City: CUMBERLAND
LIMESTONE ROAD

Site Information:

Site Name: LIMESTONE ROAD
Address: CUMBERLAND, MD

EPA ID: MDD980691588
EPA Region: 03

Site Alias Name(s):

CUMBERLAND CEMENT & SUPPLY
DIGGS SANITATION
LIMESTONE ROAD SITE

Record of Decision (ROD):

ROD Date: 09/30/1986
Operable Unit: 01
ROD ID: EPA/ROD/R03-86/026

Media: GROUNDWATER SEDIMENTS SURFACE WATER

Contaminant: CHROMIUM, INORGANICS, ORGANICS, TCE, VOCS

Abstract: THE LIMESTONE ROAD SITE IS LOCATED 2.5 MILES EAST SOUTHEAST OF CUMBERLAND, ALLEGHENY COUNTY, MD ON THE WESTERN FLANK OF IRONS MOUNTAIN. THE 210-ACRE SITE CONSISTS OF TWO PARCELS OF LAND, THE FORMER DIGGS SANITATION COMPANY (DSC-20 ACRES) AND THE CUMBERLAND CEMENT AND SUPPLY COMPANY (CC&SC - 191 ACRES). THE SITE IS BORDERED ON THE SOUTHWEST BY SEVERAL RESIDENCES, AND IMMEDIATELY TO THE NORTHWEST LIE THE CUMBERLAND CITY DUMP AND UNDEVELOPED LAND. THE SITE INCLUDES LARGE AREAS OF LANDFILLED AND DUMPED COMMERCIAL RESIDENTIAL AND DEMOLITION REFUSE ON BOTH PROPERTIES. ABOUT 110 TONS OF A CHROMIUM CONTAINING SLUDGE WERE ALSO DISPOSED OF ON THE PROPERTIES. CURRENTLY, 18 RESIDENCES ARE WITHIN A HALF-MILE DOWNHILL OF THE SITE, 5 WITHIN 100 YARDS, AND ONE ON THE DIGGS PROPERTY.

THE WATER SUPPLY FOR THESE RESIDENCES IS GROUND WATER FROM PRIVATE WELLS. GROUND WATER IN THE AREA OF THE SITE HAS THE POTENTIAL TO BE CONTAMINATED WITH INORGANIC AND ORGANIC CONSTITUENTS. IN THE MID 1970S, MR. CHARLES STEINER, PRESIDENT OF CC&SC, BEGAN ALLOWING VARIOUS CONTRACTORS TO DUMP CLEAN FILL (HOUSING DEMOLITION MATERIAL) ON THE PROPERTY TO PROVIDE A LARGER AND MORE LEVEL WORKING SURFACE. HOWEVER, A VARIETY OF WASTE HAS REPORTEDLY BEEN DUMPED INTO A RAVINE ON THE PROPERTY. IN APRIL 1981, MR. JOSEPH DIGGS, A LICENSED HAZARDOUS WASTE HAULER AND OWNER OF DSC, WAS ALLEGEDLY INVOLVED IN THE DUMPING OF 99 TONS OF HAZARDOUS WASTE CONTAINING CHROMIUM, LEAD, AND CADMIUM INTO A RAVINE ON CC&SC PROPERTY. IN ADDITION, AN ALLEGED 11 TONS OF HAZARDOUS WASTE HAVE BEEN REPORTEDLY DISPOSED OF ON THE DIGGS PROPERTY AS AN EXTENSION OF PREVIOUS FILLING AND GRADING OPERATIONS. THE NEARBY CUMBERLAND CITY DUMP FUNCTIONED AS A MUNICIPAL LANDFILL FROM 1932 TO 1968. FLY ASH, MISCELLANEOUS SOLID METAL WASTES, AND NUMEROUS TIRES ARE CURRENTLY EXPOSED ON THE NORTHERN AND SOUTHERN FACES OF THE DUMP. SEVERAL CRUSHED AND RUSTED DRUMS WERE NOTED ALONG THE BANKS OF THE INACTIVE LANDFILL. THE PRIMARY CONTAMINANTS OF CONCERN INCLUDE; VOCS, BASE-NEUTRAL COMPOUNDS, TCE, PCE, & HEAVY METALS.

THE SELECTED INTERIM REMEDIAL ACTION INCLUDES; SITE GRADING; CAPPING OF CONTAMINATED SOIL ON ALL PROPERTIES; FENCING OF BOTH PROPERTIES; CONTINUED MONITORING OF GROUNDWATER, SURFACE WATER, AND SEDIMENT; COMPLETE HISTORICAL REVIEW OF PERTINENT GEOLOGICAL INFORMATION; COLLECTION OF REGIONAL OFFSITE AND ONSITE GEOLOGICAL INFORMATION; CHEMICAL ANALYSIS OF THE SHALE TO DETERMINE ITS COMPOSITION; REEVALUATION AND ESTABLISHMENT OF BACKGROUND DATA CONTROL POINTS; FREQUENT SAMPLING TO INCREASE THE DATA BASE; INCREASE IN THE NUMBER OF STREAM AND RESIDENTIAL SAMPLING; EVALUATION OF THE EFFECTS OF NATURAL AND/OR DOMESTIC (PLUMBING) CONDITIONS ON THE OVERALL WATER QUALITY OF THE AREA. THE ESTIMATED CAPITAL COST IS $1,192,580. O&M

COST WILL BE DETERMINED AFTER COMPLETION OF GROUND WATER STUDIES.

Remedy:

- SITE GRADING
- CAPPING OF CONTAMINATED SOIL ON ALL PROPERTIES
- FENCING OF BOTH PROPERTIES
- CONTINUED MONITORING OF GROUND WATER, SURFACE WATER AND SEDIMENT
- COMPLETE HISTORICAL REVIEW OF PERTINENT GEOLOGICAL INFORMATION
- COLLECTION OF REGIONAL, OFFSITE AND ONSITE GEOLOGICAL INFORMATION
- CHEMICAL ANALYSIS OF THE SHALE TO DETERMINE ITS COMPOSITION
- REEVALUATE AND ESTABLISH BACKGROUND DATA CONTROL POINTS
- FREQUENT SAMPLING TO INCREASE THE DATA BASE
- INCREASE THE NUMBER OF STREAM AND RESIDENTIAL SAMPLING
- EVALUATE THE EFFECTS OF NATURAL AND/OR DOMESTIC (PLUMBING) CONDITIONS ON THE OVERALL WATER QUALITY OF THE AREA
- A DECISION WILL BE MADE LATER REGARDING SURFACE WATER SEDIMENT AND GROUND WATER RUNON INTERCEPTION. THE ABOVE STUDIES, INCLUDING ANY ADDITIONAL FURTHER STUDIES WILL BE DONE TO CHARACTERIZE THE SITE IN TERMS OF THE GEOLOGY AND HYDROLOGY BY EPA AND THE MARYLAND WASTE MANAGEMENT ADMINISTRATION, AND EVALUATED FOR FUTURE REMEDIAL ACTION.

Text: Full-text ROD document follows on next page.

EPA/ROD/R03-86/026
1986

EPA Superfund
Record of Decision:

LIMESTONE ROAD
EPA ID: MDD980691588
OU 01
CUMBERLAND, MD
09/30/1986

Text:
LIMESTONE ROAD SITE, CUMBERLAND MARYLAND.

#DR
DOCUMENTS REVIEWED

I AM BASING MY DECISION PRINCIPALLY ON THE FOLLOWING DOCUMENTS DESCRIBING THE ANALYSIS OF COST EFFECTIVENESS AND FEASIBILITY OF REMEDIAL ALTERNATIVES FOR THE LIMESTONE ROAD SITE. ALSO, MEETINGS TO DISCUSS THESE REMEDIAL ALTERNATIVES HAVE BEEN CONDUCTED WITH THE STATE AND THE GENERAL PUBLIC. I HAVE BEEN BRIEFED BY MY STAFF ON THE DOCUMENTS AND THE MEETINGS AND THEY FORM THE PRINCIPAL BASIS FOR MY DECISION.

- LIMESTONE ROAD REMEDIAL INVESTIGATION (CH2M HILL, AUGUST, 1986)
- LIMESTONE ROAD FEASIBILITY STUDY (CH2M HILL, JUNE, 1986)
- STAFF SUMMARIES AND RECOMMENDATIONS
- SUMMARY OF REMEDIAL ALTERNATIVES SELECTION
- RESPONSIVENESS SUMMARY.

#DE
DECLARATIONS

CONSISTENT WITH THE COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 (CERCLA), AND THE NATIONAL CONTINGENCY PLAN (40 CFR PART 300). I HAVE DETERMINED THAT THE DESCRIBED SELECTED ALTERNATIVE PROVIDES ADEQUATE PROTECTION OF PUBLIC HEALTH, WELFARE, AND THE ENVIRONMENT. THE STATE OF MARYLAND HAS BEEN CONSULTED AND AGREES WITH THE APPROVED REMEDY.

I HAVE ALSO DETERMINED THAT THE ACTION BEING TAKEN IS APPROPRIATE WHEN BALANCED AGAINST THE AVAILABILITY OF TRUST FUND MONIES FOR USE AT OTHER SITES.

9/30/86
DATE

JAMES M. SEIF
REGIONAL ADMINISTRATOR.

SITE DESCRIPTION AND SUMMARY OF REMEDIAL

ALTERNATIVE SELECTION FOR THE LIMESTONE ROAD SITE

#SLD
SITE LOCATION AND DESCRIPTION

THE LIMESTONE ROAD SITE IS LOCATED ON THE WESTERN FLANK OF IRONS MOUNTAIN NEAR CUMBERLAND, MARYLAND. THE SITE LIES ENTIRELY WITHIN ALLEGHENY COUNTY, MARYLAND, 2.5 MILES EAST SOUTHEAST OF THE CITY OF CUMBERLAND (FIGURE 1 AND 2). THE 210 ACRE SITE CONSISTS OF TWO PARCELS OF LAND, THE FORMER DIGGS SANITATION COMPANY (20 ACRES) AND THE CUMBERLAND CEMENT AND SUPPLY COMPANY (CC&SC - 191 ACRES). THE SITE IS BORDERED ON THE SOUTHWEST BY SEVERAL RESIDENCES; IMMEDIATELY TO THE NORTHEAST LIE THE CUMBERLAND CITY DUMP AND UNDEVELOPED LAND.

THE SITE INCLUDES LARGE AREAS OF LANDFILLED AND DUMPED COMMERCIAL, RESIDENTIAL AND DEMOLITION REFUSE ON BOTH PROPERTIES. IN ADDITION, ABOUT 110 TONS OF A CHROMIUM CONTAINING SLUDGE WERE DISPOSED OF ON THE PROPERTIES. THROUGH SURVEILLANCE AND SAMPLING OPERATIONS BY THE MARYLAND STATE DEPARTMENT OF HEALTH AND MENTAL HYGIENE (MDHMH) AND THE U.S. EPA REGION III FIELD INVESTIGATION TEAM (FIT), SUSPECTED AREAS OF DUMPING TOTALLING APPROXIMATELY 30 ACRES WERE DEFINED ON THE SITE. IN 1983, THE TWO PROPERTIES WERE ASSIGNED A MITRE MODEL HAZARD RANKING OF 30.54, WHICH QUALIFIED THEM FOR INCLUSION ON THE NATIONAL PRIORITIES LIST (NPL) AS A SUPERFUND SITE. THE CUMBERLAND CITY DUMP, THOUGH NOT INCLUDED IN THE SITE DEFINITION USED FOR INCLUSION OF THE LIMESTONE ROAD SITE ON THE NPL, WAS INCLUDED IN SOME OF THE FIELD INVESTIGATIVE WORK.

CURRENTLY, 18 RESIDENCES ARE WITHIN A HALF MILE DOWNHILL OF THE LIMESTONE ROAD SITE, 5 WITHIN 100 YARDS OF THE SITE, AND 1 ON THE DIGGS PROPERTY. THE WATER SUPPLY FOR RESIDENCES OF THESE NEARBY HOMES IS GROUND WATER FROM PRIVATE WELLS. GROUND WATER IN THE AREA OF THE SITE HAS THE POTENTIAL TO BE CONTAMINATED WITH INORGANIC AND ORGANIC CONSTITUENTS FROM THE SITE. GROUND WATER OCCURS UNDER BOTH ARTESIAN AND UNCONFINED CONDITIONS IN THE AREA. THE SHALES BEHAVE AS A SINGLE HYDROSTRATIGRAPHIC UNIT AND PROVIDE ALL OF THE PRIVATE WATER SUPPLY IN THE AREA. BECAUSE OF EXTENSIVE FRACTURING, SOME WELLS IN THE SHALE OF THE LIMESTONE ROAD SITE YIELD UP TO 20 GALLONS PER MINUTE. THE AVERAGE IS PROBABLY SOMEWHERE IN THE RANGE OF 5 TO 7 GPM.

SURFACE WATER DRAINAGE IN THE VICINITY OF THE SITE IS TO UNNAMED TRIBUTARY STREAMS THAT FLOW EITHER DIRECTLY TO THE NORTH BRANCH OR TO EVITTS CREEK, WHICH IS TRIBUTARY TO THE NORTH BRANCH. A SPRING DISCHARGING FROM THE BASE OF CC&SC PROPERTY FEEDS A TRIBUTARY THAT FLOWS SOUTH-SOUTHWESTERLY TO THE NORTH BRANCH. ANOTHER SPRING THAT DISCHARGES FROM THE BASE OF THE CUMBERLAND CITY DUMP FEEDS A STREAM THAT FLOWS INTO AN UNNAMED TRIBUTARY THAT EVENTUALLY DISCHARGES INTO EVITTS CREEK JUST BEFORE ITS CONFLUENCE WITH THE NORTH BRANCH. THIS SAME TRIBUTARY RECEIVES RUNOFF FROM A STEEP ERODED SLOPE OF EXPOSED FLY ASH ABOUT 1, 800 FEET UPSTREAM OF ITS CONFLUENCE WITH THE STREAM AND SPRING EMANATING FROM THE BASE OF THE CITY DUMP.

#SH
SITE HISTORY

ON SEPTEMBER 26, 1956, CUMBERLAND CEMENT AND SUPPLY COMPANY (CC&SC) PURCHASED AN UNDIVIDED ONE-HALF INTEREST IN A 191 ACRE PARCEL OF LAND LOCATED ON LIMESTONE ROAD. ON SEPTEMBER 19, 1973, CC&SC PURCHASED THE REMAINING HALF INTEREST OF THE PARCEL. MR. CHARLES STEINER, PRESIDENT OF CC&SC, INDICATED THAT THE PROPERTY WAS PURCHASED WITH THE INTENT OF USING A PREEXISTING LIMESTONE QUARRY ON THE PROPERTY. LIMESTONE HAD BEEN QUARRIED IN AREAS TO THE NORTH AND EAST OF THE SITE, HOWEVER THE QUARRY WAS NEVER WORKED BY CC&SC.

IN THE MID - 1970'S, MR. STEINER BEGAN ALLOWING VARIOUS CONTRACTORS TO DUMP CLEAN FILL (HOUSING DEMOLITION MATERIAL) ON THE PROPERTY TO PROVIDE A LARGER AND MORE LEVEL WORKING SURFACE. HOWEVER, BRICKS, MORTAR, STONE, CONCRETE, WOOD, DOMESTIC GARBAGE, DRUMS, MATTRESSES, GLASS, FURNITURE, TIRES, CLOTHING, GLASS INDUSTRY WASTE, WOODEN SPOOLS, AND PALLETS HAVE ALL REPORTEDLY BEEN DUMPED INTO A RAVINE ON THE PROPERTY.

THE PARTY PRIMARILY RESPONSIBLE FOR THE DUMPING OF CHROMIUM-CONTAMINATED HAZARDOUS WASTES ON THE CC&SC PROPERTY WAS DIGGS SANITATION, INC. THE OWNER AND OPERATOR OF THIS FACILITY WAS JOSEPH T. DIGGS, A LICENSED HAZARDOUS WASTE HAULER. ALLEGEDLY, 99 TONS OF HAZARDOUS WASTE CONTAINING CHROMIUM, LEAD, AND CADMIUM FROM FAIRCHILD REPUBLIC, HAGERSTOWN, MARYLAND, WERE DUMPED INTO A RAVINE ON THE CC&SC PROPERTY IN APRIL 1981 BY DIGGS SANITATION.

DIGGS SANITATION OPERATED FROM THE DIGGS PROPERTY ON LIMESTONE ROAD AND WAS ALSO INVOLVED WITH COMMERCIAL STORAGE AND SALVAGE. FILLING AND GRADING OPERATIONS TOOK PLACE ON THE PROPERTY PRIOR TO THE MID-1960'S. DEBRIS AND REFUSE HAVE BEEN DISPOSED OF THERE SINCE. IN ADDITION, AN ALLEGED 11 TONS OF HAZARDOUS WASTE FROM FAIRCHILD REPUBLIC, HAGERSTOWN, MARYLAND, HAVE BEEN REPORTEDLY DISPOSED OF ON THE DIGGS PROPERTY.

THE NEARBY CUMBERLAND CITY DUMP FUNCTIONED AS A MUNICIPAL LANDFILL FROM 1932 TO 1968. FLY ASH FROM COAL BURNING, MISCELLANEOUS SOLID METAL WASTES, AND NUMEROUS TIRES ARE CURRENTLY EXPOSED ON THE NORTHERN AND SOUTHERN FACES OF THE DUMP. SEVERAL CRUSHED AND RUSTED DRUMS WERE NOTED ALONG THE BANKS OF THE INACTIVE LANDFILL. THE AMOUNTS OF HOUSEHOLD TYPE WASTES THAT MAY HAVE BEEN DISPOSED OF IN THE LANDFILL ARE UNKNOWN.

A COMPLAINT AND ORDER WERE ISSUED TO DIGGS AND THE CC&SC IN JUNE 1981 BY THE MDHMH, OFFICE OF ENVIRONMENTAL PROGRAMS, REQUIRING THEM TO CLEAN UP THEIR RESPECTIVE PROPERTIES. IN MARCH 1982, THE REGION III FIT CONDUCTED A PRELIMINARY ASSESSMENT OF THE CONDITIONS AT THE SITE. WASTE SAMPLES COLLECTED FROM THE CC&SC DRUM AREA CONTAINED ETHYL BENZENE, FLUORANTHENE, VARIOUS PHTHALATES, BENZO (A) ANTHRACENE, PHENANTHRENE, PYRENE, BENZENE, 1,1,2,2 - TETRACHLOROETHANE, TRANSDICHLOROETHENE, AND NAPHTHALENE. SURFACE WATERS SHOWED LITTLE EVIDENCE OF CONTAMINATION. ONE RESIDENTIAL WELL CONTAINED 0.01 PPM OF TETRACHLOROETHENE, AS WELL AS TRACE AMOUNTS OF 1,1,1,-TRICHLOROETHANE.

#CSS
CURRENT SITE STATUS

EPA REGION III COMPLETED A REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS) AT LIMESTONE ROAD IN JULY 1986. DATA COLLECTED IN THE RI AND IN PREVIOUS STUDIES DONE BY EPA'S FIELD INVESTIGATION TEAM (FIT) AND THE MARYLAND DEPARTMENT OF HEALTH AND MENTAL HYGIENE (MDHMH) WERE USED TO DESCRIBE THE NATURE AND EXTENT OF CONTAMINATION. ADDITIONAL SOIL, SEDIMENT, SURFACE WATER, AND GROUND WATER SAMPLES WILL BE COLLECTED DURING DESIGN.

PATHWAYS AND RECEPTORS ARE DESCRIBED IN DETAIL ALONG WITH KNOWN OR SUSPECTED RISKS POSED BY CONTAMINANTS IN THE RI/FS REPORTS AND IN THE EPA REGION III TECHNICAL SUPPORT DOCUMENTS.

THE FOLLOWING IS A BRIEF SUMMARY OF THE TYPES AND CONCENTRATIONS OF CONTAMINANTS DETECTED DURING THE REMEDIAL INVESTIGATION:

- INORGANIC CONTAMINANT CONCENTRATIONS FOUND IN THE SOILS OF THE DIGGS PROPERTY WERE HIGHEST IN THE AREA OF TEST PIT ST018. THE INORGANICS OF PRINCIPAL INTEREST ON THE DIGGS PROPERTY WHEN RANKED FROM HIGHEST TO LOWEST CONCENTRATION ARE AS FOLLOWS: ZINC (4,090 MG/KG), LEAD, MANGANESE, COPPER, BARIUM, NICKEL, CHROMIUM, SELENIUM, ARSENIC, CADMIUM, AND CYANIDE (6 MG/KG).

- ON THE CC&SC PROPERTY, THE INORGANIC CONTAMINANTS WERE CONCENTRATED

IN TEST PIT AREAS ST010 AND ST030. THE INORGANICS OF PRINCIPAL INTEREST ON THE CC&SC PROPERTY WHEN RANKED FROM HIGHEST TO LOWEST CONCENTRATION ARE AS FOLLOWS: CHROMIUM (97,600 MG/KG), MANGANESE, BARIUM, CADMIUM, ZINC, LEAD, COPPER, CYANIDE, ARSENIC, SELENIUM, AND NICKEL (51 MG/KG). BASED ON TEST PIT AND SOIL BORING DEPTH CHEMICAL ANALYSIS RESULTS, IT IS ESTIMATED THAT CHROMIUM IN THIS AREA CAN BE FOUND IN A 5-FOOT LAYER, APPROXIMATELY 1.5 FEET BENEATH THE SURFACE.

- ORGANICS IN THE SOIL ON THE DIGGS PROPERTY WERE MORE WIDELY DISTRIBUTED NUMEROUS, AND GREATER IN CONCENTRATION THAN ON THE CC&SC PROPERTY. ON THE CC&SC PROPERTY THEY WERE CONCENTRATED LARGELY IN THE AREA OF TEST PITS ST010 AND ST030. THE PRINCIPAL ORGANICS DETECTED ONSITE WERE BASE/NEUTRAL COMPOUNDS SUCH AS BENZO(A)PYRENE, PESTICIDES SUCH AS CHLORDANE, AND VOLATILES SUCH AS TRICHLOROETHENE, TETRACHLOROETHENE, AND 1,1,2-TRICHLOROETHANE. CONCENTRATIONS OF THE ORGANIC CONTAMINANTS RANGED WIDELY FROM 57,000 UG/KG FOR THE BASE/NEUTRAL FLUORANTHENE TO 2 UG/KG FOR THE PESTICIDE ENDOSULFAN II.

- RESULTS OF THE ANALYTICAL TESTING PROGRAM INDICATE THAT GROUND WATER DEGRADATION HAS OCCURRED AS A RESULT OF LANDFILLING OPERATIONS IN THE AREA. DEGRADATION OCCURS PRIMARILY IN THE FORM OF INORGANIC CONSTITUENTS, SOME OF WHICH ARE CONSIDERED TO BE TOXIC.

- THE DISTRIBUTION OF TOXIC INORGANIC CONSTITUENTS IN GROUND WATER IS SPORADIC, SHOWING NO DEFINABLE TREND, WITH PERHAPS THE EXCEPTION OF NICKEL. TOXIC INORGANIC CONSTITUENTS DETECTED INCLUDE CADMIUM, CHROMIUM, CYANIDE, LEAD, MERCURY, AND SILVER. THE CONCENTRATION OF CADMIUM DETECTED IN MONITORING WELL MW10 (10 UG/L PHASE I) EQUALED THE PRIMARY INTERIM MCL (10 UG/L) AND EXCEEDED THE PROPOSED RECOMMENDED MCL (5 UG/L).

- THE CONCENTRATIONS OF LEAD IN MONITORING WELL MW6 (66 UG/L PHASE I) AND RESIDENTIAL WELLS DW8 (81 UG/L PHASE I) AND DW16 (134 UG/L PHASE III) EXCEEDED BOTH THE PRIMARY INTERIM AND PROPOSED RECOMMENDED MCL'S OF 50 UG/L AND 20 UG/L, RESPECTIVELY. READINGS OBTAINED FROM THESE WELLS DID NOT ALWAYS EXCEED VALUES SPECIFIED IN THE MCL LISTS.

- THE DISTRIBUTION OF THESE CONSTITUENTS IN RESIDENTIAL WELLS IS MORE DIFFICULT TO INTERPRET, AS MANY ARE NATURALLY OCCURRING CONSTITUENTS OF GROUNDWATER. THE CONCENTRATIONS OF IRON AND MANGANESE IN ALL RESIDENTIAL WELLS EXCEPT DW9 AND DW10 EXCEED THE SECONDARY MCL ESTABLISHED FOR THE PROTECTION OF HUMAN WELFARE. CONCENTRATIONS OF ZINC IN RESIDENTIAL WELLS DW7, DW9, AND DW16 EXCEEDED THE PROPOSED RECOMMENDED MCL OF 5,000 UG/L.

- THE DISTRIBUTION OF ORGANIC CONSTITUENTS IS MORE SPORADIC AND LESS CONSISTENT THAN THE DISTRIBUTION OF INORGANIC CONSTITUENTS IN GROUNDWATER. NO OBSERVABLE TREND CAN BE IDENTIFIED CORRELATING THE OCCURRENCE OF THESE COMPOUNDS WITH LANDFILLED AREAS. NEVERTHELESS, THE POSSIBILITY DOES EXIST GIVEN THE UNCERTAIN NATURE OF FLOW IN FRACTURED MEDIA.

- INORGANICS OF PRIMARY INTEREST IN THE SURFACE WATERS EMANATING FROM BOTH THE CC&SC AND DIGGS PROPERTY WERE CHROMIUM, CADMIUM, AND ZINC. INORGANICS IN THE SURFACE WATER INFLUENCED SOLELY BY THE CITY DUMP WERE NOT SUBSTANTIALLY DIFFERENT FROM THOSE DETECTED IN THE OTHER SURFACE WATERS.

- ONLY THE ORGANIC BIS(2-ETHYLHEXYL) PHTHALATE WAS DETECTED IN LOW LEVELS (5 UG/L) IN THE SURFACE WATER AT LOCATIONS SW005, SW006 AND SW007.

- INORGANIC CONTAMINANTS OF IMPORTANCE DETECTED IN THE STREAM SEDIMENT INFLUENCED BY THE CC&SC PROPERTY WHEN RANKED ACCORDING TO CONCENTRATION ARE AS FOLLOWS: MANGANESE (2,030 MG/KG), BARIUM, CHROMIUM, LEAD, NICKEL, AND CADMIUM (4.5 MG/KG). ON THE DIGGS PROPERTY (PRIMARILY AT LOCATION SD005), THE INORGANICS WHEN RANKED ARE AS FOLLOWS: MANGANESE (144,000 MG/KG), ZINC, NICKEL, BARIUM, LEAD, COPPER, CHROMIUM, CADMIUM, AND CYANIDE (3 MG/KG). ORGANICS DETECTED IN THE SEDIMENT WERE TOLUENE, TRICHLOROETHENE, BENZOIC ACID, PHENOL, AND BENZENE. BENZENE AND

TRICHLOROETHENE WERE DETECTED ONLY ONCE AT SITES SD005 AND SD006, RESPECTIVELY. TOLUENE WAS DETECTED AT SITES SD001, SD002, SD003, SD004, SD005, AND SD006 AT CONCENTRATIONS FROM 5 TO 6 UG/KG.

BASED ON THE QUANTITATIVE FINDINGS PRESENTED IN THE RISK CHARACTERIZATION, IT IS EVIDENT THAT A THREAT OF DIRECT CONTACT TO THE PUBLIC HEALTH AND ENVIRONMENT EXISTS FROM THE CHEMICALS AT THE LIMESTONE ROAD SITE. THE CHEMICALS EXIST IN AMOUNTS ABOVE BACKGROUND THAT, IF INGESTED FROM THE SOIL, SEDIMENT, OR WATERS COULD CAUSE HARM TO HUMAN INGESTORS AND PERHAPS TO OTHER ANIMALS. THE FOLLOWING LISTS IMPORTANT FINDINGS OF THE QUANTIFIABLE PORTION OF THE PUBLIC HEALTH EVALUATION AND ENVIRONMENTAL ASSESSMENT.

- THE NONCARCINOGENS MANGANESE, CADMIUM, LEAD, AND ZINC WERE PRESENT IN THE GROUNDWATER AND WILL EXCEED ACCEPTABLE DAILY INTAKE LEVELS IF INGESTED AT THE PUBLISHED RATES, IN ADDITION TO EXCEEDING STANDARDS AND GUIDELINES ESTABLISHED FOR SAFE DRINKING WATER. NICKEL APPEARED IN CONCENTRATIONS THAT WILL ALSO EXCEED ITS ACCEPTABLE INTAKE LEVEL. IT MAY BE THAT THE PRESENCE OF THE ABOVE IN GROUNDWATER IS A RESULT OF SITE SOIL CONTAMINATION OR SOME CONSTITUENTS (SUCH AS LEAD AND ZINC) MAY HAVE ORIGINATED FROM CONTACT OF THE WATER WITH OLD OR CORRODING PIPING OR NATURAL OCCURRENCE. FURTHER EVALUATION OF THE GROUND WATER WILL HOPEFULLY DELINEATE THE PROBLEM.

- SOIL AT THE SITE CONTAINED THE CARCINOGENS BENZO(A)PYRENE, BENZO(A)ANTHRACENE, BENZO(B) FLUORANTHENE, INDENO (1,2,3-CD)PYRENE, CHRYSENE, BETA-HCCH, CHLORDANE, HEPTACHLOR, PCB'S, 1,1,2-TRICHLOROETHANE, TRICHLOROETHENE, AND TETRACHLOROETHANE IN CONCENTRATIONS THAT RESULTED IN SITE TOTAL EXCESS LIFETIME CANCER RISKS OF 6 X 10-2, 1 X 10-3, 2 X 10-4, AND 5 X 10-4 FOR THE UPPER AND LOWER RESIDENTIAL, RECREATIONAL, AND OCCUPATIONAL EXPOSURES. THE POLYCYCLIC AROMATIC HYDROCARBONS WERE THE SIGNIFICANT CONTRIBUTORS TO THESE RISKS. TOTAL RISK BASED ON MEAN CONTAMINANT CONCENTRATIONS WERE 2 X 10-3, 2 X 10-5, AND 1 X 10-4 FOR THE UPPER AND LOWER RESIDENTIAL, RECREATIONAL AND OCCUPATIONAL EXPOSURES.

- NONCARCINOGENS IN THE SOIL INCLUDING ARSENIC, BARIUM, CADMIUM, CHROMIUM (BOTH +3 AND +6), COPPER, LEAD, CYANIDE, MANGANESE, NICKEL, SELENIUM, AND ZINC WHEN INGESTED AT PUBLISHED RATES OF INGESTION WILL EXCEED THEIR ACCEPTABLE DAILY INTAKE LEVELS FUR ADULTS AND/OR CHILDREN. NOTE THAT, IN THE SOIL CHROMIUM MAY BE EXPECTED TO BE FOUND PREDOMINANTLY IN THE TRIVALENT FORM BECAUSE OF THE PRESENCE OF REDUCING ORGANICS. THIS WOULD MEAN THAT EXCEEDANCES OF THE ACCEPTABLE INTAKES FOR THE +6 FORM OF CHROMIUM MAY NOT BE RELEVANT.

- SEDIMENT AT THE SITE CONTAINED THE QUANTIFIABLE CARCINOGENIC BENZO (A) ANTHRACENE, BENZO (B) FLUORANTHENE, INDENO (1,2,3-CD) PYRENE, CHRYSENE, BENZENE, AND TRICHLOROETHENE. TOTAL RISKS ASSOCIATED WITH THESE CHEMICALS WERE 5 X 10-4, 3 X 10-5, 3 X 10-6, AND 1 X 10-5 FOR THE UPPER AND LOWER RESIDENTIAL, RECREATIONAL AND OCCUPATIONAL EXPOSURES.

- THE NONCARCINOGENS ARSENIC, BARIUM, CADMIUM, CHROMIUM, (ASSUMED AS +6), COPPER, LEAD, MANGANESE, NICKEL, AND ZINC WERE PRESENT IN THE SEDIMENT IN CONCENTRATIONS WHICH, IF INGESTED (AT PUBLISHED RATES OF SOIL/SEDIMENT INGESTION), WILL EXCEED ACCEPTABLE INTAKE LEVELS FOR CHILDREN. NOTE THAT IN THE SEDIMENT, CHROMIUM MAY BE FOUND PREDOMINANTLY IN THE TRIVALENT FORM, AND THEREFORE, ANY EXCEEDANCE OF THE +6 ACCEPTABLE INTAKE FOR CHROMIUM MAY NOT BE APPLICABLE.

- SURFACE WATERS CONTAINED NO QUANTIFIABLE CARCINOGENS AND THEIR INGESTION DOES NOT PRESENT AN EXCESS LIFETIME CANCER RISK.

- NONCARCINOGENS PRESENT IN THE SITE'S SURFACE WATER THAT EXCEEDED ACCEPTABLE DAILY INTAKES WERE BARIUM, CADMIUM, CHROMIUM, LEAD, MANGANESE, NICKEL, SELENIUM, AND ZINC. CADMIUM, TOTAL CHROMIUM (IF ASSUMED TO EXIST AS +6), COPPER, SELENIUM, AND ZINC VIOLATED THE AMBIENT WATER QUALITY CRITERIA ESTABLISHED FOR THE PROTECTION OF AQUATIC LIFE. NOTE THAT FOR THE CHROMIUM, ITS PREDOMINANT FORM IN SURFACE WATER IS PROBABLY +6, ALTHOUGH A SMALL AMOUNT MAY BE FOUND AS +3. THIS MEANS THAT, IN THIS INSTANCE, THE ASSUMPTION OF CHROMIUM EXISTING AS +6 IS RELEVANT AND THE EXCEEDANCE APPLICABLE.

- THE QUANTIFIABLE RISK FROM INHALATION EXPOSURE TO CARCINOGENIC CHEMICALS AT THE SITE WAS 2 X 10-6 ACCOUNTING FOR BOTH THE WIND EROSION PLUS MECHANICAL RESUSPENSION OF DUST. FOR WIND EROSION ALONE, THE CARCINOGENIC RISK WAS 3 X 10-7.

- ONLY THE QUANTIFIABLE CARCINOGENS HAVE BEEN PRESENTED; OTHER CARCINOGENIC CHEMICALS WERE DISCOVERED AT THE SITE, BUT ONLY RARELY, AND DID NOT CONTRIBUTE SUBSTANTIALLY TO RISKS.

THE SUMMARY OF SITE ENDANGERMENT ISSUES IS SHOWN IN TABLE 1.

#AE
ALTERNATIVES EVALUATION

ALL REMEDIAL OBJECTIVES ARE TO MINIMIZE AND MITIGATE THREATS TO AND PROVIDE ADEQUATE PROTECTION OF HUMAN HEALTH, WELFARE, AND THE ENVIRONMENT IN RELATION TO CONDITIONS CAUSED BY THE CC&SC AND DIGGS PROPERTIES. THE REMEDIAL OBJECTIVES FOR THE LIMESTONE ROAD SITE APPLY ONLY TO THE CC&SC AND DIGGS PROPERTIES, WHICH CONSTITUTE THE SITE BY DEFINITION IN THE NPL.

REMEDIAL OBJECTIVES FOR SOIL

REMEDIAL OBJECTIVES FOR SOIL APPLY TO THE CC&SC AND DIGGS PROPERTIES. THEY FOCUS ON CONTROL OF DIRECT CONTACT BY RECEPTORS AND CONTAMINANT MIGRATION (INTERACTION WITH OTHER MEDIA) BY SOIL EROSION AND LEACHING. THE REMEDIAL OBJECTIVES ARE:

- MINIMIZE DIRECT CONTACT -- MITIGATE AND MINIMIZE THREAT TO PUBLIC HEALTH FROM DIRECT CONTACT WITH SURFACE OR BURIED SOIL AT THE CC&SC AND DIGGS PROPERTIES. SPECIFIC INFORMATION USED TO ASSESS HYPOTHETICAL SITUATIONS OF THREAT TO PUBLIC HEALTH WAS BASED ON U.S. EPA GUIDANCE FOR HEALTH RISK ASSESSMENTS. THE ASSESSMENT OF SOIL VOLUMES POSSIBLY WARRANTING REMEDIAL ACTION WAS BASED ON PUBLIC HEALTH THREATS ARISING FROM SOIL INGESTION. THREATS ASSOCIATED WITH DUST GENERATION OF VOLATILIZATION OF CONTAMINANTS IN THE SOIL WERE NOT ESTIMATED BUT WERE ALSO CONSIDERED.

- CONTROL MIGRATION TO GROUND WATER -- MINIMIZE AND MITIGATE LEACHING OF CONTAMINANTS FROM THE SOIL INTO THE GROUND WATER TO ADEQUATELY PROTECT HEALTH OF RECEPTORS USING LOCAL FRACTURED SHALE AQUIFER. THIS OBJECTIVE IS GENERAL IN SCOPE. THE RATE OF CONTAMINANT LEACHING WAS NOT ESTIMATED BECAUSE BOTH PROPERTIES ARE LARGELY REFUSE FILL AREAS WHERE MIGRATION RATES CANNOT BE ESTIMATED.

- CONTROL MIGRATION TO SURFACE WATER -- MANAGE OVERLAND MIGRATION OF CONTAMINANTS FROM EROSION OF SOIL FROM THE SITE PROPERTIES TO THE LOCAL ADJACENT UNNAMED TRIBUTARIES DISCHARGING TO EVITTS CREEK AND THE NORTH BRANCH OF THE POTOMAC RIVER.

REMEDIAL OBJECTIVES FOR GROUND WATER

REMEDIAL OBJECTIVES FOR GROUND WATER WILL BE ADDRESSED THROUGH

ACTIONS DIRECTED AT THE SITE PROPERTIES AND ACTIONS DIRECTED AT THE RECEPTORS OF GROUND WATER. THEY ARE:

- MINIMIZE DIRECT CONTAMINANT CONSUMPTION -- MITIGATE AND MINIMIZE CURRENT AND POSSIBLE FUTURE THREAT TO PUBLIC HEALTH FROM DIRECT CONSUMPTION OF CONTAMINATED GROUND WATER. THE SPECIFIC INFORMATION TO BE USED TO ASSESS THE CURRENT PUBLIC HEALTH THREAT WILL BE INTERIM PRIMARY DRINKING WATER STANDARDS AND U.S. EPA GUIDELINES FOR HEALTH RISK ASSESSMENTS, WHICH CONSIST OF BOTH CARCINOGENIC AND TOXIC EFFECTS CONSIDERATIONS.

- CONTROL CONTAMINANT MIGRATION TO SURFACE WATER -- MANAGE MIGRATION OF CONTAMINATED GROUND WATER TO THE LOCAL TRIBUTARIES OF EVITTS CREEK AND THE NORTH BRANCH OF THE POTOMAC RIVER SO PUBLIC HEALTH AND THE ENVIRONMENT ARE ADEQUATELY PROTECTED FROM SURFACE WATER AND SEDIMENT CONTAMINATION AND INGESTION OF CONTAMINATED AQUATIC LIFE.

- CONTROL MIGRATION OF CONTAMINANTS -- MINIMIZE MIGRATION OF GROUND WATER CONTAMINANTS BEYOND THE BOUNDARIES OF THE SITE PROPERTIES TO ADEQUATELY PROTECT HUMAN HEALTH, WELFARE, AND THE ENVIRONMENT.

U.S. EPA HAS PROVIDED POLICY GUIDANCE ON MEETING THE NCP OBJECTIVES FOR GROUND WATER. GENERAL GROUND WATER CLEANUP OBJECTIVES FOR EACH OF THREE AQUIFER CLASSIFICATIONS ARE DESCRIBED IN U.S. EPA'S GROUND WATER PROTECTION STRATEGY (1984).

THE FRACTURED SHALES AQUIFER THAT SERVES AS THE LOCAL AQUIFER FOR RESIDENTS ALONG LIMESTONE ROAD IS CONSIDERED A CLASS II AQUIFER. THE U.S. EPA'S GENERAL CLEANUP POLICY OBJECTIVES UNDER CERCLA AND RCRA FOR CLASS II AQUIFERS THAT ARE PRESENTLY BEING USED FOR DRINKING WATER SUPPLY ARE TO DEVELOP REMEDIAL ACTIONS THAT PROTECT HUMAN HEALTH AND THE ENVIRONMENT.

REMEDIAL OBJECTIVES FOR SURFACE WATER

OBJECTIVES FOR SURFACE WATER WILL BE ADDRESSED IN RELATION TO THE EFFECTS CAUSED BY THE CC&SC AND DIGGS PROPERTIES. SURFACE WATER OBJECTIVES WILL BE IN TERMS OF PROTECTION OF AQUATIC ORGANISMS FROM TOXIC CONTAMINANTS. OBJECTIVES FOR PROTECTION OF HUMAN HEALTH AND WELFARE ARE SECONDARY CONSIDERATIONS BECAUSE INGESTION OF SURFACE WATER IS VERY UNLIKELY AND IS CONSIDERED A MINOR COMPONENT OF OVERALL ENDANGERMENT. THE REMEDIAL OBJECTIVES ARE:

- CONTROL AQUATIC TOXICITY -- MITIGATE AND MINIMIZE THREATS TO AQUATIC ORGANISMS IN THE NORTH BRANCH OF THE POTOMAC RIVER FROM CONTAMINANTS IN SURFACE WATER FROM THE SITE PROPERTIES. AQUATIC TOXICITY IS REGARDED AS AN ENVIRONMENTAL CONCERN IN THE POTOMAC RIVER AND NOT IN THE SMALL UNNAMED TRIBUTARIES THAT CARRY SURFACE WATER AWAY FROM THE SITE PROPERTIES

- CONTROL DIRECT CONTACT -- MITIGATE AND MINIMIZE THREATS TO PUBLIC HEALTH FROM DIRECT CONTACT WITH SURFACE WATERS THAT HAVE BEEN CONTAMINATED BY THE SITE.

