Hazardous & Toxics Materials
Hand Out (2/88)

HANDOUT

ON THE

WELDON SPRING SITE

A description and analysis
of the hazardous and toxic
materials present on the
Weldon Spring site

February 1988

A U.S. DEPARTMENT OF ENERGY PROJECT

MK-FERGUSON COMPANY
AND
JACOBS ENGINEERING GROUP

-PROJECT MANAGEMENT CONTRACTOR-

I N T R O D U C T I O N

is handout contains information about current conditions at Weldon Spring Site and the possibility for exposure to viduals living or working near the site.

This booklet is organized into three major sections:

* Section I identifies the potentially hazardous and toxic substances at the Weldon Spring Site. Maps identifying areas of contamination on the site are also included in this section.

* Section II discusses the potential exposure pathways through which individuals at Francis Howell High School could come into contact with these hazardous and toxic substances.

* Section III assesses the potential health risks for individuals at Francis Howell High School.

In the first two sections, the information is set forth in a series of questions that are commonly asked about the Weldon Spring Site by visitors and local citizens. The third section nts a summary assessment of the potential for exposures to viduals at Francis Howell High School.

I. HAZARDOUS AND TOXIC SUBSTANCES PRESENT AT THE WELDON SPRING SITE

Three principal categories of hazardous and toxic substanc exist. These are asbestos, chemicals, and radiologica materials.

A. ASBESTOS

What Is Asbestos?

Asbestos is the common name for a group of naturally occurrin fibrous silicate fibers. Asbestos is used for pipe and boile insulation products, automotive brake shoes, packing materia and gaskets, fire-resistant clothing, patching compounds, flooring materials, roofing felts, home and building siding, a sprayed-on surfacing material for walls and ceilings.

What Kind Of Asbestos Materials Are Present At The Weldon Spring Site?

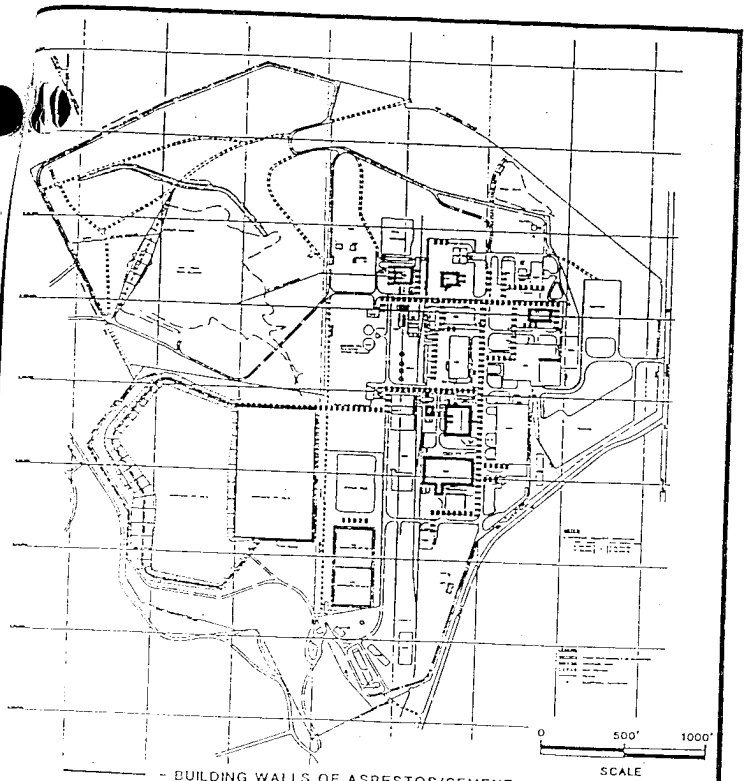
Asbestos materials were used in the construction of some of t manufacturing buildings and in much of the insulation materia which cover steam and process piping. The building construct material is cement-asbestos siding which contains approximat 25 percent asbestos fibers. The pipe insulation material contains various quantities of asbestos, ranging from one percent to fifty percent asbestos fibers. (See Map 1.1)

What Asbestos Levels Are Considered Hazardous?

