Norton Company Site

Town of Colonie, Albany County, New York
Site Number 401010

Record of Decision

March 1991

Prepared by:

NEW YORK STATE

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Region 4, 2176 Guilderland Avenue, Schenectady, N Y 12306

THOMAS C. JORLING, Commissioner

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RECORD OF DECISION

March 1991

New York State Department of Environmental Conservation

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Norton Company Site, Lansing Lane, Town of Colonie, Albany County, New York, Site ID #401010.

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Norton Company Site, developed in accordance with the New York State Environmental Conservation Law (ECL), and is consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 USL Section 9601, et seq., as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). Appendix A of this record lists the documents that comprise the Administrative Record for the Norton Company Site. The documents in the Administrative Record are the basis for the selected remedial action.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this Record of Decision, present a current or potential threat to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

The selected remedy for this site consists of construction of a slurry wall around the contaminated industrial fill area and a clay cap over the same area to isolate the contamination. A ground water collection system and vapor extraction system will remove contaminants from within the contaminated industrial fill area.

The components of the selected remedy are as follows:

- Construction of a three foot thick soil bentonite slurry wall from the surface to competent bedrock around the industrial fill area. This will prevent contaminated groundwater from moving out of the area of contamination.

- A groundwater extraction system will be installed to lower the groundwater inside the slurry wall and remove contaminated groundwater.

- Initially, removed groundwater will be stored on-site, handled as a hazardous waste, and managed by trucking to an off-site approved facility for disposal.

- Stored liquids from groundwater extraction will be sampled and analyzed to determine to what levels the contaminated groundwater needs treatment and to develop disposal options.

- An in-situ vacuum extraction system will be installed to collect soil vapor within the industrial fill area. Air extracted will be treated using activated carbon filters to meet air quality standards prior to discharge to the atmosphere. Spent carbon will be either regenerated on-site or transported off-site for regeneration or disposal. Air quality criteria and treatment requirements will be addressed during the design phase.

- A clay-soil cap will be placed and keyed to the bentonite slurry wall to prevent infiltration of water and provide a seal for proper operation of the in-situ vacuum extration unit.

- The cap will be graded to promote proper drainage and seeded to provide vegetative cover that will be maintained.

- Monitoring and sampling of the site will continue and will be done to determine the effectiveness of the technology and the progress of the remediation. Monitoring will include air quality, groundwater quality, effectiveness of groundwater collection and quality of extracted groundwater.

- The operation of the groundwater and soil vapor extraction systems will continue as long as these systems continue to provide reduction in the volume and toxicity of contaminants. In addition, the groundwater extraction system will be operated as long as necessary (in conjunction with the slurry wall and clay cap) to contain groundwater migration.

- Restrictions will be placed in the real property deed to regulate future use of the site.

DECLARATION

The selected remedy is designed to be protective of human health and the environment is designed to comply with applicable State environmental quality standards and is cost effective. This remedy satisfies the Department's preference for treatment that reduces the toxicity, mobility or volume of hazardous substances, pollutants or contaminants as the principal goal.

MAR 25 1991

Date

Edward O. Sullivan

Edward O. Sullivan
Deputy Commissioner
Office of Environmental Remediation

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SITE BACKGROUND

LOCATION

The Norton Company Site is located in the Town of Colonie, Albany County, north of the Norton Company Coated Abrasive Division. The site is 22 acres in size and is approximately pie shaped. Within these 22 acres is a four acre section that includes a landfill for industrial waste. It is these four acres that contain most of the contamination. The site is bounded by the Delaware and Hudson Railroad, the raised tracks of the former New York Central and the lands of the Niagara Mohawk Power Corporation which includes a small wetlands area. Figure 1 shows the site location and surrounding area.

The site is bound on three sides by industrial areas. To the east is a Delaware & Hudson railroad right-of-way and a Maplewood neighborhood, including Lansing and Archabald Avenues. This area is served by a public water supply.