REMEDIAL OBJECTIVES FOR SEDIMENT

OBJECTIVES FOR SEDIMENT WILL BE ADDRESSED IN TERMS OF EFFECTS CAUSED BY CC&SC AND DIGGS PROPERTIES. THEY ARE:

- DIRECT CONTACT -- MITIGATE AND MINIMIZE THREATS TO PUBLIC HEALTH AND THE ENVIRONMENT ARISING FROM DIRECT CONTACT WITH SEDIMENT CONTAMINATED BY THE SITE IN THE LOCAL UNNAMED TRIBUTARIES TO THE NORTH BRANCH OF THE POTOMAC RIVER AND EVITTS CREEK.

FACTORS USED IN SCREENING REMEDIAL TECHNOLOGIES

- TECHNICAL CRITERIA
    - APPLICABILITY TO SITE CONDITIONS (GEOLOGY, TOPOGRAPHY, ETC.)
    - APPLICABILITY TO WASTE CHARACTERISTICS
    - EFFECTIVENESS AND RELIABILITY
    - IMPLEMENTABILITY

- ENVIRONMENTAL AND PUBLIC HEALTH CRITERIA
    - PRESENTED IN TABLE 1

- COST CRITERIA
    - INCREASED COST OFFERING NO GREATER RELIABILITY OR EFFECTIVENESS

    - INCREASED COST OFFERING NO GREATER PROTECTION OF PUBLIC HEALTH OR ENVIRONMENT AS ESTABLISHED BY CRITERIA

- INSTITUTIONAL CRITERIA (COMPLIANCE WITH OTHER ENVIRONMENTAL LAWS)
    - TSCA
    - RCRA
    - CWA
    - NPDES
    - ETC.

FOR A DETAILED ANALYSIS OF TECHNOLOGIES SCREENED OUT SEE CHAPTERS 3 AND 4 OF THE FEASIBILITY STUDY.

TECHNOLOGIES CONSIDERED IN DETAIL INCLUDE:

- SOIL RESPONSE ACTIONS
    - NO ACTION
    - ACCESS RESTRICTION
    - CONTAINMENT
    - REMOVAL AND DISPOSAL

- GROUND WATER RESPONSE ACTIONS
    - NO ACTION
    - ACCESS RESTRICTION
    - RESIDENTIAL WATER SUPPLY
    - MONITORING
    - CONTAINMENT
    - COLLECTION WITHOUT TREATMENT AND DISCHARGE

- SURFACE WATER AND SEDIMENT RESPONSE ACTIONS
    - NO ACTION
    - ACCESS RESTRICTIONS
    - MONITORING
    - SEDIMENT REMOVAL AND DISPOSAL
    - RUNON AND RUNOFF CONTROL
    - SURFACE WATER COLLECTION, TREATMENT AND DISPOSAL.

ALTERNATIVES CONSIDERED IN DETAIL

FIVE ALTERNATIVES INCORPORATING THE TECHNOLOGIES CONSIDERED IN DETAIL WERE EVALUATED FOR REMEDIAL ACTION IN THE FS. THESE FIVE ALTERNATIVES WERE:

1. SOIL EXCAVATION FROM CC&SC AND DIGGS PROPERTY WITH DISPOSAL AT AN OFFSITE RCRA FACILITY. GROUND WATER MONITORING. SURFACE WATER AND SEDIMENT MONITORING.

2. CAPPING OF CONTAMINATED SOIL ON CC&SC AND DIGGS PROPERTY WITH DEED RESTRICTIONS AND FENCING. IN-HOUSE WATER TREATMENT BY ION EXCHANGE. SURFACE AND SHALLOW GROUND WATER RUN-ON INTERCEPTION AT CC&SC PROPERTY. SURFACE WATER AND SEDIMENT MONITORING.

3. DEED RESTRICTIONS AND FENCING ON CC&SC AND DIGGS PROPERTIES FOR SOIL. ALTERNATIVE WATER SUPPLY BY EXTENSION AND CONNECTION

OF CUMBERLAND MUNICIPAL WATER SYSTEM. SURFACE WATER AND SHALLOW GROUND WATER RUNON INTERCEPTION AT CC&SC PROPERTY. SURFACE WATER AND SEDIMENT MONITORING.

4. DEED RESTRICTIONS AND FENCING ON CC&SC AND DIGGS PROPERTIES FOR SOIL. GROUND WATER, SURFACE WATER AND SEDIMENT MONITORING.

5. NO ACTION. NO FUTURE ACTIONS ON ANY ENVIRONMENTAL MEDIUM. NO FUTURE MONITORING OR ACCESS RESTRICTIONS.

ALTERNATIVE 1: SOIL EXCAVATION FROM BOTH THE CC&SC AND DIGGS PROPERTIES TO REMOVE SOIL HAVING A CALCULATED EXCESS LIFETIME RISK OF 10-6 OR GREATER AND EXCEEDANCE OF THE ACCEPTABLE DAILY CHRONIC TOXIC INTAKE FOR CHILDREN. EXCAVATED SOIL WOULD BE TRANSPORTED AND DISPOSED OF OFFSITE AT A RCRA LANDFILL. GROUND WATER WOULD BE MONITORED REGULARLY AT BOTH MONITORING AND RESIDENTIAL WELLS. SURFACE WATER AND SEDIMENT WOULD BE MONITORED REGULARLY NEAR BOTH PROPERTIES. SEDIMENT IN TRIBUTARIES FROM BOTH PROPERTIES WOULD BE MONITORED LESS FREQUENTLY THAN SURFACE WATER.

THE ADVANTAGES OF THIS ALTERNATIVE INCLUDE:

- EXCAVATION AND DISPOSAL WOULD BE IN ACCORD WITH SUBSTANTIVE RCRA REQUIREMENTS. PERMITS FOR ALL ACTIVITIES WOULD BE ROUTINE. NO UNUSUAL LAND USE CHANGES OR ZONING ISSUES INVOLVED.

- EXCAVATION AND OFFSITE DISPOSAL EFFECTIVELY REMOVES SELECTED CONTAMINANTS FROM THE SITE TO A CONTROLLED FACILITY.

- SOIL REMOVAL EXPECTED TO IMPROVE QUALITY OF SURFACE WATER.

- DIRECT SOIL CONTACT POTENTIAL REDUCED AND SOME REDUCTION IN GROUND WATER METALS CONCENTRATIONS POSSIBLE.

DISADVANTAGES ASSOCIATED WITH THIS ALTERNATIVE INCLUDE:

- IMPLEMENTATION AND CONSTRUCTION SAFETY CONCERNS RELATED TO EXCAVATION IN REFUSE.

- LOCAL ENVIRONMENTAL DISRUPTION FOR CLEANING, GRUBBING, AND EXCAVATION; MITIGATED BY SURFACE RESTORATION.

- SUBSTANTIAL NOISE, DUST, AND TRAFFIC EXPECTED.

- POSSIBILITY OF SOME CONTAMINATION IN PRIVATE WELLS DUE TO THE INABILITY OF REMOVING ALL CONTAMINANTS. WOULD HAVE TO RELY ON MONITORING TO ADEQUATELY PROTECT PUBLIC HEALTH.

COSTS

CAPITAL AND OPERATION AND MAINTENANCE COSTS WERE OBTAINED FROM THE FS. CAPITAL COSTS INCLUDE:

- SOIL EXCAVATION FROM CC&SC AND DIGGS PROPERTIES = $13,279,300

- SURFACE WATER AND SEDIMENT MONITORING (YEARLY) = $67,800

TOTAL CAPITAL COSTS = $14,332,300.

OPERATION AND MAINTENANCE COSTS = $1,053,000 BASED ON A 30 YEAR PERIOD.

ALTERNATIVE 2: LIMITED SOIL CAPPING AT BOTH PROPERTIES: THE WESTERN PORTION OF THE FILL AREA ON THE CC&SC PROPERTY AND A LARGE FRACTION OF THE REFUSE FILL AREA ON THE DIGGS PROPERTY WOULD BE CAPPED WITH A RELATIVELY IMPERVIOUS MULTILAYER SYSTEM. THE CAPPING SYSTEM USED AS THE BASIS FOR THE COST ESTIMATE WAS CLAY AND SOIL. GROUND WATER USED FOR CONSUMPTION IN PRIVATE HOMES ON LIMESTONE ROAD WOULD BE TREATED FOR METALS REMOVAL BY ION EXCHANGE IN SMALL IN-HOME TREATMENT SYSTEMS.

GROUND WATER AND POTABLE WATER WOULD BE MONITORED REGULARLY TO CHECK TREATMENT SYSTEM PERFORMANCE. AT THE CC&SC PROPERTY, SURFACE WATER AND SHALLOW GROUND WATER RUN-ON WOULD BE INTERCEPTED UPGRADIENT TO THE REFUSE FILL AREA IN A GRAVITY TRENCH AND DIVERTED TO THE CC&SC TRIBUTARY SOUTH OF THE AREA OF CONTAMINATED SOIL. SURFACE WATER AND SEDIMENT IN TRIBUTARIES FROM BOTH SITES WOULD BE MONITORED REGULARLY, THOUGH SEDIMENT LESS FREQUENTLY.

THE ADVANTAGES OF THIS ALTERNATIVE INCLUDE:

- IMPLEMENTATION DOES NOT INVOLVE UNUSUAL HAZARDS AS IN ALTERNATIVE 1.

- CAPPING WOULD ISOLATE CONTAMINATED SOIL AND REDUCE INFILTRATION; RUN-ON DIVERSION AT CC&SC WOULD FURTHER REDUCE MIGRATION.

- WATER TREATMENT WOULD REDUCE RISKS RELATED TO METALS INGESTION. LONG-TERM PUBLIC HEALTH PROTECTION BENEFIT BASED ON WATER TREATMENT FOR RESIDENTIAL WELLS.

- STANDARDS FOR DRINKING WATER WOULD BE CONSISTENTLY MET IN ALL HOMES. PERMITS FOR ALL ACTIVITIES WOULD BE ROUTINE.

DISADVANTAGES ASSOCIATED WITH THIS ALTERNATIVE INCLUDE:

- LOCAL ENVIRONMENTAL DISRUPTION FOR CLEANING AND GRADING; MITIGATED BY CAP REVEGETATION, BUT NOT AS SUBSTANTIAL AS IN ALTERNATIVE 1.

- CONSTRUCTION RELATED NOISE, DUST AND TRAFFIC FROM IMPORT OF CAPPING MATERIALS.

- IN-HOUSE WATER TREATMENT BY ION EXCHANGE IS SOMEWHAT UNRELIABLE, DEPENDENT UPON PROPER LONG-TERM OPERATION AND MAINTENANCE.

COSTS

- CAPPING OF PROPERTIES $494,600
- FENCING BOTH PROPERTIES = $48,700
- RESIDENTIAL WELL WATER TREATMENT = $22,300
- SURFACE WATER AND SHALLOW GROUND WATER DIVERSION SYSTEM UPGRADIENT RUN-ON INTERCEPTOR TRENCH AT CC&SC PROPERTY = $427,000
- SURFACE WATER AND SEDIMENT MONITORING (YEARLY) = $37,800
- GROUND WATER MONITORING (YEARLY) = $72,900

TOTAL CAPITAL COSTS = $1,775,800

OPERATION AND MAINTENANCE COSTS = $1,058,00
BASED ON A 30 YEAR PERIOD.

ALTERNATIVE 3: DEED RESTRICTIONS ON BOTH SITE PROPERTIES TO RESTRICT FUTURE LAND USE AND FENCING TO RESTRICT CASUAL SITE ACCESS. GROUND WATER USED FOR CONSUMPTION IN PRIVATE HOMES ON LIMESTONE ROAD WOULD BE FURNISHED BY EXTENSION OF THE CUMBERLAND WATER SYSTEM AND CONNECTION OF ALL HOMES. AT THE CC&SC PROPERTY, SURFACE WATER AND SHALLOW GROUND WATER RUN-ON WOULD BE INTERCEPTED IN A GRAVITY TRENCH AND DIVERTED TO THE CC&SC TRIBUTARY SOUTH OF THE AREA OF CONTAMINATED SOIL. SURFACE WATER AND SEDIMENT IN TRIBUTARIES FROM BOTH SITES WOULD BE MONITORED REGULARLY, THOUGH THE SEDIMENT LESS FREQUENTLY.

THE ADVANTAGES OF THIS ALTERNATIVE INCLUDE:

- POSITIVE PERFORMANCE BECAUSE OF ALTERNATE WATER SUPPLY. MUNICIPAL SYSTEM CONSIDERED VERY RELIABLE, MUCH MORE SO THAN IN-HOUSE WATER TREATMENT AS IN ALTERNATIVE 2.

- OVERALL SAFETY REGARDED AS HIGH BECAUSE ALL ACTIONS ARE CONVENTIONAL CONSTRUCTION WITH MINOR CONTACT WITH CONTAMINATED MATERIALS.

- MINOR ENVIRONMENTAL EFFECTS.

- STANDARDS FOR DRINKING WATER WOULD BE CONSISTENTLY MET IN ALL HOUSES.

DISADVANTAGES ASSOCIATED WITH THIS ALTERNATIVE INCLUDE:

- APPLICABLE LAWS AND REGULATIONS WILL NOT BE MET.

- SOME CLEANING AND GRUBBING WOULD BE NECESSARY TO INSTALL THE FENCING, TRENCH, AND MUNICIPAL WATER SUPPLY LINES.

- WOULD NOT REDUCE INFILTRATION AND SUBSEQUENT CONTAMINANT TRANSPORT FROM THE SITE PROPERTIES.

- SURFACE WATER RUNOFF AND GROUND WATER DISCHARGE QUALITY FROM THE DIGGS PROPERTY WOULD REMAIN UNCHANGED.

COSTS

- FENCING BOTH PROPERTIES = $48,700

- CONNECTION TO CUMBERLAND CITY = $91,000 WATER SUPPLY

- SURFACE AND SHALLOW GROUND WATER DIVERSION SYSTEM, UPGRADIENT RUN-ON INTERCEPTOR TRENCH AT CC&SC PROPERTY = $427,100

- GROUND WATER MONITORING (YEARLY) = $72,900

- SURFACE WATER AND SEDIMENT MONITORING (YEARLY) = $37,800

TOTAL CAPITAL COSTS = $990,600

OPERATION AND MAINTENANCE COSTS = $1,066,200
(BASED ON 30 YEARS).

ALTERNATIVE 4: LIMITED PASSIVE ACTIONS ON ALL SITE MEDIA. INCORPORATES DEED RESTRICTIONS ON BOTH THE CC&SC AND DIGGS PROPERTIES TO REDUCE LIKELIHOOD OF DIRECT SOIL CONTACT CAUSED BY FUTURE DEVELOPMENT. FENCING PROPERTIES WOULD RESTRICT CASUAL SITE ACCESS. GROUND WATER WOULD BE MONITORED REGULARLY AT BOTH MONITORING AND RESIDENTIAL WELLS. MONITORING WOULD ALSO BE APPLIED TO THE SURFACE WATER AND SEDIMENT ON A REGULAR BASIS.

THE ADVANTAGES OF THIS ALTERNATIVE INCLUDE:

- NO CONSTRUCTION - RELATED EFFECTS, EXCEPT FOR SITE FENCING.

- CONTINUED MONITORING WOULD TRACK THE BEHAVIOR OF THE SITE INTO THE FUTURE TO PROVIDE DATA SUFFICIENT TO TRIGGER A REMEDIAL ACTION.

DISADVANTAGES ASSOCIATED WITH THIS ALTERNATIVE INCLUDE:

- APPLICABLE LAWS AND REGULATIONS WILL NOT BE MET.

- EXISTING AND POTENTIAL FUTURE ENDANGERMENT TO PUBLIC HEALTH, WELFARE, AND THE ENVIRONMENT WOULD NOT BE MITIGATED.

- NO GROUND WATER PROTECTION FOR PRIVATE HOMES.

COSTS

- FENCING BOTH PROPERTIES = $48,700

- GROUND WATER MONITORING (YEARLY) = $72,900

- SURFACE WATER AND SEDIMENT MONITORING (YEARLY) = $37,800

TOTAL CAPITAL COSTS = $100,900
(INCLUDES ENGINEERING DESIGN COSTS)

OPERATION AND MAINTENANCE COSTS = $1,048,300
(BASED ON 30 YEARS).

ALTERNATIVE 5: NO ACTION. NO FUTURE ACTIONS ON ANY ENVIRONMENTAL MEDIUM. NO FUTURE MONITORING OR ACCESS RESTRICTIONS. THIS ALTERNATIVE IS NOT APPROPRIATE BECAUSE:

- UNCONTROLLED MIGRATION OF CONTAMINANTS.

- UNCONTROLLED INGESTION OF CONTAMINATED GROUND WATER.

- MIGRATION OF ALL CONTAMINANTS WOULD NOT BE MONITORED.

- NO COMPLIANCE WITH LAWS AND REGULATIONS.

- EXISTING AND POTENTIAL FUTURE ENDANGERMENT TO PUBLIC HEALTH, WELFARE, AND THE ENVIRONMENT WOULD NOT BE MITIGATED.

NO COSTS ARE ASSOCIATED WITH THIS ALTERNATIVE. TABLE 2 SUMMARIZES THESE ALTERNATIVES.

#RA
RECOMMENDED ALTERNATIVE

AN INTERIM ALTERNATIVE HAS BEEN CHOSEN TO REMEDIATE THE LIMESTONE ROAD SITE. THIS INTERIM ALTERNATIVE WILL CONSIST OF CAPPING OF THE PROPERTIES, FENCING BOTH PROPERTIES, AND CONTINUED SURFACE WATER, SEDIMENT AND GROUND WATER MONITORING. CONTINUED MONITORING OF THE SITE WILL DETERMINE IF A SURFACE WATER AND SHALLOW GROUND WATER DIVERSION SYSTEM AND AN UPGRADIENT RUN-ON INTERCEPTOR TRENCH AT THE CC&SC PROPERTY IS NEEDED IN THE FUTURE FOR CONTINUED PROTECTION OF AQUATIC LIFE AND WILDLIFE. A COMPLETE HISTORICAL REVIEW OF PERTINENT GEOLOGICAL INFORMATION AND REGIONAL, OFFSITE AND ONSITE GEOLOGICAL INFORMATION WILL BE COLLECTED. CHEMICAL ANALYSIS OF THE SHALE AND REEVALUATION OF BACKGROUND DATA CONTROL POINTS WILL BE CONDUCTED. FURTHERMORE, A MORE DETAILED EVALUATION WILL BE CONDUCTED CONCERNING THE RESIDENTS DRINKING WATER. UPON COMPLETING THIS EVALUATION, A FINAL REMEDIAL ALTERNATIVE WILL BE SELECTED. BASED ON OUR EVALUATION OF THE COST-EFFECTIVENESS OF EACH OF THE PROPOSED ALTERNATIVES, THE COMMENTS RECEIVED FROM THE PUBLIC, THE STATE, AND POTENTIALLY RESPONSIBLE PARTIES, INFORMATION FROM THE RI/FS AND REGION III TECHNICAL SUPPORT DOCUMENTS, REGION III RECOMMENDS THAT THE ABOVE INTERIM ALTERNATIVE BE IMPLEMENTED.

#OEL
CONSISTENCY WITH OTHER ENVIRONMENTAL LAWS

THE RECOMMENDED INTERIM ALTERNATIVE WAS EVALUATED TO DETERMINE CONSISTENCY WITH APPLICABLE OR RELEVANT AND APPROPRIATE ENVIRONMENTAL LAWS.

DUE TO THE ELEVATED LEVELS OF HAZARDOUS SUBSTANCES PRESENT IN THE SOILS AND WASTES ON THE DIGGS AND CC&SC PROPERTIES, PORTIONS OF THE RCRA LANDFILL CLOSURE REQUIREMENTS (40 CFR SS264.310) ARE RELEVANT AND APPROPRIATE. A CAP IS NECESSARY AND WILL BE DESIGNED AND IMPLEMENTED TO COMPLY WITH THE FINAL COVER REQUIREMENTS OF SS264.310(A). THE CAP WILL ALSO BE MAINTAINED AND REPAIRED AS NECESSARY TO COMPLY WITH

SS264.310(B)(1). DURING DESIGN, GOOD ENGINEERING PRACTICE CONTROLS WILL BE SELECTED TO PREVENT RUN-ON AND RUN-OFF FROM ERODING OR DAMAGING THE CAP AS PER THE REQUIREMENTS OF SS264.310(B)(5). COMPLIANCE WITH THE GROUNDWATER MONITORING REQUIREMENTS OF SS264.310(B)(4) AND SUBPART F IS BEING DEFERRED AT THIS TIME AND WILL BE EVALUATED AT THE CONCLUSION OF THE ADDITIONAL STUDIES DISCUSSED ABOVE. BECAUSE THERE ARE NO EXISTING LEAK DETECTION OR LEACHATE COLLECTION SYSTEMS, THE REQUIREMENTS OF SS264.310(B)
(2) AND (3) ARE NOT APPLICABLE OR RELEVANT AND APPROPRIATE.

THERE ARE NO SURFACE WATER DISCHARGES SUBJECT TO NPDES REQUIREMENTS; HOWEVER, IF ADDITIONAL STUDIES FIND THAT GROUNDWATER AND SURFACE WATER COLLECTION IS NECESSARY, NPDES REQUIREMENTS MAY BE APPLICABLE TO OFFSITE DISCHARGES.

COSTS

THE AMERICAN ASSOCIATION OF COST ENGINEERS DEFINES AN ORDER-OF-MAGNITUDE ESTIMATE AS AN APPROXIMATE ESTIMATE MADE WITHOUT DETAILED ENGINEERING DATA. IT IS EXPECTED THAT AN ESTIMATE OF THIS TYPE IS ACCURATE WITHIN +50% TO -30%. SOURCES OF COST INFORMATION INCLUDE THE EPA'S "COMPENDIUM OF COST OF REMEDIAL TECHNOLOGIES AT HAZARDOUS WASTE SITES," THE 1986 MEANS SITE WORK COST DATA GUIDE, COST REFERENCE GUIDE FOR CONSTRUCTION EQUIPMENT 1986 AND VENDOR ESTIMATES. THE PROJECTED COSTS FOR THE RECOMMENDED ALTERNATIVE ARE AS FOLLOWS:

COST COMPONENT			CONSTRUCTION COST	O&M COST
1. CAPPING OF PROPERTIES				
SITE PREPARATION OF CC&SC PROPERTY			$6,900	
" " "		DIGGS	9,600	
CONSTRUCTION OF CLAY CAP AT CC&SC			101,500	
" " "		DIGGS	210,500	
TOPSOIL AND SEED FOR CC&SC			$22,100	
" " "		DIGGS	$65,300	
DECONTAMINATION AND SAFETY FOR CC&SC			$43,900	
" " "		DIGGS	$79,000	
INSPECTION, REPAIRS, AND MAINTENANCE FOR BOTH PROPERTIES				$1,000
MOBILIZATION/DEMOBILIZATION (5%)			26,900	
2. FENCING BOTH PROPERTIES				
FENCE FOR CC&SC PROPERTY			$22,300	
" " DIGGS PROPERTY			$26,400	
ANNUAL INSPECTION OF FENCE				$500
REPLACEMENT OF FENCE (10% EVERY 10 YEARS)				$4,300
4. GROUND WATER MONITORING (YEARLY)				
SAMPLING				$32,700
CHEMICAL ANALYSIS				$38,200
EVALUATION OF RESULTS				$ 2,000
5. SURFACE WATER AND SEDIMENT MONITORING (YEARLY)				
SAMPLING				$14,000
CHEMICAL ANALYSIS				21,800
EVALUATION OF RESULTS				2,000
CONSTRUCTION SUBTOTAL		$614,400		
BID CONTINGENCIES	10%	$ 61,440		
SCOPE CONTINGENCIES	20%	$122,880		

CONSTRUCTION TOTAL		$798,720	
PERMITTING AND LEGAL	10%	79,872	
SERVICES DURING CONSTRUCTION	10%	79,872	
TOTAL IMPLEMENTATION COST		$958,464	$116,500
ENGINEERING DESIGN COST	12%	$115,015	
TOTAL CAPITAL COST		$1,073,480	
PRESENT WORTH GRADUAL FENCE REPLACEMENT (10 YEARS)			$2,600
PRESENT WORTH OF O&M COST (BASED ON 30 YEARS)			WILL BE DETERMINED AFTER COMPLETION OF GROUND WATER STUDIES.
TOTAL PRESENT WORTH		$1,192,580.	

IF NEGOTIATIONS WITH POTENTIALLY RESPONSIBLE PARTIES FAIL, TRUST FUND MONIES WILL BE USED TO PAY FOR 90% OF THESE COSTS AND THE STATE OF MARYLAND WILL FINANCE 10% OF THESE COSTS. OPERATION AND MAINTENANCE WILL BE THE RESPONSIBILITY OF THE STATE OF MARYLAND ONE YEAR SUBSEQUENT TO COMPLETION OF CONSTRUCTION.

#SCH
SCHEDULE

PUBLIC MEETING	9/11/86
COMMENT PERIOD CLOSES	9/15/86
APPROVE ROD	9/86.

#TMA
TABLES, MEMORANDA, ATTACHMENTS

#RS

RESPONSIVENESS SUMMARY

THE FORMAT OF THE RESPONSE IS A LISTING OF RESPONSES ACCORDING TO THE SOURCES OF COMMENTS. RESPONSES ARE REFERENCED TO SPECIFIC COMMENTS WITHIN EACH SOURCE AS APPROPRIATE. THE SOURCES OF COMMENTS ON THE FOLLOWING:

- PUBLIC MEETING IN CUMBERLAND, MARYLAND ON SEPTEMBER 11, 1986.

- HERON, BUCHETTE, RUCKERT & ROTHWELL ON BEHALF OF FAIRCHILD INDUSTRIES, INC.

- KRAMON AND GRAHAM, P.A. ON BEHALF OF CUMBERLAND CEMENT AND SUPPLY COMPANY.

- STATE OF MARYLAND OFFICE OF ENVIRONMENTAL PROGRAMS, DEPARTMENT OF HEALTH AND MENTAL HYGIENE.

ALL RESPONSES ARE ENCLOSED AS ATTACHMENT A.

ATTACHMENT A

RESPONSES TO COMMENTS ON
THE LIMESTONE ROAD RI/FS

COMMENTS AND QUESTIONS RAISED DURING THE LIMESTONE ROAD PUBLIC MEETING HELD ON SEPTEMBER 11, 1986, ARE SUMMARIZED BELOW. THE PUBLIC COMMENT PERIOD EXTENDED FROM AUGUST 22, 1986 THROUGH SEPTEMBER 12, 1986.

REMEDIAL ALTERNATIVE PREFERENCE

1. ONE RESIDENT RECOMMENDED THAT HOMES ON LIMESTONE ROAD BE CONNECTED TO PUBLIC WATER.

   EPA RESPONSE: EPA'S ANNOUNCEMENT OF AN INTERIM REMEDIAL ALTERNATIVE DOES NOT PRECLUDE THE POSSIBILITY OF A HOOK-UP TO CITY WATER FOR THE LIMESTONE ROAD RESIDENCES; FURTHER EVALUATION OF THE DATA IS NEEDED BEFORE A FINAL DECISION IS MADE.

2. WHEN WILL THE DECISION BE MADE ON A FINAL REMEDIAL ACTION?

   EPA RESPONSE: WE CANNOT ESTIMATE A TIMEFRAME BECAUSE WE DO NOT KNOW WHAT WE WILL FIND DURING SUBSEQUENT EVALUATION OF THE SITE DATA. THERE MAY OR MAY NOT BE MORE TESTING OR FURTHER STUDIES, BUT WE NEED TO CONDUCT FURTHER EXAMINATION AND EVALUATION OF THE EXISTING DATA BEFORE WE MAKE A DECISION ON ANY FURTHER ACTION.

TECHNICAL QUESTIONS

1. A RESIDENT OF LIMESTONE ROAD ASKED FOR DETAILS ON WHERE AND HOW GROUND WATER SAMPLES WERE TAKEN.

   EPA RESPONSE: THE CONTRACTOR DESIGNED A MONITORING WELL NETWORK THAT WOULD PROVIDE AN IDEA OF CONTAMINATION LEAVING THE SITE. A TOTAL OF 21 MONITORING WELLS WERE DRILLED TO DIFFERENT DEPTHS -- THE DEEPEST BEING 275 FEET, AND THE MOST SHALLOW BEING 25 FEET -- THE AVERAGE DEPTH WAS 125 FEET. RESIDENTIAL WELLS OF VARYING DEPTHS WERE ALSO SAMPLED.

2. DID EPA EXAMINE THE CHLORINATED SOLVENTS AT THE PPB LEVEL?

   EPA RESPONSE: YES.

3. A QUESTION WAS RAISED REGARDING HYDROGEOLOGIC STUDIES OF THE AQUIFER.

   EPA RESPONSE: THIS IS NOT AN AQUIFER IN THE TRADITIONAL SENSE. THERE IS FRACTURED SHALE UNDER THE GROUND WHICH MAKES THE GROUND WATER BEHAVE LIKE AN AQUIFER. BUT BECAUSE OF THE NATURE OF THE FRACTURED SHALE, IT IS EXTREMELY DIFFICULT TO CHARACTERIZE THE FLOW OF GROUND WATER. THIS IS WHY FURTHER STUDY IS REQUIRED, AND WHY ONLY PART OF THE SOLUTION CAN BE PRESENTED AT THIS TIME.

4. HOW LONG WILL THE TESTING LAST, AND WILL RESIDENTS BE PROVIDED TEST RESULTS?

   EPA RESPONSE: WE DO NOT HAVE AN ESTIMATE ON THE NECESSITY, SCOPE, OR LENGTH OF TIME REQUIRED FOR ADDITIONAL TESTING. THE STATE WILL PROVIDE RESIDENTS WITH ANY TESTING RESULTS.

5. SEVERAL PEOPLE EXPRESSED CONCERN THAT THEIR WELLS HAD DRIED UP SINCE TESTING BEGAN DURING THE RI/FS.

   EPA RESPONSE: BECAUSE THE TEST WELLS ARE NOT USED CONSTANTLY, WE DO NOT BELIEVE THAT THEY ARE STRESSING THE GROUND WATER SYSTEM. THE WELLS WERE SAMPLED THREE TIMES DURING THE RI.

6. WAS ANY AIR SAMPLING CONDUCTED?

EPA RESPONSE: NOT DURING THE RI; HOWEVER, SOME AIR SAMPLING WAS DONE AS PART OF THE INITIAL HRS PROCESS.

7. ONE RESIDENT ASKED IF THE STATE COULD TAKE ANY NECESSARY NEW WATER SAMPLES NOW WHILE THE WEATHER IS DRY.

   STATE RESPONSE: NEW GROUND WATER SAMPLING WILL COMMENCE THE WEEK OF SEPTEMBER 15, 1986, AND WILL BE CONDUCTED AS RAPIDLY AS POSSIBLE.

8. HOW MUCH CHLOROFORM WAS DETECTED?

   EPA RESPONSE: IT WAS DETECTED ONCE AT A LOW LEVEL.

PUBLIC HEALTH/ENVIRONMENTAL CONCERNS

1. HOW DANGEROUS ARE THE CHEMICALS FOUND IN THE GROUND WATER?

   EPA/CDC RESPONSE: THE ONLY CONTAMINANT LEVEL OF CONCERN WAS LEAD; THE CONCENTRATIONS OF OTHER CONTAMINANTS ARE NOT HIGH ENOUGH TO CAUSE CONCERN. DR. ABRAHAM (CDC) RECOMMENDED, BASED ON DATA HE HAD SEEN, THAT TWO RESIDENCES NEED ALTERNATIVE SOURCES OF DRINKING WATER, WHICH HAS ALREADY BEEN ACCOMPLISHED. EPA WILL PROVIDE ALL RESIDENTS A SYNOPSIS OF TEST WELL RESULTS.

COSTS/FUNDING ISSUES

1. IF EPA EVENTUALLY DOES CONNECT THE LIMESTONE ROAD RESIDENCES TO CITY WATER, WHO PAYS FOR IT?

   EPA RESPONSE: IF IT IS A SUPERFUND ACTION, THE STATE WILL PAY 10% AND THE FUND WILL PAY 90% OF THE COST. IF PRPS AGREE (OR ARE ORDERED) TO FINANCE A REMEDIAL ACTION, THEN THE COST SHARE WILL BE NEGOTIATED.

2. THERE WAS CONCERN ABOUT THE AMOUNT OF MONEY SPENT TO DATE ON THE PROJECT, WITHOUT HAVING A FINAL RECOMMENDED REMEDIAL ACTION.

   EPA RESPONSE: AS FAR AS WE KNOW NOW, THE DRINKING WATER IS SAFE (WITH THE TWO EXCEPTIONS NOTED ABOVE).

OTHER ISSUES

1. WHY WAS THE CUMBERLAND CITY DUMP NOT INCLUDED IN THE DEFINITION OF THE SITE? IT SHOULD BE.

   EPA RESPONSE: WE CANNOT OFFER A FINAL SOLUTION TO THE PROBLEM AT LIMESTONE ROAD UNTIL THE STATUS OF THE DUMP IS RESOLVED. THE STATE IS ADDRESSING THE DUMP QUESTION; IT IS IN THE HANDS OF THE STATE'S ATTORNEY.

2. HAS ANY TESTING BEEN CONDUCTED AT THE DUMP?

   EPA RESPONSE: WE HAVE DONE SOME LIMITED WORK AT THE DUMP. WE ARE PARTICULARLY CONCERNED ABOUT THE FLYASH AT THE DUMP.

3. WHY HAS THE PROCESS TAKEN SO LONG? THE PROBLEM FIRST SURFACED IN 1979.

   EPA RESPONSE: EPA'S INVOLVEMENT DATES FROM 1984.

4. WHAT ABOUT CITY AND COUNTY LIABILITY IN THE PROPERTIES?

   EPA RESPONSE: TRANSFER OF OWNERSHIP DOES NOT RELEASE A PERSON FROM RESPONSIBILITY UNDER CERCLA.

5. WHAT ABOUT THE LEVEL OF TCE AT LIMESTONE ROAD VIS-A-VIS THE WOBURN, MA CASE?

EPA/CDC RESPONSE: THE "SAFE" LEVEL OF TCE IS 5 PPB; IN THE WOBURN CASE, TCE HAS NOT YET BEEN PROVEN TO HAVE A CASUAL RELATIONSHIP TO THE HEALTH ANOMALIES FOUND IN THE AREA. TCE HAS NOT BEEN FOUND AT LIMESTONE ROAD ABOVE EPA'S RECOMMENDED ACTION LEVELS; THERE IS NO IMMEDIATE HEALTH RISK.

HERON, BURCHETTE, RUCKERT & ROTHWELL

SEPTEMBER 10, 1986

BY FEDERAL EXPRESS

MS. SUSAN E. BELSKI (3HW16)
COMPLIANCE OFFICER
U.S. EPA REGION III
841 CHESTNUT BUILDING
PHILADELPHIA, PA 19107

RE: LIMESTONE ROAD SITE, CUMBERLAND, MARYLAND

DEAR MS. BELSKI:

THIS WILL RESPOND ON BEHALF OF FAIRCHILD INDUSTRIES, INC. TO THE LETTER OF MR. STEPHEN R. WASSERSUG, DATED AUGUST 11, 1986, ACCOMPANYING THE DRAFT REMEDIAL INVESTIGATION AND FEASIBILITY STUDY (RI/FS) AND INVITING COMMENTS THEREON NO LATER THAN SEPTEMBER 12, 1986 (AS PER ADVICE FROM YOUR OFFICE).

WE WISH TO CALL YOUR ATTENTION TO THE FACT THAT FAIRCHILD HAS NOTED NUMEROUS DETAILED COMMENTS CONCERNING THE RI/FS BUT HAS LIMITED THE FOLLOWING RESPONSE FOR THE PURPOSE OF ADDRESSING THE MAJOR ENDANGERMENT ISSUES AS PRESENTED. IN SO DOING, IT WAS OUR PURPOSE TO RESTRICT THIS COMMENTARY TO THOSE MATTERS WHICH DIRECTLY IMPACT ON THE PROPOSED REMEDIAL ACTION. HOWEVER, DURING THE COURSE OF FURTHER DISCUSSIONS OF THE RI/FS AND THE PROPOSED REMEDIAL ACTION, FAIRCHILD MAY, AS IT DEEMS NECESSARY, ADDRESS FURTHER COMMENTS IN ORDER TO RESOLVE ANY ISSUE PRESENTED.

GENERAL COMMENTARY

AS A GENERAL COMMENTARY THE RI/FS REPORT FOR THE LIMESTONE ROAD SITE CONTAINS A NUMBER OF ASSUMPTIONS AND QUALIFICATIONS MAKING IT DIFFICULT TO REACH DEFINITIVE AFFIRMATIVE CONCLUSIONS AS TO SITE CONTAMINATION AND ENDANGERMENT. WHAT DOES EMERGE FROM THE DATA AS A WHOLE IS THAT THE DETECTED SOIL CONTAMINATION ON THE SITE, BOTH ORGANIC AND INORGANIC, HAS MINIMAL IMPACT ON SURFACE AND GROUNDWATER AND, THEREFORE, PRESENTS LITTLE OR NO ENDANGERMENT TO HUMAN EXPOSURE. MOREOVER, THE POSSIBLE INFLUENCE OR CONTRIBUTION BY THE CITY OF CUMBERLAND DUMP TO OVERALL CONTAMINATION IN THE AREA RAISES SIGNIFICANT QUESTIONS AS TO SOURCE AND RESPONSIBILITY WHICH HAVE NOT BEEN ADDRESSED.

THE REPORT CONTAINS A NUMBER OF STATEMENTS CONCERNING CHROMIUM AND CHROMIUM SLUDGE (1) BUT IN THE END THE DATA DOES NOT SUPPORT A CONCLUSION THAT CHROMIUM PLAYS ANY SIGNIFICANT ROLE IN ENVIRONMENTAL ENDANGERMENT AT THE SITE. IN THIS CONNECTION, WE BELIEVE IT IMPORTANT TO NOTE THAT THE BACKGROUND STATEMENT IN THE RI (P. 1) THAT 110 TONS OF CHROMIUM SLUDGE WAS DUMPED ON THE SITE IS NOT SUBSTANTIATED. INDEED, A FURTHER STATEMENT THAT 99 TONS WERE DUMPED ON THE CC&SC PROPERTY AND 11 TONS ON THE DIGGS PROPERTY IS COMPLETELY GROUNDLESS. IN ADDITION, WHILE THE REPORT MAKES AN ASSUMPTION THAT CHROMIUM IN THE SOIL IS IN THE HEXAVALENT FORM IT IS CONCEDED THIS MAY BE INCORRECT (RI, PP. 6-33 TO 6-34) AND THAT SOIL CHROMIUM IS EXPECTED TO BE FOUND PRIMARILY IN THE IMMOBILE TRIVALENT FORM (RI, P. 6-37). ACCORDINGLY, IT SEEMS ONLY FAIR THAT THE REPORT CONTAIN A STATEMENT THAT THERE IS LITTLE OR NO ENDANGERMENT FROM THE FAIRCHILD SLUDGE AT THE SITE. (2).

BASED ON THE DATA IN THE RI, IT IS EASILY UNDERSTOOD WHY THE FS MAKES NO SELECTION AS TO A SPECIFIC REMEDIAL ALTERNATIVE. PERHAPS THE UNRESOLVED ISSUE OF THE CITY DUMP IS PARTLY RESPONSIBLE FOR THIS BUT WE BELIEVE IT MORE LIKELY THAT UNDER THE CIRCUMSTANCES WHERE LITTLE OR NO REAL ENDANGERMENT COULD BE CONCLUDED IT WAS PERHAPS MORE JUDICIOUS FOR THE EPA CONTRACTOR TO REVIEW THE RANGE OF POSSIBLE ALTERNATIVES WITHIN ALL FIVE OF THE GUIDELINES OF THE NATIONAL CONTINGENCY PLAN (NCP) FOR ULTIMATE SELECTION BY REGION III AND/OR THE RESPONSIBLE PARTIES. WE HAVE, THEREFORE, CAREFULLY REVIEWED WITH THE AID OF COMPETENT CONSULTANTS ALL OF THE DATA PRESENTED IN THE RI TO PINPOINT THE REAL PROBLEM AREAS AND ATTENDANT RISKS AND WILL ADDRESS THESE FOR PERTINENT REMEDIATION WHICH IS BOTH COST-EFFECTIVE AND CONSISTENT WITH THE APPLICATION OF THE NCP.

(1) THIS IS PERHAPS BECAUSE OF THE REPORTED EVENT (BY THE STATE OF MARYLAND) OF ILLEGAL DUMPING OF CHROMIUM SLUDGE FROM FAIRCHILD INDUSTRIES' HAGERSTOWN, MARYLAND, PLANT IN 1981 WHICH TRIGGERED THE LISTING OF THE SITE ON THE NATIONAL PRIORITIES LIST.

(2) IT MUST BE REPORTED THAT AT THE TIME, 1981 AND 1982, THERE WERE MANY REPORTS IN THE LOCAL NEWS MEDIA CONCERNING DIGGS' ILLEGAL DUMPING OF FAIRCHILD SLUDGE RAISING CITIZENS CONCERNS THAT THIS WAS THE PRIMARY AND PERHAPS ONLY HAZARD AT THE SITE.

