

STATE OF NEW YORK - DEPARTMENT OF HEALTH

INTEROFFICE MEMORANDUM

TO: Sandra M. Stanish
Bureau of Environmental Exposure Investigation

FROM: William J. Condon, CHP, Chief
Environmental Radiation Section *WSC*

SUBJECT: Pfohl Brothers Landfill #915043

DATE: August 4, 1989

In response to your request of July 31, 1989 I have reviewed the draft Phase I Radiation Walkover Survey Report and attached data.

The radiation survey readings indicate localized hot spots are measurable, usually only a few square feet in size. Most such areas are in the range of three to five times the typical background count rate in the general area of the site. The count rates are measured about two to three inches above the ground so one would expect the actual radiation levels at three feet above ground to be lower by a factor of about two. Assuming the typical background level for the area to be .008 mR/hr., this would correspond to about 0.012 to .025 mR/hr. at three feet above the typical hot spots. This is within the normal range of background radiation levels found in various parts of the State, which are influenced by geological factors, or house construction.

The water samples showed very low levels of radioactivity with gross alpha values below the 15 pCi/l maximum contaminant level specified by Part 5 of the State Sanitary Code; and these surface water samples are not drinking water.

The soil sample analyses show naturally occurring radionuclides in concentrations typical for soils or sediments anywhere in the State. The Cs-137 levels are also typical for fallout from atmospheric testing of nuclear weapons. This indicates no contamination of soil in the hot spot areas from the solid objects or materials which seem to contain the radioactivity.

The reasonable conclusions one can draw from this report, and earlier data are:

1. While there are low radiation measurable on the site the average level is within the range of variation for normal background radiation across the State.
2. Individual "hot spots" seem to be associated with discrete materials (rods, rocks, loose materials, etc.) mixed with the soil.

3. There is no evidence of migration of radioactivity into the soil or surface water at the site.
4. Since discrete sources seem to contain the radioactivity, people should be advised not to pick up or remove objects from this site.
5. Since radioactivity at the site seems to be associated with specific objects, there is no reason to expect that inhalation of airborne radioactivity from suspended soils will be a significant pathway of exposure. Brush cover at the site makes resuspension of soil difficult at best.
6. The additional external radiation exposure a person will accrue from working on this site or crossing the site even on a regular basis will be a small fraction of the normal background radiation level we are all exposed to.

jlf/92890770

REPORT ON THE PHASE I
WALK-OVER GAMMA RADIATION SURVEY
AT THE
PFOHL BROTHERS LANDFILL

Cheektowaga, New York

Site Number 9-15-043



Prepared For:

**NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION**

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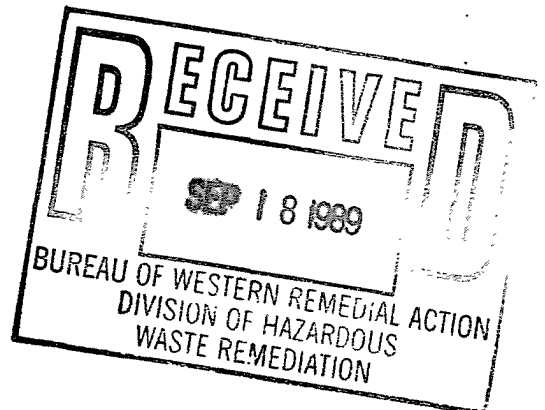
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(312/2)NY/OG



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1.0 INTRODUCTION

In September 1988, Camp Dresser & McKee (CDM) performed an initial radiation investigation which involved a "walk-over" gamma radiation survey along paths that had been cleared across the the Pfohl Brothers Landfill Site in Cheektowaga, New York during the summer of 1988. The paths were cleared along lines running in a north-south direction across the landfill, spaced 50 feet apart (see Plate 1). These cleared paths became known as transit lines. The results of the fall investigation prompted an additional gamma radiation survey which was performed between April 17, 1989 and April 27, 1989 in areas on and between the existing transits in order to better characterize the extent or frequency of spots with elevated radiation levels.

2.0 PROCEDURES

2.1 Instrument Calibration Procedures

The gamma radiation "walk-over" surveys were performed by CDM employees using a 2-inch by 2-inch (2" x 2") Sodium Iodide (NaI) gamma scintillation detector with a portable ratemeter/scalers or survey meter. The types of equipment used to conduct the surveys are listed below:

1. 2 - Ludlum Model 2220 scaler/ratemeters with Ludlum Model 44-10 2" x 2" NaI gamma scintillation detector.
2. 1 - Ludlum Model 3 survey meter with Ludlum Model 44-10 detector.
3. 1 - Ludlum Model 12 survey meter with Ludlum Model 44-10 detector.
4. 1 - Ludlum Model 14-C survey meter with Ludlum Model 44-10 detector.
5. 1 - Ludlum Model 3-5 survey meter with Ludlum Model 44-10 detector.

The model 2220's had both digital (timed) readout and analog scales, while the remaining equipment had analog scales. Since the analog scales were sectioned into 2000 count per minute (cpm) increments, only approximate measurements could be made with this instrument. This, coupled with the fact that the analog scales also tended to slightly fluctuate when the instruments were moved, resulted in measurements by the analog survey meter that are not always reproducible. In addition, since the maximum reading on the analog scales was 400,000 cpm, areas with gamma radiation

measurements in excess of 400,000 cpm had to be rescanned using the model 2220 to obtain a more accurate high level measurement. Measurements below this level were not affected as the instruments responded in approximately the same manner from background to 400,000 cpm.

Prior to initiating the survey, each set of equipment was checked against a known radioactive source and the high voltage setting was corrected so that the measurements recorded from the different instruments were similar. In this way, all measurements obtained in the field could be correlated to each other.

Daily calibration for these sets of equipment consisted of both background checks and source checks. Background measurements were taken with each instrument in an area that had a previous gamma survey and was known to be "clean". This area was located 10 feet south-southwest of the existing field trailer. A one minute count was performed with the model 2220's, while an untimed measurement was performed with the remaining instruments. Each day the background measurements obtained from each instrument were recorded on a calibration sheet. Background measurements were approximately 6,000 counts per minute (cpm) with all instruments. This background level is typical for the geological areas of western New York.

Daily source checks were performed on both the gamma and alpha radiation instruments inside of the field trailer. To perform these checks, the 44-10 detectors were placed one foot from a cesium-137 (Cs-137) source and a one minute (or untimed) measurement was taken. These measurements were again recorded on the calibration sheets. The source check procedure was also performed for the alpha probe (Ludlum model 43-5) attached to the model 2220. The alpha source, thorium-230 (Th-230), was placed in direct contact with the probe and an efficiency of the instrument pair was calculated. The efficiency of the equipment is defined as the 1 minute source measurement minus the 1 minute background measurement divided by the source strength, which is a known. No efficiency can be calculated with the cesium (gamma) source since it is not a certifiable source. (The size of the cesium source is approximately 5 microCuries (μCi).)

A summary of all background and source checks can be found in appendix A.

2.2 Radiation Survey Procedures

The initial walk-over gamma radiation survey was conducted in September 1988 with two field personnel walking up and down the paths that had been cleared across the landfill during the summer of 1988. The paths were cleared along lines running north-south across the site, perpendicular to Aero Drive. These lines became known as transit lines. Each field personnel would swing the scintillation detector side to side at an approximate height of two inches off the ground. If the transit was wider than that of the radius of the swing of the probe, the field personnel would walk side to side so that the entire area was scanned.

The second walk-over gamma radiation survey, conducted in April 1989, had four field personnel walking parallel lines between the cleared transit lines. Each person walked approximately ten feet apart from the other with the two end personnel walking ten feet from each transit line. Again, each person would swing the instrument side to side at an approximate height of two inches off the ground, covering an area of approximately three feet.

In areas of dense vegetation, the survey could not be conducted using this procedure. In these areas, one or two personnel walked between the transits lines with the two outermost personnel walking along the cleared transit lines attempting to scan areas between the transits when the vegetation thinned enough to allow entry.

2.3 Identification of Elevated Radiation

In the initial gamma radiation walk-over survey locations of "elevated" radiation were defined as spots with instrument readings greater than 18,000 cpm, or three times background. The readings were recorded in field logbooks, and the locations were staked with yellow flagging. If more than one spot revealed an elevated reading, the entire area was taped off with plastic flagging so that measurements taken outside the flagged area were approximately at background levels (6,000-10,000 cpm).

In the second gamma radiation survey, locations of "elevated" radiation were defined as spots with readings greater than 12,000 cpm, or two times background. These readings were recorded in the logbook with their location indicated in feet east or west of the appropriate transit line and feet north or south of Aero Drive. By using this method, the spots revealing elevated radiation readings were easily identified and could be located both on a map and in the field. The locations and readings of all spots found with elevated gamma radiation from both walk-over surveys are presented in appendix B.

Once a spot with elevated gamma radiation readings was identified, the uppermost soil or ground cover (approximately two inches) was removed and a second measurement was recorded if it varied greatly from the first measurement. With this second measurement, the attenuation or reduction of the gamma radiation due to soil cover could be estimated. In general, if the gross gamma measurements stayed constant and did not double with an increase in depth, the source was assumed to be homogeneous in that location. If the measurements increased by more than two times when the uppermost soil layer was removed, then the cover material was assumed to be uncontaminated and to be shielding a source of low level radiation close to the ground surface.

When the transit surveys had been completed, the survey team returned to all areas with measurements greater than 25,000 cpm and placed a yellow stake in the ground at that location with the reading in counts per minute marked on the flagging.

3.0 RESULTS

3.1 Extent of Elevated Radiation

With four personnel walking the area between the transits and close to 100 percent of the approximately 5-foot wide transits scanned, about one-third of the surface area of the landfill could be surveyed. This estimate, however, assumes areas were open and accessible. Since this was not the case,

probably only one fourth of the landfill was actually surveyed.

Notable characteristics associated with each location with elevated gamma radiation readings are provided in Table 1 and are further described below.