SITE UTILIZATION AND HISTORY

The Norton Company has used this site for disposal of a variety of materials in the last 35 years, the goal being to fill the area and prepare for future industrial development. The following is a brief chronological summary of the wastes disposed at the site.

1955-1966

A. Solid - Rolls of waste tape, coated abrasives, paper and fly ash from the boiler house.

B. Liquid - Deposited in drums as clean up waste and settling basin sludge was phenolic resin, animal glue, latex, inert filler, urethane resin, toluene, xylene, methyl isobutyl ketone, and methyl ethyl ketone.

1966-1973

Dilute latex/water solutions in five evaporation ponds (approximately 8,000 gallons per week).

1966-1980

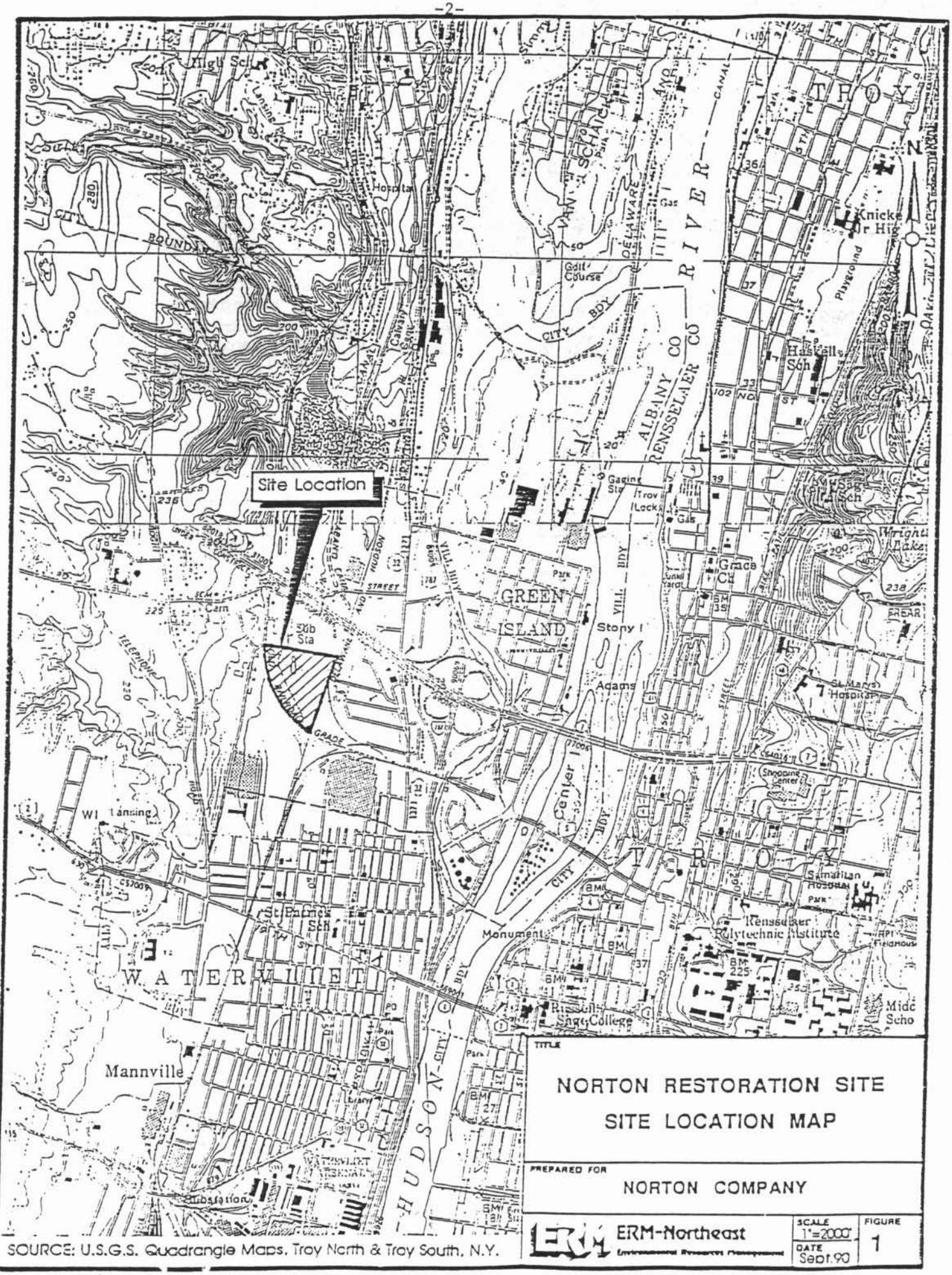
Fly ash from the boiler house.