IF REMEDIAL MEASURES ARE TO BE UNDERTAKEN AT THE SITE, THEN ADDITIONAL EFFORTS TO IDENTIFY POTENTIALLY RESPONSIBLE PARTIES NEED TO BE UNDERTAKEN. THE FS STATES THAT THE DIGGS PROPERTY WAS PART OF THE CITY DUMP FOR MANY YEARS. (FS, P. 5-14). THEREFORE, IT APPEARS THAT THE CITY OF CUMBERLAND MAY BE A RESPONSIBLE PARTY IN CONNECTION WITH THE LIMESTONE ROAD SITE. IN ADDITION, POTENTIAL SOURCES OF ORGANIC CONTAMINANTS HAVE NOT BEEN IDENTIFIED. MATERIALS IN EPA'S FILES ON OTHER PRP'S SUGGEST THAT THESE PARTIES MAY HAVE GENERATED SOLVENTS AND WASTE OILS DISPOSED OF ON THE SITE. OTHER WASTES POSSIBLY SENT TO THE SITE (E.G., GLASS MANUFACTURING WASTES) SHOULD BE FURTHER ANALYZED TO DETERMINE WHETHER THEY ARE SOURCES OF CONTAMINATION AT THE SITE.

1. ADEQUACY OF INVESTIGATION

QUESTIONS EXIST AS TO THE ADEQUACY OF THE SITE INVESTIGATION. THE VAST MAJORITY OF THE SOIL SAMPLES ANALYZED WERE TAKEN FROM SUBSURFACE MATERIAL. ON THE OTHER HAND, ALL BACKGROUND SOIL SAMPLES WERE COLLECTED FROM THE TOP TEN INCHES OF SOIL. (SEE RI, PP. 3-6 TO 3-8). IN EXPLAINING THE DIFFERENCES BETWEEN SOIL AND SHALE WITH REGARD TO CONCENTRATIONS OF CERTAIN IONS, THE RI STATES THAT THE IONS MAY HAVE BEEN LEACHED FROM THE SOIL INTO THE GROUNDWATER AND SURFACE WATERS. (RI, P. 4-11). THEREFORE, THE BACKGROUND SURFACE SOIL SAMPLES MAY NOT BE COMPARABLE TO THE ON-SITE SUBSURFACE SOIL SAMPLES. IT SHOULD ALSO BE NOTED THAT A CHEMICAL ANALYSIS OF ON-SITE SHALE SEEMS APPROPRIATE IN ORDER TO PROPERLY INTERPRET THE SAMPLING RESULTS.

THERE IS SERIOUS CONCERN ABOUT THE ADEQUACY OF THE HYDROGEOLOGIC INVESTIGATION. THE RI STATES THAT GROUNDWATER MOVEMENT IN THE SHALES APPEARS TO BE DOMINATED BY FRACTURED FLOW. (RI, P. 4-4). THE PRIMARY FRACTURES ARE PERPENDICULAR TO THE OBSERVED GROUNDWATER GRADIENTS BASED ON HEAD MEASUREMENTS (RI, PP. 4-3 TO 4-4, 4-8). ALTHOUGH A POSSIBLE SECONDARY FRACTURE SET MAY ALLOW FLOW ALONG THE SAME DIRECTION AS THE GRADIENT, IT IS NOT CLEAR THAT THE GENERALIZED GROUNDWATER FLOW MAP (RI, FIGURE 4-5) REPRESENTS THE MOST PROBABLE CHARACTERIZATION OF GROUNDWATER FLOW. IN FACT, THE HYDROGEOLOGIC INVESTIGATION INDICATES LOCALIZED GROUNDWATER FLOW DIFFERENT FROM THE REGIONAL FLOW. (SEE ATTACHMENT A, ASSESSMENT OF HYDROGEOLOGIC FINDINGS BY DR. PAUL GROSSER, CH2M).

2. ENDANGERMENT ISSUES

THE MAJOR ENDANGERMENT ISSUES AT THE SITE RELATE TO ON-SITE SOIL AND GROUNDWATER. (FS, P. 2.5). IN ORDER FOR A RISK OF AN ADVERSE EFFECT FROM A CONTAMINANT TO EXIST, THERE MUST BE: (1) A SOURCE OF THE CHEMICAL; (2) A RELEASE OF THE CHEMICAL FROM THE SOURCE; (3) A RECEPTOR FOR THE RELEASE OF THE CONTAMINANT; (4) TRANSPORT OF THE CONTAMINANTS FROM THE SOURCE TO A RECEPTOR; AND (5) EXPOSURE OF THE RECEPTOR AT A LEVEL SUFFICIENT TO PRODUCE AN ADVERSE EFFECT. (RI, P 6-3).

A. SOIL

THE REMEDIAL OBJECTIVES FOR SOIL CONTAMINATION ARE TO CONTROL MIGRATION TO GROUNDWATER, TO CONTROL MIGRATION TO SURFACE WATER, AND TO MINIMIZE DIRECT CONTACT. (FS, PP. 2-6 TO 2-7). THE MAJOR ORGANIC CONTAMINANTS OF CONCERN IN SOIL ARE BENZO(A)PYRENE AND POLYCHLORINATED BIPHENYLS (PCB'S). (SEE FS, TABLE 1). POLYCYCLIC AROMATIC HYDROCARBONS SUCH AS BENZO(A)PYRENE HAVE LOW SOLUBILITIES AND HIGH SOIL-WATER PARTITION COEFFICIENTS, INDICATING A TENDENCY TO MIGRATE VERY SLOWLY. (RI, P. 5-6). BIODEGRADATION OF BENZO(A)PYRENE IS ALSO POSSIBLE. (RI, TABLE 5-2). PCB'S HAVE BEEN FOUND AT THE SITE AT "TRACE" CONCENTRATIONS ONLY (FS, TABLE 6-2). PCB'S READILY ADSORB TO SOIL AND HAVE VERY LOW SOLUBILITIES, AND THUS MIGRATE SLOWLY. (RI, PP. 5-7 TO 5-8). IN ADDITION, THE PCB AROCHLOR 1242 IS BIODEGRADABLE. IN CONCLUSION, THE MAJOR ORGANIC CONTAMINANTS ARE UNLIKELY TO MIGRATE FROM THE SITE THROUGH GROUNDWATER.

THE MAJOR INORGANICS OF CONCERN AT THE SITE ARE BARIUM, CADMIUM, CHROMIUM, COPPER, LEAD, MANGANESE, NICKEL, SELENIUM AND ZINC. (FS, TABLE 1). THE RI REVIEWED THE ENVIRONMENTAL BEHAVIOR OF THE "INDICATOR" CONTAMINANTS BARIUM, CADMIUM, CHROMIUM, LEAD, NICKEL AND ZINC, AND CONCLUDED THAT SORPTION AND A SIGNIFICANT EFFECT ON THE MIGRATION OF EACH OF THESE METALS. (SEE RI, TABLE 5-2). THEREFORE, CONCERN REGARDING MIGRATION OF THESE CONSTITUENTS SHOULD BE MINIMAL.

"(I)N THE SOIL, CHROMIUM MAY BE EXPECTED TO BE FOUND PREDOMINANTLY IN THE TRIVALENT FORM BECAUSE OF THE PRESENCE OF REDUCING ORGANICS.". (RI, P. 6-33). AS STATED ABOVE, TRIVALENT CHROMIUM IS IMMOBILE. THE GROUNDWATER SAMPLING RESULTS, IN WHICH CHROMIUM WAS NOT DETECTED AT CONCENTRATIONS CONSIDERED THREATENING TO HUMAN HEALTH (RI, P. 4-25), SUPPORT THIS CONCLUSION.

FUTURE EXPOSURE TO PREDOMINANTLY SUBSURFACE SOILS WOULD MOST LIKELY OCCUR IF EXCAVATION OR EXTENSIVE EROSION WERE TO TAKE PLACE. (RI, P. 6-7). THE PROSPECT OF EXCAVATION CAN BE CONTROLLED WITH DEED RESTRICTIONS. THE CURRENT "EXTENSIVE" VEGETATIVE COVER SHOULD MINIMIZE THE RISKS OF EROSION. (RI, PP. 6-10 TO 6-11). FENCING WOULD ALSO MINIMIZE DIRECT CONTACT WITH CONTAMINATED SOIL AND ALLOW FOR FURTHER GROWTH OF VEGETATION.

B. GROUNDWATER

THE REMEDIAL OBJECTIVES FOR GROUNDWATER ARE TO CONTROL MIGRATION OF CONTAMINANTS TO GROUNDWATER AND SURFACE WATER AND TO MINIMIZE DIRECT CONTAMINANT CONSUMPTION. AS STATED ABOVE, THE ON-SITE SOIL CONTAMINANTS WILL TEND TO ADSORB TO SOIL. SO LONG AS THE RISKS OF EXCAVATION AND EROSION ARE MINIMIZED, THE RISKS OF MIGRATION OF CONTAMINANTS TO GROUNDWATER AND SURFACE WATER WILL HAVE BEEN ADEQUATELY ADDRESSED.

THE FS IDENTIFIES FIVE INORGANIC CONTAMINANTS OF CONCERN IN GROUNDWATER: CADMIUM, LEAD, MANGANESE, NICKEL AND ZINC. (FS, TABLE 1). NICKEL EXCEEDED EPA'S ACCEPTABLE DAILY INTAKE LEVEL IN ONE SAMPLE FROM EACH OF TWO DRINKING WATER WELLS. (FS, TABLE 2-3; RI, FIGURES 4-14 TO 4-17). "OF ALL THE TOXIC METALS, ONLY NICKEL APPEARS TO EXHIBIT A TREND EVEN THOUGH A SPECIFIC PLUME CANNOT BE IDENTIFIED.". (RI, P. 4-23). THE REPORT WAS UNABLE TO CONCLUSIVELY DETERMINE WHICH FILLED AREAS MIGHT BE CONTRIBUTING. (RI, PP. 4-24, 6-22). THE REPORT NOTES THAT A SAMPLE INDICATIVE OF THE LEACHATE BEING GENERATED BY THE CITY DUMP HAD A SIGNIFICANT CONCENTRATION OF NICKEL. (RI, P. 4-24). NICKEL COULD ALSO BE FROM LOCAL GEOLOGICAL MATERIALS NATIVE TO THE SITE IN CONTACT WITH THE GROUNDWATER. (RI, P. 6-22). THE FAIRCHILD CHROMIUM SLUDGE DID NOT CONTAIN NICKEL.

THE RI NOTES THAT THE CONCENTRATIONS OF ZINC IN RESIDENTIAL WELLS GENERALLY EXCEED THE CONCENTRATIONS OBSERVED IN MONITORING WELLS BY ONE OR TWO ORDERS OF MAGNITUDE. (RI, P. 4-14). ZINC CONCENTRATIONS EXCEEDED ACCEPTABLE DAILY INTAKE LEVELS ONLY IN RESIDENTIAL WELLS. (FS, TABLE 2-3; RI, FIGURES 4-14 TO 4-17). NO ZINC PLUME WAS IDENTIFIED IN THE ANALYTICAL DATA. (RI, P. 4-14). THEREFORE, IT IS LIKELY THAT THE ZINC IN THESE WELLS IS ATTRIBUTABLE TO A SOURCE OTHER THAN THE LANDFILL AREA. THE RI IDENTIFIES NATURALLY OCCURRING HIGH ZINC CONCENTRATIONS AND GALVANIZED PIPING OR TANKS AS AMONG THE PLAUSIBLE EXPLANATIONS FOR THE HIGH ZINC CONCENTRATION IN RESIDENTIAL WELLS. (RI, PP. 4-14 TO 4-15).

LEAD IN GROUNDWATER (AS WELL AS ZINC) MAY HAVE ORIGINATED FROM CONTACT OF THE WATER WITH OLD OR CORRODED PIPING OR SOLDER, BUT THE PRESENCE OF GALVANIZED PIPING OR WATER TANKS IN THE RESIDENTIAL WELLS WAS NOT INVESTIGATED. (RI, PP. 4-14 TO 4-15, 6-22, 6-32). LEAD WAS DETECTED IN ONLY ONE MONITORING WELL SAMPLE. (RI, FIGURES 4-14 TO 4-16). NONE OF THE DRINKING WATER WELL SAMPLES EXCEEDED THE MAXIMUM CONTAMINANT LIMIT FOR CADMIUM. (FS, TABLE 2-3; RI, FIGURE 4-17). THE TOXIC INORGANIC CONSTITUENTS CADMIUM AND LEAD "APPEAR SPORADICALLY IN BOTH MONITORING AND RESIDENTIAL WELLS BUT SHOW NO CONSISTENT SPATIAL OR TEMPORAL DISTRIBUTION.". (RI, P. 4-24). THERE IS NO CONSISTENT CORRELATION BETWEEN MONITORING WELLS, RESIDENTIAL WELLS AND GROUNDWATER FLOW PATHS TO CONCLUSIVELY SUPPORT THE CONTENTION THAT THESE CONSTITUENTS ARE MIGRATING FROM LANDFILLED AREAS. (RI, P. 4-25).

THE RI STATES THAT THE "ANALYTICAL DATA DO NOT INDICATE A DISCERNIBLE TREND RELATING HIGH CONCENTRATIONS OF MANGANESE IN RESIDENTIAL WELLS TO LANDFILLING OPERATIONS.". (RI, P. 4-15). THE MANGANESE LEVELS ARE MOST LIKELY FROM NATURALLY OCCURRING GEOLOGICAL MATERIALS AT THE SITE.

ELEVATED LEVELS OF CADMIUM, LEAD, NICKEL AND ZINC WERE FOUND IN SOIL SAMPLES TAKEN FROM THE CUMBERLAND CITY DUMP (RI, FIGURE 4-9), SUGGESTING THIS SITE AS A POSSIBLE SOURCE OF INORGANICS IN GROUNDWATER. FURTHERMORE, CADMIUM, LEAD, MANGANESE, NICKEL AND ZINC IN SEDIMENTS WERE FOUND IN THEIR HIGHEST CONCENTRATIONS AT LOCATION SD005, WHICH RECEIVES A LARGE PORTION OF ITS CONTAMINANT INPUT FROM THE CITY DUMP. (RI, P. 6-36). THE SOLE OBSERVATIONS ABOVE BACKGROUND FOR MANGANESE, NICKEL AND ZINC WERE AT THIS LOCATION. (FS, TABLE 1).

DESPITE THE RELATIVELY HIGH CONCENTRATIONS OF CHROMIUM ON THE DIGGS AND THE CC&SC PROPERTIES, CHROMIUM HAS NOT BEEN DETECTED IN GROUNDWATER AT CONCENTRATIONS CONSIDERED THREATENING TO HUMAN HEALTH. (RI, P. 4.25). THESE RESULTS SUPPORT THE CONCLUSION THAT THE CHROMIUM IS IMMOBILE. IN CONCLUSION, THE LEVELS OF INORGANICS IN DRINKING WATER RARELY EXCEEDED THE APPLICABLE STANDARDS. THE MINERALIZED GROUNDWATER IN THE AREA OF THE SITE MAKES IT DIFFICULT TO DRAW ANY CONCLUSIONS REGARDING DEGRADATION ATTRIBUTABLE TO LANDFILL AREAS.

C. SURFACE WATER AND SEDIMENT

THE FS CONCLUDES THAT THE ENDANGERMENT FROM SURFACE WATER CONTAMINATION IS MINOR SINCE INGESTION OF SURFACE WATER WOULD BE EXTREMELY UNLIKELY AND SINCE AQUATIC TOXICITY WAS NOT CONSIDERED APPLICABLE TO THE SURFACE WATER IN EITHER THE CC&SC OR THE DIGGS PROPERTY DRAINAGE STREAMS (ALTHOUGH IT IS CONSIDERED APPLICABLE TO THE NORTH BRANCH OF THE POTOMAC RIVER). (FS, TABLE 1, PP. 2-3 TO 2-4).

THE REMEDIAL OBJECTIVE FOR SEDIMENT IS TO MINIMIZE DIRECT CONTACT. (FS, PP. 2-11 TO 2-12). THE SOURCES OF STREAM SEDIMENTS ARE PRECIPITATION FROM SURFACE WATER AND EROSION OF SOILS. IF THE SURFACE WATER IS NOT CONSIDERED A CONTAMINATION PROBLEM, THEN THE PRIMARY RISK RELATES TO EROSION. POTENTIAL EROSION RISKS ARE ADEQUATELY DEALT WITH BY FENCING AND DEED RESTRICTIONS.

PROPOSED REMEDIAL ACTION

FAIRCHILD PROPOSES THAT REMEDIAL ACTION AT THE LIMESTONE ROAD SITE TO BE ACCOMPLISHED INCLUDE:

* DEED RESTRICTIONS AND FENCING OF REFUSE AREAS OF DIGGS AND CC&SC PROPERTIES.

* LIMITED MONITORING OF SURFACE WATER.

* EXTENSION OF CITY WATER SUPPLY TO LOCAL RESIDENCES.

BASED ON THE ENDANGERMENT AND RISK ASSESSMENTS IN THE RI REPORT, WE CONCLUDE THAT A LIMITED REMEDIAL ACTION ABOVE OUTLINED SUFFICIENTLY ADDRESSES THE REAL ENVIRONMENTAL CONCERNS AT THE LIMESTONE ROAD SITE. AS ALREADY STATED IN THESE COMMENTS, THESE AREAS OF CONCERN ARE THE CONTAMINANTS IN THE SOIL AND THE POSSIBLE EFFECT OF SAME ON THE GROUNDWATER. POSSIBLE ENDANGERMENT IS LIMITED TO HUMAN EXPOSURE TO BOTH MEDIA PRINCIPALLY THROUGH DIRECT CONTACT WITH SOIL AND DRINKING WATER CONSUMPTION.

WE AGREE WITH THE FS ANALYSIS THAT THIS TYPE OF RESPONSE -- FENCING AND DEED RESTRICTIONS OF THE REFUSE-FILLED AREA -- WOULD REDUCE THE LIKELIHOOD OF DIRECT SOIL CONTACT AND CASUAL SITE ACCESS. (FS, PP. 6-10 TO 6-11, 6-22 TO 6-23). IT IS ALSO SIGNIFICANT THAT SINCE THE SITE HAS BEEN CLOSED TO DUMPING OPERATIONS SINCE 1981 MOST OF THE AFFECTED AREA IS NOW COVERED WITH VEGETATION. RESTRICTED SITE ACCESS WOULD ALLOW THE VEGETATION TO INCREASE THEREBY NATURALLY REDUCING POSSIBLE SOIL EROSION. PERIODIC MONITORING OF THE SURFACE WATER FROM LEACHATE SEEPS DISCHARGING FROM THE BASE OF THE WASTE MASSES ON BOTH THE DIGGS AND CC&SC PROPERTIES FOR A LIMITED PERIOD OF TIME (ANNUALLY FOR FIVE YEARS) SHOULD BE SUFFICIENT TO DETECT ANY TREND OF CONTAMINATION OF THESE ENVIRONMENTAL MEDIA.

WHILE WE HAD EARLIER INVESTIGATED THE FEASIBILITY OF A LIMITED CLAY/SOIL COVER OVER THE SOIL CONTAMINATED AREAS, WE BELIEVE IN VIEW OF THE RI/FS FINDINGS AND ANALYSIS THAT SUCH AN ALTERNATIVE IS INAPPROPRIATE AND NOT COST EFFECTIVE. THE TWO OBJECTIVES CITED FOR THIS REMEDIAL ALTERNATIVE ARE REDUCTION OF WATER INFILTRATION THAT MAY TRANSPORT CONTAMINANTS TO GROUNDWATER AND REDUCTION OF CONTACT WITH SOIL. ONCE THE AFFECTED AREAS ARE PROPERLY FENCED THE OBJECTIVE OF REDUCING SOIL CONTACT BY COVERING IS REDUNDANT. IN ADDITION, IT IS CONCEDED IN THE (FS, P. 5-13) THAT THE SELECTIVE "CAP" FOR THE CC&SC PROPERTY WOULD ADDRESS LESS THAN 5% OF THE TOTAL VOLUME OF WATER THAT MOVES OVER AND THROUGH THE REFUSE FILL. IT IS ALSO CONCLUDED THAT THE EFFECTIVENESS OF SIMILAR CAPPING OF THE DIGGS PROPERTY "CANNOT BE ESTIMATED" (FS, P. 5-15) AND THAT "CORRELATION OF CONTAMINANT RELEASE REDUCTION WITH CAPPING SYSTEM IS NOT POSSIBLE FOR THE SOIL AND REFUSE MATRIX AT DIGGS.". FINALLY, AS STATED EARLIER, THE FACT THAT SOIL CONTAMINATION ON BOTH PROPERTIES HAS MINIMAL IMPACT ON GROUNDWATER STRONGLY SUGGESTS THAT ANY CONCERN REGARDING TRANSPORT OF CONTAMINANTS TO GROUNDWATER THROUGH INFILTRATION IS INSUFFICIENT TO WARRANT THE EXPENSIVE COVER ALTERNATIVE.

FAIRCHILD ALSO BELIEVES THAT THE GROUNDWATER QUALITY IN THE VICINITY OF THE SITE, INCLUDING THE CITY DUMP, MAY HAVE BEEN INFLUENCED BY NATURAL BACKGROUND CONDITION AS WELL AS POSSIBLE EFFECTS OF LANDFILLING OPERATIONS THAT HAVE TAKEN PLACE SINCE 1962 WHEN OPERATIONS AT THE CITY DUMP COMMENCED. ACCORDINGLY, FAIRCHILD RECOMMENDS THAT MODIFICATIONS BE MADE TO THE DRINKING WATER SUPPLIES OF LOCAL RESIDENCES WHICH WOULD CONSTITUTE A RESPONSE TO THE NATURAL PROGRESSION OF DEVELOPMENT IN THE AREA. IT IS EXPECTED THE CITY OF CUMBERLAND WILL PROVIDE THE RESOURCES NEEDED FOR CONNECTING THE MUNICIPAL WATER SUPPLY TO THESE RESIDENCES.

ONCE YOU HAVE REVIEWED THESE COMMENTS AND RECOMMENDATIONS, WE WOULD WELCOME THE OPPORTUNITY TO ANSWER ANY QUESTIONS. WE ALSO BELIEVE IT WOULD BE MOST FRUITFUL TO MORE FULLY DISCUSS THE TECHNICAL ASPECTS OF THE RI/FS REPORT AND THESE COMMENTS IN DETAIL TOWARD THE END OF ACHIEVING AGREEMENT ON A PROPER AND COST EFFECTIVE REMEDIATION.

VERY TRULY YOURS,

RICHARD R. MOLLEUR

ATTACHMENT.
H2M - HOLZMACHER, MCLENDON & MURRELL, P.C.

ATTACHMENT "A"

CONCLUSIONS

REGIONAL GROUNDWATER FLOW, AS TRADITIONALLY BASED UPON HYDRAULIC GRADIENT, IS IN THE NORTHWEST DIRECTION FOR THIS AREA. FLOW DIRECTION IS FURTHER COMPLICATED BY THE GEOLOGY OF THE AREA (I.E., FRACTURED SHALE AND STRUCTURAL ELEMENTS). FURTHER ANALYSIS OF HISTORICAL AND POSSIBLY ADDITIONAL FIELD DATA IS NEEDED TO UNDERSTAND THESE FLOW PATTERNS, ESPECIALLY IN LOCAL AREAS.

LOCAL FLOW PATTERNS MAY RENDER A CLEARER PICTURE OF ACTUAL FLOW. THIS IS EVIDENCED BY THE CC&SC SITE WHERE IT IS SEEN THAT STEEP GRADIENTS DEMONSTRATE FLOW TOWARD AND DISCHARGING TO AN UNNAMED TRIBUTARY. AT THIS SITE LOCALIZED FLOW IS TOWARDS THE SOUTHWEST AS OPPOSED TO REGIONAL FLOW TO THE NORTHWEST.

IT IS ALSO UNCLEAR WHETHER WATER PERCOLATED THROUGH THE WASTE MASS ON THE CC&SC PROPERTY WILL IF AT ALL REACH THE WATER TABLE. AT THIS POINT IN TIME, THE WELL DATA DIRECTLY DOWNGRADIENT AND BENEATH THIS LOCATION INDICATES THAT IT WILL NOT.

INTRODUCTION

COMMENTS ARE INCLUDED HEREIN ON THE HYDROGEOLOGIC INVESTIGATION OF THE REMEDIAL INVESTIGATION (RI) REPORT FOR THE LIMESTONE ROAD SUPERFUND SITE, CUMBERLAND, MARYLAND. THE PROBABLE REGIONAL GROUNDWATER FLOW PATTERNS AND LOCALIZED GROUNDWATER FLOW PATTERNS NEAR THE CUMBERLAND CEMENT & SUPPLY CO. (CC&SC) ARE DISCUSSED.

REGIONAL GROUNDWATER FLOW

THE RI REPORT HAS OBTAINED A VOLUMINOUS AMOUNT OF FIELD AND HISTORICAL DATA TO SUPPORT THEIR INTERPRETATION OF THE REGIONAL GROUNDWATER FLOW. HOWEVER, THESE FLOW PATTERNS ARE NOT CLEAR-CUT IN A FRACTURED SHALE MEDIA.

REGIONAL FLOW IS TYPICALLY BASED ON THE HYDRAULIC GRADIENT WHICH WOULD BE TO THE NORTHWEST AT THIS SITE. AT THIS PARTICULAR SITE THE FLOW DIRECTION IS COMPLICATED BY THE EXISTING SUBSURFACE (STRUCTURAL) GEOLOGY AND FRACTURE PATTERNS OF THE SHALE. THE LATTER ITEMS HAVE PROBABLY MORE INFLUENCE ON GROUNDWATER FLOW AND NEED TO BE ANALYZED FURTHER. ANOTHER KEY (AND CONTROVERSIAL) ISSUE AT THIS SITE IS THE ANISOTROPIC NATURE OF THE AQUIFER.

STRUCTURALLY, THE STRIKE TRENDS TO THE SOUTHWEST-NORTHEAST AND THE DIP AVERAGES ABOUT 70 DEGREES FROM THE HORIZONTAL. THIS INDICATES THAT THE GROUNDWATER FLOW IS PERPENDICULAR TO THE GENERAL STRIKE, WHICH IS UNREASONABLE. PRIMARY FRACTURE PATTERNS AS EXHIBITED IN FIGURE 4-4 OF THE RI REPORT ALSO PARALLEL STRIKE, BUT POSSIBLE SECONDARY FRACTURES ARE PERPENDICULAR TO STRIKE.

THE STRUCTURAL ELEMENTS JUST DISCUSSED REQUIRE FURTHER ANALYSIS TO DEFINE VERTICAL AND HORIZONTAL FLOW PATTERNS IN GROUNDWATER. THE STATE OF MARYLAND MADE SOME PERTINENT COMMENTS REGARDING THIS. DATA IS NEEDED TO UNDERSTAND THE REGIONAL AS WELL AS LOCALIZED FLOW PATTERNS, POSSIBLE RECHARGE POINTS, AND ARTESIAN CONDITIONS. PRESUMABLY, MARYLAND HAS READY ACCESS TO SUCH GEOLOGIC INFORMATION (HISTORICAL DATA) AND WOULD BE USEFUL TO OBTAIN.

FINALLY, A COMMENT ON TREATING FRACTURED SHALE AS POROUS MEDIA. THE CONSULTANT IN THE REPORT IS CLEARLY AWARE OF THE ANISOTROPIC AND HETEROGENEOUS NATURE OF THE FLOW. THE METHOD USED WAS DISCUSSED IN APPENDIX C (SNOW'S METHOD EMPLOYS ANISOTROPY FOR FLOW). ALSO, FREEZE AND CHERRY CLAIM IT IS A COMMON

APPROACH IN FIELD INVESTIGATIONS TO MATHEMATICALLY TREAT CONTAMINANT MIGRATION IN FRACTURED MEDIA AS POROUS MEDIA OF AN ISOTROPIC AND HOMOGENEOUS NATURE.

PROBABLE LOCAL GROUNDWATER FLOW PATTERNS AT THE CC&SC SITE

THE REGIONAL FLOW, AS STATED EARLIER DUE TO CHANGE IN WATER LEVEL, IS TO THE NORTHWEST. HOWEVER, AT THE CC&SC SITE, LOCAL GROUNDWATER FLOWS FROM UPLAND AREAS AND DISCHARGES TO THE INTERMEDIATE STREAM JUST SOUTHWEST OF THE SITE AS INDICATED BY THE GROUNDWATER CONTOURS (SEE SCHEMATIC FIGURE A). IT IS ASSUMED THAT THE MAJOR FRACTURE PATTERNS AS DEPICTED IN FIGURE 4-4 OF THE RI REPORT DO NOT INFLUENCE THE FLOW IN THIS LOCAL AREA.

INFILTRATION OCCURS VIA PRECIPITATION INTO THE OVERLYING, MORE PERMEABLE FILL AT THE DUMP SITE. THE FILL IS OVERLYING FRACTURED SHALE OF LOWER PERMEABILITY. THE FLOW PROCEEDS VERTICALLY TO THE GROUNDWATER AND IS DISCHARGED TO THE STREAM (SEE SCHEMATIC FIGURE B). EVIDENCE OF ARTESIAN CONDITIONS AT WELL MW-12 (SEE RI REPORT P. 4-5) INDICATES DISCHARGE WHICH IS PROBABLY DUE TO TOPOGRAPHIC CONTROL.

THIS DUMP AREA IS A RAVINE SURROUNDED BY STEEP GRADIENTS. NATURAL RUNOFF CAN OCCUR FROM THE NORTH (CITY DUMP) AND TO THE SOUTHWEST AS WELL AS FROM THE CC&SC SITE DIRECTLY AFFECTING THE STREAM. INTERFLOW IN THE THIN PERMEABLE SOIL LAYER IS A SMALL CONTRIBUTION IN ADDITION TO RUNOFF SINCE EROSION OCCURS ON THE STEEP SLOPES.

THE FRACTURES OF FIGURE 4-4 OF THE RI REPORT INDICATE SECONDARY (POSSIBLE) FRACTURES NEAR THE STREAM AND A PRINCIPAL FRACTURE SET JUST NORTHEAST OF THE CC&SC SITE. REMOTE SENSING DATA FOR THIS LOCAL SITE WOULD AID IN LOCATING LOCAL LINEAMENTS AND SURFACE FRACTURE TRACES. IT IS ASSUMED THAT AERIAL PHOTOGRAPHS WERE USED TO LOCATE THE FRACTURES IN FIGURE 4-4.

IN REGARD TO STRUCTURE, STRIKE OF THE BEDS IS NORTH-NORTHEAST TO SOUTH-SOUTHWEST. LOCALIZED FLOW INDICATES COMPLIANCE WITH STRIKE. IT IS ASSUMED THAT THE ANGLE OF DIP IS APPROXIMATELY 70 DEGREES.

RESPONSES TO COMMENTS FROM HERON, BURCHETTE,
RUCKERT AND ROTHWELL
(ON BEHALF OF FAIRCHILD INDUSTRIES, INC).

THE AGENCY AGREES WITH THE MAJORITY OF THE COMMENTS MADE ON BEHALF OF FAIRCHILD INDUSTRIES, INC. IN REFERENCE TO THE RI/FS FOR THE LIMESTONE ROAD SITE.

THE FOLLOWING RESPONSES ADDRESS COMMENTS MADE ON A PARAGRAPH-BY-PARAGRAPH BASIS. FAIRCHILD'S COMMENTS IN THIS SET OF RESPONSES ARE SOMETIMES PARAPHRASED OR SIMPLY NOT REPEATED TO SHORTEN THE RESPONSE. ACTUAL COMMENTS ARE LISTED IN A LETTER DATED SEPTEMBER 10, 1986 FROM RICHARD R. MOLLEUR OF THE FIRM HERON, BURCHETTE, RUCKERT, AND ROTHWELL. THE LETTER WAS ADDRESSED TO MS. SUSAN BELSKI, COMPLIANCE OFFICER FOR THE REGION III, U.S. EPA.

GENERAL COMMENTARY, PAGE 1, PARAGRAPH 3

THE AGENCY AGREES WITH THE GENERAL COMMENTS MADE THAT THE RI/FS REPORTS FOR THE LIMESTONE ROAD SITE CONTAIN ASSUMPTIONS AND QUALIFICATIONS THAT MADE IT DIFFICULT TO REACH "DEFINITIVE AFFIRMATIVE CONCLUSIONS" AS TO SITE CONTAMINATION AND ENDANGERMENT.

THE STATEMENT THAT THE SOIL CONTAMINATION ONSITE HAS MINIMAL IMPACT ON SURFACE AND GROUNDWATER AND, THEREFORE, PRESENTS LITTLE OR NO ENDANGERMENT TO HUMAN EXPOSURE DOES NOT ADDRESS THE POSSIBILITY FOR FUTURE RELEASES OR CHANGES IN SITE PHYSICAL CONDITIONS (SUCH AS EXCAVATION FOR FUTURE SITE DEVELOPMENT) OR CHANGES IN THE AMOUNT OR TYPE OF LEACHING WATER, THAT COULD AFFECT THE CIRCUMSTANCES OF CONTAMINATION OR ENDANGERMENT.

THE AGENCY AGREES WITH THE STATEMENT THE CONTRIBUTIONS OF THE CUMBERLAND CITY DUMP TO OVERALL CONTAMINATION RAISES QUESTIONS AS TO THE SOURCE OF CONTAMINATION AND HENCE RESPONSIBILITIES THAT HAVE NOT BEEN ADDRESSED.

PAGE 2, PARAGRAPH 1

THE RESULTS OF THE ENDANGERMENT ASSESSMENT HAVE SHOWN THAT IF CHROMIUM-CONTAINING SOIL WERE TO BE INGESTED AT A CERTAIN RATE, A SIGNIFICANT ENDANGERMENT TO PUBLIC HEALTH COULD RESULT. IN THIS INSTANCE, AN ENDANGERMENT TO PUBLIC HEALTH IS CONSIDERED A FORM OF ENVIRONMENTAL ENDANGERMENT. THE AGENCY AGREES THAT THE VALENCE FORM OF THE CHROMIUM THAT IS PRESENT IS UNKNOWN, AND RECOGNIZES THAT CHROMIUM MAY BE PRESENT IN THE LESS TOXIC, LESS MOBILE, TRIVALENT FORM. HOWEVER, THIS IS SPECULATION ONLY AND CANNOT BE CONFIRMED WITH RAW DATA. THEREFORE, IT IS NOT CERTAIN THAT THE CHROMIUM ON THE CC&SC PROPERTY PRESENTS LITTLE OR NO ENDANGERMENT.

THE SOURCE OF THE ALLEGATION THAT 99 TONS OF CHROMIUM CONTAINING SLUDGE WERE DUMPED IS SUPPORTED BY A WRITTEN REPORT OF AN INTERVIEW WITH A WASTE HAULER THAT WAS CONDUCTED BY THE MARYLAND DEPARTMENT OF HEALTH AND MENTAL HYGIENE DURING A SAMPLING TRIP ON APRIL 23 AND 24, 1981.

PAGE 2, PARAGRAPH 2

YES, THE AGENCY AGREES THAT THE UNRESOLVED ISSUE OF THE CUMBERLAND CITY DUMP PARTIALLY EXPLAINS WHY THE FS MAKES NO SPECIFIC SELECTION OF A REMEDIAL ALTERNATIVE. HOWEVER, THE ESSENTIAL REASON THAT THE FS MAKES NO SELECTION BECAUSE THE DECISION OF THE BEST REMEDIAL ALTERNATIVE COULD ONLY BE MADE BY U.S. EPA REGION III AFTER THE PUBLIC COMMENTS WERE TAKEN INTO ACCOUNT.

PAGE 3, PARAGRAPH 1

EPA HAS BEEN CONDUCTING A POTENTIALLY RESPONSIBLE PARTY (PRP) SEARCH OF THE SITE IN AN EFFORT TO IDENTIFY PRPS AND GAIN A PRP CLEANUP AT THE SITE. EPA REQUESTS THAT IF YOU HAVE INFORMATION WHICH WOULD ASSIST EPA IN CONDUCTING THE PRP SEARCH, THAT YOU PROVIDE THAT INFORMATION TO EPA AS SOON AS POSSIBLE. PLEASE ALSO BE ADVISED THAT EPA IS CURRENTLY REVIEWING ITS FILE INFORMATION IN AN EFFORT TO IDENTIFY ANY ADDITIONAL PRPS.

1. ADEQUACY OF INVESTIGATION

PAGE 3, PARAGRAPH 2

THE RI RECOGNIZES THE FACT THAT BACKGROUND SAMPLES WERE TAKEN FROM DIFFERENT SOIL STRATA THAN THE SUBSURFACE SITE SAMPLES AND HAS PRESENTED THIS AS A LIMITATION SURROUNDING THE INTERPRETATION OF THE RESULTS.

A CHEMICAL ANALYSIS OF THE ONSITE SHALE WAS NOT CONSIDERED AS PART OF THE SCOPE OF WORK INITIALLY AGREED UPON BY THE EPA, STATE OF MARYLAND, AND CH2M HILL, BECAUSE THE PROBLEMS CURRENTLY ASSOCIATED WITH THE ASSESSMENT OF GROUNDWATER CONTAMINATION WERE NOT ANTICIPATED.

PAGE 3, PARAGRAPH 3

AS FAR AS WE CAN TELL, THE ONLY ISSUE DR. GROSSER TAKES WITH THE RI REPORT IS THE DIRECTION OF GROUNDWATER FLOW BEING PERPENDICULAR TO THE STRIKE OF REGIONAL STRUCTURE. WE HAVE REPEATEDLY QUALIFIED THIS STATEMENT THROUGHOUT THE RI REPORT AND ACKNOWLEDGE THAT FLOW PATHS OTHER THAN THE ASSUMED PRINCIPAL FLOW DIRECTION CAN AND PROBABLY DO EXIST. BASED ON OUR REVIEW OF DR. GROSSER'S COMMENTS WE ARE SOMEWHAT PUZZLED BY FAIRCHILD'S ATTORNEYS' COMMENT ON PAGE THREE OF THEIR LETTER REGARDING THEIR "SERIOUS CONCERN ABOUT THE ADEQUACY OF THE HYDROGEOLOGIC INVESTIGATION.". THESE CONCERNS ARE NOT SUPPORTED BY DR. GROSSER'S COMMENTS AS PRESENTED IN ATTACHMENT A.

2. ENDANGERMENT ISSUES

PAGE 4, PARAGRAPH 1

THE AGENCY AGREES WITH THE ASSESSMENT OF THE MAJOR ENDANGERMENT ISSUES RELATING TO ONSITE SOIL AND GROUNDWATER CONTAMINATION.

A. SOIL

PAGE 4, PARAGRAPH 2

THE AGENCY AGREES WITH THE SUMMARY PROVIDED OF THE REMEDIAL OBJECTIVES. TABLE 1 IN THE FS WAS A DRAFT VERSION THAT SHOULD BE UPDATED WITH TABLE 6-19 FROM AUGUST 8, 1986 VERSION OF THE RI TO INCLUDE OTHER MEMBERS OF THE POLYCYCLIC AROMATIC HYDROCARBON FAMILIARITY OF CHEMICALS. THESE CHEMICALS WERE INITIALLY NOT ADDRESSED BECAUSE OF DIFFERENCES OF OPINION FOUND IN GUIDANCES ON THEIR QUANTITATIVE ASSESSMENT. INCLUSION OF PAH'S IN THE FS DOES NOT ALTER THE CURRENT STATUS OF THE REMEDIAL ALTERNATIVES PROPOSED.

THE AGENCY AGREES WITH THE SUPPOSITION THAT THE MAJOR ORGANIC CONTAMINANTS ARE UNLIKELY TO MIGRATE FROM THE SITE THROUGH THE SOIL, ALTHOUGH IT DOES NOT PRESUPPOSE THAT THE MIGRATION OF CHEMICALS COULD NOT OCCUR AT SOME FUTURE TIME.

PAGE 4, PARAGRAPH 3

THE STATEMENT THAT "CONCERNS REGARDING MIGRATION OF THE MAJOR INORGANIC CONTAMINANTS AT THE SITE SHOULD BE MINIMAL" IS NOT ENTIRELY AGREEABLE TO THE AGENCY. ALTHOUGH THE INORGANIC CONTAMINANTS ARE PROBABLY CURRENT BEING INFLUENCED BY SORPTION, AND AS SUCH HAVE NOT MIGRATED TO THE GROUNDWATER, THEIR SORPTION DEPENDS UPON A VARIETY OF CHANGING VARIABLES SUCH AS THE PH OF THE LEACHING WATER, THE OXIDATION-REDUCTION POTENTIAL OF THE SOIL AND LEACHING WATER, THE MICROBIAL ACTIVITY IN THE SOIL, AND

THE ORGANIC CONTENT OF THE SOIL. THEREFORE, THE AGENCY CONTENDS THAT THE MIGRATION OF THE INORGANIC CONTAMINANTS, ALTHOUGH NOT CURRENTLY EVIDENT TO A SIGNIFICANT EXTENT, MAY IN THE FUTURE BECOME MORE THAN A MINIMAL CONCERN.

PAGE 4, PARAGRAPH 4

CHROMIUM WAS NOT DETECTED IN THE GROUNDWATER AT CONCENTRATIONS CONSIDERED THREATENING TO HUMAN HEALTH. THE AGENCY HAS OFFERED A POSSIBLE, BUT NOT CERTAIN, EXPLANATION THAT THE REDUCED FOR OF CHROMIUM MAY BE COMPLEXED WITH ORGANICS AND HENCE LESS MOBILE.

PAGE 5, PARAGRAPH 1

CAPPING WOULD FURTHER MINIMIZE INFILTRATION INTO THE CONTAMINATED AREAS,

BESIDES MINIMIZING DIRECT CONTACT. FENCING WILL ONLY PROVIDE SITE SECURITY.

B. GROUNDWATER

PAGE 5, PARAGRAPH 2

AS DESCRIBED PREVIOUSLY IN RESPONSE TO THE COMMENT ON PAGE 4, PARAGRAPH 3, THE AGENCY DOES NOT CONSIDER THE MIGRATION OF INORGANICS UNLIKELY ALTHOUGH IT DOES AGREE THAT MINIMIZING THE POSSIBILITIES FOR EXCAVATION AND EROSION WILL LESSEN THE LIKELIHOOD OF CONTAMINANT MIGRATION TO GROUNDWATER AND SURFACE WATER.