Area B: Surface gamma radiation readings ranged from background (6,000 cpm) to 950,000 cpm. Approximately 250 spots of elevated gamma radiation were identified in area B. Of these, approximately 20 percent were greater than 25,000 cpm. Locations of elevated radiation were found from transit 40.50 to transit 13.00 and from 100 feet north of Aero Drive to Aero Lake (see Plate 1). The main area of elevated radiation is from transit 32.50 to transit 16.00, ranging from 500 to 1200 feet on the eastern side to 1050 to 1450 feet on the western side. This main area contains approximately 90 percent of all the spots found in area B. Within this large area, it appears that most of the spots are located in the northernmost section of the area, which is densely vegetated. Several isolated areas exist south and east of the main contamination area. These isolated areas, although small, contain many elevated spots. "Clean" areas between these clustered spots could have subsurface contamination, with the gamma radiation being shielded by the soil and/or vegetative cover.

The northernmost section of area B contains much building material and debris. This may account for the large number of slightly elevated gamma radiation measurements in this area. Some building materials such as bricks, concrete, belgium block and flag stone are naturally high in gamma radiation. These materials often contain higher than normal concentrations of naturally-occurring radioisotopes and could easily give off measurements up to 25,000 cpm.

Area C: Area C showed slightly different results than area B. Surface measurements ranged from background to 377,000 cpm. Approximately 260 spots of elevated gamma radiation were identified in this area, with approximately 10 percent being above 25,000 cpm. Spots in area C were lower in magnitude than those in area B, but were much larger in size. Often, entire areas were continuously elevated for distances up to 300 feet such as those found between transits 25.00 and 22.00. Radiation

readings in these large areas generally ranged between 12,000 and 14,000 cpm with readings up to 25,000 cpm in "gopher holes". Much coal ash was observed in these areas. Coal ash is naturally high in radium-226 and generally exhibits measurements in this range. There were, however, small isolated areas which exhibited gamma radiation measurements higher than the ranges normally found in coal ash.

Within area C, elevated gamma radiation readings were found in four general areas from transit 40.50 on the east to 16.50 on the west and from 75 feet south of Aero Drive to 1225 feet south of Aero Drive (see Plate 1). A somewhat contiguous area with elevated gamma radiation exists from transit 28.00 to transit 19.00. A second area exists east of here from transit 30.50 to 34.00 in the area from 100 feet to 650 feet south of Aero Drive. Two other smaller areas with elevated gamma radiation measurements were found at the southern border of Area C (from between transits 26.50 and 32.50) and the southeast corner of Area C (from 550 feet south of Aero Drive extending to the drainage ditches running parallel to the railroad tracks).

3.2 Preliminary Source Characterization

During the identification and staking procedure described above, several man-made objects were found that exhibited extremely elevated gamma radiation readings. During the September 1988 survey, a steel rod about one foot long and one-half inch in diameter was found along transit 16.50 in area B, about 100 feet south of the creek. This rod gave off readings of 154,000 cpm and was measured by New York State Department of Environmental Conservation (NYSDEC) staff at 110 microroentgen per hour (uR/hr) on contact and 15 uR/hr at one meter exposure. Subsequent qualitative gamma spectroscopic analysis showed the presence of thorium series radionuclides.

Additional man-made objects were found in the April 1989 walk-over. The objects found seemed to be dislodged pieces of equipment. Two metal discs were found, one was 0.5 inches in diameter and the other was 1.5 inches in diameter. Both objects had glass coating on one side. These objects

are low energy gamma emitters as there was a dramatic drop-off in radiation readings with distance. For example, contact readings of one source exhibited 1.8 million cpm, while three feet from the source, the readings dropped to 36,000 cpm. A third metal disc of 1-inch diameter with readings of 80,000 cpm was also found. A shorter and wider metal rod (3" X 9") was found with readings to 600,000 cpm. Finally, a 1 inch by 3 inch rectangular piece of metal with readings of 182,000 cpm was found.

Since detection of the above mentioned objects by field survey equipment is only possible if they are very close to the surface, there may be additional objects that remain undetected. It is not anticipated that these objects could contribute to ground water contamination at the site, although further study on these objects is necessary to confirm this.

In addition to the man-made objects described above, a second type of source material found in abundance at the site was "white/grey" in color and had the consistency of vermiculite or fertilizer. This material gave off approximately 25-70,000 cpm. This white material was most prevalent in the northern section of area B where it was found scattered around in many locations. One note, however, is that for this material to exhibit elevated measurements, several inches of the material had to be in place. In several areas this material did not give off any elevated measurements. Several drums were found containing this material, with each exhibiting similar responses from our instruments. In many of these areas, the drums were heavily corroded which could allow leaching of this material into the surface water or ground water. Most of this material was found in area B, with smaller amounts being found in area C. Buried drums of this material may exist beneath the surface--a few inches of soil would provide adequate shielding so that the instruments could not detect the elevated gamma radiation levels exhibited by the material.

4.0 CONCLUSIONS

Based on the background history and available data, the following conclusions can be made.

- o Several areas of elevated gamma radiation exist at the site; one large area in Area B and four major areas in Area C. See section 3.1.
- o The highest gamma radiation measurements were not found in any one specific location, but were scattered throughout these areas.
- o The sources of the elevated measurements are both natural materials such as rocks and coal ash and man-made materials (ie. metal rods and disks).
- o The man-made objects can be broken down into three main categories; machined metal materials such as rods, disks and other metal objects, white sandy or vermiculite material (presumably originating from drums), and finally, building materials such as tar or cement covered objects.
- o Due to the low energy emissions of the machined metal materials, detection of all such objects is not possible since their emissions are easily shielded by soil cover.
- o In area C, the extent and level of contamination was harder to define due to the wetness of the area. The moisture in the soil could attenuate the gamma measurements enough so that areas with elevated gamma radiation presented readings at background or just slightly greater than background and were therefore not noted during the surveys.

5.0 RECOMMENDATIONS

To characterize the nature of the sources of elevated radiation found at the site and better define its subsurface extent, further investigations are recommended. A two-phased approach is recommended as described below:

1. Perform exploratory sampling of the subsurface soil beneath representative locations where gamma radiation readings exceeded 12,000 cpm. The soil at the location should be carefully removed using either a shovel or hand auger, with the hole and the excavated soil constantly scanned with alpha, beta and gamma radiation detectors. If an object is found, it should be sent to a laboratory for analysis, analyzed in the field with a field gamma spectrometer, or brought to an onsite trailer-based gamma

spectrometer where the material can be identified.

2. At locations where such exploratory sampling is prevented due to subsurface obstructions (such as buried drums) and at locations where contamination continues below two or three feet, a more traditional subsurface investigation using traditional borehole techniques should be conducted. Additional borings should also be installed in selected "clean areas" to determine if contamination exists at depth.

(DLG 3/6)OG

TABLE 1

**ELEVATED GAMMA RADIATION LOCATIONS IN AREAS B AND C
EXHIBITING SPECIAL CHARACTERISTICS**

(AREA B)

<u>Location</u>	<u>Result</u>	<u>Description of Area</u>
636'N 8'E of 40.50	14,000 cpm	Debris - small rocks
590'N 11'E of 38.50	34,000 cpm	Readings increased to 60,000 cpm 3" down. 10,000 cpm around spot. No grass cover, some building material in area (10' x 10').
700'N on line 38.00	227,550 cpm	NYSDEC surface soil sample results: Radium 226 at 0.7 picocurie per gram (pCi/gr) Radium 228 at 3.9 pCi/gr
683'N 25' E of 38.00	14,000 cpm	3' x 3' area
755'N on line 37.50	128,200 cpm	Rock
825'N on line 37.50	20,100 cpm	Drum
639'N 3'E of 36.50	35,000 cpm	Rock. Mounded ground around area at 23,000 cpm. Much building material in area, no soil cover. Area of spot 3' x 3'.
190'N 8'W of 36.50	66,000 cpm*	Small area 1' x 1'. Weeds on ground. 219,000 cpm 4" down, some metal in area.
837'N 3'W of 35.00	25,000 cpm	Leaves cover area, soil underneath. Much debris in area, metal & rocks. 1' x 1' area.
856'N 1'W of 35.00	30,000 cpm	White material on ground, consistency of fertilizer. No soil cover, some rocks in area. Refusal noted at 6". Area size 1' x 1'.
846'N 1'E of 34.50	42,000 cpm.	White material. Some trash, metal, building material found at the surface. 2" down - 51,000 cpm; material is hard and dry. Refusal at 3". Area is 3' x 3'.
864'N 2'W of 34.00	31,000 cpm	Much building material, metal, no soil cover. A 3' x 3' area above 12,000 cpm exists around spot.

725'N 15'W of 33.50	25,000 cpm	Small area, moss cover. No elevated readings in area.
404'N 20'E of 33.00	68,000 cpm	Tar material, small spot 3" x 3". Approximately 10,000 cpm on other portion of material.
1059'N 20'W of 32.50	700,000 cpm*	Metal rod (3" x 9"). 16,000 cpm at waist level. Removed rod and excavated down 1'; no elevated readings. Wood scraps, white material, and metal in hole.
1125'N on line 31.50	28,960 cpm	Rock. Building material 3" x 4" x 2".
650'N on 31.50'	54,000 cpm	Rock with elevated readings. Excavated down 6"- no elevated readings.
1027'N 25' E of 31.00	12,500 cpm	In hole.
652'N 2'W of 31.50	80,000 cpm	Piece of metal rod 1 1/2" diameter by 1" high.
535'N on 31.00	20,000 cpm	3" x 3" x 1" tar w/rock
1180'N on 31.00	12-16,000 cpm	Stones, building material
1142'N 3'E OF 30.50	30,000 cpm	Rock on surface, 20,000 cpm around it. Excavated down 6"- 16,000 cpm. Much white material. Rock is very hard. Black with sand and cement on one side. Area is small.
1025'N 3'E of 30.50	28,000 cpm	Rock, same as above but not smooth. Not elevated around spot. Could not excavate because of metal and roots.
950'N 10'E of 30.50	14,200 cpm	Belgian block/building material.
958'N on line 30.50	14,000 cpm	Belgian block/building material.
1011'N on 30.50	16,000 cpm	Belgian block/building material.
860'N on 30.50	32,000 cpm	Soil area, moss in area. At 3" down- 58,000 cpm. Could not excavate deeper.
1100'N 15'E of 30.50	13,000 cpm	Gravel and tar.
1198'N 3'W of 30.00	25,000 cpm	Black rock (as before). Soil is not elevated around it.

