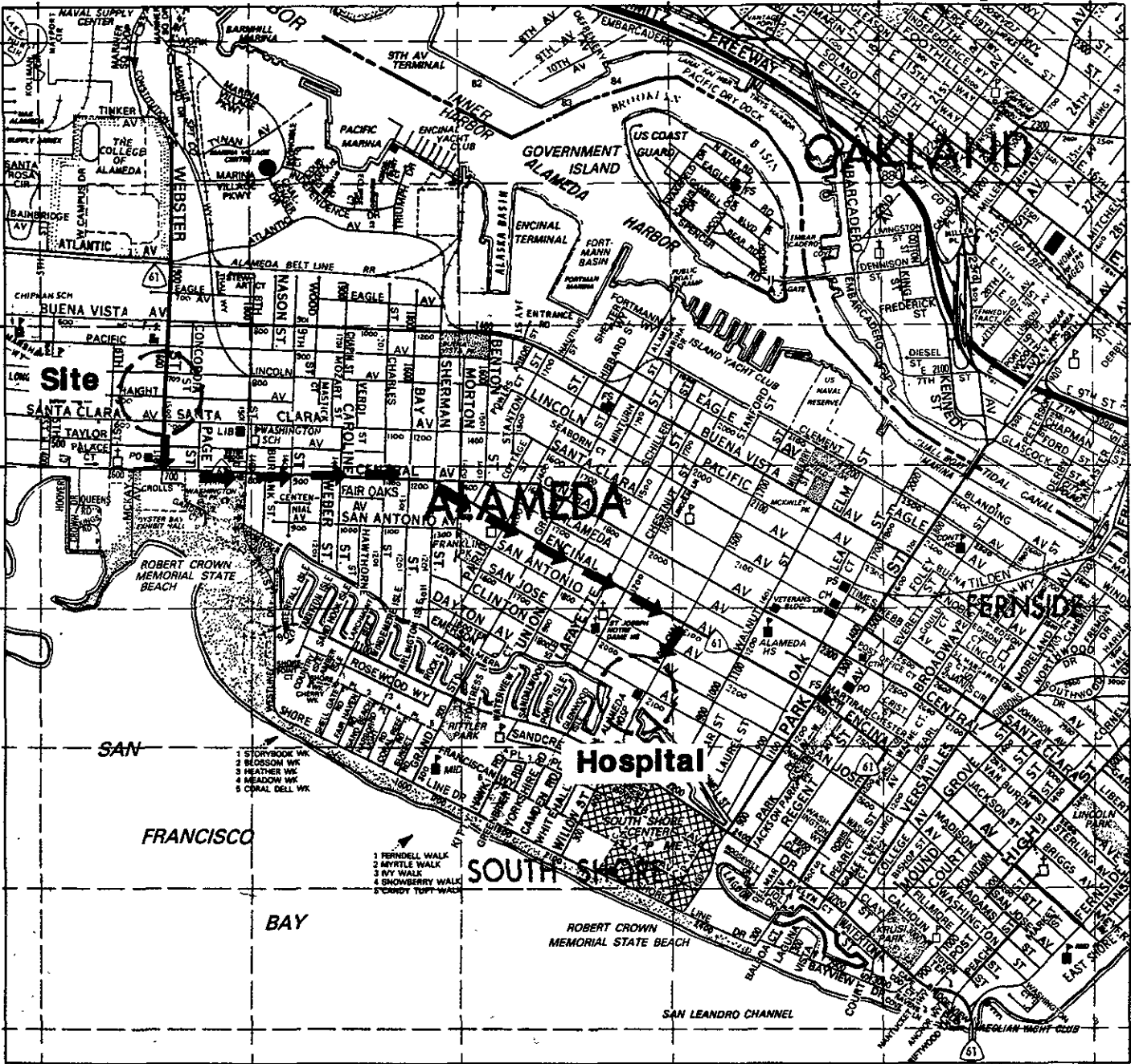
Pamela Han Silkwood
Project Health and Safety Officer
Toxicologist
Western Operations

This plan reviewed by:

Mike Holbrook
Project Supervisor
Supervisor, Field Operations
Western Operations

APPENDIX A

HOSPITAL LOCATIONS



**Alameda Hospital
2070 Clinton Avenue**

APPENDIX B

KEY PERSONNEL ROLES AND RESPONSIBILITIES

KEY PERSONNEL ROLES AND RESPONSIBILITIES

Project Supervisor

The Project Manager, Mr. Mike Holbrook, has the responsibility for all field work and enforces safe work practices by all workers. He directs all project investigation, monitoring, and remedial activities at the site.

Health and Safety Officer

The Project Health and Safety Officer, Ms. Pamela Han Silkwood, has prepared the site health and safety plan. She has the primary responsibility for the approval of the health and safety procedures to be utilized during all site operations.

Site Safety Officer (SSO)

The Site Safety Officer (SSO), Mr. Mike Holbrook, has the responsibility for implementing and enforcing the site safety program and procedures. He maintains the appropriate protection equipment and enforces the use of protection equipment. He oversees the on-site air monitoring and decides when action levels have been reached and when more stringent personnel protection is required. Mr. Holbrook has the primary responsibility for the approval of all site operations that will be conducted during the field investigation.

Mr. Holbrook will take the following actions when appropriate:

- Order the immediate evacuation of personnel from the work area during serious or life-threatening situations
- Take charge during emergency situations, notifying local public emergency officials when necessary
- Require personnel engaged in field work at the site to obtain immediate medical attention in the case of a work-related injury or illness
- Properly store and maintain protective clothing and equipment (Clayton site personnel only)
- Restrict visitors from areas of potential exposure to harmful substances
- Provide emergency eye wash kit

APPENDIX C

TOXICOLOGY

BBL250 BENZENE

pounds. Reacts explosively with aniline at 240°C/7.6 bar. Can react vigorously with oxidizing materials. To fight fire, use water, CO₂, water mist or spray, dry chemical. See also ANILINE. For further information, see Vol. 4, No. 4 of *DPIM Report*.