PAGE 5, PARAGRAPH 3

THE AGENCY DOES NOT DISAGREE WITH POINTS CONTAINED IN THIS PARAGRAPH.

PAGE 5, PARAGRAPH 4

THE PRESENCE OF ZINC IN THE RESIDENTIAL WELL GROUNDWATER MAY HAVE ATTRIBUTABLE TO NATURALLY OCCURRING SOURCES, CONVEYANCE PIPES, STORAGE TANKS, OR THE LANDFILL AREA. DATA LIMITATIONS HAVE RESULTED IN THE INABILITY TO CHARACTERIZE THE SOURCE OF THE ZINC FURTHER.

PAGE 6, PARAGRAPH 1

THE AGENCY AGREES WITH THIS PARAGRAPH, BUT CALLS ATTENTION TO THE INSTANCES WHERE LEAD EXCEEDED INTERIM PRIMARY DRINKING WATER STANDARDS.

PAGE 6, PARAGRAPH 2

THE AGENCY AGREES WITH THE STATEMENTS IN THIS PARAGRAPH.

PAGE 6, PARAGRAPH 3

ELEVATED LEVELS OF ARSENIC, BARIUM, CADMIUM, COPPER, LEAD AND SILVER WERE FOUND IN THE FLY ASH AND SOIL-LIKE MATERIAL SAMPLED FROM THE CUMBERLAND CITY DUMP. THE RI SUGGESTS THAT THE FLY ASH MATERIAL COULD BE EASILY TRANSPORTED VIA WIND AND WATER BORNE ROUTES AND, THEREFORE CAUSE ELEVATED CONCENTRATIONS OF THE ABOVE ELEMENTS IN THE SOIL AND SEDIMENT. GROUNDWATER IN CONTACT WITH THIS WASTE MASS COULD BE A SOURCE OF THE INORGANICS.

PAGE 6, PARAGRAPH 4

THE AGENCY AGREES WITH THE FIRST STATEMENT OF THIS PARAGRAPH AND HAS ADDRESSED THE QUESTION OF CHROMIUM'S MOBILITY IN THE RESPONSE TO THE COMMENT ON PAGE 4, PARAGRAPH 4.

THE AGENCY IS IN CONCURRENCE WITH THE OPTION THAT THE MINERALIZED GROUNDWATER IN THE AREA OF THE SITE MAKES IN DIFFICULT TO DRAW CONCLUSIONS REGARDING GROUNDWATER DEGRADATION ATTRIBUTABLE TO LANDFILL AREAS.

CERTAIN LEVELS OF CADMIUM, LEAD, MANGANESE, IRON, NICKEL, AND ZINC IN THE GROUNDWATER EXCEED APPLICABLE STANDARDS AND OR ACCEPTABLE DAILY INTAKE RATES.

C. SURFACE WATER AND SEDIMENT, PAGE 6, PARAGRAPH 5

THE AGENCY AGREES WITH THE STATEMENTS MADE IN THIS PARAGRAPH.

PAGE 7, PARAGRAPH 1

THE AGENCY DOES NOT AGREE THAT POTENTIAL EROSION RISKS ARE DEALT WITH ADEQUATELY BY FENCING AND DEED RESTRICTIONS ALONE. THIS IS BECAUSE OF THE STEEP NATURE OF THE CC&SC PROPERTY ABOVE THE DRAINAGE STREAM. DEED RESTRICTIONS WILL ALLOW THE FURTHER GROWTH OF VEGETATION THAT WILL DETERMINE EROSION, BUT WILL NOT SOLVE THE PROBLEM IN A DIRECT FASHION.

PROPOSED REMEDIAL ACTION, PAGE 7, PARAGRAPH 2

THE AGENCY AGREES THAT THE REMEDIAL ACTION AT THE SITE SHOULD INCLUDE THE ARTICLES MENTIONED, BUT FEELS IT SHOULD NOT BE STRICTLY LIMITED TO THESE ACTIONS.

PAGE 7, PARAGRAPH 3

AGAIN, THE AGENCY AGREES THAT THE REMEDIAL ACTION AT THE SITE SHOULD INCLUDE THE ARTICLES MENTIONED IN PARAGRAPH 2 OF PAGE 7 BUT MAINTAINS THAT OTHER ACTIONS ARE ALSO NECESSARY. THE AGENCY AGREES THAT CONTAMINATION IN THE SOIL AND THE POSSIBLE EFFECT OF THE CONTAMINANTS ON GROUND WATER ARE MAJOR ENVIRONMENTAL CONCERNS AT THE SITE.

PAGE 7, PARAGRAPH 4

THE AGENCY AGREES WITH THE STATEMENTS MADE IN THIS PARAGRAPH, ALTHOUGH IT HAS NOT DETERMINED A SUFFICIENT TIME PERIOD FOR MONITORING.

PAGE 8, PARAGRAPH 1

EPA DISAGREES WITH THIS PARAGRAPH AND HAS INCLUDED CAPPING AS PART OF THE SELECTED INTERIM REMEDY. THE CAP WILL MINIMIZE THE LEACHING OF CONTAMINANTS FROM THE SOIL INTO THE GROUND WATER AND WILL CONTROL THE EROSION AND MIGRATION OF SITE CONTAMINANTS FROM SITE SOILS INTO SURFACE WATERS.

PAGE 8, PARAGRAPH 2

EPA AND THE STATE ARE PROPOSING ADDITIONAL HYDROLOGICAL STUDIES TO DEFINE MOVEMENT OF GROUND WATER IN THE AREA. ONCE THESE STUDIES HAVE BEEN COMPLETED, EPA AND THE STATE WILL EVALUATE FUTURE REMEDIAL ACTIONS.

GLT611/13.

KRAMON & GRAHAM, P.A.

SEPTEMBER 12, 1986

MS. SUSAN E. BELSKI (3HW16)
COMPLIANCE OFFICER
UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY
REGION III
841 CHESTNUT BUILDING
PHILADELPHIA, PENNSYLVANIA 19107

RE: LIMESTONE ROAD SITE
CUMBERLAND, MARYLAND
3HW16

CUMBERLAND CEMENT
AND SUPPLY COMPANY

DEAR MS. BELSKI:

I WRITE ON BEHALF OF CUMBERLAND CEMENT AND SUPPLY COMPANY ("CUMBERLAND CEMENT") IN RESPONSE TO A LETTER DATED AUGUST 11, 1986 FROM STEVEN R. WASSERSUG. MR. WASSERSUG'S LETTER ACCOMPANIED THE DRAFT RI/FS RESPECTING THE ABOVE-MENTIONED SITE AND INDICATED THAT EPA WAS INTERESTED IN COMMENTS REGARDING THE RI/FS. YOUR OFFICE HAS REQUESTED SUCH COMMENTS BE FORWARDED NO LATER THAN THE DATE OF THIS LETTER.

AS A PREFATORY MATTER, CUMBERLAND CEMENT ADOPTS THE DISCUSSION CONTAINED IN THE "GENERAL COMMENTARY" SECTION OF THE LETTER DATED SEPTEMBER 10, 1986 TO YOU FROM RICHARD R. MOLLEUR, ESQUIRE, COUNSEL FOR FAIRCHILD INDUSTRIES, INC. CUMBERLAND CEMENT, OF COURSE, RESERVES THE RIGHT TO SUPPLEMENT THOSE COMMENTS AS FUTURE DISCUSSIONS AND ANALYSIS MAY WARRANT.

AS A FURTHER COMMENT, CUMBERLAND CEMENT HAS STRONG RESERVATIONS ABOUT THE VALIDITY OF THE COST ESTIMATES FOR CERTAIN MAJOR COMPONENTS OF THE ASSEMBLED ALTERNATIVES IN THE FS. THE ESTIMATES PREPARED BY EPA'S CONTRACTOR ARE GROSSLY UNDERSTATED. AT CUMBERLAND CEMENT'S REQUEST, A RESPECTED, INTERSTATE ENGINEERING AND CONSTRUCTION FIRM WITH OPERATIONS IN WESTERN MARYLAND PREPARED ESTIMATES FOR PROJECTS LISTED IN TABLES 5-3 (SOIL ALTERNATIVES EVALUATION MATRIX) AND 5-4 (GROUNDWATER ALTERNATIVES EVALUATION MATRIX) OF THE FS.

THE WESTERN MARYLAND FIRM, WHICH HAS EXTENSIVE EXPERIENCE IN UNDERTAKING SUCH PROJECTS IN THE REGION WHERE THE SITE IS LOCATED, DETERMINED THAT THE ACTUAL COSTS OF THE PROPOSED ALTERNATIVES FAR EXCEED THE ESTIMATES SET FORTH IN THE FS.

FOR EXAMPLE, THE WESTERN MARYLAND FIRM ESTIMATED THAT THE COST OF A CLAY CAP -- NOT INCLUDING TOPSOIL -- FOR THE CUMBERLAND CEMENT PARCEL OF THE SITE WOULD BE $655,000 00. HOWEVER, THE FS ESTIMATE LISTS THE CAPITAL COST FOR THAT SAME PORTION OF THE SITE AT ONLY $181,500.00. (FS, TABLE 5-3). FURTHER, EPA'S CONTRACTOR ESTIMATED THAT THE CAPITAL COST OF PROVIDING AN ALTERNATE WATER SUPPLY, BY MEANS OF EXTENDING THE CITY OF CUMBERLAND WATER DISTRIBUTION SYSTEM TO THE LIMESTONE ROAD RESIDENTS, TO BE ONLY $176,800.00 (FS, TABLE 5-4). THE WESTERN MARYLAND FIRM, HOWEVER, ESTIMATES THAT THE SAME WORK WILL COST BETWEEN $450,000.00 AND $500,000.00. FINALLY, THE CONSTRUCTION OF A SURFACE WATER INTERCEPTION AND DIVERSION TRENCH -- A REMEDIAL ALTERNATIVE THAT EPA HAS MADE CLEAR IT DOES NOT INTEND TO PURSUE -- IS ESTIMATED BY THE WESTERN MARYLAND CONTRACTOR TO HAVE A TOTAL COST OF $700,000.00; THE FS ESTIMATED THE CAPITAL COST OF THAT DIVERSION SYSTEM, A MAJOR UNDERTAKING, TO BE ONLY $390,000.00.

FOR OBVIOUS REASONS, THE VALIDITY OF THE COST ESTIMATES PREPARED BY EPA'S CONTRACTOR IS CLEARLY SUSPECT. THE ASTONISHING DISCREPANCY BETWEEN THE TWO SETS OF ESTIMATES COMPELS THE CONCLUSION THAT FURTHER DETAILED AND INDEPENDENT ANALYSIS OF THE ASSEMBLED ALTERNATIVES MUST OCCUR BEFORE CUMBERLAND CEMENT CAN FAIRLY BE EXPECTED TO PARTICIPATE IN ANY VOLUNTARY PLAN FOR REMEDIAL ACTION.

I ALSO WRITE TO ADVISE YOU THAT CUMBERLAND CEMENT CONCURS IN THE DISCUSSION ENTITLED "PROPOSED REMEDIAL ACTION" IN MR. MOLLEUR'S LETTER OF SEPTEMBER 10, 1986 TO YOU. CUMBERLAND CEMENT BELIEVES THAT, AS GENERALLY OUTLINED, THE PROPOSED ACTION WILL BE AN ADEQUATE RESPONSE TO THE ENVIRONMENTAL CIRCUMSTANCES AT THE SITE. AS DISCUSSED IN MY AUGUST 26, 1986 LETTER TO YOU, ALL THE INTERESTED PARTIES, AND THE VARIOUS GOVERNMENTAL UNITS, WILL NEED TO ADDRESS ALLOCATION OF COSTS AND RESPONSIBILITIES FOR THE PREPARATION OF THE RI/FS AND THE EXECUTION OF ANY REMEDIAL ACTION. CONSISTENT WITH THE PURPOSE AND THRUST OF CERCLA, REMEDIAL ACTION MUST BE COST EFFECTIVE AND CUMBERLAND CEMENT'S PARTICIPATION IN ANY SUCH PLAN IS INEXORABLY BOUND, OF COURSE, TO ITS FINANCIAL ABILITY TO SO PARTICIPATE.

I LOOK FORWARD TO DISCUSSING THESE COMMENTS WITH YOU IN THE NEAR FUTURE, IN THE HOPE THAT AN APPROPRIATE CONCLUSION CAN BE REACHED SOON RESPECTING REMEDIAL ACTION AT THE SITE.

SINCERELY,

PHILIP M. ANDREWS

PMA:JAC
CC: MR. CHARLES S. STEINER
W. STEVENS HIDEY, ESQUIRE.

DRAFT RESPONSES TO COMMENTS FROM KRAMON AND GRAHAM
(WRITING ON BEHALF OF CUMBERLAND CEMENT
AND SUPPLY COMPANY)

COMMENTS BY KRAMON AND GRAHAM PERTAIN TO SELECTED COST ESTIMATES PRESENTED IN THE FS. THE FS COST ESTIMATES ARE BASED ON NUMEROUS ASSUMPTIONS REGARDING SIZE, LOCATION, PHYSICAL CONDITIONS (SUCH AS SOIL DEPTH AND APPLICABLE CONSTRUCTION METHODS), HEALTH AND SAFETY REQUIREMENTS, CLIMATE, AVAILABILITY OF CONSTRUCTION MATERIALS, ETC. COST ESTIMATES PREPARED IN THE FS ARE FOR COMPARATIVE PURPOSES. IT IS PROBABLE THAT THE COST ESTIMATES WILL CHANGE AS DETAILS OF ALTERNATIVES ARE DEVELOPED THROUGH THE PREDESIGN AND DESIGN PROCESS.

GLT611/12.

STATE OF MARYLAND

DEPARTMENT OF HEALTH AND MENTAL HYGIENE

JULY 28, 1986

MS. STEPHANIE DEL RE
REMEDIAL PROJECT MANAGER
U.S. ENVIRONMENTAL PROTECTION
AGENCY
REGION III
841 CHESTNUT BUILDING
PHILADELPHIA, PENNSYLVANIA 19107

DEAR MS. DEL RE:

THIS LETTER IS IN RESPONSE TO THE DRAFT REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS) FOR THE LIMESTONE ROAD SITE. ON JULY 15, 1986 YOU ARRANGED A TECHNICAL MEETING WITH YOUR STAFF AND THE CONSULTANT TO DISCUSS THE DRAFT REMEDIAL INVESTIGATION. TWO OF WASTE MANAGEMENT ADMINISTRATION PERSONNEL ATTENDED THIS MEETING TO ASK QUESTIONS ABOUT THE CONSULTANT'S REPORT. THE FEASIBILITY STUDY WAS NOT ADDRESSED AT THIS MEETING AND YOU INDICATED ANOTHER MEETING WOULD BE ARRANGED TO DISCUSS THIS DOCUMENT. THIS LETTER CONTAINS COMMENTS ON OUR MAJOR CONCERNS WITH THE DRAFT REMEDIAL INVESTIGATION. OUR COMMENTS ARE LISTED IN TWO CATEGORIES; GENERAL COMMENTS CONCERNING THE OVERALL REPORT AND SPECIFIC COMMENTS RELATING TO CERTAIN PARTS OF THE REPORT.

I.) GENERAL COMMENTS

1) THE REPORT IS NOT DIRECT ENOUGH IN ITS WORDING. TOO OFTEN VAGUE TERMINOLOGY WAS USED THAT DETRACTED FROM THE IMPACT OF THE REPORT. IN LATER DRAFTS THE USE OF WORDS SUCH AS "POSSIBLY", "PROBABLY", AND "MOST LIKELY" SHOULD BE AVOIDED. IF THERE IS DOUBT CONCERNING A SPECIFIC STATEMENT OR IF THERE IS NO SUPPORTIVE DATA, THEN THIS SHOULD BE STATED.

2) THE REPORT DOES NOT ADDRESS ALL POSSIBILITIES OR ALTERNATIVES WHEN MAKING ITS CONCLUSIONS. DURING OUR MEETING IT WAS LEARNED THAT MANY ASPECTS HAD BEEN CONSIDERED, YET ONLY ONE WAS PRESENTED IN THE REPORT. ALL PERTINENT ASPECTS ADDRESSED BY THE CONSULTANT SHOULD BE INCLUDED INTO THE TEXT OF THE REPORT.

3) THE REPORT LACKS SIGNIFICANT SUPPORT DATA WHICH IS NEEDED TO MAKE ITS CONCLUSIONS. SOME OF THIS DATA IS MERELY HISTORICAL (SUCH AS REFERENCES THAT DISCUSS THE GEOLOGY OF THE AREA AND THE NATURE OF THE BEDROCK), SOME WOULD BE ILLUSTRATIVE TO THE READER (SUCH AS; A) TEMPORAL AND SPATIAL MAPS OF INVESTIGATED PARAMETERS, B) MAPS THAT INDICATE CHANGES IN, STREAM QUALITY RELATED TO SPECIFIC SITE AREAS, ETC.), WHILE SOME DATA MISSING ARE CRUCIAL TO THE STUDY. THERE IS A LACK OF GOOD BACKGROUND SAMPLE DATA REPRESENTATIVE OF THE AREA. FINALLY, NO DEFINITIVE DATA ARE PRESENTED THAT CONFIRM THAT CONTAMINATION OF THE SITES IS ATTRIBUTABLE TO THE STUDY AREA.

4) THE HYDROGEOLOGIC ASSESSMENT OF THE LIMESTONE ROAD SITE IS OVER SIMPLIFIED. ALTHOUGH THE REPORT ACKNOWLEDGES THAT THE BEDROCK BENEATH THE SITE IS

WELL FRACTURED, THE REPORT TREATS THE SITE AS IF IT WERE A POROUS MEDIA AQUIFER. MORE SPECIFIC COMMENTS CONCERNING THIS ARE DISCUSSED LATER.

5) THERE ARE INACCURACIES THROUGHOUT THE REPORT WHICH NEEDED TO BE CORRECTED. FIRST, THE TERMS MG/KG AND UG/KG ARE USED INCONSISTENTLY. IN ADDITION, ALL FIGURES SHOULD BE CLEARLY LABELED AS PPB OR PPM. A NUMBER OF VALUES ON THE TABLES ARE INCORRECT AND SOME CITED VALUES IN THE REPORT DO NOT MATCH THE TABLES.

6) IT IS UNCLEAR WHAT BACKGROUND CONCENTRATIONS ARE BEING USED IN MANY OF THE TABLES AND FIGURES. FOR EXAMPLE, IN FIGURE 4-15, CC&SC PROPERTY MONITORING WELL ORGANICS, WHAT ARE THE BACKGROUND CONCENTRATIONS FOR EACH OF THE PARAMETERS BEING INVESTIGATED, AND WHERE WERE THESE VALUES OBTAINED FROM? THIS TYPE OF INFORMATION WOULD BE EXTREMELY USEFUL TO THE READER.

7) ONE ASPECT NOT CONSIDERED IN THE REPORT IS THAT INORGANIC AQUEOUS DATA FROM THE MONITORING WELL DECREASE WITH TIME FROM PHASE I TO PHASE III. AN EVALUATION OF THIS MUST BE MADE IN THE REPORT.

8) AS WAS DISCUSSED BY YOUR TOXICOLOGIST THERE ARE SUBSTANTIAL CONCERNS IN CHAPTERS 5 & 6 OF THE REMEDIAL INVESTIGATION. A FEW OF THE POINTS ARE AS FOLLOWS: THE CONTAMINANT TRANSPORT AND FATE CHAPTER DOES NOT ADEQUATELY ADDRESS THE ENVIRONMENTAL ISSUES. IN THE ENDANGERMENT ASSESSMENT THERE IS OVERESTIMATE OF THE RISK OF INGESTION. EPA HAS A MAJOR CONCERN OF USING ARSENIC IN THE MANNER ADDRESSED IN THE REPORT. IT LACKS DETAIL ON FUGITIVE DUST AND DERMAL CONSIDERATIONS. A COMPLETE PUBLIC HEALTH EVALUATION NEEDS TO BE ADDRESSED. MANY OF THE STATEMENTS ARE "BOILER PLATE", AND NEED TO BE SITE SPECIFIC.

9) THE CHANGES REQUIRED TO IMPROVE THIS REMEDIAL INVESTIGATION (RI) WILL HAVE A DIRECT IMPACT ON THE FEASIBILITY STUDY (FS). IN AT LEAST TWO PLACES THE FS STATES THE "REPORT IS BASED ON THE INFORMATION AND DATA PRESENTED IN THE REMEDIAL INVESTIGATION REPORT.". SINCE THE RI HAS TO BE REWRITTEN, AND MANY OF THE CHANGES MADE IN THE RI HAVE TO BE INCORPORATED INTO THE FS, WE WILL RESERVE OUR COMMENTS ON THE FS UNTIL THE NEXT DRAFT OF THE RI IS COMPLETED. WE ASSUME THAT IS WHY THE FS WAS NOT DISCUSSED AT THE JULY 15TH MEETING AND WHY ANOTHER MEETING WILL BE ARRANGED TO DISCUSS THE FS.

II.) TEXT COMMENTS

1) P-3 REMEDIAL INVESTIGATION

THE TEXT STATES THAT 16 MONITORING WELLS WERE INSTALLED ON SITE, WHEN IN FACT 21 MONITORING WELLS WERE USED FOR THE STUDY.

2) P-3 HYDROGEOLOGIC INVESTIGATION

THE TEXT RECOGNIZES THAT THE SHALES ARE FRACTURED, YET THE DISCUSSION OF THIS PARAGRAPH CONSIDERS THE SIMPLER POROUS MEDIA GROUNDWATER FLOW. IT IS

UNREASONABLE TO MAKE THIS ASSUMPTION, KNOWING THAT THE SHALES ARE FRACTURED.

3) P-4 THROUGH P-6 - VARIOUS INORGANIC AND ORGANIC CONSTITUENTS WERE NOTED TO BE ABOVE BACKGROUND CONCENTRATIONS. HOWEVER, NO DEFINITIVE BACKGROUND LEVELS FOR THESE CONSTITUENTS WERE FOUND AT THE SITE IN THE SEDIMENT, SOIL, SURFACE WATER AND GROUNDWATER ANALYSES.

4) P-9 CITY DUMP EFFECTS

THE CONCLUSIONS THAT GROUNDWATER IS IN CONTACT WITH THE CUMBERLAND CITY DUMP (CCD) WASTE IS NOT SUBSTANTIATED LATER IN THE TEXT. IF THIS CONCLUSION IS IN FACT TRUE, IT SHOULD BE DOCUMENTED IN LATER SECTIONS OF THE REPORT.

5) P-10 PRIVATE WATER WELL CONTAMINATION

ALTHOUGH SOME INORGANICS WERE DETECTED, THEY ARE ISOLATED IN OCCURRENCE AND HAVE MORE THAN ONE POSSIBLE POINT SOURCE, WHICH IS NOT ADDRESSED IN THE EXECUTIVE SUMMARY (I.E. NATURAL BACKGROUND, PLUMBING, ETC.).

6) P. 2-1 LOCATION

ALTHOUGH THE CUMBERLAND CITY DUMP (CCD) IS EXCLUDED FROM THE REMEDIAL INVESTIGATION (RI), IT DOES NOT INTERFERE WITH MAKING APPROPRIATE CONCLUSIONS FOR THIS RI.

7) P. 2-4 GEOLOGY

THE DISCUSSION ON THE GEOLOGY OF THE AREA IS NOT ADEQUATE. THIS SECTION SHOULD BE SUBDIVIDED INTO SEPARATE SECTIONS: STRUCTURAL GEOLOGY, STRATIGRAPHY, ETC. IN ADDITION, THE DEFORMATIONAL HISTORY AND THE RESULTANT ATTITUDE OF THE ROCKS AT THE SITE ARE TOO BRIEF AND SECTIONS PERTAINING TO THE GEOLOGIC HISTORY AND GEOLOGIC SETTING SHOULD BE ADDED. THE DEPOSITIONAL ENVIRONMENT OF THE SEDIMENTARY ROCK HAS NOTHING TO DO WITH THE STRUCTURAL GEOLOGY. (SEE ATTACHED REFERENCES FOR FURTHER INFORMATION REGARDING THE STUDY AREA.).

8) P. 2-6, 2-7 GROUNDWATER

THE CREST OF IRONS MOUNTAIN IS ONLY A NATURAL SURFACE WATER DIVIDE. IT CANNOT BE ASSUMED TO BE A GROUNDWATER DIVIDE BECAUSE OF THE FRACTURED NATURE OF THE SHALES AND THE STRUCTURAL GEOLOGY IN THE AREA.

GROUNDWATER FLOWING FROM THE UPLANDS TO THE POTOMAC RIVER IS TOO GENERAL OF A STATEMENT, AND NOT AT ALL DESCRIPTIVE OF SITE CONDITIONS. IS THE FLOW PARALLEL TO STRIKE OR NORMAL TO STRIKE? DOES THE GROUNDWATER DISCHARGE TO INTERMEDIATE STREAMS PRIOR TO REACHING THE POTOMAC RIVER OR REACHING THE POTOMAC RIVER OR DOES IT DISCHARGE DIRECTLY TO THE POTOMAC RIVER?

THE DISCUSSION ON THE RECHARGE-DISCHARGE AREA IS UNCLEAR. WHERE ARE THE RECHARGE-DISCHARGE AREAS AND HOW WERE THEY DETERMINED? WHY IS INFILTRATION

RESTRICTED TO EXPOSED BEDROCK ONLY?

THE EFFECT OF CLAYS FILLING IN FRACTURES AND REDUCING GROUNDWATER INFILTRATION/PERMEABILITY THROUGH THE FRACTURES IS MINIMAL. THE FACT THAT THE CLAYS ARE SURFICIAL IN OCCURRENCE, SOIL COVER IS THIN AND STEEP SLOPES IN THE AREA ALLOW FOR SIGNIFICANT RUNOFF, REDUCE THE EFFECTS OF THE FRACTURES BEING INFILLED.

THE USE OF THE TERM SOLUTION CHANNELS IS MISLEADING. SOLUTION CHANNELS ARE ASSOCIATED WITH LIMESTONES AND SINCE THERE ARE NO REFERENCED CARBONATE UNITS PRESENT IN THESE SHALES, THIS TERMINOLOGY SHOULD NOT BE USED.

IT CANNOT BE ASSUMED THAT UPGRADIENT AND CROSS-STRIKE LIMESTONES AND SANDSTONES RECHARGE THE SITE AREA. THESE UNITS ARE UP TO ONE-HALF OF A MILE TO THE EAST, ARE WELL FRACTURED THEMSELVES, AND DIP STEEPLY BENEATH THE SITE. THEREFORE, RECHARGE OF THESE UNITS MAY GO ELSEWHERE OTHER THAN DOWNGRADIENT TO THE SITE. TO ASSUME THAT WATER FLOWS NORMAL TO THE STRIKE (AND THUS NORMAL TO THE DOMINANT FRACTURE TRENDS PARALLEL TO BEDDING) IS UNREALISTIC. FURTHERMORE, THE ORISKANY SANDSTONE, WHICH SEPARATES THE SHALES ON-SITE FROM THE UPGRADIENT LIMESTONES, IS WELL FRACTURED AND EXTREMELY POROUS. ANY RECHARGE IN THE LIMESTONES THAT MIGHT FLOW NORMAL TO STRIKE ALONG POSSIBLE HORIZONTAL PATHWAYS WOULD BE INTERCEPTED BY THE ORISKANY SANDSTONE.

FINALLY, SINCE BEDDING PLANE FRACTURES ARE PRESENT, AND SINCE BEDDING DIPS STEEPLY TO THE WEST, THERE MAY BE SIGNIFICANT DEEP RECHARGE BOTH UPGRADIENT AND ON-SITE.

THE TERM PHREATIC IS NOT USEFUL IN DESCRIBING GROUNDWATER CONDITIONS AT THE SITE. GROUNDWATER CONDITIONS CAN BE BETTER DESCRIBED AS BEING AN UNCONFINED AQUIFER WITH LOCALIZED FLOWING TO NON-FLOWING ARTESIAN CONDITIONS.

9) P. 2-10 LAND USE

THE TERM "HOUSEHOLD - TYPE HAZARDOUS WASTES" IS MENTIONED IN THE SECTION AND SOME CONCERN IS RAISED ABOUT THIS WASTE. IS THE CONCERN VALID AND ARE THE LANDFILL WASTES TRULY HAZARDOUS?

10) P. 2-10 EVENTS LEADING TO THE SUPERFUND CLASSIFICATION

THIS SECTION MENTIONS THE REGION III FIT CONDUCTING A PRELIMINARY ASSESSMENT, WHEN IN ACTUALITY IT WAS A SITE INSPECTION WITH A MINOR PORTION ON THE PRELIMINARY ASSESSMENT.

11) P. 3-4 HYDROGEOLOGIC INVESTIGATIONS

THE CHARACTERIZATION OF AQUIFER CONDITIONS AND GROUNDWATER FLOW DIRECTION IS INCOMPLETE. THESE POINTS MUST BE ADDRESSED FULLY, (I.E. WHAT ARE ALL THE POTENTIAL SUBSURFACE PATHWAYS AND GROUNDWATER FLOW DIRECTION?).

12) P. 4-2, 4-3 GEOLOGY

THIS SECTION SHOULD BE LABELED "GEOLOGIC ASPECTS THAT AFFECT GROUNDWATER". THE EXACT STRIKE/DIP OF THE ROCK IS NOT GIVEN. SOME REPRESENTATIVE MEASUREMENTS AND THEIR LOCATIONS SHOULD BE GIVEN.

WHY IS THE BEDROCK HIGHLY FRACTURED IN THE UPPER 10'-15' ZONE? IS THAT DUE TO WEATHERING, DRILLING, ETC.?

WHERE WERE THE HORIZONTAL FRACTURES THAT WERE MENTIONED OBSERVED, AND WHAT ARE THEY RELATED TO? ARE THEY A SURFACE PHENOMENON OR DO THEY EXTEND TO DEPTH? WHY ARE ONLY A SMALL PERCENTAGE OF THESE HORIZONTAL FRACTURES RELATED TO MECHANICAL BREAKAGE?

WHAT ARE REPRESENTATIVE ORIENTATIONS OF ALL THE FRACTURE SETS? (A TABLE WITH THIS INFORMATION SHOULD BE PRESENTED.). DID ANY OF THE FRACTURE SETS HAVE DISTINCTIVE MARKINGS, SUCH AS, WEATHERING, CEMENTATION, MINERAL GROWTH OR WERE THEY ALL FRESH?

REGIONAL FRACTURE TRENDS SHOULD BE RESEARCHED AND PRESENTED IN THE DISCUSSION OF FRACTURES. (SEE ATTACHED REFERENCES.).

FRACTURED ROCKS CANNOT BE TREATED ENTIRELY AS A POROUS MEDIA AS STATED. WITH REGARDS TO THE LIMESTONE ROAD SITE THE ROCK IS NOT UNIFORMLY FRACTURED IN EITHER DIRECTION OR INTENSITY. THE SHALES ARE DOMINANTLY FRACTURED PARALLEL TO BEDDING, AND DIFFERENT LITHOLOGIES PROBABLY DEVELOP THESE FRACTURES BETTER. HENCE, THERE ARE HETEROGENEITITIES IN THE ROCK AT THIS SITE WHICH MIGHT CREATE AN ANISOTROPIC FLOW, RATHER THAN THE SIMPLER POROUS MEDIA FLOW DESCRIBED.

13) FIGURES 4-2, 4-3, 4-4

THESE FIGURES SHOULD BE LABELED AS BEING NORMAL TO STRIKE. IN ADDITION, THE STRIKE DIRECTION OF THE ROCK SHOULD BE SHOWN ON THESE FIGURES.

14) FIGURE 4-5

THE FLOW OF GROUNDWATER IS CONSTRUED TO BE NORMAL TO THE GROUNDWATER CONTOUR LINES. GROUNDWATER FLOW SUCH AS THIS IS BOTH NORMAL TO THE STRIKE OF THE ROCK AND THE DOMINANT FRACTURES PRESENT. ACCORDING TO FREEZE & CHERRY (1979) GROUNDWATER FLOW IN A FRACTURED MEDIA THAT HAS A KNOWN HETEROGENIETY CAN BE IN A DIRECTION OTHER THAN NORMAL TO THE EQUIPOTENTIAL LINES.

15) P.4-4, 4-5 GROUNDWATER HYDROLOGY

IT IS ASSUMED THE WATER IS MOVING NORMAL TO STRIKE. YET, THE BEST FRACTURES PRESENT AT THE SITE ARE PARALLEL TO STRIKE. THIS HAS TO BE EXPLAINED.

AN IMPORTANT ASSUMPTION IS THAT THE FRACTURED SHALES CAN BE TREATED AS A POROUS MEDIA. ALTHOUGH THE SPACING AND INTENSITY MAY BE TREATED AS BEING HOMOGENEOUS (ALTHOUGH IT IS NOT PROVEN), THE

ORIENTATION OF THE FRACTURES IS DOMINANTLY IN ONE DIRECTION. THEREFORE, GROUNDWATER FLOW IN THE SHALES CAN ONLY BE TREATED AS A POROUS MEDIA PARALLEL TO THE FRACTURE ORIENTATION.

THE FACT THAT MONITORING WELLS IN THE VALLEYS ARE UNDER ARTESIAN CONDITIONS SUGGESTS THAT SOME TYPE OF CONTROL IS PRESENT ON THE GROUNDWATER. ASSUMING A POROUS MEDIA, THE ARTESIAN CONDITIONS WOULD NOT EXIST.

THE COMPUTED VALUES FOR HORIZONTAL AND VERTICAL GROUNDWATER GRADIENTS SHOULD BE REFERENCED.

IT SHOULD BE STATED MORE CLEARLY THAT BORINGS A-1, B-1, C-1, D-1 ARE ALSO MONITORING WELLS MWA-1, MWB-1, MWC-1, MWD-1.

THE VARIABILITY OF BOTH THE VERTICAL AND HORIZONTAL HYDRAULIC CONDUCTIVITIES ARGUES STRONGLY AGAINST A POROUS MEDIA CONDITION. THIS MUST BE EXPLAINED.

16) P. 4-7 THRU 4-11 HYDROGEOCHEMISTRY

THROUGHOUT THIS SECTION NO CHEMICAL ANALYSIS OF THE ON-SITE SHALES WAS DONE. THE LACK OF KNOWLEDGE OF WHAT THE SHALES CONTAIN AND THE FACT THAT NO UP-GRADIENT WELLS ARE PRESENT HINDER THE ABILITY TO ASSESS THE BACKGROUND CONTRIBUTION OF INORGANIC CONSTITUENTS. THESE FACTS SHOULD BE BROUGHT OUT MORE CLEARLY.

THE ASSUMPTION THAT DIFFERENT SHALES WILL CONTRIBUTE VARYING AMOUNTS OF INORGANICS IS MISLEADING. SINCE THESE ARE ALL DARK SHALES, DEPOSITED IN SIMILAR ENVIRONMENTS, WITH SIMILAR SOURCE AREAS AND A SIMILAR GEOLOGIC HISTORY, THE VARIANCE IN INORGANIC CONSTITUENTS SHOULD BE MINOR.

DUE TO THE LACK OF A DEFINITE POINT SOURCE OF CONTAMINATION, THE REPORT ASSUMES THAT INORGANICS IN DW-7, DW-10, DW-14 ARE DUE TO ROCK INFLUENCES. HOWEVER, THERE ARE OTHER WELLS IN THE SAME AREA WITHOUT AN INORGANIC PROBLEM. IN ADDITION, DW-7 AND DW-10 ARE THE DEEPEST WELLS (450' AND 697', RESPECTIVELY). THEREFORE, THESE TWO WELLS MAY BE INTERCEPTING A DEEPER FLOW.

EVEN THOUGH THE RESIDENCE TIME AND THE TRAVEL DISTANCE OF THE GROUNDWATER IS IMPORTANT IN TERMS OF INORGANICS IN THE GROUNDWATER, THESE ASPECTS ARE NOT THAT CRITICAL. FIRST THE DISTANCE SEPARATING ALL THE RESIDENCE WELLS IS NOT THAT GREAT AND SECONDLY, THE RESIDENCE TIME OF THE GROUNDWATER IS NOT THAT SUBSTANTIAL, CONSIDERING YOUR OWN GROUNDWATER VELOCITIES IN APPENDIX C.

A NATURAL OCCURRENCE OF ZINC CANNOT FULLY EXPLAIN THE ZINC IN THE RESIDENTIAL WELLS. FIRST, IF THE ROCK IS THE SOURCE, THEN THERE SHOULD BE A FAIRLY UNIFORM CONCENTRATION. SECOND, THERE ARE SEVERAL NEARBY RESIDENTIAL WELLS THAT DON'T HAVE ZINC. THIRD, ALL THE WELLS WITH ZINC ARE GREATER THAN 200' AND THE WELLS WITHOUT ZINC ARE LESS THAN 100'. ALL THESE POINTS NEED TO BE ADDRESSED.

17) TABLE 4-3

MANY OF THE AVERAGE VALUES DO NOT AGREE WITH THE ACTUAL VALUES. IN ADDITION, MANY OF THE VALUES ARE DECREASING IN CONCENTRATION CHRONOLOGICALLY FROM PHASE I THRU PHASE III. ALL THESE ASPECTS SHOULD BE EXPLAINED.

18) P. 4-15, 4-16 SOIL CONTAMINATION

TP-10 AND TP-30 ON THE CC&SC PROPERTY DO NOT EXHIBIT THE HIGHEST VALUES FOR ARSENIC, LEAD OR BARIUM AS STATED IN THE TEXT. TP-18 ON THE DIGGS PROPERTY DOES NOT HAVE THE HIGHEST VALUE FOR ARSENIC OR BARIUM AS STATED IN THE TEXT. STATEMENTS USING VALUES FROM THE CHARTS MUST BE VERIFIABLE.

19) P. 4-17 THRU 4-19 ORGANICS

SEVERAL THINGS IN THE TEXT ARE IMPLIED BUT ARE NOT VERIFIED BY THE FIGURES.

A) MANY TEST PITS ON CC&SC PROPERTY HAVE ORGANICS AND TP-10 AND TP-30 ARE NOT THE ONLY ISOLATED AREAS.

B) ALL THE TEST PITS ON THE DIGGS PROPERTY SHOW SIMILAR CONCENTRATIONS OF ORGANICS. THIS DISTRIBUTION OF ORGANICS NEEDS TO BE EXPLAINED.

C) WHY DOES THE TEXT USE FOUR SOIL BORINGS, RATHER THAN USE THE THIRTY-FOUR (34) TEST PIT RESULTS TO CHARACTERIZE THE ORGANICS ON-SITE?

20) P. 4-21 INORGANICS

THE TEXT STATES THE SOURCE OF LEAD IN RESIDENTIAL WELLS IS UNKNOWN. RATHER THAN DRAW ON POSSIBLE ASSUMPTIONS, THIS SOURCE SHOULD BE INVESTIGATED (I.E. SOLDER, PIPING, ETC.).

21) P. 4-26 SUMMARY & CONCLUSIONS

IS THE USE OF MG/KG CORRECT OR IS THE VALUES UG/KG. THESE ALSO NEED TO BE STATED IN PPM OR PPB.

22) P. 5-1 MIGRATION PATHWAY

MIGRATION PATHWAYS OF THE GROUNDWATER IS OVERSIMPLIFIED. THE USE OF POROUS MEDIA WITH GROUNDWATER FLOW PERPENDICULAR TO THE EQUIPOTENTIAL LINES MUST BE CORRECTED. WHAT FLOW PATHS DO WHICH RESIDENTS LIE ALONG? BECAUSE OF EARLIER COMMENTS, NOT MUCH CREDENCE CAN BE PUT INTO FIGURE 4-5. WHAT IS THE CONTRIBUTION OF INORGANICS TO THE SURFACE WATER AND STREAM SEDIMENT ADJACENT TO, AND BELOW EACH OF THE SITES? THIS SHOULD AND CAN BE MAPPED.

23) FIGURE 5-1 THRU 5-7

THESE ARE AN OVER SIMPLIFICATION OF SITE CONDITIONS. THE MORE LIKELY PATHWAYS SHOULD BE

SHOWN. SHOULDN'T THESE FIGURES BE REFERENCED?

24) TABLE 5-1

THIS TABLE WOULD MEAN A LOT MORE IF IT WAS DONE CHRONOLOGICALLY (I.E. SEPARATE TABLES FOR PHASE I, PHASE II AND AND PHASE III) AND INCLUDE THE CONCENTRATIONS OF THE MEASURED PARAMETERS. THIS WOULD ENABLE THE READER TO OBSERVE LONG-TERM AND SEASONAL ASPECTS.

25) P. 5-2, 5-3 INDICATOR CHEMICALS

IT STATES THAT CHEMICALS SELECTED WERE FOUND ELEVATED ABOVE BACKGROUND. WHAT WERE THE BACKGROUND LEVELS AND LOCATIONS, SO COMPARISON CAN BE MADE? ALL OF THIS NEEDS TO BE DISCUSSED MORE THOROUGHLY.

26) P. 5-4 THRU 5-8 INDICATOR CHEMICALS TRANSPORT & FATE

ALTHOUGH THE POTENTIAL EXISTS FOR VOLATILES, PHENOLICS, BASE/NEUTRALS, PESTICIDES AND PCB'S TO ENTER INTO THE GROUNDWATER, IT SHOULD BE MADE CLEAR THAT ONLY INORGANICS HAVE BEEN FOUND IN THE GROUNDWATER.

THE FIT REPORT IS REFERENCED CONCERNING ORGANIC CONTAMINATION. THIS DATA SHOULD BE INCLUDED IN THE REPORT.

WHY WOULD DISSOLVED METAL IONS MOVE SLOWLY IN GROUNDWATER THAT IS REPORTED TO HAVE HIGH VELOCITIES. CONDITIONS THAT INHIBIT METAL ION MIGRATION SHOULD BE EXPLAINED. HAVE THE EFFECTS OF SORPTION AND PRECIPITATION BEEN OBSERVED?

