111811
ORIGINAL
(Red)

APPENDIX E

GEOLOGIC LOGS

ORIGINAL
(Red)

TEST BORING Nº M2B

BY SJC DATE 4-26-94 CHK'D ✓ DATE

PROJECT NAME HELEVA LANDFILL PROJECT Nº 0760.16 LOCATION ORMROD, PA

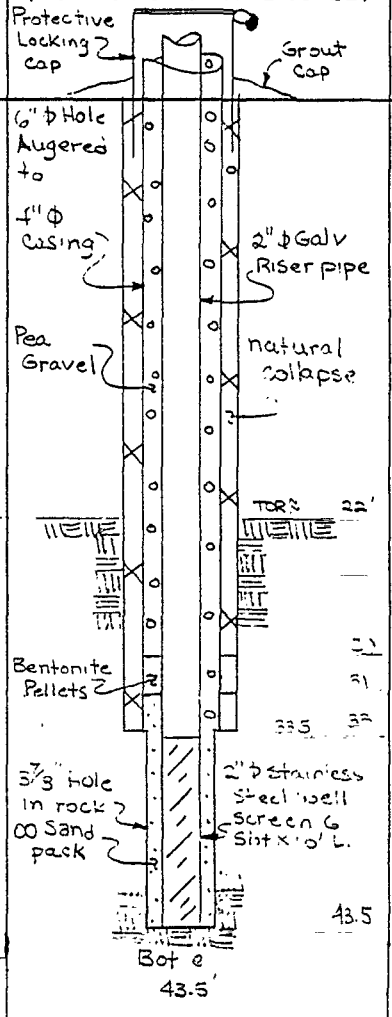
GEOLOGIST/ENGINEER SJ CONTI / L. REITZ DRILLING CONTRACTOR PENNA. DRILLING CO. DRILLER JIM McCANN

DRILL MOBILE DRILLING METHOD AUGER / ROLLER BIT DRILLING DATE 4-12-94 COORDINATES

SURFACE ELEVATION 471.5 STICK UP ELEVATION 473.55 (stee SCALE 1" = 5' VERTICAL

LITHOLOGY	PROFILE	DEPTH, FEET	SOIL SAMPLE: NUMBER	PENETRATION (INCHES)	RECOVERY (INCHES)	DEPTH, FEET	BLOWS/6"	STATIC WATER LEVEL, FEET	BORING-CASING DIAMETER, INCHES	ROCK SAMPLE: RUN	RECOVERY %	RQD %	REMARKS
SURFACE													
0-22 Soft to Med Stiff, yellow brown CLAY, some silt and coarse Sand, Bad odor, moist to wet.		22'							6" Φ Auger to 33' Set 4" casing to 33'				
22-45 SHALE, Dark Gray Soft, weathered with coarse sand, possible Joint or fracture.		45'											

WELL CONSTRUCTION DETAILS (NOT TO HORIZONTAL SCALE)



AR300538

ORIGINAL
(Red)

TEST BORING Nº MZA

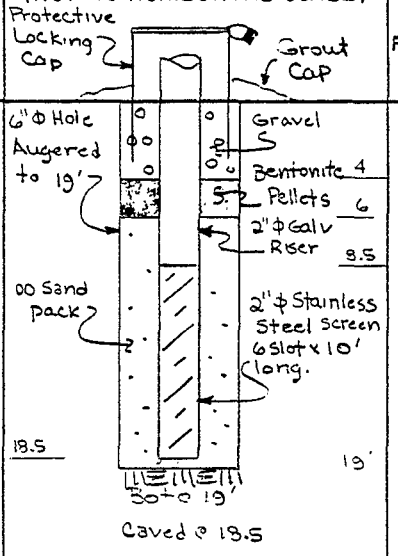
BY SJC DATE 4-26-84 CHK'D DATE

PROJECT NAME HELEVA LANDFILL PROJECT Nº 0760.16 LOCATION ORMROD, PA.

GEOLOGIST/ENGINEER SCONTI / L. REITZ DRILLING CONTRACTOR PENNA. DRILLING CO. DRILLER JIM MCCANN

DRILL MOBILE DRILLING METHOD AUGER, ROLLER BIT DRILLING DATE 4-12-84 COORDINATES

SURFACE ELEVATION 477.5 STICK UP ELEVATION 479.37 (5-feet) SCALE 1" = 10' VERTICAL

LITHOLOGY SURFACE	PROFILE	DEPTH, FEET	SOIL SAMPLE NUMBER	PENETRATION (INCHES)	RECOVERY (INCHES)	DEPTH, FEET	BLOWS/6"	STATIC WATER LEVEL, FEET	BORING-CASING DIAMETER, INCHES	ROCK SAMPLE RUN	RECOVERY %	RQD %	WELL CONSTRUCTION DETAILS (NOT TO HORIZONTAL SCALE)	REMARKS
														

AR300539

ORIGINAL
(Red)

TEST BORING Nº M33

BY SJC DATE 1-26-84 CHK'D RD DATE 2-20-

PROJECT NAME HELENA LANDFILL PROJECT Nº 0760.16 LOCATION ORMROD, PA.

GEOLOGIST/ENGINEER S. CONTI / L. REITZ DRILLING CONTRACTOR PENNA. DRILLING CO. DRILLER JIM McCANN

DRILL MOBILE DRILLING METHOD AUGER/ROTARY DRILLING DATE 4/2/84 COORDINATES

SURFACE ELEVATION [illegible] STICK UP ELEVATION [illegible] SCALE 1" = 10' VERTICAL

LITHOLOGY (SURFACE)	PROFILE	DEPTH, FEET	SOIL SAMPLE: NUMBER	PENETRATION (INCHES)	RECOVERY (INCHES)	DEPTH, FEET	BLOWS/6"	STATIC WATER LEVEL, FEET	BORING-CASING DIAMETER, INCHES	ROCK SAMPLE: RUN	RECOVERY %	RQD %	WELL CONSTRUCTION DETAILS (NOT TO HORIZONTAL SCALE)	REMARKS
0-34 Soft to Medium Stiff, yellow brown CLAY, some silt and pebbles, damp, no water zone intersected.		34							6" ϕ Auger to 39' Set 4" casing to 39'				6" Hole Auger to 39' / Protective Locking Cap / Grout Cap / Cement grout / 4" ϕ Casing Set to 39' / T.O.R.	Only did deep hole here, no shallow well installed as no water encountered to top of rock. Compl 4-10-84
34-70 LIMESTONE, very dark gray, hard argillaceous fractured. lost return at 40' in fracture, assumed rock as before		70							3 7/8" ϕ Rotary hole in Rock				3 7/8" ϕ Rotary hole in rock (open hole well) / Bot @ 70'	lost return at 40'.

34 / 39' / 70'

AR300540

ORIGINAL (Red)

TEST BORING Nº M-23

BY SJG DATE 4-26-84 CHK'D [illegible] DATE [illegible]

PROJECT NAME HELENA LANDFILL PROJECT Nº 0760.16 LOCATION ORMROD, PA.

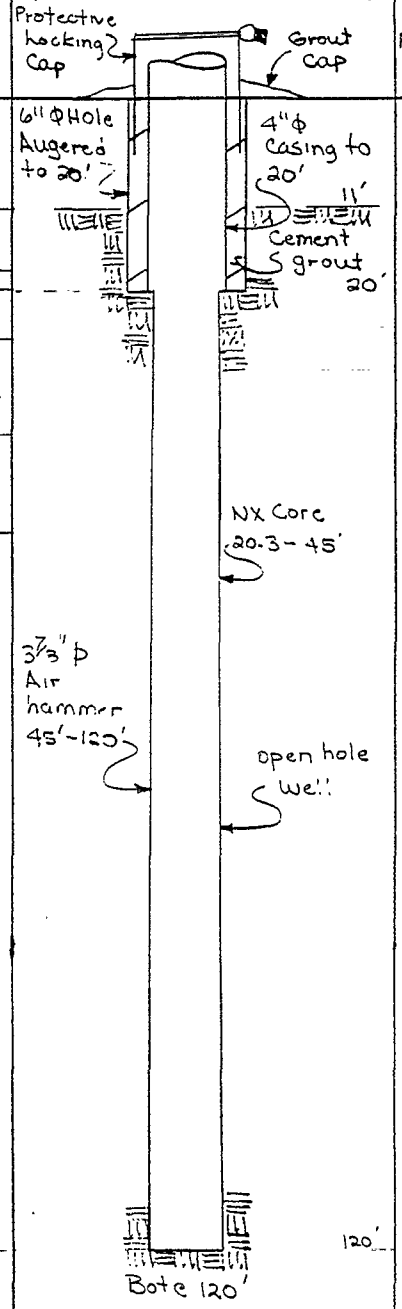
GEOLOGIST/ENGINEER [illegible] DRILLING CONTRACTOR PENNA DRILLING CO. DRILLER BERNIE GOLLIHUE

DRILL ACKER ON 2½ TON DRILLING METHOD AUGER/HAMMER DRILLING DATE 4-2-84 COORDINATES

SURFACE ELEVATION 476.4 STICK UP ELEVATION 478.56 [illegible] SCALE 1" = 20 VERTICAL

LITHOLOGY (SURFACE)	PROFILE	DEPTH, FEET	SOIL SAMPLE NUMBER	PENETRATION (INCHES)	RECOVERY (INCHES)	DEPTH, FEET	BLOWS/6"	STATIC WATER LEVEL, FEET	BORING-CASING DIAMETER, INCHES	ROCK SAMPLE RUN	RECOVERY %	RQD %	REMARKS
0-11 Soft Red Brown Clay, Some silt, moist, occasional subangular hematite gravels, mod. weathered			1	18	18	1.5	3-2-3		6" ϕ Auger to 20'				
			2	18	12	6.5	1-1-2						
		11.0	3	18	12	11	51-71		Casing 4" ϕ to 20'				
11-20.3 LIMESTONE, Dark Gray thickly bedded, slightly weathered, trace pyrite, dry, calcite vein filling common, fracture c 19', limonite staining.			18										
		14.2	20							1	70	0	
		43/5	25							2	86	70	
20-23.2 LIMESTONE, Dark gray, hard, no bedding, argillaceous, sandy, load features common, possible shell frags. calcite fractures, bot. contact sharp.		9.4/10.0	35						18-45 NX Core	3	94	74	
		6.4/10	45							4	64	47	
23.2-45 LIMESTONE Dark gray, hard, thick bedded load features calcite fillings, 1% fine disseminated pyrite/marcasite, sandy, fractures c 25', 26', 28' RQD decr. w/ Depth		60							45-120 Air Hammer 3⅞" ϕ				
		70											
45-60 LIMESTONE Dark gray, hard.													
60-70 LIMESTONE Dark gray to black, hard													
70-100 LIMESTONE Dark gray, hard		100											
100-120 LIMESTONE, Dark gray to black, hard.		120'											

WELL CONSTRUCTION DETAILS (NOT TO HORIZONTAL SCALE)



AR300541

ORIGINAL
(Red)

TEST BORING Nº M53

BY SJC DATE 4-26-94 CHK'D [illegible] DATE [illegible]

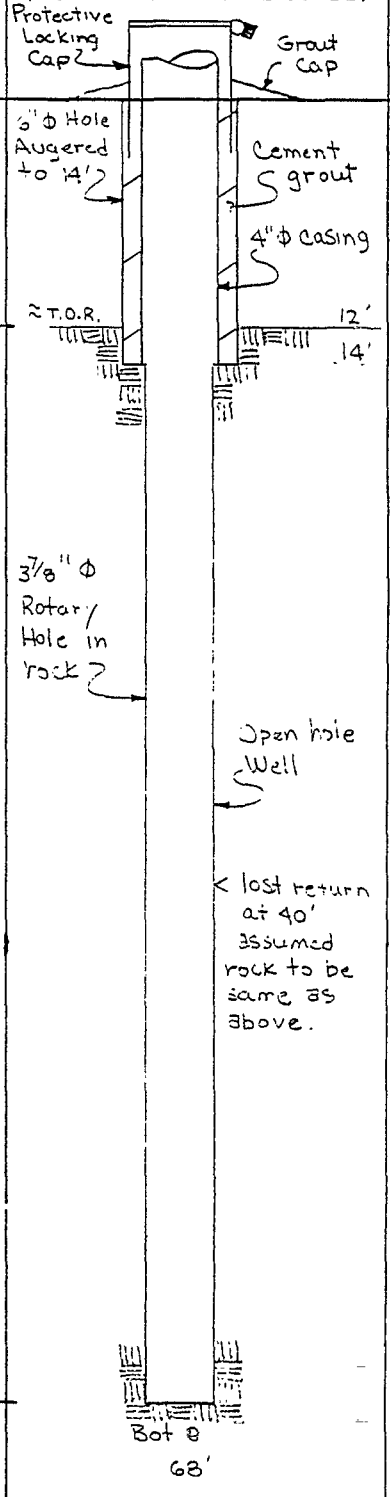
PROJECT NAME HELEVA LANDFILL PROJECT Nº 0760.16 LOCATION ORMROD, PA.

GEOLOGIST/ENGINEER SCOTT L. REITZ DRILLING CONTRACTOR PENNA. DRILLING CO. DRILLER JIM MCCANN

DRILL MOBILE DRILLING METHOD AUGER/ROTARY DRILLING DATE 4-11-94 COORDINATES

SURFACE ELEVATION 463.3 STICK UP ELEVATION 470.65 (STEEL) SCALE 1" = 10' VERTICAL

LITHOLOGY	PROFILE	DEPTH, FEET	SOIL SAMPLE NUMBER	PENETRATION (INCHES)	RECOVERY (INCHES)	DEPTH, FEET	BLOWS/6"	STATIC WATER LEVEL, FEET	BORING-CASING DIAMETER, INCHES	ROCK SAMPLE RUN	RECOVERY %	RQD %	WELL CONSTRUCTION DETAILS (NOT TO HORIZONTAL SCALE)	REMARKS
SURFACE														
0-12 Soft to Med Stiff, yellow brown CLAY, some silt and pebbles, gr/ to top of rock.		12					6" Hole Auger to 14' Set 4"Φ Casing @ 14'		6"Φ Auger to 14' 4" Φ Casing Set @ 14'.				6"Φ Hole Augered to 14'	Compl 4-12-94
12-68 LIMESTONE, very dark gray, hard argillaceous, fractured		68							3 7/8" Φ Rotary hole in rock to 68'				3 7/8" Φ Rotary Hole in rock	



AR300542

ORIGINAL (Red)

TEST BORING Nº M65

BY SJC DATE 4-11-84 CHK'D ZD DATE

PROJECT NAME HELEVA LANDFILL PROJECT Nº 2760.16 LOCATION OSWEGO, PA.

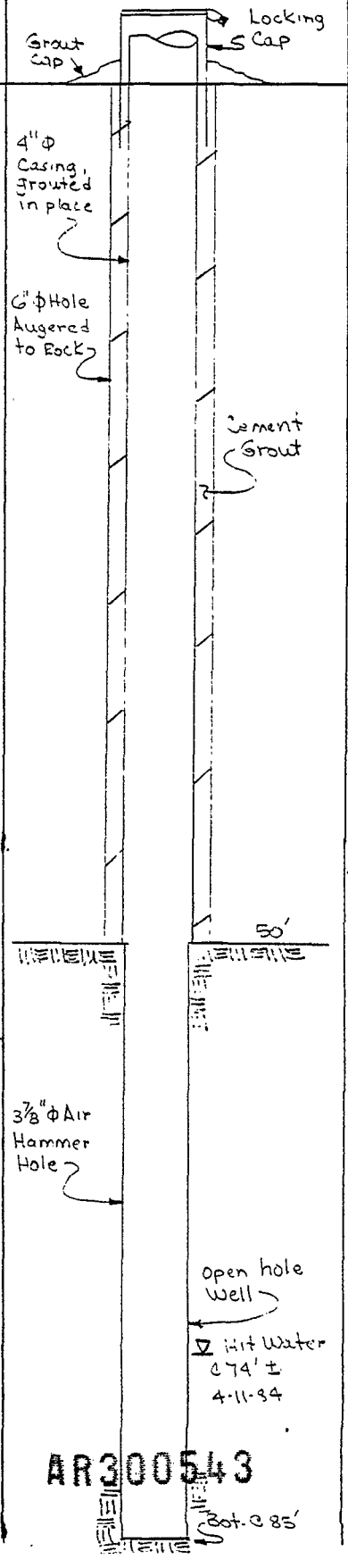
GEOLOGIST/ENGINEER [illegible] DRILLING CONTRACTOR PENNA. DRILLING DRILLER BERNIE COLLINS

DRILL ACKER ON 2½ TON DRILLING METHOD AUGER/HAMMER DRILLING DATE 4/9 - 4/10 COORDINATES

SURFACE ELEVATION 441.4 STICK UP ELEVATION 443.3' PVC SCALE 1" = 10' VERTICAL

LITHOLOGY (SURFACE)	PROFILE	DEPTH, FEET	SOIL SAMPLE NUMBER	PENETRATION (INCHES)	RECOVERY (INCHES)	DEPTH, FEET	BLOWS/6"	STATIC WATER LEVEL, FEET	BORING-CASING DIAMETER, INCHES	ROCK SAMPLE RUN	RECOVERY %	RQD %	REMARKS
0-10 Soft to Medium Stiff Reddish Brown Clayey SILT, moist to wet.			1	18		0-1.5	2-1-3		6" Φ Auger to 55', Air Hammer in Rock				Sampled Hole was used for Hole 6A But put Lithology on this sheet. Hit rock @ actual 68 at shallow depth (50')
			2	18		5-6.5	1-1-2						
10-15 Medium Stiff, Yellow Brown Silty CLAY, Trace Hematite Gravel, moist.			3	18		10-11.5	3-6-7						
15-20 Medium Stiff to Stiff Mottled Yellow Brown to Reddish Gray Clayey SILT, Trace Weathered Hematite and Rock fragments. Trace Very fine Sand at 25', Moist to Wet, Hit Water at 20'±.			4	18		15-16.5	9-9-14						
			5	18		20-21.5	7-9-11						Compl. 4-10-84
			6	18		25-26.5	9-11-11						
30 Soft to Medium Stiff Mottled Reddish Brown Gray Silty CLAY - Some Shale and Hematite fragments, moist to wet			7	18		30-31.5	12-10-14						
			8	18		35-36.5	16-22-20						
			9	15		40-41.5	19-17-24						Hit Boulder @ 43 and 45 feet
45-46 Hard Boulder - No Recovery			10	6		45-45.5	75/.5						
50-55.5 Soft Dark Gray Silty CLAY, Some Limestone Fragments - Shaly, very calcareous weathered, moist to wet - VER			11	18		50-51.5	16-27-22						
		55.5	12	6		55-55.5	71/.5						
55-85 Hard Dark gray Shaly LIMESTONE													Rock Dis. from Cuttings
BOT @ 85'		85.0											

WELL CONSTRUCTION DETAILS (NOT TO HORIZONTAL SCALE)



AR300543

ORIGINAL (Red)

TEST BORING Nº M6A

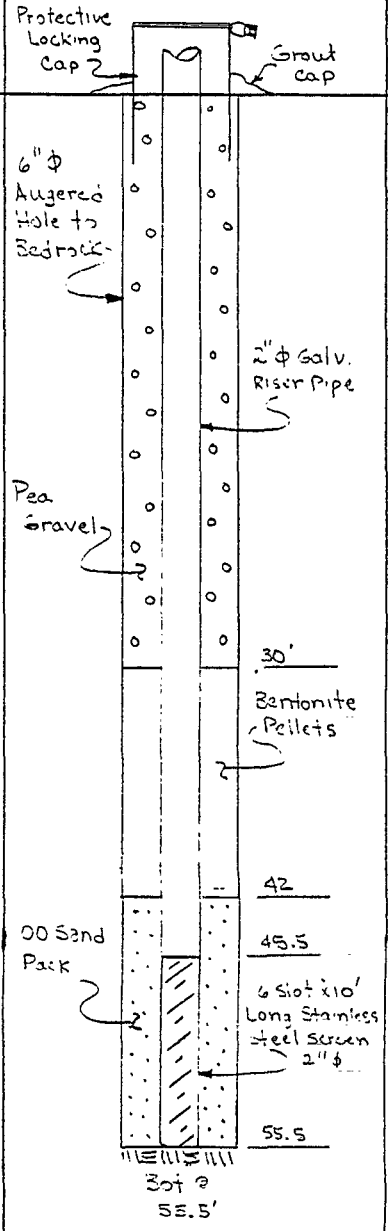
BY SJC DATE 4-10-84 CHK'D [illegible] DATE [illegible]

PROJECT NAME HELENA LANDFILL PROJECT Nº 0769.16 LOCATION DERRY, PA

GEOLOGIST/ENGINEER [illegible] DRILLING CONTRACTOR PENNA. DRILLING CO. DRILLER BERNIE GOLLIHUE

DRILL MAKE OR TYPE [illegible] DRILLING METHOD AUGER/HAMMER DRILLING DATE 4-10-84 COORDINATES

SURFACE ELEVATION 441.2 STICK UP ELEVATION 442.54 STEEL SCALE 1" = 10' VERTICAL

LITHOLOGY SURFACE	PROFILE	DEPTH, FEET	SOIL SAMPLE NUMBER	PENETRATION (INCHES)	RECOVERY (INCHES)	DEPTH, FEET	BLOWS/6"	STATIC WATER LEVEL, FEET	BORING-CASING DIAMETER, INCHES	ROCK SAMPLE RUN	RECOVERY %	RQD %	WELL CONSTRUCTION DETAILS (NOT TO HORIZONTAL SCALE)	REMARKS
														Comp 4-10-84
														V. Wet @ 20' ±
														Top of Rock @ 55.5'

AR300544

ORIGINAL (Red)

TEST BORING Nº M7B

BY SJC DATE 4-27-84 CHK'D RD DATE 12/21/3

ROJECT NAME HELENA LANDFILL PROJECT Nº 07650.16 LOCATION OBNROD, PA

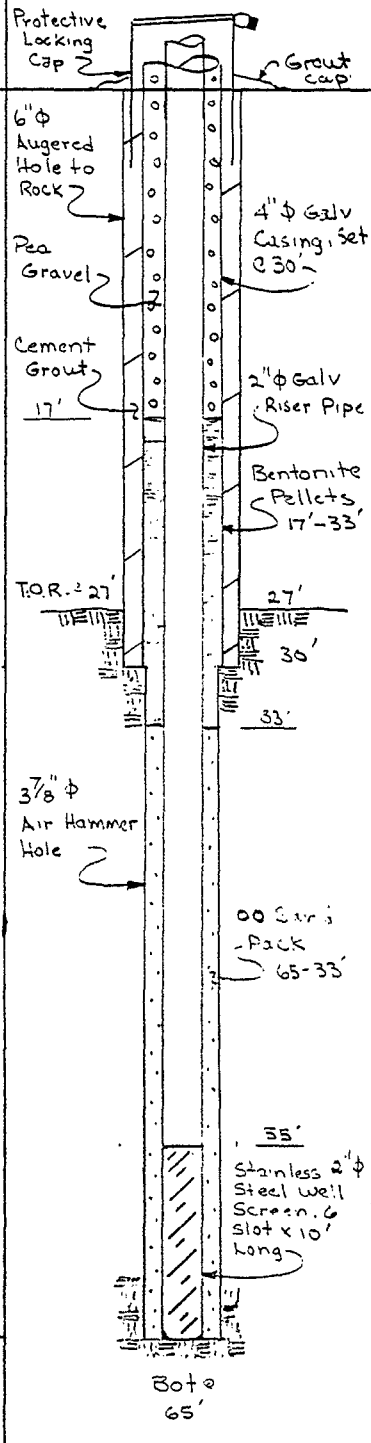
GEOLOGIST/ENGINEER J. Hughart / S. Conti DRILLING CONTRACTOR PENNA. DRILLING DRILLER BERNIE GOLLINUE

L ACKERMAN 3½ TON DRILLING METHOD Auger/Hammer DRILLING DATE 4-4-84 COORDINATES

FACE ELEVATION 439.5 STICK UP ELEVATION 441.78 STEEL SCALE 1" = 10' VERTICAL

LITHOLOGY	PROFILE	DEPTH, FEET	SOIL SAMPLE NUMBER	PENETRATION (INCHES)	RECOVERY FT. (INCHES)	DEPTH, FEET	BLOWS/6"	STATIC WATER LEVEL, FEET	BORING-CASING DIAMETER, INCHES	ROCK SAMPLE RUN	RECOVERY %	RQD %	REMARKS
SURFACE													
0-22 – Soft to stiff Red Brown CLAY, some silt, Few Organic shale fragments, moist.			1		1.2	0-1.5	2-3-3		6"ϕ Auger to Rock then Air Hammer 3⅞"ϕ				Had to move hole from orig location Could not set well @ initial location Moved ≈ 6'. Hit Rock at lower El.
			2		1.5	5-6.5	6-13-12						
			3		1.5	10-11.5	11-12-14						
			4		1.5	15-16.5	3-7-9						
		22'	5		1.25	20-21.5	4-7-9						
1-25 Hard Dark Gray LIMESTONE													
1-40 Hard Gray Brown LIMESTONE			6		0.2	25-25.5	75/.5						
40-42 Soft Brown Clay Seam													
42-61 - Hard Dark Gray LIMESTONE													
61-64 Soft Clay Seam													
4-65.5 Hard Gray LIMESTONE		65.5											

WELL CONSTRUCTION DETAILS (NOT TO HORIZONTAL SCALE)



AR300545

ORIGINAL
(Red)

TEST BORING Nº M7A

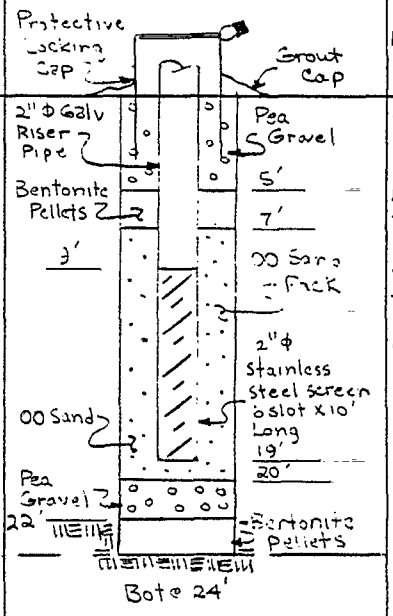
BY SJC DATE 4/26/84 CHK'D [illegible] DATE [illegible]

PROJECT NAME ELEVA LANDFILL PROJECT Nº 0760-15 LOCATION DRMROD, PA.

GEOLOGIST/ENGINEER J. HUGLET / S CONTI DRILLING CONTRACTOR PENNA DRILLING CO DRILLER BERNIE GOLLINUE

DRILL ACKER DN 2½ TON DRILLING METHOD AUGER/HAMMER DRILLING DATE 4/3/84 COORDINATES

SURFACE ELEVATION ~330.0 STICK UP ELEVATION 4.41 STEEL SCALE 1" = 10' VERTICAL

LITHOLOGY SURFACE	PROFILE	DEPTH, FEET	SOIL SAMPLE NUMBER	PENETRATION (INCHES)	RECOVERY (INCHES)	DEPTH, FEET	BLOWS/6"	STATIC WATER LEVEL, FEET	BORING-CASING DIAMETER, INCHES	ROCK SAMPLE RUN	RECOVERY %	RQD %	WELL CONSTRUCTION DETAILS (NOT TO HORIZONTAL SCALE)	REMARKS
														Hole was initially to be 7B. Auger'd to 35' out couldn't [illegible] casing past 24', so backfilled w/ bentonite at bottom Compl 4-13-84

AR300546

ORIGINAL (Red)

TEST BORING Nº MBB

BY SJC DATE 4-25-84 CHK'D RP DATE 12/20/..

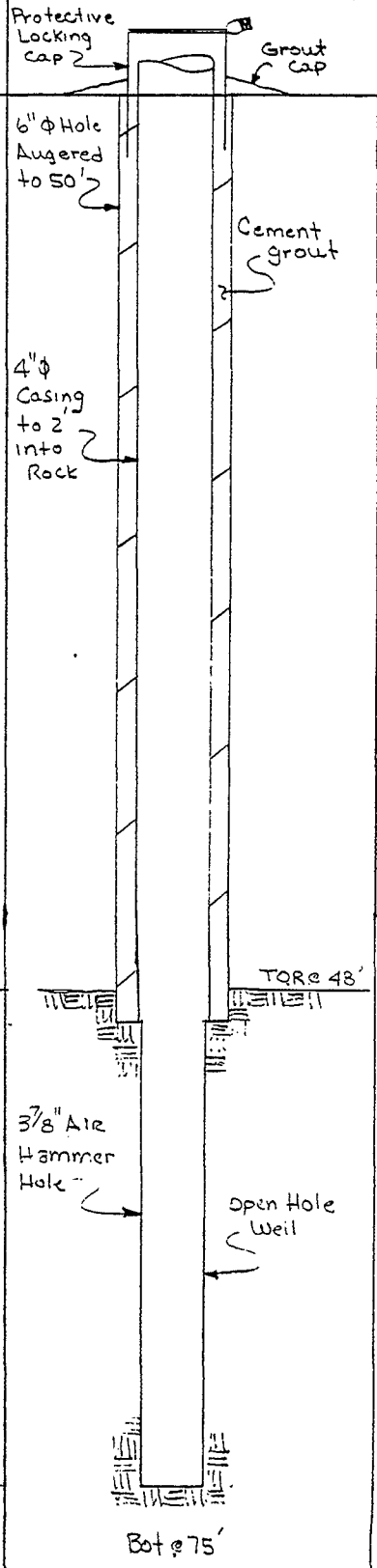
OJECT NAME HELEVA LANDFILL PROJECT Nº 9760-16 LOCATION ORMROD, PA.