1973-1980

Construction debris.

1980-Present

The site is inactive except for a small fire training area used until 1986.



SOURCE: U.S.G.S. Quadrangle Maps, Troy North & Troy South, N.Y.

REMEDIAL PROGRAM AND ENFORCEMENT HISTORY

The following is a brief chronological summary of investigative and remedial activity.

1979 - Albany County Health Department inspects site.

1980 - In September and October the USEPA inspects the site and conducts soil and water sampling.

1984 - NYSDEC conducts a Phase I investigation.

1986 - Fire training operations on the site are discontinued.

1987 - Enforcing Article 27 Title 13 of the Environmental Conservation Law NYSDEC negotiates an Order on Consent with Norton Company, the responsible party. Under the Consent Order Norton hires ERM-Northeast to conduct a Phase II investigation.

1988 - NYSDEC accepts the Phase II and reclassifies the site as a class 2 because of the significant threat to the public health or environment. Action is required.

1989 - Pursuant to Environmental Conservation Law Section 27-1313(3)(a) NYSDEC enters into an Order on Consent with Norton Company, to perform a Remedial Investigation and Feasibility Study (RI/FS). Norton, in turn, retained ERM-Northeast to perform the necessary engineering.

Through the RI/FS process, sites requiring remediation go through an intensive examination to define the nature and extent of contamination and collect data necessary to evaluate alternatives for remediating the site. The result is the selection of the most appropriate remedial action which will protect the environment and human health from contaminants at the site.

Throughout this process, DEC keeps the local public informed about work under way at the site and of factors leading to the remedial action decision.

SITE GEOLOGY

The purpose of the Phase II investigation was to determine whether the site presents a potential threat to the environment. In meeting this purpose, the investigation provided a detailed description of the geology of the site. Bedrock under the site consists of a competent shale that outcrops at the northwest and northeast corners of the site and forms a shallow trough that

slopes to the southeast. This shale is at least 100 feet thick. Overburden deposits are residual from weathered shale soils, natural marsh deposits, and fill materials. The non-industrial fill material consists of iron slag mixed with coal ash, brick fragments, cinders and soils ranging from silts to gravels. This fill on top of marsh deposits has a total thickness that varies over the site from nothing at the bedrock outcrops to 15 feet thick.

CONTAMINATION AT THE SITE

In addition, the Phase II study provided a detailed picture of the extent of contamination at the site. The source of contamination at the site is approximately four acres of industrial fill in the center of the site. This industrial fill contains material such as pressure sensitive tape, rags, wire, drums, abrasive material and ceramics. Contaminants include acetone, benzene, toluene, ethylbenzene and xylene.

During the phase II study a grid of 49 areas were laid out and a magnetometer study was completed. A test pit was dug in each of these 49 areas to determine the characteristics of the overburden. If magnetometer anomalies were found in the specific grid area, then this became the location of the test pit. In this manner, 8 pits were found to contain drums, drum remnants or large pails in the industrial fill area. Drums were in various conditions from partially intact to remnants. Monitoring by an organic vapor analyzer (OVA) showed no response when air in these pits was analyzed in 5 of these 8 occurrences; two showed a slight response and one resulted in a high response. Monitoring with an OVA detects organic vapors and was used to screen if organic chemicals may have been present. The high response on the OVA was attributed to large quantities of tape in the excavation rather than to any drums containing chemicals. This one pit was near the center of the industrial fill.