Th cupational Safety and Health Administration (OSHA) has centration limit of 0.2 asbestos fibers per cubic eter of air in the workplace (0.2 f/cc). Exceeding tha level would be considered a hazard to the worker by OSHA. Th s equivalent to a level which would result in breathing in out 200 fibers with every breath of an average adult.

at Asbestos Levels Are Present At The Weldon Spring Site?

asurements made at both indoor and outdoor locations at the te have shown airborne asbestos levels to be less than 0.01 cc, which is less than 1/20 of the limits set by OSHA. Beyond e fenceline of the site, asbestos fibers disperse to gnificantly less than the 0.01 f/cc levels found at the site ndaries and dispersal over the one-half mile distance to the ool is expected to lower these levels even further and below ection limits.



KNOWN LOCATIONS OF ASBESTOS OUTDOORS

1.7

MAP 1.1

B. CHEMICALS

What Hazardous Chemicals Are Present At The Weldon Spring Site

The potentially hazardous chemicals present at the Weldon Sp Site include trinitrotoluene (TNT) and dinitrotoluene (D (commonly referred to as nitroaromatics), polychlorinate biphenyls (PCBs), nitrates, sulfates, and miscellaneous containerized chemicals, which include items such as industri cleaners, paints, solvents and lubricants.

What Is TNT?

TNT, or trinitrotoluene, is a colorless to pale yellow crystalline solid with no appreciable odor. Used as an explosive, it was produced in large quantities during World II at the Weldon Spring Ordnance Works. Ingestion of TNT c cause liver damage in humans. (See Maps 1.4 and 1.5)

What Is DNT?

DNT, or dinitrotoluene, is an orange-yellow crystalline sol having a characteristic odor. Used as an explosive and prod in large quantities during World War II at the Weldon Spri Ordnance Works, it is considered by the National Institute cupational Safety and Health (NIOSH) to be a suspected rcinogen, based on animal toxicity studies. (See Maps 1.4 1.5)

What Are PCBs?

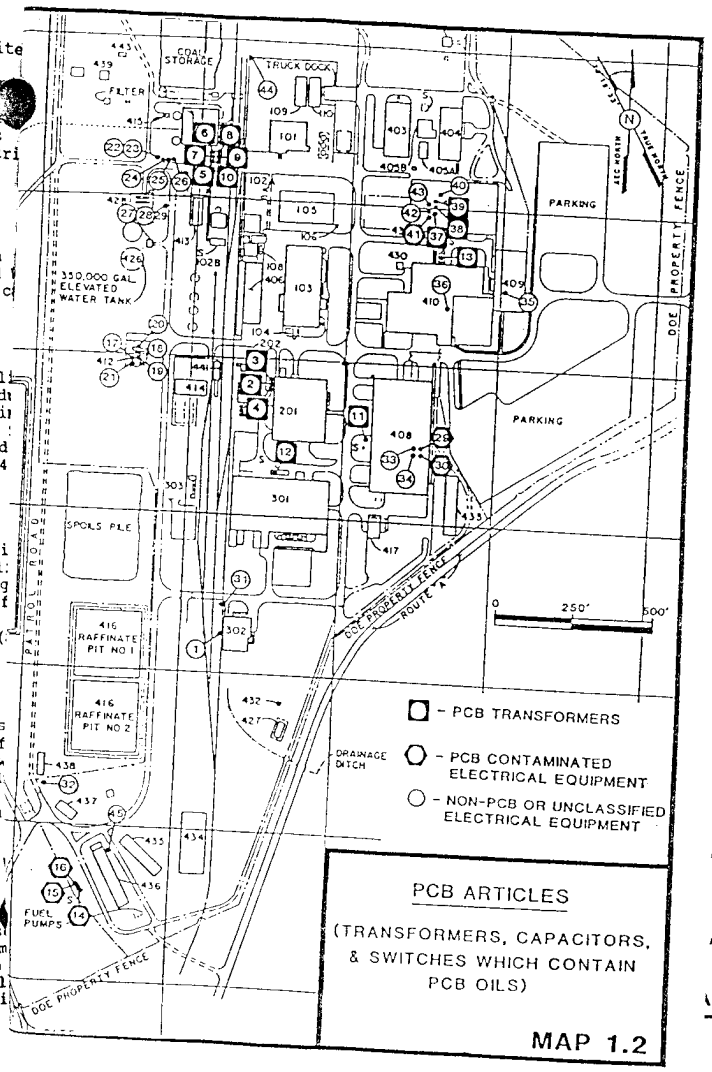
PCBs, or polychlorinated biphenyls, are a thick oily liqui pale yellow or dark brown in color, which has a mild oil-l odor. PCBs are considered by NIOSH to be suspected carcinog based on animal toxicity studies. About 6500 gallons of PCB-containing liquid, are contained in 20 electrical transformers which operated during the 1950s and 1960s. (Map 1.2)

What Are Nitrates And Sulfates?