**BBL250
BENZENE**

CAS: 71-43-2

DOT: 1114

mf: C₆H₆ mw: 78.12

PROP: Clear, colorless liquid. Mp: 5.51°, bp: 80.093°-80.094°, flash p: 12°F (CC), d: 0.8794 @ 20°, autoign temp: 1044°F, lel: 1.4%, uel: 8.0%, vap press: 100 mm @ 26.1°, vap d: 2.77, ulc: 95-100.

SYNS:

(6)ANNULENE
BENZEEN (DUTCH)
BENZEN (POLISH)
BENZIN (OBS.)
BENZINE (OBS.)
BENZOL (DOT)
BENZOLE
BENZOLENE
BENZOLO (ITALIAN)
BICARBURET OF HYDROGEN
CARBON OIL
COAL NAPHTHA

CYCLOHEXATRIENE
FENZEN (CZECH)
MINERAL NAPHTHA
MOTOR BENZOL
NCI-C55276
NITRATION BENZENE
PHENE
PHENYL HYDRIDE
PYROBENZOL
PYROBENZOLE
RCRA WASTE NUMBER U019

TOXICITY DATA:

skn-rbt 15 mg/24H open MLD
eye-rbt 88 mg MOD
eye-rbt 2 mg/24H SEV
skn-rbt 500 mg/24H MOD
slt-dmg-ori 11250 µmol/L
oms-hmn:lym 5 µmol/L
mma-mus:emb 2500 mg/L
cyt-ham:lng 550 mg/L
sln-ham:lvr 62500 µg/L
ihl-rat TCLO:670 mg/m³/24H
(15D pre/1-22D preg):REP
ihl-rat TCLO:50 ppm/24H (7-14D preg):TER
ihl-rat TCLO:150 ppm/24H (7-14D preg):TER
ihl-man TCLO:200 mg/m³/78W-I:CAR,BLD
ihl-hmn TCLO:10 ppm/8H/10Y-I:CAR,BLD
ori-rat TDLo:52 g/kg/52W-I:CAR
ihl-rat TCLO:1200 ppm/6H/10W-I:ETA
ori-mus LD50:18250 mg/kg/2Y-C:CAR
ihl-mus TCLO:300 ppm/6H/16W-I:ETA
skn-mus TDLo:1200 g/kg/49W-I:NEO
ipr-mus TDLo:1200 mg/kg/8W-I:NEO

CODEN:

AIHAAP 23,95,62
AMIHAB 14,387,56
28ZPAK -,23,72
28ZPAK -,23,72
PMRSDJ 5,325,85
CNREA8 45,2471,85
PMRSDJ 5,639,85
PMRSDJ 5,427,85
PMRSDJ 5,397,85
HYSAAV 33,327,68
JHEMA2 24,363,80
JHEMA2 24,363,80
EJCAAH 7,83,71
TRBMAV 37,153,78
MELAAD 70,352,79
PAACA3 25,75,84
NTPTR* NTP-TR-289,86
TXAPA9 75,358,84
BJCAA1 16,275,62
TXAPA9 82,19,86

HR: 3

NIOSH: CY 1400000

scu-mus TDLo:600 mg/kg/17W-I:ETA
par-mus TDLo:670 mg/kg/19W-I:ETA
ihl-hmn TC:150 ppm/15M/8Y-I:CAR,BLD
ori-rat TD :52 g/kg/1Y-I:CAR
ori-rat TD:10 g/kg/52W-I:CAR
ihl-hmn TC:150 ppm/15M/8Y-I:CAR,BLD
ihl-man TC:150 ppm/11Y-I:CAR,BLD
ihl-mus TC:1200 ppm/6H/10W-I:ETA
ihl-hmn LCLo:2 pph/5M
ori-hmn TDLo:130 mg/kg:CNS,GIT
ihl-hmn LCLo:20000 ppm/5M
ihl-hmn TCLO:210 ppm:CNS,GIT
ihl-man TCLO:150 ppm/1Y-I:MET,BLD
ihl-hmn TCLO:100 ppm:CNS,GIT,SKN
ihl-hmn LCLo:65 mg/m³/5Y:BLD
ori-rat LD50:3400 mg/kg
ihl-rat LC50:10000 ppm/7H
ipr-rat LD50:2890 µg/kg
ori-mus LD50:4700 mg/kg
ihl-mus LC50:9980 ppm
skn-mus LD50:48 mg/kg
ipr-mus LD50:990 µg/kg
ori-dog LDLo:2000 mg/kg
ihl-dog LCLo:146000 mg/m³
ihl-cat LCLo:170000 mg/m³
ivn-rbt LDLo:88 mg/kg
ipr-gpg LDLo:527 mg/kg
scu-frg LDLo:1400 mg/kg
ihl-mam LCLo:20000 ppm/5M

KRANAW 9,403,32
KLWOAZ 12,109,33
BLOOAW 52,285,78
AJIMD8 4,589,83
MELAAD 70,352,79
NEJMAG 271,872,64
BLUTA9 28,293,74
PAACA3 25,75,84
TABIA2 3,231,33
AHYGAJ 31,336,1897
29ZUA8 -,53
27ZXA3 -,341,63
BLUTA9 28,293,74
INMEAF 17,199,48
ARGEAR 44,145,74
NPIRI* 1,5,74
28ZRAQ -,113,60
36YFAG -,302,77
HYSAAV 32,349,67
JIHTAB 25,366,43
NPIRI* 1,5,74
AGGHAR 18,109,60
HBAMAK 4,1313,35
HBTXAC 1,324,56
HBTXAC 1,324,56
JTEHD6
-(Suppl.2),45,77
HBTXAC 1,42,56
HBAMAK 4,1313,35
AEPPAE 138,65,28

IARC Cancer Review: Human Limited Evidence IMEMDT 7,203,74; Animal Inadequate Evidence IMEMDT 7,203,74; IARC Cancer Review: Animal Limited Evidence IMEMDT 29,93,82; Human Sufficient Evidence IMEMDT 29,93,82; NTP Carcinogenesis Studies (gavage): Clear Evidence: mouse, rat NTPTR* NTP-TR-289,86. EPA Genetic Toxicology Program. Reported in EPA TSCA Inventory. On Community Right To Know List.