27) P. 5-9 LIMITATIONS OF THE RI

THE LACK OF A GOOD SET OF BACKGROUND SAMPLES TO COMPARE THE SAMPLE ANALYSIS WITH SEVERELY LIMITS THE RI. WITH SUCH A LARGE SITE WITH POSSIBLE MULTIPLE CONTRIBUTORS THIS ASPECT SHOULD HAVE BEEN A PRIORITY.

28) TABLE 6-1

THIS TABLE WOULD MEAN MORE IF IT WAS DONE CHRONOLOGICALLY AND IF THE CONCENTRATIONS WERE INCLUDED.

29) P. 6-28 SUMMARY

HOW OFTEN, WHERE, AND IN WHAT CONCENTRATIONS WAS CHLOROFORM FOUND?

30) TECHNICAL MEMORANDUM #6, VOL. 2

EITHER IN THIS MEMORANDUM, OR IN THE MAIN BODY OF THE REPORT, A COMPLETE DISCUSSION OF THE SAMPLING TECHNIQUES AND RATIONALE USED SHOULD BE GIVEN. IT IS UNCLEAR AS TO HOW AND WHEN WATER LEVELS WERE MEASURED. WERE ALL THE WELLS MEASURED PRIOR TO SAMPLING, OR WERE THE WATER LEVELS MEASURED AT EACH WELL CLUSTER DURING SAMPLING?

31) THE LIMITATIONS OF USING FILTERED SAMPLE

SHOULD BE DISCUSSED IN THE REPORT. IN ADDITION, TO QUALIFY THE FILTERED SAMPLE RESULTS, THE TURBIDITY VALUES OF EACH OF THESE SAMPLES SHOULD BE GIVEN. IF NO MEASURE OF TURBIDITY IS AVAILABLE, THEN A ROUGH ESTIMATE OF CLEAR, CLOUDY, ETC., SHOULD BE GIVEN.

32) TO MAKE THE REVIEW OF THE MONITORING WELL DATA EASIER, ALL THE DATA SHOULD BE INCLUDED INTO ONE TABLE. FOR EXAMPLE, INFORMATION NEEDED ARE; WELL NUMBER, WELL DEPTH, CASING ELEVATION, BOTTOM ELEVATION, GROUT SEAL DEPTH, SCREENED INTERVAL, WATER LEVEL MEASUREMENTS FOR PHASE I, PHASE II, PHASE III, AND WELL YIELDS. ALSO, A DISCUSSION OF WHICH WELLS HAD GOOD RECHARGE VERSUS THOSE WITH A LIMITED RECHARGE CAPABILITY SHOULD BE GIVEN.

THE ABOVE COMMENTS HAVE BEEN OFFERED TO IMPROVE THE DRAFT RI FOR THE LIMESTONE ROAD SITE. THESE COMMENTS ARE MEANT TO BE CONSTRUCTIVE AND IN NO WAY ARE THEY INTENDED TO BE CRITICAL OF THE REPORT OR ITS DATA. IF YOU HAVE ANY QUESTIONS, PLEASE CONTACT ME AT (301)-225-5700.

SINCERELY,

JOHN W. KOONTZ, ADMINISTRATOR
ENFORCEMENT PROGRAM

JWK:JM

CC: MR. RONALD NELSON
MR. FRANK HENDERSON
MR. ROBERT CRETER
MR. DAVID HEALY
MR. TED MEYER.

STATE OF MARYLAND

DEPARTMENT OF HEALTH AND MENTAL HYGIENE

SEPTEMBER 10, 1986

MS. STEPHANIE DEL RE
REMEDIAL PROJECT MANAGER
U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 CHESTNUT BUILDING
PHILADELPHIA, PENNSYLVANIA 19107

DEAR MS. DEL RE:

WE HAVE RECEIVED AND REVIEWED THE SECOND DRAFT OF THE REMEDIAL INVESTIGATION ON THE LIMESTONE ROAD SITE. GENERALLY, THE SECOND DRAFT REITERATES THE FINDINGS OF THE FIRST DRAFT AND CONTINUES TO APPLY A GLOSS OF ASSUMPTIONS TO GROUNDWATER FLOW, LOCAL GEOLOGY AND THE EXTENT OF CONTAMINATION.

THE FOLLOWING ARE THE STATE'S COMMENTS, FIRST GENERAL AND THEN THE SPECIFIC COMMENTS:

I. GENERAL COMMENTS

1. THIS COMMENT HAS BEEN ADDRESSED. THE SECOND DRAFT OF THE REPORT HAS BEEN MADE MORE DIRECT.

2. THE REPORT HAS PRESENTED AND CONSIDERED ALTERNATE HYPOTHESES FOR THE DATA. HOWEVER, THE REPORT IS NOT THOROUGH IN ITS ASSESSMENT OF ALL THE DIFFERENT ALTERNATIVES.

3. THIS COMMENT HAS NOT BEEN ADDRESSED.

4. THE HYDROGEOLOGIC ASSESSMENT HAS BEEN DRASTICALLY IMPROVED IN THE SECOND DRAFT OF THE RI. HOWEVER, THERE ARE STILL SOME CONCERNS WITH THIS SECTION (SEE THE FOLLOWING SPECIFIC COMMENTS).

5. THIS COMMENT HAS BEEN ADDRESSED AND IT APPEARS THAT MOST OF THE INACCURACIES OF THE REPORT HAVE BEEN CORRECTED IN THE SECOND DRAFT.

6. THIS COMMENT HAS NOT BEEN ADDRESSED (SEE THE SPECIFIC COMMENTS, NO. 3).

7. THIS COMMENT HAS NOT BEEN ADDRESSED (SEE THE SPECIFIC COMMENTS, NO. 17).

8. SOME OF THE CONCERNS OF THIS COMMENT HAVE BEEN ADDRESSED.

9. THIS COMMENT HAS NOT BEEN ADDRESSED.

II. SPECIFIC TEXT COMMENTS:

1. THIS COMMENT HAS BEEN ADDRESSED AND CORRECTED.

2. THIS COMMENT HAS BEEN ADDRESSED AND THE SECOND DRAFT OF THE RI NOW REFLECTS WMA'S CONCERN THAT GROUNDWATER MAY BE MOVING PARALLEL TO FRACTURES IN THE BEDROCK.

3. THIS COMMENT HAS NOT BEEN ADDRESSED. VARIOUS ORGANIC AND INORGANIC CONSTITUENTS ARE PRESENT IN SAMPLES OF SEDIMENT, SURFACE WATER, SOIL, AND GROUNDWATER THAT WERE PRESUMED TO BE BACKGROUND. SECONDLY, A LOCATION CONSIDERED IN THE TEXT AS BACKGROUND HAS PARAMETERS LABELED AS GT OR 5X GT BACKGROUND. HOW CAN THIS BE?

4. THIS COMMENT HAS BEEN ADDRESSED AND NOW THE RI STATES MORE CLEARLY HOW IT CONCLUDED THAT GROUNDWATER WAS IN CONTACT WITH THE CONTENTS OF THE CUMBERLAND CITY DUMP.

5. THIS COMMENT HAS BEEN ADDRESSED.

6. THIS COMMENT HAS NOT BEEN ADDRESSED. WMA STILL MAINTAINS THAT APPROPRIATE CONCLUSIONS CAN BE MADE WITHOUT THE INCLUSION OF THE CUMBERLAND CITY DUMP INTO THE RI. THERE IS AMPLE EVIDENCE PRESENT IN THE RI TO MAKE SOME DEFINITE CONCLUSIONS AND RESPONSIBLE RECOMMENDATIONS.

7. THIS COMMENT HAS NOT BEEN ADDRESSED. THERE IS A LARGE BODY OF BACKGROUND GEOLOGICAL INFORMATION PERTAINING TO THIS AREA THAT HAS NOT BEEN CONSULTED. AT A SITE WHERE THE GEOLOGY IS AS COMPLEX AS LIMESTONE ROAD (BY THE RI'S OWN ADMISSION), A THOROUGH UNDERSTANDING OF THE SITE IS NEEDED TO EVALUATE THE FLOW OF GROUNDWATER AND THE MOVEMENT OF CONTAMINANTS FROM THE SITE.

8. THIS GROUP OF COMMENTS HAS BEEN ADDRESSED; HOWEVER, THE ENTIRE SECTION ON GROUNDWATER IS POORLY REWRITTEN. THERE ARE WHOLE SECTIONS THAT HAVE BEEN DUPLICATED, SOME SENTENCES ARE POORLY WRITTEN, AND THE THOUGHTS BETWEEN PARAGRAPHS ARE POORLY CONNECTED.

A. THIS COMMENT WAS ADDRESSED BUT THE REVISION IS STILL INADEQUATE. WHAT TYPE OF DIVIDE IS IRONS MOUNTAIN AND WHAT IS ITS IMPORTANCE IN SEPARATING THE CUMBERLAND AND WARRIOR MOUNTAIN WATER PROVINCES? ISN'T THIS MERELY A SURFACE WATER DIVIDE?

B-F. THESE COMMENTS HAVE BEEN ADDRESSED.

G. THIS COMMENT HAS NOT BEEN ADDRESSED. ALTHOUGH THE REPORT IS TECHNICALLY CORRECT IN USING THE TERMS "PHREATIC" AND "VADOSE", THESE TERMS ARE NOT AT ALL DESCRIPTIVE OF THE SITE AQUIFER CONDITIONS.

9. THIS COMMENT HAS NOT BEEN ADDRESSED. THE RI STILL RAISES THE ISSUE THAT THE CUMBERLAND CITY DUMP CONTAINS "HOUSE-HOLD HAZARDOUS WASTE", BUT NO WHERE IN THE REPORT IS THIS VERIFIED.

10. THIS COMMENT HAS NOT BEEN ADDRESSED.

11. THIS COMMENT HAS NOT BEEN ADDRESSED. THE GOALS OF THE RI FROM THE BEGINNING WERE TO "...CHARACTERIZE THE AQUIFER CONDITIONS AND DETERMINE GROUNDWATER FLOW DIRECTIONS...", YET THE RI STATES THAT THE AQUIFER CONDITIONS ACROSS THE SITE ARE VARIABLE AND THERE IS NO CONSENSUS OF HOW OR WHERE GROUNDWATER FLOWS FROM UNDERNEATH THE SITE.

12. THIS ENTIRE GROUP OF COMMENTS HAS NOT BEEN ADDRESSED.

A. IT IS IMPERATIVE THAT BASIC DATA SUCH AS THE STRIKE AND DIP OF THE MAJOR GEOLOGIC STRUCTURES (BEDDING, FRACTURES, AND ANTICLINES) BE INCLUDED IN THE TEXT OF THE RI SO THAT FUTURE WORKERS OR READERS UNFAMILIAR WITH THE AREA CAN EVALUATE THE DATA.

B-E. THIS GROUP OF COMMENTS RELATE SPECIFICALLY TO THE RI'S "ALLEGED" FRACTURES. THE RI LACKS ANY MORPHOLOGICAL, GEOMETRICAL, OR DYNAMIC DESCRIPTION ABOUT THE VARIOUS OBSERVED FRACTURES IN THE AREA. THIS TYPE OF INFORMATION IS BASIC TO THE ANALYSIS AND UNDERSTANDING OF FRACTURES.

F. THIS COMMENT HAS BEEN ADDRESSED ADEQUATELY. IN FACT, THE RI NOW CONTAINS A DISCUSSION ON THE FRACTURED NATURE OF THE BEDROCK AND GROUNDWATER FLOW. HOWEVER, AS STATED BEFORE IN A LETTER, THE POTENTIOMETRIC LINES (OR MAPS) ONLY INDICATE POTENTIAL DIRECTION OF GROUNDWATER FLOW (SEE ALSO COMMENT 15).

G. WHERE ARE ALL THE BORING AND MONITORING WELL LOGS? THE RI ONLY HAS LOGS FOR MONITORING WELLS 3, 5, 9, A1, B1, C1, D1, EB1, EB2, EB3.

13. THIS COMMENT HAS NOT BEEN ADDRESSED. BY LABELING THESE FIGURES AS BEING NORMAL TO STRIKE, A PERSON UNFAMILIAR TO THE AREA WILL BE ABLE TO UNDERSTAND THE SITE GEOLOGY BETTER.

14. THIS COMMENT HAS BEEN ADDRESSED. THE GROUNDWATER CONTOUR MAP (POTENTIOMETRIC MAP) HAS BEEN REDRAWN AND NOW PORTRAYS THE POSSIBLE SITE CONDITIONS MORE REALISTICALLY.

15. THIS COMMENT HAS BEEN ADDRESSED. NOW, THE RI PRESENTS AND CONSIDERS THE POSSIBILITY THAT GROUNDWATER FLOW MAY BE CONTROLLED BY THE FRACTURED BEDROCK. HOWEVER, THERE ARE STILL SOME CONCERNS WITH SOME OF THE RI'S STATEMENTS AND CONCLUSIONS.

A. PP. 4-4 THROUGH 4-6. THE DISCUSSION ON THE GROUNDWATER GRADIENT, BOTH IN THE TEXT AND IN APPENDIX C, IS A SIMPLISTIC VIEW OF GROUNDWATER FLOW THAT IS CONTRADICTED BY DATA IN TABLE C-1. THE TEXT STATES THAT WELLS LOCATED IN "UPLAND AREAS" GENERALLY HAVE SLIGHT DOWNWARD GRADIENTS. HOWEVER, THE DATA IN TABLE C-1 SHOWS THAT MW 5/6 AND MW 9/10 HAVE STRONG DOWNWARD GRADIENTS, MW 1/2 HAVE A SLIGHT UPWARD GRADIENT AND ONLY MW 3/4 HAVE A SLIGHT DOWNWARD GRADIENT. IN ADDITION, THE TEXT STATES THAT WELLS LOCATED IN VALLEYS GENERALLY HAVE A STRONG UPWARD GRADIENT. HOWEVER, THE DATA IN TABLE C-1 SHOWS THAT OF THE FOUR WELL CLUSTERS IN VALLEYS, ONE HAS A SLIGHT UPWARD GRADIENT (MW 11/12), ONE HAS A MODERATE UPWARD GRADIENT (MW 7/8), ONE HAS A STRONG UPWARD GRADIENT (MW B1/B3), AND ONE HAS A STRONG DOWNWARD GRADIENT (MD D1/D2).

B. P. 4-5. A POTENTIOMETRIC MAP DOES NOT INDICATE "... THE PRINCIPAL DIRECTION OF GROUNDWATER FLOW...", IT ONLY INDICATES THE POTENTIAL FOR GROUNDWATER FLOW. HOWEVER, WHEN OTHER COMPLICATING FACTORS SUCH AS FRACTURES, VARIABLE VERTICAL AND HORIZONTAL GRADIENTS (AN UNEVEN AQUIFER SURFACE) AND THE PRESENCE OF DIFFERENT LITHOLOGIES, POTENTIOMETRIC MAPS ARE NOT USEFUL IN DETERMINING GROUNDWATER FLOW DIRECTIONS. THIS SAME CONCEPT MUST BE CHANGED IN APPENDIX C, PP. C-3, C-4 AND C-5.

C. P. 4-8. THE TEXT STATES THAT IT IS "...PROBABLE THAT SUFFICIENT VERTICAL FRACTURES EXIST (PERPENDICULAR TO STRIKE) TO ALLOW FLOW ALONG THE SAME DIRECTION AS THE GRADIENT.". HOWEVER, FROM THE BORING LOGS SUPPLIED IN THE APPENDIX (APPENDIX TM 7-1) THE FRACTURES PARALLEL TO

BEDDING ARE THE ONLY ONES DESCRIBED. WHERE ARE THESE OTHER FRACTURES AND WHAT ARE THEY RELATED TO?

D. P. C-3. THERE IS NO EVIDENCE THAT THE PRINCIPAL COMPONENT OF GROUNDWATER FLOW IS CROSS-STRIKE (I.E., NORMAL TO THE BEDDING AND THE BEDDING PLANE FRACTURES), NOR IS THIS FACT OBVIOUS FROM ANY FIGURE IN THE RI. AGAIN, THE POTENTIOMETRIC MAP CAN ONLY BE USED TO INDICATE THE POTENTIAL DIRECTION OF GROUNDWATER FLOW. THE ARGUMENT USED TO SUBSTANTIATE CROSS-STRIKE FLOW VS. PARALLEL-STRIKE FLOW IS USEFUL, BUT EXACTLY WRONG IN LOGIC. CONSIDER THIS: MWA1, MW3, AND MW11 ARE ALL PARALLEL TO STRIKE AND TO EACH OTHER, AND THEY ARE ALL SCREENED AT APPROXIMATELY THE SAME TOPOGRAPHIC ELEVATION. THUS, THEY ARE QUITE LIKELY TO BE IN THE SAME, OR SIMILAR STRATAGRAPHIC UNIT AND UNDER THE SAME CONDITIONS. MWA1 AND MW3 ARE BOTH ON A HIGH PLATEAU, AND THEY BOTH HAVE SIMILAR GROUNDWATER HEAD ELEVATION. MW11 IS DOWNGRADIENT AND IN A VALLEY. IT ALSO HAS A LOWER GROUNDWATER HEAD ELEVATION THAN MWA1 AND MW3. THUS, THERE IS EVIDENCE OF A GRADIENT PARALLEL TO STRIKE, AND MORE IMPORTANTLY, THERE IS NO EVIDENCE OF SIMILAR HEAD LEVELS AT SIMILAR TOPOGRAPHIC ELEVATIONS PARALLEL TO STRIKE. THE SAME CANNOT BE SAID FOR CROSS-STRIKE FLOW.

A SIMILAR RELATIONSHIP IS SEEN BETWEEN MWC3, MW9 AND MW8. THESE WELLS ARE ALL SCREENED AT SIMILAR DEPTHS, AND ARE PARALLEL TO EACH OTHER AND TO STRIKE. THE UPGRADIENT WELL (MW9) HAS THE HIGHEST HEAD ELEVATION, WHILE THE TWO DOWNGRADIENT WELLS IN EITHER DIRECTION PARALLEL TO STRIKE, HAVE LOWER ELEVATIONS THAT AGREE WITH ONE ANOTHER.

E. P. C-13. FRACTURED MEDIA CAN ONLY BE ASSUMED TO BEHAVE AS A POROUS MEDIA IN A DIRECTION THAT IS PARALLEL TO THE FRACTURES.

F. PP. C-13 AND C-14. THERE IS A LARGE DISCUSSION ABOUT FRACTURE POROSITY AND HOW IT DOES NOT ADD CONSIDERABLY TO THE GROUNDWATER FLOW. HOWEVER, THE AMOUNT OF POROSITY THAT THE FRACTURES CONTRIBUTE IS NOT OF CONCERN, IT IS THE DEGREE OF INTERCONNECTIVITY OF THE FRACTURES THAT MAKES THEM SIGNIFICANT TO GROUNDWATER FLOW. THE SHALES ALREADY HAVE A GOOD POROSITY. THE IMPORTANCE OF A WELL-DEVELOPED SET OF FRACTURES IS THAT THEY INCREASE THE PERMEABILITY OF THE ROCK.

G. P. C-16. GROUNDWATER FLOW THROUGH A SERIES OF INTERCONNECTED JOINTS HAS NOT BEEN PROVEN BY THIS RI. IT HAS BEEN ASSUMED, AND THERE IS NO INDICATION AS TO WHICH FRACTURES ARE IMPORTANT, OR HOW GROUNDWATER MOVES IN THOSE FRACTURES.

FROM ALL OF THE ABOVE, IT IS APPARENT THAT THE GROUNDWATER FLOW IS VERY COMPLEX, AND THAT THE NATURE OF THE FRACTURE FLOW AND THE DISTRIBUTION OF THE LITHOLOGIES BENEATH THE SITE ARE AT THE CORE OF THE PROBLEM.

16. THIS ENTIRE GROUP OF COMMENTS HAS NOT BEEN ADDRESSED. STATEMENTS ABOUT WHAT THE ROCK CAN AND CANNOT CONTRIBUTE TO THE GROUNDWATER ARE HINDERED BY THIS MISSING DATA. ACCORDING TO WMA REFERENCES, THE CHEMICAL COMPOSITION OF ALL 9000 FEET OF THE DEVONIAN SHALES DOES NOT VARY MUCH. FOR THE RI TO MAKE THIS POINT, ADDITIONAL SUPPORTIVE DATA NEEDS TO BE USED. ALL THE COMMENTS FROM OUR FIRST LETTER STILL NEED TO BE ADDRESSED.

17. THIS COMMENT HAS NOT BEEN ADDRESSED. THE TEMPORAL ASPECT WITH REGARDS TO THE SAMPLING DATA, ESPECIALLY FROM THE MONITORING WELLS, HAS NOT BEEN CONSIDERED. FIRST, MANY OF THE INORGANICS IN THE MONITORING WELLS (TABLES 4-14, 15 AND 16) SEEM TO DECREASE IN CONCENTRATION OVER TIME. SECOND, MANY OF THE ORGANICS APPEAR TO FOLLOW THIS TREND TOO. A REASON FOR THE FORMER MAY BE THAT THE WELL DRILLING ACTIVITY DISTURBED THE ROCK AND IT HAS TAKEN SOME TIME FOR ALL THE ROCK PARTICLES TO FLUSH OUT. A REASON FOR THE LATER MAY BE THAT THE MATERIAL USED TO CONSTRUCT THE WELLS (PVC) CAUSED SOME MINOR CONTAMINATION. BIS (2-ETHYLHEXYL) PHTHALATES IS A COMMON BYPRODUCT OF PVC. SINCE MOST OF THE WELLS ONLY HAVE THIS COMPOUND, AND IT ONLY OCCURS AT LOW LEVELS, ITS PRESENCE MAY

BE DUE TO THE WELL MATERIAL. (MWC1 AND MW9 (CONSISTENTLY) HAVE ELEVATED VALUES FOR B(2-E)P WHICH MUST BE CONSIDERED TO BE FROM A DIFFERENT SOURCE.).

FINALLY, WHY WASN'T SAMPLING CONSISTENT FROM ONE PHASE TO ANOTHER? FOR EXAMPLE, FIGURE 4-20, THE LOCATIONS FOR SURFACE WATER SAMPLING VARIED DURING ALL THE PHASES. ALSO, IN FIGURE 4-18, WHY WEREN'T ALL THE MONITORING WELLS SAMPLED IN PHASE III?

18. THIS COMMENT HAS BEEN CONSIDERED AND CORRECTED.

19. THIS COMMENT HAS NOT BEEN ADDRESSED. THE DATA SHOWS THAT THE ORGANIC CONTAMINATION AT BOTH THE DIGGS AND THE CC&SC PROPERTIES ARE WIDESPREAD. THE COMMENTS THAT WMA MADE IN ITS FIRST LETTER ARE STILL VALID AND NEED TO BE CONSIDERED.

20. THIS COMMENT HAS BEEN ADDRESSED.

21. THIS COMMENT HAS BEEN ADDRESSED.

22. THIS COMMENT HAS BEEN ADDRESSED AND CORRECTED.

23. OVERALL, THE MIGRATION PATHWAYS ARE MORE THOROUGH. HOWEVER, THE DISCUSSION IS NOT SITE SPECIFIC, BUT GENERAL IN NATURE.

24. THIS COMMENT HAS NOT BEEN ADDRESSED.

25. THIS COMMENT HAS NOT BEEN ADDRESSED. AGAIN, THE TEXT REFERS TO THE BACKGROUND LEVELS OF ORGANIC AND INORGANIC CONSTITUENTS, BUT THESE LEVELS ARE NOT CLEARLY ILLUSTRATED IN A TABLE OR FIGURE. A SIMILAR COMMENT HAS BEEN MADE UNDER COMMENT 3.

26. THESE COMMENTS HAVE NOT BEEN ADDRESSED. ONLY INORGANICS HAVE BEEN DETECTED IN GROUNDWATER MONITORING WELLS. NO. 1,1,2-TCA, TCE, OR PCE WERE FOUND IN THE MONITORING WELLS. ALSO, WHY ARE THE SAMPLE ANALYSIS FROM THE FIT SITE INVESTIGATION MENTIONED HERE WHEN THAT DATA IS NOT PROVIDED IN THE RI?

27. THIS COMMENT HAS NOT BEEN ADDRESSED. IN FACT, THIS ENTIRE SECTION, WHICH WAS USEFUL, HAS BEEN DELETED FROM THE TEXT OF THE REPORT.

28. THIS COMMENT HAS NOT BEEN ADDRESSED.

29. THIS COMMENT HAS NOT BEEN ADDRESSED. WHY DOES THE SUMMARY DISCUSS THE RISK RELATED TO CHLOROFORM IN THE GROUNDWATER? CHLOROFORM WAS ONLY FOUND IN A FEW MONITORING WELLS IN PHASE I, AND AT CONCENTRATIONS OF LESS THAN 5 PPB. FURTHERMORE, THE DISCUSSION ON PAGE 4-29 ON THE RI RELATES THE OCCURRENCE OF CHLOROFORM IN THE GROUNDWATER SAMPLES TO POSSIBLE LABORATORY CONTAMINATION.

30. THIS COMMENT HAS NOT BEEN ADDRESSED.

31. THIS COMMENT HAS NOT BEEN ADDRESSED.

32. THIS COMMENT HAS NOT BEEN ADDRESSED.

IN SUMMARY, THE REMEDIAL INVESTIGATION IS NOT A COMPLETE INVESTIGATION OF CONDITIONS AT THE SITE. WE BELIEVE THAT THE RI, WITHIN ITS LIMITATIONS, PROVIDES A SOUND BASIS FOR A LIMITED RESPONSE AT THIS TIME AND FURTHER DEFINITION OF THE EXTENT OF CONTAMINATION. HOWEVER, THE REMEDIAL INVESTIGATION SHOULD NOT BE PRESENTED AS A CONCLUSIVE REVIEW OF THE SITE.

IF YOU HAVE ANY QUESTIONS, PLEASE CONTACT ME AT (301)-225-5700.

SINCERELY,

ARTHUR N. CAPLE

ACTING ADMINISTRATOR
ENFORCEMENT PROGRAM

ANC:AMJ

CC: MR. RONALD NELSON
MR. FRANK HENDERSON
MR. ROBERT CRETER
MR. DAVID HEALY
MR. THEODORE MEYER.

CH2M HILL RESPONSE TO STATE OF MARYLAND COMMENTS TO THE
LIMESTONE ROAD REMEDIAL INVESTIGATION REPORT

GENERAL COMMENTS

1. NO RESPONSE NECESSARY.

2. IT IS OUR OPINION THAT OUR ASSESSMENT WAS AS THOROUGH AS NECESSARY FOR THE PURPOSES OF THIS RI REPORT. REMEDIAL INVESTIGATIONS ARE CONDUCTED TO GATHER SUFFICIENT DATA TO SUPPORT A FEASIBILITY STUDY. IT IS OUR OPINION THAT WE HAVE ACCOMPLISHED THIS GOAL. REMEDIAL INVESTIGATIONS ARE NOT DESIGNED TO BE EXHAUSTIVE RESEARCH PROJECTS EXAMINING EVERY DETAILED ASPECT OF AN NPL SITE.

3. IT IS OUR OPINION THAT THE DISCUSSION OF THE REGIONAL GEOLOGY IS SUFFICIENT FOR THE INTENDED PURPOSE OF THE RI REPORT.

   A THOROUGH DISCUSSION OF THE SPATIAL AND TEMPORAL DISTRIBUTION OF OBSERVED CONTAMINANTS IS PRESENTED IN THE MAIN BODY OF THE RI REPORT.

   FIGURES WERE PREPARED BUT NOT INCLUDED. THEY ARE AVAILABLE UPON REQUEST.

   THE NUMBER OF BACKGROUND SAMPLES COLLECTED FOR ANY GIVEN SITE IS OFTEN PERCEIVED TO BE INSUFFICIENT. THERE IS CONSTANT DEBATE ON HOW MANY SAMPLES ARE NEEDED TO ESTABLISH "BACKGROUND" CONDITIONS.

   THE REMEDIAL INVESTIGATION HAS DETERMINED THAT ENVIRONMENTAL DEGRADATION HAS OCCURRED IN THE SITE AREA FROM UNCONTROLLED DUMPING AND THAT THIS HAS THE POTENTIAL FOR POSING A THREAT TO THE PUBLIC HEALTH AND THE ENVIRONMENT. THE RESULTS OF THE STUDY ARE INCONCLUSIVE AS TO THE SOURCE OF THIS ENVIRONMENTAL DEGRADATION. THREE POSSIBILITIES EXIST: THE FORMER DIGGS PROPERTY, THE CC&SC PROPERTY AND THE OLD CITY DUMP.

4. NO RESPONSE NECESSARY.

5. NO RESPONSE NECESSARY.

6. SEE NO. 3 UNDER SPECIFIC TEXT COMMENTS BELOW.

7. AN ANALYSIS OF TRENDS IN AQUEOUS INORGANIC CONSTITUENTS WAS CONDUCTED. OUR CONCLUSION IS THAT THERE IS NO OBSERVABLE DECREASE OR INCREASE IN THESE CONSTITUENTS OVER TIME. THIS IS STATED ON PAGE 4-20 OF THE RI REPORT.

8. SPECIFIC PORTIONS OF CHAPTERS 5 AND 6 WERE CHANGED TO REFLECT COMMENTS TO THE DRAFT RI REPORT. THESE CHANGES HAVE MADE THE REPORT ACCEPTABLE TO U.S. EPA.

9. NONE OF THE CHANGES MADE TO THE RI REPORT HAVE AFFECTED THE BASIC CONCLUSIONS OF THE REMEDIAL INVESTIGATION. CONSEQUENTLY, THESE CHANGES HAVE NOT HAD AN IMPACT ON THE RECOMMENDATIONS PRESENTED IN THE FEASIBILITY STUDY REPORT.

SPECIFIC TEXT COMMENTS

1. NO RESPONSE NECESSARY.

2. NO RESPONSE NECESSARY.

3. BACKGROUND LEVELS FOR CONSTITUENTS IN THE SOIL, GROUND-WATER,

SURFACE WATER, AND SEDIMENT HAVE BEEN PRESENTED IN TABLES 4-6, 4-9, 4-11, AND 4-12 OF THE RI. A SEPARATE FIGURE, FIGURE 4-10, WAS USED TO CONVEY THE CONSTITUENTS PRESENT IN THE BACKGROUND SOILS. IT WAS NOT CONSIDERED APPROPRIATE TO REPEAT THIS BACKGROUND MATERIAL ON THE FIGURES FOR THE VARIOUS MEDIA. FIGURES 4-15, 4-16, 4-20, AND 4-22 CONTAIN TYPOGRAPHICAL ERRORS INVOLVING THE PLACEMENT OF ASTERISKS UNDER LOCATIONS USED AS BACKGROUND. THESE ASTERISKS SHOULD NOT BE PRESENT.

4. NO RESPONSE NECESSARY.

5. NO RESPONSE NECESSARY.

6. WE DISAGREE.

7. THE CUMBERLAND CITY DUMP IS A LARGE BODY OF WASTE MATERIALS IMMEDIATELY ADJACENT TO THE SITE PARCELS. RELATIVE CONTRIBUTIONS FROM THE SITE PARCELS AND THE CITY DUMP CANNOT BE RESOLVED AT THIS TIME. IT IS OUR OPINION THAT WHILE A GOOD UNDERSTANDING OF THE REGIONAL GEOLOGY IS IMPORTANT, AN EXHAUSTIVE DISCUSSION OF THIS SUBJECT IN THE MAIN BODY OF THE RI REPORT IS UNWARRANTED.

8. IT IS OUR OPINION THAT THE SECTION ON REGIONAL GROUNDWATER IS SUFFICIENTLY DETAILED FOR THE PURPOSES OF THE RI REPORT.

9. THIS STATEMENT (P. 2-11) REFERRING TO "HOUSEHOLD TYPE HAZARDOUS WASTE" STATES THAT THE AMOUNTS IN THE LANDFILL ARE UNKNOWN.

10. THIS COMMENT WAS NOT ADDRESSED PREVIOUSLY, AS COMMENTS FROM THE STATE OF MARYLAND WERE NOT SENT IN A TIMELY MANNER AND COULD NOT BE ADDRESSED PRIOR TO SUBMISSION OF THE AUGUST 8, 1986 RI DOCUMENT.

    THE DOCUMENTS IN THE EPA FILES THAT DESCRIBE THE EVENTS PRIOR TO CLASSIFICATION OF THE SITE AS A SUPERFUND SITE ARE ENTITLED "FIELD" OR "SITE" INVESTIGATIONS. THE TERMINOLOGY "PRELIMINARY ASSESSMENT" WAS INTENDED TO INCLUDE THE INVESTIGATIONS THAT TOOK PLACE PURSUANT TO THE IDENTIFICATION AND ASSESSMENT OF THE SITE AS A HAZARDOUS WASTE SITE.

11. A DETAILED, PRECISE UNDERSTANDING OF ALL POTENTIAL MIGRATION PATHWAYS IN FRACTURED BEDROCK IS BEYOND THE SCOPE OF A TYPICAL REMEDIAL INVESTIGATION. IT IS OUR OPINION THAT THE SYSTEM HAS BEEN DESCRIBED ADEQUATELY GIVEN THE TIME AND BUDGETARY CONSTRAINTS IMPOSED ON THE RI. THE PRINCIPAL CONCLUSION OF THE REMEDIAL INVESTIGATION IS THAT THE GROUNDWATER FLOW SYSTEM IS SUFFICIENTLY COMPLEX TO WARRANT THE EXCLUSION OF CERTAIN REMEDIAL ACTIONS IN FAVOR OF OTHERS.

12. THE STRIKE AND DIP OF THE REGIONAL AND LOCAL STRUCTURE ARE DISCUSSED ON PAGE 4-2. A REGIONAL GEOLOGIC MAP WITH REFERENCES IS PRESENTED IN FIGURE 2-6. LOCAL STRIKE AND DIP MEASUREMENTS COLLECTED IN THE FIELD WERE REGRETABLY NOT INCLUDED. THESE MEASUREMENTS GENERALLY AGREED WITH REGIONAL TRENDS. THESE MEASUREMENTS WILL BE MADE AVAILABLE UPON REQUEST THROUGH EPA.

    THE OCCURRENCE OF FRACTURE SETS IS NOT ALLEGED. THEIR OCCURRENCE IS WELL DOCUMENTED IN THE BORING LOGS CONTAINED IN THE TECHNICAL MEMORANDA IN APPENDIX A OF VOLUME 2 OF THE RI REPORT. HORIZONTAL FRACTURES WERE OBSERVED IN SEVERAL OF THE CORES. THIS IS WELL DOCUMENTED ON THE

ROCK CORE LOGS. IT IS SPECULATED THAT SOME OF THESE MAY BE DUE TO MECHANICAL FRACTURING DURING CORING (P. 4-3). IT IS OUR OPINION THAT IT IS SUFFICIENT TO NOTE THAT THE ATTITUDE AND ORIENTATION OF THE FRACTURE SETS OBSERVED. FURTHER DISCUSSION IS ACADEMIC AND BEYOND THE SCOPE OF THE REMEDIAL INVESTIGATION.

AS NOTED IN TECHNICAL MEMORANDUM NO. 1 (RI REPORT, VOLUME 2, APPENDIX A), BORING EB-01 WAS DRILLED AND LOGGED AT MONITORING WELL NEST LOCATION MW11/MW12. SIMILARLY, BORINGS EB-02 AND EB-03 WERE DRILLED AND LOGGED AT LOCATIONS MW1/MW2 AND MW7/MW8, RESPECTIVELY. THE LOGS FOR THESE BORINGS ARE PRESENTED IN APPENDIX TM-1-A. THEIR LOCATIONS ARE SHOWN IN FIGURE TM-1-2. FOR ALL THE OTHERS, THE DEEPEST BORING AT EACH LOCATION WAS LOGGED.

13. AFTER READING THE RI SECTION ON THE GEOLOGY, EXAMINING FIGURES 2-6 AND 4-5, IT SHOULD BE CLEAR THAT THE SECTIONS WERE DRAWN PERPENDICULAR TO STRIKE.

14. NO RESPONSE NECESSARY.

15. A. GROUNDWATER FLOW IS GOVERNED BY A POTENTIOMETRIC RELATIONSHIP. THIS IS A FACT. GROUNDWATER FLOWS FROM HIGHER TO LOWER POTENTIAL. THE DATA PRESENTED IN TABLE C-1 DO NOT CONTRADICT THE DISCUSSION. ONE CANNOT MAKE ANY STATEMENT ABOUT VERTICAL GRADIENTS AT WELL CLUSTER D1/D2 BECAUSE WELL D1 WAS DETERMINED TO BE DRY. NO WATER LEVEL WAS EVER COLLECTED FROM THIS WELL. THIS IS DOCUMENTED IN TECHNICAL MEMORANDUM NO. 7.

B. IT IS OUR OPINION THAT WE SUFFICIENTLY DISCUSS THE COMPLICATING FACTORS WHICH MAY ARISE TO SKEW THE DIRECTION OF GROUNDWATER FLOW. WE AGREE THAT A POTENTIOMETRIC SURFACE MAP IS AN INDICATION OF THE POSSIBLE DIRECTIONS OF FLOW AND ACKNOWLEDGE THAT THERE MAY BE COMPONENTS OF FLOW IN DIRECTIONS TANGENT TO THOSE INDICATED ON THE POTENTIOMETRIC SURFACE MAPS.

C. VERTICAL FRACTURES WERE NOTED IN BORINGS B-1 AND C-1. EXAMINATION OF AERIAL PHOTOGRAPHS INDICATES THAT THERE MAY BE MAJOR VERTICAL FRACTURES PERPENDICULAR TO STRIKE TRENDING ALONG THE RAVINE BETWEEN THE CITY DUMP AND THE DIGGS PROPERTY. ANOTHER FRACTURE MAY EXIST ALONG THE RAVINE TO THE NORTHWEST OF THE CITY DUMP. THERE ARE INSUFFICIENT DATA TO SAY ANYTHING FURTHER. IT IS BEYOND THE SCOPE OF THE RI TO CHARACTERIZE EVERY ASPECT OF THE SITE GEOLOGY.

D. WE ACKNOWLEDGE THAT OTHER COMPONENTS OF FLOW CAN AND PROBABLY DO EXIST IN THE AREA. THIS IS DISCUSSED ON P. C-4, VOLUME 2, APPENDIX C. THIS DISCUSSION IS NOT INTENDED TO BE AN EXHAUSTIVE DISSERTATION ON THE SUBJECT.

E. WE PRESENT THIS SECTION FOR THE SAKE OF COMPLETENESS. THE NUMBERS CONTAINED THEREIN HAVE NO BEARING ON THE CONCLUSIONS OF THE RI NOR DO THEY AFFECT THE RECOMMENDATIONS IN THE FEASIBILITY STUDY. IN THIS REGARD, THE REVIEWER'S COMMENT, WHILE TECHNICALLY CORRECT, IS ACADEMIC AND NEED NOT BE CONSIDERED FURTHER.

F. THE PURPOSE OF THIS DISCUSSION IS TO INTRODUCE THE CONCEPT OF FRACTURE POROSITY AND MAKE AN ESTIMATE OF ITS VALUE. WE STATE THAT SECONDARY POROSITY IS OFTEN GREATER THAN PRIMARY POROSITY. IT IS OBVIOUS

THAT THE INTERCONNECTEDNESS OF THE FRACTURES WILL HAVE AN EFFECT ON THE HYDRAULIC CONDUCTIVITY.

G. WE REPEATEDLY STATE THAT THE FLOW IS COMPLEX. DETAILED CHARACTERIZATION OF THE SUBSURFACE FLOW SYSTEM IS BEYOND THE SCOPE OF A REMEDIAL INVESTIGATION. WE ACKNOWLEDGE THAT BETTER UNDERSTANDING OF THE SYSTEM COULD BE ACHIEVED. HOWEVER, THE TIME AND BUDGETARY CONSTRAINTS OF THE REMEDIAL INVESTIGATION IS SUCH THAT WE ARE ASSIGNED TO MAKE THAT BEST ENGINEERING DECISIONS POSSIBLE WITH THE LIMITED DATA GENERATED BY THE RI. IT IS OUR OPINION THAT THE DATA GENERATED BY THIS RI WERE SUFFICIENT TO CONDUCT A FEASIBILITY STUDY.

16. IT IS NEVER DEFINITIVELY STATED ANYWHERE IN THE RI REPORT THAT THE SEEMINGLY ANOMALOUS CONCENTRATIONS OF INORGANIC CONSTITUENTS ARE DUE TO NATURALLY OCCURRING PHENOMENA. IT IS MADE CLEAR THAT THE DATA ARE INSUFFICIENT TO MAKE ANY DEFINITIVE STATEMENT ABOUT THE DISTRIBUTION OF THESE CONSTITUENTS. THE HYPOTHESIS IS SPECULATIVE AND IS OFFERED AS A POSSIBLE EXPLANATION ONLY.

17. THIS COMMENT WAS ADDRESSED AS RESPONSE NO. 7 OF THE GENERAL COMMENTS SECTION.

18. NO RESPONSE NECESSARY.

19. A. SEE STATEMENT ON PAGE 4-20 OF THE RI UNDER "ORGANICS.". THE STATEMENT READS "OF THE SOIL LOCATIONS SAMPLED FROM THIS SITE, MANY CONTAINED HSL ORGANIC COMPOUNDS.". FIGURES 4-12 AND 4-11 SHOW THE NUMEROUS ORGANICS DETECTED IN THE SOIL OF BOTH PROPERTIES.

B. ALL THE ORGANICS DETECTED IN THE TEST PITS ON THE DIGGS PROPERTY DO NOT SHOW SIMILAR CONCENTRATIONS OF ORGANICS.

C. THE TEXT ADDRESSES THE ORGANICS FOUND IN BOTH THE SOIL BORINGS AND TEST PITS WHEN CHARACTERIZING THE ORGANICS PRESENT (SEE PAGES 4-20 THROUGH 4-22).