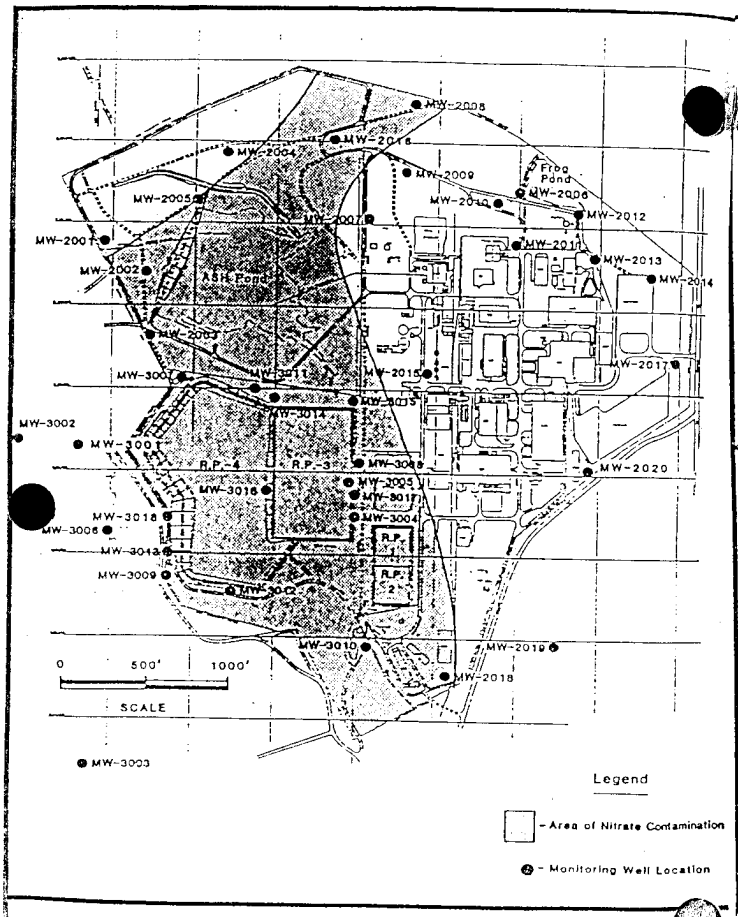
Nitrates and sulfates are negatively charged ions (anions These anions are often associated with various types of inorganic salt compounds. Nitrate and sulfate compounds w used in the various manufacturing processes both in the Ord Works and in the Chemical Plant. (See Map 1.3) Nitrates drinking water are considered harmful to mothers and you children.

Can I Possibly Be Exposed To These Chemicals If I Live Or Near The Site?

For those who live or work outside the site boundaries, i extremely remote, if not altogether impossible, to be expos these hazardous chemicals. There are only three possible m by which one could come into contact with the chemicals on Weldon Spring Site, and these three means, which are call potential exposure pathways, are discussed in the next secti