OSHA PEL: TWA 1 ppm/8H; Pk 5 ppm/15M
ACGIH TLV: TWA 10 ppm (suspected human carcinogen); BEI (total phenol in urine at end of shift) 50 mg/L recommended as a mean value
DFG TRK: 8 ppm (26 mg/m³)
NIOSH REL: CL 1 ppm/60M

DOT Classification: Flammable Liquid, Label: Flammable Liquid

THR: A human poison by inhalation. An experimental poison by skin contact, intraperitoneal, intravenous and possibly other routes. Moderately toxic by ingestion and subcuta-

neous routes. A severe eye and moderate skin irritant. Human systemic effects by inhalation and ingestion: euphoria, somnolence, changes in REM sleep, changes in motor activity, nausea or vomiting, reduced number of blood platelets, other unspecified blood effects, dermatitis, and fever. A human carcinogen which produces myeloid leukemia and lymphomas by inhalation. An experimental carcinogen, neoplastigen, tumorigen, and teratogen. Other experimental animal reproductive effects. Human mutagenic data. A narcotic. In industry, inhalation is the primary route of chronic benzene poisoning. Poisoning by skin contact has been reported. Recent (1987) research indicates that effects are seen at less than 1 ppm. Exposures needed to be reduced to 0.1 ppm before no toxic effects were observed. Elimination is chiefly through the lungs. A common air contaminant.

A dangerous fire hazard when exposed to heat or flame. Explodes on contact with diborane; bromine pentafluoride; permanganic acid; peroxomonosulfuric acid; and peroxodisulfuric acid. Forms sensitive, explosive mixtures with iodine pentafluoride; silver perchlorate; nitryl perchlorate; nitric acid; liquid oxygen; ozone; arsenic pentafluoride + potassium methoxide (explodes above 30°C). Ignites on contact with sodium peroxide + water; dioxygenyl tetrafluoroborate; iodine heptafluoride; and dioxygen difluoride. Vigorous or incandescent reaction with hydrogen + Raney nickel (above 210°C); uranium hexafluoride; and bromine trifluoride. Can react vigorously with oxidizing materials, such as Cl₂; CrO₃; O₂; NClO₄; O₃; perchlorates; (AlCl₃ + FClO₄); (H₂SO₄ + permanganates); K₂O₂; (AgClO₄ + acetic acid); Na₂O₂. Moderate explosion hazard when exposed to heat or flame. Use with adequate ventilation. To fight fire, use foam, CO₂, dry chemical. For further information, see Vol. 4, No. 6 of *DPIM Report*.

Poisoning occurs most commonly via inhalation of the vapor, although benzene can penetrate the skin and cause poisoning. Locally, benzene has a comparatively strong irritating effect, producing erythema and burning, and, in more severe cases, edema and even blistering. Exposure to high concentrations of the vapor (3000 ppm or higher) may result from failure of equipment or spillage. Such exposure, while rare in industry, may cause acute poisoning, characterized by the narcotic action of benzene on the central nervous system. The anesthetic action of benzene is similar to that of other anesthetic gases, consisting of a preliminary stage of excitation followed by depression and, if exposure is continued, death through respiratory failure. The chronic, rather than the acute form, of benzene poisoning is important in industry. It is a recognized leukemogen. There is no specific blood picture occurring in cases of chronic benzol poisoning. The bone marrow may be hypoplastic, normal, or hyperplastic, the changes reflected in the peripheral blood. Anemia, leucopenia, macrocytosis, reticulocytosis, thrombocytopenia, high color index, and prolonged bleeding time may be present. Cases of myeloid

leukemia have been reported. For the worker, repeated blood examinations are necessary, including hemoglobin determinations, white and red cell counts and differential smears. Where a worker shows a progressive drop in either red or white cells, or where the white count remains low, 5,000/mm³ or the red count <4.0 million/mm³, on two successive monthly examinations, he should be immediately removed from benzene exposure. Elimination is chiefly through the lungs, when fresh air is breathed. The portion that is absorbed is oxidized, and the oxidation products are combined with sulfuric and glycuronic acids and eliminated in the urine. This may be used as a diagnostic sign. Benzene has a definite cumulative action, and exposure to a relatively high concentration is not serious from the point of view of causing damage to the blood-forming system, provided the exposure is not repeated. In acute poisoning, the worker becomes confused and dizzy, complains of tightening of the leg muscles and of pressure over the forehead, then passes into a stage of excitement. If allowed to remain exposed, he quickly becomes stupefied and lapses into coma. In non-fatal cases, recovery is usually complete with no permanent disability. In chronic poisoning the onset is slow, with the symptoms vague; fatigue, headache, dizziness, nausea and loss of appetite, loss of weight and weakness are common complaints in early cases. Later, pallor, nosebleeds, bleeding gums, menorrhagia, petechiae and purpura may develop. There is great individual variation in the signs and symptoms of chronic benzene poisoning.

BBL500**BENZENEACETALDEHYDE**

CAS: 122-78-1

mf: C₈H₈O mw: 120.16**HR: 2**

NIOSH: CY 1420000

PROP: Oily, colorless liquid which polymerizes and grows more viscous on standing. Odor similar to lilac and hyacinth. Has been crystallized, mp: 33-34°, d:(25/25) 1.023-1.030, bp: (10) 78°, n (20/D) 1.524-1.528. Slightly sol in water. Sol in alc, ether. One part is sol in two parts of 80% alc forming a clear solution.

SYNS:

HYACINTHIN

PAA

PHENYLACETALDEHYDE

PHENYLACETIC ALDEHYDE

PHENYLETHANAL

α-TOLUALDEHYDE

α-TOLUIC ALDEHYDE

TOXICITY DATA:

skn-hmn 2%/48H

orl-rat LD50: 1550 mg/kg

orl-mus LD50: 3890 mg/kg

orl-gpg LD50: 3890 mg/kg

CODEN:

FCTXAV 17,377,79

FCTXAV 17,377,79

FCTXAV 17,377,79

FCTXAV 17,377,79

Reported in EPA TSCA Inventory.