962'N on line 30.00	15,000 cpm	Debris; could be the rocks.
725'N on line 29.50	110,000 cpm	Soil: Radium 226 at 0.7 pCi/gr; Radium 228 at 0.6 pCi/gr.
580'N 15'E of 29.50 (to 620'N)	12-25,000 cpm	10' x 30' area; small mounds elevated, some blocks in area.
313'N 10'E of 29.00	16,000 cpm	Readings measured up to 20,000 cpm 3" down.
250'N 15'E of 28.00	20,000 cpm	10' x 10' area.
1105'N 15'W of 28.50	30,000 cpm	Drum buried in ground, only east side elevated. Readings do not increase 8" down. Wood in area. No drum contents.
900'-950'N of line 27.50	12-26,000 cpm	White pellets in ground (3").
1196'N 10-17'W of 27.50	15,000 cpm	18-22,000 cpm 3" down. White pellets in ground (3").
685'N 15'W of 27.00	60,000 cpm	Open drum or metal sheet with white material. Much grass cover in area.
Area to 1175' N to line 27.00	15-20,000 cpm	Area 20' x 50'. Same found on line 27.50 to 1150' N.
1132'N 5'E of 27.00	22,000 cpm	In gopher hole.
620'N 25-40'W of 27.00	30,000 cpm	Many buried drums in area.
100'N 10'E of 28.50	72,000 cpm	Buried drum, only 1' x 2' area showing. Drum not open.
135'N 25'W of 27.50	255,000 cpm*	This measurement was at surface. Object found with reading of 1,000,000 cpm. 1/2" x 1/2" glass on one side, metal on the other. Readings at waist level were 8,000 cpm. Area is grass covered and not elevated. No readings in hole.
988'N 5'W of 26.50	13,600 cpm	12,000 cpm measured at the surface.
615'N 2'W to 15'W of 26.00	14,000 cpm	Shielded by grass 10' x 50'. Area generally 10,000 to 12,000 cpm.
1190'N 15'E of 26.50	13,000 cpm	Near drums.

842'N 5'E of 25.50	36,000 cpm*	This measurement was at surface. Found metal object with a reading of 182,000 cpm. Readings of 6,000 cpm at waist level. Grass cover in area. No readings in hole.
1160' to 1175'N 3'E of 25.50	12,000 cpm	14,000 cpm measured at 1" below the ground surface.
852'N 20'E of 25.50	66,000 cpm*	This measurement was at surface. Found object with reading of 1.8 million cpm. Disk 2" x 2"; yellow on one side, metal on the other. Reading of 36,000 cpm measured at waist level.
630'N 20'W of 25.50	14,000 cpm	Area generally elevated.
630'N 5'E of 25.00	12,000 cpm	In hole.
1115'N 3'E of 25.50	40,000 cpm	White material found below leaf cover. Encountered refusal when placing stakes. Did not excavate further.
1252'N 8'E of 23.00	30,000 cpm	Leaf cover, some grass, soil under leaves. Some white specs of material found. Area 2' x 2'.
1040'N 1'E of 25.00	18,000 cpm	Whole area measured 12-20,000 cpm between 1000' and 1050'N on 25.00.
660'N 12'W of 25.00	16,000 cpm	A reading of 30,000 cpm was measured 3" below the ground surface.
1100'N 25'E of 24.00	14,500 cpm	Area generally greater than 10,000 cpm.
1040'N 15'E of 24.00	12,000 cpm	Area from 1100'-1050' N of 24.00 was elevated.
1080'N 10'W of 24.00	12,000 cpm	Area generally elevated.
1225'N of 23.50	97,000 cpm	Drum tested by NYSDEC-- Radium 226 at 25 pCi/gr; Radium 228 at 8 pCi/gr.
815'N 25'W of 23.50	14,000 cpm	Area around location was elevated to 795'N. 15-20,000 cpm. Elevated readings were measured along the center of line to 715'N.

846'N 20'E of 23.00	630,000 cpm	36,000 cpm at waist level. Grass cover with soil underneath. Refusal w/stake.
670'N 25'E of 23.00	260,000 cpm	In hole approximately 6" down, grass cover 38,000 cpm around spot. Debris, trash, glass and metal in hole.
1205'N 10'E of 22.50	26,000 cpm	No soil cover at spot, some moss and leaves in area. Whole area 10' x 15' is over 12,000 cpm.
300'N 1'E of 22.50	12,000 cpm	Area around location is elevated.
825'N 10'E of 22.50	16,000 cpm	In hole.
1250'N 20'E of 22.00	31,000 cpm	Leaf cover in area, white substance under soil. Refusal with stake. Surrounding area is not elevated.
1237'N 25'E of 21.50	14-16,000 cpm	Area 6' in diameter.
1280'-1320'N 20-40'E of 21.50 to 1400'N approx. 25'E of 21.50	14-18,000 cpm 12-20,000 cpm	In isolated spots over area. Found in center of area.
1350'N on line 21.50	31,480 cpm	White material in drum. Sampled by NYSDEC-- Radium 228 at 410 pCi/gr.
1210'N 10'W of 21.00	51,000 cpm	Drum area, 12,000 cpm surrounding it. Refusal when staking.
1348'N 15'E of 21.00	20,000 cpm	White/grey material.
1310'N 10'W of 21.00	13,000 cpm	Surrounding area is elevated.
1350'-1354'N 5'W of 21.00	21,000 cpm	Many white pellets on line.
1335'N 6'W of 21.00	15,000 cpm	Area approximately 12,000 cpm.
1115'N 10'W of 21.00 Area elevated north of it.	41,000 cpm	Leaf cover with white material underneath. Area is 10' x 15'.
1358'N 15'W of 20.50	32,000 cpm	Leaf cover, some white material present. Area is 5' x 10'. Some metal debris on ground.
1275'N 15'E of 20.50	22,000 cpm	Whole area elevated; white pellets as before.

1337'N 10'E of 20.00	21,000 cpm	Area elevated.
1300'N 20'E of 19.50	13,000 cpm	Area elevated.
1400'-1410'N 25-30'W of 19.50	18,000 cpm	Area elevated, white pellets.
1436'N 3'E of 19.00	20,000 cpm	Rocks and debris.
1340'N 5'E of 18.00	27,000 cpm	Some leaves on ground. Red-brown material on ground; could be rusted metal giving off this color.
1454'N 30'W of 18.00	12-14,000 cpm	Area elevated.
1225'N 10'E of 17.50	212,000 cpm	Grass cover - 230,000 cpm under grass. No further elevated measurements found.
585'N 35-50'W of 17.50	12-34,000 cpm	Area elevated.
1285'N 20'E of 17.50	950,000 cpm	Small elevated area under grass. Leaf cover with soil underneath. Reading of 22,000 cpm measured at waist level.
585'N 15'W of 17.00	22,000 cpm	In hole.
1070'N 20'W of 18.00	155,000 cpm	In hole, 80,000 cpm at surface. Ground is leaf covered with some weeds, rocks and glass found in hole. Refusal with stake.
595'N 20'W of 18.00	62,000 cpm	In hole. Weed and grass cover in area.
1371'N 15'W of 17.50	237,000 cpm	Leaf cover, metal objects in area.
1475'N on line 16.50	154,000 cpm	Steel rod
1340'N 10'E of 16.00	200,000 cpm	Machinery metal in area; leaf cover with soil underneath.
1170'N 25-35'E of 16.00 1220'N 25-35'E of 16.00	60,000 cpm	White/brown material, could be rust stains.
1285'N on line 16.00	26,000 cpm	White material pellets with ceramic piping material in area.
420'N 15'W of 15.50	20,000 cpm	Reading at surface. 60,000 cpm reading measured under the grass.
355'N 17'E of 15.00	59,000 cpm	Weed and grass cover with soil underneath.

250'N 5'W of 15.00	13,600 cpm	In hole.
385'N 10'W of 15.00	113,000 cpm	Grass and weed cover, small spot, soil underneath.
580'N to 620'N 15'E of 29.50	12-25,000 cpm	Could not locate spot - may need to excavate (see note #1)
620'N 25-40'W of 27.00	30,000 cpm	Could not locate spot - may need to excavate (see note #1)
660'N 12'W of 25.00	16,000 cpm	30,000 cpm 3" down - could not locate spot, same as above (see note #1)

* Revisited these locations to take measurement with alpha and beta probe.

Note #1 - Areas which were initially found to be over 25,000 cpm but could not be found in subsequent staking. These areas may have been saturated by rainwater causing the gamma radiation to be attenuated. These areas should be reinvestigated.

(374/22)OG/SS

TABLE 1 (Cont.)

**ELEVATED GAMMA RADIATION LOCATIONS IN AREAS B AND C
EXHIBITING SPECIAL CHARACTERISTICS**

(AREA C)

<u>Location</u>	<u>Result</u>	<u>Description of Area</u>
600' to 622'S 12'W of 39.50	20-22,000 cpm	Westinghouse signs found at 650' and 600' markers.
755'S 10'W of 38.50	65,000 cpm	Area elevated surrounding hot spot approximately 15' x 15'. Readings of 12-50,000 cpm measured. Large rocks with grass cover and soil underneath.
787'S 1'W of 38.00	33,000 cpm	Soil with leaf cover. Reading measured at 3" below the ground surface. Soil is sandy (fine-med) with lighter (white) sand grains mixed with brown.
770'S 3'E of 37.50	41,000 cpm	Same soil as above, but more rocks. Some black shiny soil.
892'S on 38.00	28,000 cpm	Soil cover. A piece of coal ash noted.
1100'S 25'E of 36.50	98,000 cpm	Large quantities of glass, small rocks, and debris; no leaf cover.
675'S 25'W of 36.00	40,000 cpm	Rock, cement and stone sidewalk material.
570'S of 35.50 to 36.00	18,000 cpm	Whole area is elevated; fill material.
690'S 5-15'E of 34.50	20-44,000 cpm	44,000 cpm at rear of truck parking lot. Five feet of fill in area; much construction debris, roads and sidewalks.
625'S 5'W of 34.50	24,000 cpm	Truck parking lot.
190'S 2'E of 32.50	14,000 cpm	Area elevated with readings greater than 10,000 cpm.
197'S 6'E of 32.50 to 220'S	17,000 cpm	Debris found on the ground. Area has elevated readings.
375'S 20'E of 32.50	12,000 cpm	Area has elevated readings.
430'S on 33.00	14,000 cpm	In gopher hole.

