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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, NEW YORK 10278

JUL 15 1991

Mr. Gerald F. Hoover
Project Engineer, Code 142
Environmental Restoration Branch
U.S. Navy, Northern Division
Naval Facilities Engineering Command
U.S. Naval Base, Bldg. 77Low
Philadelphia, PA 19112-5094

Re: Workplan for Site 8 (Landfill East of S-186)

Dear Mr. Hoover:

This is in response to Richard E. Fini's letter dated May 13, 1991, and Thomas G. Sheckles' letter dated June 24, 1991, regarding the above referenced subject.

At the June 11, 1991, Technical Review Committee meeting I mentioned that I wanted to refer back to the Initial Assessment Study completed in October 1983 before commenting on the Site 8 SI Workplan because I had concerns that preserved lumber had been disposed of on-site and I wanted to be sure that any samples were analyzed for the appropriate parameters. I contacted the U.S. Environmental Protection Agency (EPA) Environmental Research Laboratory in Ada, Oklahoma to get any guidance they had on Wood Preserving. Subsequently, they magnafaxed this information to me on June 27, 1991 and I magnafaxed it to you on July 1, 1991 (a summary of it is attached).

I told Eileen Neilands last week that additional test pit samples may have to be taken and that the samples may have to be analyzed for additional parameters. I went back and reviewed the Remedial Investigation Workplan to see how many samples were taken at the test pits for Sites 3, 4, 5, 7 and 10. Although only two test pit samples were taken per site, sediment, groundwater and surface water samples were also taken and analyzed. As the Workplan for Site 8 is written now, it is our understanding that only two of six test pits will be sampled. We do not believe this to be adequate. Therefore, we require that samples from all six test pits be taken. All samples should be analyzed for TCL, TAL, TPHC, TCLP and the compounds and components of Tables 1 and 2 to address our concerns that preserved lumber may have been disposed of on-site. If ground water is encountered in any of the test pits, ground water samples should also be analyzed for the same parameters. We believe this is necessary since this will be the only opportunity to determine if Site 8 needs Remedial Action.

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The nine construction borings taken at Site 8 in 1985 for the Traffic and Railroad Signals Project and any aerial photos should be utilized for determining the location of the test pits. The Site 8 Workplan also mentions locating the test pits in upslope and downslope locations. We assume this means upgradient and downgradient. If not please let me know.

EPA would also like to take split samples at Site 8. Please advise me in advance of any sampling, so that I can arrange for these splits to be taken by our contractor.

If you have any questions concerning this matter, please contact me at (212) 264-6609.

Sincerely yours,

Paul G. Ingrisano

Paul G. Ingrisano
Project Manager
Federal Facilities Section

Enclosures

cc: Captain W. M. Migrala, Jr., NWS Earle
G. Goepfert, NWS Earle
J. Freudenberg, NJDEP
D. Weeks, Versar

ATTACHMENT

INTRODUCTION TO WOOD PRESERVING

THE WOOD PRESERVING INDUSTRY

Wood is treated with one of four types of preservatives: 1) creosote, 2) PCP in petroleum (penta), or other solvents, 3) water solutions of copper, chromium, and arsenic (CCA), or ammoniacal solutions of copper and arsenic (ACA) and 4) fire retardants.

WOOD TREATING PROCESSES

PRESSURE TREATING PROCESSES

OIL BASED TREATMENTS

The organic preservative most used is coal tar creosote, a by-product from the production of coke from coal. Creosote is mostly aromatic single to multiple ring compounds (polycyclic aromatic hydrocarbons). Over 200 different components have been identified in creosote. Creosote is used straight or blended with coal tar or petroleum.

Pentachlorophenol (4-8%) dissolved in No. 2 fuel oil carrier is the second most common organic wood preservative. Technical grade PCP is about 85% to 90% pure PCP plus various levels of other chlorinated phenolic compounds.

Pentachlorophenol-hydrocarbon mixtures consist of heavy petroleum, mineral spirits, or liquified petroleum gas.