GEOLOGIST / ENGINEER S. CONTI, J. HUGHART DRILLING CONTRACTOR PENNA. DRILLING CO DRILLER BERNIE GOLLINUE

D[illegible] LOWERING 7 1/2 TON DRILLING METHOD AUGER/CORE/AIR DRILLING DATE 4-9 / 4-9 1984 COORDINATES

ACE ELEVATION 428.9 STICK UP ELEVATION 430.70 SCALE 1" = 10' VERTICAL

LITHOLOGY (SURFACE)	PROFILE	DEPTH, FEET	SOIL SAMPLE: NUMBER	PENETRATION (INCHES)	RECOVERY (INCHES)	DEPTH, FEET	BLOWS/6"	STATIC WATER LEVEL, FEET	BORING-CASING DIAMETER, INCHES	ROCK SAMPLE: RUN	RECOVERY %	RQD %	WELL CONSTRUCTION DETAILS (NOT TO HORIZONTAL SCALE)	REMARKS
) 48' Red Brown CLAY Some Silt, Few to Some angular shale and limestone Gravel, 0-40, moist, 40-48, wet.		48'							6" ϕ Hole Augered 2' into Rock, Set 4" ϕ Casing. 3 7/8" ϕ Air hammer to 75'					Shovel Samples obtained @ 5' intv in unconsol. material
48-75 LIMESTONE - Dark Gray Hard. Almost Black in color, Shaly.		75'												Rock Descrip from Cuttings



AR300547

ORIGINAL
(Red)

TEST BORING Nº M8A

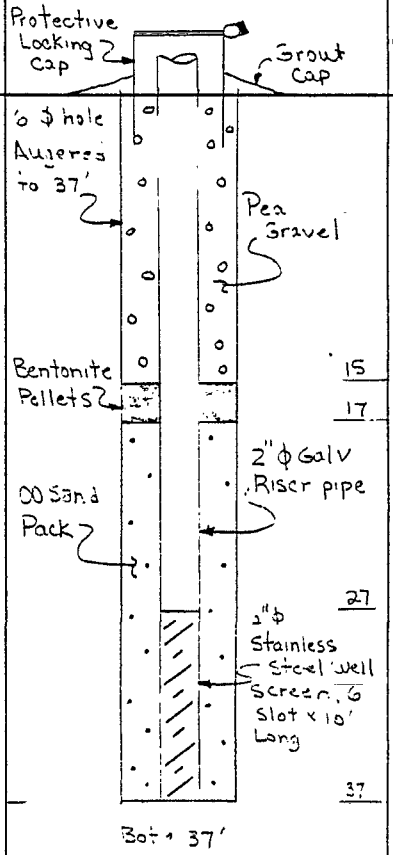
BY SJC DATE 4-25-84 CHK'D BD DATE 10/20

OJECT NAME HELEVA LANDFILL PROJECT Nº 0760.16 LOCATION ORMROD, PA.

GEOLOGIST / ENGINEER S. CONTI / L. PETZ DRILLING CONTRACTOR PENNA. DRILLING CO. DRILLER BERNIE [illegible]

DRILL ACKER ON 2½ TON DRILLING METHOD AUGER / CORE DRILLING DATE 4/3/84 COORDINATES

RFACE ELEVATION 429.3 STICK UP ELEVATION 431.16 SCALE 1" = 10 VERTICAL

LITHOLOGY SURFACE	PROFILE	DEPTH, FEET	SOIL SAMPLE NUMBER	PENETRATION (INCHES)	RECOVERY (INCHES)	DEPTH, FEET	BLOWS/6"	STATIC WATER LEVEL, FEET	BORING-CASING DIAMETER, INCHES	ROCK SAMPLE RUN	RECOVERY %	RQD %	WELL CONSTRUCTION DETAILS (NOT TO HORIZONTAL SCALE)	REMARKS
														Comp 4-16-84

AR300548

ORIGINAL
(Red)

TEST BORING Nº M08

BY SJC DATE 4-25-84 CHK'D [illegible] DATE [illegible]

PROJECT NAME HELENA LANDFILL PROJECT Nº 07160-16 LOCATION DRMROD, PA

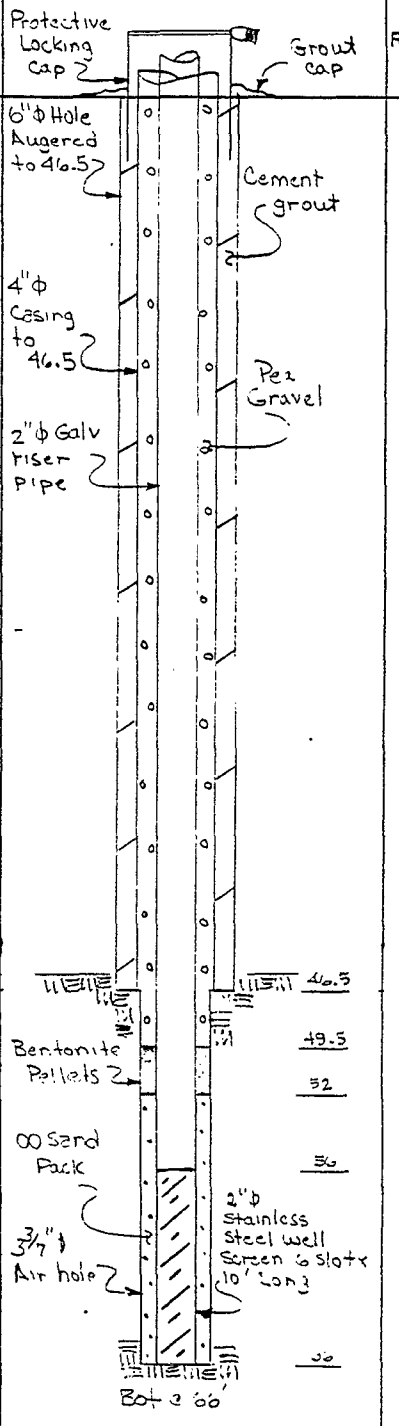
GEOLOGIST/ENGINEER S. CONTI / J. HUGHART DRILLING CONTRACTOR PENNA. DRILLING CO. DRILLER FRENCH GOLLINGE

DRILL JACKER ON 2½ TON DRILLING METHOD AUGER / NX CORE DRILLING DATE 4-2-84 COORDINATES

SURFACE ELEVATION 438.5 STICK UP ELEVATION 440.19 STEEL SCALE 1" = 10' VERTICAL

LITHOLOGY (SURFACE)	PROFILE	DEPTH, FEET	SOIL SAMPLE NUMBER	PENETRATION (INCHES)	RECOVERY (INCHES)	DEPTH, FEET	BLOWS/6"	STATIC WATER LEVEL, FEET	BORING-CASING DIAMETER, INCHES	ROCK SAMPLE RUN	RECOVERY %	RQD %	REMARKS
0-35' Soft to Very Stiff Red-Brown CLAY, Some Silt, Moist 0-28' Wet 28-30, Few Angular to Subrounded Dolomite Gravel			1	18		1.5	1-2-3		6"ϕ Auger hole to Rock, NX Core and air hammer in rock.				Comp. 4-16-84
			2	18		6.5	5-9-1						
			3	18		11.5	6-9-11						
			4	18		16.5	13-17-28						
			5	18		21.5	6-7-9						
			6	18		26.5	3-3-8						
35-40' Med Stiff to Stiff Red Brown CLAY and SILT, Wet, Few angular to subrounded Dolomite Gravels			7	18		31.5	5-3-9						
			8	18		36.5	8-12-17						
40-42' Very Stiff Red-Brown Clay, Some Silt [illegible], Some Slightly Weathered Dolomite Gravel			9	18		41.5	10-16-20						
		45.5								45.5			
42-47.5 LIMESTONE, Dark Gray Hard, No Bedding, Argillaceous, Fractures > Core Diameter Common, Bottom Contact Gradational.		5.0/5.0								1	100	50	
		50.5								50.5			
		4.0/5.0								2	80	15	
47.5-50.5 LIMESTONE, Gray, Hard, Non Bedded, Load Features Common, Occasional Fractures > Core Diameters with minor limonite staining		55.5								55.5			
		2.5/5.0								3	50	0	
		60.5								60.5			
50.5-70.5 LIMESTONE, Dark Gray, Hard.		5.0/100								4	50	0	
		70.5								70.5			

WELL CONSTRUCTION DETAILS (NOT TO HORIZONTAL SCALE)



AR300549

.NAL
d)

TEST BORING Nº MSA

BY SJC DATE 4-25-84 CHK'D ____ DATE ____

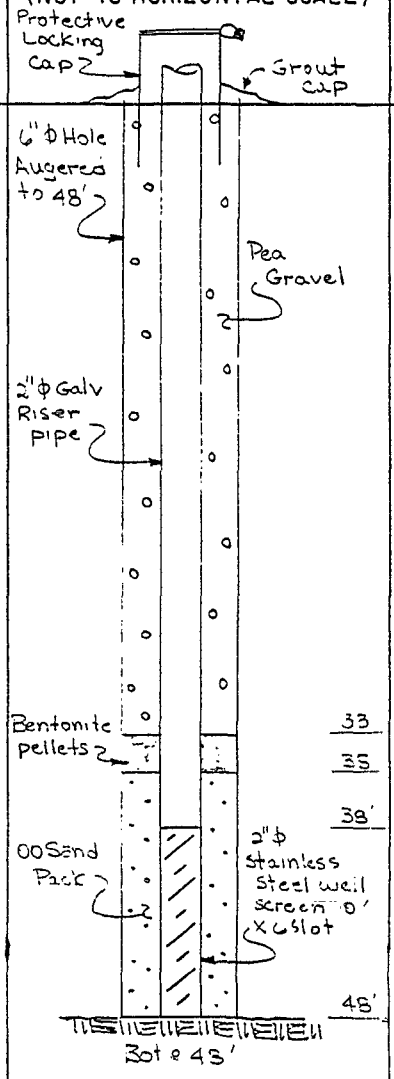
PROJECT NAME HELEVA LANDFILL PROJECT Nº 0760.16 LOCATION ORWIGSBURG PA.

GEOLOGIST / ENGINEER S. CONTI / J. HUGHART DRILLING CONTRACTOR PENNA DRILLING DRILLER BERNIE GOLLHUE

DRILL ACKERMAN & VITTON DRILLING METHOD AUGER DRILLING DATE 4-16-84 COORDINATES ____

SURFACE ELEVATION 439.3 STICK UP ELEVATION 440.48 STEEL SCALE 1" = 10' VERTICAL

LITHOLOGY SURFACE	PROFILE	DEPTH, FEET	SOIL SAMPLE NUMBER	PENETRATION (INCHES)	RECOVERY (INCHES)	DEPTH, FEET	BLOWS/6"	STATIC WATER LEVEL, FEET	BORING-CASING DIAMETER, INCHES	ROCK SAMPLE RUN	RECOVERY %	RQD %	WELL CONSTRUCTION DETAILS (NOT TO HORIZONTAL SCALE)	REMARKS



AR300550

ORIGINAL

TEST BORING Nº M108

BY SJC DATE 4-25-84 CHK'D RC DATE 12-[illegible]

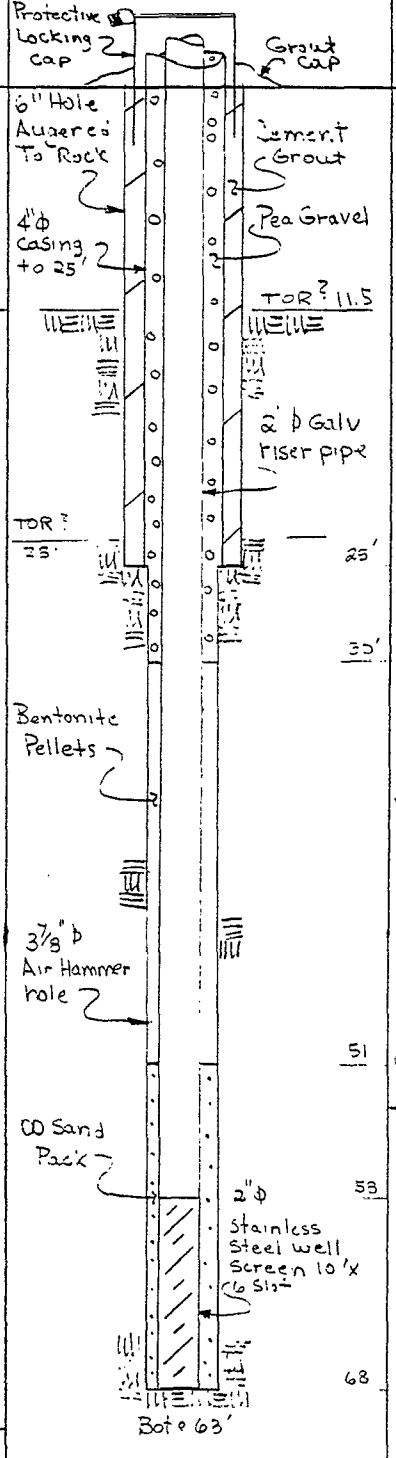
PROJECT NAME HELENA LANDFILL PROJECT Nº 07760.16 LOCATION ORMROD, PA.

GEOLOGIST/ENGINEER S. CONTI / J. HUGHART DRILLING CONTRACTOR PENNA DRILLING CO. DRILLER BERNIE GOLLINUE.

DRILL [illegible] ACKER ON 2½ TON DRILLING METHOD AUGER, HAMMER DRILLING DATE 4-2-84 COORDINATES

SURFACE ELEVATION 456.1 STICK UP ELEVATION 459.38 SCALE 1" = 10' VERTICAL

LITHOLOGY (SURFACE)	PROFILE	DEPTH, FEET	SOIL SAMPLE NUMBER	PENETRATION (INCHES)	RECOVERY (INCHES)	DEPTH, FEET	BLOWS/6"	STATIC WATER LEVEL, FEET	BORING-CASING DIAMETER, INCHES	ROCK SAMPLE RUN	RECOVERY %	RQD %	REMARKS
0-5 Soft to med Stiff Red Brown Silty CLAY Moist, with pebble size limestone frags.			1	18		1.5	3-4-7		Auger hole 6"ϕ to rock Air Hammer in rock.				
			2	18		6.5	17-27-41						
5-11.5 Soft to med Stiff Red Brown Silty CLAY w/ rock fragments LIMESTONE, moist.		11.5	3	18		11.5	17-13-68						Boulder 11.5 ?
11.5-25 LIMESTONE, Gray, Hard									3⅞"ϕ Air hammer in rock				Descrip of rock from 5' shovel samples
20-25 Yellow Brown Clay-filled joint, Some silt, moist, with weathered limestone fragments													
25-35 LIMESTONE, Gray, hard													
35-40 Gray Brown Silty Clay and limestone fragments, moist													
40-70 LIMESTONE Gray to Dark gray, Hard, few clay filled joints moist to wet.		70											Hole Dry to 50' ±



AR300551

ORIGINAL
(Red)

TEST BORING Nº M11B

BY SJC DATE 4/25/84 CHK'D [illegible] DATE [illegible]

OJECT NAME HELEVA LANDFILL PROJECT Nº 0760.16 LOCATION ORMROD, PA.

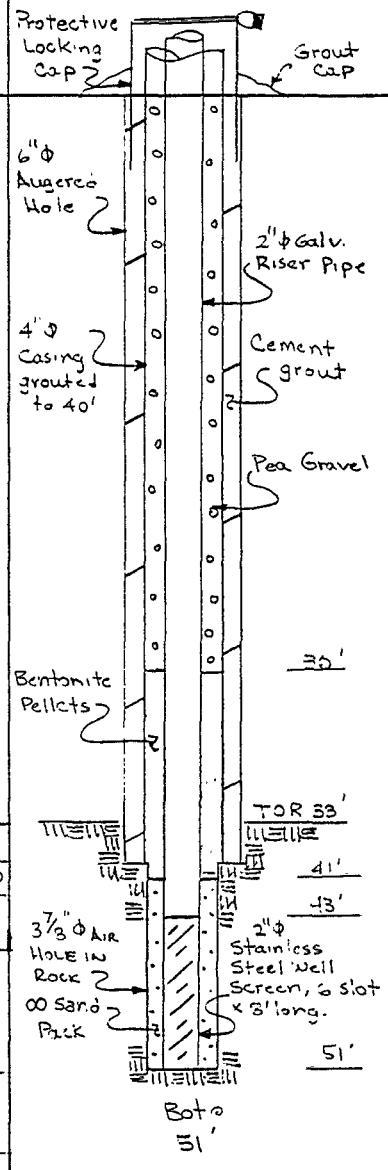
GEOLOGIST / ENGINEER S. CONTI, J. HUGHART DRILLING CONTRACTOR PENNJ. DRILLING CO. DRILLER JIM McCANN

DRILL MOBILE DRILLING METHOD AUGER, NX CORE DRILLING DATE 4-17-84 COORDINATES

RFACE ELEVATION 429.5' STICK UP ELEVATION 431.88 STEEL SCALE 1" = 10' VERTICAL

LITHOLOGY	PROFILE	DEPTH, FEET	SOIL SAMPLE NUMBER	PENETRATION (INCHES)	RECOVERY (INCHES)	DEPTH, FEET	BLOWS/6"	STATIC WATER LEVEL, FEET	BORING-CASING DIAMETER, INCHES	ROCK SAMPLE RUN	RECOVERY %	RQD %	REMARKS
SURFACE													
0-38' Red Brown CLAY, some Silt. Trace Dolomite and Limestone Gravel, Moist to 30' wet 30 to 39. Limestone Boulder @ 35'		38'							6"ϕ Auger Hole, NX Core in Rock Reamed to 4"ϕ				Shovel Samples Obtained at 5' In-In Unconsol. Matls.
38-40 Dark Gray LIMESTONE Hard, Thickly Bedded		1.7/1.6	40							40			
			41.6							41.6 1	88	50	
40-52 - Gray LIMESTONE Hard, Fault present? core rec <10% limonite staining common		0.4/2.9	44.5							2 44.5	14	0	
	45	0.5/6.5								3 51	8	0	
	50		51										
		2.9/4.0								4	50	0	
	55		55							55			
		0.5/7								5	7	0	
			62							62			

WELL CONSTRUCTION DETAILS (NOT TO HORIZONTAL SCALE)



AR300552

ORIGINAL (Red)

TEST BORING Nº MW1A

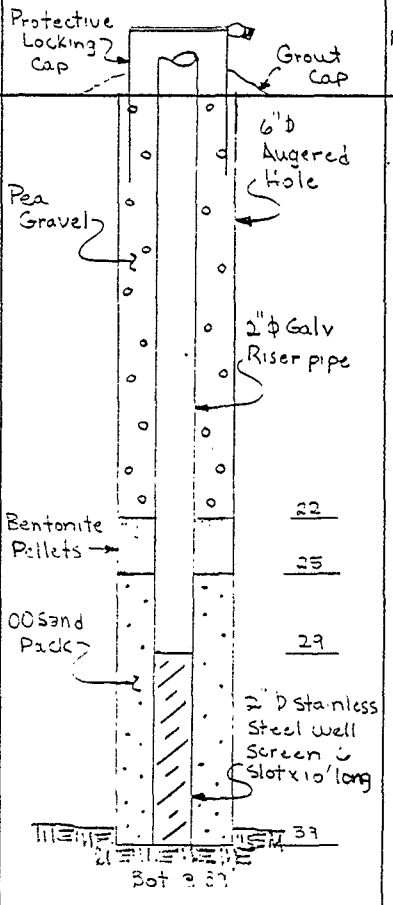
BY SJC DATE 4-23-84 CHK'D [illegible] DATE [illegible]

PROJECT NAME HELENA LANDFILL PROJECT Nº 0760.16 LOCATION [illegible]

GEOLOGIST/ENGINEER S. CONTI / J. HUGHART DRILLING CONTRACTOR [illegible] DRILLER [illegible]

DRILL MOBILE DRILLING METHOD AUGER DRILLING DATE 4-16-84 COORDINATES

[illegible]CE ELEVATION [illegible] STICK UP ELEVATION [illegible] SCALE 1" = [illegible] VERTICAL

LITHOLOGY SURFACE	PROFILE	DEPTH, FEET	SOIL SAMPLE NUMBER	PENETRATION (INCHES)	RECOVERY (INCHES)	DEPTH, FEET	BLOWS/6"	STATIC WATER LEVEL, FEET	BORING-CASING DIAMETER, INCHES	ROCK SAMPLE RUN	RECOVERY %	RQD %	WELL CONSTRUCTION DETAILS (NOT TO HORIZONTAL SCALE)	REMARKS
														Comp 4-16-84

AR300553

ORIGINAL
(Red)

TEST BORING Nº M12B

BY S.J.C. DATE 4-25-84 CHK'D ____ DATE ____

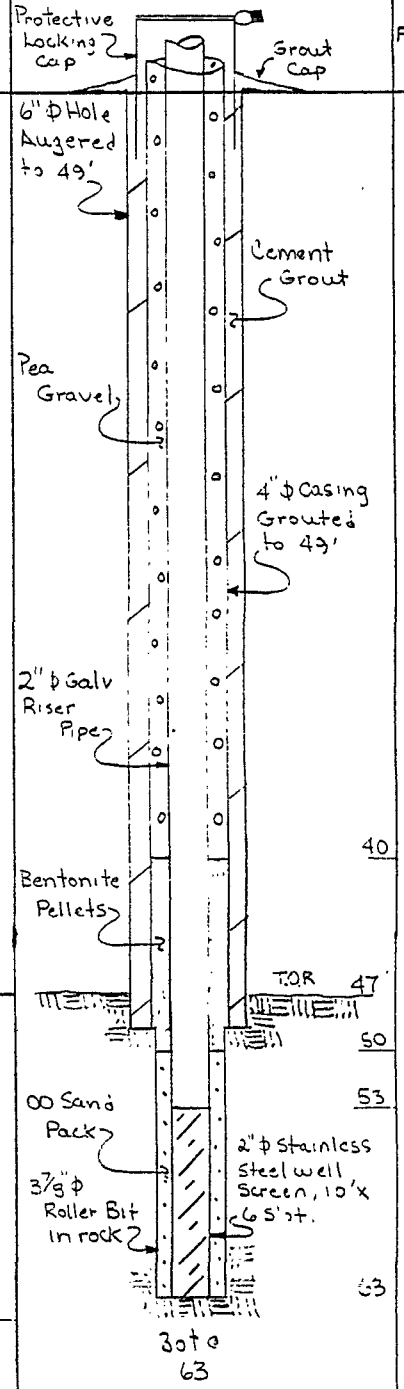
OJECT NAME HELEVA LANDFILL PROJECT Nº 0760.16 LOCATION CEMOOD, PA.

GEOLOGIST/ENGINEER S. CONTI / L. REITZ DRILLING CONTRACTOR PENNA. DRILLING CO. DRILLER J. J. MCGINN

DRILL MOBILE DRILLING METHOD AUGER / ROLLER BIT DRILLING DATE 4-4-84 COORDINATES ____

IRFACE ELEVATION 429.7 STICK UP ELEVATION 431.94 STEEL SCALE 1" = 10' VERTICAL

LITHOLOGY (SURFACE)	PROFILE	DEPTH, FEET	SOIL SAMPLE: NUMBER	PENETRATION (INCHES)	RECOVERY (INCHES)	DEPTH, FEET	BLOWS/6"	STATIC WATER LEVEL, FEET	BORING-CASING DIAMETER, INCHES	ROCK SAMPLE: RUN	RECOVERY %	RQD %	WELL CONSTRUCTION DETAILS (NOT TO HORIZONTAL SCALE)	REMARKS
0-44 Red Brown CLAY, Some Silt, Trace Subrounded Limestone gravel, 0-35' moist, 35-44' wet									6" ϕ Auger Hole to 49' Roller Bit to 64' in Rock. 4" casing Grouted to 49'					
44-47 Red Brown CLAY and Limestone Boulders, wet		47'												
47-53 LIMESTONE - Gray to dark gray, hard.														
53-64 Coarse sand, fine shale chips, coarse calcite chips, soft, Joint filling ?		64'												



AR300554

ORIGINAL

TEST BORING Nº M-12A

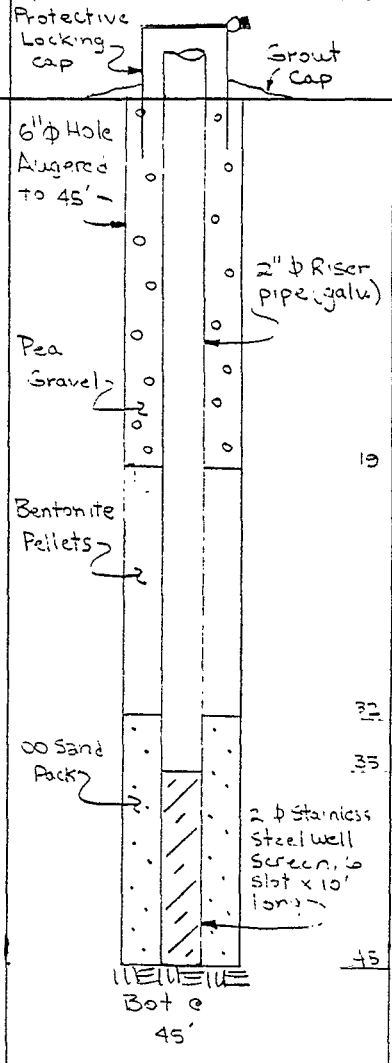
BY SJC DATE 4-26-84 CHK'D TP DATE 12/4/84

PROJECT NAME HELEVA LANDFILL PROJECT Nº 0760.16 LOCATION ORMROD, PA.

GEOLOGIST/ENGINEER S. CONTI/L. PEITZ DRILLING CONTRACTOR PENNA. DRILLING CO. DRILLER [illegible] MCGUIRE

DRILL MOBILE DRILLING METHOD AUGER DRILLING DATE 4-9-84 COORDINATES

SURFACE ELEVATION 428.8 STICK UP ELEVATION 431.66 5 max SCALE 1" = 10' VERTICAL

LITHOLOGY SURFACE	PROFILE	DEPTH, FEET	SOIL SAMPLE NUMBER	PENETRATION (INCHES)	RECOVERY (INCHES)	DEPTH, FEET	BLOWS/6"	STATIC WATER LEVEL, FEET	BORING-CASING DIAMETER, INCHES	ROCK SAMPLE RUN	RECOVERY %	RQD %	WELL CONSTRUCTION DETAILS (NOT TO HORIZONTAL SCALE)	REMARKS
														Coupl 4-10-84

AR300555

ORIGINAL (Red)

TEST BORING Nº M13B

BY [illegible] DATE 4-26-84 CHK'D [illegible] DATE [illegible]

OJECT NAME HELEVA LANDFILL PROJECT Nº 0760.16 LOCATION CENTRE, PA.

GEOLOGIST/ENGINEER S CONTI / L. REITZ DRILLING CONTRACTOR PENNIA. DRILLING CO. DRILLER JIM MCGANN

DRILL MORSE DRILLING METHOD AUGER & CORE DRILLING DATE 4-5-84 COORDINATES

RFACE ELEVATION 436.2 STICK UP ELEVATION 437.68 STEEL SCALE 1" = 10 VERTICAL

LITHOLOGY (SURFACE)	PROFILE	DEPTH, FEET	SOIL SAMPLE NUMBER	PENETRATION (INCHES)	RECOVERY (INCHES)	DEPTH, FEET	BLOWS/6"	STATIC WATER LEVEL, FEET	BORING-CASING DIAMETER, INCHES	ROCK SAMPLE RUN	RECOVERY %	RQD %	WELL CONSTRUCTION DETAILS (NOT TO HORIZONTAL SCALE)	REMARKS
0 – 53 Red Brown CLAY, some silt, few weathered brown and black shale fragments, (gravel size), 0-35 moist, 35-53 wet. Soft to Stiff (Boulder at ± 47')			1	18		1.5	1-2-2		6"φ Auger to 3' into Bedrock NX core reamed to 3 7/8"φ 4"φ Casing to 53'				Protective Locking Cap; Grout Cap; 6"φ Hole Augered to 56'; 4"φ Galv. Steel Casing; Cement Grout	Split Spoon Samples actually taken from no. M13A, but put on this sheet. Comp 4-5-84
			2	18		6.5	4-4-6							
			3	18		11.5	4-6-5							
			4	18		16.5	5-6-11							
			5	18		21.5	4-7-6							
			6	18		26.5	5-7-7							
			7	13		31.5	6-6-5							
			8	18		36.5	8-6-8							
			9	18		41.5	5-6-7							
			10	18		46.5	3-4-3							
		53.0	11	24		52	11-10-9-60							
53.0 – 56.5 SHALE, Brown and Black, Thinly Bedded m. Soft Fractured, Weathered													T.C.R. 53'; 56'	
56.5 – 85.5 SHALE Dark gray Hard, laminated to thinly bedded, very calcareous, abundant calcareous laminae, occasional calcite crystal lined fractures (>core diameter), 1% pyrite/marcasite flecks and fine disseminated crystals, micro-structural deformation common in bedding planes and calcite laminae. (Slumpfolds and rippling)		9.0/9.0	56.5							1	100	0	3 7/8"φ Hole in Rock	
		9.8/10.0	65.5							2	98	10	Open hole - Well	
		10.0/10.0	75.5							3	100	10		
			85.5										Bot. 85.5	

AR300556

ORIGINAL (Red)

TEST BORING Nº M13A

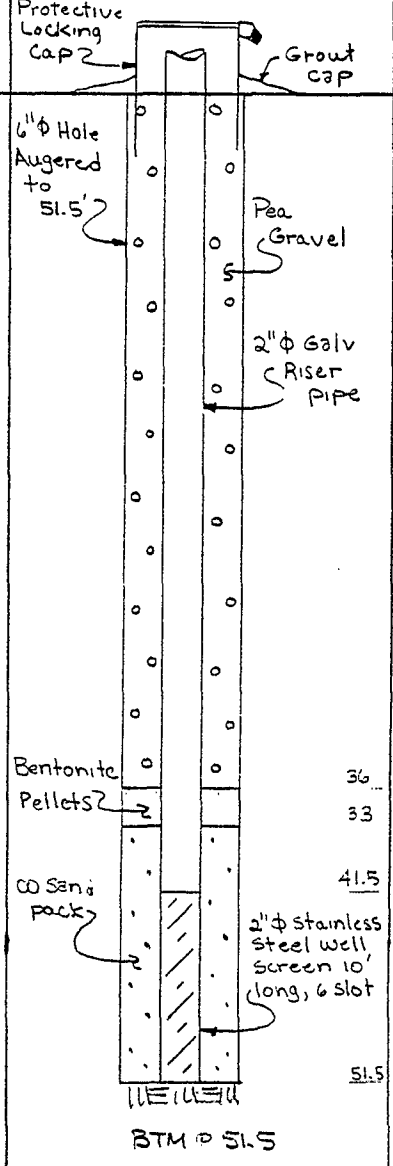
BY S.J.C. DATE 4-26-84 CHK'D RP DATE 12/20/84

PROJECT NAME HELENA LANDFILL PROJECT Nº 07100.16 LOCATION ORMROD, PA.