920'S 5'E of 32.00	32,000 cpm	Much metal and debris in area, Reading of 25,000 cpm measured 3" below the ground surface. Soil is very dark and organically rich. Some weed and leaf cover.
615'S 20'E of 32.00	12,000 cpm	Area has readings up to 20,000 cpm.
340'S 10-12'E of 32.00	14,000 cpm	Area has readings of 10,000 cpm.
300'-325'S 10'E of 32.00 to 32.50	12-70,000 cpm	Reading of 70,000 cpm measured at 315'S, 15'W of line 32.50. White fertilizer-type material. Much weed cover. Refusal encountered when staking.
235'S 25'E of 32.00	20,000 cpm	Area has elevated readings.
200'S 2'W of 32.50	20,000 cpm	Area has elevated readings.
596'S 20'W of 32.00	44,000 cpm	Many readings of 15,000 cpm in the area. Few locations were found to be greater than 25,000 cpm. Weed cover - open area. Other elevated areas within 10' of spot.
593'S 15'W of 31.50	50,000 cpm	Weed cover, soil underneath is light brown; some small rocks in area.
645'S 28'E of 31.00	15,000 cpm	Grassy area.
641'S 6'W of 31.50	12,000 cpm	Similar values in surrounding areas within 10'.
635'S 20'W of 31.50	22,000 cpm	Grassy area.
350'S 10'E of 30.50	14,000 cpm	Mossy ground.
1220'S 10'W of 30.00	20,000 cpm	Granite building material.
1055'S 10'E of 29.50	64,000 cpm	Leaf cover; soil underneath is rocky and light brown.
1120'S 10'E of 29.00	27,000 cpm	Weed and leaf cover, dark black material underneath. Measurement of 12,000 cpm recorded in a 6' radius west and south of the elevated reading.

338'S 3'E of 29.00	16,000 cpm	Gopher hole.
846'S 20'E of 29.00	25,000 cpm	Weed cover and black organic soil underneath.
840'S 1'E of 29.00	16,000 cpm	Reading at surface; 22,000 cpm found 4" below the ground surface.
615'S 15'E of 28.50	155,000 cpm	Reading recorded in hole, approx. 4" below the ground surface. Much small metal debris in hole, weed cover. Surface reading of 24,000 cpm. Reading of 40,000 cpm recorded 2" below the ground surface.
842'S 5'W of 28.50	31,000 cpm	Rock is likely cause of elevated readings. Black organic soil, some weed and leaf cover. Refusal with stake.
1096'S 10'E of 28.00	36,000 cpm	Weed cover, some open areas, light brown soil.
975'S 2'E of 28.00	42,000 cpm	Rock. Reading on one side was 42,000 cpm; other side-30,000 cpm. Black tarry material.
915'S 8'E of 28.00	27,000 cpm	Rocks in area, elevated in slight depression. Refusal with stake.
1010'S to 1015'S 15'W of 28.00	26,000 cpm	Area has elevated readings. Rocky area. Refusal with stake.
950'S 17'W of 28.00	28,000 cpm	Many rocks in area.
135'S on line 27.50	16,000 cpm	Grinding stone.
980'S 20'E of 27.50	28,700 cpm	Many rocks in area on slight hill, weed and grass cover. Rocks at surface in area with elevated readings ranging from 12,000 cpm to 13,000 cpm.
950'S 20'E of 27.50	13,000 cpm	Same as above; readings elevated 10' further south.
680'S 10'W of 27.50	15,000 cpm	4' x 4' area of rocks.
165'S 20'E of 26.50	13,000 cpm	In hole.
1050'S to 1100'S between 27.00 and 26.50	10-12,000 cpm	Wet area.

250'S 17'E of 26.00	17,000 cpm	In hole, area generally 10,000 cpm to 11,000 cpm; higher readings found in the holes.
240'S 5'W of 26.00	16,000 cpm	Gopher hole. Entire area has elevated readings of 12,000 cpm.
800'S 25'W of 26.00	14,000 cpm	In hole.
70'S 5'W of 25.50	280,000 cpm	Reading taken at 3" below the ground surface. Swampy area, many reeds. Reading at surface was 150,000 cpm.
335'S 25'E of 25.50	16,000 cpm	In gopher hole.
840'S 10'E of 25.50	16,500 cpm	Reading at ground surface ranged from 10,000 cpm to less than 12,000 cpm. From lines 1150' to road, readings were approximately 10,000 cpm. All holes to 950'S were elevated to 16,000 - 14,000 cpm.
240'S 20'W of 25.00	264,000 cpm	Reeds on ground, open area.
1125'S 10'E of 25.00 to 20'E of 25.00	12-13,000 cpm	Readings in area were generally greater than 11,000 cpm. 16,000 cpm in holes.
Hotspots from 1000' to 1040'S across line 25.00 to 25.50.	12-17,000 cpm	Readings at surface. Reading in excess of 16,000 cpm measured in holes. Readings at surface were less than 12,000 cpm.
225'S 15'W of 25.00	12,000 cpm	Area has elevated readings.
270'S 5'E of 24.50	12,000 cpm	Area has elevated readings; some coal ash in holes.
725'S to 1120'S between 24.50 - 25.00	12-15,000 cpm	Coal ash in gopher holes. 20,000 cpm recorded in some holes.
475'S on line 24.00	320,000 cpm	Reading at surface. At 6" below surface- 1,105,350 cpm. NYSDEC surface soil sample results: Radium 226 at 2.2 pCi/gr and Radium 228 at 94 pCi/gr.
198'S 2'W of 24.00	73,600 cpm	Open area, coal ash, grass and reeds on ground.

400'S to 420'S between lines 24.00 and 24.50	12,000 cpm	Much ash in holes.
350'S to 100'S of 24.50	12,000 cpm	Area has elevated readings. 100'S of line 24.50 to Aero Dr. the area is wet; readings of 10,000 cpm. Area appears to be shielded.
710'S 20'E of 23.50	12,000 cpm	Some spots measured at 15,000 cpm.
725'S to 1100'S of 23.50 - 24.00	12,000 cpm	Holes with readings of 16,000 cpm.
1025'S to 710'S 23.50 - 23.00	12,000 cpm	Some spots at 15,000 cpm.
525'S 10-25'E of 23.00	12,000 cpm	Area has elevated readings.
415'S 3'W of 23.50	12,000 cpm	Readings generally less than 12,000 cpm.
125'S to 120'S of 23.50	12-13,000 cpm	At 250'S 10'E of 22.50 readings were less than 12,000 cpm.
150'S to 250'S 23.00 to 22.50	12,000 cpm	From 260'S 25'E readings were less than 12,000 cpm.
300'S 10'W of 23.00	>12,000 cpm	Area of elevated readings.
540'S to 30'E of 22.50	13,000 cpm	West side of line 23.00 readings were approx. 11,000 cpm.
675'S 20'E of 22.50	13,000 cpm	All readings generally ranged between 10,000 to 11,000 cpm.
870' to 690' of 22.50-22.00	12,000 cpm	Reading of 24,000 cpm was measured in a hole; much ash present.
200'S 5'W of 22.50	14,000 cpm	10' x 10' area.
640'S 10'E of 21.00	13,000 cpm	In large pit (6' x 10' x 3').
370'S 25'W of 16.50	70,000 cpm	Grey mounds 3-4' high with elevated readings exceeding 12,000 cpm.

* Revisited these locations to take measurements with the alpha and beta probes.

Note #1 - Areas which were initially found to be over 25,000 cpm, but could not be found in subsequent staking. These areas may have been saturated by rainwater causing the gamma radiation to be attenuated. These areas should be reinvestigated.

(374/22)OG

Appendix A

APPENDIX A

Site Apple Brothers Landfill

Date (YYYY)	Time	Instruments	Serial #'s	HV Set	Source		Background		Source		Calibration		Source Check		OK ?	Checked By
					Type	I.D.	Activity	t, min	Counts	t, min	Gross Counts	Efficiency	Units	Efficiency		
7-28	7:50	2220	37796	750	α	CS7A	SMC _u	1	5205	1	25945	-	-	-	✓	MJ
		43-5		500	α			1		1						
		44-9			α			1		1						
7-29		2220	37796	750	α	CS7A	SMC _u	1	7157	1	26283	-	-	-	✓	MJ
8-9	7:00	2220	37796	750		CS7A	SMC _u	1		1	23660	-	-	-		MJ
8-10	7:00	2220	37796	750		CS7A	SMC _u	1		1	22462	-	-	-		MJ
8-11	7:15	2220	37796	750		CS7A	SMC _u	1		1	22880	-	-	-		MJ
8-12	7:15	2220	37796	750		CS7A	SMC _u	1		1	22908	-	-	-		MJ
8-22	8:10	MODEL 14C	58808	750		CS7A	SMC _u	METER	6000		25000	-	-	-		MJ
8-23	7:00	MODEL 14C						METER			26000	-	-	-		MJ
8-24	7:00	MODEL 14C						METER			29000	-	-	-		MJ
8-25	6:50	MODEL 14C									24000	-	-	-		MJ
9-6	8:50	2220	37796	44-10/100		CS7A		1	5287		21970	-	-	-		MJ
9-7	7:00	2220	46600								28190	-	-	-		MJ
		2220	37796								25527	-	-	-		MJ
9-8	7:00	2220	37796								27917	-	-	-		MJ
9-8	7:00	2220	46600								28779	-	-	-		CW
9-9	7:15	2220	46600								27904	-	-	-		MJ
9-9	7:15	2220	37796								25754	-	-	-		MJ
9-10	7:05	2220	37796								19678	-	-	-		MJ
9-10	7:05	2220	46600								19941	-	-	-		MJ
9-12	7:10	2220	37796	44-10							24833	-	-	-		CW
9-12	7:10	2220	46600	44-10							23175	-	-	-		CW
9-13	7:50	2220	37796	44-10							21485	-	-	-		MJ
9-13	7:50	2220	46600	44-10							22450	-	-	-		MJ
9-14	8:00	2220	37796	44-10							24562	-	-	-		MJ
9-14	8:00	2220	46600	44-10			SMC _u				20147	-	-	-		MJ
9-15	8:00	2220	37796	44-10							25654	-	-	-		MJ
9-15	8:00	2220	46600	44-10							23082	-	-	-		MJ