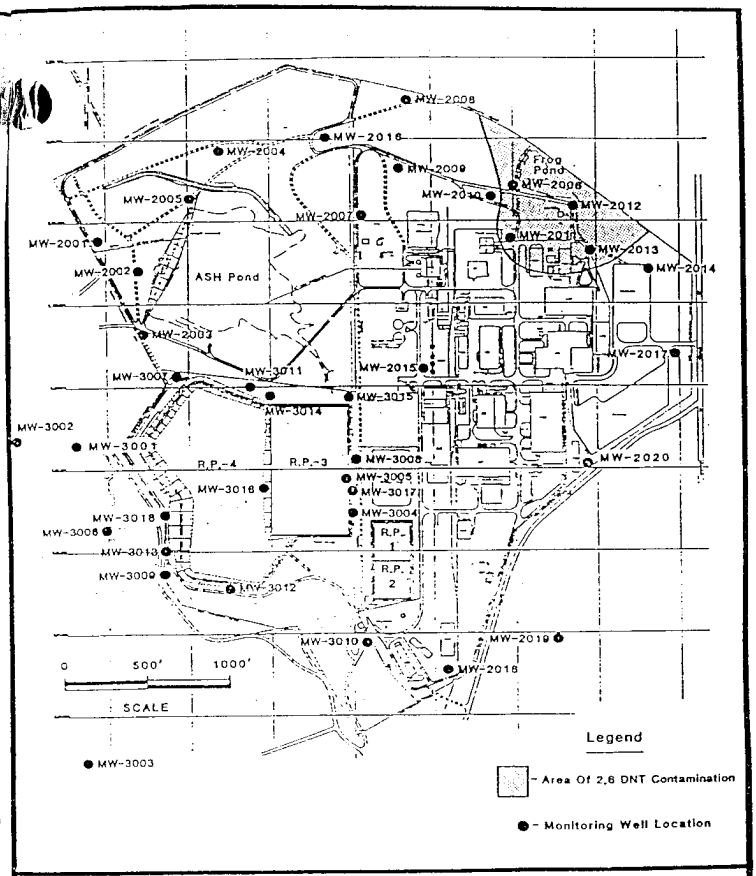


MAP 1.2



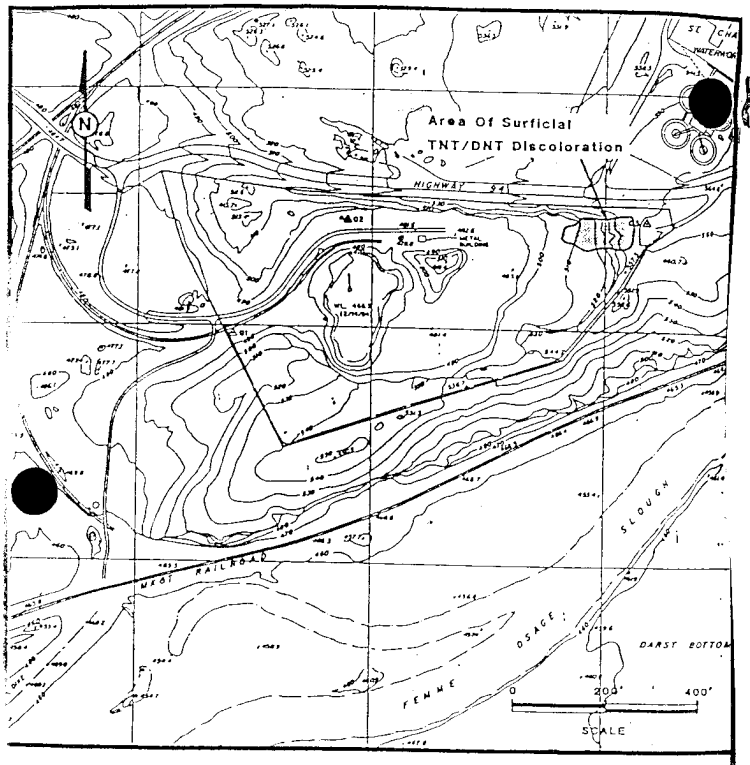
Area Of Nitrate Contamination At The Weldon Spring Site. (Measured In Groundwater At Depths Of 50-100 Feet)

MAP 1.3



Area Of 2,6 - Dinitrotoluene (DNT) Contamination At The Weldon Spring Site. (Measured In Groundwater At Depths Of 50-70 Feet)

MAP 1.4



Weldon Spring Quarry Showing Location Of Surficial Discoloration Containing Percent Levels Of TNT And DNT

MAP 1.5

C. RADIOLOGICAL

What Is Radiation?

Radiation is the energy or particles released through the breakdown of atoms. Radiation exists everywhere in the world. It is present naturally in soil, air, and almost all materials on earth, even the human body.

Radiation can also be created by man through the processing of these naturally occurring elements. Nuclear fuel rods are manufactured to react in a fission process that powers nuclear reactors. Radioactive medical isotopes are created to treat various illnesses. X-rays are used to diagnose medical problems.