20. NO RESPONSE NECESSARY.

21. NO RESPONSE NECESSARY.

22. NO RESPONSE NECESSARY.

23. IT IS OUR OPINION THAT THE DISCUSSION OF MIGRATION PATHWAYS IS SUFFICIENT FOR THE PURPOSES OF THE RI REPORT.

24. TABLE 5-1 WAS THE LISTING USED TO CONVEY THE REASONS WHY A PARTICULAR CHEMICAL WAS SELECTED AS AN INDICATOR CHEMICAL FOR THE SITE. IT WAS NOT INTENDED TO BE A SUMMARY OF THE DATA.

25. BACKGROUND LOCATIONS AND THE CONCENTRATIONS OF THEIR CONSTITUENTS WERE DISCUSSED IN DETAIL IN CHAPTER 4. IT WAS NOT NECESSARY TO REPEAT THIS INFORMATION IN CHAPTER 5.

26. A. CHAPTER 5 IS OFFERED AS A GENERAL DESCRIPTION OF THE FATE AND TRANSPORT OF THE INDICATOR CHEMICALS AT THE SITE. THE FIGURES AND TABLES OF CHAPTER 5 MAKE IT CLEAR WHICH INDICATOR CHEMICALS WERE FOUND IN THE GROUNDWATER. IN FACT, THE INDICATOR ORGANIC CHEMICALS BIS(2-ETHYLHEXYL)PHTHALATE AND CHRYSENE WERE FOUND IN THE GROUNDWATER.

B. THE FIT REPORT WAS REFERENCED TO PROVIDE AN EXPLANATORY EXAMPLE OF THE POSSIBLE RAPID LOSS OF A VOLATILE CHEMICAL. RESULTS OF THE FIT INVESTIGATIONS WERE JUDGED NOT TO BE OF VERIFIABLY GOOD QUALITY AND, AS SUCH, WERE NOT INCLUDED IN THE RI (SEE PAGE 2-11).

C. THE SCOPE OF WORK OF THE RI DID NOT INCLUDE MEASUREMENT OF THE AMOUNT OF SORBED OR PRECIPITATED CHEMICALS OCCURRING IN THE GROUNDWATER. CURRENT CONTRACT LABORATORY PROGRAM PROTOCOL DOES NOT DISTINGUISH THE VALENCE STATE OF METALS WHICH IS AN INDICATION OF THEIR LIKELY ENVIRONMENTAL FORM.

SAMPLES WERE FILTERED IN THE FIELD TO ELIMINATE THE INTERFERENCE OF SUSPENDED MATERIALS THAT MAY HAVE BEEN GENERATED DURING WELL INSTALLATION. NO MEASUREMENT OF PARTICULATE METALS WAS AVAILABLE.

THE CONDITIONS INHIBITING METAL ION MIGRATION HAVE BEEN ADDRESSED IN CHAPTER 5.

WITH REGARD TO THE QUESTION, "WHY WOULD DISSOLVED METAL IONS MOVE SLOWLY IN GROUNDWATER THAT IS REPORTED TO HAVE HIGH VELOCITIES?", THE CONCEPT THAT "DISSOLVED METAL IONS MOVE SLOWLY" HAS BEEN TAKEN OUT OF THE CONTEXT OF CHAPTER 5, WHERE IT IS EXPLAINED THAT METALS WILL PERSIST IN THE PARTICULATE FRACTION OF GROUNDWATER AND WILL, THEREFORE, BE RELATIVELY IMMOBILE AS COMPARED TO THE DISSOLVED METALS IONS.

27. THE "LIMITATIONS OF THE RI" SECTION WAS MOVED TO PAGE 6-37 OF THE RI. SUBSEQUENT TO THE FIRST REVIEW DRAFT OF THE RI, ADDITIONAL SAMPLES FOR SEDIMENT AND SURFACE WATER WERE REASONED TO BE INACTIVE OF BACKGROUND AND CONSIDERED TO BE AS CLOSE TO A "GOOD SET" OF BACKGROUND DATA AS WAS AVAILABLE.

28. ONCE AGAIN, THE PURPOSE OF THIS TABLE WAS TO PRESENT THE SUBSTANCES DETECTED AT THE SITE. IT WAS NOT INTENDED AS A COMPLETE SUMMARY OF THE RI DATA. THIS WAS PRESENTED IN APPENDIX B AND IN THE CHAPTER 4 TEXT AND TABLES.

29. CHLOROFORM'S OCCURRENCE WAS DESCRIBED ON PAGE 6-21. CHLOROFORM WAS DISCUSSED BECAUSE IT WAS THE ONLY QUANTIFIABLE CARCINOGEN OBSERVED IN THE GROUNDWATER SAMPLES AND AS SUCH DID NOT LEND ITSELF TO TABULATION AS FOR THE OTHER MEDIA. ALL CHEMICALS THAT COULD BE QUANTIFIABLY ASSESSED FOR RISK, WERE. CHLOROFORM WAS MENTIONED AS A POSSIBLE LABORATORY CONTAMINANT ONLY. THIS WAS OFFERED AS A POSSIBLE EXPLANATION FOR ITS SINGULAR OCCURRENCE.

30. SAMPLING TECHNIQUES ARE DESCRIBED IN DETAIL IN THE QUALITY ASSURANCE PROJECT PLANS AND SAMPLING PLANS PREPARED FOR THIS SITE. THESE DOCUMENTS ARE AVAILABLE FROM U.S. EPA. IT IS OUR OPINION THAT THE INFORMATION CONTAINED IN THE TECHNICAL MEMORANDA SUFFICIENTLY DESCRIBE THE PROCEDURES FOLLOWED.

31. WE DO NOT BELIEVE THAT SUCH A DISCUSSION IS NECESSARY. IT IS SUFFICIENT TO NOTE WHICH SAMPLES WERE FIELD FILTERED. VALUES OF TURBIDITY WERE NOT FIELD OR LAB DETERMINED. VISUAL OBSERVATIONS WERE MADE IN THE FIELD BUT WERE NOT INCLUDED IN THE TECHNICAL MEMORANDA.

32. CONSTRUCTION DETAILS OF ALL MONITORING WELLS ARE PRESENTED IN EITHER FIGURE TM-1-3 OR FIGURE TM-7-3, V.2 APPENDIX A

OF THE RI REPORT. WATER LEVELS ARE SUMMARIZED IN TABLE C-1. THIS IS A QUESTION OF FORMAT. IT IS ACKNOWLEDGED THAT NO MENTION WAS MADE OF WELL RECHARGE RATES. THIS INFORMATION IS AVAILABLE UPON REQUEST FROM U.S. EPA.

SUMMARY

THE RI IS AS THOROUGH AS TIME AND MONEY ALLOW. IT IS CONSIDERED TO BE SUFFICIENT FOR THE PURPOSE FOR WHICH IT IS INTENDED, MAINLY TO DETERMINE THE NEED FOR AND TO SUPPORT THE FEASIBILITY STUDY. IT IS NOT DESIGNED NOR WAS IT EVER INTENDED TO BE AN EXHAUSTIVE STUDY INTO EVERY ASPECT OF THE SITE.

LIMESTONE ROAD

Site Information:

Site Name: LIMESTONE ROAD
Address: CUMBERLAND, MD

EPA ID: MDD980691588
EPA Region: 03

Site Alias Name(s):

CUMBERLAND CEMENT & SUPPLY
DIGGS SANITATION
LIMESTONE ROAD SITE

Record of Decision (ROD):

ROD Date: 06/28/1996
Operable Unit: 02
ROD ID: EPA/ROD/R03-96/226

Media: groundwater, surface water, sediment

Contaminant: Cadmium, chromium, lead, manganese, nickel, arsenic, copper, zinc

Abstract: Please note that the text in this document summarizes the Record of Decision for the purposes of facilitating searching and retrieving key text on the ROD. It is not the officially approved abstract drafted by the EPA Regional offices. Once EPA Headquarters receives the official abstract, this text will be replaced.

The Limestone Road site is located 2 « miles southeast of Cumberland, Maryland. The site includes contamination found on two separate parcels of land: the Diggs Sanitation Company (Diggs) property on the north side of Limestone Road, and the Cumberland Cement and Supply Company (CC&SC) property on the south side of Limestone Road. The Diggs property is bordered on the southwest by several residences and to the northeast by the former Cumberland City Dump (City Dump) and undeveloped land. The CC&SC property is partially bordered on the north by the City Dump and Limestone Road, and undeveloped land on the remaining perimeter of the property. Currently, 18 residences are within « of the site, five are within 100 yards of the site, and one is located on the Diggs property. These residences are serviced by individual water supply

wells.

In the 1960s, a trash collection and burning operation was reported opening on the Diggs property. In the early 1970s, Diggs Sanitation, Inc., a licensed waste hauler, bought the property and then conducted refuse operations, primarily the landfilling of commercial limestone quarrying. The land was then purchased by an individual for the purpose of developing the quarry to the north and east of the site. The quarry was never developed and instead, ravine areas on the site were filled during the mid 1970s in to make a level working area. The fill reportedly consisted of a wide variety of clean construction and demolition debris as well as household trash and commercial and industrial refuse. Activities such as vehicle repair and oil recovery have also reportedly been conducted on the CC&SC property.

In April 1981, waste sludge contaminated with chromium, lead, and cadmium was illegally dumped. It was estimated that 99 tons of that sludge was disposed of on the CC&SC property and 11 tons on the Diggs property. In 1984, a 20,000-gallon tank located in the area of the reported oil recovery operation and the soil surrounding the tank were successfully removed under the supervision of the Maryland Waste Management Administration and the Allegany County Health Department.

Early studies in findings conducted in the area indicated that some local residential wells contained elevated levels of metals, including lead, manganese, copper, and nickel. Potable water was provided to residents with elevated levels of contaminants in their wells.

Data from analysis of groundwater, surface water, and sediments in reports were thoroughly examined to evaluate the chemicals present and their distribution and concentrations at the site. Based on current land use, the site itself is expected to remain undeveloped. For residents living at or near the site, the primary pathway for exposure to site-related contaminants is through use of groundwater. Exposure could occur by consumption of groundwater, contact from household use, and inhalation of volatiles while bathing/showering.

Remedy: The selected remedy consists of the following components: installation of a waterline and ancillary equipment to service residents in the vicinity of the site with the waterline of sufficient capacity to meet the needs of both current and reasonably expected future development of the area; implementation of deed restrictions on the previously capped areas of the site to prevent use of such areas in such a manner as would cause disturbance of the caps; implementation of a groundwater management program to prevent installation of drinking water wells in the vicinity of the site; continuation of the long term groundwater, surface water, and sediment monitoring plans currently being implemented pursuant to OU1; and abandonment of existing residential water supply wells.

Text: Full-text ROD document follows on next page.

EPA/ROD/R03-96/226
1996

EPA Superfund
Record of Decision:

LIMESTONE ROAD
EPA ID: MDD980691588
OU 02
CUMBERLAND, MD
06/28/1996

Text:

Limestone Road Superfund Site
Cumberland, Maryland

Record of Decision
Operable Unit 2

Prepared by
The U.S. Environmental Protection Agency

Table of Contents

Record of Decision
Limestone Road Superfund Site

Part 1 - Declaration

1.0 Site Name, and Location

Limestone Road Superfund Site
Operable Unit 2
Cumberland, Maryland

2.0 Statement of Basis and Purpose

This Record of Decision ("ROD") presents the final remedial action selected for Operable Unit 2 ("OU2") of the Limestone Road Superfund Site ("Site"), located in Cumberland, Allegany County, Maryland. This remedial action was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended ("CERCLA"), 42 U.S.C. §§ 9601 et seq., and the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP"), 40 C.F.R. Part 300. This decision document explains the factual and legal basis for selecting the remedial action and is based on the Administrative Record for this Site. An index of documents included in the Administrative Record may be found at Appendix A of the ROD.

The Maryland Department of the Environment (MDE) was sent a draft of the ROD on June 5, 1996, and by letter of June 12, 1996, indicated that it had no comments on the ROD. A revised draft of the ROD was sent to MDE on June 20, 1996, along with a request for concurrence on the ROD. The State has verbally indicated a willingness to concur, but wishes to see the final version before doing so in writing.

3.0 Assessment of the Site

Pursuant to duly delegated authority, I hereby determine, pursuant to Section 106 of CERCLA, 42 U.S.C. § 9606, that actual or threatened releases of hazardous substances from this Site, as discussed in Section 6.0 (Summary of Site Risks) of Part 2 of this ROD, if not addressed by implementing the remedial action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

4.0 Description of the Selected Remedy

The selected remedy for the Site consists of the following major components:

< Installation of a waterline and ancillary equipment (a pumping station and fire hydrants) to service residents in the vicinity of the Site. The waterline will be of sufficient capacity to meet the needs of both current and reasonably expected future development of the area; and

< Implementation of deed restrictions on the previously capped areas of the Site to prevent use of such areas in such a manner as would cause disturbance of the caps;

< Implementation of a ground water management program to prevent installation of drinking water wells in the vicinity of the Site;

< Continuation of the long term ground water, surface water, and sediment monitoring plans currently being implemented pursuant to OU1;

< Abandonment of existing residential water supply wells.

5.0 Statutory Determination

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. The remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable for this Site. While EPA considered an alternative that employed treatment as a principal element in order to reduce toxicity, mobility, or volume, this

alternative was not considered praticable and was not selected. A five year review for OU2 will be included in the Site-wide five year review that has already been triggered by the start of construction of the OU1 remedy.

<IMG SRC 0396226>
Thomas C. Voltaggio Date
Director
Hazardous Waste Management Division
Region 3
Environmental Protection Agency

Record of Decision
Limestone Road Superfund Site

Part 2 - Decision Summary

1.0 Site Name, Location and Description

The Limestone Road Superfund Site is located in Allegany County, Maryland, 2 1/2 miles southeast of the city of Cumberland (see Figure 1). The Site includes contamination found on two separate parcels of land: the Diggs Sanitation Company (Diggs) property on the north side of Limestone Road (approximately 20 acres), and the Cumberland Cement and Supply Company (CC&SC) property on the south side of Limestone Road (approximately 190 acres). The Diggs property is bordered on the southwest by several residences and to the northeast by the former Cumberland City Dump (City Dump) and undeveloped land. The CC&SC property is partially bordered on the north by the City Dump and Limestone Road, and undeveloped land on the remaining perimeter of the property. Currently, 18 residences are within a half mile of the Site, five are within 100 yards of the Site and one is located on the Diggs property. These residences are serviced by individual water supply wells.

2.0 Site History and Enforcement Activities

Paul and George Boch reportedly operated a trash collection and burning operation on the Diggs property during the 1960's. In the early 1970's Diggs Sanitation, Inc. (Diggs), a licensed waste hauler, bought the property and then conducted refuse operations, primarily the landfilling of commercial, residential and demolition waste, until the early 1980's.

The Cumberland Cement and Supply Company (CC&SC) property, which had been the site of a commercial limestone quarrying operation was purchased by Charles Steiner in 1962 for the purpose of developing the quarry to the north and

east of the Site. The quarry, however, was never developed. Instead, ravine areas on the Site were filled during the mid-1970's in order to make a level working area. The fill reportedly consisted of a wide variety of clean construction and demolition debris as well as household trash and commercial and industrial refuse. Activities such as vehicle repair and oil recovery have also reportedly been conducted on the CC&SC property.

In April of 1981, Diggs illegally dumped contaminated waste sludge containing chromium, lead, and cadmium from Fairchild Republic Company (now Fairchild Holding Corp., the successor to Fairchild Industries, Inc., which in turn, is the successor to Fairchild Republic Company) of Hagerstown, Maryland. It was estimated that 99 tons of that sludge was disposed of on the CC&SC property and 11 tons on the Diggs property. In June 1981, following an initial investigation by the Maryland Department of Health and Mental Hygiene, Diggs Sanitation, Inc. and CC&SC were ordered by the State to clean up their respective properties. The order was challenged by Diggs and CC&SC and reversed; subsequently, new orders were issued to both parties. This action was stayed when EPA became the lead agency for the site. In 1984, a 20,000 gallon tank located in the area of the reported oil recovery operation and the soil surrounding the tank were successfully removed under the supervision of the Maryland Waste Management Administration and the Allegany County Health Department.

In March 1982, EPA conducted a preliminary assessment of the Site which resulted in the proposal for placement of the Site on the Superfund National Priorities List (NPL). In September of 1983, EPA included the Site on the NPL.

In 1986, EPA concluded a Remedial Investigation (RI) and Feasibility Study (FS) for Operable Unit 1 (OU1) at the Site. Based on the findings of these reports, EPA issued an OU1 ROD on September 30, 1986 to address the immediate threats posed by the exposed waste at the Site. The ROD required capping of contaminated soil on both properties and fencing the capped areas. The OUI ROD also required a Supplemental Remedial Investigation (SRI) and Feasibility Study (SFS) to evaluate the local ground water system and adjacent streams. In February of 1990, EPA and

two potentially responsible parties entered into a Partial Consent Decree to conduct the work described in the OU1 ROD. Construction of the fences and low permeability caps for areas on both the Diggs and CC&SC properties began in June 1994 and was completed in November 1994. The supplemental studies were completed in the fall of 1995.

Early findings of the SRI indicated that some local residential wells contained elevated levels of metals, including lead, manganese, copper, and nickel. To address this immediate threat to human health, several Potentially Responsible Parties (PRPs) entered into an Administrative Order on Consent (AOC) in April of 1994 to conduct regular monitoring of residential wells and to provide potable water to residents with elevated levels of contaminants in their wells. At this time, several residents are still receiving bottled water due to elevated levels of contaminants in their wells.

3.0 Scope and Role of Response Action

As with many Superfund sites, the problems at the Limestone Road Site are complex. Thus, the Site has been divided into "Operable Units" (OUs) to simplify the process of addressing these problems. The first OU, OU1, focused on the contaminant source areas. These areas were capped and fenced, as required by the OU1 ROD, in 1994. Operable Unit 2 (OU2) addresses the ground water, surface water, and sediment in the vicinity of the Site based on the SRI and SFS, which studied the contamination in these areas and evaluated alternatives to address it. This ROD addresses OU2 and is the final planned action at the Site.

4.0 Highlights of Community Participation

Pursuant to Section 113(k)(2)(B) of CERCLA, 42 U.S.C. §113(k)(2)(B), the SRI and SFS reports, the Proposed Plan, and other documents relating to OU2 were released to the public for comment on April 15, 1996. These documents were made available to the public in the Administrative Record located in tile EPA Docket Room in EPA's Region 3 office, and in the Allegany County Library located in Cummberland, Maryland. The notice of availability of these documents was published in the Cumberland Times-News on April 15 and April 24 1996.

A public comment period on the documents was held from April 15 until May 14, 1996. EPA held a public meeting in Cumberland on April 24, 1996 during which representatives from both EPA and the State of Maryland answered questions regarding the Site and the Proposed Plan. Responses to the comments received during the public comment period are included in the Responsiveness Summary of this ROD.

5.0 Summary of Site Characteristics

5.1 Site Geology

The Site is located in the Valley and Ridge physiographic province of the Appalachian Highlands. The area is dominated by steeply dipping slopes and ravines and northeast/southwest trending ridges. Relief in the vicinity of the Site is approximately 1,100 feet, ranging in elevation from 590 feet above sea level at the North Branch of the Potomac River to 1,700 feet above sea level at the crest of Irons Mountain. The Site itself is located on the western slope of Irons Mountain. The elevations across the Site range from 660 feet above sea level to approximately 900 feet above sea level. The original topography of the Site has been altered by the landfilling and subsequent capping of the Diggs and CC&SC properties.

During the course of the SRI, the extent of the fill materials requiring capping on both properties was defined. In addition, the geologic and hydrogeologic units were studied. The fill unit consists of a highly variable mixture of brick, glass, concrete, wood, paper, slag, plastic and fly ash in a silt, sand, gravel and clay matrix. The thickness of the fill unit ranged from 0 to 26.4 feet on the CC&SC property and from 0 to 17 feet at the Diggs property. The hydraulic conductivity of the fill materials was measured and found to be approximately 1x10-7 cm/sec, much lower than might be expected for fill material.

A 10-foot thick residuum/saprolite unit separates the fill unit from the underlying bedrock. The very low vertical hydraulic conductivity of this unit (less than 1 x 10'8 cm/sec) combined with its thickness, suggests that the unit acts as an barrier that limits the movement of fill unit water into the unsaturated portion of the bedrock. The bedrock unit beneath the Site consists of steeply dipping, fractured shales and siltstones. The major structure within the bedrock which impact ground water flow are horizontal or nearly horizontal fractures, bedding plane fractures, and vertical joints oriented in the direction of the dip of the bedding planes. Short- and long-term pumping tests have shown that the fractures are interconnected; however, the degree of interconnectedness varies across the Site. The general direction of ground water flow in the bedrock unit is in a west-northwest direction, with ground water discharge occurring in Evitts Creek.

5.2 Ground water

Monitoring wells were installed into the fill units on both the Diggs and CC&SC properties. Four volatile organic compounds (VOCs), acetone, benzene, ethylbenzene, and trichloroethene, were detected at low concentrations (less than 15 parts per billion (ppb)) on the Diggs property; none were detected on the CC&SC property. With the exception of nickel, total metals concentrations were generally higher on the Diggs property. The maximum concentrations reported on either property are 1.6 ppb for cadmium, 18.6 ppb for chromium, 20.2 ppb for lead (which exceeds the health advisory level for this metal), 227 ppb for manganese, and 90.8 ppb for nickel.

Twenty-eight bedrock wells were installed and sampled during the SRI. No VOCs were detected in the background monitoring wells or the background residential well. Trichloroethene was detected in three bedrock monitoring wells at

concentrations ranging from 0.5 ppb to 1.2 ppb, levels which do not pose a threat to human health. Other VOCs detected in either bedrock wells or residential wells were acetone, chloromethane, 2-butanone, chloroform, ethylbenzene, tetrachloroethane,

toluene, and xylene. All were at concentrations below the appropriate Safe Drinking Water Act Maximum Contaminant Level (MCL) or health advisory level.

Metals were found in background, onsite, and residential wells. The maximum concentrations of total metals found in background wells were 2.4 ppb cadmium, 57.2 ppb chromium, 443 ppb lead, 1700 ppb manganese, and 121 ppb nickel. The levels of lead, manganese and nickel are all above MCLs or health advisory levels. Concentrations of total metals exceeded background levels in numerous bedrock monitoring wells; cadmium in three wells, manganese in seven wells, and nickel in five wells. Total cadmium was found in one residential well at 137 ppb, total chromium was found in 11 residential wells at levels ranging from 5 to 9.6 ppb, total lead was found in 13 residential wells at levels ranging from 1.7 to 34.3 ppb, total manganese was found in 20 residential wells at levels ranging from 6.7 to 2,510 ppb, and total nickel was found in 8 residential wells at levels ranging from 12.3 to 100 ppb.

Concentrations of dissolved metals appear in ground water samples in the same relative concentrations as they were detected in the bedrock core samples (manganese is the highest, cadmium the lowest). There is no apparent spatial pattern in the concentrations of the inorganics as a group; each constituent appears in its highest concentration in a different monitoring well. Maximum concentrations of dissolved cadmium, lead, and manganese found in the background wells were 5.3, 1.5, and 525 ppb respectively. Cadmium was not detected above background levels in any bedrock monitoring well or residential well. Chromium was detected above background in four wells, lead in four wells, manganese in 18 wells, and nickel in 13 wells. The maximum concentrations of both total and dissolved metals and the appropriate action levels are shown in Table 1.

The ground water analyses conducted during the SRI have confirmed that trichloroethylene (TCE) and methylene chloride are not contaminants of concern (COCs) at the Site. TCE was detected in only eight of the 52 wells sampled, all at levels below the MCL. Methylene chloride was detected in two residential wells; however, in both cases, it was also detected in blank samples as well, which indicates the chemical was present as a result of the analytical procedure, not actual onsite

contamination.

The only inorganics which exceeded MCLs in onsite monitoring wells were cadmium and nickel. The MCL for nickel (in the dissolved samples) was exceeded in four wells. Exceedance of the MCL for cadmium occurred only in a background monitoring well. Although an MCL has not been established for manganese, the high concentrations of this inorganic pose a potential human health risk. Concentrations of manganese appear to be higher in the immediate vicinity of the two landfilled areas. The presence of organic chemical compounds onsite could cause elevated levels of manganese in the ground water. The distribution of dissolved manganese in ground water shows no obvious pattern, most likely because of the fractured bedrock medium. While a traditional plume-like distribution is expected in a fractured medium, the actual distribution is dependent upon the fracture network and the degree to which the rock behaves as a porous medium. Sources of contamination other than the Site may be contributing to the elevated levels of manganese in some residential wells since numerous wells with much lower concentrations are located between the Site and those wells. However, no other specific sources have been identified.

Evaluation of temporal trends shows that the concentrations of all indicators, with the exception of manganese, are generally decreasing or remaining stable. The concentrations of manganese in all wells, inducting background wells, have shown an increase over time.

5.3 Surface Water and Sediment

The Site is in the drainage basin of the North Branch of the Potomac River (North Branch). Surface water drains from the Site to unnamed tributary streams that flow to the North Branch and Evitts Creek. A spring discharging from the base of the CC&SC property drains to a tributary that flows south/southwest to the North Branch. A spring also discharges from the base of the City Dump and drains to a stream which receives runoff from the City Dump and the Diggs Property and flows into the unnamed tributary above the confluence of Evitts Creek with the North Branch. The capping of the contaminated areas of the Diggs and CC&SC properties has eliminated the contaminated surface runoff; however, the streams still receive groundwater discharge from the bedrock aquifers beneath the Site. In addition, the stream that receives runoff from the Diggs property still receives runoff from the City Dump. While some of the waste on that site has been capped, it is currently being used for salvage operations by the property owner.

Sediment in the two streams which receive surface runoff from the Site have been impacted by Site activities. The sediment in the stream on the CC&SC property exhibits a slightly elevated concentration of chromium at a sampling location near the edge of the Site cap. At the Diggs property, all sampling locations may have been affected by Site conditions. It is difficult, if not impossible, to determine to what degree the contaminants originate from the Diggs and City Dump properties, respectively. Site-related metals found in the stream include chromium, lead, and manganese, all contaminants of concern. These metals have also been found on the City Dump property, which has only been partially capped and which is still used as a salvage yard. Ground water at the City Dump has not been studied and may or may not be contaminated. If it is contaminated, discharge of this water to the creek would be an additional source of contamination to the stream.

In order to assess the impact of the Site on surface water the data from the analyses of the total and dissolved constituents must be reviewed in conjunction with the sediment data. Near the CC&SC property manganese was detected above background in the dissolved analyses at all locations. Manganese was not present above background in the sediment analyses at these locations, however. This suggests that the source of manganese in surface water is ground water rather than surface runoff. (Were the source surface runoff, sediment levels would likely be above background levels as well.) Cadmium and chromium, on he other hand, were reported on total concentrations but were not detected in any dissolved analyses, indicating that surface runoff was the source. Lead and zinc were both reported above background in total and dissolved analyses in the sample taken nearest the Site. However, these samples were collected prior to the capping of this property.

The quality of surface water in the vicinity of the Diggs property is very

similar. Near the Diggs property manganese was present above background in the total and dissolved analyses of surface water and in the stream sediments in all locations. Manganese is also present at elevated concentrations n ground water in this area of the Site. Springs occur at two sampling locations, and the presence of maganese in the surface water samples in this area most likely reflects ground water contribution. Zinc, cadmium, and lead were present above background in total analyses of surface water and in sediment analyses near the Diggs property. Cadmium was also present in dissolved analyses of surface water at one location, and zinc at two locations. Again, these samples were collected prior to the capping of this property. Table 2 shows the maximum and average concentrations of metals found in the surface water and sediment as compared to the Biological and Technical Assistance Group (BTAG) screening levels. (These are threshold levels below which adverse impacts to biota are not expected to occur.)

5.4 Fate and Transport

The construction of the caps has effectively eliminated the potential for migration of Site-related contamination via surface water runoff and by air through either volatilization or by entrainment of chemicals absorbed onto particulate matter. The caps have also eliminated the infiltration of precipitation into the fill units. This will reduce the amount of leachate produced over time. Fill unit water leaking vertically through the residuum saprolite unit and into the bedrock aquifer would mix with the ground water and migrate in the general direction of ground water flow (west-northwest). Local residents are currently relying on ground water as a potable water source.

6.0 Summary Site Risks

The Baseline Risk Assessment (BRA) was prepared as a part of the SRI prior to the start of the OU1 remedial action (i.e., the capping of the landfilled areas) and thus did not consider the impact of these actions on the fate and transport of Site contaminants. Construction of the caps has effectively eliminated the potential for future contamination of the surface water and sediment via runoff; thus, these pathways will not be discussed here.

6.1 Data collection and evaluation

Data from analysis of ground water, surface water and sediments reported in the 1986 RI and the more recent SRI reports were thoroughly examined to evaluate the chemicals present, their distribution and concentrations at the Site. Based upon this review, the data did not demonstrate any dear trends. This is exemplified by the sporadic nature and variability of positive detections for volatiles and inorganics in ground water. Therefore, only the SRI analyses of groundwater, surface water and sediments were used in this BRA as this data is more representative of current site conditions.

Data validation qualifiers were treated according to EPA guidance. Rejected samples ("R" qualifiers) were not included in the database for the risk assessment. Non-detect results ("U" qualifiers) were included only if other results for a given chemical in a particular medium/area indicated the chemical was present. In these instances, half the reported quantitation limit was used. Estimated results, usually indicated by a "J" qualifier, were included in the evaluation. Duplicate samples were averaged and considered as one sample.

Based on Region 3 policy, the exposure point concentrations used in the BRA were calculated based on dissolved inorganics data in monitoring wells and on total inorganics in residential wells.

6.2 Exposure Assessment

There are three basic steps involved in an exposure assessment A: 1) identifying the potentially exposed populations, both current and future; 2) determining the pathways by which these populations could be exposed; and 3) quantifying the exposure.

The current and probable future land uses of the Site are critical in identifying current and future potentially exposed populations. Based upon current land use,

current zoning and planning, local populations, and future land use plans, residential development is the actual or potential land use for property in the vicinity of the Site. The Site itself is expected to remain undeveloped.

The Site is zoned as a general urban district. Property to he southwest below (downhill of) the Site is zoned for residential use. Due to erosion problems, the steeply sloping wooded land above (uphill of) the Site is a restricted conservation area where no further development will be permitted. Property to the west of the Site slopes steeply down to Evitts Creek. This area is less accessible and would be difficult to develop as residential lots and is likely to remain undeveloped.

For residents living at or near the Site, the primary pathway for exposure to Site-related contaminants is through use of ground water. Homes in the vicinity of the Site obtain drinking water from the local groundwater aquifer through private wells. Due to the rural nature of the area, any new residences would be expected to use this ground water as well. Ground water can release and transport contaminants. Infiltration of precipitation through the soil can potentially leach Site-related contaminants to ground water, although at this Site, the caps should greatly reduce the amount of precipitation reaching the fill material. There is a current and future potential exposure to Site-related contaminants in drinking water wells on and downgradient from the Site. Exposure could occur by consumption of groundwater, dermal contact from household use (i.e. dishwashing, washing cars, laundry, bathing/showering) and inhalation of volatiles while bathing/showering.

Another group of individuals who could be potentially exposed to Site-related contaminants are hikers, hunters and others using the area in the immediate vicinity of the Site for recreational purposes. Evitts Creek is classified as a IV-P surface water which is defined as "recreational trout waters and public water supply". This use designation includes a) holding and supporting adult trout for put-and-take fishing; b) special fishery by periodic stocking and seasonal catching; and c) use as a public water supply. The main stem of the North Branch Potomac River is classified as a I-P surface water which is defined as "water contact recreation, protection of aquatic life and public water supply". This use designation includes a) water contact sports; b) play and leisure time activities where individuals may come in direct contact with surface water; c)fishing; d) the growth and propagation of fish; e) agricultural water supply; f) industrial water supply; and g) public water supply.

The unnamed tributaries of Evitts Creek and the North Branch of the Potomac River receive runoff from the Site as well as the City Dump. Since the construction of the Site caps was completed, contaminated surface runoff was eliminated; however, the streams still receive ground water discharging from beneath the Site. Potential exposure to any contaminants found in surface water could occur during recreational activities by hunters and hikers in unnamed tributaries of Evitts Creek and the North Branch of the Potomac River. Because of the location of the stream and the nature of the surrounding terrain, it is highly unlikely that unattended small children would play in the area or that adults would bring small children to the area to play. Exposure routes associated with these pathways include incidental ingestion and dermal contact with surface water by adults and small children hiking or hunting in the area. The physical conditions of the unnamed tributaries of Evitts Creek and the North Branch of Potomac River are such that they will not provide a suitable habitat to support a population of sizable game fish. Therefore, ingestion of fish from these streams is not evaluated.

In order to quantify the potential exposure associated with each exposure pathway discussed above, assumptions were made with respect to the various factors used in the calculations. Table 3 summarizes the values used in the BRA.

6.3 Toxicity Assessment

The purpose of the toxicity assessment is to weigh available evidence regarding the potential for particular contaminants to cause adverse effects in exposed individuals. Where possible, the assessment provides a quantitative estimate of the relationship between the extent of exposure to a contaminant and the increased likelihood and/or severity of adverse effects.

A toxicity assessment for contaminants found at a Superfund site is generally accomplished in two steps: 1) hazard identification; and 2) dose-response

assessment. Hazard identification is the process of determining whether exposure to a contaminant can cause an increase in the incidence of a particular adverse health effect (e.g., cancer or birth defects) and whether the adverse health effect is likely to occur in humans. It involves characterizing the nature and strength of the evidence of causation.

Dose-response evaluation is the process of quantitatively evaluating the toxicity information and characterizing the relationship between the dose of the contaminant administered or received and the incidence of adverse health effects in the administered population. From this quantitative dose-response relationship, toxicity values (e.g., reference doses and slope factors) are derived that can be used to estimate the incidence of or potential for adverse effects as a function of human exposure to the contaminant. These toxicity values are used in the risk characterization step to estimate the likelihood of adverse effects occurring in humans at different exposure levels. For the purpose of the BRA, contaminants were classified into two groups: potential carcinogens and noncarcinogens. The risks posed by these two types of compounds are assessed differently because noncarcinogens generally exhibit a threshold dose below which no adverse effects occur, while no such threshold has been proven to exist for most carcinogens. As used here, the term carcinogen means any chemical for which there is sufficient evidence that exposure may result in continuing uncontrolled cell division (cancer) in humans and/or animals. Conversely, the term noncarcinogen means any chemical for which the carcinogenic evidence is negative or insufficient.

Slope factors have been developed by EPA's Carcinogenic Assessment Group for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic contaminants of concern. Slope factors, which are expressed in units of (mg/kg-day)-1, are multiplied by the estimated intake of a potential carcinogen, in mg/kg-day, to provide an upper-bound estimate of the excess lifetime cancer risk associated with exposure at that intake level. The term "upper-bound" reflects the conservative estimate of the risks calculated from the slope factor. Use of this approach makes underestimation of the actual cancer risk highly unlikely. Slope factors are derived from the results of human epidemiological studies or chronic animal bioassays to which animal-to-human extrapolation and uncertainty factors have been applied (e.g., to account for the use of animal data to predict effects on humans). Slope factors used in the BRA for contaminants found at the Site are presented in Table 4.

Reference doses (RfDs) have been developed by EPA to indicate the potential for adverse health effects from exposure to contaminants of concern exhibiting noncarcinogenic effects. RfDs, which are expressed in units of mg/kg-day, are estimates of lifetime daily exposure levels for humans, including sensitive individuals. Estimated intakes of contaminants of concern from human epidemiological studies or animal studies to which uncertainty factors have been applied account for the use of animal data to predict effects on humans. Reference doses used in the BRA for contaminants of concern are presented in Table 4.

6.4 Human Health Effects

The contaminants of concern for this Site were determined to be arsenic, cadmium, copper, manganese, nickel, and zinc. The following discussion of the human health effects of each of these contaminants is summarized from the BRA.

Arsenic

Arsenic is a naturally occurring element that can be present in a number of different valence states and as a constituent of both inorganic and organic compounds. It occurs most often as a sulfide in a variety of complex minerals containing copper, lead, iron, nickel, cobalt, and other metals. Most of the arsenical compounds are used in the production of agricultural chemicals such as insecticides, herbicides, algicides, and growth stimulants for plants and animals. In certain areas, concentrations in soil may be elevated because of naturally high levels in mineral deposits in the area.

The fate of arsenic in water depends upon the chemical form of the arsenic and on interactions with other materials present. Soluble forms move with water, and may be carried long distances through rivers. However, arsenic may be adsorbed from

water onto sediments, especially clays, iron oxides, aluminum hydroxides, manganese compounds and organic material. Bioconcentration of arsenic occurs in aquatic organisms, primarily in algae and lower invertebrates. Biomagnification in aquatic food chains does not appear to be significant. There is no evidence that photolysis and volatilization are important removal mechanisms of arsenic in the aquatic environment. Although arsenic minerals and compounds are readily soluble, migration of arsenic through soil is greatly limited due to the strong sorption by clays, hydroxides, and organic matter.

Acute oral poisoning in humans may result in gastrointestinal disturbances (nausea, vomiting and diarrhea), hemolysis and encephalopathy following very high doses. In most cases, effects are seen only after chronic low-dose exposures, whether environmental or occupational. These disorders have been linked to exposure to drinking water containing greater than 50 grams of Arsenic per liter of water. Higher exposures to inorganic arsenic related to arsenical poisoning or industrial exposures can also cause characteristic skin lesions, dark and light patches, and small corns on heavily cornified skin such as palms and soles of feet.

Arsenic has been classified by EPA as a Group A - Human Carcinogen. This is based on reports of increased cancer incidence from inhalation and drinking water exposures.

Cadmium

Cadmium is present generally throughout the environment and in many materials. Elevated concentrations are generally related to non-ferrous mining and refining. It is used in steel manufacturing and in pigments for plastics. Cadmium concentrations in soil are increased by the application of sewage sludge and phosphate fertilizers. Long-term exposure to excessive cadmium causes adverse kidney effects and effects on calcium metabolism. An association has been shown between occupational exposure and an increase incidence of lung and prostate cancer in workers. Teratogenic effects have been observed in test animals after very high doses.

Cadmium is classed as a B1 carcinogen (some evidence in humans and adequate evidence in animal studies) only by inhalation.

Copper

Copper occurs naturally as sulfides, oxides and carbonates. Sulfide ores constitute 75 percent of the total copper production. Approximately half of all copper production is used in electrical equipment. Another common use for copper is in plumbing and heating equipment. Copper salts also function as pesticides for fungi or algae and as herbicides.

Copper is an essential element and forms part of several enzymes. The daily requirement is about 2 mg for adult humans. The daily intake of copper ranges from 2 to 5 mg/day and comes from common food stuff which contain up to 10 mg/kg.

By inhalation, copper is a respiratory irritant. Occupational exposure to copper dust via inhalation has resulted in mucosal irritation of the mouth, eyes, and nose; anorexia; nausea; and occasional diarrhea by factory workers. Accidental exposure to large amounts of copper can cause gastrointestinal disturbances including vomiting, diarrhea, nausea, abdominal pain and metallic taste in the mouth. Copper fumes can cause irritation of the respiratory tract otherwise known as metal fume fever, a reversible flu-like response. The drinking water limits (secondary MCL of 1 mg/L and MCL of 1.3 mg/L) are based on adverse tastes and potential health risks, respectively.

Manganese

Manganese is widely distributed and found naturally as oxides, carbonates and silicates. It is used in metallurgy, chemical manufacture, tanning, textile bleaching and welding rods. It is added as a trace element in fertilizers for certain crops. Manganese is an essential trace element in the diet, but deficiencies have not been reported. Manganese is neurotoxic at adequate dose levels; neurological disorders are well-documented via the inhalation route by workers.

The general public is primarily exposed to manganese by ingestion of foods and

water or inadvertent ingestion of soil. Very little information is available concerning manganese poisoning by the oral route. Dermal exposure has not been noted as a concern except in the case of potassium permanganate which may cause severe irritation or is corrosive when it contacts skin or mucous membrane.

Nickel

Agricultural soils, world-wide, contain from 3 to 1000 mg/kg nickel. Nickel is found in many foods and the average daily intake in the U.S.A is reported to be from 300 to 500 mg. Less than 10 percent of the ingested inorganic nickel is adsorbed from the digestive tract. Nickel has been shown to be an essential element in the diet of some animal species but this has not been proven for the human species. Large oral doses are tolerated by animals and systemic effects from oral ingestion are unlikely. Nickel can cause pulmonary inflammation and dermal contact has caused dermatitis in nickel workers.

Nickel is classified as a known human carcinogen via inhalation (Group A) by USEPA and the oral RfD for soluble salts is 0.02 mg/kg/day.

Zinc

Zinc concentration in soils varies from 10 to 300 mg/kg. Zinc is found in foods, particularly those high in protein. Zinc is an essential element, necessary for the function of various enzymes. Fifteen mg/day has been recommended as the daily requirement for adults by the National Academy of Scientists Food and Nutrition Board. Chronic poisoning from zinc ingestion has not been described in humans. Zinc is not a suspected carcinogen.