THR: Moderately toxic by ingestion. Human skin irritant. When heated to decomposition it emits acrid smoke and irritating fumes. Used in perfumery. See also ALDEHYDES.

TOXICITY DATA:

ims-rat TDLo: 50 mg/kg:ETA

CODEN:

CNREA8 29,506,69

THR: An experimental tumorigen. When heated to decomposition it emits acrid smoke and irritating fumes.

EGP500

ETHYL BENZENE

HR: 2

CAS: 100-41-4

NIOSH: DA 0700000

DOT: 1175

mf: C₈H₁₀ mw: 106.18

PROP: Colorless liquid, aromatic odor. Misc in alcohol and ether, insol in NH₃; sol in SO₂. Bp: 136.2°, fp: -94.9°, flash p: 59°F, d: 0.8669 @ 20°/4°, autoign temp: 810°F, vap press: 10 mm @ 25.9°, vap d: 3.66, lel: 1.2%, uel: 6.8%.

SYNS:

AETHYLBENZOL (GERMAN)

EB

ETHYLBENZEEN (DUTCH)

ETHYLBENZOL

ETILBENZENE (ITALIAN)

ETYLOBENZEN (POLISH)

NCI-C56393

PHENYLETHANE

TOXICITY DATA:

skn-rbt 15 mg/24H open MLD

eye-rbt 100 mg

sce-hmn:lym 1 mmol/L

ihl-rat TCLo: 97 ppm/7H (15D preg):REP

ihl-rat TCLo: 985 ppm/7H (1-19D preg):TER

ihl-rat TCLo: 96 ppm/7H (1-19D preg):TER

ihl-hmn TCLo: 100 ppm/8H: EYE,CNS,PUL

ori-rat LD50: 3500 mg/kg

ihl-rat LCLo: 4000 ppm/4H

ihl-mus LCLo: 50 g/m³/2H

ipr-mus LD50: 2272 mg/kg

skn-rbt LD50: 17800 mg/kg

ihl-gpg LCLo: 10000 ppm

CODEN:

AIHAAP 23,95,62

AJOPAA 29,1363,46

MUREAV 116,379,83

BATTL* JAN,81

BATTL* JAN,81

BATTL* JAN,81

AIHAAP 31,206,70

AMIHAB 14,387,56

AIHAAP 23,95,62

GTPZAB 5(5),3,61

ARTODN 58,106,85

FCTXAV 13,803,75

PHRPA6 45,1241,30

Reported in EPA TSCA Inventory. EPA Genetic Toxicology Program. Community Right To Know List.

OSHA PEL: TWA 100 ppm (skin)

ACGIH TLV: TWA 100 ppm; STEL 125 ppm; BEI: 2 g/L (mandelic acid in urine at end of shift)

DFG MAK: 100 ppm (440 mg/m³)

DOT Classification: Flammable Liquid, Label: Flammable Liquid

THR: Moderately toxic by ingestion and intraperitoneal route. Mildly toxic by inhalation and skin contact. An experimental teratogen. Human systemic effects by inhalation: eye, sleep and pulmonary changes. An eye and skin irritant. Human mutagenic data. The liquid is an irritant to the skin and mucous membranes. A concentration of 0.1% of the vapor in air is an irritant to human eyes, and a concentration of 0.2% is extremely irritating at first, then causes

dizziness, irritation of the nose and throat and a sense of constriction in the chest. Exposure of guinea pigs to 1% concentration has been reported as causing ataxia, loss of consciousness, tremor of the extremities and finally death through respiratory failure. The pathological findings were congestion of the brain and lungs with edema. No data are available regarding the effect of chronic exposure.

A very dangerous fire and explosion hazard when exposed to heat or flame; can react vigorously with oxidizing materials. To fight fire, use foam, CO₂, dry chemical. When heated to decomposition it emits acrid smoke and irritating fumes. For further information, see Vol. 2, No. 6 of *DPIM Report*.

EGQ000

HR: 2

α-ETHYLBENZENEMETHANOL

CAS: 93-54-9

NIOSH: DO 5470000

mf: C₉H₁₂O

mw: 136.21

SYNS:

EJIBL

α-ETHYLBENZYL ALCOHOL

ETHYL PHENYL CARBINOL

FELICUR

FELITROPE

FENICOL

α-HYDROXYPROPYL BENZENE

LIVONAL

PHENICOL

PHENYCHOLON

PHENYLAETHYL CARBINOL (GERMAN)

1-PHENYLPROPANOL

1-PHENYL-1-PROPANOL

1-PHENYLPROPYL ALCOHOL

SH 261

TOXICITY DATA:

ori-rat LD50: 1600 mg/kg

ori-mus LD50: 500 mg/kg

scu-mus LD50: 700 mg/kg

CODEN:

ARZNAD 12,347,62

AIPAK 116,154,58

AIPAK 116,154,58

THR: Moderately toxic by ingestion and subcutaneous route. When heated to decomposition it emits acrid smoke and irritating fumes.

EGR000

HR: 2

ETHYL BENZOATE

CAS: 93-89-0

NIOSH: DH 0200000

mf: C₉H₁₀O₂

mw: 150.19

PROP: Colorless, aromatic liquid. Mp: -34.6°, bp: 213.4°, flash p: >204°F, d: 1.048 @ 20°/20°, vap press: 1 mm @ 44.0°, vap d: 5.17, autoign temp: 914°F. Insol in water; misc in petroleum, alcohol, chloroform, and ether.

SYNS:

BENZOIC ETHER

ESSENCE OF NIOBE

TOXICITY DATA:

skn-rbt 10 mg/24H open MLD

eye-rbt 500 mg open

ori-rat LD50: 2100 mg/kg

skn-cat LDLo: 10 g/kg

ori-rbt LD50: 2630 mg/kg

CODEN:

AMIHBC 10,61,54

AMIHBC 10,61,54

JPETAB 84,358,45

JPETAB 84,358,45

JPETAB 84,358,45

Reported in EPA TSCA Inventory.