environmental engineers, scientists
planners & management consultants

Site: Gold Butte - Landfill

Date (Y89)	Time	Instruments	Serial #'s	IIV Set	Source			Background		Source		Calibration		Source Check		OK ?	Checked By
					Type	I.D.	Activity	t, min	Counts	t, min	Gross Counts	Efficiency	Units	Efficiency	Units		
9-16	8:10	2220	37796	44-10													MZ
9-16	8:10	2220	46600	44-10													MZ
9-19	9:00	Ludlum 2220	37796	750	CS7A		SACi										MZ/CW
9-19	9:00	2220	46600	750	CS7A		SACi										MZ/CW
9-20	8:00	2220	37796	750	CS7A		SACi										MZ
9-20	8:00	2220	46600	750	CS7A		SACi										MZ
9-21	8:00	2220	46600	750	CS7A		SACi										CW/MZ
9-21	11:00	2220	37796	750	CS7A		SACi										CW/MZ
9-22	7:30	2220	37796	750	CS7A		SACi										CW/MZ
9-22	7:30	2220	46600	750	CS7A		SACi										CW/MZ
9-22	8:10	2220	46600	750	CS7A		SACi										MZ/CW
9-22	8:10	2220	46600	750	CS7A		SACi										MZ/CW
9-23	8:50	2220	46600	750	CS7A		SACi										MZ/CW
9-23	8:50	2220	37796	750	CS7A		SACi										RDB
9-26	8:50	2220	37796	750	CS7A		SACi										MZ
9-26	8:50	2220	46600	750	CS7A		SACi										MZ
9-27	8:30	2220	37796	750	CS7A		SACi										MZ
10-11	9:00	2220	46600	750	CS7A		SACi										MZ
10-17	7:30	2220	46600	750	CS7A		SACi										CW
(1989)																	
4-11	8:00	Ludlum	58808														CW
4-12	9:30	14C	58808														CW
4-13	8:45	14C	58808														CW
4-14	8:30	14C	58808														CW



environmental engineers, scientists,
planners & management consultants

Site Pfohl Brothers 1989

Date	Time	Instruments	Serial #s	HW Set	Source		Background		Source		Calibration		Source Check		OK ?	Checked By
					Type	I.D.	Activity	t, min	Counts	t, min	Gross Counts	Efficiency	Units	Efficiency		
4-17	1400	12	13307												Yes	JJ
		44-10	025685	800		CS-137	~5 uCi	1	6750	1	16000				Yes	JJ
		2220	46600													
		44-10	033518	700		CS-137	~5 uCi	1	6719	1	16451				Yes	JJ
		2220	37776													
		44-10	033513	800		CS-137	~5 uCi	1	6608	1	15863				Yes	JJ
		3	60730													
		44-10	027911	1100		CS-137	~5 uCi	1	6500	1	16000				Yes	JJ
4-18	0720	12	13307												Yes	JJ
		44-10	025685	800		CS-137	~5 uCi	1	7000	1	20000				Yes	JJ
		2220	46600													
		44-10	033518	700		CS-137	~5 uCi	1	6322	1	20617				Yes	JJ
		2220	37776													
		44-10	033513	800		CS-137	~5 uCi	1	6200	1	19427				Yes	JJ
		3	60730													
		44-10	027911	1100		CS-137	~5 uCi	1	7000	1	20000				Yes	JJ
		2220	46600													
4-19	0715	3-5	038253	500		76230	14,300	1	0	1	1682		11.8		Yes	JJ
		3-5	41655													
		44-10	025685	900		CS-137	~5 uCi	1	6100	1	15000				Yes	JJ
		2220	46600													
		44-10	033518	700		CS-137	~5 uCi	1	6502	1	16351				Yes	JJ
		2220	37776													
		44-10	033512	800		CS-137	~5 uCi	1	6139	1	15214				Yes	JJ
		3	60730													
		44-10	027911	1100		CS-137	~5 uCi	1	7000	1	16000				Yes	JJ
		2220	46600													
		43-5	38252	500		76230	14,300	1	0	1	1505		10.5		Yes	JJ

* Source was only 1 1/2 inches from Instrument

CDM

Environmental Engineers & Scientists
Pollution & Environmental Solutions

Daily Source Check form

Site: Afghl Brothers 1989

Date	Time	Instruments	Serial #s	HV Set	Source		Background		Source		Calibration		Source Check		Checked By	
					Type	I.D.	Activity	t, min	Counts	t, min	Gross Counts	Efficiency	Units	Efficiency		Units
4-20	0715	3-5	41655												Yes	JJ
		44-10	025685	900		CS-137	~5 uCi	6000	1	15000					Yes	JJ
		2220	46600	750		CS-137	~5 uCi	6021	1	17841					Yes	JJ
		44-10	033518	800		CS-137	~5 uCi	6140	1	15262					Yes	JJ
		2220	37796												Yes	JJ
		44-10	033513	800		CS-137	~5 uCi	6000	1	16500					Yes	JJ
		3	60730												Yes	JJ
		44-10	027911	1100		CS-137	~5 uCi	6000	1	1558					Yes	JJ
		2220	46600												Yes	JJ
		43-5	38252	500		Th-230	14,300	7000	1	15000			10.9	%	Yes	JJ
4-21	0715	3-5	41655												Yes	JJ
		44-10	025685	900		CS-137	~5 uCi	6313	1	17465					NO	JJ
		2220	46600												Yes	JJ
		44-10	033518	700		CS-137	~5 uCi	6313	1	17465					Yes	JJ
		2220	37796												Yes	JJ
		44-10	033513	800		CS-137	~5 uCi	6500	1	16500					Yes	JJ
		3	60730												Yes	JJ
		44-10	027911	1100		CS-137	~5 uCi	6500	1	16500					Yes	JJ
		2220	46600												Yes	JJ
		43-5	38252	500		Th-230	14,300	0	1	1874			13.1	%	Yes	JJ
		2220	46600												Yes	JJ
		44-10	033518	550		CS-137	~5 uCi	6883	1	17214					Yes	JJ

* After 1/2 day instruments not working

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Environmental Engineers, Scientists
Planners & Management Consultants

Daily Source Check Form

Site Pfchl Brothers 1989

Date	Time	Instruments	Serial #	NW Set	Source		Background		Source		Calibration		Source Check		Checked By		
					Type	I.D.	Activity	t.min	Counts	t.min	Gross Counts	Efficiency	Units	Efficiency		Units	
4-22	0600	14-C	58808	-													
		44-10	040705	-		~5 mCi	1	7000							Yes	FL	
		2220	46600														
		44-10	033708	550		~5 mCi	1	6654							Yes	FL	
		2220	37796														
		44-10	033513	800		~5 mCi	1	6142							Yes	FL	
		3	60730														
		44-10	027911	1100		~5 mCi	1	7000							Yes	FL	
		2220	46600														
		43-5	038251	500		14,300	1	0						12.5	Yes	FL	
4-23	0730	14-C	58808	-													
		44-10	040705	-		~5 mCi	1	7000							Yes	FL	
		2220	46600														
		44-10	033708	550		~5 mCi	1	6620							Yes	FL	
		2220	37796														
		44-10	033513	800		~5 mCi	1	6300							Yes	FL	
		3	60730														
4-24	0700	14-C	58808	-													
		44-10	027911	1100		~5 mCi	1	6700							Yes	FL	
		2220	46600														
		44-10	040705	-		~5 mCi	1	6500							Yes	FL	
		2220	46600														
		44-10	033708	550		~5 mCi	1	6603							Yes	FL	
		2220	37796														
		44-10	033513	800		~5 mCi	1	6804							Yes	FL	
		3	60730														
		44-10	027911	1100		~5 mCi	1	7000							Yes	FL	
		2220	46600														
		43-5	038251	500		14,300	1	2						11.7	Yes	FL	

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Construction Engineers, Scientists
Professionals & Management Consultants

Daily Source Check Form

Site Pech Brothers 1989

Date	Time	Instruments	Serial #'s	HW Set	Source			Background		Source		Calibration		Source Check		OK ?	Checked By
					Type	I.D.	Activity	t, min	Counts	t, min	Gross Counts	Efficiency	Units	Efficiency	Units		
4-25	-	3-5	41655	900												Yes	FL
		44-3 cover	026886	900				1	180-220							Yes	FL
		44-3 microwave	026886	900				1	200							Yes	FL
		44-6 open	026884	900				1	0							Yes	FL
		44-6 closed	026884	900				1	20							Yes	FL
		44-9 screen	026882	900				1	20-40							Yes	FL
		44-9 cover	026882	900				1	40-60							Yes	FL
		44-9 bench	026882	900				1	20-30							Yes	FL
4-26	-	3-5	41655	900												Yes	FL
		44-3 cover	026886	900				1	180-220							Yes	FL
		44-3 microwave	026886	900				1	200							Yes	FL
		44-6 open	026884	900				1	0							Yes	FL
		44-6 closed	026884	900				1	20							Yes	FL
		44-9 screen	026882	900				1	20-40							Yes	FL
		44-9 cover	026882	900				1	40-60							Yes	FL
		44-9 bench	026882	900				1	20-30							Yes	FL

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Environmental Engineers, Scientists
Planners & Management Consultants

Daily Source Check Form

Site Pfohl Brothers 1989

Date	Time	Instruments	Serial #s	HW Set	Source		Background		Source		Calibration		Source Check		OK ?	Checked By	
					Type	I.D.	Activity	t, min	Counts	t, min	Gross Counts	Efficiency	Units	Efficiency			Units
4-25	0815	14-C	58808														
		44-10	040205			CS-137	~5 uCi	1	6100	1	18000				Yes	FL	
		2220	46600														
		44-10	033908	550		CS-137	~5 uCi	1	6757	1	17435				Yes	FL	
		2220	37796														
		44-10	033513	800		CS-137	~5 uCi	1	5900	1	16576				Yes	FL	
		3	60720														
		44-10	027911	1100		CS-137	~5 uCi	1	6000	1	17500				Yes	FL	
4-26	0900	2220	37796														
		44-10	033513	800		CS-137	~5 uCi	1	6283	1	-				Yes	FL	
		2220	46600														
		43-5	038052	500		Th-230	~5 uCi	1	0	.1	-				Yes	FL	
4-27	0815	2220	37796														
		44-10	033513	800		CS-137	~5 uCi	1	6640	1	14840				Yes	FL	