The combination of radiation from the earth and cosmic sources is called natural background radiation, which varies with the geographic area. Radioactive materials which are brought into an area, such as the processing materials at the Weldon Spring Site, are considered to be above what is naturally found in the environment.

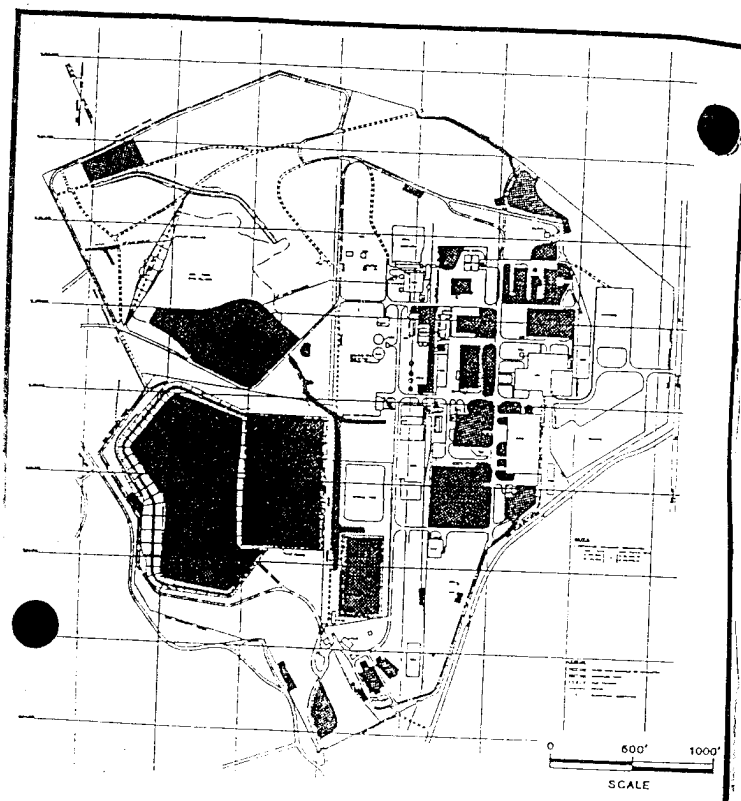
Where Does Radiation Come From At The Weldon Spring Site?

The radiation that is measured above natural background levels at the Weldon Spring Site comes from uranium and thorium and their radioactive decay products. These two naturally occurring metals were processed at the Weldon Spring Site from 1957 to 1966. Most of the material was shipped off site as uranium and thorium metal, but residues remain on site in the buildings, the soil, the raffinate pits, and the quarry. (See Maps 1.6 and 1.7)

Is Francis Howell High School Receiving Radiation From The Weldon Spring Site?

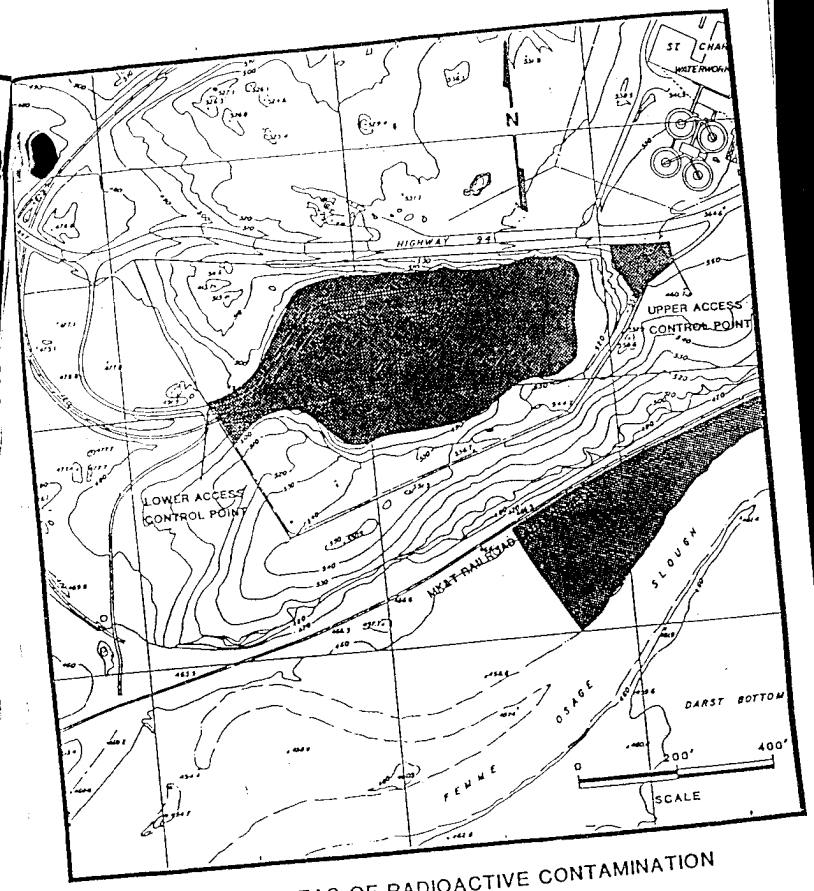
There is above natural background levels of radiation present on the Weldon Spring Site. However, radioactivity measurements made at Francis Howell High School have indicated the presence of only natural background levels of radiation at the school. A detailed explanation of the potential exposure pathways by which substances present at the plant site could be transported to the high school is discussed in the next section.