GEOLOGIST / ENGINEER S. SMITH / L. PEIRCE DRILLING CONTRACTOR PENNA DRILLING CO DRILLER JIM McCLANN

DEPTH MODELLER DRILLING METHOD AUGER / CASING DRILLING DATE 4-12-84 COORDINATES

SURFACE ELEVATION 486.6 STICK UP ELEVATION 488.59 STEEL SCALE 1" = 10' VERTICAL

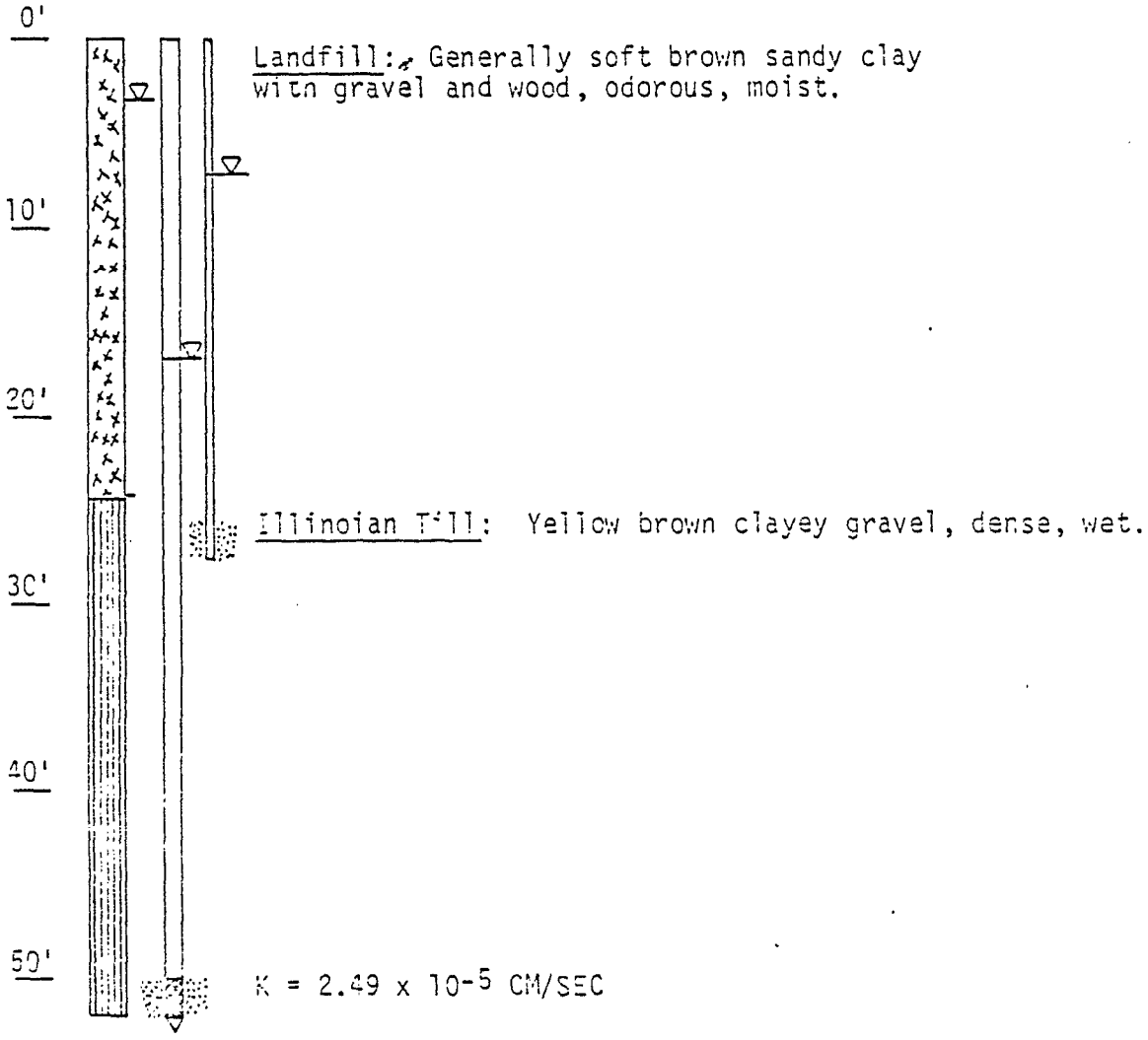
LITHOLOGY (SURFACE)	PROFILE	DEPTH, FEET	SOIL SAMPLE: NUMBER	PENETRATION (INCHES)	RECOVERY (INCHES)	DEPTH, FEET	BLOWS/6"	STATIC WATER LEVEL, FEET	BORING-CASING DIAMETER, INCHES	ROCK SAMPLE: RUN	RECOVERY %	RQD %	WELL CONSTRUCTION DETAILS (NOT TO HORIZONTAL SCALE)	REMARKS
														Compl 4-13-84

AR300557

ORIGINAL
(Red)

BORING 1

G.S.E. +432.44'



NOTE: 1 - (K) determined by slug test.
2 - Water levels as of 6/6/74.
3 - Completed 3/26/74 by F. T. Kitlinski & Associates.

AR300558

ORIGINAL (Red)

For Nassaux-Hemsley, Inc.
Chambersburg, Pa.
Project No. 74-03-1971

F. T. KITLINSKI & ASSOCIATES
Harrisburg, Pennsylvania

TEST BORING LOG

Boring No. B-1
Sheet 1 of 1

Job Name and Location: Heleva Landfill, N. Whitehall Township, Lehigh County, Pa.
Boring Location: Per Nassaux-Hemsley Plan

Date Begin	3-25-74	Casing Size, O.D.	4	Spoon Size O.D.	2
Date Completed	3-26-74	Hammer Weight	300	Hammer Wt.	140
Depth of Soil	52.0'	Hammer Drop	18	Hammer Drop	30
Depth of Rock	0.0'	Core Bit Size	--	Rig No.	109
Total Boring Depth	52.0'	Driller	H. Growden, Sr.	Asst. Driller	D. Glotfelty

Progress & Ground Water Data

Date	Depth Reached	Depth Water	Hour
3-26-74	52.0'	3.5'	0 Hr.
3-27-74	52.0'	16.5'	24 Hr.

Ground Elev. 440.28
Datum Elev.
Depth Surf. Water
Weather: Windy & cool

BORING LOG		SPOON SAMPLE & ROCK CORE DATA								REMARKS	CASING BLOWS
Depth From To	Material Description	Sample No.	Depth	Blows on Spoon 6" Intervals				Depth of Run	Core Recov. %	Water loss, cavities, etc.	
0.0 to 24.5	FILL-garbage, wood, silty clay, metal, etc.		0.0							No rock encountered	10
		1	2.0	10	18	25	31				27
			5.0								33
		2	7.0	15	17	19	27				27
			10.0								46
		3	12.0	10	17	22	31				49
			15.0								33
		4	17.0	14	17	19	27				59
24.5 to 52.0	Br. silty clay moist-stiff to hard		20.0								22
		5	22.0	22	33	27	45				31
			25.0								14
		6	27.0	10	11	17	21				17
			30.0								19
		7	32.0	11	17	22	22				90
			35.0								49
		8	37.0	10	11	12	12				50
			40.0								100
		9	42.0	12	17	17	18			End of boring at 52.0'	80
			45.0								85
		10	47.0	14	14	21	21				130
			50.0								110
		11	52.0	20	20	20	20				137
											111
											125
											115
											135
											150
											140
											140

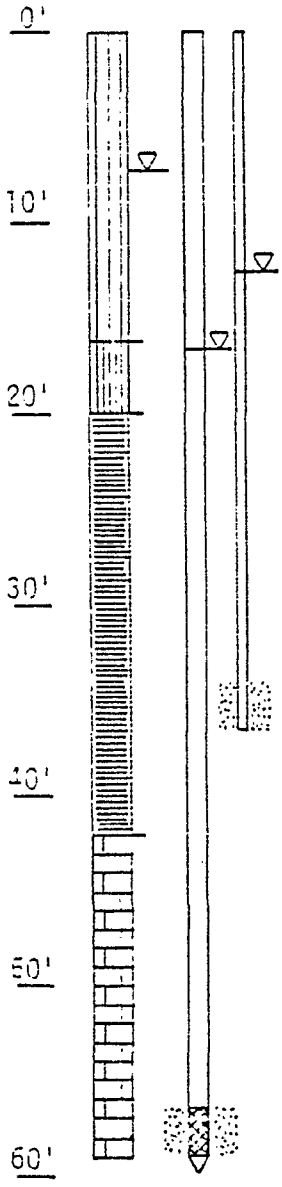
NOTE: Upon completion, boring developed into a double ground-water piezometer. Upper-level piezometer developed by placing 37.5' of 1/2" dia. galvanized steel pipe in hole and 1.5" of pipe above ground. Lower-level piezometer developed by placing 51.5' of 1-1/4" dia. plastic pipe, including a screened wellpoint, in hole and 1.5' of pipe above ground. Zone between pipe and hole sealed with bentonite clay and sacrete.

AR300559

ORIGINAL
(Red)

BORING 2

G.S.E. +457.76'



Mine Tailings: Brown fine sandy shale from 0' - 2' changes to dark brown silty and clayey sand, moist, loose.

Illinoian Till: Yellow brown clayey gravel, moist, dense.

Martinsburg Shale: Weathered to brown clayey silt, wet.

$K = 1.56 \times 10^{-9}$ CM/SEC

Beekmantown Limestone: Gray limestone.

$K = 4.92 \times 10^{-5}$ CM/SEC

NOTE: 1 - (K) determined by slug test.
2 - Water levels as of 6/6/74.
3 - Completed 3/23/74 by F. T. Kitlinski & Associates.

AR300560

ORIGINAL (Red)

F. Nassaux-Hemsley, Inc.
Chambersburg, Pa.
Project No. 74-03-1971

F. T. KITLINSKI & ASSOCIATES
Harrisburg, Pennsylvania

TEST BORING LOG

Boring No. B-2
Sheet 1 of 1

Job Name and Location: Heleva Landfill, N. Whitehall Township, Lehigh County, Pa.
Boring Location: Per Nassaux-Hemsley Plan

Date Begun	3-26-74	Casing Size O.D.	4	Spoon Size, O.D.	2
Date Completed	3-28-74	Hammer Weight	300	Hammer Wt.	140
Depth of Soil	42.5'	Hammer Drop	18	Hammer Drop	30
Depth of Rock	16.5'	Core Bit Size	NXM-2 1/8"	Rig No.	109
Total Boring Depth	59.0'	Driller	H. Growden, Sr.	Asst. Driller	D. Glotfelty

Progress & Ground Water Data

Date	Depth Reached	Depth Water	Hour
3-28-74	59.0'	21.5'	0 Hr.

Ground Elev. 453.28
Datum Elev.
Depth Surf. Water
Weather Warm

Depth From	Material Description	Sample No.	Sample Depth	Blows on Spoon 6" Intervals	Run No.	Depth of Run	Core Rec.	Remarks (Water loss, cavities, etc.)	Casing Blows
0.0 to .5	Br. sandy topsoil moist-loose	1	0.0 / 2.0	1 2 2 2					4 4 4
		2	5.0 / 7.0	3 4 4 4					14 12 7
.5 to 16.0	Br. silty sand moist-loose to med.	3	10.0 / 12.0	4 4 4 5				Tricone refusal at 42.5'	5 6 15
		4	15.0 / 17.0	11 12 14 17					10 12
.5 to 42.5	Br. silty clay moist-stiff to hard	5	20.0 / 22.0	16 16 21 20				Started coring at 42.5'	10 12 25
		6	25.0 / 27.0	10 12 12 17					60 25
		7	30.0 / 32.0	15 15 15 20				No loss of drill water	25 35
		8	35.0 / 37.0	14 17 17 19		42.5			96 145
42.5 to 59.0	Gr. silty lime-stone-broken med. hard	9	40.0 / 42.0	19 21 23 27	1	49.0	6.5	End of boring at 59.0'	130 140 130
					2	59.0	10.0		

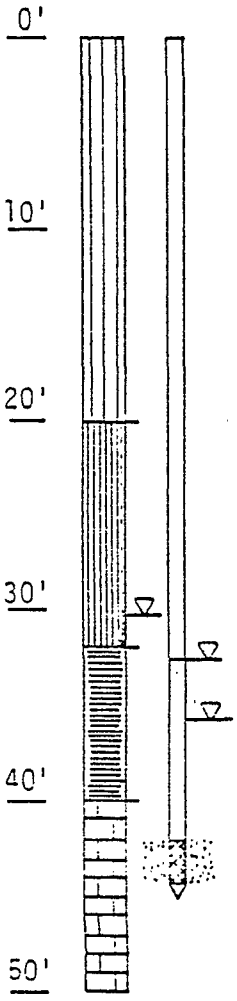
NOTE: Upon completion, boring developed into a double ground-water piezometer. Upper-level piezometer developed by placing 7.0' of 1/2" dia. galvanized steel pipe in hole and 2.0' of pipe above ground. Lower-level piezometer developed by placing 59.0' of 1-1/4" dia. plastic pipe, including a screened wellpoint, in hole and 2.0' of pipe above ground. Zone between pipe tips sealed with bentonite clay and sacrete.

AR300561

ORIGINAL
(Red)

BORING 3

G.S.E. +428.24'



Mine Tailings: Brown silty clay, wet, soft.

Illinoian Till: Yellow brown sandy clay with gravel, wet, stiff.

Martinsburg Shale: Brown silty shale, damp, changes to silty clay at 35'.

W6E

Jacksonburg Cement Rock: Dark gray argillaceous limestone very hard with nearly verticle joints cemented with calcite.

K = 3.13 x 10^{-4} CM/SEC

NOTE: 1 - (K) determined by slug test.
2 - Water levels as of 6/6/74.
3 - Completed 3/29/74 by F. T. Kitlinski & Associates.

ORIGINAL (Red)

For Nassaux-Hemsley, Inc.
Chambersburg, Pa.
Project No. 74-03-1971

F. T. KIEFFER & ASSOCIATES
Harrisburg, Pennsylvania

TEST BORING LOG

Boring No. B-3
Sheet 1 of 1

Job Name and Location Heleva Landfill, N. Whitehall Township, Lehigh County, Pa.
Boring Location Per Nassaux-Hemsley Plan

Date Begin	3-29-74	Casing Size, O.D.	4	Spoon Size, O.D.	2
Date Completed	3-29-74	Hammer Weight	300	Hammer Wt	140
Depth of Soil	40.0'	Hammer Drop	18	Hammer Drop	30
Depth of Rock	10.0'	Core Bit Size	NXM-2 1/8	Rig No.	109
Total Boring Depth	50.0'	Driller	H. Growden, Sr.	Asst. Driller	D. Glotfelty

Progress & Ground Water Data

Date	Depth Reached	Depth Water	Hour
3-29-74	50.0'	43.0'	0 Hr.

Ground Elev.
Datum Elev.
Depth Surf. Water
Weather Cool

Depth From To	Material Description	Sample No.	Sample Depth	Blows on Spoon 6" Intervals	Core No.	Depth Core Run	Remarks (Water loss, cavities, etc.)	Blows per 6"
0.0 to 0.5	Br. sandy topsoil moist-loose		0.0					4 4
		1	2.0	1 2 2 3				6 12
			5.0					13
		2	7.0	5 5 7 9				10 10
0.5 to 4.5	Br. silty clay moist-med.		10.0				Tricone refusal at 40.0'	12
		3	12.0	4 4 5 7				25
			15.0					30
		4	17.0	3 3 6 6				50
4.5 to 40.0	Br. silty sand w/ rock frags. moist-loose to dense		20.0				Started coring at 40.0'	65
		5	22.0	8 11 13 13				72
			25.0					
		6	27.0	12 11 16 18				
			30.0				Lost drill water at 42.5'	
		7	32.0	30 20 17 20				
			35.0					
		8	37.0	19 20 20 23		40.0		
40.0 to 50.0	Gr. sandy shale broken soft				1	50.0	5.5 End of boring at 50.0'	

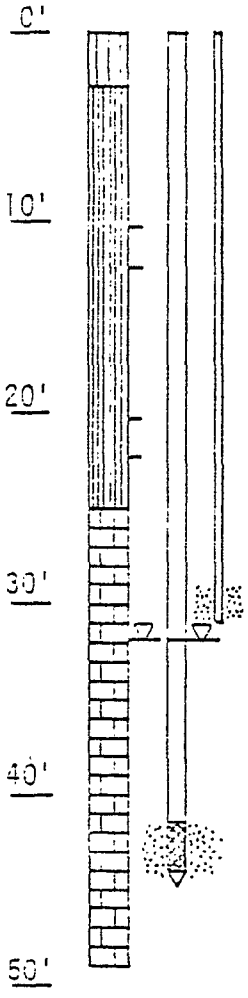
NOTE: Upon completion, boring developed into a ground-water piezometer using 52.0' of 1-1/4" plastic and screened wellpoint, 50.0' of pipe in hole and 2.0' above ground. Area above wellpoint sealed with sacrete.

AR300563

ORIGINAL
(Red)

BORING B-4

G.S.E. +434.26'



Mine Tailings: Yellow-brown sandy silt trace clay.

Illinoian Till: Yellow-brown sandy clay little silt with gravel changes to clayey silt at -10', to silty clay -15' to -25'.

Beekmantown Limestone: Medium-bedded, gray limestone, highly weathered -25' to -27'. Contains clay seams.

$K = 9.81 \times 10^{-4}$ CM/SEC

NOTE: 1 - (K) determined by slug test.
2 - Water levels as of 6/6/74.
3.- Completed 3/18/74 by F. T. Kitlinski & Associates.

ORIGINAL (Red)

For Nassaux-Hemsley, Inc.
Chambersburg, Pa.
Project No. 74-03-1971

F. T. KITUNSKI & ASSOCIATES
Harrisburg, Pennsylvania

TEST BORING LOG

Boring No. B-4
Sheet 1 of 1

Name and Location: Heleva Landfill, N. Whitehall Township, Lehigh County, Pa.
Boring Location: Per Nassaux-Hemsley Plan

Date Begun	3-15-74	Casing Size (O.D.)	4"	Sampler Size (O.D.)	2"
Date Completed	3-18-74	Hammer Weight	300	Hammer Wt.	140
Depth of Soil	30.2'	Hammer Drop	18	Hammer Drop	30
Depth of Rock	19.0'	Core Bit Size	NQM-2 1/8"	Rig No.	109
Total Boring Depth	49.0'	Driller	H. Growden, Sr.	Asst. Driller	D. Glotfelty

Progress & Ground Water Data

Date	Depth Reached	Depth Water	Hour
3-15-74	43.0'	30.5'	---
3-18-74	49.0'	35.5'	0 Hr.
3-27-74	49.0'	35.3'	9 days

Ground Elev. 435.23
Datum Elev.
Depth Surf. Water
Weather: Cloudy & cool

Depth	Material Description	Sample No.	Sample Depth	Blows on Spoon (6" intervals)	Run No.	Depth of Run	Core Rec. (ft)	Remarks (water loss, cavities, etc.)	Casing Blows
0.0 to .5	Br. sandy topsoil moist-loose	1	0.0 / 2.0	1 1 2 2					4 5 7
		2	5.0 / 7.0	2 3 6 6					12 15 30
.5 to 30.0	Br. silty clay moist-stiff to hard	3	10.0 / 12.0	15 15 17 17				Attempted spoon sample at 30.0'- no penetration	41 33 60
		4	15.0 / 17.0	19 21 27 31					68 57 63
		5	20.0 / 22.0	31 33 39 41				Started coring at 30.0'	55 75 72
		6	25.0 / 27.0	41 48 53 61		30.0			75 69
30.0 to 49.0	Gr. limestone w/ clay seams hard				1	35.0 / 1.5		Lost drill water at 30.0'	63 92 92
					2	43.0 / 2.5			95 90
					3	49.0 / 2.3		End of boring at 49.0'	67 125 95 110 176 275

NOTE:
Upon completion, boring developed into a double ground-water piezometer. Upper-level piezometer developed by placing 2.5' of 1/2" dia. galvanized steel pipe in hole and 2.0' of pipe above ground. Lower level piezometer developed by placing 48.0' of 1-1/4" dia. plastic pipe, including a screened wellpoint, in hole and 2.0' of pipe above ground.

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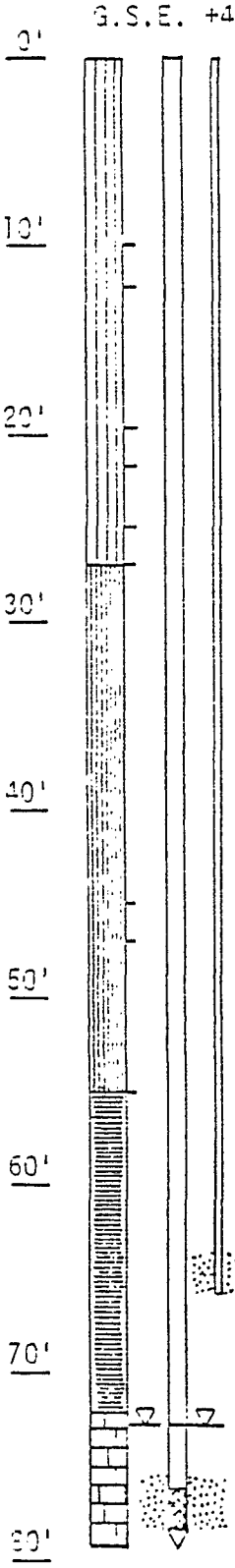
ORIGINAL
(Red)

BORING B-5

G.S.E. +478.20



Mine Tailings: Brown and yellow brown clayey silt with very thin layers of fine sand, loose, wet.

25% sand, 50% silt, 25% clay (U.S.B.S. Class).
Dry unit weight 84.0 pcf, natural water content 33.9%, LL 33%, PL 28%, PI 5%.

52% sand, 31% silt, 17% clay (U.S.B.S. Class).
Dry unit weight 86.5 pcf, natural water content 36.4%, LL 36%, PL 32%, PI 4%.

Natural water content 34.7%, dry unit weight 87.8 pcf C.E.C., 14.59 me/100 gms.

Illinoian Till: Yellow brown clayey silt little sand and quartzite gravel, hard moist. Changes to brown silt with thin lenses of black and brown fine sand at approximately 50'.

Natural water content 23.4%, dry unit weight 104.1 pcf C.E.C., 5.22 me/100 gms.

Martinsburg Shale: Brown silty clay to clayey silt shale; fractured with nearly vertical joints stained yellow-brown, hard, moist.

Beekmantown Limestone: Light gray, medium bedded, well-fractured with nearly vertical joints which have been recemented with calcite. Nodules of black chert noted.

Clay-filled fracture (?) noted at approximately 85'.

AR306566

$K = 2.96 \times 10^{-6}$ CM/SEC

NOTE: 1 - (K) determined by slug test.

2 - Water levels as of 6/5/74.

3 - Completed 3/18/74 by F. T. Kitlinski & Associates.

ORIGINAL

For Nassaux-Hemsley, Inc.
Chambersburg, Pa.
Project No. 74-03-1971

F. T. Ward Clark Associates
Harrisburg, Pennsylvania

TEST BORING LOG

Boring No. B-5
Sheet 1 of 2

Name and Location: Heleva Landfill, N. Whitehall Township, Lehigh County, Pa.
Elev. and Location: Per Nassaux-Hemsley Plan

Date Begun	3-19-74	Casing Size I.D.	4	Spoon Size O.D.	2
Date Completed	3-21-74	Hammer Weight	300	[illegible]	140
Depth of Soil	72.0'	Hammer Drop	18	[illegible]	30
Depth of Rock	10.0'	Core Bit Size	NXM-2 1/8	[illegible]	109
Total Boring Depth	82.0'	Driller	H. Growden, Sr.	Asst. Driller	D. Glotfelty

Progress & Ground Water Data

Date	Depth Reached	Depth Water	Hour
3-21-74	82.0'	69.0'	0 Hr.
3-27-74	82.0'	69.5'	6 days

Ground Elev. 472.98
Datum Elev.
Weather Sunny & cool

Depth From	Material Description	Sample No.	Depth	Blows per 6 inches	Depth Core Run	Remarks	Elev.
0.0 to 0.5	Brown sandy topsoil moist-loose	1	0.0 2.0	1 2 2 3			2 2 2 6 6 7 10
0.5 to 5.5	Brown silty clay w/ fine-grained sand moist-soft	2	5.0 7.0	1 1 1 1		Took Shelby tube samples: 10.0'-12.0' & 20.0'-22.0'	8 20 17 19
5.5 to 35.5	Brown silty sand wet-v. loose to v. dense	1U 3 2U 4 5 6	10.0 12.0 15.0 17.0 20.0 22.0 25.0 27.0 30.0 32.0 35.0 37.0	- 3 4 4 3 - 10 10 12 16 21 23 27 33 35 35 46 55			15 15 30 22 22 15 17 30 20 22 22 20 30 30 28 28 25 33 33 41 110 112 99

Casing blows continued:

AR300567

35

ORIGINAL (Red)

Nassaux-Hemsley, Inc.
Chambersburg, Pa.
Project No. 74-03-1971

F. T. KIRLINGER & ASSOCIATES
Harrisburg, Pennsylvania

TEST BORING LOG

Boring No. B-5
Sheet 2 of 2

Name and Location: Heleva Landfill, N. Whitehall Township, Lehigh County, Pa.
Hole Location: Per Nassaux-Hemsley Plan

Begun	3-19-74	Casing Size I.D.	4	Sample Size I.D.	2
Completed	3-21-74	Hammer Weight	300	Hammer Fall	140
Depth to Soil	72.0'	Hammer Drop	13	Hammer Drop	30
Depth to Rock	10.0'	Core Barrel Size	NXM-2 1/8	Blows	109
Total Boring Depth	82.0'	Driller	H. Growden, Sr.	Asst. Driller	D. Glotfelty

Progress & Ground Water Data

Date	Depth Reached	Depth Water	Hour
3-21-74	82.0'	69.0'	0 Hr.
3-27-74	82.0'	69.5'	6 days

Surface Elev. 472.98
Datum
Weather: Sunny & cool

Depth From To	Material Description	Sample No.	Blows per 6"	Depth Core Rec.	Remarks
			Total Depth 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24		
35.5 to 7 .0	Br. silty clay w/ rock frags. moist-stiff to hard	35.0 6 37.0 35 35 46 55			
		40.0 7 42.0 28 33 39 43			
		45.0 8 47.0 12 12 12 17			Spoon refusal at 72.0'
		50.0 9 52.0 16 19 22 26			
		55.0 10 57.0 15 20 25 30			Started Coring at 72.0'
		60.0 11 62.0 17 24 29 36			
		65.0 12 67.0 22 31 38 42			Lost drill water at 72.0'
		70.0 13 72.0 25 35 45 79		72.0	
7 .0 to 82.0	Gr. limestone w/ clay seams weathered		1	82.0 6.0	End of boring at 82.0'

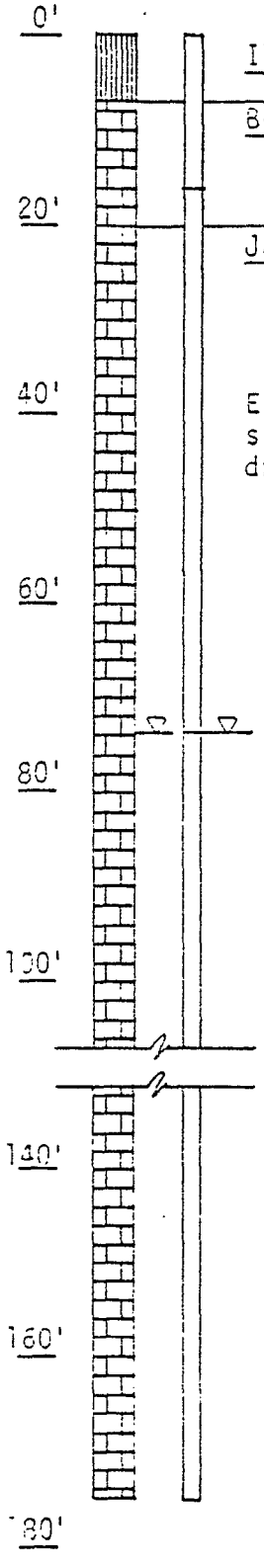
NOTE:
Upon completion, boring developed into a double ground-water piezometer. Upper-level piezometer developed by placing 67.0' of 1/2" dia. galvanized steel pipe in hole and 2.0' of pipe above ground. Lower-level piezometer developed by placing 82.0' of 1-1/4" dia. plastic pipe, including a screened wellpoint, in hole and 2.0' of pipe above ground. Zone between pipe tips sealed with bentonite clay and sacrete

AR300568

ORIGINAL
(Red)

BORING (WELL) 6

G.S.E. +477.11'



Illinoian Till(?): Dark red-brown clayey sand with gravel.