TGK750
TOLUENE

CAS: 108-88-3

mf: C₇H₈ mw: 92.15

DOT: 1294

HR: 3

NIOSH: XS 5250000

PROP: Colorless liquid; benzol-like odor. Mp: -95 to -94.5°, bp: 110.4°, flash p: 40°F (CC), ulc: 75-80, lel: 1.27%, uel: 7%, d: 0.866 @ 20°/4°, autoign temp: 996°F, vap press: 36.7 mm @ 30°, vap d: 3.14. Insol in water; sol in acetone; misc in absolute alc, ether, chloroform.

SYNS:

ANTISAL 1a
METHACIDE
METHYLBENZENE
METHYLBENZOL
NCI-C07272
PHENYLMETHANE
RCRA WASTE NUMBER U220

TOLUEEN (DUTCH)
TOLUEN (CZECH)
TOLUOL
TOLUOL (DOT)
TOLUOLO (ITALIAN)
TOLU-SOL

TOXICITY DATA:

eye-hmn 300 ppm
skn-rbt 435 mg MLD
skn-rbt 500 MOD
eye-rbt 870 µg MLD
eye-rbt 2 mg/24H SEV
eye-rbt 100 mg/30S rms MLD
oms-grh-ihl 562 mg/L
dns-rat: lvr 30 umol/L
cyt-rat-ihl 5400 µg/m³/16W-I
cyt-rat-scu 12 g/kg/12D-I
mnt-mus-ori 200 mg/kg
mnt-mus-ipr 433 µg/kg/24H
ihl-rat TClO: 1500 mg/m³/24H
(1-8D preg): TER
ori-mus TDLo: 9 g/kg (6-15D
preg): TER
ihl-hmn TClO: 200 ppm:
BRN, CNS, BLD
ihl-man TClO: 100 ppm:
CNS
ori-rat LD50: 5000 mg/kg
ihl-rat LCLo: 4000 ppm/4H
ipr-rat LDLo: 800 mg/kg
ivn-rat LD50: 1960 mg/kg
unr-rat LD50: 6900 mg/kg
ihl-mus LC50: 5320 ppm/8H
ipr-mus LD50: 1120 µg/kg
unr-mus LD50: 2000 mg/kg
skn-rbt LD50: 12124 mg/kg
ihl-gpg LCLo: 1600 ppm
scu-frg LDLo: 920 mg/kg

CODEN:

JHHTAB 25,282,43
UCDS** 7/23/70
FCTOD7 20,563,82
UCDS** 7/23/70
28ZPAK -,23,72
FCTOD7 20,573,82
MUREAV 113,467,83
SinJF# 26OCT82
GTPZAB 25(7),33,81
GTPZAB 17(3),24,73
MUREAV 147,294,85
ARTODN 58,106,85
TXCYAC 11,55,78
TJADAB 19,41A,79
JAMAAP 123,1106,43
WEHRBJ 9,131,72
AMIHAB 19,403,59
AIHAAP 30,470,69
TXAPA9 1,156,59
MELAAD 54,486,63
GISAAA 45(12),64,80
JHHTAB 25,366,43
AGGHAR 18,109,60
GISAAA 45(12),64,80
AIHAAP 30,470,69
JIDHAN 10,261,28
AEPPAE 130,250,28

Community Right To Know List. Reported in EPA TSCA Inventory. EPA Genetic Toxicology Program.

OSHA PEL: TWA 200 ppm; CL 300; Pk 500/10M

ACGIH TLV: TWA 100 ppm; STEL 150 ppm; BEI: toluene in venous blood end of shift 1 mg/L

DFG MAK: 100 ppm (375 mg/m³); BAT: blood end of shift 340 µg/dl

NIOSH REL: (Toluene) TWA 100 ppm; CL 200 ppm/10M

DOT Classification: Flammable Liquid; Label: Flammable Liquid

THR: Poison by intraperitoneal route. Moderately toxic by intravenous, subcutaneous and possibly other routes. Mildly toxic by inhalation. An experimental teratogen. Human systemic effects by inhalation: CNS recording changes, hallucinations or distorted perceptions, motor activity changes, antipsychotic, psychophysiological test changes and bone marrow changes. Experimental reproductive effects. Mutagenic data. A human eye irritant. An experimental skin and severe eye irritant.

Toluene is derived from coal tar, and commercial grades usually contain small amounts of benzene as an impurity. Inhalation of 200 ppm of toluene for 8 hours may cause impairment of coordination and reaction time; with higher concentrations (up to 800 ppm) these effects are increased and are observed in a shorter time. In the few cases of acute toluene poisoning reported, the effect has been that of a narcotic, the workman passing through a stage of intoxication into one of coma. Recovery following removal from exposure has been the rule. An occasional report of chronic poisoning describes an anemia and leucopenia, with biopsy showing a bone marrow hypoplasia. These effects, however, are less common in people working with toluene, and they are not as severe. At 200-500 ppm, headache, nausea, eye irritation, loss of appetite, a bad taste, lassitude, impairment of coordination and reaction time are reported, but are not usually accompanied by any laboratory or physical findings of significance. With higher concentrations, the above complaints are increased and in addition, anemia, leukopenia and enlarged liver may be found in rare cases. A common air contaminant.

A very dangerous fire hazard when exposed to heat, flame or oxidizers. Explosive in the form of vapor when exposed to heat or flame. Explosive reaction with 1,3-dichloro-5,5-dimethyl-2,4-imidazolididione; dinitrogen tetroxide; concentrated nitric acid; H₂SO₄ + HNO₃; N₂O₄; AgClO₄; BrF₃; UF₆. Forms an explosive mixture with tetranitromethane. Can react vigorously with oxidizing materials. To fight fire, use foam, CO₂, dry chemical. When heated to decomposition it emits acrid smoke and irritating fumes. For further information, see Vol. 7, No. 5 of *DPIM Report*.

TGL500**TOLUENEDIAMINE**

CAS: 25376-45-8

NIOSH: XS 9445000

mf: C₇H₁₀N₂ mw: 122.19

DOT: 1709

HR: 3

SYNS:

ar-METHYLBENZENEDIAMINE
DIAMINOTOLUENE

METHYLPHENYLENEDIAMINE
TOLYLENEDIAMINE

Community Right To Know List. Reported in EPA TSCA Inventory.