WATER BASED TREATMENTS

CCA and ACA mixtures are currently the most commonly used; most treated lumber is treated with CCA or ACA solutions. ACA is an ammoniacal solution of arsenic and copper. CCA is an acid solution of copper oxide, chromic acid and arsenic acid. These materials react with the wood to form a complex of relatively insoluble precipitates. Other salts of copper and chromium may be used instead of copper oxide and chromic acid.

NON PRESSURE PROCESSES

Diffusion processes apply waterborne salts, such as copper sulfate and zinc chloride, copper naphthenate.

CHARACTERISTICS OF WOOD PRESERVATIVES

ORGANIC WOOD PRESERVATIVES

The two major organic wood preservatives are PCP and creosote.

Technical grade PCP use for treating wood contains 85% to 90% PCP. The remaining materials in technical grade PCP are 2,3,4,6-tetrachlorophenol (4% to 8%), "higher chlorophenols" (2% to 6%), and dioxins and furans (0.1%).

The other contaminants found in technical grade PCP are formed during manufacture. PCP is manufactured from phenol by a catalytic chlorination process. During chlorination, side reaction gives rise to contaminants, including traces of trichlorophenol, chlorinated dibenzo-p-dioxins, chlorinated dibenzofurans, chlorophenoxy phenols, chlorodiphenyl ethers, chlorohydroxydiphenyl ethers, and traces of even more complex reaction products of phenol. Chlorodibenzodioxins and furans are the by-products which generate the greatest concerns. The principal chlorodibenzodioxin and chlorodibenzofuran contaminants are those containing six to eight chlorines.

The other major organic wood preservative used in the United States is creosote. Creosote, in contrast to PCP, is a very complex mixture of organic compounds produced from the high temperature carbonization of bituminous coal. Coal tar creosote contains approximately 85% polynuclear aromatic hydrocarbons (PAHs), 10% phenolic compounds, and 5% nitrogen, sulfur or oxygen containing heterocycles.

At least 200 chemical compounds have been identified in creosote.

The greater part of the composition of creosote consists of neutral fractions. Tar acids, such as phenol and the cresols, as well as such tar bases as pyridines, quinolines, and acridines, constitute a rather small percentage of the total weight of creosote.

There are three commonly used inorganic arsenical wood preservatives: chromated copper arsenate (CCA), ammoniacal copper arsenate (ACA), and fluor chrome arsenate phenol (FCAP). These are various mixtures made in part from ammonium arsenic pentoxide, sodium arsenate, or sodium pyroarsenate.

Other inorganic or inorganic/organic preservative formulations that have been used include Tanalith, a mixture of sodium flouride, sodium dichromate, arsenic and dinitrophenol; Minalith, a mixture of diammonium phosphate, ammonium sulfate, sodium tetraborate and boric acid; ACZA, ammoniacal copper-zinc-arsenate; and Pyresote, a mixture of zinc chloride, sodium dichromate, ammonium sulfate and boric acid.

TABLE 1: CHEMICAL COMPOSITION OF CREOSOTE

COMPOUND OR COMPONENT
Naphthalene
Methyl naphthalene
Diphenyl dimethylnaphthalene
Biphenyl
Acenaphthene
Dimethylnaphthalene
Diphenyloxide
Dibenzofuran
Fluorene-related compounds
Methyl fluorenes
Phenanthrene
Anthracene
Carbazole
Methylphenanthrene
Methyl anthracenes
Fluoranthene
Pyrene
Benzofluorene
Chrysene

TABLE 2: COMPOSITION OF PENTACHLOROPHENOL

COMPONENT
Pentachlorophenol
Tetrachlorophenol
Trichlorophenol
Chlorinated phenoxyphenols
Octachlorodioxin
Heptachlorodioxins
Hexachlorodioxins
Octachlorodibenzofuran
Heptachlorodibenzofurans
Hexachlorodibenzofurans