Appendix B

APPENDIX B

FOHL BROTHERS RADIATION SURVEY - 1989

ID	X	Y	C-VALUE	UNITS	CDETECT	COMMENTS
1000	636	4058	14000	cpm	12000	
1001	560	4000	18000	cpm	12000	
1002	704	3800	228000	cpm	12000	
1003	590	3861	34000	cpm	12000	
1004	683	3825	14000	cpm	12000	
1005	765	3750	128000	cpm	12000	
1006	825	3750	20000	cpm	12000	
1007	300	3700	38000	cpm	12000	
1008	639	3653	35000	cpm	12000	
1009	190	3642	66000	cpm	12000	
1010	856	3499	30000	cpm	12000	
1011	650	3520	16000	cpm	12000	
1012	837	3497	25000	cpm	12000	
1013	846	3451	42000	cpm	12000	
1014	864	3398	31000	cpm	12000	
1015	742	3365	15000	cpm	12000	
1016	740	3350	27000	cpm	12000	
1017	715	3350	20000	cpm	12000	*
1018	725	3335	25000	cpm	12000	*
1019	404	3320	68000	cpm	12000	
1020	1059	3230	700000	cpm	12000	
1021	1056	3232	18000	cpm	12000	
1022	1125	3150	29000	cpm	12000	
1023	1140	3125	16000	cpm	12000	
1024	1037	3120	16000	cpm	12000	
1025	1027	3125	12500	cpm	12000	
1026	650	3150	40000	cpm	12000	
1027	652	3148	80000	cpm	12000	
1028	535	3100	20000	cpm	12000	
1029	950	3060	14000	cpm	12000	
1030	958	3050	14000	cpm	12000	
1031	1011	3050	16000	cpm	12000	
1032	1025	3100	21000	cpm	12000	
1033	1100	3065	13000	cpm	12000	
1034	1180	3100	16000	cpm	12000	
1035	1142	3053	30000	cpm	12000	
1036	1050	3050	18000	cpm	12000	
1037	1010	3050	16000	cpm	12000	
1038	962	3000	15000	cpm	12000	
1039	1025	3053	28000	cpm	12000	
1040	1100	3050	44000	cpm	12000	
1041	860	3050	32000	cpm	12000	
1042	575	3000	44000	cpm	12000	
1043	580	2965	12000	cpm	12000	*
1044	620	2965	25000	cpm	12000	*
1045	646	2994	12000	cpm	12000	
1046	650	2990	24000	cpm	12000	
1047	1140	2996	14000	cpm	12000	
1048	1145	2998	12000	cpm	12000	
1049	1198	2997	25000	cpm	12000	
1050	725	2950	110000	cpm	12000	
1051	1190	2947	24000	cpm	12000	
1052	620	2935	25000	cpm	12000	*
1053	580	2935	15000	cpm	12000	*
1054	313	2910	16000	cpm	12000	
1055	700	2900	29000	cpm	12000	
1056	711	2885	12000	cpm	12000	
1057	800	2896	18000	cpm	12000	
1058	804	2890	12000	cpm	12000	
1059	650	2850	38000	cpm	12000	
1060	760	2850	29000	cpm	12000	
1061	975	2850	15000	cpm	12000	
1062	1100	2835	30000	cpm	12000	*
1063	1105	2835	30000	cpm	12000	*
1064	987	2840	20000	cpm	12000	
1065	860	2815	15000	cpm	12000	

FOHL BROTHERS RADIATION SURVEY - 1989

1066	661	2840	18000	cpm	12000
1067	250	2815	20000	cpm	12000
1068	100	2860	72000	cpm	12000
1069	950	2800	78000	cpm	12000
1070	1010	2800	30000	cpm	12000
1071	225	2800	36000	cpm	12000
1072	250	2800	26000	cpm	12000
1073	100	2200	15000	cpm	12000
1074	1196	2740	15000	cpm	12000 *
1075	1196	2733	15000	cpm	12000 *
1076	1175	2700	20000	cpm	12000 *
1077	1175	2750	15000	cpm	12000 *
1078	1132	2705	22000	cpm	12000
1079	745	2750	19000	cpm	12000
1080	915	2750	17000	cpm	12000
1081	900	2750	12000	cpm	12000 *
1082	950	2750	26000	cpm	12000 *
1083	800	2750	12000	cpm	12000 *
1084	850	2750	19000	cpm	12000 *
1085	810	2750	19000	cpm	12000
1086	800	2705	17000	cpm	12000
1087	135	2725	255000	cpm	12000
1088	465	2705	19000	cpm	12000
1089	900	2700	14000	cpm	12000
1090	1190	2700	29000	cpm	12000
1091	500	2685	16000	cpm	12000
1092	510	2685	12000	cpm	12000
1093	620	2675	30000	cpm	12000 *
1094	620	2660	30000	cpm	12000 *
1095	685	2685	60000	cpm	12000
1096	751	2690	16000	cpm	12000
1097	887	2670	12000	cpm	12000
1098	1180	2685	15500	cpm	12000 *
1099	1170	2690	15500	cpm	12000 *
1100	1190	2665	13000	cpm	12000
1101	1112	2650	16250	cpm	12000
1102	988	2645	13600	cpm	12000
1103	725	2635	12500	cpm	12000
1104	820	2658	24000	cpm	12000
1105	400	2650	76000	cpm	12000
1106	450	2650	33000	cpm	12000
1107	450	2650	61000	cpm	12000
1108	480	2650	35000	cpm	12000
1109	600	2650	27000	cpm	12000
1110	662	2650	24000	cpm	12000
1111	850	2650	24000	cpm	12000
1112	463	2650	17000	cpm	12000
1113	465	2600	40000	cpm	12000
1114	1050	2600	19000	cpm	12000
1115	1150	2600	15000	cpm	12000
1116	615	2598	14200	cpm	12000
1117	615	2585	14000	cpm	12000
1118	775	2595	13800	cpm	12000
1119	852	2570	160000	cpm	12000 *
1120	842	2555	36000	cpm	12000 *
1121	1035	2585	17000	cpm	12000
1122	1115	2553	40000	cpm	12000
1123	1160	2553	12000	cpm	12000
1124	1175	2553	12000	cpm	12000
1125	1125	2502	14000	cpm	12000
1126	1040	2501	18000	cpm	12000
1127	200	2500	17000	cpm	12000
1128	1000	2500	20000	cpm	12000 *
1129	1050	2500	12000	cpm	12000 *
1130	630	2530	14000	cpm	12000
1131	630	2505	12000	cpm	12000
1132	660	2488	16000	cpm	12000
1133	1040	2455	12000	cpm	12000
1134	1049	2452	12000	cpm	12000
1135	975	2450	40000	cpm	12000

PFOHL BROTHERS RADIATION SURVEY - 1989

1136	1039	2480	13000	cpm	12000
1137	1155	2408	17000	cpm	12000
1138	1100	2425	14500	cpm	12000
1139	1040	2415	12000	cpm	12000
1140	1050	2400	19000	cpm	12000
1141	597	2370	20000	cpm	12000
1142	1080	2390	12000	cpm	12000
1143	1225	2350	97000	cpm	12000
1144	1320	2306	14000	cpm	12000
1145	1252	2308	30000	cpm	12000
1146	896	2292	14000	cpm	12000
1147	846	2320	630000	cpm	12000
1148	797	2333	15000	cpm	12000
1149	815	2325	14000	cpm	12000 *
1150	715	2325	20000	cpm	12000 *
1151	670	2325	260000	cpm	12000
1152	313	2303	15000	cpm	12000
1153	225	2200	14000	cpm	12000
1154	1225	2200	18000	cpm	12000
1155	1350	2200	20000	cpm	12000
1156	300	2251	12000	cpm	12000
1157	680	2280	16000	cpm	12000
1158	690	2275	14000	cpm	12000
1159	825	2260	16000	cpm	12000
1160	1040	2253	15000	cpm	12000
1161	1200	2270	12000	cpm	12000 *
1162	1215	2260	26000	cpm	12000 *
1163	1304	2210	14000	cpm	12000
1164	1250	2220	31000	cpm	12000
1165	1136	2215	12000	cpm	12000
1166	880	2300	18000	cpm	12000
1167	1275	2300	16000	cpm	12000
1168	1315	2300	16000	cpm	12000
1169	246	2165	12000	cpm	12000
1170	1237	2175	16000	cpm	12000
1171	1280	2170	14000	cpm	12000 *
1172	1320	2190	18000	cpm	12000 *
1173	1320	2175	12000	cpm	12000 *
1174	1400	2175	20000	cpm	12000 *
1175	1236	2150	30000	cpm	12000
1176	1350	2150	31000	cpm	12000
1177	1390	2150	31000	cpm	12000
1178	1348	2115	20000	cpm	12000
1179	100	2100	13000	cpm	12000
1180	225	2100	10000	cpm	12000
1181	250	2100	18000	cpm	12000
1182	1175	2100	18000	cpm	12000
1183	1376	2100	20000	cpm	12000
1184	1105	2100	18000	cpm	12000
1185	1150	2075	12000	cpm	12000 *
1186	1200	2070	30000	cpm	12000 *
1187	1210	2090	51000	cpm	12000
1188	1240	2075	20000	cpm	12000
1189	1275	2065	22000	cpm	12000
1190	1115	2090	41000	cpm	12000
1191	1310	2090	13000	cpm	12000
1192	1335	2094	15000	cpm	12000
1193	1310	2060	18000	cpm	12000
1194	1350	2095	21000	cpm	12000 *
1195	1354	2095	21000	cpm	12000 *
1196	1250	2050	18000	cpm	12000
1197	1358	2035	32000	cpm	12000 *
1198	1350	2035	25000	cpm	12000 *
1199	1337	2010	21000	cpm	12000
1200	1400	2000	30000	cpm	12000
1201	1325	1950	31000	cpm	12000
1202	1294	1953	16000	cpm	12000
1203	1300	1970	13000	cpm	12000
1204	1436	1903	20000	cpm	12000
1205	1410	1925	18000	cpm	12000 *