REMEDIAL INVESTIGATION AND FEASIBILITY STUDY

In 1988, during negotiations between Norton and NYSDEC on a Consent Order requiring a remedial investigation and feasibility study (RI/FS), Norton retained ERM-Northeast to develop a workplan to outline the work and time frame necessary to complete an RI/FS. The RI/FS was to expand on the findings from the Phase II including detailed mapping of the site, further soil investigation, install additional groundwater monitoring wells, complete more extensive groundwater analysis, extensive sampling of surface water and sediment, and interpret the collected data. The RI/FS also assesses the risk to public health and environment. The final task of the RI/FS is to outline remedial alternatives, investigate various remedial technologies, and evaluate viable alternatives for remediation of the site.

Remedial Investigation Findings

Low levels of volatile organic solvents and tentatively identified semi-volatile compounds were found in the unsaturated industrial fill material above the groundwater. The highest concentrations are in the approximate center of the fill and decreases rapidly away from this center. Acetone, benzene, toluene, ethylbenzene, and xylene were the volatile organic compounds found.

Concentrations of contaminants in the soil were in the parts per billion range (see table 1).

During the Phase II investigation PCB's were detected in a concentration of 16.4 ppm at one location. There were no other findings of PCB's in further studies during the RI/FS and this one finding was viewed as an isolated finding.

Contamination is significantly lower in the perimeter area than in the industrial fill. Only two volatile organic compounds were detected, acetone and tetrachloroethene. Also detected were 17 semi-volatile compounds and 14 metals. The majority of these contaminants are concentrated in the southern corner of the site. The coal ash and slag deposited here over the years serves as the source of these semi-volatiles and metals. As was the case in the industrial fill, no pesticides or PCB's were detected in any of the samples.

Fire training activities that occurred in the southwest portion of the site were not found to have contaminated the soil materials.

The groundwater flow in this area follows the bedrock surface, which slopes to the south. Groundwater flow is very slow. Sampling shows that the contaminated groundwater has not migrated past the site boundary and is localized around the center of the industrial fill area. Further, none of the contaminants detected in the groundwater in the industrial fill area were detected in the down gradient wells. Past investigations detected free product in the groundwater in one well, which was not sampled during the RI because it was clogged with a resin like substance. Secondary soil boring and sampling work was completed to better define the lateral and vertical extent of this resin-like material and associated groundwater contamination. The resin-like substance was not found during this second round of soil boring work.

The level of surface water and sediment contamination is below water quality standards. Offsite migration of contaminants through these pathways does not pose a significant threat to human health and the environment.

TABLE 1A

SOIL SAMPLES FROM INDUSTRIAL FILL AREA
VOLATILE ORGANIC COMPOUNDS
NORTON RESTORATION SITE

TCL Compounds	SB 2 SS 2	SB 3 SS 3	SB 4 SS 2	SB 5 SS 2	SB 6 SS 1	SB 6 SS 2	SB 7 SS 1	SB 7 SS 2	SB 8 SS 2
Acetone	-	15 J	45 J	26 J	59	70	72	140	37
Benzene	-	-	16	32	18	38	-	-	-
Toluene	-	5 J	11	7	-	-	-	-	-
Ethyl Benzene	-	-	80	-	-	-	-	-	-
Xylenes (total)	-	3 J	330 Q	4 J	-	-	-	-	-
TIC Compounds									
Hexane	7 Q	8 Q	-	-	-	-	-	-	-
Propyl Benzene	-	-	60 Q	-	-	-	-	-	-
1,1,2-trichloro-1,2,ethane	-	-	-	10 Q	-	6 Q	-	-	-
Unknown Hydrocarbon(R.T.=16.81)	-	-	-	5 Q	-	-	-	-	10 Q
Dimethyl Cyclopentane Isomer	-	-	-	10 Q	20 Q	10 Q	-	-	-
2,3-Dimethyl Pentane	-	-	-	20 Q	-	-	-	-	-
Unknown Hydrocarbon(R.T.=18.90)	-	-	-	7 Q	-	-	-	-	-
Unknown Substituted Alkane(R.T.=19.83)	-	-	-	100 Q	-	-	-	-	-
Unknown (R.T.=20.30)	-	-	-	80 Q	-	-	-	-	-
Unknown Aromatic (R.T.=23.04)	-	-	-	6 Q	-	-	-	-	-
Unknown (R.T.=17.67)	-	-	-	-	20 Q	10 Q	-	-	-
Unknown (R.T.=19.77)	-	-	-	-	80 Q	-	-	-	-
Unknown Hydrocarbon(R.T.-21.850	-	-	-	-	6 Q	20 Q	-	-	-
Unknown Cyclic Alkane(R.T.=12.10)	-	-	-	-	-	8 Q	-	-	-
1,1,3 Trimethyl Cyclopentane	-	-	-	-	-	7 Q	-	-	-
Trimethyl Benzene Isomer	-	-	-	-	-	30 Q	-	-	-
Unknown (R.T.=11.44)	-	-	-	-	-	-	-	-	6 Q
Unknown Hydrocarbon(R.T.=19.85)	-	-	-	-	-	-	-	-	9 Q