2051

TOXICITY DATA:
 ipr-mus LD50: 118 mg/kg
 scu-mus LD50: 107 mg/kg
 scu-rbt LD50: 54 mg/kg

THR: Poison by subcutaneous and intraperitoneal routes. When heated to decomposition it emits toxic fumes of NO_x and HCl. See also ESTERS.

CODEN:
 JPETAB 94,299,48
 JPETAB 70,315,40
 JPETAB 70,315,40

HR: 3

NAJ600
NAPHTHACENE
 CAS: 92-24-0
 mf: C₁₈H₁₂ mw: 228.30

NIOSH: QI 7605000

PROP: Orange crystals. Sublimes in vacuo. Mp: 341°, d: 1.35.

SYNS:
 BENZO(a)ANTHRACENE
 2,3-BENZANTHRACENE

2,3-BENZANTHRENE
 TETRACENE

TOXICITY DATA:
 mma-sat 5 µmol/L
 dns-rat: lvr 500 µmol/L
 dnd-mam: lym 20 mg

CODEN:
 ENMUDM 3,11,81
 ENMUDM 3,11,81
 BIPMAA 4,409,66

Reported in EPA TSCA Inventory.

THR: Mutagenic data. Explosion hazard; shock will explode it. Can react on contact with oxidizing materials. When heated to decomposition it emits acrid smoke and irritating fumes.

NAI500
NAPHTHA, COAL TAR
 CAS: 8030-30-6
 DOT: 1255/1256/2553

HR: 2

NIOSH: DE 3030000

PROP: Dark straw-colored to colorless liquid. Bp: 149-216°, flash p: 107°F (CC), d: 0.862-0.892, autoign temp: 531°F. Sol in benzene, toluene, xylene, etc.

SYNS:
 ANSCO H-J
 AMSCO H-SB
 BENZIN B70
 COAL TAR NAPHTHA DISTILLATE
 160 DEGREE BENZOL
 HI-FLASH NAPHTHA

NAPHTHA
 NAPHTHA, PETROLEUM
 PETROLEUM BENZIN
 PETROLEUM NAPHTHA
 SUPER VMP

TOXICITY DATA:
 ihl-hmn LCLo: 3 pph/5M
 ihl-rat LCLo: 1600 ppm/6H

CODEN:
 TABIA2 3,231,33
 CHINAG 17,1078,39

Reported in EPA TSCA Inventory.

OSHA PEL: TWA 100 ppm

DOT Classification: Flammable or Combustible Liquid; Label: Flammable Liquid

THR: Mildly toxic by inhalation. Can cause unconsciousness which may go to coma, stentorious breathing, and bluish tint to the skin. Recovery follows removal from

exposure. In mild form, intoxication resembles drunkenness. On a chronic basis, no true poisoning; sometimes headache, lack of appetite, dizziness, sleeplessness, indigestion, and nausea. A common air contaminant. Flammable when exposed to heat or flame; can react with oxidizing materials. Keep containers tightly closed. Slight explosion hazard. To fight fire, use foam, CO₂, dry chemical. See also MINERAL OILS.

NAJ000
α-NAPHTHAL
 CAS: 66-77-3

HR: 3

NIOSH: QJ 0175000

TOXICITY DATA:
 scu-dog LDLo: 330 mg/kg

CODEN:
 ZMWIAJ 19,545,1881

Reported in EPA TSCA Inventory.

THR: Poison by subcutaneous route. When heated to decomposition it emits acrid smoke and irritating fumes.

NAJ500
NAPHTHALENE

HR: 3

NIOSH: QJ 0525000

CAS: 91-20-3
 DOT: 1334/2304
 mf: C₁₀H₈ mw: 128.18

PROP: Aromatic odor; white, crystalline, volatile flakes. Mp: 80.1°, bp: 217.9°, flash p: 174°F (OC), d: 1.162, lel: 0.9%, uel: 5.9%, vap press: 1 mm @ 52.6°, vap d: 4.42, autoign temp: 1053°F (567°C). Sol in alc, benzene; insol in water; very sol in ether, CCl₄, CS₂, hydronaphthalenes, in fixed and volatile oils.

SYNS:
 CAMPHOR TAR
 MIGHTY 150
 MOTH BALLS
 MOTH FLAKES
 NAFTALEN (POLISH)
 NAPHTHALENE, CRUDE or REFINED (DOT)
 NAPHTHALENE, MOLTEN (DOT)

NAPHTHALIN (DOT)
 NAPHTHALINE
 NAPHTHENE
 NCI-C52904
 RCRA WASTE NUMBER U165
 TAR CAMPHOR
 WHITE TAR

TOXICITY DATA:
 skn-rbt 495 mg open MLD
 eye-rbt 100 mg MLD
 dnd-rat-ori 26 umol/kg
 dnd-mus-ipr 200 mg/kg
 ipr-rat TDLo: 5925 mg/kg (1-15D preg):REP
 ori-mus TDLo: 2400 mg/kg (7-14D preg):REP
 scu-rat TDLo: 3500 mg/kg/12W-1:ETA
 ori-chd LDLo: 100 mg/kg
 unr-man LDLo: 74 mg/kg
 ori-rat LD50: 1250 mg/kg
 ori-mus LD50: 533 mg/kg

CODEN:
 UCDS** 1/11/68
 BIOFX* 16-4/70
 CBINA8 33,301,81
 CBINA8 40,287,82
 TXAPA9 48,A35,79

JTEHD6 15,25,85

APAVAY 329,141,56

28ZRAQ -,228,60
 85DCAI 2,73,70
 GISAAA 47(11),78,82
 FAATDF 4(3, Pt 1),-406,84
 NTIS** AD691-490
 TOIZAG 20,772,73

ipr-mus LD50: 150 mg/kg
 scu-mus LD50: 969 mg/kg

NAK000 1-NAPHTHALENEACETAMIDE

ivn-mus LD50: 100 mg/kg
 orl-dog LDLo: 400 mg/kg
 orl-cat LDLo: 1000 mg/kg
 orl-rbt LDLo: 3 g/kg
 orl-gpg LD50: 1200 mg/kg

CSLNX* NX#00203
 HBAMAK 4,1289,35
 HBAMAK 4,1289,35
 HBAMAK 4,1289,35
 GISAAA 47(11),78,82

PROP: Needles from H₂O; white, odorless crystals. mp 134.5-135.5°. Only sltly water-sol; sol in approx 30 parts alc; very sol in acetone, ether, chloroform.