1.7



KNOWN AREAS OF RADIOACTIVE CONTAMINATION

MAP 1.6



KNOWN AREAS OF RADIOACTIVE CONTAMINATION
AT THE WELDON SPRING QUARRY

MAP 1.7

II. POTENTIAL EXPOSURE PATHWAYS

A. ASBESTOS

Can I Be Exposed To Asbestos Fibers From The Weldon Spring Site?

It is highly unlikely that any measurable amounts of asbestos fibers from the Weldon Spring Site would reach the campus of Francis Howell High School. The cement-asbestos siding material is intact and in good condition and therefore will not release asbestos fibers to the atmosphere. However, much of the pipe insulation outdoors is badly weathered and deteriorated. This material does represent a potential source of airborne asbestos fibers.

As stated earlier, airborne asbestos levels measured at the Weldon Spring Site boundaries show levels to be less than .01 f/cc, which is less than 1/20 of the limits set by OSHA for safe airborne asbestos levels.

Would This Be The Level of Asbestos Fibers At Francis Howell High School?

No. The half-mile distance from the site boundary to Francis Howell High School would disperse these asbestos fibers and reduce the levels or airborne asbestos fibers to much less than the .01 f/cc levels we measure here on the site.

But Won't The Prevailing Winds Blow More Of These Asbestos Fibers Toward Francis Howell High School?

No. The asbestos measurements taken on the site were taken at several locations and many of them were downwind of the asbestos contamination on site. All measurements taken were below the 0.1 f/cc levels; therefore, any prevailing winds would not blow more asbestos fibers toward the school.

What About The Large Amounts Of Asbestos Fibers That Could Be Released When You Begin Removing The Asbestos From The Site?

In order to remove any of the asbestos-containing material from the site, our site personnel and subcontractors must follow strict state, EPA, and OSHA guidelines for asbestos removal. Techniques such as enclosure, wetting and bagging the asbestos material will be employed to ensure that airborne asbestos levels are minimized and do not pose a threat to onsite or offsite persons. In addition, monitoring will be performed by site personnel while the work is performed, both at the location of the work and at the site boundaries.

Furthermore, when the pipe insulation is cleaned up over the next several months, this potential exposure to asbestos will be removed.

B. CHEMICALS

What Potential For Exposure From The Hazardous Chemicals At The Weldon Spring Site Exists For Francis Howell High School?

There are three primary pathways through which exposure to hazardous chemicals can occur. These potential exposure pathways are: Direct Physical Contact (skin exposure), Consumption of Hazardous Chemical Liquids/Solids (ingestion), and Inhalation of Airborne Chemical Hazards (breathing).

Can I Come Into Direct Physical Contact With These Hazardous Materials?

No. Under current conditions, there is no means by which any individual working at Francis Howell High School can come into direct contact with the hazardous chemicals.

Are These Hazardous Chemicals In The Drinking Water?

No. None of the hazardous chemicals on the Weldon Spring Site have been detected in the drinking water that is supplied to Francis Howell High School. The drinking water would be the only plausible environmental pathway for ingestion of the hazardous chemicals.