6.5 Risk Characterization

The risk characterization process integrates the toxicity and exposure assessments into a quantitative expression of risk. For carcinogens, the exposure point concentrations and exposure factors discussed earlier are mathematically combined to generate a chronic daily intake value that is average over a lifetime (i.e., 70 years). This intake value is then multiplied by the toxicity value for the contaminant (i.e., the slope factor) to generate the incremental probability of an individual developing cancer over a lifetime as a result of exposure to the contaminant. These probabilities are generally expressed in scientific notation (e.g., 1.0 x 10-6, otherwise expressed as 1E-6). An excess lifetime cancer risk of 1.0 x 10-6 indicates that, as a reasonable maximum estimate, an individual has a 1 in 1,000,000 chance of developing cancer as a result of site-related exposure to a carcinogen over a 70- year lifetime under specific exposure conditions at a site. The generally acceptable excess cancer risk range, as defined by Section 300.430 (e)(2)(I)(A)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. § 300.430 (e)(2)(I)(A)(2), is between 1.0 x 10-4 and 1.0 x 10-6.

The potential for noncarcinogenic effects is evaluated by comparing an exposure level over a specified time period (i.e., the chronic daily intake) with the toxicity of the contaminant for a similar time period (.i.e., the reference dose). The ratio of exposure to toxicity is called a hazard quotient. A Hazard Index (HI) is generated by adding the appropriate hazard quotients for contaminants to which a given population may reasonably be exposed. Any media with an HI greater than 1.0 has the potential to adversely affect health.

Under current residential use scenario it was found that the Site did not pose an unacceptable carcinogenic risk. The carcinogenic risk was between 1x 10-4 and 1x 10-6 in all but one monitoring well, where it exceeded 1x10-4. The carcinogenic risk is driven primarily by arsenic; however, the levels of arsenic are below the MCL even in the well that exceeded the acceptable risk level. Furthermore, it is not clear that the arsenic is Site-related. Under this same scenario, it was found that the Hazard Index exceeded 1 for many residential and onsite wells. The elevated Hazard Index values were primarily driven by manganese. The risk posed by the Site indicates that remedial action is warranted to address the ground water contaminated by manganese and to prevent future exposure. Table 5 shows the maximum calculated cancer risks and hazard indices for both onsite and offsite wells, using both the average concentrations detected and the maximum concentrations detected.

Elevated levels of lead found in the drinking water of several residences has also been of concern. Several exceedances of EPA's action level for lead (15 ppb) have been detected. The source(s) of the lead have not been determined. Potential sources of lead are both contamination from the Site and residential plumbing.

No unacceptable levels of risk were associated with the recreational use of the area in the vicinity of the Site.

The ecological risk assessment showed that there are elevated levels of contaminants in adjacent streams. Prior to the construction of the Site caps, the streams received runoff from the fill areas. These past discharges may have left areas of contamination in the stream sediment that could be a continuing source of contaminants to the environment. Also, ground water currently flowing beneath the Site still reaches the streams and is a potential continued source of contamination.

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

7.0 Description of Alternatives

The SFS Report discusses the alternatives evaluated for the Site and provides supporting information relating to the alternatives presented in this ROD.

7.1 Alternatives Considered

The alternatives considered for the OU2 are as follows:

1. No Action
2. Home Treatment Units, Monitoring, and Institutional Controls
3. Waterline, Monitoring, and Institutional Controls
4. Pump and Treat, Waterline, Monitoring, and Institutional Controls

Alternative 1: No Action

Estimated Capital Costs: $0
Estimated Annual O&M Costs: $0
Estimated Present-Worth Costs: $0

The NCP requires that EPA consider a no action alternative for every site to establish a baseline for comparison to alternatives that do require action. This alternative assumes that the measures currently being undertaken as a part of the OU1 Interim Remedial Action called for in the September, 1986 ROD would continue, but no additional actions would be taken. These measures include periodic inspection of the landfill caps, ground water monitoring, and surface water monitoring. There would be no additional costs associated with the No Action alternative.

Common Elements of Alternatives 2 through 4

The three additional alternatives analyzed contain several common elements.

These common elements are necessary to monitor and/or prevent unacceptable risks posed to human health and the environment. These elements include:

- institutional controls;
- ground water monitoring; and
- ecological monitoring.

Description and Purpose of each Common Element

< Institutional controls: The length of time necessary to return the ground water to natural conditions (if this is possible) cannot be determined. Therefore, institutional controls will be used to prevent the use of contaminated ground water and installation of additional wells into the contaminated aquifer. These

controls will take the form of deed restrictions and the use of a ground water management zone in the vicinity of the Site. The deed restrictions will also prevent future use of the land in such a way as to potentially expose the fill material.

< Ground water monitoring: The ground water monitoring program currently being implemented at the Site pursuant to the OU. 1 ROD will continue. This monitoring program currently consists of the collection of samples from onsite and offsite monitoring wells on a quarterly basis and will be modified as necessary and appropriate based on yearly reviews of the monitoring data.

< Ecological monitoring: The surface water and sediment monitoring program currently being implemented at the Site pursuant to the OU. 1 ROD will continue. This monitoring program currently consists of he collection of samples from streams receiving ground water discharge and surface water runoff from both the Diggs and CC&SC properties on a quarterly basis. This program, like the ground water monitoring program, will be modified as necessary and appropriate based on yearly reviews of the data.

Alternative 2 - Home Treatment Units plus Common Elements

Estimated Capital Costs: $268,000
Estimated Annual O&M Costs: $34,000
Estimated Present-Worth Costs: $608,000
Time to Implement: Less than one year

In-home treatment of residential well water would be provided through the use of individual units such as ion exchange systems. These home treatment units would be installed on the water supply line from the well to treat water to be used for domestic purposes. Any expended resin cartridges would require either onsite regeneration or disposal. In addition to the ground water monitoring of residential wells would described under "Common Elements," quarterly monitoring of residential wells would also be required.

The cost estimate for this alternative assumes that 19 residences would need home treatment units. This is a conservative assumption; results from recent home well monitoring suggest that fewer than half of the residences would in fact need units.

With the completion of the Site caps required under OU1, it is expected that levels of contaminants will slowly dissipate to background levels and that ground water could eventually be available for beneficial use. Monitoring of onsite and offsite wells, including residential wells, will track ground water contaminant levels for up to 30 years to ensure that contaminant levels do not increase.

Alternative 3 - Waterline plus Common Elements

Estimated Capital Costs: $683,000
Estimated Annual O&M Costs: $19,000
Estimated Present-Worth Costs: $873,000
Time to implement: Approximately one year

A waterline would be installed to provide an alternative water supply to the 19 residents along Limestone Road. Specific remedial activities include the installation of approximately 2,800 feet of 6-inch diameter watermain, one booster pumping station, five fire hydrants, and 19 house connections, as well as the abandonment of 19 residential wells. The proposed alignment of the watermain is shown on Figure 2.

With the completion of the Site caps required under OU1, it is expected that levels of contaminants will slowly dissipate to background levels and that ground water could eventually be available for beneficial use. Monitoring of onsite and offsite wells will track ground water contaminant levels for up to 30 years to ensure that contaminant levels do not increase.

Alternative 4 - Pump and Treat, Waterline, plus Common Elements

Estimated Capital Costs: $1,766,500
Estimated Annual O&M Costs: $300,000
Estimated Present-Worth Costs: $4,766,500

Time to Implement: One to two years

This alternative includes all of the elements of Alternative 3, plus the installation of five to ten groundwater extraction wells around the downgradient perimeter of the Site, performance of limited pumping tests on each extraction well, construction of a pump station above each extraction well location, installation of buried forcemains to convey extracted ground water to a central on-Site treatment facility, construction of a ground water treatment facility, construction of a gravity main to convey treated ground water from the treatment facility to the drainage swale on the Diggs property and any drainage improvements required to convey the treated water to Evitts Creek, and long-term discharge monitoring. Ground water treatment would continue until the aquifer has been restored to beneficial use. For cost estimation purposes, operation and maintenance of the system was assumed to continue for thirty years.

Home treatment units were ruled out as a part of a pump and treat option because it is likely that the ground water extraction would dry up or severely limit the production of residential wells.

8.0 Summary of Comparative Analysis of Alternatives

The remedial action alternatives described above were evaluated using the following criteria, as required under Section 300.430(e)(9)(iii) of the NCP, 40 C.F.R. § 300.430(e)(9)(iii):

Threshold Criteria: Statutory requirements that each alternative must satisfy in order to be eligible for selection.

1. Overall Protection of Human Health and the Environment - Evaluation of the ability of each alternative to provide adequate protection of human health and the environment in the long and short-term and of how risks posed through each exposure pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) - Evaluation of the ability of each alternative to attain applicable or relevant and appropriate requirements under federal environmental laws and state environmental or facility siting laws or provide grounds for invoking a waiver established under CERCLA.

Primary Balancing Criteria: Technical criteria upon which the detailed analysis of the alternatives is primarily based.

3. Long-Term Effectiveness and Permanence - Evaluation of expected residual risk and the ability of each alternative to maintain reliable protect ion of human health and the environment over time after cleanup requirements have been met.

4. Reduction of Toxicity, Mobility, or Volume through Treatment- Evaluation of the degree to which an alternative employs treatment methods to reduce the toxicity, mobility or volume of hazardous substances at the Site.

5. Short-Term Effectiveness. Evaluation of the period of time needed for each alternative to achieve protection and any adverse impact on human health and the environment that may be posed during the construction and implementation period.

6. Implementability - Evaluation of the technical and administrative feasibility of each alternative, including the availability of materials and services.

7. Cost- Section 121 of CERCLA, 42 U.S.C. § 9621, requires selection of a cost-effective remedy that protects human health and the environment and meets the other requirements of the statute. Alternatives are compared using present worth cost, which includes all capital costs and the operation and maintenance costs incurred over the life of the project. Capital costs include expenditures necessary to implement a remedial action (e.g., construction costs). All costs presented are estimates calculated for comparison purposes only.

Modifying Criteria: Criteria considered throughout the development of the preferred remedial alternative and formally assessed after the public comment period, which may modify the preferred alternative.

8. State Acceptance - Assessment of technical and administrative issues and concerns that the State may have regarding each alternative. -

9. Community Acceptance - Assessment of issues and concerns the public may have regarding each alternative based on a review of public comments received on the Administrative Record and the Proposed Plan.

Alternative 1 (No Action) contains no provisions for preventing exposure to contamination and is not protective of human health and the environment. Because Alternative 1 does not meet this threshold criteria, it will not be evaluated further.

8.1 Overall Protection of Human Health and the Environment

Alternative 1 (No Action) contains no provisions for preventing exposure to contamination and is not protective of human health and the environment. Because Alternative 1 does not meet this threshold criteria, it will not be evaluated further.

The common elements in Alternatives 2, 3, and 4 include monitoring and institutional controls to ensure that the alternatives are protective of human health and the environment. Institutional controls will restrict the potential for use of contaminated ground water. Ground water monitoring will track ground water contaminant levels and monitor the effectiveness of the Site clean-up. The ecological monitoring will ensure that Site-related contamination does not pose unacceptable environmental risks.

In Alternatives 2, 3, and 4, either a waterline or home treatment units will remove the potential current and future exposure of local residents to Site-related contaminants. Therefore, Alternatives 2, 3, and 4 are considered equally protective of human health. The pump and treat system considered under Alternative 4 would reduce the amount of Site-related contamination reaching both the ground water and the stream, decreasing the threats to both.

8.2 Compliance with ARARs

The Federal and State requirements or criteria that a Superfund remedy must comply with are called Applicable or Relevant and Appropriate Requirements (ARARs). In this section of the ROD, EPA has identified certain ARARs which the alternatives must meet. The ARAR for Alternative 2 follows:

40 C.F.R. Part 141	Safe Drinking Water Act	Establishes Maximum Contaminant Levels (MCLs) and non-zero Maximum Contaminant Level Goals (MCLGs)that would be allowed to remain in ground water used for drinking water; applies to water that has been treated by the home treatment units.
40 C.F.R Parts 260-270; COMAR 26.13	Standards for Generation, Treatment, Storage or Disposal of Hazardous by Waste	Establishes standards for the handling of hazardous waste; applies to wastes which may be generated the home treatment units.

In addition, 40 C.F.R Part 268 may be applicable if residues generated by the home treatment units are land disposal restricted wastes.

The ARARs for Alternative 3 are as follows:

40 C.F.R Part 141	Safe Drinking Water Act	Establishes Maximum Contaminant Levels (MCLs) and non-zero Maximum Contaminant Level Goals (MCLGs)that would be allowed to remain in ground water used for drinking water; applies to water delivered by the public water supply line.
Code of Maryland Regulations (COMAR) 26.04.04	Well Construction	Includes requirements for construction and abandonment of wells.

The ARARs for Alternative 4 include those which are pertinent to Alternative 3, plus the following:

16 U.S.C. 661-667e	Fish and Wildlife Coordination Act	Coordinates Federal, State, public, and private organizations in protecting fish, wildlife, and their habitats.
40 C.F.R Part 261 COMAR 26.13.02	Identification and Listing of Hazardous Waste	Establishes the criteria for determining if a solid waste exhibits the characteristics of toxicity, ignitability, corrosivity, or reactivity or is a listed waste; applies to waste generated during the ground water treatment process.
40 C.F.R Part 262 COMAR 26.13.03	Standards Applicable to Generators of Hazardous Waste	Establishes requirements for a generator who treats, stores or disposes of hazardous waste onsite; applies to waste generated during the ground water treatment process.
40 C.F.R Part	Standards Applicable	Establishes standards which apply to

263 COMAR 26.13.04	to Transporters of Hazardous Waste	persons transporting hazardous waste within the State if the transportation requires a manifest under COMAR 26.13.03; applies to offsite transport of waste generated during the ground water treatment process.
40 C.F.R Part 264 COMAR 26.13.05	Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities	Establishes minimum State standards which define the acceptable management of hazardous waste; applies to operation of the ground water treatment plant.
40 C.F.R. Part 268	Land Disposal Restrictions	Restrictions on land disposal and certain storage of land disposal restricted wastes which may be generated by the treatment of contaminated ground water.
COMAR 26.08.01	Maryland Water Pollution Control Regulations	Establishes Best Practicable Control Technology Currently Available as the requirement for water pollution control; applies to treatment of ground water.
COMAR 26.08.02	Maryland Water Quality Regulations	Establishes designated uses of the waters of the State and sets water quality criteria based on protection of these uses; applies to discharge of treated ground water.
COMAR 26.08.03	Maryland Discharge Regulations	Establishes discharge limitations for point source discharges to surface water; applies to discharge of treated ground water.
33 U.S.C.A. § 1342 COMAR 26.08.04	Clean Water Act Maryland Discharge Permits	Establishes requirements for issuance of permits for water discharge; substantive (but not administrative) requirements apply to discharge of treated ground water.

8.3 Long-term Effectiveness and Permanence

The Site caps are expected to reduce the impacts of Site contamination to the ground water, surface water and sediment. The monitoring provisions of the common elements will track any changes in ground water quality over time. The land use restrictions will prevent any disturbance of the caps that could reduce their effectiveness or cause a release of the contaminated fill material beneath them.

Alternative 2 (Home Treatment Units) provides an immediate supply of safe drinking water to those residences that are impacted by the Site. The reliability and effectiveness of the home treatment units will depend on consistent ground water monitoring and adequate maintenance of the units. This option would require a greater degree of regular monitoring and maintenance than the other alternatives to ensure the continued protection of human health.

Alternative 3 (Waterline) provides a permanent, safe and reliable water supply to all currently impacted residences, as well as those that may be impacted in the future. This alternative would not require the regular monitoring of residential wells or maintenance of the treatment units as would Alternative 2, and thus is a more reliable source of safe drinking water.

Alternative 4 (Pump and Treat, Waterline) would result in the removal and treatment of Site-related contaminated groundwater from beneath the Site, and

therefore, may provide greater overall effectiveness than either a Waterline or home treatment units. Furthermore, pumping and treating the ground water would reduce the amount of contamination leaving the Site and impacting the stream.

8.4 Reduction of Toxicity, Mobility or Volume through Treatment

Alternative 4 is the only alternative that has the potential to reduce the volume of contaminated ground water at the Site, as it is the only alternative that includes active treatment to reduce the contaminant levels at the source area. However, because of the fractured bedrock, it would be difficult to implement a program that would effectively capture and treat the contaminated ground water. In addition, the caps installed over the contaminated areas during the OU1 Interim Remedial Action are expected to reduce the levels of contaminated ground water leaving the Site over time.

8.5 Short-term Effectiveness

Because the monitoring provisions of the common elements are a continuation of actions already being taken pursuant to the OU1 ROD, no additional construction or start up period would be necessary. The deed restrictions could be implemented in less than one year.

Installation of home treatment units (Alternative 2) would be easier and quicker than the construction of a waterline or a pump and treat system. While the design of a waterline could take some time, the actual construction of the waterline (Alternatives 3 and 4) would only require a few months. In the interim, the PRPs are required, under the terms of the April 1994 AOC, to provide residences with excessive levels of Site contaminants in their well water with bottled drinking water until the selected remedial action has been fully implemented. Thus, the impacted residences would not be at risk during the time required to construct any of the alternatives.

The design and construction of the pump and treat system included in Alternative 4 would likely take up to one year longer than the design and construction of the water line. Because this construction work would take place onsite, the only additional risk to the community would be posed by the increased traffic in the vicinity of the Site. The risk to workers would occur primarily during the installation of the extraction wells through potential contact with contaminated ground water. The workers could be protected from any potential hazards through a properly implemented and enforced health and safety plan.

8.6 Implementability

Because the monitoring provisions of the common elements are a continuation of actions already being taken pursuant to the OU1 ROD, implementability is not an issue. Because the Site owners are PRPs, it is expected that they will agree to implement deed restrictions on the Site properties.

Under Alternative 2, the use of home-treatment units is technically feasible, as the equipment is readily available. Long-term maintenance of the systems would be required in order to ensure that the units remain effective. This type of maintenance may be difficult to implement over the assumed 30-year O&M period. Any expended resin cartridges (or other waste products) from each unit would require regeneration or disposal, possibly as a hazardous waste.

There are no foreseeable implementability concerns for Alternative 3. This alternative employs standard construction techniques and demonstrated and reliable technologies.

Implementation of the ground water pump and treat portion of Alternative 4 may not be feasible for a number of reasons. Because there is no clearly discernable contaminant plume, it would be difficult to properly locate the extraction wells. It is questionable whether an extraction system could be designed which would effectively contain or capture Site-related contaminants since their distribution is not clear. In addition, the pumping of water at the Site could mobilize contaminants from other sources, including the City Dump, which is located adjacent to the Site. Also, metal sludge generated during the treatment process would require temporary onsite storage in compliance with 40 C.F.R Parts 264 and 268 and eventual offsite disposal.

8.7 Cost

The estimated present worth cost of Alternative 2 (home treatment units) is $608,000. Based on verbal quotations received from vendors, the capital cost (equipment and installation) would be approximately $268,000 for 19 units. It was assumed that over the next 30 years, one replacement unit would be required at each location. O&M costs would be approximately $34,000 annually.

The estimated present worth cost of Alternative 3 (water line) is $873,400. This includes a capital cost $683,000, and O&M costs of approximately $19,000 annually.

The estimated present worth cost for Alternative 4 (pump and treat and waterline) is $4,766,500. The capital cost of $1,766,500 includes the waterline, the pump and treat system, a water treatment plant, and a discharge line. The annual O&M costs will be approximately $300,000.

8.8 State Acceptance

The Maryland Department of the Environment (MDE) was sent a draft of the ROD on June 5, 1996, and by letter of June 12, 1996, indicated that it had no comments on the ROD. A revised draft of the ROD was sent to MDE on June 20, 1996, along with a request for concurrence on the ROD. The State has verbally indicated a willingness to concur, but wishes to see the final version before doing so in writing.

8.9 Community Acceptance

A public comment period on the Proposed Plan was held from April 15 to May 14, 1996 and a public meeting was held to discuss the plan and SRI and SRS on April 24, 1996, as described in Section 3 of this ROD. As shown in the Responsiveness Summary section, the comments received during the meeting were supportive of EPA's preferred remedy. Letters received from local officials during the public comment period were also supportive of the remedy.

9.0 Selected Remedy and Performance Standards

After consideration of the requirements of CERCLA, the detailed analysis of the alternatives using the nine criteria, and public comments, EPA has determined that Alternative 3, Waterline plus Common Elements, is the most appropriate remedy for the Limestone Road Superfund Site. This alternative meets the threshold criteria of overall protection of human health and the environment and compliance with ARARs, and provides the best balance of long-term effectiveness and permanence, reduction of toxicity, mobility or volume of contaminants through treatment, short-term effectiveness, implementability, and cost.

The selected remedy consists of the following major components:

< Installation of a waterline and ancillary equipment (a pumping station and fire hydrants) to service residents in the vicinity of the Site. The waterline will be of sufficient capacity to meet the needs of both current and reasonably expected future development of the area; and

< Implementation of deed restrictions on the previously capped areas of the Site to prevent use of such areas in such a manner as would cause disturbance of the caps;

< Implementation of a ground water management program to prevent installation of drinking water wells in the vicinity of the Site;

< Continuation of the long term ground water, surface water, and sediment monitoring plans currently being implemented pursuant to the ROD for OU1;

< Abandonment of existing residential water supply wells.

The proposed alignment of the waterline is shown in Figure 2.

10.0 Statutory Determinations

EPA's primary responsibility at Superfund sites is to select remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA, 42 U.S.C. § 9621, establishes several other statutory requirements and preferences. These requirements and preferences specify that, when complete, the selected remedial action for a site must comply with applicable relevant and appropriate requirements established under Federal and State environmental laws, unless a statutory waiver is justified. The selected remedy must also be cost-effective and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. The statute also expresses a preference for remedies that employ treatment as a principal element.

10.1 Protection of Human Health and the Environment

The selected remedy for the Site will provide adequate protection of human health and the environment as follows: the institutional controls will prevent the future use of the landfilled areas such that the integrity of the caps would be compromised, thus preventing direct contact with the fill material, and would prevent the installation of a drinking water well into the fill area; the ground water, surface water and sediment monitoring will track what are expected to be decreasing levels of contaminants in these media (due to the site caps); and the waterline will provide safe drinking water for area residents, eliminating their reliance on ground water for a drinking water supply.

10.2 Compliance with Applicable or Relevant and Appropriate Requirements

Under Section 121(d) of CERCLA, 42 U.S.C. § 9621(d) and EPA guidance, remedial actions at Superfund sites must attain legally applicable or relevant and appropriate Federal and State environmental standards, requirements, criteria, and limitations (collectively referred to as ARARs). Applicable requirements are those substantive environmental protection requirements, criteria, or limitations promulgated under Federal or State law that specifically address hazardous material found at the site, the remedial action to be implemented at the site, the location of the site, or other circumstances at the site. Relevant and appropriate requirements are those which, while not directly applicable to the site, nevertheless address problems or situations sufficiently similar to those encountered at the site that their use is well suited to that site.

The selected remedy will comply with all applicable or relevant and appropriate requirements. These ARARs are presented in Section 8.2 (Compliance with ARARs).

10.3 Cost-Effectiveness

Section 300.430(f)(1)(ii)(D) of the NCP, 40 C.F.R § 300.430(f)(1)(ii)(D), requires EPA to evaluate cost-effectiveness by first determining if the alternative satisfies the threshold criteria: protection of human health and the environment and compliance with ARARs. The effectiveness of the alternative is then determined by evaluating the following three of the five balancing criteria: long-term effectiveness and permanence, reduction of toxicity, mobility, or volume through treatment, and short-term effectiveness. EPA has determined that the selected remedy will satisfy the threshold criteria and most effectively address the threats presented by contaminated ground water at the Site. The estimated present worth costs are $873,000. The selected remedy is cost effective because the cost is proportional to the overall effectiveness as compared to the other alternatives that were considered.

10.4 Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to the Maximum Extent Practicable

EPA has determined that the selected remedy represents the maximum extent to which permanent solutions and alternative treatment technologies can be utilized in a cost-effective manner at the Site. The waterline will provide a permanent source of safe drinking water to the residents living in the vicinity of the Site. While pumping and treatment of the contaminated ground water was considered, this alternative was not selected because the effectiveness of such a system is highly questionable due to the nature of the impacted aquifer (fractured bedrock). Also, the system could possibly exacerbate the problem by pulling contaminants from another local source (the City Dump). Finally, the caps installed during the OU1 Interim Remedial Action are expected to reduce impact of the Site on the ground water and

surface water over time.

10.5 Preference for Treatment as a Principal Element

There are no treatment technologies in the selected remedy. As discussed in Section 10.4, treatment was not considered practicable at this Site due to the nature of the contaminated media and the expectation that the caps will reduce the Site impacts to ground water and surface water over time. These impacts will continue to be monitored as a part of this selected remedy.

11.0 Documentation of Significant Changes

EPA issued the Proposed Remedial Action Plan for OU2 of this Site for public review and comment on April 15, 1996, and held a public meeting to discuss the plan on April 24, 1996. The local community, including the local public officials, were supportive of the then proposed (now selected) remedy identified by EPA.

EPA received three letters containing comments during the comment period. Two were from local officials and were again supportive of EPA's plan. The third letter was from Conestoga-Rovers & Associates (CRA), a firm that has served as the prime contractor for the PRPs during the SKI and the interim remedial action. EPA agreed with many of the comments in the letter, which are addressed in the Responsiveness Summary section of this ROD.

Among other things, CRA commented on the monitoring provisions of the proposed plan. Specifically, EPA's proposed plan called for quarterly monitoring of ground water, surface water and sediment for both organic and inorganic contaminants, as well as bioassays. CRA suggested that the extant interim monitoring plan, which currently includes quarterly monitoring of these same media for inorganics, was adequate to meet the needs of the project since the contaminants of concern, as identified in the SKI and presented in the ROD, are inorganics. EPA agrees, and has modified the selected remedy accordingly.

<IMG SRC 0396226A>
<IMG SRC 0396226B>

Table 1

Concentrations of Total and Dissolved Metals in Site Monitoring Wells Compared to MCLs and Risk-Based Concentrations (RBCs)

values in ug/l

Metal	Range, dissolved	Range, total	RBC	MCL
Aluminum	n.d. - 1080	n.d. - 4760	11,000	-
Arsenic	n.d. - 31.6	n.d. - 230	0.045	50
Barium	10.6 - 441	n.d. - 934	2600	2,000
Beryllium	n.d. - 0.31	n.d. - 1.7	0.02	4
Cadmium	n.d. - 3.3	n.d. - 10.0	18	5
Calcium	2870 - 394,000	3610 - 420,000	-	-
Chromium	n.d.- 27.9	n.d.- 144	180	100
Cobalt	n.d. - 40	n.d.- 152	2200	-
Copper	n.d. - 7.3	n.d. - 287	1500	1300
Iron	n.d. - 45,000	n.d. - 191,000	-	-
Lead	n.d. - 10.1	n.d. - 504	-	15
Magnesium	n.d. - 186,000	n.d. - 165,000	-	-
Manganese	17.5 - 3050	6.8 - 37,000	800	-
Mercury	n.d. - 0.15	n.d. - 0.4	37	2
Nickel	n.d. - 180	n.d. - 328	730	100
Potassium	543 - 35,200	n.d.- 32,900	-	-
Silver	n.d.- 5.5	n.d. - 6.9	18	50
Sodium	17,100 - 1,800,000	12,000 - 2,390,000	-	-
Thallium	n.d.- 1.3	n.d.	2.9	2
Vanadium	n.d. - 2.5	n.d. - 54	260	-
Zinc	n.d. - 332	n.d. - 1520	11000	-

n.d. = not detected

Table 2

Concentrations of Metals in Site Surface water and Sediment compared to BTAG screening levels (Flora/Fauna)

Metal	Surface Water Range, dissolved	Surface water Range, total	BTAG Screening Level	Sediment Range	BTAG Screening Level
Aluminum	n.d. - 20,200	n.a.	460/200	1600 - 33,000	- / -
Arsenic	n.d. - 4.4	n.d.	-/874	n.d. - 38	-/8.200
Barium	n.d. - 330	n.d. - 197	-/10,000	84 - 626	-/-
Beryllium	n.d. - 31	n.a.	100,000/5.3	n.d. - 3.8	- / -
Cadmium	n.d. - 44	n.d. - 1.3	1.1/0.15	n.d. - 80	676/-
Calcium	26,500 - 351,000	39,900 - 294,000	- / -	n.d. - 63,000	- / -
Chromium	n.d. - 58	n.d.	-/210	n.d. - 90	5/260,000
Cobalt	n.d. - 151	n.a.	- / -	n.d. - 160	- / -
Copper	n.d. - 50	n.d.- 9.1	-/6.5	n.d. - 136	-/34,000
Hex. Cr.	n.d. - 0.05	n.a.	2/1	n.d. - 0.08	-/<81,0OO
Iron	n.d. - 39,000	n.d.- 112	-/320	5750.66,500	- / -
Lead	n.d. - 86	n.d. - 2.9	-/1	13.4 - 220	-/46,700
Magnesium	4350- 177,000	4790 - 118,000	- / -	n.d. 10,000	- / -
Manganese	n.d. - 86,200	n.d. - 103	- / -	n.d- 178,000	- / -
Mercury	n.d. - 40	n.a.	-/O.012	n.d. - 0.21	- / 150
Nickel	n.d. - 4000	n.d. - 15.7	-/14.77	n.d. - 729	-/20,900
Potassium	n.d. - 224,000	1900 - 207,000	- / -	n.d. - 5000	- / -
Selenium	n.d. - 5.2	n.d.	522/3	n.d. - 1.4	- / -
Silver	n.d. - 18,000	n.a.	1.9/0.0001	n.d. - 4.9	-/733
Sodium	n.d. - 1,000,000	1960 - 516,000	- / -	n.d. - 10,500	- / -
Thallium	n.d. - 70	n.a.	-/40	n.d.	- / -
Vanadium	n.d.	n.a.	./< 10.O	n.d. - 50	- / -
Zinc	n.d. - 15,500	n.d. - 982	110/110	24 - 31,900	- /150,00

n.d. = not detected
n.a. = not analyzed

Table 3 - Exposure Assumptions

Ground water ingestion scenario
Average and Maximum expected exposures

Variable	Value, Child		Value, Adult	
	Average	Maximum	Average	Maximum
Chemical Concentration	mean	maximum	mean	maximum
Ingestion rate (liters/day)	1	1	2	2
Body weight (kilograms)	15	15	70	70
Exposure frequency (days/year)	350	350	350	350
Exposure duration - carcinogen (years)	10	30*	10	30
Exposure duration - noncarcinogen (years)	1*	1*	1*	1*
Averaging time - carcinogen (years x days)*	25550	25550	25550	25550
Averaging time - noncarcinogen (years x days)*	365	365	365	365 -

* These values are non-standard for EPA-approved risk assessments; however, they do not change the net result of the risk assessment.

Table 4 - Cancer Potency Slopes and Reference Doses (RfDs) for Contaminants of Concern (COCs)

COC	Cancer Potency Slope (mg/kg/day)-1	RfD (mg/kg-day)
Arsenic	1.5	3.00 x 10-4
Cadmium	n.c.	5.00 x 10-4
Copper	n.c.	3.70 x 10-2
Manganese	n.c.	2.40 x 10-2
Nickel	n.c.	2.00 x 10-2
Zinc	n.c.	3.00 x 10-1

n.c. = non-carcinogen

Table 5 - Maximum Cancer Risk and Hazard Indices

	Cancer Risk	Hazard Index
Onsite wells - average concentration	3.11x10-4	8.06
Onsite wells - maximum concentration	7.94x10-4	8.48
Offsite wells - average concentration	2.34x10-5	7.39
Offsite wells - maximum concentration	9.04x10-5	19.2

< Cancer risk is, in all cases, driven by arsenic, which does not exceed the Maximum Contaminant Level (MCL).

< Except for the "offsite wells - maximum concentration," hazard indices are driven by manganese; on this case, it is driven by cadmium, which exceeds the MCL.

Record of Decision
Limestone Road Superfund Site

Part 3 - Responsiveness Summary

This Responsiveness Summary documents public comments expressed to EPA on the Proposed Remedial Action Plan for OU2 of the Limestone Road Superfund Site and EPA's responses to those comments. The information is organized as follows:

A. Overview
B. Comments Received During the Public Meeting
C. Written Comments Received During the Comment Period

A. Overview

EPA held a public comment period from April 15 through May 4, 1996, to receive comments from the public on the Supplemental Remedial Investigation and Supplemental Feasibility Study (SPA and SFS) reports and the Proposed Remedial Action Plan ("Proposed Plan") for OU2 of the Limestone Road Superfund Site. EPA held a public meeting on April 24, 1996 at 7:00 at the District 16 Fire Hall in Cumberland, Maryland. The public meeting was attended by EPA and Maryland Department of the Environment (MDE) staff, local residents, public officials, and representatives and consultants of the Potentially Responsible Parties (PRPs). The transcript from the public meeting is in the Administrative Record for the Site.

The purpose of the meeting was to present and discuss the findings of the SRI/SFS and to apprise the meeting participants of EPA's preferred remedial alterative for OU2. Comments received during the meeting and written comments received throughout the public comment period are presented below, along with EPA's response.

B. Comment Received During the Public Meeting

1. A community member asked how EPA would select the final alternative to address the ground water.

EPA RESPONSE: EPA relies on public input during the clean-up process so that the remedy for each Superfund site meets the needs and concerns of the local community. EPA has, in the past, reviewed public input and recommendations on a proposed clean-up remedy and changed that remedy to address the community's concerns. EPA will review all of the comments received from the community during the public meeting and those submitted in writing during the public comment period. After reviewing these comments, EPA will select a final alternative and announce this selection in a document called a Record of Decision. In addition, EPA will place a public notice in the Cumberland Times News to inform the community of the Record of Decision. EPA may also produce a brief fact sheet highlighting the selected remedy and send the fact sheet to each person on the Site mailing list.

2. A community member asked who will pay for the cost of constructing the proposed waterline or any of the proposed remedies.

EPA RESPONSE: Once EPA selects its final alternative, EPA will negotiate with the PRPs to pay for the costs of the remedy including the construction, maintenance, and initial hook-up to the existing residences. If EPA is unsuccessful in coming to an agreement with the PRPs, then money from the Superfund trust fund may be used to pay for the selected remedy. If money is used from the trust fund, EPA will continue to pursue the PRPs to recover the money spent on implementing the selected remedy.

3. A community member asked EPA to identify the PRPs at the Site.

EPA RESPONSE: EPA has identified Joseph and Patricia Diggs, Fairchild Industries, Cumberland Cement and Supply Company, and Kelly Springfield Tire Company as the PRPs at the Limestone Road Site. These parties, with the exception of Joseph and Patricia Diggs, have entered into agreements with EPA to perform work at the Site, including capping and fencing the landfilled areas, supplying bottled water to local residents, and conducting the supplemental groundwater and stream studies.

4. A community member asked why parties responsible for Site contamination are identified by EPA as only potentially responsible.

EPA RESPONSE: The CERCLA statute provides the definition of a PRP. They are considered to be "potentially responsible" until such time as their liability is established by a court of law.

5. A community member asked how EPA identifies parties responsible for contamination and how they are involved in the cleanup.

EPA RESPONSE: CERCLA § 107 identifies four categories of individuals or organizations that are responsible parties: current site owners or operators; owners or operators of the site at the time hazardous substances were disposed of at the site; certain persons who arranged for treatment or disposal of hazardous substances at the site; and certain persons who transported hazardous substances to the site. EPA attempts to compel these parties to perform or pay the costs associated with the cleanup at a site. However some parties are financially unable to provide support to the cleanup, so EPA will use money from the Superfund trust fund, which is established through a tax on the chemical and petroleum industries, to pay for the costs associated with the cleanup.'

6. A community member asked if EPA's final decision on a selected remedy depends on the willingness of the PRPs to pay for implementing the remedy.

EPA RESPONSE: EPA's final decision on a selected remedy does not depend on the willingness of the PRPs to pay for implementing the remedy. However, the NCP requires EPA to consider the cost effectiveness of a proposed remedy. If the PRPs choose not pay for the remedy, EPA may pay for the remedy using Superfund trim monies and pursue the PRPs through court action to recover the costs for the remedy. EPA may also issue an order to the PRPs requiring them to implement the remedy.

7. A community member asked where the proposed waterline would be placed, what size it would be, and how far it would extend.

EPA RESPONSE: The proposed waterline is in the conceptual stages and has yet to be designed. If EPA selects the waterline alternative, the location, size, and length will be addressed during the design stage. Currently, there is an existing water main located on Route 51 that could be used to connect a waterline to provide service for the residents in the Site area.

8. A community member asked how long it would take to install the proposed waterline if Alternative 3 is selected as the remedy.

EPA RESPONSE: Once EPA selects a final remedy, the Agency will attempt to negotiate with the PRPs to conduct the work needed to implement the selected remedy. This work will include preparing the designs and specifications and constructing and implementing the selected remedy. EPA estimates that construction will be completed in approximately two years.

9. A community member asked if local residents will be responsible for any of the costs associated with installing the proposed waterline.

EPA RESPONSE: Local residents and community members will not be responsible for any of the costs associated with constructing or installing the proposed waterline. EPA will negotiate the costs with the PRPs or utilize the Superfund trust monies o cover the costs of constructing and installing the proposed waterline. However, residents will be responsible for paying future bills for water service.

10. A community member asked if installing a sewage system is included as part of the waterline alternatives in the Proposed Plan.

EPA RESPONSE: A sewage system is not included in EPA's proposed waterline alternatives at the Site. Any information on installing a sewage system would be handled by local government and not EPA.

11. A community member asked about the projected costs for installing the proposed waterline.

EPA RESPONSE: The current projected cost of the proposed waterline work, including constructing, installing, and monitoring, is $875,000.00.

12. A community member asked if the proposed waterline will be large enough to service more than the 19 houses listed in the Proposed Plan.

EPA RESPONSE: The size of the proposed waterline will be addressed and determined during the design stage of the project. Areas that are currently impacted by the Site or may be impacted in the future will be included in the area to be serviced.

13. A community member asked if the American Legion property (baseball field) would be included in the hook-up to the proposed waterline.

EPA RESPONSE: The proposed waterline will be designed to have a capacity to provide service to the entire Site area, including this property.

14. A community member asked EPA to explain the deed restrictions on the landfill properties that are listed under Alternative 3 in the Proposed Plan.

EPA RESPONSE: The deed restrictions that are listed under Alternative 3 are designed to prevent someone from installing a well through the landfill caps, building a structure on top of the landfill caps, or using ground water affected by contamination at the Site.

15. A community member asked if the residential wells will be capped in EPA's recommended alternative and if well water can be used to water lawns and wash cars.

EPA RESPONSE: In order to prevent future exposure to contaminated ground water, EPA's selected remedy includes capping the residential wells once the water line is in place. Therefore, once the remedy is installed, residents would not have access to the well water for use on their lawns or cars.

16. A community member asked what contaminants are currently in the ground water and whether EPA found contamination in Evitts Creek or the Potomac River.

EPA RESPONSE: Sampling results revealed elevated levels of nickel, manganese, and cadmium in the ground water. In addition, slightly elevated levels of lead were detected; however, it is not known if the lead is present as a result of the Site or residential plumbing. Sampling results from Evitts Creek revealed elevated levels of nickel, manganese, lead, chromium, cadmium, and zinc. Because of the size of the Potomac River, any contamination migrating from the Site to the Potomac River would not be detectable because of dilution. Therefore, EPA did not sample the water in the Potomac River.

17. A community member commented on the inconsistency of contamination showing up in their wells and asked if EPA will continue to sample and monitor the residential wells for contamination until the selected remedy is implemented.

EPA RESPONSE: The PRPs, under the direction of EPA, continue to test a number of residential wells in an effort to monitor the type and amount of contamination in the Site area. The sampling will continue if necessary until the waterline is in place.

18. A community member commented that a local resident was taken off of bottled water because sampling showed that contaminants, which were once present in the resident's well, were no longer detected. The community member asked what criteria EPA uses to determine whether residences can be taken off the bottled water supply.

EPA RESPONSE: EPA identified certain criteria and health-based levels for contamination in the 1994 Administrative Order on Consent with the PRPs. Residential wells were sampled for one year, and if the data indicated that the wells were not, in fact, contaminated, the resident was taken off bottled water.

19. A community member asked if there are any potential risks associated with currently using contaminated well water to water lawns or wash cars.

EPA RESPONSE: The risk posed by the contaminants in the ground water is through direct, long-term ingestion. In addition, the contaminants remain in the water and do not dissipate into the air. Therefore, the contaminated ground water does not pose any short-term risks when used to water lawns or wash cars.

20. A community member commented that a house is currently under construction near the Site. The community member asked if EPA would provide bottled water to that

residence once it is completed or would the homeowner need to have a well installed and sampled to determine if that well is contaminated.

EPA RESPONSE: EPA can not determine if the ground water in that area is contaminated without installing a well. However, if a well is installed at this property and sampling indicates that the water is contaminated, bottled water would be provided to that residence pursuant to the AOC.

21. A community member asked about the type of waste dumped at the Site and if the waste posed an immediate danger to the community.

EPA RESPONSE: A majority of the waste at the Site is residential ant industrial debris and trash. However, some hazardous wastes, including chromium, lead, and cadmium, were disposed on both properties of the Site. These contaminants pose a risk to human health and the environment through long-term direct contact or direct exposure (ingestion). The cap fencing previously installed will prevent direct contact with the contaminants and the alternate water supply will prevent direct exposure to the contaminants.

22. A community member asked if the contaminants at the Site could get into the air and endanger the local residents who live immediately near the Site.

EPA RESPONSE: The exposed wastes at the Site have been capped, thereby preventing the possibility of the contaminants becoming airborne.

23. A community member asked EPA to explain how they capped the exposed waste and asked how long the caps will last.

EPA RESPONSE: The cap consists of four layers. The first layer above the landfill is a soil base; the second layer is a synthetic liner; the third layer is a drainage latter, and the final layer is a two-foot layer of soil. The cap prevents water from coming in contact with the waste and reduces the spreading of contamination off-site. In addition, fences were erected around the capped areas. The cap will be evaluated on a regular basis to ensure that it maintains its effectiveness. Currently, the PRPs are maintaining the call, sampling the ground water every three months, and performing inspections of the cap to ensure that there is no significant erosion. The PRP's activities are closely monitored by EPA and the State of Maryland.