Beekmantown Limestone: Gray limestone.

Jacksonburg Cement Limestone(?): Black-dark gray limestone.

Eight inch hole was drilled to -18' and a 6" diameter non-slotted casing was installed. A 5-5/8" hole was then drilled to 175'.

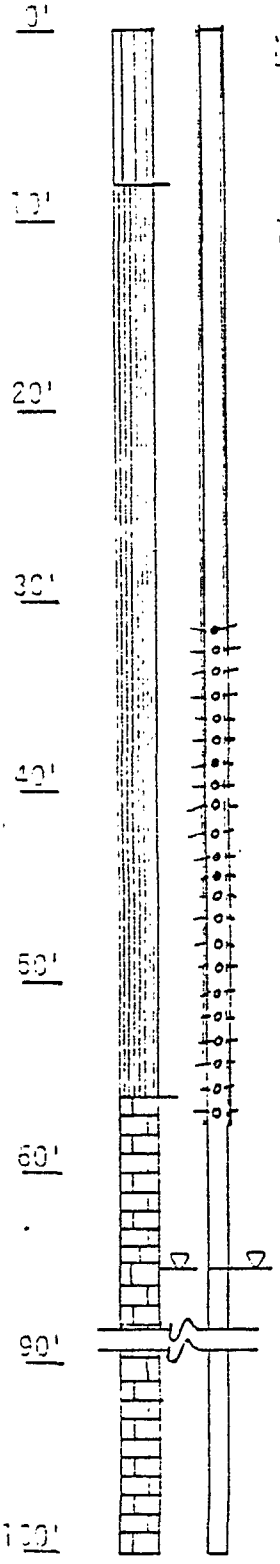
NOTE: 1 - Water levels as of 6/6/74.
2 - Well log description by Moody & Associates.
3 - Completed 4/24/74 by Moody & Associates.

AR300569

ORIGINAL
(Red)

BORING (WELL) 7

G.S.E. +467.67'



Mine Tailings: Red brown to brown to buff brown silt.

Illinoian Till(?): Variably colored clayey pebbly clay, damp.

Gray limestone boulder at 40' - 43' -- strong odor of leachate at this depth.

Beekmantown Limestone: Gray limestone sixty-three feet of 6"ø casing, slotted along the bottom -31.5', was installed in a 8"ø drilled hole. A 5-5/8"ø hole was then drilled to 100' depth.

NOTE: 1 - Water levels as of 6/6/74.

2 - Well log description by Moody & Associates. Geology by Nassaux-Hemsley, Inc.

3 - Completed 4/25/74 by Moody & Associates.

AR300570

ORIGINAL

HELEVA SANITARY LANDFILL

DRILLER'S LOGS FOR WELLS B-8, B-9 AND B-10
MOYER DRILLING; LEHIGHTON, PENNSYLVANIA

B-8	0'-118'	Brown Clay
	118'-124'	Gravel, Rounded
	124'-200'	Black Limestone

6" diameter solid steel casing installed to 143'; 1½" diameter PVC pipe installed to 64.5'. Well completed 9/13/76; air-rotary.

B-9	0'-136'	Brown Clay
	136'-143'	Limestone

6" diameter steel casing to 143' which was slotted from 133'-143'. Well completed 9/13/76; air-rotary.

B-10	0'- 90'	Clay, Boulders
	90'-102'	Limestone, Water encountered at 99'

6" diameter slotted steel casing installed. Rate of flow from pump test 10 gpm. Well completed 10/22/76; air-rotary.

ORIGINAL
(Red)

HELEVA SANITARY LANDFILL
BORING LOGS 10, 14, AND 4B

All borings installed by Duane Moyer by air-rotary well drilling rig on date indicated. Data below supplied by driller excluding well elevations.

B-10 TOC = +474.65

0' - 90' Clay, Boulders
90' - 103' Limestone
Water encountered at 99'; estimated well capacity is 10 gpm.
103' of 6" diameter steel casing installed; bottom 10' is slotted.
Well started and completed October 22, 1976.

B-11 TOC = 427.43

0' - 141' Clay
141' - 165' Gray Limestone
145' of 6" diameter steel casing installed; bottom 10' is slotted.
Well started and completed November 26, 1977.

B-12 TOC = +437.27

0' - 38' Clay
38' - 78' Black Limestone
78' - 138' Gray Limestone with mud seams.
45' of 6" diameter steel casing installed.
Estimated well capacity 50 gpm.
Well started and completed November 26, 1977.

B-13 TOC = +444

0' - 28' Clay
28' - 51' Gray Limestone
Encountered water at 28'; estimated well capacity is 40 gpm.
51' of 6" diameter casing installed; bottom 10' is slotted.

AR300572

HELEVA SANITARY LANDFILL

BORING LOGS 10, 14, AND 4B
(CONTINUED)

B-14 TOC = +430

0' - 72' Clay
72' - 148' Black Limestone
Water encountered at 113' and 135'; water level 38'.
Estimated capacity 120 gpm but well plugged off during development.
146' of 6" diameter steel casing installed; bottom 10' is slotted.
Well started and completed January 3, 1978.

B-4B TOC = +436.64

0' - 34' Clay
34' - 158' Broken gray limestone with mud seams.
100' of 2" diameter stainless steel casing installed.
Estimated well capacity 50 gpm.
Well started and completed November 26, 1977.

AR300573

ORIGINAL
(Red)

APPENDIX F

REVIEW OF TECHNOLOGIES FOR AN ALTERNATIVE WATER SUPPLY

ORIGINAL
(Red)

APPENDIX F

EXTEND EXISTING PUBLIC WATER LINES

Introduction

A number of the residents living on Hill Street, near the Heleva Landfill, rely on private wells for their water supply. Analytical results have shown contamination in two of those wells. The potential for contamination of the other wells exists. An alternative water supply may be used as a remedial action to address this problem. There are four technologies that can be used to provide an alternative water supply. The purpose of this section is to evaluate these four technologies.

Existing Conditions

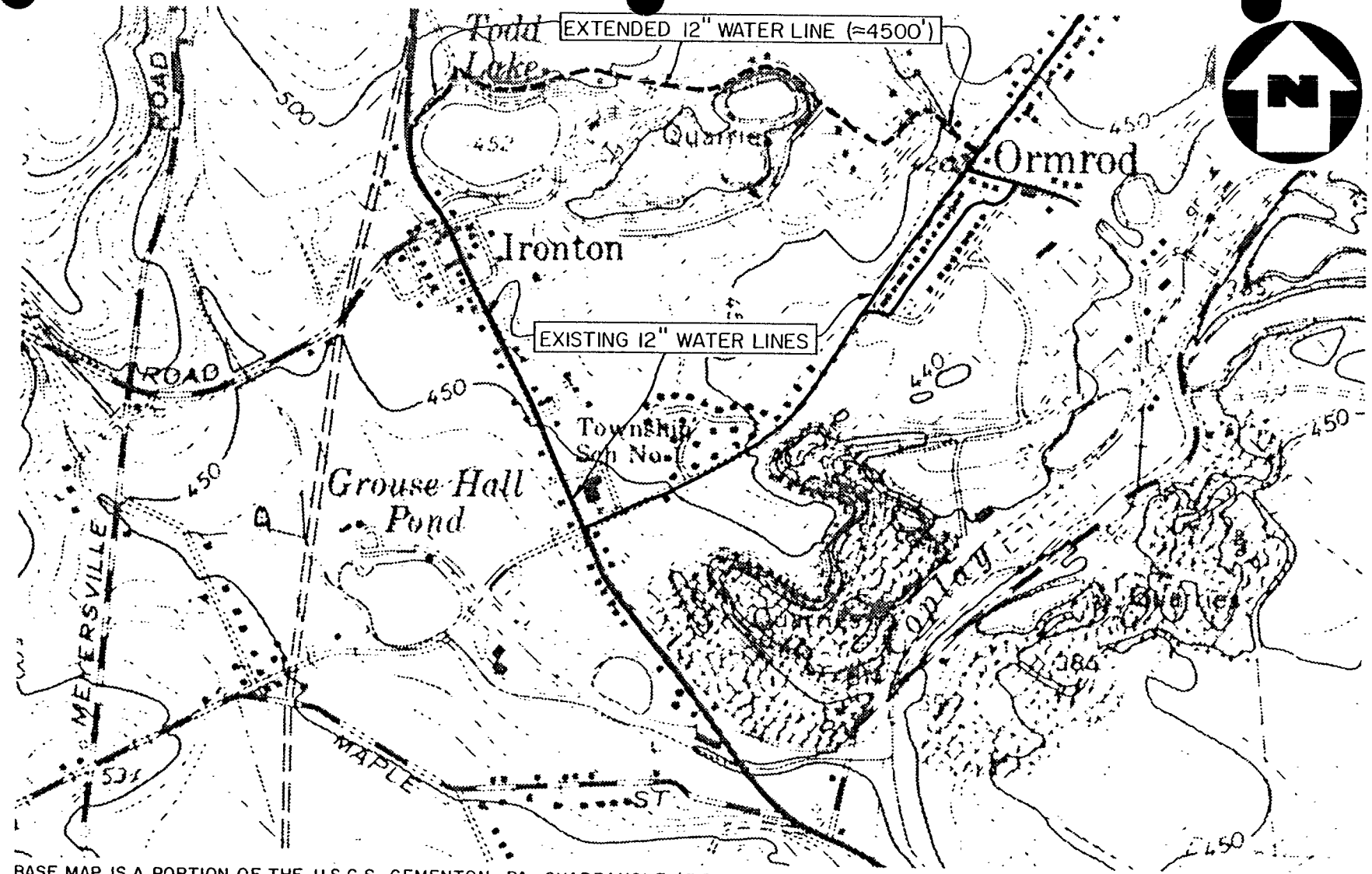
Water lines in the vicinity of the landfill are 12-inch-diameter, ductile iron, push-on joints. They were installed by the Northampton Municipal Water Authority. Water is supplied to these homes by gravity from a 200,000-gallon water tank connected to the local reservoir system. All future water supply lines installed by the Water Authority will be of the same diameter and construction.

Proposed Response

Implementation of this alternative involves extending the existing public water supply lines to 15 homes along Hill Street and a portion of Main Street, in Ironton. Rights for providing water supply services in the vicinity of the Heleva Landfill are held by the Northampton Municipal Water Authority. Figure F-1 depicts the location of the existing public water lines along Main Street in the Village of Ironton and Main Street in the Village of Ormrod.

Figure F-1 depicts the proposed route that would be used to extend the public water lines and implement this alternative. It also indicates the approximate locations of the existing 12-inch waterline. The proposed route entails laying

AR300576



BASE MAP IS A PORTION OF THE U.S.G.S. CEMENTON, PA QUADRANGLE (7.5 MINUTE SERIES, 1964, PHOTOREVISED 1972, CONTOUR INTERVAL 10)

FIGURE F-1

ALTERNATE WATER SUPPLY
EXTEND EXISTING 12-INCH WATER LINE
HELEVA LANDFILL SITE, NORTH WHITEHALL TWP., PA

SCALE: 1" = 1000'

NUS CORPORATION
A Halliburton Company

AR300577

approximately 5300 lineal feet of new waterline, in addition to supplying fire protection and service connections to about 15 homes along Hill Street and a portion of Main Street in Ironton.

The most critical problem associated with this alternative is the increased demand on the quantity of flow by the additional 15 homes. Since the construction of this new line would provide for a completely closed loop in the site vicinity, and the pressure at the intersection of Main Street and Hill Street (in Ormrod) is near 100 pounds per square inch (PSI), no booster pumps would be required, and the current water pressure would adequately supply the additional homes with water.

Costs

The costs for various water supply alternatives are presented in the cost summary table at the end of this appendix.

Initial Capital Costs

A breakdown of the costs shows that $54.00 per foot was used to estimate the cost of placing a 12-inch water supply line. The costs of connecting the waterline to the residences/facilities fall into two catagories. For residences located adjacent to Hill Street indicates, the connection to the main line will average $985.00 per connection. For homes located along a private road just off the eastern portion of Hill Street, a smaller waterline will be used for service connections to these residences. It is estimated that a total capital cost of $26,185.00 would be incurred for water service and fire connections along this private road.

The capital cost for installation of this alternative water supply, including residential service and fire protection, is estimated to be $287,320. The total cost for this alternative includes a 20 percent contingency cost and a 15 percent engineering cost, and is estimated at $387,900.

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*Ref: Telephone memo 12/20/84 with Dick Paul, Northampton Municipal Water Authority

Operation and Maintenance Costs

The operation and maintenance (O & M) requirements for the alternative were assumed to extend for a period of 30 years. It was assumed that all O & M costs for this alternative would be incurred by Northampton Municipal Water Authority and handled through normal user fees. Therefore, the O & M costs for this alternative would be zero.

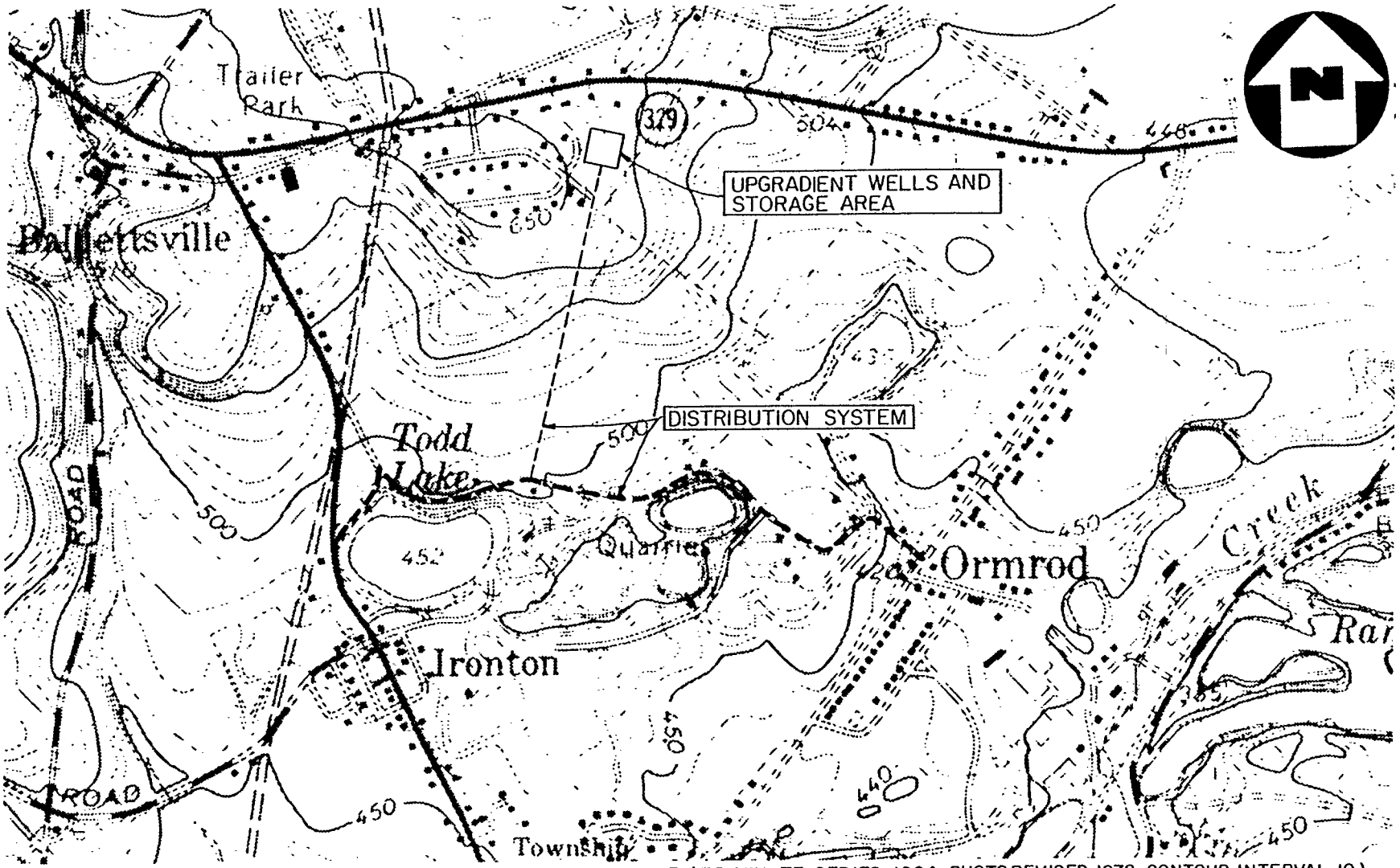
Since the annual cost of O & M for this alternative was determined to be zero, the present worth O & M cost is also zero.

ALTERNATE WATER SUPPLY VIA UPGRADIENT WELL AND DISTRIBUTION SYSTEM

Proposed Response

This alternate water supply technology involves installation of two deep wells, far enough upgradient of the landfill that a fresh groundwater supply can be used to service the 15 residences and facilities along Hill Street, as shown in Figure F-2. If the wells are correctly placed, contaminants from the Heleva Landfill will not affect the residences.

Implementation of this alternative involves drilling two wells 2000 feet upgradient of the Heleva Landfill to a depth of 250 feet, and distributing the water pumped from the wells to the 15 residences and facilities through a 6-inch water main. The wells will contain 100 feet of 8-inch-diameter pipe in a 10-inch-diameter hole, followed by 150 feet of a 6-inch-diameter open hole. A 1-1/2 H.P., 220-volt, 3-phase submersible pump capable of pumping 20 gpm with 250 feet of head is installed in each well. A 30-foot-diameter by 24-foot-high, flat-bottom storage tank is proposed for storing a one-week supply of potable water for the 15 users. This tank will be supported on a ring wall foundation about 4 feet below the ground surface to protect against frost. The distribution system from the tank will be gravity-fed though a 6-inch-diameter, ductile iron water main. The storage tank would have an estimated capacity of 125,000 gallons over the 7-day storage period. This was based on a usage rate of 100 gallons per capita per day and an average of



BASE MAP IS A PORTION OF THE U.S.G.S. CEMENTON, PA QUADRANGLE (7.5 MINUTE SERIES, 1964, PHOTOREVISED 1972, CONTOUR INTERVAL 10)

FIGURE F-2

ORIGINAL (Red)

ALTERNATE WATER SUPPLY
UPGRADIENT WELLS WITH STORAGE AND DISTRIBUTION SYSTEM
HELEVA LANDFILL SITE, NORTH WHITEHALL TWP., PA

SCALE: 1" = 1000'

NUS CORPORATION
A Halliburton Company

AR300580

ORIGINAL
(Red)

4 occupants per residence. A factor of 3.0 was applied to increase the required storage capacity to allow for peak usage and for fire protection.

Based on information obtained from production wells in the vicinity that have yields greater than 400 gpm, no exploratory boreholes were estimated for the proposed wells.

Costs

The costs for this alternative are presented in the cost summary table at the end of this appendix.

Initial Capital Costs

Initial capital costs include construction of two 20 gpm production wells, a 126,000 gallon, flat-bottom storage tank with foundation, and the distribution system to the 15 residences and facilities along Hill Street and Main Street in Ironton. Acquisition of property for the wells and storage tank and right-of-ways through private property were also included. The initial capital cost, which included a 20 percent contingency cost and a 15 percent engineering cost, has been estimated at $379,690.

Operation and Maintenance Costs

Operation and maintenance costs for this alternative include annual monitoring (Hazardous Substance List parameters) of the water supply to insure the quality of water, service charges for use of the system, and general upkeep charges for maintenance of the system. Costs for general upkeep were estimated to be 3 percent of the initial capital costs, while yearly service charges are estimated at $200 per residence or facility. Typical monitoring cost for HSL parameters is $1,000 per sampling analysis. As outlined in the cost summary table, annual O & M costs were estimated to be $17,100 for this alternative. Following construction, it is anticipated that the entire system will be operated either by the Township or the local water authority.

AR300581

ALTERNATE WATER SUPPLY FROM BOTTLED WATER.

Proposed Response

Implementation of this alternative involves providing bottled water to the 15 residences and facilities. This would provide them with an uncontaminated water supply.

Costs

Annual costs for this alternative were developed based on estimates from the Glenrock Water Company, located in the vicinity of the Heleva Landfill. The anticipated annual cost for bottled water per residence or facility is $143.00. These costs are considered as operation and maintenance (O & M) costs, and are assumed to extend over a 30-year period, for comparison purposes. Under this assumption, initial capital costs for implementation of this alternative are zero. The summary table presents the costs for this alternative.

TREATMENT OF EXISTING WATER SUPPLIES

Proposed Response

Since contaminants from the Heleva Landfill are flowing through the existing groundwater network into private wells utilized as potable water, treatment units can be installed on the individual wells to remove contaminants in the local wells.

The residential and monitoring wells have been sampled and analyzed for both organic and inorganic contaminants. Results indicate that elevated levels of organics are present in some wells used by residents for water supply. The organic contaminants of concern in the residential wells are listed in Table F-1. Levels of inorganics are generally below the drinking water standards for each substance. High zinc, iron, and manganese levels, found in the groundwater and in Todd Lake, are not related to any chemicals found in the landfill but, rather, are naturally high in local aquifers.

AR300582

ORIGINAL
(Red)

TABLE F-1

MAJOR CONTAMINANTS OF CONCERN DETECTED IN RESIDENTIAL WELL WATER
HELEVA LANDFILL, PENNSYLVANIA
(Based on Well Samplings of February, April, September, and October 1984)

Contaminant	Maximum Concentration Detected (µg/l)
Trichloroethylene (TCE)	200 µg/l
1,2-trans-dichloroethylene	31 µg/l

AR300583

In determining the appropriate treatment method to reduce the contamination of residential wells, the types and concentrations of contaminants must be examined. The method devised must reduce the levels of contaminants at each residential well to acceptable levels.

As previously shown, the majority of chemicals present are volatile organics. Although air stripping of volatiles is the favored treatment method over carbon adsorption, it cannot be implemented on an individual well basis, since units that are small enough are not readily available. In addition, the removal of volatile organics from the water by this process requires emission of these volatile organics to the atmosphere. This would necessitate monitoring, and possibly treatment, of the gases, which would significantly increase the cost of this system. Based on the monitoring requirements of air-stripping and the infeasibility of constructing small units for the private wells, carbon adsorption was chosen as the treatment method for organics in the individual wells.

Individual carbon filters for residential use are readily available commercially. The units come in a variety of configurations, but basically require installing the unit on the main waterline leading into the residence or facility. The organics in the water entering the unit would adsorb onto the carbon, resulting in a reduced level of organics in the drinking water leaving the filter. The carbon in the unit would have to be replaced on a regular basis to assure the quality of the drinking water. To determine costs and provide for effectiveness in the system, it was assumed that the carbon would have to be replaced every six months.

The presence of zinc, iron, and manganese in elevated levels in some residential wells, while not a health risk at these levels, is also of concern. Both of these elements are regulated in the Secondary Drinking Water Standards (40 CFR Part 143.3, revised July 1, 1982), which primarily govern the aesthetic qualities of drinking water. An excess of either of these elements gives a brownish color to porcelain fixtures and laundered goods, and may impair the taste of the water. It was determined that a treatment method should be devised to remediate this problem.

A unit similar to the type described for the removal of organics may be used for the zinc, iron, and manganese removal system, but with a synthetic resin instead of carbon as the media. The synthetic resin would remove the zinc, iron, and manganese, and the media would have to be replaced regularly. For costing purposes, it was assumed that the resin would be replaced annually. The filtering units are assumed to last 30 years for costing purposes, with regular replacement of the filtering media.

Sampling would be performed quarterly at each home, with both the influent and effluent water to the treatment units being sampled. Samples would be analyzed for volatile organics, iron, and manganese for each of the first three quarters of the year. During the fourth quarter, samples, including organics and inorganics, would undergo a full Hazardous Substance List (HSL) scan. The quarterly sampling performed at each home should determine the efficiency of the filters in removing contaminants from the water, as well as indicate the frequency at which the media in the units should be changed. It was assumed that the samples would be collected by the State as part of the operation and maintenance of the system.

If a breakthrough in the carbon filter or clogging in the iron/manganese filter is not detected and the units continue to be used, water of a poor quality is likely to be consumed. The units, even when functioning properly, may not remove all contaminants to acceptable levels and may not work on certain contaminants, that may appear in the water at a future time. Proper operation and maintenance of these units would be costly because of the large amount of sampling to be performed.

Costs

The summary table presents the summary of costs for this alternative. Construction, operation, and maintenance costs were determined on the basis of providing treatment of the existing water supplies for the 15 residences and facilities along Hill Street.

Initial Capital Costs

Initial capital cost estimates include the cost for the purchase and installation of 5-gallon-per-minute (gpm) residential wells, carbon filter units, and the zinc, iron, and manganese removal units for residential wells. Both systems include an automatic backflush system. The total initial capital cost for servicing the 15 residences and facilities is estimated at $62,775.

Operation and Maintenance Costs

The operation and maintenance (O & M) costs include semi-annual replacement of the carbon, annual replacement of the zinc, iron, and manganese filter media, sampling labor, and laboratory analyses. Annual O & M costs were estimated at $314,285, and are assumed to extend over a 30-year period.

AR300586

TABLE F-2

ALTERNATE WATER SUPPLY TECHNOLOGIES
COST BREAKDOWN SUMMARY

Extend Exising Public Water Lines		Upgradient Well, Storage and Distribution System		Individual Treatment System on Wells		Supply Bottled Water	
Initial Capital Costs		Initial Capital Costs		Initial Capital Costs		Initial Capital Costs	
Extend Existing Lines	$246,395	Well Installation	$ 8,373	Carbon Filter Units	$ 22,500		$ 0
Service Connections To Residences/Facilites	$ 40,925	Storage System Distribution System	$ 73,140 $199,740	Zinc, Iron, Manganese Units	$ 24,000		
Subtotal	**$287,320**	**Subtotal**	**$281,253**	**Subtotal**	**$ 46,500**		
20% Contingency	$ 57,480	20% Contingency	$ 56,250	20% Contingency	$ 9,300		
15% Engineering	$ 43,100	15% Engineering	$ 42,180	15% Engineering	$ 6,975		
Total	**$387,900**	**Total**	**$379,683**	**Total**	**$ 62,775**		
Annual O & M Costs		Annual O & M Costs		Annual O & M Costs		Annual O & M Costs	
Assumed by Northampton Municipal Water Authority	$ 0	General Upkeep and Service Charges	$ 15,100	Replace Filters	$ 1,500	Bottled Water	$2,145
Present Worth O & M Costs	$ 0	Aquisition of Land	$ 2,000	Chemicals	$ 2,500	Present Worth Over 30 Years	$20,220
				Monitoring	$ 22,680		
		TOTAL	$ 17,100	TOTAL	$ 26,680		
		Present Worth Over 30 Years	$161,200	Present Worth Over 30 Years	$251,510		
TOTAL PROJECT COST	$387,900	TOTAL PROJECT COST	$557,983	TOTAL PROJECT COST	$340,965	TOTAL PROJECT COST	$22,365

AR300587

AR300588

ORIGINAL
(Red)

APPENDIX G

DETAILED COST COMPONENTS

APPENDIX G

DETAILED COST COMPONENTS

Effective Measures

Direct capital costs may include the following cost components:

- Construction Costs - Components include equipment, labor (including fringe benefits and workman's compensation), and materials required to install a remedial action.

- Equipment Costs - In addition to the construction equipment cost component, remedial action and service equipment should be included.

- Land and Site-Development - Costs include land-related expenses associated with the purchase of land and development of existing property.

- Buildings and Services - Costs include process and non-process buildings and utility hook-ups.

Indirect Capital Costs may include the following components:

- Engineering Expenses - Components will include administration, design, construction supervision, drafting, and testing of remedial action alternatives.

- Legal Fees and License and Permit Costs - Components will include administrative and technical costs necessary to retain licenses and permits for facility installation and operation.

- Relocation Expenses - Relocation expenses should include costs for temporary or permanent accommodations for affected nearby residents.

AR300590

ORIGINAL
(Red)

- Start-up and Shake-down Costs - Costs incurred during remedial action startup for long-term activities should be included.

- Contingency Allowances - Contingency allowances should correlate with the reliability of estimated costs and experience with the remedial action technology.

The operation and Maintenance cost may include the following components:

- Operating Labor Costs - Include all wages, salaries, training, overhead, and fringe benefits associated with the labor needed for post-construction operations.

- Maintenance Materials and Labor Costs - Include the costs for labor, parts, and other materials required to perform routine maintenance of facilities and equipment for the remedial alternative.

- Auxiliary Materials and Energy - Include such items as chemicals and electricity needed for treatment plant operations, water and sewer service, and fuel costs.