PFOHL BROTHERS RADIATION SURVEY - 1989

1206	1400	1920	18000	cpm	12000	*
1207	1338	1915	18000	cpm	12000	
1208	1338	1938	13000	cpm	12000	
1209	1325	1940	20000	cpm	12000	
1210	1450	1925	39000	cpm	12000	
1211	1176	1917	15000	cpm	12000	
1212	1310	1850	63000	cpm	12000	
1213	1340	1805	27000	cpm	12000	
1214	652	1830	12000	cpm	12000	
1215	652	1820	18000	cpm	12000	
1216	1350	1800	30000	cpm	12000	
1217	595	1780	62000	cpm	12000	
1218	1070	1780	155000	cpm	12000	
1219	1225	1760	212000	cpm	12000	
1220	1285	1770	950000	cpm	12000	
1221	1454	1770	14000	cpm	12000	
1222	1380	1698	18000	cpm	12000	
1223	1371	1735	237000	cpm	12000	
1224	1246	1740	12400	cpm	12000	
1225	1065	1735	15500	cpm	12000	
1226	585	1715	12000	cpm	12000	*
1227	585	1700	34000	cpm	12000	*
1228	220	1712	12000	cpm	12000	
1229	576	1700	15000	cpm	12000	
1230	220	1672	19000	cpm	12000	
1231	585	1685	22000	cpm	12000	
1232	1330	1650	31000	cpm	12000	
1233	1325	1650	230000	cpm	12000	
1234	1312	1650	220000	cpm	12000	
1235	1475	1650	154000	cpm	12000	
1236	1340	1610	200000	cpm	12000	
1237	1170	1630	60000	cpm	12000	
1238	1285	1600	26000	cpm	12000	
1239	420	1535	20000	cpm	12000	
1240	355	1517	59000	cpm	12000	
1241	178	1500	17000	cpm	12000	
1242	232	1500	20000	cpm	12000	
1243	250	1495	13600	cpm	12000	
1244	385	1490	113000	cpm	12000	
1245	230	1450	30000	cpm	12000	
1246	235	1446	12000	cpm	12000	*
1247	200	1400	20000	cpm	12000	
1248	235	1400	12000	cpm	12000	*
1249	150	1350	14000	cpm	12000	
1250	216	1350	14000	cpm	12000	
1251	200	1350	14000	cpm	12000	*
1252	200	1300	22000	cpm	12000	*
1253	-586	4000	30000	cpm	12000	
1254	-650	3990	28000	cpm	12000	
1255	-785	3980	18000	cpm	12000	*
1256	-715	3912	14000	cpm	12000	
1257	-695	3950	22000	cpm	12000	
1258	-622	3938	20000	cpm	12000	*
1259	-600	3938	22000	cpm	12000	*
1260	-755	3840	65000	cpm	12000	
1261	-828	3850	50000	cpm	12000	
1262	-675	3800	20000	cpm	12000	
1263	-787	3799	33000	cpm	12000	
1264	-770	3753	41000	cpm	12000	
1265	-892	3800	28000	cpm	12000	
1266	-1000	3785	21000	cpm	12000	
1267	-315	3675	18000	cpm	12000	
1268	-740	3660	12000	cpm	12000	*
1269	-760	3665	20000	cpm	12000	*
1270	-795	3685	15000	cpm	12000	
1271	-1100	3675	98000	cpm	12000	
1272	-730	3650	25000	cpm	12000	
1273	-836	3600	25000	cpm	12000	
1274	-570	3600	18000	cpm	12000	*
1275	-570	3550	18000	cpm	12000	*

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1276	-675	3575	40000	cpm	12000
1277	-690	3465	37000	cpm	12000
1278	-600	3450	37000	cpm	12000
1279	-625	3445	24000	cpm	12000
1280	-300	3350	92000	cpm	12000
1281	-120	3400	18000	cpm	12000
1282	-700	3400	58000	cpm	12000
1283	-420	3250	23000	cpm	12000
1284	-190	3252	14000	cpm	12000
1285	-197	3256	17000	cpm	12000 *
1286	-220	3256	17000	cpm	12000 *
1287	-375	3270	12000	cpm	12000
1288	-110	3200	115000	cpm	12000
1289	-200	3200	377000	cpm	12000
1290	-312	3200	34000	cpm	12000
1291	-610	3200	22000	cpm	12000
1292	-430	3300	14000	cpm	12000
1293	-450	3260	12000	cpm	12000 *
1294	-450	3262	20000	cpm	12000 *
1295	-1115	3235	12000	cpm	12000
1296	-1170	3225	20000	cpm	12000
1297	-920	3205	32000	cpm	12000
1298	-615	3220	12000	cpm	12000
1299	-375	3260	12000	cpm	12000 *
1300	-380	3265	22000	cpm	12000 *
1301	-340	3210	14000	cpm	12000 *
1302	-340	3212	14000	cpm	12000 *
1303	-300	3210	12000	cpm	12000 *
1304	-325	3250	70000	cpm	12000 *
1305	-250	3225	12000	cpm	12000
1306	-235	3225	20000	cpm	12000
1307	-200	3248	20000	cpm	12000
1308	-225	3200	12000	cpm	12000 *
1309	-250	3150	25000	cpm	12000
1310	-550	3150	23000	cpm	12000
1311	-1090	3150	20000	cpm	12000
1312	-1132	3150	27000	cpm	12000
1313	-250	3150	20000	cpm	12000 *
1314	-320	3175	15000	cpm	12000
1315	-335	3188	16000	cpm	12000
1316	-375	3175	15000	cpm	12000
1317	-596	3180	44000	cpm	12000 *
1318	-600	3200	15000	cpm	12000 *
1319	-1206	3198	16000	cpm	12000
1320	-645	3128	15000	cpm	12000
1321	-641	3144	12000	cpm	12000
1322	-635	3130	22000	cpm	12000
1323	-612	3130	15000	cpm	12000
1324	-593	3135	50000	cpm	12000
1325	-590	3150	12000	cpm	12000 *
1326	-645	3125	12000	cpm	12000 *
1327	-562	3142	20000	cpm	12000
1328	-317	3106	16000	cpm	12000
1329	-256	3148	12000	cpm	12000 *
1330	-256	3140	24000	cpm	12000 *
1331	-350	3100	26000	cpm	12000
1332	-350	3060	14000	cpm	12000
1333	-1055	2960	64000	cpm	12000
1334	-1103	2953	15000	cpm	12000
1335	-1115	2956	15000	cpm	12000
1336	-1220	2990	20000	cpm	12000
1337	-1120	2910	27000	cpm	12000
1338	-846	2925	25000	cpm	12000
1339	-338	2903	16000	cpm	12000
1340	-850	2906	19000	cpm	12000
1341	-615	2865	155000	cpm	12000
1342	-840	2901	16000	cpm	12000
1343	-912	2868	15000	cpm	12000
1344	-920	2868	17000	cpm	12000
1345	-1195	2849	22000	cpm	12000

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1346	-1151	2808	14000	cpm	12000
1347	-1140	2835	15000	cpm	12000
1348	-842	2845	31000	cpm	12000
1349	-1150	2846	30000	cpm	12000
1350	-1137	2820	18000	cpm	12000
1351	-1096	2810	36000	cpm	12000
1352	-975	2802	42000	cpm	12000
1353	-975	2805	15000	cpm	12000
1354	-910	2804	12000	cpm	12000 *
1355	-915	2808	27000	cpm	12000 *
1356	-300	2806	14000	cpm	12000
1357	-950	2783	28000	cpm	12000
1358	-950	2770	13000	cpm	12000
1359	-980	2770	28700	cpm	12000
1360	-1010	2785	26000	cpm	12000 *
1361	-1015	2790	26000	cpm	12000 *
1362	-135	2750	16000	cpm	12000
1363	-680	2740	15000	cpm	12000
1364	-200	2740	20000	cpm	12000
1365	-165	2670	13000	cpm	12000
1366	-1100	2650	12000	cpm	12000 *
1367	-250	2617	17000	cpm	12000
1368	-165	2550	12000	cpm	12000 *
1369	-250	2550	12000	cpm	12000 *
1370	-240	2595	16000	cpm	12000
1371	-335	2575	16000	cpm	12000
1372	-755	2595	20000	cpm	12000
1373	-800	2575	14000	cpm	12000
1374	-840	2560	16500	cpm	12000
1375	-1125	2510	12000	cpm	12000 *
1376	-1125	2520	13000	cpm	12000 *
1377	-1040	2550	12000	cpm	12000 *
1378	-1030	2500	12000	cpm	12000 *
1379	-1000	2550	17000	cpm	12000 *
1380	-950	2500	12000	cpm	12000 *
1381	-400	2500	14000	cpm	12000
1382	-280	2530	13000	cpm	12000 *
1383	-270	2530	13000	cpm	12000 *
1384	-230	2530	13000	cpm	12000
1385	-220	2530	13000	cpm	12000 *
1386	-220	2520	13000	cpm	12000 *
1387	-70	2545	280000	cpm	12000
1388	-110	2457	12000	cpm	12000
1389	-125	2457	12000	cpm	12000
1390	-210	2490	12000	cpm	12000
1391	-225	2485	12000	cpm	12000
1392	-240	2480	264000	cpm	12000
1393	-270	2455	12000	cpm	12000 *
1394	-350	2500	12000	cpm	12000 *
1395	-775	2460	12000	cpm	12000
1396	-750	2490	14000	cpm	12000 *
1397	-790	2490	14000	cpm	12000 *
1398	-815	2450	12000	cpm	12000 *
1399	-1120	2500	12000	cpm	12000 *
1400	-1100	2450	12000	cpm	12000 *
1401	-475	2400	320000	cpm	12000
1402	-725	2400	15000	cpm	12000 *
1403	-400	2400	12000	cpm	12000 *
1404	-420	2450	12000	cpm	12000 *
1405	-350	2450	12000	cpm	12000 *
1406	-100	2400	12000	cpm	12000 *
1407	-110	2400	12000	cpm	12000 *
1408	-350	2350	12000	cpm	12000 *
1409	-198	2398	73600	cpm	12000
1410	-365	2400	12000	cpm	12000 *
1411	-400	2350	12000	cpm	12000 *
1412	-650	2357	12000	cpm	12000
1413	-650	2400	12000	cpm	12000 *
1414	-660	2350	12000	cpm	12000 *
1415	-710	2370	12000	cpm	12000