C. Written Comments Received During the Comment Period

EPA received three letters of comment during the public comment period for the Propose Plan; two were from local officials, and the third was from Conestoga-Rovers and Associates (CRA), prime contractor to the PRPs.

1. The first letter received was from the Allegany County Health Department. In addition to supporting the selected remedy, the Depart mere also requested that three comments become a part of the Site record:

1.) Connection to a newly constructed public water supply must be mandated by regulation or local code home rule ordinance; and

2.) After connection to the public water supply, all domestic groundwater supplies (e.g., wells) formerly serving these residents must be abandoned and sealed in conformance with Code of Maryland Regulations 26.04.04 - Well Construction; and

3.) All tap connections to the public supply must be inspected by the appropriate County authority. Similarly, severance of connections from former groundwater supplies must be inspected to eliminate any possibilities of cross-contamination.

EPA Response: All written comments are included in the Administrative Record for the Site

2. The second letter received was from the Allegany County Department of Public Works. In addition to supporting the proposed remedy, the County asked that EPA consider a currently planned water supply project "as the solution to the Limestone Road Site rather than proceeding to have the PRPs provide the water system."

EPA Response: EPA will keep the County's willingness and proven ability to provide public water service in mind When planning the implementation of the selected remedy.

3. The final Letter received was from CRA. They, too "agree that USEPA's proposed remedial action...is the most appropriate remedial action of those [presented in the Proposed Plan] in light of the conditions at the Site. Additional comments are summarized below:

A. CRA discusses the change in Reference Dose (RfD) for manganese between the time the SRI and risk assessment were completed and the time the Proposed Plan was prepared, and recommends the new RfD be used in the preparation of the ROD.

EPA Response: The hazard index values presented in the Proposed Plan do reflect the new RfD; it was used in preparation of the ROD, as well.

B. CRA suggests the Proposed Plan was misleading in that it didn't mention that the streams near the Site "also would receive runoff from other properties which are likely to contribute contaminants (e.g., the City Dump)."

EPA Response: The City Dump is not a part of the Superfund Site and thus was not discussed in detail in either the Proposed Plan or this ROD. EPA agrees that the City Dump has contributed and may still contribute contaminants to the tributary o Evitts Creek, which also flows by the Diggs Property.

C. CRA suggests that the Proposed Plan was misleading regarding the presence of lead in residential wells, stating that currently, only one residential well has shown an exceedance of the EPA Action Level.

EPA Response: While CRA's statement is correct regarding recent sampling, data from the OU1 RI/FS show lead in residential wells at levels of up to 134 ppb.

D. CRA discusses in detail the differences between the monitoring requirements of the various alternatives and the associated differences in cost associated with the requirement and suggests these differences are not taken into account in the Propose Plan. For example, Alternative 2 would require substantially more residential well monitoring than Alternatives 3 or 4 because under those alternatives, residential wells would be abandoned, thus, the monitoring costs associated with Alternative 2 would be higher than those associated with Alternatives 3 and 4.

EPA Response: These differences were, in fact, taken into account in the cost estimates presented in both the Proposed Plan and this ROD.

E. CRA suggests that the groundwater "monitoring program for the remedial action should build upon the existing [Interim Monitoring Program], and not commence with up to five years of quarterly sampling as proposed in the Proposed Plan." They further maintain that there is no need for surface water and sediment monitoring at the Site because the caps have eliminated the potential for contaminants to migrate to the streams via surface runoff.

EPA Response: Upon further consideration, EPA agrees that it is appropriate for the monitoring provisions of this ROD to mirror those currently required under the Interim Monitoring Program and has altered the provisions of the Proposed Plan accordingly. The issue of continued monitoring of the stream will be revisited when the current years' monitoring data are reviewed.

F. CRA states that Alternative 3 "could be implemented in the shortest time frame," and further suggests that because "(t)he design and installation of waterlines are standard civil engineering practices...Detailed review of this component of the remedial action by the USEPA, the Army Corps of Engineers, or USEPA's oversight contractor would not be necessary."

EPA Response: EPA does not agree that Alternative 3 could be implemented in the shortest time frame; it would be more expeditious to provide home treatment units to local residents (as provided for under Alternative 2). However, the estimated time difference for implementation between those two alternatives is months and residents with elevated levels of contaminants in their wells would continue receiving bottled water during this period. - EPA does agree, however, that the design and installation of a waterline is a standard civil engineering practice and will take a streamlined approach to the oversight of this work,

should the PRPs agree to undertake it.

G. CRA and the Settlors suggested that EPA include in the ROD language to the effect that under the pump and treat scheme proposed under Alternative 4, "capture of contaminants by pumping from the aquifer would be difficult due to the fractured nature of the bedrock aquifer. Therefore, Alternative 4 may not be reliable over the long term."

EPA Response: EPA generally agrees with this statement. See Section 8.6 of the Decision Summary

LIMESTONE ROAD OU2
ADMINISTRATIVE RECORD FILM * **
INDEX OF DOCUMENTS

II. REMEDIAL ENFORCEMENT PLANNING

1. Complaint, In the United States District Court the District of Maryland, United States of America, Plaintiff, v. Fairchild Industries, Inc. and Cumberland Cement and Supply Co., Defendant, (undated). P. 200001-200011.

2. Partial Consent Decree, In the United States District Court for the District of Maryland; Civil Action No. R-88-2933; United States of America, et al., Plaintiffs; v. Fairchild Industries, Inc. and Cumberland Cement and Supply Co., Defendants, (undated). P. 200012-200071.

3. Letter to Mr. Tracy Getz, Winston & Strawn, from Ms. Cynthia Nadolski, U.S. EPA, re: Interpretation of the language in the Partial Consent Decree describing the procedures EPA uses to approve or disapprove of plans, reports, or proposals, 1/23/92. P. 200072-200073.

4. Letter to Mr. Danald [sic] Rose from M. S. Andrew Sochanski, U.S. EPA, re: Consent for Access or Right, of Entry to Mr. Rose's property, 1/31/92. P. 200074-200075.

5. Letter to Mrs. Viola Piper from Mr. S. Andrew Sochanski, U.S. EPA, re: consent for Access or Right of Entry to Ms. Piper's property, 1/31/92. P. 200075-200075.

6. Letter to Mr. Ray Brabson from Mr. S. Andrew Sochanski, U.S. EPA, re: Consent for Access or Right of Entry to Mr. Brabson's property, 1/31/92 P. 200076-200076.

7. Letter to Ms. Viola Piper from Mr. S. Andrew Sochanski, U.S. EPA, re: The signed Consent for Access or Right of Entry to Ms. Piper's property, 1/31/92. P. 200077-200079. The Consent for Access is attached.

* Administrative Record File available 3/11/91, updated 3/27/92, 2/2/93, 10/18/93, and 4/11/96.

** Further information pertaining Limestone Road OU2 can be found in the Administrative Record File for Limestone Road OU1.

8. Letter to Mr. and Mrs. Ray Brabson from Mr. S. Andrew Sochanski, U.S. EPA, re: The signed Consent for Access or Right of Entry to the Brabson's property, 1/31/92. P. 200080-200082. The Consent for Access is attached.

9. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Philip M. Andrews, Kramon & Graham, re: Clarification of requirements in the Consent Decree not being fulfilled, 2/18/92. P. 200083-200085.

10. Consent for Access to Property, signed by Mr. Donald R. Rose, 3/18/92. P. 200086-200088. A site map is attached.

11. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Philip M. Andrews, Kramon & Graham, re: Notice of

violation letter sent to Cumberland Cement and Supply and Fairchild Industries, Inc., 4/2/92. P. 200089-200090.

12. Letter to Mr. Philip M. Andrews, Kramon & Graham, from Mr. S. Andrew Sochanski, U.S. EPA, re: Non-compliance with the Consent Decree, 4/24/92. P. 200091-200092.

13. Letter to Mr. Philip M. Andrews, Kramon & Graham, from Mr. S. Andrew Sochanski, U.S. EPA, re: Non-compliance with the Consent Decree, 5/5/92. P. 200093-200094.

14. Letter to Ms. Cynthia Nadolski, U.S. EPA, from Mr. B. Michael Hodge, The Fairchild Corporation, re: Replacement of Mr. Tracy Getz of Winston & Strawn as counsel for Fairchild Industries, Inc., 10/1/92. P 200095-200095.

III. REMEDIAL RESPONSE PLANNING

1. Report: Work Plan for the Supplemental Remedial Investigation/Feasibility Study (SRI/FS) and Remedial Design/Remedial Action (RD/RA) at the Limestone Road Site, Cumberland, Maryland, prepared by/Geraghty and Miller, Inc., 5/88. P. 300001-300076.

2. National Priorities List (NPL) Site Certification, Limestone Road Site, Cumberland, Allegheny Co., Maryland, 4/21 to 22/90. P. 300077-300077.

3. Letter to Mr. Robert Davis, U.S. EPA, from Mr. John P. Wolfin, U.S. Department of the Interior (DOI), re: Site biological characterization, 7/13/90. P. 300078-300080. A map showing additional sampling locations is attached.

4. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. John P. Wolflin, U.S. DOI, re: Presence of endangered species at the site, 10/4/90. P. 300081-300082.

5. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. James Burtis, Jr., Maryland Department of Natural Resources, re: Presence of Federal or state threatened or endangered plant or wildlife species at the site, 10/12/90. P. 300083-300083.

6. Memorandum to Mr. Andrew Sochansky [sic], U.S. EPA, from Biological Technical Assistance Group (BTAG), re: Recommendations for Potentially Responsible Parties (PRPs) to carry out sampling and analysis suggestions, 12/20/90. P. 300084-300085. A letter regarding the U.S. DOI's review of the revised Field Sampling Plan is attached.

7. Report: Field Sampling Plan for the SRI/FS at the Limestone Road Site, Cumberland, Maryland, Draft Report, prepared by Geraghty & Miller, Inc., 6/90. P. 300086-300241. A cover letter is attached.

8. Report: Quality Assurance Project Plan for the SRI/FS at the Limestone Road Site. Cumberland, Maryland, Draft Report, prepared by Geraghty & Miller, Inc., 6/90. P. 300242-300552. (Pages 300251-300258 and 300452-300468 have been removed because they contain confidential information.)

9. Letter to Mr. Scott Phillips, Geraghty & Miller, Inc., from Mr. S. Andrew Sochanski, U.S. EPA, re: Initial review of the draft Field Sampling Plan (DFSP) and the draft Quality Assurance Project Plan (DQAPP) for the

SRI/FS, 7/23/90. P. 300553-300584. The following are attached:

a) Figure 3.1, Locations of Sampling Sites for the Supplemental Remedial Investigation;

b) comments on the draft Field Sampling Plan;

c) comments on the draft Quality Assurance Project Plan;

d) comments on the Quality Assurance Project Plan Review.

10. Report: Field Sampling Plan for the SRI/FS at the Limestone Road Site, Cumberland, Maryland, Revised Draft Report, prepared by Geraghty & Miller, Inc., 8/90. P. 300585-300830. A cover letter and responses to EPA's review of the Field Sampling Plan are attached.

11. Report: Revised Draft Quality Assurance Project Plan, Limestone Road SRI/FS, Cumberland, Maryland, prepared by Geraghty & Miller, Inc., 8/90. P. 300831-301059. A cover letter and a summary of responses to the draft Quality Assurance Project Plan are attached. (Pages 300862-300869 and 300932-300969 have been removed because they contain confidential information.)

12. Report: Appendix B, Laboratory Quality Assurance Plan, Limestone Road RI/FS, prepared by Geraghty & Miller, Inc., 8/28/90. P. 301060-301177. (Pages 301138-301148 and 301153-301158 have been-removed because they contain confidential information.)

13. Letter to Mr. Scott Phillips, Geraghty & Miller, Inc., from Mr. S. Andrew Sochanski, U.S. EPA, re: Second review of the draft Field Sampling Plan and draft Quality Assurance Project Plan, 10/18/90. P. 301178-301197. EPA's responses to Geraghty & Miller's comments and an agenda for review of significant comments to the second draft of the Field Sampling Plan are attached.

14. Report: Revised Field Sampling Plan for the SRI/FS at the Limestone Road Site, Cumberland, Maryland, Draft Report, prepared by Geraghty & Miller, Inc., 11/90. P. 301198-301453. A cover letter and responses to EPA's October 1990 comments on the review of the Field Sampling Plan and the Quality Assurance Project Plan are attached.

15. Report: Revised Draft Quality Assurance Project Plan, Limestone Road SRI/FS, Cumberland, MaryLand, prepared by Geraghty & Miller, Inc., 11/90. P 301454-301783. (Pages 301471-301478, 301541-301575, 301655-301665, and 301670-301675 have been removed because they contain confidential information.)

16. Report: Field Sampling Plan for the SRI/FS at the Limestone Road Site, Cumberland, Maryland, prepared by Geraghty & Miller, Inc., 7/91. P. 301784-302067. Six letters and a non-potable water chemistry proficiency test report are attached.

17. Report: Quality Assurance Project Plan, Limestone Road SRI/FS, Cumberland, Maryland, prepared by Geraghty & Miller, Inc., 7/91. P. 302068-302395. (Pages 302085-302092, 302157-302190, and 302270-302277 have been removed because they contain confidential information.)

18. Letter to Mr. Bob Byer, Geraghty & Miller, Inc., from Mr. S. Andrew Sochanski, U.S. EPA, re: Fourth review of the revised Field Sampling Plan and Quality Assurance Project Plan, 9/16/91. P. 302396-302400.

19. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Robert M. Byer, Jr., Mr. John E. Claypool, and Mr. Jeffrey P. Sgambat, Geraghty & Miller, Inc., re: Revised pages of the Field Sampling Plan and Quality Assurance Project Plan, 9/30/91. P. 302401-302452. Responses to EPA's September 1991 comments on the review of the Field Sampling Plan and Quality Assurance Project Plan and the revised pages of the plans are attached. (Pages 302436-302448 have been removed because they contain confidential information.)

20. Letter to Mr. S. Andrew Sochanski, Ms. Cynthia Nadolski, and Mr. David Healy, U.S. EPA from Mr. Jeffrey P. Sgambat, Geraghty & Miller, Inc., re: Revised pages of the Field Sampling Plan and Quality Assurance Project Plan, 12/19/91. P. 302453-302492. The following are attached:

    a) a facsimile cover letter;

    b) Attachment 1, Responses to EPA's November 20, 1991 Comments on the Review of the Field Sampling Plan and Quality Assurance Project Plan;

    c) the revised pages of the Field Sampling Plan;

    d) the revised pages of the Quality Assurance Project Plan.

21. Report: Health and Safety Plan for the SRI/FS at the Limestone Road Site, Cumberland, Maryland, prepared by Geraghty & Miller, Inc., 9/90. P. 302493-302690.

22. Report: Field Sampling Plan for the SRI/FS at the Limestone Road Site, Cumberland, Maryland, prepared by Geraghty & Miller, Inc., 12/91. P. 302691-302925.

23. Letter to Mr. Jeffery P. Sgambat, Geraghty & Miller, Inc., from Mr. S. Andrew Sochanski, U.S. EPA, re: Review of the draft Field Sampling,Plan and the Quality Assurance Project Plan, 1/17/92. P. 302926-302929. The review comments are attached.

24. Report: Revised Quality Assurance Project Plan, Limestone Road SRI/FS, Cumberland, Maryland, prepared by Geraghty & Miller, Inc., 2/92. P. 302930-303238.

25. Letter to Mr. Tracy M. Getz, Winston & Strawn, and Mr. Philip M. Andrews, Kramon & Graham, from Mr. S. Andrew Sochanski, U.S. EPA, re: Review and acceptance of the proposed substitute Prime Contractor for site work, 3/11/92. P. 303239-303240.

26. Letter to Ms. Cynthia Nadolski, U.S. EPA, from Mr. Philip M. Andrews, Kramon & Graham, re: Proposed sign locations, 3/17/92. P. 303241-303244. Two site maps showing approximate locations for signs are attached.

27. Report: Geophysical Investigation at the Limestone Road Site near Cumberland, Maryland, (author cited), 4/92 to 6/92. P. 303245-303426.

28. Letter to Mr. David Kargbo, U.S. EPA, from Mr. Robert

T. Pyle, Conestoga-Rovers & Associates, re: Site inspection to review alternate borehole and monitoring well locations, 4/2/92. P. 303427-303429. A site map and a facsimile transmittal sheet are attached.

29. Report: Summary Report of Short Term Aquifer Testing Program and Long Term Aquifer Testing proposal, Limestone Road Site, Cumberland, Maryland, prepared by Conestoga-Rovers & Associates, 5/92. P. 303430-303581.

30. Report: Geotechnical Testing Report, Limestone Road Site, Cumberland, Maryland, prepared by Empire Soils Investigations, Inc., 6/92. P. 303582-303643.

31. Letter to Mr. Robert T. Pyle, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Review comments on the Summary Report of Short Term Aquifer Testing Program and Long Term Aquifer Testing Proposal, 6/8/92. P. 303644-303648. The comments are attached.

32. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Robert T. Pyle, Conestoga-Rovers & Associates, re: Responses to EPA's comments on the Summary Report of Short Term Aquifer Testing Program and Long Term Aquifer Testing Proposal, 6/8/92. P. 303649-303661. The responses are attached.

33. Memorandum to Ms. Carol Dunnigan from Ms. Doreen Carden, re: Analytical Data Quality Assessment and Validation of the surface soil cap area and soil borings investigation, 8/4/92. P. 30662-30703. The following are attached:

    a) Table 1, Analytical Results, Fill Sample Program;
    b) Table 2, Analytical Results, Soil Fill Boreholes;

    c) Table 3, Summary of Sample Collection and Analytical Programs;

    d) Table 4, Qualification of Data due to Outlying Internal Standard Area Counts;

    e) Table 5, Qualified Sample Data due to Field Duplicated Discrepancies, Soil Borings;

    f) Table 6, Qualification of Data due to Outlying Matrix Spike Recoveries;

    g) Table 7, Qualified Sample Data due to Field Duplicated Discrepancies, Soil Fill.

34. Letter to Mr. Robert T. Pyle, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Summary of EPA's and Maryland Department of the Environment's position on the RI/FS work tasks, 8/6/92. P. 303704-303706.

35. Letter to Mr. S. Andrew Sochanski U.S. EPA, from Mr. Robert T. Pyle, Conestoga-Rovers & Associates, re: Response to clarify Conestoga-Rovers' understanding of the progress of site work, 8/12/92. P. 303706-303709.

36. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Robert T. Pyle, Conestoga-Rovers & Associates, re: Clarification of issues concerning the Long Term Aquifer Testing Program, 9/4/92. P. 303710-303712.

37. Letter to Mr. Robert T. Pyle, Conestoga-Rovers &

Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Review comments on the Geotechnical Testing Report, the Geophysical Investigation Report, and the Analytical Data Quality Assessment and Validation, 9/11/92. P. 303713-303716. The comments are attached.

38. Letter to Mr. Andrew Sochanski, U.S. EPA, from Mr. Robert T. Pyle, Conestoga-Rovers & Associates, re: Proposed changes to the Long Term Aquifer Testing Program, 9/22/92. P. 303717-303725. Three graphs are attached.

39. Letter to Mr. S.A. Sochanski, U.S. EPA, from Ms. Carol F. Dunnigan, Conestoga-Rovers & Associates, re: Clarification of sampling results, 10/15/92. P. 303726-303730. A table of Surface Fill Soil Samples and a site map are attached.

40. Letter to Mr. Robert T. Pyle, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: The Long Term Aquifer Testing Program, 10/24/92. P. 303731-303735.

41. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Robert T. Pyle, Conestoga-Rovers & Associates, re: Installation of additional monitoring wells and scheduling of field activities for the Supplemental Remedial Investigation, 11/13/92. P. 303736-303740. Two revised RI/FS schedules are attached.

42. Letter to Mr. Robert T. Pyle, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Review comments on the Analytical Quality Assessment and Validation, 11/16/92. P. 303741-303743. The comments are attached.

43 Letter to Mr. Jeffery P. Sgambat, Geraghty & Miller, Inc., from Mr. S. Andrew Sochanski, U.S. EPA, re: Discovery of bullet holes in monitoring well casings, 7/3/91. P. 303744-303745.

44 Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Philip M. Andrews, Kramon & Graham, re: Response to the letter concerning bullet holes found in monitoring well casings, 7/22/91. P. 303746-30374.

45 Letter to Mr. Phil Andrews, Kramon & Graham, from Ms. Cynthia Nadolski, U.S. EPA, re: Signs: to be posted at the site to deter unrestricted access, 9/24/91. P. 303748-303749.

46 Report: Remedial Investigation Risk Assessment Work Plan, Limestone Road Site, Cumberland, Maryland, prepared by Dynamac Corporation, 3/31/92. P. 303750-303787. A cover letter is attached.

47 Report: Analytical Data Quality Assessment and Validation, Limestone Road SRI/FS, prepared by Conestoga-Rovers & Associates, 7/8/92. P. 303788-303866.

48 Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Robert T. Pyle, Conestoga-Rovers & Associates, re: Results of fill material sampling, 8/12/92. P. 303867-303868.

49 Letter to Mr. Robert T. Pyle, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Acceptance of the schedule for additional monitoring

well installation, 12/14/92. P. 303869-303870.

50 Report: Supplemental Remedial Investigation, Long-Term Pumping Test Results and Additional Monitoring Well Proposal, Limestone Road Site, Cumberland, Maryland, prepared by Conestoga-Rovers & Associates, 1/29/93. P. 303871-304193. A cover letter is attached.

51. Report: Attachment 1, Supplemental Remedial Investigation, Long-Term Pumping Test Results and Additional Monitoring Well Proposal, Limestone Road Site, Cumberland, Maryland, prepared by Gonestoga-Rovers & Associates, 1/29/93. P. 304194-304392.

52. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Robert T. Pyle, Conestoga-Rovers & Associates, re: Request for a meeting to resolve differences concerning the expansion of activities beyond site limits, 2/1/93. P. 304393-304401. A letter dated January 21, 1993 regarding the third round surface soil sampling and six site maps are attached.

53. Report: Residential Well Sampling Proposal, Limestone Road Site, Cumberland, Maryland, prepared by Conestoga-Rovers & Associates, 2/5/93. P. 304402-304432. A cover letter is attached.

54. Letter to Mr. Camille Costa, Dynamac Corporation, from Mr. S. Andrew Sochanski, U.S. EPA, re: Review of the revised Ecological Risk Assessment Work Plan, 2/8/93. P. 304433-304433.

55. Letter to Director of Public Works, City of Cumberland, from Ms. Carol F. Dunnigan, Conestoga-Rovers & Associates, re: Request for permission to discharge to the city wastewater treatment facility, 2/9/93. P. 304434-304458. A table of stored ground water sampling results and an analytical report of sampling results are attached.

56. Letter to Mr. Robert T. Pyle, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Review comments on the Long Term Pumping Test Results and Additional Monitoring Well Proposal and the Geophysical Survey Report, 2/16/93. P. 304459-304474. The comments are attached.

57. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Robert T. Pyle, Conestoga-Rovers & Associates, re: Results of the reanalysis of archived fill samples and a change to be made to the analysis method for cadmium, 2/18/93. P. 304475-304493. The following are attached:

a) Figure 1, Perimeter Fill Material Analytical Data Summary;

b) a table of Surface Fill Soil Samples;

c) a memorandum regarding the assessment and validation of analytical results, dated February 9, 1993;

d) Table 1, Analytical Data, Cadmium Reanalysis;

e) Table 2, Qualified Data due to Outlying Matrix Spike Recoveries, Cadmium Reanalysis;

f) Table 3, Qualified Sample Data due to

Outlying MSA Correlation Coefficients, Cadmium Reanalysis;

g) Table 4, Field Duplicate Results and Qualified sample Data, Cadmium Reanalysis;

h) Table 5, Sample Data Discrepancies, Cadmium Reanalysis.

58. Report: Analytical Data Quality Assessment and Validation, Limestone Road SRI/FS, Soil Samples (13), prepared by Conestoga-Rovers & Associates, 3/4/93. P. 304494-304515.

59. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Ms. Carol F. Dunnigan, Conestoga-Rovers & Associates, re: Notification of a change in Project, Coordinator for Conestoga-Rovers & Associates 3/4/93. P. 304516-304525. The resume of Mr. Jack J.A. Michels is attached.

60. Letter to Mr. Robert T. Pyle, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Review comments on the Residential Well Sampling proposal, 3/4/93. P. 304526-304533. The comments are attached.

61. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Andrew P. Kisiel, Conestoga-Rovers & Associates, re: Specifications for well construction details, 3/5/93. P. 304534-304535.

62. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Michael G. Mateyk, Conestoga-Rovers & Associates, re: Response to EPA's and Maryland Department of the Environment's comments on the Additional Monitoring Well Proposal, 3/9/93. P. 304536-304554. The responses are attached.

63. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Jack J.A. Michels, Conestoga-Rovers & Associates, re: Request for an extension to submit the remedial Design Plan, 3/12/93. P. 304555-304555.

64. Memorandum to Mr. Frederick Dreisch from Behrooz Khoshkhoo, Lockheed Environmental systems & Technologies Co., re: Total hexavalent chromium determinations, 3/22/93. P. 304556-304559.

65. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Michael G. Mateyk, Conestoga-Rovers & Associates, re: Response to EPA's and Maryland Department of the Environment's comments on the Residential Well Sampling Proposal, 3/24/93. P. 304560-304572. The responses are attached.

66. Memorandum to Mr. Frederick Dreisch from Ms. Linda D. Vaughan, Lockheed Environmental Systems & Technologies Co., re: Determination of pH in soil samples, 3/26/93. P. 304573-304574.

67. Letter to Mr. Jack J.A. Michels, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Acceptance of the request for an extension to submit the Remedial Design Work Plan, 3/31/93. P. 304575-304576.

68. Letter to Mr. Jack J.A. Michels, Conestoga-Rovers & Associates, form Mr. S. Andrew Sochanski, U.S. EPA, re: Acceptance of Mr. Michels as the new Project Coordinator for Conestoga-Rovers & Associates, 3/31/93.

P. 304577-304578.

69. Report: Analytical Data Quality Assessment and Validation Limestone Road SRI/FS, Soil Fill Samples (10), prepared by Conestoga-Rovers & Associates, 4/93. P. 304579-304597.

70. Letter to Mr. Jack J.A. Michels, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Review of the Residential Well Sampling Proposal and the Long Term Pumping Test Results and Additional Monitoring Well Proposal, 4/7/93. P. 304598-304600.

71. Letter to Mr. Jack J.A. Michels, Conestoga-Rovers & Associates, from Mr. S Andrew Sochanski, U.S. EPA, re: Design specifications, 4/8/93. P. 304601-304603. A Remedial Design Specifications and Plans Distribution List is attached.

72. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Jack Michels, Conestoga-Rovers & Associates, re: Response to EPA's comments on the Residential Well Sampling Proposal, 4/13/93. P. 304604-304606. A table of residential wells sampled is attached.

73. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Ms. Carol F. Dunnigan, Conestoga-Rovers & Associates, re: Request for a sample key, 4/15/93. P.304607-304607.

74. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Jack Michels, Conestoga-Rovers & Associates, re: Residential well sampling efforts, 4/1593. P. 304608-304611. Two lists of residential wells to be sampled are attached.

75. Report: Trip Report for Enforcement Sampling at the Limestone Road Site, Cumberland, Maryland, prepared by Dynamac Corporation, 4/16/93. P. 304612-304662. A cover letter is attached.

76. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Jack Michels, Conestoga-Rovers & Associates, re: Request for permission to discharge ground water, 4/22/93. P. 304663-304669. A stored ground water analysis table and ground water sampling results are attached.

77. Letter to Mr. Jack Michels, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Request for a meeting to discuss the Long Term Monitoring Well Proposal, the Additional Monitoring Well Installation, and the Residential Well Sampling Proposal, 4/26/93. P. 304670-304671.

77. Letter to Mr. Burly Cunningham from Mr. S. Andrew Sochanski, U.S. EPA, re: Request for vehicles and other salvage material to be removed from the Diggs property, 4/27/93. P. 304672-304673.

79. Letter to Mr. Jack Michels, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: EPA's contesting of a dispute resolution claim and information on the residential well sampling, 4/27/93. P. 304674-304675.

80. Report: Limestone Road. Superfund Enforcement Account

No. TGB03N663, REO 9300067, prepared by U.S. EPA, 4/28/93. P. 304676-304697.

81. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Jack Michels, Conestoga-Rovers & Associates, re: Results of the filtered and unfiltered ground and surface water sampling, 4/30/93. P. 304698-304699.

82. Letter to Mr. Jack Michels, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Denial of a request to dispose of ground water on-site, 5/4/93. P. 304700-304700.

83. Report: Analytical Report, Project Number 4550, prepared by Enesco-Wadsworth/Alert Laboratories, 5/12/93. P. 304701-304738.

84. Report: Remedial Design Plan, Limestone Road, Cumberland, Maryland, prepared by Conestoga-Rovers & Associates, 5/12/93. P. 304739-304990.

85. Report: Health and Safety Plan, Interim Remedial Action, Limestone Road Site, Cumberland, Maryland, prepared by Conestoga-Rovers & Associates, 5/12/93. P. 304991-305083.

86. Report: Operation and Maintenance Plan Limestone Road Site, Cumberland, Maryland, prepared by Conestoga-Rovers & Associates, 5/12/93. P. 305084-305101.

87. Report: Interim Remedial Program Project Specifications, Limestone Road Site, Cumberland, Maryland, prepared by Conestoga-Rovers & Associates, 5/12/93. P. 305102-305231.

88. Report: Construction Quality Assurance Project Plan, Limestone Road Site, Cumberland, Maryland, prepared by Conestoga-Rovers & Associates, 5/12/93. P. 305232-305261.

89. Report: Evaluation of Total Versus Dissolved Constituent Concentrations, Supplemental Remedial Investigation/Feasibility Study, Limestone Road Site, Cumberland, Maryland, prepared by Conestoga-Rovers & Associates, 5/12/93. P. 305262-305382. A cover letter is attached.

90. Report: Trip Report for Enforcement Sampling at the Limestone Road Site, Cumberland, Maryland, prepared by Dynamac Corporation, 5/17/93. P. 305383-305406. A cover letter is attached.

91. Report: Evaluation of Total Versus Dissolved Constituent Concentrations, Supplemental Remedial Investigation/Feasibility Study, Limestone Road Site, Cumberland, Maryland, prepared by Conestoga-Rovers & Associates, 5/28/93. P. 305407-305466. A cover letter is attached.

92. Letter to Mr. Jack Michels, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Need for collection of additional geophysical data, 6/1/93. P. 305467-305468.

93. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Jack Michels, Conestoga-Rovers & Associates, re: Notice that Fairchild Industries will not perform additional geophysical data collection, 6/7/93.

P. 305469-305469.

94. Letter to Mr. Jack Michels, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Review of the Total Versus Dissolved Metals Residential Well Sampling, 6/7/93. P. 305470-305471.

95. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Jack Michels, Conestoga-Rovers & Associates, re: Additional residential well sampling, 6/10/93. P. 305472-305474. The sampling results are attached.

96. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Jack Michels, Conestoga-Rovers & Associates, re: Revision of the capping boundaries, 6/16/93. P. 304575-305481. Surface fill sampling results are attached.

97. Letter to Mr. Jack Michels, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Review comments on the Remedial Design Plan, the Project Specifications, the Construction Quality Assurance Project Plan, the Operation and Maintenance Plan, and the Health and Safety Plan, 6/16/93. P. 305482-305528. The comments are attached.

98. Letter to Mr. Jack Michels, Conestoga-Rovers & Associates, from Mr. S. Andrew Sochanski, U.S. EPA, re: Review comments on the operation and Maintenance Plan, 6/17/93. P. 305529-305530. The comments are attached

99. Report: Trip Report for Enforcement Sampling at the Limestone Road Site, Cumberland, Maryland, prepared by Dynamac Corporation, 6/17/93. P. 305531-305558. A cover letter is attached.

100. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Philip M. Andrews, Kramon & Graham, re: Notice that Cumberland Cement and Supply Company will not perform additional work, 6/17/93. P. 305559-305559.

101. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Andrew P. Kisiel, Conestoga-Rovers & Associates, re: A field audit conducted on May 20, 1993 to verify that sampling was being performed according to the Work Plan, 6/17/93. P. 305560-305568. A memorandum dated June 14, 1993 regarding the field audit and a field audit summary form are attached.

102. Memorandum to Mr. Gregg Crystall, U.S. EPA, from Ms. Marian Murphy, Roy F. Weston, Inc., re: Analytical review of five water samples, 6/22/93. P. 305569-305584.

103. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Steven C. Day, Conestoga-Rovers & Associates, re: A laboratory audit conducted on May 27, 1993 to verify that analyses were being performed according to the Work Plan, 6/24/93. P. 305585-305664. A memorandum dated June 23, 1993 regarding the laboratory audit, the Audit Checklist, and Performance Evaluation Results are attached.

104. Special Bulletin A to Regional Response Center, Region III, U.S. EPA, from Mr. George English, U.S. EPA, re: Notification of a $50,000 activation, 7/1/93. P. 305665-305667.

105. Letter to Mr. S. Andrew Sochanski and Ms. Cynthia Nadolski, U.S. EPA, and Mr. David Healy, Maryland Department of the Environment, from Ms. Carol F. Dunnigan, Conestoga-Rovers & Associates re: The April 1993 Analytical Data Quality Assessment and Validation report, 7/7/93. P. 305668-305687. The report is attached.

106. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Wayne H. Sonntag, U.S. DOI, re: The U.S. Geological Survey Work Plan for povision of technical support, 7/7/93 P. 305688-305735. The Work Plan and the scope of Work for Borehole Geophysical Logging and Interpretation are attached.

107. Memorandum to Mr. Andy Sochanski, U.S. EPA, from Ms. Cynthia E. Caporale, U.S. EPA, re: Organic Data Validation for Case 20107/7571HQ, 7/14/93. P. 305736-305745. The Organic Data Validation for Case 20107/7571HQ; Appendix A, Glossary of Data Qualifiers; and Appendix B, Data Summary Forms, are attached.

108. Report: Limestone Road, Superfund Enforcement Account No. 3TGB03N663, REO 9306, prepared by U.S. EPA, 7/21/93. P. 305746-305752.

109. Letter to Mr. S. Andrew Sochanski, U.S. EPA, from Mr. Jack Michels, Conestoga-Rovers & Associates, re: Response to comments on the Remedial Design Plan, 7/21/93. P. 305753-305808. The response is attached.

110. Facsimile transmittal sheet to Mr. Andrew Sochanski, U.S. EPA, from J. Kozel, Dynamac Corporation, re: Summary tables for residential well sampling, 7/28/93. P. 305809-305812. The tables are attached.

111. Report: Analytical Data Quality Assessment and Validation, Limestone Road SRI/FS, Groundwater Investigation Round I, Surface Water/Sediment Investigation Round I, Residential Well Sampling Round I, prepared by Conestoga-Rovers & Associates, 7/28/93. P. 305813-305880. A cover letter is attached.

112. Report: Analytical Data Quality Assessment and Validation, Limestone Road SRI/FS, Groundwater Investigation Round II, Surface Water/Sediment Investigation Round II, Residential Well Sampling Round II, prepared by Contestoga-Rovers & Associates, 7/28/93. P. 305881-305946.

113. Memorandum to Mr. Andy Sochanski, U.S. EPA, from Ms. Cynthia E. Caporale, U.S. EPA, re: Inorganic Data Validation for Case SAS 7865C-03, 8/2/93. P. 305947-305965. The following are attached:

    a) the Inorganic Data Validation for Case SAS 7865C-03;

    b) Table 1, Data Summary Form;

    c) Table 2, Glossary of Data Qualifier Codes;

    d) four Special Analytical Service Packing List/ chain of Custody forms;

    e) three EPA Sample Shipping Logs.

114. Memorandum to Mr. Andy Sochanski, U.S. EPA, from Ms. Cynthia E. Caporale, U.S. EPA, re: Inorganic Data

a) the Inorganic Data Validation for Case SAS 7908C-02;

b) Table 1A, Summary of Qualifiers on Data Summary After Data Validation;

c) Table 1B, Codes Used in Comments Column;

d) Table 2, Glossary of Data Qualifier Codes;

e) Table 3, Summary of Sample Locations and Associated EPA sample Numbers;

f) Appendix A, Results Reported by Laboratory From Inorganics (Is);

g) two Special Analytical Service Packing List/ Chain of Custody forms;

e) two EPA Sample Shipping Logs.

115. Report: Phase I Ecological Assessment Supplemental Remedial Investigation, prepared by Conestoga-Rovers & Associates, 9/94. P. 305982-306102.

116 Letter to Mr. Gerald Hoover, U.S. EPA, from Mr. Jack Michels, Conestoga-Rovers & Associates, re: Supplemental information for the ecological risk assessment for the site, 1/13/95. P. 306103-306111.

117. Letter to Mr. Gerald Hoover, U.S. EPA, from Mr. Jack Michels, Conestoga-Rovers & Associates, re: Supplemental information concerning the ecological risk assessment, 1/16/95. P. 306112-306116.

118. Letter to Mr. Gerald Hoover, U.S. EPA, from Mr. Christopher Bozzini, CH2M Hill, re: Comments concerning the supplemental ecological risk assessment information submitted by Conestoga-Rovers & Associates, 2/6/95. P. 306117-306119.

119. Memorandum Mr. Gerald Hoover, U.S. EPA from Mr. Robert S. Davis, U.S. EPA, re: Biological Technical Assistance Group's (BTAG) comments concerning the supplemental ecological risk assessment information submitted by Conestoga-Rovers & Associates, 2/6/95. P. 306120-306122.

120. Memorandum to Mr. Gerald Hoover, U.S. EPA, from Mr. Robert S. Davis, U.S. EPA, re: Comments concerning the supplemental ecological risk assessment information submitted by Conestoga-Rovers & Associates, 2/10/95. P. 306123-306125.

121. Report: Final Remedial Investigation Report, Volume I Text and Appendices, prepared by Conestoga-Rovers & Associates, 3/95. P. 306126-307152. A transmittal letter is attached.

122. Report: Final supplemental Feasibility Study, prepared by Conestoga-Rovers & Associates, 4/95. P. 307153-307359.

123. U.S. EPA Summary of Environmental Risk Assessment, Limestone Road Superfund Site, 4/10/95. P. 307360-307367. A facsimile transmittal is attached.

124. Memorandum to Mr. Gerald Hoover, U.S. EPA, from Mr. Robert S. Davis, U.S. EPA, re: Comments concerning the ecological risk assessment, 4/26/95. P. 307368-307369.

125. Letter to Mr. Gerald S. Lapsey, U.S. EPA, from Mr. Jack Michels, Conestoga-Rovers & Associates, re: Summary of the results of the residential well monitoring program and proposed changes in the program, 11/17/95. P. 307370-307422. A letter providing EPA's conditional approval to changes in the residential well monitoring program a summary of the statistical methodology used by Conestoga-Rovers & Associates, and the analytical results and comparison statistics for the monitoring program are attached.

126. Report: Interim Remedial Action Operation and Maintenance and Interim Monitoring Program, prepared by Conestoga-Rovers & Associates, 1/96. P. 307423-307587.

127. Letter to Mr. Jack Michels, Conestoga-Rovers & Associates, from Ms. Lesley Brunker, U.S. EPA, re: Conditional approval of the final supplemental feasibility study for the site, 2/14/96. P. 307588-307589.

128. Letter to Ms. Lesley Brunker, U.S. EPA, from Mr. Rick Grills, Maryland Department of the Environment (MDE), re: Approval of the draft proposed plan for the site and notification that the state has no comments concerning this document, 2/29/96. P. 307590-307590.

129. Memorandum to Ms. Lesley Brunker, U.S. EPA, from Mr. Robert S. Davis, U.S. EPA, re: BTAG's comments concerning the draft proposed plan, 3/6/96. P. 307591-307592.

130. Memorandum to Ms. Lesley Brunker, U.S. EPA, from Mr. Roy Smith, U.S. EPA, re: Comments concerning the proposed plan, 3/11/96. P. 307593-307593.

131. Memorandum to the site file, from Mr. Lesley Brunker, re: Revised risk calculations based on changes in the reference dose for manganese, 3/20/96. p. 307594-307594.

132. Proposed Plan, Limestone Road OU2 Site, 4/96. P. 307595-307611.

133. Letter to Ms. Lesley Brunker, U.S. EPA, from Dr. Jane A. Fiscus, Allegheny County Health Department, re: Notification of the Allegheny County Health Department's support of EPA Alternative 3 for the Limestone Road Site, 4/26/96. P.

134. Letter to Ms. Lesley Brunker, U.S. EPA, from Mr. Ronald K. Snyder, Allegheny County Department of Public Works, re: Recommendation that Allegheny County, rather than the PRPs, provide a water supply to the Limestone Road Site, 5/10/96. P.

135. Letter to Ms. Lesley Brunker, U.S. EPA, from Mr. Jack Michels, Constega-Rovers & Associates, re: Transmittal of comments regarding EPA's Proposed Plan for the Limestone Road OU2 Site on behalf of the PRPs, 5/13/96. P.

136. Letter to Ms. Lesley Brunker, U.S. EPA, from Mr. Rick Grills, Maryland Department of the Environment (MDE), re: Notification that MDE has no comments regarding the draft Record of Decision (ROD) for the Limestone Road OU2 Site, 6/12/96. P.

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137. U.S. EPA Fact Sheet, Limestone Road Site, 4/93. P. 500001-500004.

138. Minutes of a public meeting held on April 24, 1996, in the District 16 Fire Hall, 1210 North Branch Road, Cumberland, Maryland, to discuss the proposed plan for the Limestone Road Site, 4/24/96. P.