But Isn't The Groundwater Contaminated With Chemicals?

Yes. There is a groundwater contamination problem beneath the Weldon Spring Site. But none of the groundwater contamination has been found in wells that supply drinking water to individuals in St. Charles County. Tests of private and public water supplies by the Missouri Department of Health and St. Charles County have not identified groundwater contamination from the site reaching these drinking water supplies. Monitoring wells have been installed and are tested on a regular basis to ensure that groundwater contamination migration can be identified and action taken before it reaches public drinking water supplies.

What About Breathing In Hazardous Chemicals? Could I Breathe In Airborne Chemicals Carried From The Site To Francis Howell High School?

There is no possibility of inhaling hazardous chemicals to the point where they would pose a health concern. Hazardous chemicals are in the soil, groundwater and surface water on the site. However, it is not likely that a detectable amount of hazardous chemicals could be released to the air by wind erosion.

This is substantiated by air monitoring studies at the site for PCBs. Monitoring for PCBs on site has shown that airborne concentrations are below detection limits. The results of these monitoring activities indicate that levels at the perimeter of the site represent normal background levels. Since the concentrations of chemical PCBs are below detection limits at

the site boundaries, we would not expect any higher levels at Francis Howell High School.

In An Emergency, Such As A Fire, Tornado, Or A Chemical Spill Or Runoff, Wouldn't Hazardous Chemicals Be Released Off Site?

Yes. There is a potential for chemicals to be released from site. However, since much of the chemicals are in the soil, groundwater, and surface water, a fire on the site would not be expected to burn these chemicals. Any amounts that would be released to the atmosphere would be dispersed over such a wide area as to be below detection limits.

A tornado's winds would also disperse these chemicals over such a wide area as to be below detection limits.

A Spill Response Team has been assembled on site which can identify, locate, and clean up materials that could go off site in an accident. The quick response and cleanup by the Spill Response Team is expected to preclude any increase in potential exposure to individuals at Francis Howell High School.

Interim Response Actions to remove asbestos, PCBs, and containerized chemicals are underway to remove these potentially hazardous materials from the site.

C. RADIOLOGICAL

What Radiation Am I Receiving From The Weldon Spring Site As A Worker Or Student At Francis Howell High School?

Measurements have been made which show that there are no measurable levels of radiation or radioactivity that exceed natural background at Francis Howell High School.

Since there are no measurable levels of radiation above background, there are no increased health risks from radioactivity to workers at Francis Howell High School.

How Can I Be Sure That I'm Not Receiving Any Radiation From The Weldon Spring Site When One Cannot See Radiation?

While radiation and radioactivity cannot be seen by the naked eye, it is actually very easy to "see" and measure radiation and radioactivity through the use of instruments. Measurements are made on a regular basis both on the site and at off site locations like Francis Howell High School to measure radioactivity. Tests are conducted to measure radon, a radioactive gas which is released from radium, air particulate concentrations, which could contain radioactive particles, and gamma rays, which are electromagnetic radiation.

Tests are also conducted on the St. Charles County Wellfield and the County Water Treatment System, which supplies water to Francis Howell High School.

What Is Natural Background Radiation At Francis Howell High School?

Natural background radiation, or the combination of radiation received naturally from earth and cosmic sources, in Missouri and St. Charles County ranges from 61 to 89 millirems per year, as measured by Oak Ridge Associated Universities in 1985 and United Nuclear Corporation in 1987. This measurement of background radiation is taken from gamma radiation exposure rates. Under current conditions, the gamma radiation exposure rate at Francis Howell High School is 79.6 millirems per year, as measured by site personnel.

What About Radon Gas? Aren't There Clouds Of Radon Being Released From The Site?

No. Radon gas measurements are made continuously in 31 locations, four of which are offsite. One of the offsite locations is located at Francis Howell High School in an area close to the site boundary. A typical range for natural background radon concentrations in Missouri is 0.25 to 2.0 picocuries per liter (pCi/L). At Francis Howell High School, the measured radon concentration was 0.27 pCi/L.

Do Dust Particles From The Weldon Spring Site Contain Radioactivity?