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1416	-1100	2350	12000	cpm	12000	*
1417	-1025	2350	12000	cpm	12000	*
1418	-710	2300	12000	cpm	12000	*
1419	-658	2340	14000	cpm	12000	
1420	-525	2310	12000	cpm	12000	*
1421	-525	2325	12000	cpm	12000	*
1422	-510	2315	12300	cpm	12000	
1423	-475	2335	12000	cpm	12000	
1424	-460	2340	12000	cpm	12000	
1425	-415	2347	12000	cpm	12000	
1426	-375	2310	13000	cpm	12000	
1427	-340	2350	12000	cpm	12000	*
1428	-150	2300	13000	cpm	12000	*
1429	-125	2350	12000	cpm	12000	*
1430	-120	2300	13000	cpm	12000	*
1431	-250	2250	12000	cpm	12000	*
1432	-300	2290	12000	cpm	12000	
1433	-265	2265	12000	cpm	12000	
1434	-335	2265	12000	cpm	12000	*
1435	-335	2275	13000	cpm	12000	*
1436	-295	2290	13000	cpm	12000	
1437	-375	2290	13000	cpm	12000	
1438	-405	2260	13000	cpm	12000	*
1439	-405	2275	15000	cpm	12000	*
1440	-425	2300	12000	cpm	12000	*
1441	-525	2250	12000	cpm	12000	*
1442	-540	2280	13000	cpm	12000	
1443	-575	2300	12000	cpm	12000	*
1444	-600	2250	14000	cpm	12000	*
1445	-675	2270	13000	cpm	12000	
1446	-700	2300	12000	cpm	12000	*
1447	-780	2300	14000	cpm	12000	*
1448	-700	2250	12000	cpm	12000	*
1449	-780	2250	14000	cpm	12000	*
1450	-800	2300	12000	cpm	12000	*
1451	-860	2250	12000	cpm	12000	*
1452	-875	2290	12000	cpm	12000	*
1453	-900	2290	12000	cpm	12000	*
1454	-1000	2300	12000	cpm	12000	*
1455	-1030	2250	12000	cpm	12000	*
1456	-870	2250	12000	cpm	12000	*
1457	-690	2200	12000	cpm	12000	*
1458	-620	2225	14000	cpm	12000	
1459	-570	2250	12000	cpm	12000	*
1460	-570	2200	14000	cpm	12000	*
1461	-460	2250	12000	cpm	12000	*
1462	-415	2200	12000	cpm	12000	*
1463	-285	2207	12000	cpm	12000	
1464	-265	2225	12000	cpm	12000	
1465	-200	2245	14000	cpm	12000	
1466	-280	2190	12000	cpm	12000	
1467	-325	2185	12000	cpm	12000	
1468	-342	2155	12000	cpm	12000	
1469	-360	2170	12000	cpm	12000	*
1470	-360	2180	12000	cpm	12000	*
1471	-360	2170	12000	cpm	12000	*
1472	-375	2170	12000	cpm	12000	*
1473	-448	2190	12000	cpm	12000	
1474	-480	2170	12000	cpm	12000	*
1475	-520	2150	12000	cpm	12000	*
1476	-525	2195	12000	cpm	12000	*
1477	-550	2185	12000	cpm	12000	*
1478	-550	2185	12000	cpm	12000	*
1479	-580	2185	12000	cpm	12000	*
1480	-655	2180	12000	cpm	12000	*
1481	-680	2180	12000	cpm	12000	*
1482	-701	2160	12000	cpm	12000	*
1483	-710	2160	12000	cpm	12000	*
1484	-710	2200	12000	cpm	12000	*
1485	-750	2150	12000	cpm	12000	*

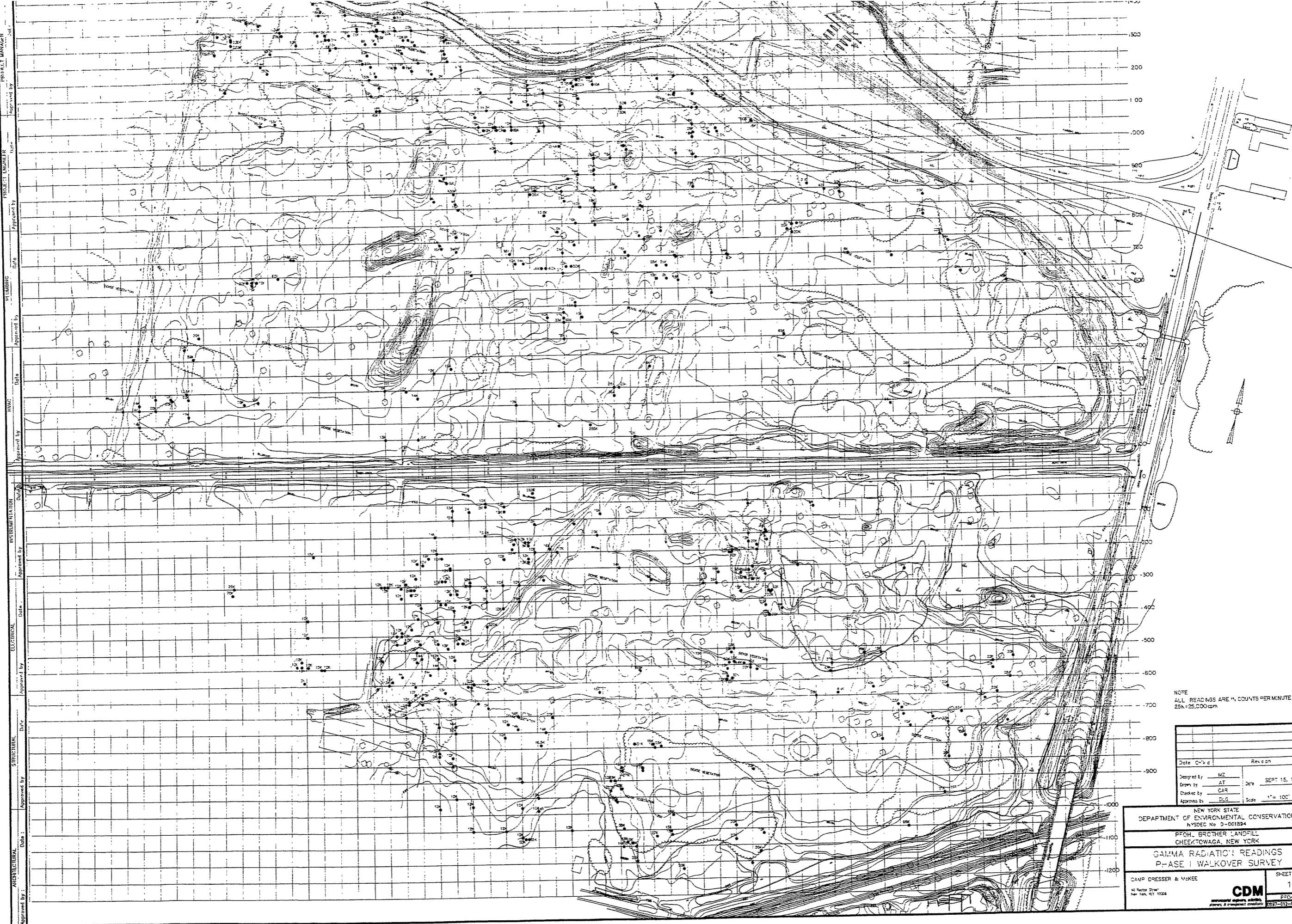
PFOHL BROTHERS RADIATION SURVEY - 1989

1486	-750	2150	12000	cpm	12000	*
1487	-725	2100	12000	cpm	12000	*
1488	-640	2110	13000	cpm	12000	
1489	-625	2140	14000	cpm	12000	
1490	-525	2125	12000	cpm	12000	*
1491	-500	2125	12000	cpm	12000	*
1492	-500	2140	12000	cpm	12000	*
1493	-490	2140	12000	cpm	12000	*
1494	-385	2140	12000	cpm	12000	
1495	-355	2140	12000	cpm	12000	
1496	-350	2100	12000	cpm	12000	*
1497	-350	2090	12000	cpm	12000	*
1498	-350	2080	12000	cpm	12000	*
1499	-575	2080	12000	cpm	12000	*
1500	-650	2100	13000	cpm	12000	
1501	-660	2065	12000	cpm	12000	
1502	-600	1905	12000	cpm	12000	
1503	-255	1875	15000	cpm	12000	
1504	-450	1855	12000	cpm	12000	*
1505	-500	1855	12000	cpm	12000	*
1506	-600	1895	12000	cpm	12000	
1507	-592	1855	12000	cpm	12000	
1508	-640	1843	12000	cpm	12000	
1509	-590	1820	12000	cpm	12000	*
1510	-590	1835	13000	cpm	12000	*
1511	-575	1835	12000	cpm	12000	
1512	-350	1630	25000	cpm	12000	*
1513	-370	1625	70000	cpm	12000	*

PFOHL BROTHERS RADIATION SURVEY - 1989

KEY:

- D - Sequential numbering system to give each data point its own unique identification number.
- ^ - Distance in feet north (+) or south (-) of Aero Drive
- Y - Distance in feet east (-) or west (+) of transit. (ie. for a hotspot found 8 feet east of transit 40+50 the corresponding Y value would be 4058 and if found 8 feet west of 45+50 the Y would be 4042
- value - The concentration value of the hotspot in counts per minute (cpm)
- Cdetect - The detection limit (2 times background). Background is 6000 cpm.
- * - Represents a location which makes up a corner of an area.



PROJECT MANAGER Approved by _____ Date _____
 PROJECT ENGINEER Approved by _____ Date _____
 PLUMBING Approved by _____ Date _____
 HVAC Approved by _____ Date _____
 MECHANICAL Approved by _____ Date _____
 ELECTRICAL Approved by _____ Date _____
 STRUCTURAL Approved by _____ Date _____
 ARCHITECTURAL Approved by _____ Date _____

NOTE
 ALL READINGS ARE IN COUNTS PER MINUTE (cpm)
 25N = 25,000 cpm

Date	Ch'g'd	Revision
Designed by	MZ	
Drawn by	AT	DATE: SEPT 15, 1989
Checked by	CAR	
Approved by	DUG	Scale: 1" = 100'

NEW YORK STATE
 DEPARTMENT OF ENVIRONMENTAL CONSERVATION
 NYSDEC No. D-061894

FRONL BROTHER LANDFILL
 CHEEKTOWAGA, NEW YORK

GAMMA RADIATION READINGS
 P-ASE I WALKOVER SURVEY

CAMP DRESSER & VEEKE
 45 West 27th
 New York, NY 10004

SHEET NO.
 1

CDM
 CONSULTING ENGINEERS, ARCHITECTS,
 PLUMBERS, & MECHANICAL CONTRACTORS
 2517-01-RC-0405