- Purchased Services - Include such items as sampling costs, laboratory fees, and professional services for which the need can be predicted.

- Disposal Costs - Costs should include transportation and disposal of any waste materials, such as treatment plant residues, generated during remedial operations.

- Administrative Costs - Cover all other O&M costs, including labor-related costs not included under that category.

- Insurance, Taxes, and Licensing Costs - Include such items as liability and sudden and accidental insurance, real estate taxes on purchased land or

AR300591

ORIGINAL
(Red)

right-of-way, licensing fees for certain technologies, and permit renewal and reporting costs.

- Maintenance Reserve and Contingency Funds - Represent annual payments into escrow funds to cover anticipated replacement or rebuilding of equipment and any large, unanticipated O&M costs, respectively.

Construction costs and operation and maintenance costs were estimated, and a present-worth analysis was used to convert the annual costs to an equivalent single value.

AR300592

ORIGINAL
(Red)

APPENDIX H

COST ESTIMATE BREAKDOWN

ORIGINAL
(Red)

ALTERNATIVE #1 COSTS

NO-ACTION - MONITORING

9,4269

PRICING SHEET

PAGE NO. ____ OF ____ PAGES

NAME	ORIGINAL (Red)	ARCH. OR CONTRACTOR	ESTIMATE NO.
Helena			
LOCATION		TYPE OF WORK: No Action w/ monitoring	

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE
BES		~~Fabite~~		

DESCRIPTION	QUAN.	@			EXTENSION
Labor	80 hr per person	$ 25 40	2032		
	X 2 people		4064		4064
Cost of Living	4 days	75/day	300		
	X 2		600		600
Car	5 days	40/day	200		200
Equipment rental, disposables etc.					500
Lab 12 Surface H_2O	36	175	6300		6300
13 Ground					
5 homes					
3 blank					
3 Dup					
Sub Total					11664
w/Contingency	20%				2336
Total per trip					14000
4 per year					56000
					527900
w/o residential wells 5 homes	5	175 -	875 X4 = 3500		
New annual					52500
			30 yr		494912
w/o leachate	3	175	525 X4 =		2100
					50400
			30 yrs		475115
TOTALS					

AR300596

ORIGINAL
(Red)

ALTERNATIVE #1 SENSITIVITY ANALYSIS COSTS

NO-ACTION - MONITORING

PRICING SHEET

ORIGINAL (Red) PAGE NO. ____ OF ____ PAGES

NAME: Helena Landfill RI/FS
ARCH. OR CONTRACTOR:
ESTIMATE NO.:
LOCATION:
TYPE OF WORK: No Action with Monitoring - Sensitivity Analysis
ESTIMATED BY:
PRICED BY:
EXTENDED BY: GLE
CHECKED BY:
DATE: 1/18/85

DESCRIPTION	QUAN.	@	EXTENSION
Labor - (Remain at Base Level)			4,064
Costs of Living - (RBL)			600
Car (RBL)			200
Equipment (RBL)			500
Lab - Base Level - (36 Samples)	$175/sample		6300
+ 10% 40 Samples	$175/sample		7000
- 10% 32 Samples	$175/sample		5600
Subtotal Base Level			11,664
+10%			12,364
-10%			10,964
Contingency Base Level	20%		2,333
+10%			2,473
-10%			2,193
Total / trip Base Level			13,997
+10%			14,837
-10%			13,157
Total - 4 trips / year Base Level			$55,988 ≈ $56,000
+10%			$59,348 ≈ $59,000
-10%			$52,628 ≈ $53,000
Present Worth Base Level	- 10% Interest	30 yrs.	$527,793 ≈ $528,000
+10%			$559,468 ≈ $559,000
-10%			$496,119 ≈ $500,000
TOTALS			

AR300598

PRODUCT 235 INFORS Inc. Gardner, Mass. 01440

ORIGINAL
(Red)

ALTERNATIVE #2 COSTS

ALTERNATE WATER SUPPLY

MONITORING

PRICING SHEET

ORIGINAL (Red)

PAGE NO. 1 OF ___ PAGES

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
HELEVA LANDFILL	NUS CORP.	5760.21

LOCATION	TYPE OF WORK
ALLENTOWN, PA ; NORTH WHITEHALL TOWNSHIP	EST. NEW WATER LINES 12"Ø, REF: MEANS 1984

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE

DESCRIPTION	QUAN.	@	E	L *	M *	EXTENSION
ESTIMATED COSTS BASED ON MEANS 1984 SITE WORK GUIDE						
NOTE: ACCORDING TO AMF NO TOTAL COSTS FROM MEANS ARE TO BE USED. ONLY BARE EQUIPMENT MATERIAL & LABOR COSTS WHICH WILL BE ADJUSTED AFTER THEY ARE TOTALED.						
* NOTE: MATERIAL COSTS FROM MEAN INCLUDE 10% MARK-UP & INST COST INCLUD 44% BOTH ARE REMOVED						
• ASSUME 12" DIA DUCTILE IRON, TYTON JOINT, 4' DEEP IN TRENCH WITH 1 1/2 : 1 SIDE SLOPES 2' WIDE, 3/8" CY BUCKET (REF: PG. 136)						
1.) TRENCHING SYSTEM	5300 LF		@1.38	@2.13		
(INCLUDES. EXCAVATION			7320	11,290		18,610
BACKFILL IN LIFTS						
COMPACTION)						
2.) PIPE BEDDING SYSTEM	5300 LF			@1.69	@1.51	
(COMPACTED BANK SAND USED				8960	8000	16,960
AS BEDDING & FILLED						
12" OVER PIPE)						
3.) PIPING, WATER DIST. DUCT. IRON	5300 LF		@1.21	@7.94	@12.50	
(PAGE 70, ** COSTS SHOWN ARE			6400	42,080	66,250	114,730
DIRECTLY FROM MEANS BARE COSTS)						
4.) INDIVIDUAL WATER HOOK-UP	15 HOMES			@2.13	@3.12	
SERVICE *				3180	4690	7870 •
(USE COST FOR 8" DIA. MAIN						
& 2" DIA. TAPS, 20' OFFSETS						
INCL. EXCAV., BACKFILL & CORP STOPS)						
4..) FOR HOMES ALONG PRIVATE DRIVE (SEE PG. 2a FOR BREAKDOWN)						
			10,120		14,605	24,725
				@12.60	@43.00	
5.) WATER METERS FOR HOMES **	15 HOMES			190	645	835 •
(3/4" DIA, TO 30GPM)						
			TOTALS			

AR300600

PRICING SHEET

ORIGINAL (Red)

PAGE NO. 2 OF ____ PAGES

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
HELEVA LANDFILL	NUS CORP.	

LOCATION	TYPE OF WORK
ALLENTOWN, PA ; NORTH WHITEHALL TOWNSHIP	EST. NEW WATER LINES 12"Φ REF: MEANS

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE

DESCRIPTION	QUAN.	@	E	L*	M*	EXTENSION
6.) FIRE HYDRANTS - 4' DEEP						
4 1/2" VALVE SIZE, 10' OFFSET				@ 424	@ 1890	
(1200' C-C OVER 4500')	4			1700	7560	9260
SUBTOTAL			23,840	67,400	101,710	192,950
BURDEN - 13%				8760		8760
LABOR - 15%				10,110		10,110
MATERIAL - 10%					10,170	10,170
TOTAL DIRECT COST			23,840	86,270	111,880	221,990
INDIRECTS - 50%				43,130		43,130
PROFIL - 10%						22,200
						287,320
ENGINEERING - 15%						43,100
CONTINGENCY - 20%						57,480
						387,900
					SAY	390,000

NOTE: ANNUAL O & M COSTS WILL BE ASSUMED BY NORTH HAMPTON MUNICIPAL WATER AUTHORITY

AR300601

TOTALS

PRODUCT 235 NEBS Inc. Groton, Mass. 01450

PRICING SHEET

ORIGINAL 2a OF 2a PAGES

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
HELEVA LANDFILL	NUS CORP. (Red)	0760,21
LOCATION: ALLENTOWN PA	TYPE OF WORK: EST. NEW 12" WATER LINES (REF MEANS p327)	
ESTIMATED BY / PRICED BY	EXTENDED BY: PJC	CHECKED BY: 9 RJ (1/7/85)
		DATE: 12/20/84

DESCRIPTION	QUAN.	@	M	I/E	L	EXTENSION
INSTALL INDIVIDUAL HOOK-UPS TO 4 HOMES ALONG PRIVATE DRIVE OFF - HILL ST, 2' DEEP TRENCH, 3' WIDE, 700 LINEAL FT.						
WATER SERVICE (*)						
				C 2.28		
TRENCH EXC, 1/2 CY, BACKHOE	156 CY			360		
DRILL & TAP MAIN	1			105		
			C 14.00	10.83		
CORPORATION, BRASS,	4		60	45		
			22.72			
SADDLE CAST IRON	4		90	—		
			20.57	13.14		
COPPER TUBING, TYPE K, 1" ϕ	700		14400	9200		
CURB STOP, BRASS 1" ϕ	1		30	15		
CURB BOX, CAST IRON	1		25	15		
				C.77		
BACKFILL, BY HAND NO COMP.	156 CY			120		
				1.66		
COMPACTION, VIBR. PLATE	156 CY			260		
SUBTOTAL (See pg 1 for included Costs)			14605	10120		24,725
(*) COSTS IN MEANS REDUCED TO BARE COSTS I/E ÷ 1.44 & M ÷ 1.10						
TOTALS						

AR300602

PRICING SHEET

PAGE NO. (incl) OF ____ PAGES

NAME: Helena Landfill RI/FS		ARCH. OR CONTRACTOR	ESTIMATE NO.
LOCATION		TYPE OF WORK: Monitoring with Alt. Water Supply	
ESTIMATED BY: BES	PRICED BY	EXTENDED BY: GLZ	CHECKED BY: BES	DATE: 1/23/85

DESCRIPTION	QUAN.	@	EXTENSION
Labor - Same as Monitoring No Action			
Cost of Living			
Car			
Equipment etc.			5,364/trip
Lab 12 Surface W	31	$175/sample	5,425/trip
13 Ground W			
0 homes			
3 Blank			
3 Dup			
subtotal			$10,789/trip
Contingency	20%		$2,158/trip
			12,947/trip
			x 4
			$51,788/yr
			≈ 52,000
30 year Present Worth			$490,000
TOTALS			

AR300603

ORIGINAL
(Red)

ALTERNATIVE #2 SENSITIVITY ANALYSIS COSTS

ALTERNATE WATER SUPPLY

MONITORING

PRICING SHEET

ORIGINAL (Red)

NAME: HELEVA LANDFILL	ARCH. OR CONTRACTOR		ESTIMATE NO.
LOCATION: PA	TYPE OF WORK: ALT. WATER SUPPLY - SENITIVITY ANALYSIS		
ESTIMATED BY	PRICED BY	EXTENDED BY: GLZ	CHECKED BY	DATE: 1-25-85

DESCRIPTION	QUAN.	@	E	L	M	EXTENSION
- 30% LENGTH OF LINE						
BASE LENGTH 5300 LF						
× .70 = 3700 LF						
			(1.38/FT)	(2.13/FT)		
1. TRENCHING	3700 FT		5,106	7,881		12,987
				(1.69/FT)	(1.51/FT)	
2. PIPE BEDDING SYSTEM	3700 FT			6,253	5587	11,840
			(1.21/FT)	(7.94/FT)	(12.50/FT)	
PIPING	3700 FT		4,477	29,378	46,250	80,105
				(212.00/HOME)	(310.00/HOME)	
4. INDIVIDUAL HOME HOOK-UP SERVICE	15 HOMES			3,180	4,650	7,830
4A. FOR HOMES ALONG PRIVATE DRIVE - SEE PAGE 2A OF BASE COST			10,120		14,605	24,725
				(12.60/HOME)	(43.00/HOME)	
5. WATER METERS FOR 15 HOMES	15 HOMES			190	645	835
				(424.00/HY.)	(1890/HY.)	
6. FIRE HYDRANTS	4			1700	7560	9,260
SUBTOTAL			19,703	48,582	79,297	147,582
BURDEN 13% OF LABOR				6,316		6,316
LABOR 15% OF LABOR				7287		7,287
MATERIAL 10% OF MTL.					7930	7930
			19,703	62,185	87,227	169,1[illegible]
TOTALS						

AR300505

PRICING SHEET

PAGE NO. 2 OF 2 PAGES

ORIGINAL (Red)

NAME: HELEVA LANDFILL RI/FS		ARCH. OR CONTRACTOR	ESTIMATE NO.
LOCATION: PA		TYPE OF WORK: ALT. WATER SUPPLY - SENSITIVITY ANALYSIS	
ESTIMATED BY	PRICED BY	EXTENDED BY: GLZ	CHECKED BY	DATE: 1-25-85

DESCRIPTION	QUAN.	@	E	L	M	EXTENSION
SUBTOTALS FROM PAGE 1			19,703	62,185	87,227	169,115
INDIRECT COSTS 50% OF LABOR				31,093		31,093
PROFITS 10% OF SUBTOTAL						16,912
						217,120
ENGINEERING 15%						32,568
CONTINGENCY 20%						43,424
						$ 293,112
						$ 293,000
TOTALS						

AR300606

PRICING SHEET

PAGE NO. 1 OF 1 PAGES

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
Helena Landfill	ORIGINAL (Red)	
LOCATION	TYPE OF WORK	
	Monitoring With Alt Water Supply - Sensitivity Analy	

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE
		GLZ		1/23/85

DESCRIPTION	QUAN.	@	EXTENSION
± 10% on # of lab samples			
		+ 10%	
Labor, Cost of Living, Car, Equip. - Same As Base Cost			5,364/trip
lab 31 samples +10%	34	$175/sample	5,950/trip
Subtotal			11,314/trip
Contingency 20%			2,263/trip
			13,577/
			X4
			$54,308/yr
			$54,000
30 yr. Present Worth			$509,000
		− 10%	
Labor etc.			5,364/tri
lab 31 samples - 10%	28	$175/sample	4,900/trip
subtotal			$10,264/tri
Contingency 20%			$2,053/trip
			$12,317/trip
			X4
			$49,268
			$49,000
		TOTALS 30 yr Present Worth	$462,000

AR300607

ORIGINAL
(Red)

ALTERNATIVE #3 COSTS

ALTERNATE WATER SUPPLY

LANDFILL CAP

MONITORING

PRICING SHEET

ORIGINAL (Red)

PAGE NO. 1 OF 1 PAGES

NAME: Helena Landfill	ARCH. OR CONTRACTOR	ESTIMATE NO.
LOCATION	TYPE OF WORK: Alt. Water Supply	
ESTIMATED BY / PRICED BY	EXTENDED BY: GLZ / CHECKED BY	DATE: 1/30/85

DESCRIPTION	QUAN.	@			EXTENSION
The costs for the alternate water system are included with the costs for Alternative # 2.					
			TOTALS		

AR300609

PRICING SHEET

NAME: Heleva Landfill RI/FS
ARCH. OR CONTRACTOR:
ESTIMATE NO.:
LOCATION: Lehigh Co. PA
TYPE OF WORK: ~~RCRA~~ Landfill Cap
ESTIMATED BY:
PRICED BY:
EXTENDED BY:
CHECKED BY: GLZ
DATE: 1/23/85

ORIGINAL (Red)

DESCRIPTION	QUAN.	@	M	E + L	Total	EXTENSION
	[marked up cost]			71,251	71,251	
1. Grading - 6" deep 23 acres	18,555 yd³	384 yd³		~~71,215~~	~~71,215~~	
2. Compact cover material 23 acres - 2 passes; 6" lifts	18,555 yd³	262 yd³ / yd³		486,14	486,14	
			(780)	(4,62)		
3a Clay - 2 ft thick 23 acres	74,219 yd³	1242 yd³	578,908	3428,92	921800	
b Place + spread clay 23 acres	74,219 yd³	325 yd³		241212	241212	
c. Compact clay	74,219 yd³	262 yd³		194454	194454	
				898,423		
			578908	~~898,523~~	1,477,331	
Subtotal (1,2,3)					~~1,477,291~~	
Health + Safety Monitoring (8% sub Total)					118,186 ~~118,184~~	
Level "D" Construction Condition (15% Equip + Labor)					134,763 ~~134,786~~	
Total					1,730,280 ~~1,730,265~~	
Contingency (20% Total)					346,056 ~~346,053~~	
Engineering (10% Total)					173,028 ~~173,026~~	
Total - Clay Cap (1,2,3)					~~2,249,344~~ 2,249,364	
			540 yd³	436 yd³		
a Coarse matl, 1 foot thick (flow zone)	37,110 yd³	976 yd³	200394	161800	362194	
b Place + spread coarse matl	37,110 yd³	325 yd³		120608	120608	
TOTALS						

AR300610

PRICING SHEET

NAME: Heleva Landfill RI/FS
ARCH. OR CONTRACTOR:
ESTIMATE NO.:
LOCATION: Lehigh Co. PA
TYPE OF WORK: ~~RCRA~~ cap Landfill
ESTIMATED BY: SFP
PRICED BY:
EXTENDED BY:
CHECKED BY: GLZ 1/23/85
DATE:

ORIGINAL (Red)

DESCRIPTION	QUAN.	@	M	Ex L	Total	EXTENSION
c Compact coarse mat'l	37,110 yd³	262 yd³		972228	972228	
			100 yd²	020 yd²		
5. Geotextile	111,320 yd²	120 yd²	111320	222264	1335584	
			165 yd³	326		
6. a. 42" common borrow	129,885 yd³	491 yd³	214320	423425	637735	
b compact borrow	129,885 yd³	262 yd³		340300	340300	
			605 yd³	436 yd³	193160	
c 6" Top soil	18,555 yd³	1041 yd³	~~112350~~	80900	~~193250~~	
			112,260			
d compact topsoil	18,555	262 yd³		48614	48614	
e revegetation	23 acres	1500/ac			34500	
					14900	
f erosion control	3,600 ft	409 ft			~~19400~~	
			638,284	1,295,139	1,982,623	
sub total (4,5,6)					~~1982413~~	
					396,525	
contingency (20% subtotal)					~~396483~~	
					198,262	
Engineering (10% subtotal)					~~198241~~	
					2,577,410	
Total (4,5,6)					~~2,577,137~~	
					4,826,774	≈ 4,827,000
Total (1,2,3,4,5,6)					~~4,826481~~	
		TOTALS				

AR300611

PRICING SHEET

NAME: Helena Landfill		ARCH. OR CONTRACTOR	ESTIMATE NO. ORIGINAL
LOCATION		TYPE OF WORK: ~~RCRA~~ CAP - O + M costs	(Red)
ESTIMATED BY: GLZ	PRICED BY: GLZ	EXTENDED BY: GLZ	CHECKED BY: DATE: 1/23/85

DESCRIPTION	QUAN.	@			EXTENSION
1. Labor - Inspection 4 trips/year, 2 days/trip, 8 hrs/day					
	64 hrs	50.00/hr		$3,200/yr.	
2. Revegetating 1 acre/year	1 acre	1500/acre		$1,500/yr	
Subtotal				$4,700/yr	
Contingency 20%				$940/yr	
				5,640/yr ≈	$6,000/yr
30 year Present Worth				56,561 ≈	$57,000
TOTALS					

AR300612

PRICING SHEET

PAGE 1 OF 1 PAGES

EPA - HELEVA — PEC DIV. - NUS — E760.3 — ORIGINAL (Red)

ALLENTOWN, PA. — GAS VENT SYSTEM

ESTIMATED BY AMF — PRICED BY AMF — EXTENDED BY — CHECKED BY — DATE 1/3/85

DESCRIPTION	QUAN.	M	L	E	EXTENSION
GAS VENT SYSTEM					
1) 4"φ PVC PERFORATED PERIMETER PIPING	4000'	2600	5300		
) 4"φ PVC VENT CONNECTION PIPING	1100'	700	1450		
3) 6" PVC VENT PIPING	1150'	1700	1600		
4) 6" PVC - 90° ELL	60	600	2000		
5) 12" CASING 30 x 20' TO 70' LG REMOVE CASING AFTER INSTALLATION OF 6" VENT PIPING & GRAVEL	940'	7200	5700	3750	
6) GRAVEL BED	30YD³	300	50	50	
		13100	16100	3800	33000
BURDENS - 13%			2100		2100
LABOR - 15%			2400		2400
MATERIAL - 5%		700			700
TOTAL DIRECT COST		13800	20600	3800	38200
INDIRECTS - 75%			15500		15500
PROFIT - 10%					3800
					57500
CONTINGENCY - 20%					11500
ENGINEERING - 15%					8600
					77600

AR300613

4" PVC PERIMETER PIPE - 4000'

4" PVC VENT CONN. PIPE - 1100'

6" PIPE VENT x 20'

V1 THRU 14 (14x20') - 280'

6" PIPE VENT x 30'

PV15 THRU 19 (5x30') - 150'

6" PIPE VENT x 40'

PV 20, 23, 24, 28 (4x40') - 160'

6" PIPE VENT x 50'

PV 21, 22, 25 (3x50') - 150'

6" PIPE VENT x 60'

PV 29 60'

6" PIPE VENT x 70

PV 26, 27 (2x70') 140'

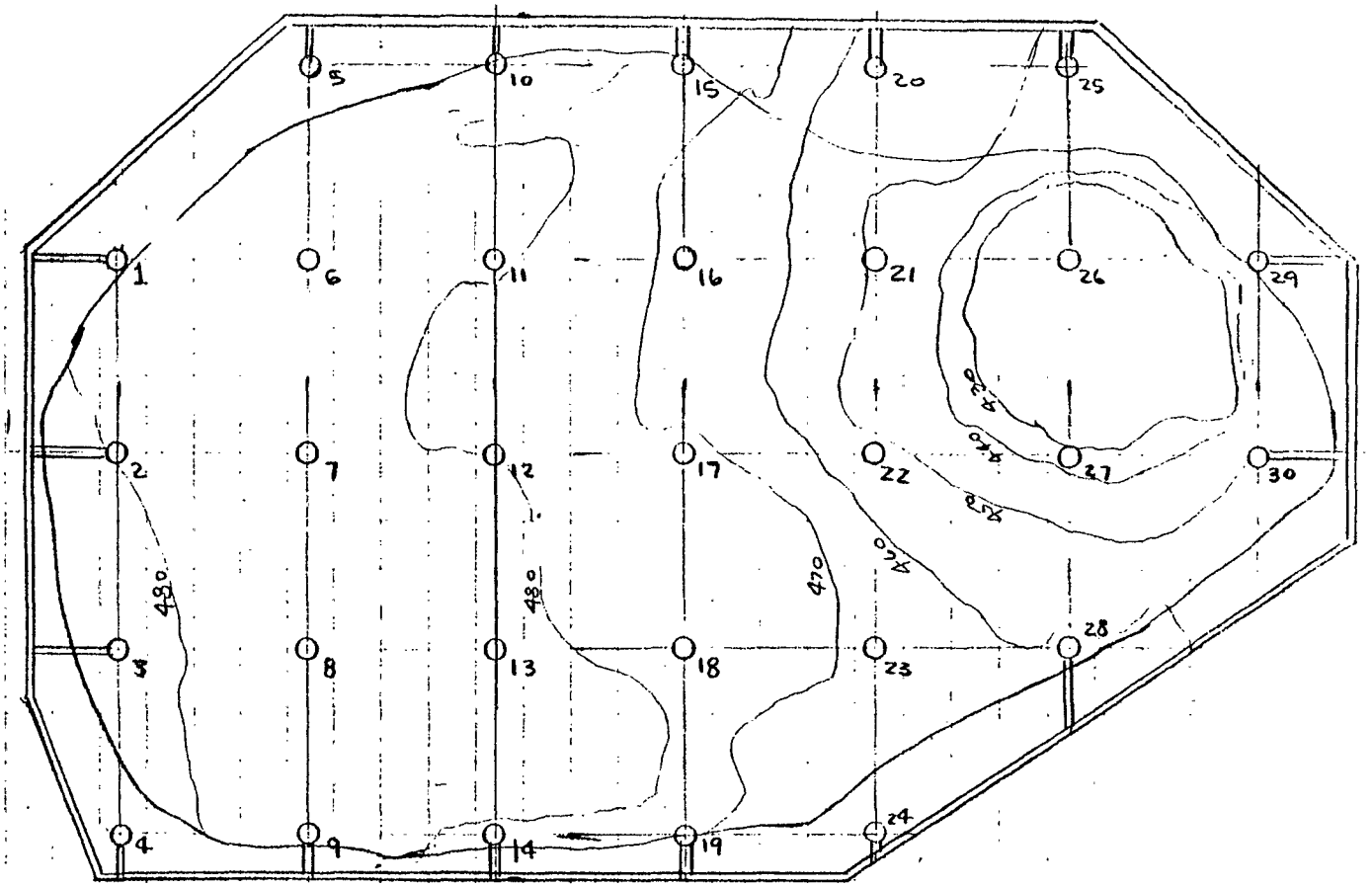
} 940'

(ABOVE GRADE)

30 VENTS x 7' EXTENSION = 210'

940' + 210' = 1150

1½" GRAVEL x 940' = 30YD³



TOP OF LANDFILL ELEV. 500.0'

1" = 200'

HELEVA SITE - #760

GAS VENT SYSTEM

ORIGINAL (Red)

1900614

PAGE NO. 1 OF 1 PAGES

NAME: EPA - HELEVA

ARCH OR CONTRACTOR: PECDIU - NUS

ESTIMATE NO.: # 760.2 ORIGINAL (Red)

LOCATION: ALLENTOWN, PA.