Notes: All concentrations are in parts per billion (ppb).
If a boring number is not listed, no compounds were detected in that boring.
- = Compound not detected in this sample but present in another sample.
J = Semi-Quantitative due to value below CRQL or data validation requirements.
Q = Qualitative due to data validation requirements or compound being a TIC.

TABLE 1B

SOIL SAMPLES FROM INDUSTRIAL FILL AREA
SEMI-VOLATILE ORGANIC COMPOUNDS
NORTON RESTORATION SITE

TCL Compounds	SB 1 SS-2	SB 1 SS 2	SB 1 SS 3	SB 2 SS 2	SB 3 SS 3	SB 4 SS-1	SB 4 SS-2	SB 5 SS 2	SB 6 SS-1	SB 6 SS-2	SB 7 SS-1	SB 7 SS-2	SB 8 SS-1	SB 8 SS 2
Naphthalene	-	-	-	-	-	59 J	120 J	44 J	-	-	-	-	-	-
2-Methylnaphthalene	-	50 J	40 J	42 J	55 J	74 J	140 J	44 J	-	43 J	-	-	52 J	72 J
Dibenzofuran	-	-	-	-	-	32 J	55 J	-	-	-	-	-	-	-
Phenanthrene	-	300 J	330 J	310 J	40 J	290 J	480	300 J	400 J	130 J	120 J	170 J	260 J	330 J
Anthracene	-	42 J	45 J	-	-	41 J	78 J	-	44 J	-	-	-	-	52 J
Fluoranthene	-	540	630	630	170 J	420	950	490	890	190 J	180 J	250 J	450	650
Pyrene	-	500	610	600	170 J	320 J	660	340 J	790	190 J	150 J	230 J	490	560
Benzo(a)Anthracene	-	430	500	500	130 J	260 J	430	300 J	660	120 J	110 J	130 J	340 J	470
Chrysene	-	630	740	760	160 J	400 J	610	480	1100	140 J	150 J	150 J	470	630
Benzo(b)Fluroanthene	-	710	750	960	240 J	390 J	470	560	1200	86 J	94 J	270 J	570	820
Benzo(k)Fluroanthene	-	380	470	450	240 J	260 J	300 J	250 J	660	87 J	260 J	230 J	350 J	430
Benzo(a)Pyrene	-	490	500	560	100 J	270 J	330 J	320 J	790	110 J	110 J	130 J	370 J	560
Indeno(1,2,3-cd)Pyrene	-	360 J	340 J	400 J	87 J	230 J	210 J	270 J	570	-	84 J	-	200 J	350 J
Dibenzo(a,h)Anthracene	-	-	-	-	-	98 J	-	-	-	-	-	-	-	-
Benzo(g,h,i)Perylene	-	380	420	520	92 J	250 J	260 J	320 J	550	-	100 J	-	350 J	410
TIC Compounds														
Assorted Unknowns	2600 Q	-	-	-	-	-	-	-	400 Q	-	300 Q	800 Q	1100 Q	-
Assorted Alkanes	1000 Q	200 Q	100 Q	-	-	800 Q	800 Q	-	1000 Q	200 Q	-	400 Q	2500 Q	500 Q
Assorted Polynuclear Aromatics	-	1600 Q	1600 Q	1400 Q	200 Q	1000 Q	1200 Q	800 Q	1000 Q	80 Q	-	-	2000 Q	900 Q
Assorted Carboxylic Acids	-	300 Q	400 Q	400 Q	-	200 Q	-	200 Q	800 Q	-	-	-	2300 Q	300 Q
Unknown Oxygenated Hydrocarbons	1000 Q	-	-	300 Q	-	-	-	-	-	-	-	-	-	-
Assorted Aromatic Hydrocarbons	-	-	-	-	-	-	1700 Q	-	-	-	-	-	200 Q	-
Assorted Unknown Hydrocarbons	-	-	-	-	-	-	-	-	-	-	-	-	600 Q	-
Assorted Unknown Cyclic Hydrocarbons	-	-	-	-	-	-	-	-	-	-	-	-	-	1600 Q