Reported in EPA TSCA Inventory. EPA Genetic Toxicology Program. Community Right To Know List.

OSHA PEL: TWA 10 ppm
 ACGIH TLV: TWA 10 ppm; STEL 15 ppm
 DFG MAK: 10 ppm (50 mg/m³)

DOT Classification: ORM-A; Label: None; Flammable Solid; Label: Flammable Solid

THR: Human poison by ingestion and possibly other routes. Experimental poison by ingestion, intravenous, and intraperitoneal routes. Moderately toxic by subcutaneous route. An experimental tumorigen. Experimental reproductive effects. Mutagenic data. An eye and skin irritant. Can cause nausea, headache, diaphoresis, hematuria, fever, anemia, liver damage, vomiting, convulsions, and coma. Poisoning may occur by ingestion of large doses, inhalation, or skin absorption. Flammable when exposed to heat or flame; reacts with oxidizing materials. Explosive reaction with dinitrogen pentoxide. Reacts violently with CrO₃; aluminum chloride + benzoyl chloride. Fires in the benzene scrubbers of coke oven gas plants have been attributed to oxidation of naphthalene. Explosive in the form of vapor or dust when exposed to heat or flame. To fight fire, use water, CO₂, dry chemical. When heated to decomposition it emits acrid smoke and irritating fumes.

NAK000
1-NAPHTHALENEACETAMIDE

HR: 2

CAS: 86-86-2
 mf: C₁₂H₁₁NO mw: 185.24

NIOSH: QJ 0590000

SYNS:

N-ACETYL-1-NAPHTHYLAMINE
 AMID-THIN
 FRUITONE
 NAAM
 NAD
 NAPHTHALENE ACETAMIDE

α-NAPHTHALENEACETAMIDE
 α-NAPHTHYLACETAMIDE
 1-NAPHTHYLACETAMIDE
 ROOTONE
 ROSETONE

TOXICITY DATA:
 orl-mam LD50: 1000 mg/kg

CODEN:
 FMCHA2 -,C165,83

Reported in EPA TSCA Inventory.

THR: Moderately toxic by ingestion. When heated to decomposition it emits toxic fumes of NO_x.

NAK500
1-NAPHTHALENEACETIC ACID

HR: 3

CAS: 86-87-3
 mf: C₁₂H₁₀O₂ mw: 186.22

NIOSH: QJ 0875000

SYNS:

AGRONAA
 ALPHASPRA
 ANA
 APPL-SET
 CELMONE
 FRUITONE
 KLINGTITE
 LIQUI-STIK
 NAA 800
 NAFUSAKU
 NAPHTHALENE-1-ACETIC ACID
 α-NAPHTHALENEACETIC ACID
 α-NAPHTHYLACETIC
 NAPHTHYLACETIC ACID
 α-NAPHTHYLACETIC ACID
 1-NAPHTHYLACETIC ACID
 α-NAPHTHYLENEACETIC ACID
 α-NAPHTHYLESSIGSAEURE (GERMAN)

NAPHYL-1-ESSIGSAEURE (GERMAN)
 NIAGARA-STIK
 NU-TONE
 PARMONE
 PHYMONE
 PIMACOL-SOL
 PLANOFIX
 PLUCKER
 PRIMACOL
 ROOTONE
 STAFAST
 STIK
 STOP-DROP
 TEKKAM
 TIP-OFF
 TRANSPLANTONE
 TRE-HOLD
 VARDHAK

TOXICITY DATA:

eye-rbt 100 mg SEV
 mmo-smc 500 mg/L
 orl-rat TDLo: 27 g/kg (90D male): REP
 orl-rat LD50: 1000 mg/kg
 ipr-rat LD50: 100 mg/kg
 ipr-mus LD50: 720 mg/kg
 orl-mam LD50: 1000 mg/kg

CODEN:

PESTC* 9,10,80
 IDZAAW 48,185,73
 TXCYAC 5,371,76
 85DPAN -, -,71/76
 PESTC* 9,10,80
 FRPSAX 13,286,58
 FMCHA2 -,C165,83

Reported in EPA TSCA Inventory.

THR: Poison by intraperitoneal route. Moderately toxic by ingestion. Experimental reproductive effects. Mutagenic data. A skin, mucous membrane and severe eye irritant. Can cause depression. A pesticide. When heated to decomposition it emits acrid smoke and irritating fumes.

NAM000
1,5-NAPHTHALENE DIAMINE

HR: 3

CAS: 2243-62-1
 mf: C₁₀H₁₀N₂ mw: 158.22

NIOSH: QJ 3400000

SYNS:

1,5-DIAMINONAPHTHALENE
 1,5-NAPHTHYLENE DIAMINE

NCI-C03021

TOXICITY DATA:

mma-sat 33300 ng/plate
 mma-sat 33300 ng/plate
 otr-rat:emb 5200 ng/plate
 orl-rat TDLo: 721 g/kg/1Y-C:
 CAR
 orl-mus TDLo: 120 g/kg/2Y-C:
 CAR
 orl-mus TD :288 g/kg/2Y-C:
 CAR

CODEN:

ENMUDM 7(Suppl 5),1,85
 ENMUDM 7(Suppl 5),1,85
 JJATDK 1,190,81
 IARC** 27,127,82
 NCITR* NCI-CG-TR-143,78
 NCITR* NCI-CG-TR-143,78

| | |
|--------------------------|-----------------------------|
| ivn-rat LD50: 24 mg/kg | YACHDS 12(Suppl 6), 969, 84 |
| orl-mus LD50: 325 mg/kg | YACHDS 12(Suppl 6), 969, 84 |
| scu-mus LD50: 284 mg/kg | YACHDS 12(Suppl 6), 969, 84 |
| ivn-mus LD50: 28 mg/kg | YACHDS 12(Suppl 6), 969, 84 |
| orl-dog LD50: 405 mg/kg | YACHDS 12(Suppl 6), 969, 84 |
| ivn-dog LD50: 9200 µg/kg | YACHDS 12(Suppl 6), 969, 84 |
| orl-rbt LD50: 425 mg/kg | YACHDS 12(Suppl 6), 969, 84 |

THR: Poison by ingestion, subcutaneous and intravenous routes. When heated to decomposition it emits toxic fumes of NO_x and HCl.