TYPE OF WORK: LANDFILL PERIMETER FENCING - 23A

ESTIMATED BY: AMF | PRICED BY: AMF | EXTENDED BY: | CHECKED BY: | DATE: 2/12/85

DESCRIPTION	QUAN.	$			SUB CONTRACT	EXTENSION
1) 8' Hi Fence w/Barb Wire	4000'	13.95			55800	
2) Vechicle Gate	1	500.00			500	
3) Man Gate	2	250.00			500	
						56900
Subcontract - 10%						5700
						62600
Profit - 10%						6300
						68900
Contingency - 20%						13800
Engineering - 15%						10300
						93000
TOTALS						

AR300615

Alt. #3

PRICING SHEET

NAME: HELENA LANDFILL
ARCH. OR CONTRACTOR:
ESTIMATE NO.: ORIGINAL (Red)
LOCATION: PA
TYPE OF WORK: Additional Monitoring Wells - RCRA Cap.
ESTIMATED BY:
PRICED BY:
EXTENDED BY: GLB
CHECKED BY:
DATE: 2/12/85

DESCRIPTION	QUAN.	@	Material	Labor & Equip.	EXTENSION
Install 8 groundwater monitoring wells - 4" PVC					
4 clusters - 1 to bedrock, 1 into bedrock					
1-60' well, 2-90' wells, 1-100' well, 2-130' wells, 1-136' well, 1-176' well — 10' screen/well, 3' stickup/well — 912 ft. of drilling					
Drilling Costs	912'	$16.88/ft		15,400	15,400
Pipe Costs	856'	$2.40/ft	2,054		2,054
Screen Cost	80'	$7.40/ft	592		592
Protective Casing	8	150/casing	1,200		1,200
Misc. Supplies Sand, Grout			400		400
Well Installation	2 hrs/well @ $187/hr			2,992	2,992
Supervision by	80 hrs	$50.00/hr		4,000	4,000
Geologist	10 days	$75/day	750		750
Subtotal			$4,996	$22,392	$27,388
Health & Safety Monitoring 10% of Total	(0.10 x 27,388)			2,739	2,739
TOTALS			$4,996	25,131	$30,127

AR300616

PRICING SHEET

NAME: Helena Landfill
ARCH. OR CONTRACTOR:
ESTIMATE NO.: ORIGIN. (Red)
LOCATION: PA
TYPE OF WORK: Additional Monitoring Wells - RCRA Cap
ESTIMATED BY:
PRICED BY:
EXTENDED BY: GLZ
CHECKED BY:
DATE: 2/12/85

DESCRIPTION	QUAN.	@	Material	Lab & Equip		EXTENSION
Level B const. cond. 1.5 x Total Labor						31,914
						$61,541
Contingency 20%						$12,308
Overhead & Profit 20%						$12,308
Engineering 10%						6,154
						$92,311
TOTALS						

AR300617

PRICING SHEET

PAGE NO. 1 OF (Rad) PAGES — ORIGINAL

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
HELEVA LAND FILL		

LOCATION	TYPE OF WORK
PA	Monitoring - RCRA cap & Alt. Supply

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE
		GLZ		2/12/85

DESCRIPTION	QUAN.	@	EXTENSI
Monitoring			
Labor	80 hrs/person	@ $25.40/hr = 2,032/person X2	$4,064.
Cost of Living	4 days/person	@ $75/day = $300/person X2	$600
Car	5 days	@ $40/day	$200
Equipment rental, disposable, etc.			$500
			$5364
Laboratory Costs			
9 Surface Water	36	@ $175/sample	$6,300
21 Ground Water			
0 Homes			
3 Blank			
3 Dup.			
subtotal / trip			$11,664/tr.
Contingency 20%			$2,333/tr
			$13,997/tr
			x4 tr.
			$55,988/yr
			≈ $56,000/
30 Yr Present Worth			$527,906.
			≈ $528,000
TOTALS			

AR300618

ORIGINAL
(Red)

ALTERNATIVE #3 SENSITIVITY ANALYSIS COSTS

ALTERNATE WATER SUPPLY

LANDFILL CAP

MONITORING

PRICING SHEET

(Rev)

PAGE NO. 1 OF 1 PAGES

NAME: Helena Landfill	ARCH. OR CONTRACTOR	ESTIMATE NO.
LOCATION	TYPE OF WORK: Alt. Water Supply - Sensitivity Analysis	
ESTIMATED BY / PRICED BY	EXTENDED BY: GLB / CHECKED BY	DATE: 1/30/85

DESCRIPTION	QUAN.	@			EXTENSION
The sensitivity analysis costs for the alternate water system are included in the sensitivity analysis costs for Alternative #2.					
TOTALS					

AR300620

PRICING SHEET

NAME: Helena Landfill RI/FS
ARCH. OR CONTRACTOR:
ESTIMATE NO.:
LOCATION:
TYPE OF WORK: Landfill Cap - Sensitivity Analysis
ESTIMATED BY:
PRICED BY:
EXTENDED BY: GLZ
CHECKED BY:
DATE: 1/23/85

ORIGINAL (Red)

DESCRIPTION	QUAN.	@	M	E&L	Total	EXTENSION
±10% for clay shrink/swell						
			+10%			
1. Grading - Same as Base Cost				71,251	71,251	
2. Compact Cover Mtl.				48,614	48,614	
Same as Base Cost						
			(7.80/cy)	(4.62/cy)		
3. a. Clay - 2 ft thick	81,641 cy	12.42/cy	636,800	377,181	1,013,981	
23 acres 74,219 cy x 1.1						
b. Place & spread clay	81,641 cy	3.25/cy		265,333	265,333	
c. Compact clay	81,641 cy	2.62/cy		213,899	213,899	
Subtotal (1, 2, 3)			636,800	976,278	1,613,078	
Health & Safety Monitoring (8% of subtotal)					129,046	
"Level D" Construction Condition 15% Equip & Labor					146,442	
					1,888,566	
Contingency 20% Total Cost					377,713	
Engineering 10% Total Cost					188,857	
Total Clay Cap (1,2,3)					$2,455,136	
Total (4,5,6) - Base Costs					2,577,410	
TOTAL					5,032,546	≈5,033,000
		TOTALS				

AR300621

PRICING SHEET

NAME: Helena Landfill RI/FS
ARCH. OR CONTRACTOR:
ESTIMATE NO.:
LOCATION:
TYPE OF WORK: Landfill cap - Sensitivity Analysis
ORIGINAL (Red)
ESTIMATED BY:
PRICED BY:
EXTENDED BY: GLZ
CHECKED BY:
DATE: 1/23/85

DESCRIPTION	QUAN.	@	M	E&L	Total	EXTENSION
			-10%			
1. Grading same as Base Costs				71,251	71,251	
2 Compact Cover Mtl. same as Base Costs				48,614	48,614	
			(7.80 cy)	(4.62 cy)		
3. a Clay 74,219 cy x 0.90	66,797 cy	12.42/cy	521,017	308,602	829,619	
b. Place & Spread Clay	66,797 cy	3.25/cy		217,090	217,090	
c. Compact Clay	66,797 cy	2.62/cy		175,008	175,008	
Subtotal (1,2,3)			521,017	820,065	1,341,582	
Health & Safety Monitoring 8% of Total					107,327	
Level D Const. Cont 15% of E&L					123,010	
					1,571,919	
Contingency 20% Total Cost					314,384	
Engineering 10% Total Cost					157,192	
Total (1,2,3)					$ 2,043,495	
Total (4,5,6) - Base Costs					2,577,410	
					4,620,905 ≈ 4,621,000	
TOTALS						

AR300622

PRICING SHEET

ORIGINAL (Red) PAGE 1 OF 1 PAGES

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
Helena Landfill		

LOCATION	TYPE OF WORK
	Monitoring with Alt. Water Sup. & Cap - Sensitivity Analysis

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE
		GLZ		12/12/85

DESCRIPTION	QUAN.	@			EXTENSION
± 10% number of lab samples					
			± 10%		
labor, etc. same as base costs					$5,364/trip
Lab Samples 36 samples + 10%	40 samples	@	$175/sample		$7,000/trip
					12,364/trip
Contingency 20%					2,473
					$14,837/trip
					$59,348/yr
					≈ $59,000/yr
30 year present worth					$556,187
					≈ $556,000
			− 10%		
labor					$5,364/trip
lab 36 − 10%	32 samples	@	$175/sample =		$5,600
					$10,964/trip
Contingency 20%					$2,193/trip
					$13,157
					x4
30 year Present Worth					$53,628 ≈ $53,000
				499,626	≈ $500,000
	TOTALS				

AR300623

ORIGINAL
(Red)

ALTERNATIVE #4 COSTS

ALTERNATE WATER SUPPLY

LANDFILL CAP

SOURCE REDUCTION

MONITORING

PRICING SHEET

PAGE NO. 1 OF 1 PAGES

NAME: Helena Landfill

PROP OR CONTRACTOR:

ESTIMATE NO.: ORIGINAL (Red)

LOCATION:

TYPE OF WORK: Alt Water Supply

ESTIMATED BY: PRICED BY: EXTENDED BY: CHECKED BY: GLZ DATE: 1/30/85

DESCRIPTION	QUAN.	$				EXTENSION
The costs for the alternate water system are included with the costs for Alternative # 2.						
		TOTALS				

AR300625

PRICING SHEET

PAGE NO. 1 OF [illegible] PAGES

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
Helena Landfill		ORIGINAL (Red)
LOCATION	TYPE OF WORK: Landfill Cap	

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE
		GLZ		1/30/85

DESCRIPTION	QUAN.	@			EXTENSI
The Costs for the Landfill Cap and Venting system, additional monitoring wells, and fencing are included in the costs for alternative #3.					
TOTALS					

AR300626

PRODUCT 235 — NEBS Inc., Groton, Mass. 01450

PRICING SHEET

NAME: Helena Landfill RI/FS	ARCH. OR CONTRACTOR		ESTIMATE NO. ORIGINAL (Red)
LOCATION: PA	TYPE OF WORK: Source Reduction		
ESTIMATED BY: RTP / PRICED BY: RTP	EXTENDED BY: GLZ	CHECKED BY	DATE: 1/23/85

DESCRIPTION	QUAN.	@	Material	Labor & Equipment	EXTENSION
12" wells drilled in a 200' grid spacing - each well 80' in unconsolidated Mtl, 20' in bedrock for 100' overall length, each well 4" PVC with 5' of Screen, each well will pump 5 gpm (Ejector system Inc.)					
Drilling Costs	100'	$16.88/ft		$1,688/hole X 12 holes	20,256
Pipe Costs	98'	$2.40/ft	$235.20/hole X 12 holes		2,822
Screen Costs	5'	$7.42/ft	$37/hole X 12 holes		444
Protective Casing	1	$150.00/casing	$150/hole X 12 holes		1,800
Misc. Supplies (Sand gravel)	LS		$400		400
Well Installation	2 hrs/well @ $187/hr			$374/well X 12 wells	4,488
Supervison by Geologist	80 hrs	50.00/hr		$4,000	4,000
T&L	10 day	75.00/day	$750		750
Pump Costs	12	5,600/well	67,200		67,200
Subtotal			73,416	28,744	102,160
Health & Safety Monitoring 10% of Total	(0.10 X 102,160)			10,216	10,216
			73,416	38,960	112,376
		TOTALS			

AR300621

PRICING SHEET

NAME: Helena Landfill RI/FS	ARCH. OR CONTRACTOR		ESTIMATE NO. ORIGINAL (Red)
LOCATION: PA	TYPE OF WORK: Source Reduction		
ESTIMATED BY: RTP / PRICED BY: RTP	EXTENDED BY: GLZ	CHECKED BY	DATE: 1/23/85

DESCRIPTION	QUAN.	@	Material	Labor & Equip.	EXTENSION
Subtotal from page 1			73,416	38,960	112,376
Level B Construction Cost, 1.5 x Total Labor	(1.5 x 38,960)			58,440	58,440
					170,816
Contingency 20% of Total (0.20 x 170,816)					34,163
Overhead & Profit 20% of Total (0.20 x 170,816)					34,163
Engineering 10% of Total (0.10 x 170,816)					17,082
					$256,224
O&M Costs Labor 1-8hr day/month/well at $50/hr					57,600/y.
Power Costs $50/month					$600/y.
					$58,200
Contingency 20% of total (0.20 x 58,200)					$11,640
					$69,840/yr
O&M costs for 2 years					$140,000
TOTAL Capital & 2 year O&M					$396,000
TOTALS					

AR300628

PRICING SHEET

PAGE NO. 1 OF 1 PAGES

ORIGINAL (Red)

NAME	Helena Landfill
ARCH. OR CONTRACTOR	
ESTIMATE NO.	
LOCATION	
TYPE OF WORK	Source Reduction TREATMENT - SUMMARY COSTS
ESTIMATED BY	
PRICED BY	
EXTENDED BY	GLZ
CHECKED BY	
DATE	1/24/85

DESCRIPTION	QUAN.	@			EXTENSION
CAPITAL COSTS					
1. Leachate Treatment Costs	(AMF)		$749,300		
2. 2" Water Line	(JEL)		$22,000		
3. Discharge Line 4"	(JEL)		$100,000		
			871,300	x	$871,000
4. 2 yr O&M					$508,000
TOTAL					$1,379,000
		TOTALS			

AR300629

(Red)

PEC DIV - NJ

LEACHATE TREATMENT SYSTEM (20 GPM)

ALLENTOWN, PA.

LINE

1/16/85

DESCRIPTION	QUAN.	@	M	E	L	EXTENSION
SUMMARY						
I) EQUIPMENT			149300		66800	
II) PIPING			16975		7550	
III) FOUNDATION			20600	1075	28125	
IV) ELECTRICAL			30050		25550	
			216925	1075	128025	346025
BURDEN - 13%					16675	16675
LABOR - 15%					19200	19200
MATERIAL - 5%			10900			10900
TOTAL DIRECT COST			227825	1075	163900	392800
INDIRECTS - 75%					122900	122900
PROFIT - 10%						39300
TOTAL FIELD COST						555000
CONTINGENCY - 20%						111000
ENGINEERING - 15%						83300
TOTAL PROJECT COST						749300

AR300630

ALLENTOWN, PA. — PEC D V- NUS — #760.21

LEACHATE TREATMENT SYSTEM (20 GPM)

AMF — EXTENDED BY — CHECKED BY — DATE 1/16/85 — ORIGINAL (Red)

DESCRIPTION	QUAN	M	E	L	EXTENSION
EQUIPMENT					
1) NEUTRALIZATION TANK-600GAL	1	1500		300	
2) NEUT TANK MIXER-1HP	1	1500		300	
3) LIME FEED SYSTEM INCL STORAGE BIN (2WKS-BAG LIME) VIBRATOR, SCREW FEEDER. 1/2HP-1/2HP	1	14000		2000	
4) CLARIFIER - 8' Φ - 1/2HP	1	23000		8000	
5) NEUTRALIZATION TANK-600GAL	1	1500		300	
6) NEUT. TANK MIXER - 1HP	1	1500		300	
7) ACID FEED PUMPS 1/4HP	2	6000		400	
8) PACKAGED ACTIVATED SLUDGE PLANT 1HP-1HP	1	40000		51000	
9) STRIPPER FEED PUMPS 20GPM @ 60' TDH - 1HP	2	3600		400	
10) STRIPPING TOWER - 1' Φ x 29' PACKING HEIGHT INCL. PACKING	1	32000		1500	
11) AIR BLOWER - .5HP	2	400		400	
12) DUCT HEATER - 15CFM	1	300		100	
13) CARBON FILTER - 4' Φ	1	23000		1800	
TOTALS		149300		66800	

EPC - HELENA PRC DIV - NJS ORIGINAL

ALLENTOWN, PA LEACHATE TREATMENT SYSTEM (20 GPM Red)

AMF AMF 10/85

DESCRIPTION	QUAN.	M	E	L	EXTENSION
PIPING					
1) NEUT. TANK SUPPLY PIPING 1 1/2"	100'	1000		500	
2) INTERCONN. PIPING 2"	100'	1300		700	
3) ACID FEED PIPING 1/4"	50'	175		100	
4) STRIPPER & CARBON 1 1/2" FILTER SUPPLY PIPING	100'	1000		500	
5) EFFLUENT PIPING 2"	200'	2600		1400	
6) SYSTEM VALVES 1/4"	4	300		100	
1 1/2"	4	1600		200	
7) PH CONTROL SYSTEM INCL. ELEM. TRANS. CONTROL	2	8000		1200	
8) GAUGES	2	300		50	
9) DUCTWORK	1 LOT	700		2000	
		16975		7550	

PRICING SHEET

PAGE NO. 4 OF 4 PAGES

PEC DIV - NUS

LEACHATE TREATMENT SYSTEM (20 GPM

ALLENTOWN, PA.

AMF

EXTENDED BY: AMF

CHECKED BY:

DATE: 1/16/80

ORIGINAL (Rev.)

DESCRIPTION	QUAN	@	M	E	L	EXTENSION
FOUNDATION						
1) TREATMENT BUILDING 20x40'	800 FT²		12000		12000	
2) TRMT BUILDING FDN	35 YD³		7000	875	13125	
3) STRIPPER SUMP	6 YD³		1200	150	2250	
4) STRIPPER FDN	2 YD³		400	50	750	
			20600	1075	28125	
ELECTRICAL						
1) MOTOR STARTERS	13		10400		2600	
2) DISCONNECT SWITCH	4		3200		3200	
3) 25 KVA TRANSFORMER	1		1000		400	
4) CONDUIT, CABLE, CONTROL	13		5200		9100	
5) GROUNDING	13		3250		3250	
6) MISC WIRING	1 LOT		7000		7000	
			30050		25550	
TOTALS						

AR300633

PRICING SHEET

PAGE NO. ____ OF ____ PAGES

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
HELEVA LANDFILL	NUS CORP.	S 706.21
LOCATION: NORTH WHITEHALL TOWNSHIP	TYPE OF WORK: 2" PIPELINE 1200LF	ORIGINAL (Red)

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE

DESCRIPTION	QUAN.	@	M	E	L	EXTENSION
DESCRIPTION: PIPELINE, 2" DIA, WITH VALVE & TAP TO EXISTING WATER LINE						
1.) EXCAVATION FOR PIPE TRENCH	1200LF			@ 1.38	@ 2.13	
				1660	2560	4220
2.) BEDDING FOR PIPE	1200LF		@ 0.86		@ 0.97	
			1030		1170	2200
3.) FURNISH & PLACE 2" DIA WATER SERVICE PIPE CLASS 150	1200LF		@ 0.40		@ 1.96	
			480		2350	2830
4.) FURNISH & PLACE 2" GATE VALVE	1 EA		550		150	700
5.) TAP TO EXISTING MAIN	1 EA	LS				
			200		140	340
			1765	1660	7395	11,320
BURDEN @ 13% LABOR					960	960
LABOR MU 15%					1110	1110
MATERIAL MU 5%			90			90
TOTAL DIRECT			1855	1660	7100	7100
INDIRECTS (0.75 8,880)						
PROFIT - 10%						1300
						21,380
ENGINEERING 10%						2140
TOTAL PROJECT COST						4280
CONTINGENCY 20%						
						27,800
TOTALS						

AR300634

PRICING SHEET

PAGE NO. ____ OF ____ PAGES

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
HELEVA LANDFILL	NUS CORP.	5760.21

LOCATION	TYPE OF WORK
NORTH WHITEHALL TOWNSHIP, PA	DRAINAGE PIPE TO COPLAY CREEK

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE

ORIGINAL (Red)

DESCRIPTION	QUAN.	@	M	E	L	EXTENSION
DESCRIPTION: 4" DRAINAGE PIPE TO COPLAY CREEK (4,000LF)						
1.) EXCAVATION & BACKFILL FOR PIPE TRENCH	4000LF			@1.38	@2.13	
				5520	8520	14,040
2.) BEDDING FOR PIPE	4000LF			@0.86	@0.97	
				3440	3880	7320
3.) FURNISH & PLACE 4" DIA. PIPE - SEWAGE PIPE	4000LF		@1.75		@2.25	@4.00
			7000		9000	16,000
4.) MANHOLE	4 EA.		500		350	
			2000		1400	3400
SUB-TOTAL			12,440	5520	22,800	40,760
BURDEN 13% LABOR					2970	3400
LABOR MU 15%					3420	3420
MATERIAL MU 5%			620			620
TOTAL DIRECT COST			13,060	5520	29,190	47,770
INDIRECT COST 75%						21,900
PROFIT 10%						4800
TOTAL COST						74,470
ENGINEERING 10%						7450
CONTINGENCY 20%						14,900
						96,820
		TOTALS				

BR300635

PRICING SHEET

PAGE NO. 1 OF 1 PAGES

NAME: Helena Landfill Site	ARCH. OR CONTRACTOR: NUS Corp PEC	ESTIMATE NO. $760.21
LOCATION: North Whitehall Twp PA	TYPE OF WORK: O&M Costs Water treatment	
ESTIMATED BY: DFM / PRICED BY: DFM	EXTENDED BY:	CHECKED BY: / DATE: Jan 23, 1985

DESCRIPTION	QUAN.	@	EXTENSION
Utilities			
Electrical			
7.18 kilowatt hrs ($/kwh)	58589	0.07	4100
Water ($/1000 gal)	391 x 10³	0.87	340
Chemical Costs			
Lime ($/ton)	17 ton	35—	600
Acid H_2SO_4 ($/ton)	12 ton	80—	960
Carbon ($/lb)	14696	0.90	1320
Labor			
5 operators ($/year)		50000—	225000
Maintenance 2½% Cap Cost	871,300		21780
Total O&M Costs			$254100— /yr
Two year O&M costs			$508,000
Total Capital & 2 Year O&M			$1,379,000
		TOTALS	

AR300636

PRICING SHEET

PAGE NO. 1 OF 1 PAGES

NAME: Helena Landfill	ARCH. OR CONTRACTOR	ESTIMATE NO. ORIGINAL (Red)
LOCATION	TYPE OF WORK: Monitoring	
ESTIMATED BY	PRICED BY	EXTENDED BY: GLB
CHECKED BY	DATE: 1/30/85	

DESCRIPTION	QUAN.	@			EXTENSION
The costs for monitoring are included in the costs for Alternative #3					
TOTALS					

AR300637

ORIGINAL
(Red)

ALTERNATIVE #4 SENSITIVITY ANALYSIS COSTS

ALTERNATE WATER SUPPLY

LANDFILL CAP

SOURCE REDUCTION

MONITORING

PRICING SHEET

(Red)

PAGE NO. 1 OF 1 PAGES

NAME: Helena Landfill

APCH OR CONTRACTOR:

ESTIMATE NO:

LOCATION:

TYPE OF WORK: A16. Water Supply - Sensitivity Analysis

ESTIMATED BY:

PRICED BY:

EXTENDED BY: GLB

CHECKED BY:

DATE: 1/30/85

DESCRIPTION	QUAN.	@				EXTENSION
The sensitivity analysis costs for the alternate water system are included in the sensitivity analysis costs for Alternative #2.						

AR300639

PRICING SHEET

PAGE NO. ORIGINAL OF ____ PAGES

NAME: Helena Landfill

ARCH. OR CONTRACTOR

ESTIMATE NO. (Red)

LOCATION

TYPE OF WORK: Landfill Cap - Sensitivity Analysis

ESTIMATED BY | PRICED BY | EXTENDED BY | CHECKED BY | DATE

DESCRIPTION	QUAN.	@			EXTENSION
The sensitivity analysis costs for the landfill cap are included in the sensitivity analysis cost for Alternative #3.					
TOTALS					

AR300640

PRICING SHEET

PAGE NO. 1 OF 1 PAGES

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
Helena Landfill RI/FS		ORIGINAL

LOCATION	TYPE OF WORK
	Source Reduction - Sensitivity Analysis (Red)

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE
		GLZ		2/14/85

DESCRIPTION	QUAN.	@				EXTENSION
1. Source Reduction	Base		High	Low		
a. Capital	$256,000		$319,000	$194,000		
b O&M (2 yrs considered as capital	$140,000		$140,000	$140,000		
TOTAL	$396,000		$459,000	$334,000		
2. Wastewater Treatment						
a. Capital	$871,000		$1,246,000	$497,000		
b. O&M (2yrs as Capital)	$508,000		$762,000	$259,000		
TOTAL	$1,379,000		2,008,000	$751,000		
TOTALS						

AR300641

PRICING SHEET

ORIGINAL (Red) PAGE NO. 3 OF 3 PAGES

NAME: Helena Landfill RI/FS	ARCH. OR CONTRACTOR		ESTIMATE NO.
LOCATION: PA	TYPE OF WORK: Source Reduction - Sensitivity Analysis		
ESTIMATED BY	PRICED BY	EXTENDED BY: GLZ	CHECKED BY	DATE: 1/23/85

DESCRIPTION	QUAN.	@	Material	Labor & Eq.	EXTENSION
± 50 % on length of well					
	±	50 %			
Drilling costs	150'	16.88/ft		2,532/hole x 12 holes	30,384
Pipe Costs	148'	2.40/ft	355.20/hole x 12 holes		4,262
Screen Costs	5'	7.40/ft	37.00/hole x 12 holes		444
Protective Casing	1	150.00/casing	150.00/hole x 12 holes		1,800
Misc. Supplies (sand & gravel, etc.)	LS		$400		400
Well Installation	3 hrs/well $187/hr			$561/well x 12 wells	6,732
Supervision by	120 hrs	$50.00/hr		$6,000	6,000
Geologist	15 days	75.00/day			
T&L			$1,125		1,125
Pump Costs	12	5,600/well	67,200		67,200
Subtotal			$75,231	43,116	118,347
Health & Safety Monitoring 10% of Total	(0.10 x 118,347)			11,835	11,835
			75,231	54,951	130,18[illegible]
Level B Const. Cond. (1.5 x Total Labor)	(1.5 x 54,951)				82,427
		TOTALS			212,609

AR300642

PRICING SHEET

PAGE NO. 2 OF 5 PAGES ORIGINAL (Red)

NAME: Helena Landfill RI/FS		ARCH. OR CONTRACTOR	ESTIMATE NO.
LOCATION: PA		TYPE OF WORK: Source Reduction - Sensitivity Analysis	
ESTIMATED BY	PRICED BY	EXTENDED BY: GLZ	CHECKED BY / DATE: 1/23/85

DESCRIPTION	QUAN.	@	Material	Labor & Equip	EXTENSION
subtotal from page 1					212,609
Contingency 20% of Total	(0.20 x 212,609)				42,522
O&P 20% of Total	(0.20 x 212,609)				42,522
Engineering 10% of Total	(0.10 x 212,609)				21,261
					318,914
	- 50%				
Drilling Costs	50'	16.88/ft		844/hole x 12 holes	10,128
Pipe Costs	48'	$2.40/ft	115.20/hole x 12 holes		1,382
Screen Costs	5'	7.40/ft	37.00/hole x 12 holes		444
Protective Casing	1	150.00/casing	150.00/hole x 12 holes		1,800
Misc. Supplies (sand & gravel)	LS		$400		400
Well Installation	1 hr/well $187/hr			$187/well x 12 well	2,244
Supervision by Geologist	40 hrs	$50/hr		2,000	2,000
T&L	5 days	$75/day	375		375
Pump Costs	12	$5,600/well	$67,200		$67,200
Subtotal			71,601	14,372	$85,973
TOTALS					

PRICING SHEET

NAME: Helena Landfill RI/FS
ARCH. OR CONTRACTOR:
ESTIMATE NO.:
LOCATION: PA
TYPE OF WORK: Source Reduction - Sensitivity Analysis
ORIGINAL (Red)
ESTIMATED BY:
PRICED BY:
EXTENDED BY: GHZ
CHECKED BY:
DATE: 1/23/85

DESCRIPTION	QUAN.	@	M&I	L&E		EXTENSION
Subtotal from pg 02			71,601	14,372		85,973
Health & Safety Monitoring 10% of Total	(0.10 x 85,973)			8,597		8,597
			71,601	22,969		94,570
Level B Const. Cond. 1.5 x Total Labor	(1.5 x 22,969)					34,454
						129,024
Contingency 20% of Total		(0.20 x 129,024)				25,805
O & P 20% of Total		(0.20 x 129,024)				25,805
Eng. 10% of Total		(0.10 x 129,024)				12,9[illegible]
						$193,536
TOTALS						

AR300644

PRICING SHEET

NAME: Helena Landfill RI/FS	ARCH. OR CONTRACTOR		ESTIMATE NO. ORIGINAL
LOCATION	TYPE OF WORK: Source Reduction TREATMENT		Sensitivity Anal (Red)
ESTIMATED BY	PRICED BY	EXTENDED BY: GLZ	CHECKED BY	DATE: 1/24/85

DESCRIPTION	QUAN.	@				EXTENSION
Capital Costs ± 50%						
			+50%			
Leachate Treatment	$749,300	X 1.5 =		$1,123,950		
2" Water Line (JEL)				22,000		
4" Discharge Line (JEL)				100,000		
			$1,245,950	≈	$1,246,000	
			-50%			
1. Leachate Tr.	749,300	X .5 =		$374,650		
2. 2" Water Line (JEL)				22,000		
3. 4" Discharge Line (JEL)				100,000		
				496,650	≈	$497,000
TOTALS						

AR300645

PRICING SHEET

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
Helena Landfill RI/FS		ORIGINAL (Red)
LOCATION	TYPE OF WORK	
	Source Reduction TREATMENT - Sensitivity Analysis	

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE
		GLZ		1/24/85

DESCRIPTION	QUAN.	@				EXTENSION
O&M Costs ±50%						
+50%						
1. Leachate Treatment	$254,000/yr	x 1.5	=	$381,000/yr		
2 yrs as Capital		$762,000				
-50%						
1. Leachate Treatment	$254,000/yr	x .5	=	$127,000/yr		
2 yrs as Capital		$254,000				
TOTALS						

AR300646

PRICING SHEET

PAGE NO. 1 OF 1 PAGES

NAME: Helena Landfill	ARCH. OR CONTRACTOR	ESTIMATE NO. ORIGINAL (Red)
LOCATION	TYPE OF WORK: Monitoring - Sensitivity Analysis	

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE
		GLT		1/30/85

DESCRIPTION	QUAN.	@			EXTENSION
The sensitivity analysis costs for monitoring are included in the sensitivity analysis costs for Alternative #3.					
TOTALS					

AR300647

ORIGINAL
(Red)

ALTERNATIVE #5 COSTS

ALTERNATE WATER SUPPLY

EXCAVATION OF EXISTING LANDFILL

DISPOSAL IN AN ONSITE RCRA - APPROVED LANDFILL

MONITORING

PRICING SHEET

PAGE 1 OF ORIGINALS (Red)

NAME: Helena Landfill

APPROVED CONTRACTOR

DESCRIPTION

TYPE OF WORK: Alt water supply

ESTIMATED BY | PRICED BY | EXTENDED BY | CHECKED BY: B.E. | DATE: 1/30/85

DESCRIPTION	QUAN					EXTENSION
The costs for the alternate water system are included with the costs for Alternative # 2.						
TOTALS						

AR300649

PRICING SHEET

PAGE NO. 1 OF 1 PAGES

NAME: HELEVA LANDFILL RI/FS
ARCH. OR CONTRACTOR:
ESTIMATE NO.:
LOCATION:
TYPE OF WORK: EXCAVATION TOTAL COSTS
ESTIMATED BY: PRICED BY: EXTENDED BY: CHECKED BY: DATE:

ORIGINAL (Red)

DESCRIPTION	QUAN.	@	LABOR	EQUIP.		EXTENSION
		0.23/cy	0.36/cy	0.88/cy		
1.) DRY FILL	650,000cy		234,000	572,000		806,000
2.) HEALTH & SAFETY MONITORING 8% OF TOTAL			64,500			64,500
			298,500			870,500
LEVEL B WORKING CONDITIONS 1.5 x LABOR & EQUIPMENT TOTAL	806,000 x 1.5			=		1,209,000
						2,015,000
CONTINGENCY 20% OF TOTAL						403,000
ENGINEERING 8% OF TOTAL						161,200
						2,579,200
3.) WET FILL (SEE AMF'S COST SHEETS)						2,798,000
TOTAL EXCAVATION						5,377,200
					TOTALS	

AR300650

PRODUCT 235 [illegible] Inc. Boston, Mass. 01450

PRICING SHEET

NAME: EPA - HELEVA
ARCH OR CONTRACTOR: PEC DIV - NUS
ESTIMATE NO: #760.23
LOCATION: ALLENTOWN, PA.
TYPE OF WORK: REFUSE REMOVAL & DEWATERING
ESTIMATED BY: AMF PRICED BY: AMF EXTENDED BY: CHECKED BY: DATE: 1/24/85

ORIGINAL (Red)

DESCRIPTION	QUAN.	M	L	E	EXTENSION
1) POND No. 1 EXCAVATION	40000 YD³		23200	39600	
1½ YD³ CAP. DRAGLINE					
2 POND No. 2 EXCAVATION	60000 YD³		34900	59300	
1½ YD³ CAP. DRAGLINE					
3) COMPACTION AREAS					
(4) 40' x 80'					
24" CRUSHED STONE	1000 YD³	10000	800	2000	
30 MIL PVC LINER	18000 FT²	5400	4500		
12" SAND BASE	500 YD³	3500	400	1000	
PVC DRAIN PIPE - 4"	1200'	800	1600		
6'φ x 6' PP SUMP	4	3600	400	200	
CONTAINMENT WALL	5200 FT²	4200	10600	1900	
		$27,500	$18,300	5,100	
			.54	.54	
4) COMPACTION AREA LOADING	40000 YD³		11600	21600	
POND No. 1 - FRONT END LOADER - 2½ YD³					
5) COMPACTION AREA LOADING	60000 YD³		17300	32400	
POND No. 2 - FRONT END LOADER - 2½ YD³					
6) COMPACTION - EXC. REFUSE	40000 YD³		19200	24400	
POND No. 1 CAT 826C LANDFILL COMPACTOR					
7) COMPACTION - EXC REFUSE	60000 YD³		28900	36700	
POND No. 2 CAT 826C LANDFILL COMPACTOR					
8) REMOVAL COMPACTED REFUSE	40000 YD³		11600	21600	
POND No. 1 - FRONT END LOADER - 2½ YD³					
9) REMOVAL COMPACTED REFUSE	60000 YD³		17300	32400	
POND No. 2 - FRONT END LOADER					
TOTALS					