Notes: All concentrations are in parts per billion (ppb).
- = Compound not present in this sample but present in another.
J = Semi-Quantitative due to value below CRQL or data validation requirements.
Q = Qualitative due to data validation requirements or compound being a TIC.

TABLE 1C

SOIL SAMPLES FROM INDUSTRIAL FILL AREA
PP METALS (EXPANDED)
NORTON RESTORATION SITE

Metal	Background Sample	SB-1 SS-1	SB-1 SS-2	SB-1 SS 3	SB 2 SS 2	SB 3 SS 2	SB-3 SS-3	SB-4 SS-1	SB-4 SS-2	SB-5 SS-2	SB-6 SS-1	SB-6 SS-2	SB-7 SS-1	SB-7 SS 2	SB 8 SS-1	SB 8 SS 2
Arsenic	3.5	8.2	2.3	1.9	3.6	2.8	6.9	1.3	1.5	1.5	0.76	0.72	0.7	4.2	1.0	1.0
Barium	103	135 J	32.3 J	27.9 J	19.1 J	41.6 J	40.6 J	41.5 J	18.8 J	31.7 J	45.8 J	21.1 J	63.2 J	205 J	21.7 J	22.6 J
Beryllium	1.7	0.67	-	-	-	-	-	-	-	-	-	0.33	1.1	.90	0.47	0.32
Cadmium	1.7	1.4 J	1.2 J	0.8 J	1.3 J	1.5 J	1.4 J	1.1 J	1.3 J	1.8 J	1.2 J	1.0 J	1.5 J	2.4 J	1.0 J	0.9 J
Chromium	21	17.7	12.4	18.8	10	10.9	15.4	10.3	6.4	119	17.9	9.0	14.8	26.9	8.6	6.9
Copper	17	17.4	16.2	20.7	27.2	86.0	51.1	56.3	31.6	1350	33.1	21.9	43.5	63.7	24.1	25.6
Iron	29200	29100 J	31300 J	34000 J	47600 J	66900 J	48200 J	37000 J	39700 J	54600 J	36000 J	28200 J	40600 J	39400 J	35700 J	33100 J
Lead	25	22.2	30.6	30.2	40.6	136	154	62.9	46.8	105	84.5	30.9	86.3	295	24.2	43.0
Manganese	763	449 J	388 J	375 J	627 J	710 J	1200 J	475 J	282 J	862 J	759 J	314 J	429 J	798 J	477 J	399 J
Mercury	0.14	0.10	0.08	0.10	0.10	0.09	0.74	0.38	-	0.45	0.28	0.02	0.21	0.51	-	0.11
Nickel	17	14.2	8.4	10.7	6.5	9.6	9.6	8.4	9.3	12.4	10.8	8.21	56.4	30.8	6.9	7.0
Zinc	64	108 J	43.1 J	43.4 J	36.8 J	73.6 J	90.0 J	93.9 J	31.6 J	70.1 J	118 J	29.3 J	223 J	328 J	28.7 J	41.4J
Selenium	-	-	-	0.33	-	-	-	-	-	-	-	-	-	-	-	-

Notes: All concentrations are in part per million (ppm).
- = Analyte not detected in this sample but present in another sample.
J = Semi-quantitative due to concentration below CRQL or data validation requirements.
B = Value is below CRQL but above instrument detection limit.