XGA725

HR: 3

XILOBAM

CAS: 50528-97-7

NIOSH: YT 8850000

mf: C₁₄H₁₉N₃O mw: 245.36**SYNS:**

N-(2,6-DIMETHYLPHENYL)-N'-(1-METHYL-2-PYRROLIDINYLDENE)UREA

MCN-3113

1-(1-METHYL-2-PYRROLIDINYLDENE)-3-(2,6-XYLYL)UREA

TOXICITY DATA:

orl-rat LD50: 830 mg/kg
 ipr-rat LD50: 128 mg/kg
 orl-mus LD50: 320 mg/kg
 ipr-mus LD50: 110 mg/kg

CODEN:

AIPTAK 233,326,78
 AIPTAK 233,326,78
 JMCMAR 21,1044,78
 AIPTAK 233,326,78

THR: Poison by ingestion and intraperitoneal routes. When heated to decomposition it emits toxic fumes of NO_x.

XGS000

HR: 2

XYLENE

CAS: 1330-20-7

NIOSH: ZE 2100000

DOT: 1307

mf: C₈H₁₀ mw: 106.18

PROP: A clear liquid. Bp: 138.5°, flash p: 100°F (TOC), d: 0.864 @ 20°/4°, vap press: 6.72 mm @ 21°. Composition: as nonaromatics 0.07%, toluene 14%, ethyl benzene 19.27%, p-xylene 7.84%, m-xylene 65.01%, o-xylene 7.63%, C₉ and aromatics 0.04% (TXAPA9 33,543,75).

SYNS:

DIMETHYLBENZENE
 KSYLEN (POLISH)
 METHYL TOLUENE
 NCI-C55232
 RCRA WASTE NUMBER U239

VIOLET 3
 XILOLI (ITALIAN)
 XYLENEN (DUTCH)
 XYLOL (DOT)
 XYLOLE (GERMAN)

TOXICITY DATA:

eye-hmn 200 ppm
 skn-rbt 100% MOD
 skn-rbt 500 mg/24H MOD
 eye-rbt 87 mg MLD

CODEN:

JHTAB 25,282,43
 AMIHAB 14,387,56
 28ZPAK -,24,72
 AMIHAB 14,387,56

eye-rbt 5 mg/24H SEV
 cyt-smc 1 mmol/tube
 ihl-rat TCLo: 1000 mg/m³/24H (9-14D preg): TER
 orl-mus TDLo: 31 mg/kg (6-15D preg): REP
 ihl-mus TCLo: 2000 ppm/6H (6-12D preg): TER
 ihl-hmn TCLo: 200 ppm: NOSE,EYE,PUL
 ihl-man LCLo: 10000 ppm/6H
 orl-rat LD50: 4300 mg/kg
 ihl-rat LC50: 5000 ppm/4H
 scu-rat LD50: 1700 mg/kg
 ipr-mus LD50: 1548 mg/kg
 ipr-gpg LDLo: 2000 mg/kg
 ipr-mam LDLo: 2000 mg/kg

28ZPAK -,24,72
 HEREAY 33,457,47
 TXCYAC 11,55,78

JTEHD6 9,97,82

TJADAB 28,22A,83

JHTAB 25,282,43

BMJOAE 3,442,70
 AMIHAB 14,387,56
 NPRI* 1,123,74
 NPRI* 1,123,74
 AGGHAR 18,109,60
 AIHAAP 35,21,74
 AJHYA2 7,276,27

Reported in EPA TSCA Inventory. EPA Genetic Toxicology Program. Community Right To Know List.

OSHA PEL: TWA 100 ppm

ACGIH TLV: TWA 100 ppm; STEL 150 ppm; BEI: methyl

hippuric acids in urine end of shift 1.5 g/g creatinine

DFG MAK: (all isomers) 100 ppm (440 mg/m³); BAT:

blood end of shift 150 µg/dl, urine 2 g/l

NIOSH REL: (Xylene) TWA 100 ppm; CL 200 ppm/10M

DOT Classification: Flammable Liquid; Label: Flammable Liquid; Flammable or Combustible Liquid; Label: Flammable Liquid

THR: Moderately toxic by intraperitoneal and subcutaneous routes. Mildly toxic by ingestion and inhalation. An experimental teratogen. Human systemic effects by inhalation: olfactory changes, conjunctiva irritation and pulmonary changes. Experimental reproductive effects. Mutagenic data. A human eye irritant. An experimental skin and severe eye irritant. Some temporary corneal effects are noted, as well as some conjunctival irritation by instillation (adding drops to the eyes one at a time). Irritation can start at 200 ppm. A very dangerous fire hazard when exposed to heat or flame; can react with oxidizing materials. To fight fire, use foam, CO₂, dry chemical. When heated to decomposition it emits acrid smoke and irritating fumes. See also other xylene entries. For further information, see Vol. 6, No. 4 of DPIM Report.

XHA000

HR: 3

m-XYLENE

CAS: 108-38-3

NIOSH: ZE 2275000

DOT: 1307

mf: C₈H₁₀ mw: 106.18

PROP: Colorless liquid. Mp: -47.9°, bp: 139°, lel: 1.1%, uel: 7.0%, flash p: 77°F, d: 0.864 @ 20°/4°, vap press: 10 mm @ 28.3°, vap d: 3.66, autoign temp: 986°F. Insol in water; misc with alc, ether and some organic solvents.