AR300651

PRICING SHEET

NAME: EPA-HELEVA
ARCH OR CONTRACTOR: PEC DIV-NUS
ESTIMATE NO: $760 ORIGINAL (Red)
LOCATION: ALLENTOWN, PA.
TYPE OF WORK: REFUSE REMOVAL & DEWATERING
ESTIMATED BY: AMF PRICED BY: AMF EXTENDED BY: CHECKED BY: DATE: 1/24/85

DESCRIPTION	QUAN.	@	M	L	E	EXTENSION
10) ROAD INSTALLATION	2000 LF		30000	30000		
24' WIDE - GRAVEL BASE						
			57500	212300	273100	542900
BURDEN - 13%				27600		27600
LABOR - 15%				31800		31800
MATERIAL - 5%			2900			2900
TOTAL DIRECT COST			60400	271700	273100	605200
INDIRECTS - 75%				203800		203800
PROFIT - 10%						60500
TOTAL FIELD COST				475500	273100	869500
LEVEL "B" WORKING CONDITIONS	(475,500+273,100) × 1.5					1122900
HEALTH & SAFETY MONITORING	(869500+1,122,900) × .08					159400
						2151800
CONTINGENCY - 20%						430400
ENGINEERING - 10%						215800
						2798000
TOTALS			AR300652			

PRICING SHEET

PAGE NO. 1 OF 3 PAGES

NAME		ARCH. OR CONTRACTOR	ESTIMATE NO.
LOCATION Helena		TYPE OF WORK Treat Water from Dewatered Mtl.	ORIGINAL (Red)
ESTIMATED BY	PRICED BY	EXTENDED BY GLZ	CHECKED BY	DATE 2/15/85

DESCRIPTION	QUAN.	@				EXTENSION
Treat ~~Dewater~~ Water from Dewatered Mtl.						
1. Cost of Tr. System (Costs are in Alt. #4)				$871,000		
2. Cost of Dewatering System				$172,000		
3. 1 year cost of O&M (Costs in Alt. #4; considered capital)				254,000		
TOTAL				$1,297,000		
			TOTALS			

AR300653

PRICING SHEET

ORIGINAL (Red) 3

PAGE NO. 2 PAGES

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
EPA Heleva	NUS	$760.2
LOCATION: Allentown PA	TYPE OF WORK: Runoff + dewatering treatment	
ESTIMATED BY: SFP / PRICED BY:	EXTENDED BY: / CHECKED BY:	DATE: 1/25/85

DESCRIPTION	QUAN.	@	M	L	E	EXTENSION
I a Equalization pond. excavation	225 yd³			685	840	
b Leachate Coll. + Detect. Sys						
1.a Sand (1' thick)	33 yd³		215			
b place + spread				27	65	
c compact				20	25	
2. a Clay (2')	60 yd³		515			
b place + spread				54	129	
c. compact				63	80	
3. Synthetic liner	100 yd²		270	180		
4. underdrain						
a. 4" perf. pipe	1,88 ft		117	238		
b manhole						
5. sewers (from pads)						
a Estimate 3500 ft 6" C.I. Pipe	3000		24750	25400		
b Trenching - 4 ft x 3000 ft	1800 yd³			3420	1818	
c Gravel backfill	1800 yd³		1350	1458	3510	
TOTALS			39367	31545	6467	

AR300054

AR300054

PRICING SHEET

PAGE NO. 3 OF 7 PAGES ORIGINAL (Red)

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
EPA - HELENA	NUS	$760.21
LOCATION: ALLENTOWN PA	TYPE OF WORK: RUNOFF & DEWATERING TREATMENT	

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE
SFP				1/25/85

DESCRIPTION	QUAN.	@	M	L	E	EXTENSION
TOTAL			39367	31545	6467	77379
BURDEN - 13%				4100		4100
LABOR - 15%				4731		4731
MATERIAL - 5%			1969			1969
TOTAL DIRECT COST			41336	40376	6467	88179
INDIRECTS - 75%				30282		30282
PROFIT - 10%						8839
TOTAL FIELD COST						127300
CONTINGENCY - 20%						25500
ENGINEERING - 15%						19100
						171900
TOTALS						

AR300655

PRICING SHEET

PAGE NO. ____ OF ____ PAGES

NAME: HELENA LANDFILL
ARCH. OR CONTRACTOR:
ESTIMATE NO.:
LOCATION:
TYPE OF WORK: HAULING FILL FROM EXCAVATION
ESTIMATED BY: | PRICED BY: | EXTENDED BY: | CHECKED BY: | DATE:

ORIGINAL (Red)

DESCRIPTION	QUAN.	@				EXTENSION
DRY FILL						
1.) TRANSPORTATION COST	650,000 CY	+ 15% FOR SWELLING			= 748,000 CY	
FROM DRY FILL TO						
ONSITE RCRA LANDFILL	748,000 CY		/20 CY/MILE	1/2 MILE/TRIP		
			0.46	1.06		
	748,000 CY		344,000	792,900	1,136,900	
2) HEALTH & SAFETY MONITORING					45,500	
4% OF TRANS. COST						
					1,182,400	
20% CONTINGENCY					236,500	
ENGINEERING 4%					47,300	
					1,466,200	
WET FILL	100,000 CY	+ 15% SWELL			115,000 CY	
TRANSPORTATION COSTS FROM						
WET FILL TO DEWATERING	115,000 CY		4.00/20 CY/MILE	1/2 MILE		
			0.46	1.06		174,800
			52,900	121,900		
4.) TRANSPORTATION COSTS FROM	115,000 CY		4.00/20 CY/MILE	1/2 MILE		
DEWATERING TO ONSITE RCRA LANDFILL			0.46	1.06		
			52,900	121,900		174,800
SUBTOTAL TRANS. COST						349,600
		TOTALS				

AR300656

PRICING SHEET

PAGE NO. ____ OF ____ PAGES

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
HELENA LANDFILL		

LOCATION	TYPE OF WORK
	HAULING MATERIAL FROM EXCAVATION

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE

ORIGINAL (Red)

DESCRIPTION	QUAN.	@			EXTENSION
3.) LOADING COST					
x6. IN EXCAVATION OF WET FILL					
4.) LEVEL B WORKING CONDITIONS					
1.5 x LOADING COST					
5.) HEALTH & SAFETY MONITORING					14,000
4% OF TRANS. COST					
					363,600
CONTINGENCY 20%					72,700
ENGINEERING 4%					14,000
TOTAL					436,300
TOTAL DRY FILL & WET FILL	(1,466,200 + 436,300)				1,902,500
	AR300657				
		TOTALS			

PRICING SHEET

PAGE NO. ____ OF ____ PAGES

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
HELENA LANDFILL	NUS CORP.	4760
LOCATION	TYPE OF WORK	
	GRADING & REVEGETATING	

ORIGINAL (Red)

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE

DESCRIPTION	QUAN.	@	M	E	L	EXTENSION
REGRADE EXCAVATED AREA						
15 YD³ SCRAPER (FT²)	871,000					
@ 1.5 FT (YD³)	48,390	1.91		75,490	16,940	92,430
FURNISH & PLACE TOPSOIL						
2' DEEP (YD³)	64,500	4.00		161,250	96,750	258,000
SEEDING W/ GRASS (#/1000 FT²)	871	35.00	21,430	4010	5050	30,490
TOTALS			21,430	240,750	118,740	380,920
BURDEN 13% LABOR					15,440	
LABOR 15%					17,810	
MATERIAL M.D 5%			1070			
TOTAL DIRECT COSTS			22,500	240,750	151,990	415,240
INDIRECT COST 75% DIRECT LABOR	CS				113,990	113,990
			SUBTOTAL			529,230
PROFIT 10% TOTAL						41,520
TOTAL						570,750
CONTINGENCY 20%						114,150
ENGINEERING 5%						28,600
PROJECT COST						713,500
		TOTALS				

AR300658

PRICING SHEET

NAME: Helena Landfill RI/FS
ARCH. OR CONTRACTOR:
ESTIMATE NO.:
LOCATION: PA
TYPE OF WORK: RCRA Landfill - onsite
ESTIMATED BY:
PRICED BY:
EXTENDED BY: GLZ
CHECKED BY:
DATE: 1/24/85

ORIGINAL (Red)

DESCRIPTION	QUAN.	@	M	E&L	Total	EXTENSION
Bottom Liner						
1. Excavation for Site Preparation 18 Acres - 10' Deep	290,000 cy	2.60/cy		754,000	754,000	
2. Clay - Place Spread & Compact 18 Acres - 2' thick	58,080 cy	18.29/cy	(7.80/cy) 453,024	(10.49/cy) 609,259	1,062,283	
3. Coarse Mtl. Place Spread & Compact 18 Acres - 1' - 2 layers	58,080 cy	15.63/cy	(5.40/cy) 313,632	(10.23/cy) 594,158	907,790	
4. 50 mil synthetic liner 18 acres	784,080 ft²	0.70/ft²	(0.50/ft²) 392,040	(0.20/ft²) 156,816	548,856	
5. PVC pipe in Coarse Mtl. 4" Collection & Detection System	12,000 Linear ft	2.10/ft	(0.75/ft) 9,000	(1.35/ft) 16,200	25,200	
6. geotextile - 18 acres	87,120 yd²		(1.00/yd²) 87,120	(.20/yd²) 17,424	104,544	
7. Common Borrow Place, Spread & Compact 18 Acres, 1 foot	29,040 cy	7.53/cy	(1.65/cy) 47,916	(5.88/cy) 170,755	218,671	
Subtotal Bottom Liner			1,302,732	2,318,612	3,621,344	
Top Liner						
8. Clay - Place Spread & Compact 18 acres 2' thick	58,080 cy	18.29/cy	(7.80/cy) 453,024	(10.49/cy) 609,259	1,062,283	
9. 30 mil synthetic liner 18 acres	784,080 ft²	0.50/ft²	(0.30/ft²) 235,224	(0.20/ft²) 156,816	392,040	
10. Coarse Mtl. Place Spread & Compact 18 acres, 1'	29,040 cy	15.63/cy	(5.40/cy) 156,816	(10.23/cy) 297,079	453,895	
TOTALS						

PRODUCT 235 NEBS Inc., Groton, Mass. 01450

PRICING SHEET

NAME: Helena Landfill RI/FS	ARCH. OR CONTRACTOR		ESTIMATE NO.
LOCATION: PA	TYPE OF WORK: RCRA Landfill - onsite		ORIGINAL (Red)
ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE

DESCRIPTION	QUAN.	@	M	E&L	Total	EXTENSION
Top Liner (cont.)						
11. Common Borrow - Place Spread 18 acres - 42" & Compact	101,640 cy	7.53/cy	(1.65/cy) 167,706	(5.88/cy) 597,643	765,349	
12 Topsoil Place Spread & Compact 18 acres 6"	14,520 cy	13.03/cy	(6.05/cy) 87,846	(6.98/cy) 101,350	189,196	
Subtotal Top Liner			1,100,616	1,762,147	2,862,763	
13. Revegetate	18 Acres	1500/Acre		27,000	27,000	
14. Erosion Control	3,600 ft	4.09/ft		14,700	14,700	
Subtotal Revegetate etc.				41,700	41,700	
TOTAL Bottom + Top + Revegs			2,403,348	4,122,459	6,525,807	
Contingency 20% Total					1,305,161	
Engineering 10% Total					652,581	
					8,483,549	≈ $8,484,000
TOTALS						

AR300660

PRICING SHEET

PAGE NO. 1 OF 1 PAGES

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
Helena Landfill		

LOCATION	TYPE OF WORK
PA	RCRA Landfill - onsite - fencing

ORIGINAL (Red)

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE
	AMF	GLB		2/14/85

DESCRIPTION	QUAN.	@		EXTENSION
1. 8' Ht Fence With Barb wire	3,540 ft	$13.95	$49,400	
2. Vehicle Gate	1	$500	$500	
3. Man Gate	2	$250	$500	
				$50,400
subcontract 10%				5,040
				$ 55,440
Profit 10%				5,544
				$ 60,984
Contingency 20%				$ 12,197
Engineering 15%				$ 9,148
				82,325 =
				$ 82,000
TOTALS				

AR300661

PRICING SHEET

PAGE NO. ____ OF ____ PAGES

NAME: HELENA LANDFILL	ARCH. OR CONTRACTOR: NUS CORP.	ESTIMATE NO.
LOCATION	TYPE OF WORK: ONSITE RCRA LANDFILL - SPREAD & COMPACT MAT'L.	

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE

DESCRIPTION	QUAN.	@	M	E&L	TOTAL	EXTENSION
1) PLACE, SPRED & COMPACT MAT'L.	863,000cy	@ 5.88/cy		5,074,440	5,074,440	
2.) DAILY COVER MAT'L - PLACE & SPREAD			1.65/cy	3.26/cy		
COMMON BORROW MAT'L	216,000cy	4.82/cy	356,400	704,160	1,060,560	
25% OF TOTAL VOL.						
COMPACT DAILEY COVER	216,000cy	2.62/cy		565,920	565,920	
			356,400	6,344,520	6,700,920	
HEALTH & SAFETY MONITORING						
8% OF TOTAL				536,074	536,074	
			356,400	6,880,594	7,236,994	
LEVEL B WORKING CONDITIONS						
1.5 X TOTAL LABOR					10,320,891	
					17,557,885	
CONTINGENCY 20% OF TOTAL					3,511,577	
ENGINEERING 10% OF TOTAL					1,755,789	
					22,825,250	

AR300562

TOTALS

PRICING SHEET

PAGE NO. 1 OF ___ PAGES

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
Helstda Landfill		

LOCATION	TYPE OF WORK	
	Monitoring - Exc. Onsite Disposal	ORIGINAL (Red)

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE
		GLZ		2/14/85

DESCRIPTION	QUAN.	@			EXTENSION
The costs for monitoring are included in the costs for alternative #3					
		TOTALS			

AR300663

ORIGINAL
(Red)

ALTERNATIVE #5 SENSITIVITY ANALYSIS COSTS

ALTERNATE WATER SUPPLY

EXCAVATION OF EXISTING LANDFILL

DISPOSAL IN AN ONSITE RCRA - APPROVED LANDFILL

MONITORING

PRICING SHEET

(Red)

PAGE NO 1 OF 1 PAGES

NAME Helena Landfill

ARCH OR CONTRACTOR

ESTIMATE NO

LOCATION

TYPE OF WORK Alt. Water Supply - Sensitivity Analyses

ESTIMATED BY | PRICED BY | EXTENDED BY GLB | CHECKED BY | DATE 1/30/85

DESCRIPTION	QUAN.	@				EXTENSION
The sensitivity analysis costs for the alternate water system are included in the sensitivity analysis costs for Alternative #2.						
TOTALS						

AR300665

PRICING SHEET

PAGE NO. 1 OF 4 PAGES

ORIGINAL (Red)

NAME: HELEVA LANDFILL RI/FS	ARCH. OR CONTRACTOR	ESTIMATE NO.	
LOCATION	TYPE OF WORK: EXCAVATION - SENSITIVITY ANALYSIS		
ESTIMATED BY	PRICED BY	EXTENDED BY: GLZ	CHECKED BY	DATE: 1-25-85

DESCRIPTION	QUAN.	@	LABOR	EQUIPMENT		EXTENSION
± 30%						
			+ 30 %			
1. DRY FILL	650000 CY	x 1.3	= 845,000 CY			
			(0.30/CY)	(0.88/CY)		
	845,000 CY	.93/CY	304200	743600		$1,047800
2. HEATH & SAFETY MONITORING						
8% OF TOTAL			83800			83,800
			388000	743600		1,131600
LEVEL B WORKING COND.						1,697,400
1.5 x TOTAL LABOR & EQUIP.						
						2,829,0
CONTINGENCY 20% OF TOTAL						565800
ENG. 8% OF TOTAL						226320
TOTAL DRY FILL						3,621,120
			MATERIAL	LABOR	EQUIPMENT	
WET FILL				(0.58/CY)		
A. POND #1	52,000 CY			30,160	51,480	81,640
B. POND #2	78,000 CY			45240	77220	122460
C. COMPACTION AREAS			27500	18300	5100	50900
(SEE AMF'S COST SHEETS FOR BASE COSTS)						
				(0.29/CY)	(.59/CY)	
D. COMPACTION AREA LOADING	130,000 CY			37,700	70200	107900
		TOTALS				

AR300666

PRICING SHEET

NAME: HELEVA LANDFILL
ARCH. OR CONTRACTOR:
ESTIMATE: ORIGINAL (Red)
LOCATION: PA
TYPE OF WORK: EXCAVATION - SENSITIVITY ANALYSIS
ESTIMATED BY:
PRICED BY:
EXTENDED BY: GLZ
CHECKED BY:
DATE: 1/25/85

DESCRIPTION	QUAN.	@	M	L	E	EXTENSION
				(0.48/cy)	(0.64/cy)	
4 COMPACTION OF EXC. REFUSE	130,000 CY			62,400	79,300	141,700
				(0.29/cy)	(0.54/cy)	
5 REMOVE COMPACTED MTL.	130,000			37,700	70,200	107,900
6 ROAD INSTALLATION	2,000 LF		30,000	30,000		60,000
			57,500	261,500	353,500	672,500
BURDEN 13% OF LABOR				33,995		33,995
LABOR 15% OF LABOR				39,225		39,225
5% OF MATERIAL			2,900			2,900
			60,400	334,720	353,500	748,620
INDIRECTS 75% LABOR				251,040		251,040
PROFIT 10% TOTAL						74,862
				585,760	353,500	1,074,522
LEVEL B WORKING COND. 1.5 × EQUIP. & LABOR						1,408,890
HEALTH & SAFETY MONITORING 8% OF SUBTOTAL						198,673
						2,682,085
CONTINGENCY 20%						536,417
ENG. 10%						268,209
TOTAL WET FILL						3,486,711
TOTAL						$ 7,108,000
TOTALS			7,107,836			

AR300667

PRICING SHEET

ORIGINAL (Red)

PAGE NO. ____ OF ____ PAGES

NAME	HELENA LANDFILL
ARCH. OR CONTRACTOR	
ESTIMATE NO.	
LOCATION	PA
TYPE OF WORK	Excavation Sensitivity Analysis
ESTIMATED BY	
PRICED BY	
EXTENDED BY	GLZ
CHECKED BY	
DATE	1/25/85

DESCRIPTION	QUAN.	@	M	L	E	EXTENSION
-30% Volume.						
				(36/cy)	(.88/cy)	
1. Dry Fill	455000 Cy			163,800.	400,400	$564200
2. Health & Safety Monitoring 8% TOTAL.				45136		45136.
				208936	400400	609,336
Level B Working Cond 1.5 X Total Labor & Equip						914004
						1,523340
Contingency 20% of TOTAL						304668
Engineering 8% of TOTAL						121867
TOTAL DRY FILL						1949875
Wet Fill				(0.54/cy)	(0.94/cy)	
1. Excavate.	70,000 cy			40,600	69300.	109900
2. Compaction Areas. (See AMF's costs for)			27500	18300	5100.	50900.
				(.29/cy)	(.54/cy)	
Compaction Area Loading	70,000 cy			20300	37800	58100
				(0.48/cy)	(0.61/cy)	
4. Compaction of Exec. Refuse	70,000 cy			33600	42700	76300
				(0.29/cy)	(0.54/cy)	
5. Remove Compacted Mtl.	70,000 cy			20300	37800	58100
6. Road Installation			30,000	30,000		60,000.
TOTALS			57500	963100	192700	413300

AR300668

PRODUCT 235 NEBS Inc., Groton, Mass. 01450

PRICING SHEET

NAME | ARCH. OR CONTRACTOR | ESTIMATE NO.

LOCATION | TYPE OF WORK: EXCAVATION - Sensitivity Analy

ESTIMATED BY | PRICED BY | EXTENDED BY | CHECKED BY | DATE

ORIGINA (Red)

DESCRIPTION	QUAN.	@	M	L	E	EXTENSION
Subtotal From Page 1.			57,500	163,100	192,700	413,300
Burden 13% Labor.				21,203		21,203
Labor 15% Labor				24,465		24,465
MATERIALS 5%			2,900			2,900
			60,400	208,768	192,700	461,868
INDIRECT 75% LABOR				156,576		156,576
PROFIT 10% OF TOTAL						46,187
				365,344	192,700	664,631
LEVEL B WORKING COND.						837,066
1.5 × LABOR & EQUIP.						
						1,501,697
HEALTH & SAFETY MONITORING						120,136
8% OF SUBTOTAL						
						1,621,833
CONTINGENCY 20% TOTAL						324,367
ENG. 10% OF TOTAL						162,183
						1,784,016
TOTAL WET & DRY FILL						3,733,891
						$3,734,000
TOTALS						

AR300669

PRICING SHEET

PAGE NO. ____ OF ____ PAGES

NAME: HELENA LANDFILL

ARCH. OR CONTRACTOR:

ESTIMATE NO.:

LOCATION:

TYPE OF WORK: HAULING MATL FROM EXCAVATION - SENSITIVITY ANALYSIS

ESTIMATED BY | PRICED BY | EXTENDED BY | CHECKED BY | DATE

DESCRIPTION	QUAN.	@				EXTENSION
± 30% VOLUME						
BASE COST			1,903,000			
+30% COST			2,474,000			
-30 COST			1,332,000			
		TOTALS				

AR300670

PRICING SHEET

PAGE NO. 1 OF ORIGINAL PAGES

NAME: Helena Landfill	ARCH. OR CONTRACTOR	ESTIMATE NO. (Red)
LOCATION: PA	TYPE OF WORK: Grading + Revegetation & RCRA Landfill - Sensitivity Analy.	
ESTIMATED BY / PRICED BY	EXTENDED BY: GLZ / CHECKED BY	DATE: 1-24-85

DESCRIPTION	QUAN.	@			EXTENSION
Grade and Revegetate ± 30%	$714,000		+ 30% =	$928,000	
	$714,000		− 30% =	$500,000	
RCRA Landfill ± 30%					
O & M Cost ± 30%	$6,000	/yr	+ 30% =	$7,800/yr → PW $74,000	
	$6,000	/yr	− 30% =	$4,200/yr → PW $401,000	
TOTALS					

AR300671

PRICING SHEET

PAGE NO. 1 OF 1 PAGES

ORIGINAL (Red)

NAME: Helena Landfill	ARCH. OR CONTRACTOR	ESTIMATE	
LOCATION: PA	TYPE OF WORK: Water from Dewatering Process - Sensitivity Analysis		
ESTIMATED BY	PRICED BY	EXTENDED BY: GLZ	CHECKED BY	DATE: 2/15/85

DESCRIPTION	QUAN.	@				EXTENSION
		High		Low		
1. Cost of Treating Water (from A/B #4).		$1,246,000		$497,000		
2. Cost of Dewatering (Same as Base Costs)		$172,000		$172,000		
3. O & M costs (from A/B #4 - considered Capital Costs)		$381,000		$127,000		
TOTAL		$1,799,000		$796,000		
TOTALS						

AR300672

PRICING SHEET

PAGE NO. 1 OF 2 ORIGINAL (Red)

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
HELENA LANDFILL		

LOCATION	TYPE OF WORK
	ONSITE RCRA LANDFILL - SPREAD MTL. SENSITIV. ANALYS.

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE

DESCRIPTION	QUAN.	@	M	E & L	TOTAL	EXTENSION
± 30% VOLUME						
+30%	863,000 × 1.3 = 1,122,000					
-30%	863,000 × .7 = 604,000					
30%						
1. PLACE, SPREAD & COMPACT MTL.	1,122,000 CY	(5.88/CY)		6,586,440	6,586,140	
			1.65/CY	5.88/CY		
2. COVER MTL. PLACE, SPREAD & COMPACT	280,500 CY	(7.53/CY)	462,825	1,649,340	2,112,165	
25% OF TOTAL VOLUME			462,825	8,235,480	8,699,305	
H&S MONITORING 8% TOTAL				695,864	695,864	
			462,825	8,931,344	9,394,169	
LEVEL B WORKING COND. 1.5 × TOTAL LABOR					13,397,016	
					22,791,185	
CONTINGENCY 20% OF TOTAL					4,558,237	
ENG. 10% OF TOTAL					2,279,119	
					29,628,541 ≈ 29,629,000	
TOTALS						

AR300673

PRICING SHEET

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
Helena Landfill RI/FS		(Red)
LOCATION: PA	TYPE OF WORK: Onsite RORA Landfill - Spread Mil - Sensitivity Anal	

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE
		GLZ		1-24-85

DESCRIPTION	QUAN.	@	M	E+L	TOTAL	EXTENSION
-30% Volume						
1. Place, Spread, Compact	604,000 cy	5.88/cy		3,551,520	3,551,520	
2. Daily Cond - Place Spread + Compact			1.65/cy	5.88/cy		
25% of Total Volumes	151,000 cy	7.53/cy	249,150	887,880	1,137,030	
			249,150	4,439,400	4,688,550	
H&S Monitoring 8% of Total				375,084	375,084	
			249,150	4,814,484	5,063,634	
Level B Working Cond 1.5 x Total Labor					7,221,726	
					12,285,360	
Contingency 20% of Total					2,457,072	
Eng 10% of Total					1,228,536	
					$15,970,968	
TOTALS						

AR300674

PRICING SHEET

PAGE NO. ____ OF ____ PAGES

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
Helena Landfill		ORIGINAL
LOCATION: PA	TYPE OF WORK: Monitoring - Sensibility Analysis	(Red)

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE
		GLZ		2/15/85

DESCRIPTION	QUAN.	@			EXTENSION
The costs for monitoring are included in the costs for alternative # 3					

AR300675

TOTALS

ORIGINAL
(Red)

ALTERNATIVE #6 COSTS

ALTERNATE WATER SUPPLY

EXCAVATION OF EXISTING LANDFILL

DISPOSAL IN AN ONSITE INCINERATOR

MONITORING

PRICING SHEET

PAGE NO 1 OF 6 PAGES

TITLE: Cells Lot 4

ARCHITECT OR CONTRACTOR:

EST. ITEM NO:

TYPE OF WORK: Alt. Water Supply

ORIGINAL (Red)

ESTIMATED BY: | REVIEWED BY: | EXTENDED BY: GLE | CHECKED BY: | DATE: 11/30/85

DESCRIPTION	QUAN.					EXTENSION
The costs for the alternate water system are included with the costs for Alternative # 2.						
TOTALS						

AR300677

PRICING SHEET

PAGE NO. 1 OF 1 PAGES

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
Helena Landfill		

LOCATION	TYPE OF WORK
	Excavation

ORIGINAL (Red)

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE
		GB		1/30/85

DESCRIPTION	QUAN.	@			EXTENSION
The costs for Excavation, Dewatering, Water Treatment, Hauling, & Grading and Revegetation are included in the costs for Alternative #5					
TOTALS					

AR300678

PRICING SHEET

PAGE NO. ____ OF ____ PAGES

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
Helova Landfill		

LOCATION	TYPE OF WORK
PA	Incinerator Costs

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE
DFM	DFM	DFM/GLZ		1/23/84

ORIGINAL (Red)

DESCRIPTION	QUAN.	@	EXTENSION
Total Capital Cost for 1 incinerator			$3,774,000
Contingency 20%			754,800
O&P 10%			377,400
Eng. 15%			566,100
			5,472,300
			≈ 5,472,000/unit
3 units			$16,416,000
Buildings			333,000
			$16,749,000
Base			
1 Years O&M	$20,505,000/yr	X 2 yrs	41,010,000
TOTAL			$57,759,000

TOTALS

AR300679

PRICING SHEET

NAME: Helena Landfill Site	ARCH. OR CONTRACTOR: NUS Corp	ESTIMATE NO.: $760
LOCATION:	TYPE OF WORK: Capital + O&M Costs	

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE
DFM	DFM	DFM		Jan 12, 1985

DESCRIPTION	QUAN.	@				EXTENSION
Incinerator Cost Summary						
Total Capital Cost (P1)	(1)					3 774 000 —
Contingency 20%						755 000 —
						4 529 000 —
Overhead & Profit 10%						453 000 —
						4 982 000 —
Engineering 15%						747 000 —
					T >	5 729 000 —
	(3)				T >	17 187 000 —
Operation & Maintenance						
		VOID	See			3 508 000
1 unit Total (P2)	(1)		page 4 of 4			3 517 000 —
Contingency 20%						4 220 000 —
O&P 10%					T >	4 642 000 —
3 units	(3)					10 223 000 —
Contingency 20%						12 268 000 —
O&P 10%					T >	13 494 000 —
TOTALS						

AR300680

PRICING SHEET

PAGE NO. 2 OF 4 PAGES

NAME: Helena Landfill Site	ARCH. OR CONTRACTOR: NUS Corp	ESTIMATE NO. $760 ORIGINAL (Red)
LOCATION: PA	TYPE OF WORK: Incinerator Cost	
ESTIMATED BY: DFM	PRICED BY: DFM Ref 3/17/84 New Bed ①	EXTENDED BY: DFM
CHECKED BY:	DATE: Jan 12, 1985	

DESCRIPTION	QUAN.	@		EXTENSION
Incinerator – 50M BTU/hr		Capital Costs		
7.5 tons / hour				
Loading System	LS		10000 —	
Combustion Chamber	LS		35000 —	
Shell & Drive Mech.	2195ft²	302	664000 —	
Internals	LS		89500 —	
				798500 —
Combustion Chamber				
Shell			77000 —	
Internals			13400 —	
				90500 —
Burner System				
50 X 10⁶	LS		48000 —	48000 —
Material Removal System	LS		220000 —	220000 —
Air pollution Control Equip	LS		360000 —	
Stack w/ Fan			268400 —	
				6234400 —
Total Equipment Cost	(June 81)			1780400 —
		784/721.3 (Sep 84)	⇒	1935000 —
Miscellaneous Costs				
Installation (50% equip cost)				968000 —
Site prep & Utilities	7% equip			135000 —
Start up	10% "			194000 —
Spare Parts	8% "			155000 —
Instrumentation & Control	20% equip			387000 —
			Sub Total ▶	1839000 —
		Total Capital Costs		3774000 —
		TOTALS		

AR300681

PRICING SHEET

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
HELEVA LANDFILL	NUS CORP.	$760 ORIGINAL (Red)
LOCATION	TYPE OF WORK	
	INCINERATOR COST (O & M)	

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE

DESCRIPTION	QUAN.	@		EXTENSION
OPERATION & MAINTENANCE COSTS				
1.) LABOR				
OPERATOR 4 SHIFTS, 7 DAYS	4	50,000/YR	200,000	
YARD CREW				
2 PEOPLE / SHIFT / DAY 8 SHIFTS / WEEK	8	50,000/YR	400,000	
SUPERVISORY				
2 SHIFTS / WEEK	2	50,000/YR	100,000	
TOTAL LABOR				700,000
2.) UTILITIES				
POWER				
7,00 HRS x 400 hp x 0.043	LS		124,000	
WATER				
@ 4300 GAL / HOUR / 1000 GAL		10¢	32,000	
AUXILIARY FUEL				
FUEL OIL #6	2,355,000 GAL	10¢/GAL	2,567,000	
TOTAL UTILITIES				2,723,000
3.) CHEMICAL COSTS	LS			107,000
4.) MAINTENANCE COST / YR	10%			377,000
TOTAL O & M / YR				3,508,000
* FOR 3 INCINERATORS				
LABOR (700 K)	2			1,400,000
UTILITIES (2723 K)	3			8,169,000
CHEMICAL COSTS (107 K)	3			321,000
MAINTENANCE (377 K)	3			1,131,000
TOTAL O & M - 3 INCINERATORS				11,021,000
		TOTALS		

AR300682

PRICING SHEET

PAGE NO. ____ OF ____ PAGES

ORIGINAL (Red)

NAME: HELEVA LANDFILL | ARCH. OR CONTRACTOR | ESTIMATE NO.