Yes, there is a potential that radioactivity could be attached to air particulate matter, or dust. However, no radioactivity above that which can be expected from natural background sources has been measured at Francis Howell High School or at the several other locations in which we have installed air particulate samplers. These air particulate samplers measure for radioactivity in dust particles on a continuous basis. Under current conditions, we would not expect these levels to increase above natural background levels. This is based on more than 12 months of measurements which show no radioactivity above background at any of the sampling locations.

Is The Water We Drink And Use At Francis Howell High School Contaminated With Radioactivity From The Weldon Spring Site?

No. Samples have been taken of water treated at the St. Charles County Water Treatment Plant which supplies the water to Francis Howell High School. No radioactivity has been detected in the water above that expected from natural sources. Groundwater and surface water samples have also been taken at the St. Charles County Wellfield, where the Water Treatment Plant receives its raw water. In these samples, no radioactivity above natural background was detected.

III. SUMMARY OF HEALTH RISKS TO WORKERS AT FRANCIS HOWELL HIGH SCHOOL

A. ASBESTOS

Measured airborne asbestos levels at the Weldon Spring Site boundaries are less than 0.01 f/cc, which is less than 1/20 of the limits set by OSHA for safe airborne asbestos levels. The half-mile distance from the site boundary to Francis Howell High School is expected to disperse these asbestos fibers to much lower concentrations.

Therefore, since the levels of airborne asbestos fibers do not even approach the limits set by OSHA for asbestos fiber concentration in the air, there is no measurable health risk to individuals at Francis Howell High School from asbestos present on the Weldon Spring Site.

Furthermore, after the deteriorated asbestos is removed, under strict state and federal guidelines, any possible exposure to asbestos fibers will be removed.

B. CHEMICAL

In the previous section, the three potential exposure pathways were discussed as the only plausible means by which hazardous chemicals at the Weldon Spring Site could reach individuals at Francis Howell High School.

There is no credible means by which individuals at Francis Howell can come into direct contact with the hazardous chemicals; therefore, there is no potential health risk from this exposure pathway.

Since none of the hazardous chemicals have been detected in the drinking water that is supplied to Francis Howell High School, there is no plausible means by which these chemicals can be taken in by workers through ingestion; therefore, there is no potential health risk from this exposure pathway.

Air monitoring has been performed at the site to measure for PCBs in the air at the site. Our measurements show that the levels of PCBs on the site are below detection limits; therefore, we would not be able to detect them at Francis Howell High School. Most of the hazardous chemicals on the site are in the soil, groundwater, or surface water and many of these areas are overgrown with vegetation. It is not likely that a detectable amount of hazardous chemicals could be released to the air by wind erosion. Thus, there is no health risk from air particulate matter containing hazardous chemicals.

As an additional measure, a Spill Response Team has been assembled on site to respond immediately to any unusual occurrence, such as a tornado, fire, spill, or accident. Their immediate response and cleanup is expected to preclude any increase in potential exposure or health risk to individuals at Francis Howell High School.

C. RADIOLOGICAL

In the previous section, the potential for exposure to radiation from the Weldon Spring Site to workers at Francis Howell High School was discussed. Under current conditions, there have been no measurements of radiation at Francis Howell High School that exceed natural background radiation.

The tests and measurements for radiation levels that could affect the workers at Francis Howell High School included tests for total gamma radiation exposure, radon gas measurements, and air particulate concentrations. Tests were also made of the water from the St. Charles County Water Treatment Plant, which supplies water to Francis Howell High School, and of the water from the St. Charles County Wellfield, which supplies the raw water to the treatment facility.

There are no measurable levels of radiation above natural background under current conditions; therefore there are no increased health risks from radioactivity at the Weldon Spring Site to individuals at Francis Howell High School.

C O N C L U S I O N

You have just finished reading a summary of the materials present at the Weldon Spring Site and your potential for exposure to them as an individual at Francis Howell High School. In the effort to make this both an informative and useful booklet, we have summarized much of what is contained in technical documents and data available on site.

This booklet is not intended to be the only reference material available to those with an interest in the Weldon Spring Project and its effect on their lives. Rather, it is a starting point. The Weldon Spring Project is committed to public information and public participation through the life of this project. If there are any questions or data that our technical staff can provide for you that would answer any other questions you might have or enhance the information contained in this booklet please do not hesitate to call the Community Relations Department on site at 441-8086.