LOCATION | TYPE OF WORK: INCINERATION O&M COSTS - ASH DISPOSAL

ESTIMATED BY | PRICED BY | EXTENDED BY | CHECKED BY | DATE

DESCRIPTION	QUAN.	@				EXTENSION
ASH DISPOSAL (25% OF INITIAL VOLUME IS ASH, 5% OF THAT IS FLYASH)						
7.5 TON/HR/UNIT x 24 HR/DAY x	340 DAYS/YR x 0.25 =					15,300 TONS/YR
DISPOSAL	15,300 T	57.63/TON =				882,000/YR
TRANSPORTATION 15,300 TONS/YEAR x	1 FT³/60 LBS	x	2000 LB/TON	x	1 CY/27 CY³ =	19,000 CY/YEAR
19,000 CY/YR x	1 LOAD/20 CY	x	$4.00/LOADED MILE	x	300 MILES	
						1,140,000/YR
TOTAL ASH DISPOSAL/UNIT	2,022,000/YR/UNIT					
TOTAL O&M COST		PER UNIT			PER 3 UNITS	PER 6 UNITS
LABOR (2 CREWS/3 UNITS)		700,000			1,400,000	2,800,000
UTILITIES		2,723,000			8,169,000	16,338,000
CHEMICAL COSTS		107,000			321,000	642,000
MAINTENANCE		377,000			1,131,000	2,262,000
ASH DISPOSAL		2,022,000			6,066,000	12,132,000
		5,929,000			17,087,000	34,174,000
CONTINGENCY 20%		1,186,000			3,418,000	6,835,000
TOTAL O&M COSTS		7,115,000			20,505,000	41,009,000
		TOTALS				

AR300683

PRICING SHEET

PAGE NO. 1 OF 1 PAGES

EPA - HELENA | ARCH OR CONTRACTOR: PEC DIV - NUS | ESTIMATE NO: # 760.21 | ORIGINA (Red)

ALLENTOWN PA | TYPE OF WORK: STORAGE & CONTROL BUILDINGS

ESTIMATED: | PRICED BY: AMF | EXTENDED BY: | CHECKED BY: | DATE: 1/25/85

DESCRIPTION	QUAN.	#	M	L&E	SUB	EXTENSION
) STORAGE BUILDING	3600 FT^2				72000	
PREFAB - 60' x 60'						
) STORAGE BUILDING FDN	125 YD^3		18800	31300		
) CONTROL BUILDING	600 FT^2				30000	
20' x 30' - OFFICE, CONTROL ROOM						
REST ROOM, SHOWER						
) CONTROL BUILDING FDN	35 YD^3		5300	8800		
			24100	40100	102000	166200
BURDEN - 13%				5200		5200
LABOR - 15%				6000		6000
MATERIAL - 5%			1200			1200
SUBCONTRACT - 10%					10200	10200
TOTAL DIRECT COST			25300	51300	112200	188800
INDIRECTS - 75%				38500		38500
PROFIT - 10%						18900
TOTAL FIELD COST						246200
CONTINGENCY - 20%						49300
ENGINEERING - 15%						36900
						332400
		TOTALS				

AR300684

PRICING SHEET

PAGE NO. ____ OF ____ PAGES

NAME: HELEVA LANDFILL

ARCH. OR CONTRACTOR:

ESTIMATE NO.:

LOCATION:

TYPE OF WORK: INCINERATOR - COST OF ONSITE ASH DISPOSAL

ESTIMATED BY | PRICED BY | EXTENDED BY | CHECKED BY | DATE

ORIGINAL (Red)

DESCRIPTION	QUAN.	@	EXTENSION
VOLUME - 25% OF INITIAL VOLUME		$863,000 × 0.25 =	$216,000
COST OF PREPARING LANDFILL VOLUME - SEE	25% OF COST OF PREPARING LANDFILL FOR FULL A10 & 5		
COST OF FILLING LANDFILL -	25% OF COST OF FILLING LANDFILL FOR FULL VOLUME - SEE A10 & 5		
1.) INITIAL CONSTRUCTION	8,484,000 × 0.25 =		2,121,000
2.) COST OF FILLING LANDFILL	24,581,000 × 0.25 =		6,145,000
TOTAL Cost of Ash Landfill			8,266,000
O&M COSTS WITHOUT ASH DISPOSAL	11,021,000/YR		
CONTINGENCY 20%	2,204,000		
TOTAL	13,225,000/YR	FOR	a.) 2 YRS b.) 2.5 YRS c.) 1.5 YRS
TOTAL COST FOR ONSITE ASH DISPOSAL A. 2 yrs. - $34,716,000 More expensive than offsite disposal			
TOTALS			

AR300585

PRODUCT 235 NEBS Inc. Groton, Mass. 01450

Alt #6

PRICING SHEET

PAGE NO. ____ OF ____ PAGES

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
Helena Landfill		

LOCATION	TYPE OF WORK
PA	Monitoring - Excavation

ORIGINAL (Red)

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE
		GLZ		2/12/85

DESCRIPTION	QUAN.	@				EXTENSION
Labor, Cost of Living, Car, Equipment etc. Same as Monitoring - NO Action						$5,364/trip
Lab 9 Surface Water	28	@ $175/sample				$4,900/trip
13 Ground water						
0 houses						
3 blanks						
3 dup.						
						$10,264/trip
Contingency 20 %						$2,053/trip
						$12,317/trip
						X4 trips/yr
						49,268/yr
						≈ $49,000
30 yr Present Worth						$461,918
						≈ $462,000
TOTALS						

AR300686

ORIGINAL
(Red)

ALTERNATIVE #6 SENSITIVITY ANALYSIS COSTS

ALTERNATE WATER SUPPLY

EXCAVATION OF EXISTING LANDFILL

DISPOSAL IN AN ONSITE INCINERATOR

MONITORING

PRICING SHEET

PAGE NO 1 OF ~~PAGES~~ ORIGINAL (Red)

NAME: Helena Landfill
ARCH. OR CONTRACTOR:
ESTIMATE NO:
LOCATION:
TYPE OF WORK: Alt. Water Supply - Sensitivity Analysis
ESTIMATED BY:
PRICED BY:
EXTENDED BY: GLB
CHECKED BY:
DATE: 1/30/85

DESCRIPTION	QUAN.	@				EXTENSION
The sensitivity analysis costs for the alternate water system are included in the sensitivity analysis costs for Alternative #2.						

AR300688

TOTALS

PRICING SHEET

PAGE NO. 1 OF 1 PAGES

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
Helena Landfill		

LOCATION	TYPE OF WORK
	Excavation - Sensitivity Analysis

ORIGINAL (Red)

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE
		GLZ		1/30/85

DESCRIPTION	QUAN.	@			EXTENSI
The sensitivity analysis costs for Excavation, Water Treatment, Hauling, & Grading and Revegetation are included in the sensitivity analysis cost for Alternative #5.					
TOTALS					

AR300689

PRICING SHEET

NAME: Helena Landfill RI/FS
ARCH. OR CONTRACTOR:
ESTIMATE NO.: ORIGINAL (Red)
LOCATION:
TYPE OF WORK: Incineration - Sensitivity Analysis
ESTIMATED BY:
PRICED BY:
EXTENDED BY: GLZ
CHECKED BY:
DATE: 1/23/85

DESCRIPTION	QUAN.	@				EXTENSION
A. 1 Incinerator at 7.5 Ton/hr						
Capital Cost	5,472,000/unit		(from OFM costs)			$5,472,000
O&M Cost	7189,000/yr		(from OFM/GLZ costs)			$7,189,000/yr
Length of operation	1 incinerator					
Base - 759,000 cy + 15% swell = 863,000 cy to be incinerated						
+30%	(1.3 × 863,000 cy) = 1,122,000 cy					" " "
-30%	(0.7 × 863,000 cy) = 604,000 cy					" " "
at 7.5 Ton/hr × 24 hr/day × 340 days/year = 61,200 Tons/year						
Base	863,000 cy	× 820 lb/cy	× 1 Ton/2,000 lb			= 354,000 Tons
	5.78 years					
+30%	1,122,000 cy	× 820 lb/cy	× 1 Ton/2,000 lb			= 460,000 Tons
	7.52 years					
-30%	604,000 cy	× 820 lb/cy	× 1 Ton/2,000 lb			= 248,000 Tons
	4.05 years					
TOTALS						

AR300690

PRICING SHEET

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
Helena Landfill		ORIGI
LOCATION: PA	TYPE OF WORK: Incineration - Sensitivity Analysis	(Red
ESTIMATED BY / PRICED BY	EXTENDED BY: GLZ / CHECKED BY	DATE: 2/15/85

DESCRIPTION	QUAN.	@				EXTENSIO
		High		Low		
1. Cost of 3 Incinerators (Same as Base Cost)		$16,749,000		$16,749,000		
2. O & M costs 20,505,000/yr x 2½ yrs for High		$51,263,000		$30,758,000		
x 1½ yrs for Low						
TOTAL		$68,012,000		$47,507,000		
TOTALS						

PRICING SHEET

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
Helena Landfill RI/FS		ORIGINAL (Red)
LOCATION: PA	TYPE OF WORK: Incineration - Sensitivity Analysis	

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE
		GLZ		1/22/85

DESCRIPTION	QUAN.	@				EXTENSION
B. 3 Incinerators at 7.5 Ton/hr/unit						
Capital Cost	$5,472,000/unit		(from OFM costs)			$16,416,000
O&M Cost	$7,189,000/unit/yr		(from OFM/GLZ costs)			21,176,000/yr
Length of operation						
Base 750,000 cy	+ 15% swell =	863,000 cy	to be incinerated			
+30%	(1.30 x 863,000)	1,122,000 cy	to be incinerated			
-30%	(0.70 x 863,000) =	604,000 cy	to be incinerated			
at 7.5 Tons/hr/unit	24 hr/day x	340 days/yr =	61,200 Tons/unit/y			
			x 3 units			
			183,600 Ton/yr.			
Base	863,000 cy x	820 lb/cy x	1 Ton / 2,000 lb =			354,000 Ton
2 yrs	1.93 years					
+30%	1,122,000 cy x	820 lb/cy x	1 Ton / 2,000 lb =			460,000 Tons
2½ yrs	2.51 years					
-30%	604,000 cy x	820 lb/cy x	1 Ton / 2,000 lb =			248,000 Tons
1½ yrs	1.35 years					
TOTALS						

PRICING SHEET

NAME: Helena Landfill RI/FS
ARCH. OR CONTRACTOR:
ESTIMATE NO.:
LOCATION: PA
TYPE OF WORK: Incineration - Sensitivity Analysis
ORIGINAL (Red)
ESTIMATED BY: PRICED BY: EXTENDED BY: CHECKED BY: DATE:

DESCRIPTION	QUAN.	@				EXTENSION
C. 6 Incinerators at 7.5 Tons/hr/unit						
Capital cost	5,472,000 /units		(From OFM costs)			$32,832,000
O&M costs	7,189,000 /unit/year		(From OFM/GLE costs)			$42,352,000/yr
Length of operation of 6 incinerators						
Base	863,000 cy					
+30%	1,122,000 cy					
-30%	604,000 cy					
at 7.5 Ton/hr/unit X 6 units X 24 hr/day X 340 day/yr = 367,200 Ton/yr						
Base	863,000 cy X 820 lb/cy X 1 Ton/2,000 lb =					354,000 Ton
	.96 years					
+30%	1,122,000 cy X 820 lb/cy X 1 Ton/2,000 lb =					460,000 Ton
	1.25 years					
-30%	604,000 cy X 820 lb/cy X 1 Ton/2,000 lb =					248,000 Ton
	.68 years					
TOTALS						

AR300693

Alt #6

PRICING SHEET

PAGE NO. 1 OF 1 PAGES

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
Helena Landfill		

LOCATION	TYPE OF WORK	
	Monitoring with Excavation - Sensitivity Analysis	ORIGINAL (Red)

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE
		GLZ		2/12/85

DESCRIPTION	QUAN.	@				EXTENSION
± 10% number of samples						
labor, etc. same as base costs						$5,364/bri
46 samples 28 +10%	31 samples	@	$175/sample			5,425/bri
						$10,789/bri
contingency 20%						2,158/bri
						12,947/bri
						x4 bri/yr
						51,788/yr
						≈$52,000
30 Yr Present Worth			$490,199	≈	$490,000	
lab samples 28 - 10%	25 samples	@	175/sample			4,375/bri
				labor -		5,364/bri
contingency 20%						$9,739/bri
						1,948/bri
						$11,687/bri
						x4 bri/yr
						$46,748/yr
						≈ $47,000
30 Yr. Present Worth		$443,064		≈	$443,000	
TOTALS						

AR300694

ORIGINAL
(Red)

ALTERNATIVE #7 COSTS

ALTERNATE WATER SUPPLY

EXCAVATION OF EXISTING LANDFILL

DISPOSAL IN AN OFFSITE RCRA - APPROVED LANDFILL

MONITORING

PRICING SHEET

PAGE NO 1 OF 1 PAGES

NAME: Kalama Landfill

GROUP OR CONTRACTOR:

ESTIMATE NO:

ORIGINAL (Red)

SHEET:

TYPE OF WORK: Alt. Water Supply

ESTIMATED BY: PRICED BY: EXTENDED BY: CHECKED BY: GLE DATE: 1/30/85

DESCRIPTION	QUAN.					EXTENSION
The costs for the alternate water system are included with the costs for Alternative # 2.						
TOTALS						

AR300696

PRICING SHEET

PAGE NO. 1 OF 1 PAGES

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
Helena Landfill		ORIGINAL (Red)
OCATION	TYPE OF WORK: Excavation	

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE
		GLZ		1/30/85

DESCRIPTION	QUAN.	@				EXTENSIO
The Costs for Excavation, Water Treatment & Grading and Revegetation are included in the costs for Alternative #5.						
The cost of onsite hauling is not necessary in this alternative.						
TOTALS						

AR300697

PRICING SHEET

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
Helena Landfill - RI/FS		
LOCATION: PA	TYPE OF WORK: Off-site Disposal	ORIGINAL (Red)

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE
	BES	GLZ		1/23/85

DESCRIPTION	QUAN.	@				EXTENSION
WASE						
Disposal Costs	750,000 cy excavated + 15% Swell =					863,000 cy at 820 lb/cy
	863,000 cy x 820 lb/cy x 1 Ton / 2,000 lb =					354,000 Tons
	354,000 Tons 57.63 / Ton =					$ 20,401,000
Transportation Costs	$4 / 20 cy / mile - 300 mile trip					
	$1,200 / 20 cy					
	863,000 cy x $1,200 / 20 cy =					$ 51,780,000
						$ 72,181,000
Loading 1% of Total Cost		(72,181,000 x .01) =				$ 722,000
H&S = 2% of Total Cost		(72,181,000 x .02) =				$ 1,444,000
						74,347,000
Contingency & Profit 20% of Total		(0.20 x 74,347,000) =				14,869,000
						$ 89,216,000
		TOTALS				

AR300698

PRICING SHEET

PAGE NO 1 OF 1 PAGES

NAME Holiday Landfill

ARCH OR CONTRACTOR

ESTIMATE NO

ORIGINAL (Red)

LOCATION

TYPE OF WORK Monitoring

ESTIMATED BY | PRICED BY | EXTENDED BY GLZ | CHECKED BY | DATE 1/30/85

DESCRIPTION	QUAN.					EXTENSION
The costs for monitoring are included in the costs for Alternative #6.						

AR300699

ORIGINAL
(Red)

ALTERNATIVE #7 SENSITIVITY ANALYSIS COSTS

ALTERNATE WATER SUPPLY EXCAVATION OF EXISTING LANDFILL

DISPOSAL IN AN OFFSITE RCRA - APPROVED LANDFILL

MONITORING

PRICING SHEET

PAGE NO. 1 OF 1 PAGES

NAME: Helena Landfill

ARCH OR CONTRACTOR

ESTIMATE NO.

LOCATION

TYPE OF WORK: Alt. Water Supply - Sensitivity Analysis

ESTIMATED BY | PRICED BY | EXTENDED BY: GLB | CHECKED BY | DATE: 1/30/85

DESCRIPTION	QUAN.	#				EXTENSION
						ORIGINAL (Red)
The sensitivity analysis costs for the alternate water system are included in the sensitivity analysis costs for Alternative #2.						

AR300701

TOTALS

PRICING SHEET

PAGE NO. 1 OF 1 PAGES

NAME	ARCH. OR CONTRACTOR	ESTIMATE NO.
Helena Landfill		

LOCATION	TYPE OF WORK
	Excavation - Sensitivity Analysis

ESTIMATED BY	PRICED BY	EXTENDED BY	CHECKED BY	DATE
		GLZ		1/30/86

DESCRIPTION	QUAN.	@				EXTENSION
The sensitivity analysis costs for Excavation, Water Treatment, & Grading and Revegetation are included in the sensitivity analysis costs for Alternative #5.						ORIGINAL (Red)
The cost of onsite hauling is not included in this alternative.						
		TOTALS				

AR300702

PRICING SHEET

NAME: Helena Landfill RI/FS	ARCH. OR CONTRACTOR		ESTIMATE NO.
LOCATION	TYPE OF WORK: Offsite Disposal - Sensitivity Analysis		
ESTIMATED BY	PRICED BY: BES	EXTENDED BY: GLZ	CHECKED BY	DATE: 1/23/85

ORIGINAL (Red)

DESCRIPTION	QUAN.	@	EXTENSION
+ 30% Volume	863,000 cy -	base volume X 1.3 =	1,122,000 cy
	1,122,000 cy	X 820 lb/cy X 1 Ton / 2,000 lb =	460,000 Tons
Disposal Cost	460,000 Tons	at 57.63/Ton =	$26,510,000
Transportation Costs	$4/20 cy/mile	X 300 miles =	$1200/20 cy
	1,122,000 cy	X $1,200/20 cy =	$67,230,000
			$93,830,000
Loading 1% of Total Cost	(0.01 X 93,830,000)		938,000
H&S 2% of Total Cost	(0.02 X 93,830,000)		1,877,000
			$96,645,000
Contingency & Profit - 20% of Total	(0.20 X 96,645,000)		19,329,000
			$115,974,000
TOTALS			

AR300703

PRICING SHEET

NAME: Helena Landfill RI/FS	ARCH. OR CONTRACTOR		ESTIMATE NO.
LOCATION	TYPE OF WORK: Offsite Disposal - Sensitivity Analysis		
ESTIMATED BY	PRICED BY: BES	EXTENDED BY: CLZ	CHECKED BY	DATE: 1/23/85	ORIGINAL (Red)

DESCRIPTION	QUAN.	@				EXTENSION
-30 % Volume	863,000 cy	base volume	x	0.70	=	604,000 cy
	604,000 cy	x 820 lb/cy	x	1 Ton / 2,000 lb	=	248,000 Ton
Disposal Cost	248,000 Tons	at $57.63/Ton				$14,293,000
Transportation Cost	$4/20 cy/mile	x 300 miles	=	$1,200/20 cy		
	604,000 cy	x $1,200/20 cy	=			$36,240,000
						$ 50,533,000
Loading 1% of Total Cost	(0.01 x 50,532,000)	=				505,000
H&S 2% of Total Cost	(0.02 x 50,532,000)	=				1,011,000
						52,048,000
Contingency & Profit 20% of Total	(0.20 x 52,048,000)	=				10,410,000
						$ 62,458,000
TOTALS						

PRICING SHEET

PAGE NO. 1 OF 1 PAGES

NAME: Helena Landfill

ARCH OR CONTRACTOR

ESTIMATE NO.

LOCATION

TYPE OF WORK: Monitoring - Sensitivity Analysis

ORIGI (Red

ESTIMATED BY | PRICED BY | EXTENDED BY: GLZ | CHECKED BY | DATE: 1/30/85

DESCRIPTION	QUAN.					EXTENSI
The sensitivity analysis costs for monitoring are included in the sensitivity analysis costs for Alternative #6,						

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ORIGINAL
(Red)

APPENDIX I

GEOPHYSICAL FIELD OPERATIONS AND DATA REDUCTION TECHNIQUES

ORIGINAL (Red)

Field Operations

Seismic Refraction Survey

Refraction data were obtained along approximately 3,050 feet of line.

A preliminary survey conducted along Line O (Figure 3-1), using a geophone spacing of 20 feet, showed that bedrock was well over 100 feet deep in some places (DN 0760.15-01). Based on this information, it was decided that a geophone spacing of 40 feet would allow more accurate survey data at greater depths. The data were collected using a Geometrics ES-1210F twelve-channel signal enhancement seismograph. A Betsy Seisgun was used to generate the seismic signals; two to four shots were generally sufficient to produce discernible first arrivals on the seismograph's CRT display and hard copy outputs.

Electromagnetic (EM) Conductivity Survey

EM profiling was performed along 5,700 feet of survey lines. The surveys were concentrated in the fields southeast of the site, with two lines north of the site, to be used for background information. A Geonics EM34-3 terrain conductivity meter was used to collect the data.

Horizontal and vertical dipole modes were used with a 10-meter intercoil spacing along all lines, providing vertically-averaged conductivity values for depths of investigation of 0 to 25 and 0 to 50 feet, respectively. Two lines also used a twenty-meter intercoil spacing, which yielded additional data for the approximate depth interval of 0 to 100 feet.

Vertical Electrical Sounding (VES) Survey

Seven VES surveys were performed on and near the site. A Bison 2350B resistivity meter was utilized to obtain sounding data using the Schlumberger electrode array. Readings were taken with electrode spacings of 2 to 300 feet, spaced

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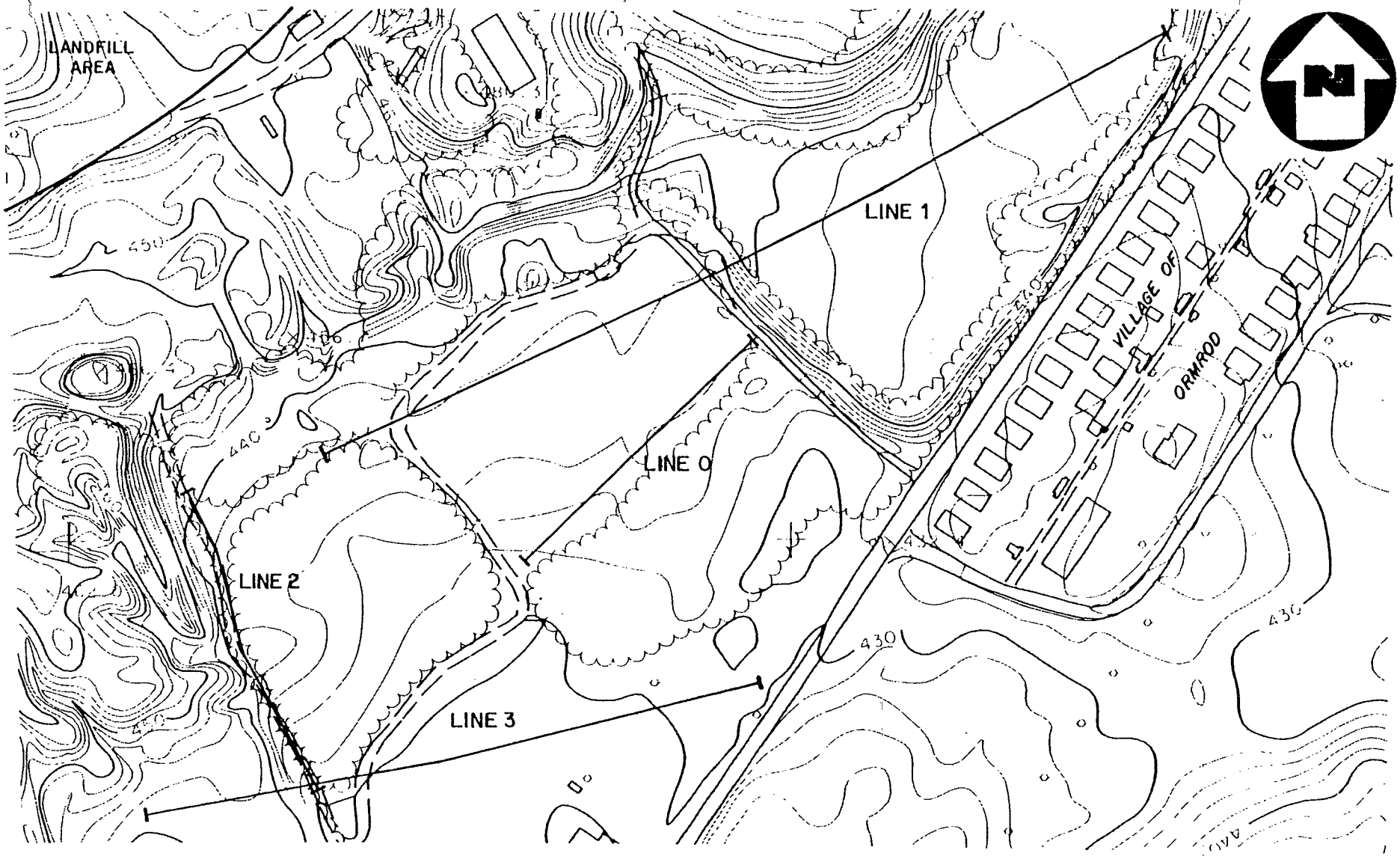

FIGURE 3-1

SEISMIC SURVEY LINES

HELEVA LANDFILL SITE, NORTH WHITEHALL TWP., PA

SCALE 1" = 200'

NUS CORPORATION

A Halliburton Company

AR300709

logarithmically, to provide resistivity coverage to a depth of approximately 100 feet.

Data Reduction

Seismic Refraction Data

The refraction method consists of measuring the travel time required for a compressional wave generated at the surface by a mechanical impact to return to the surface after refracting from subsurface interfaces. The raw data consist of travel times and source-receiver distances, which are used to determine the subsurface layer velocities and their orientation.

The processing of seismic refraction data involves four steps. First, arrival times must be picked from field records. Second, a plot of arrival time versus source-receiver distance must be made to determine the number of layers present and their velocities. The third step utilizes a computer program to perform seismic ray path tracing and to determine layer thicknesses and dips.

Once the thicknesses and dips of the subsurface formations have been determined, a seismic cross-section can be generated. For an in-depth look at seismic refraction data acquisition, processing, and interpretation, refer to Applied Geophysics by Telford, Geldart, Sheriff, and Keys or to Volume 1 of the Handbook of Engineering Geophysics by Mooney.

EM/VES Data

The EM data were reduced by converting scale and percent deflection into conductivity and resistivity data. These data were then manually plotted in semilogarithmic format.

VES data were converted into apparent resistivities. Current electrode spacings and their corresponding, apparent resistivity values were then plotted in log format for interpretation.

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