Risk Assessment

A risk assessment was conducted as a part of the remedial investigation. The risk assessment included identifying indicator contaminants that pose the greatest risk, determining the potential routes of exposure, quantitatively evaluating these potential exposures, assessing the toxicity of the indicator contaminants, characterizing the risk to human health, and finally assessing the environmental risk.

The risk assessment determined that there are no significant exposure pathways by which residents in the area could be exposed to contamination from the site via injestion. Exposures to contaminants via inhalation of fugitive dust emissions and volatilized organics from soils are not expected to result in any significant risk. On-site groundwater contamination exceeds water quality standards and drinking water quality standards. Evaluation of the site groundwater conditions indicates that use of groundwater in the immediate vicinity of the site for domestic water supply could result in adverse affects on human health. However, based on the conservative nature of the risk assessment and the fact that there are no residences in the immediate vicinity of the site, no adverse affects to human health due to present groundwater conditions are expected. The nearest residences to the site are clearly outside the contaminant plume and are served by public water.

There is a proposal to use the property for future industrial development. Exposures to construction workers employed at the site during development of the site for industrial purposes are not expected to result in any significant risks via direct contact with soils.

Finally, no adverse effects to sensitive environmental resources are expected as a result of site contamination. Surface water and sediment criteria for protection of aquatic life are exceeded in some samples. However, many of these criteria are also exceeded in the upstream (background) sample. Based on NYSDEC's draft guidance document on Habitat Based Assessment, remediation of sediments is not considered necessary.

REMEDIAL ALTERNATIVES

In order to address the need for remediation at the Norton Company Site, ERM-Northeast Engineers carried out a Feasibility Study which reviewed many remedial technologies and ultimately resulted in the formulation and evaluation of five site specific alternative remedial options. All the remedial alternatives except No. 1, the control or no action alternative, offer protection to human health and the environment from any future impact.

SUMMARY OF ALTERNATIVES

1 - No Action. Consideration of no action is the baseline for evaluation of other alternatives. It was included in the detailed evaluation in accordance with program requirements. The only action envisioned under this alternative is continued site monitoring.

2 - **Containment.** This alternative would completely encircle the industrial fill area with a low permeability bentonite-soil slurry wall. This wall would be approximately three feet thick, 15 feet deep to solid bed rock and 2,000 feet in length. The industrial fill area would be covered with a 190,000 square foot cap composed of gravel fill, a geofabric material and a two foot thick layer of low permeability clay keyed into the slurry wall. Site monitoring and sampling would occur twice a year.

3 - **Vitrification.** This in-situ vitrification process uses an electric current which is passed between electrodes in the ground and converts soil and contaminated materials to a stable glass material. After vitrification is complete only fencing and monitoring would be required.

4 - **Containment with Groundwater Treatment and Soil Venting.** In this alternative a slurry wall and cap would be constructed as described in Alternative No. 2. Additionally, a groundwater collection and soil venting system would be installed. Initially this groundwater would be collected and analyzed for disposal options. The soil venting system would have blowers to create a negative pressure, drawing out the gases to be scrubbed. There would be monitoring and sampling to gauge the progress of the remediation. This monitoring would be done within the waste area and around the containment system.

5 - **Source removal.** In this alternative the industrial fill area would be dewatered and then excavated, a volume of approximately 110,000 cubic yards. This excavated material would then have to be screened and disposed of in an industrial landfill. Subsequent to screening of soils, the soils would be transported to an incinerator for treatment.

EVALUATION OF REMEDIAL ALTERNATIVES

The alternatives were evaluated with respect to five criteria. Those five criteria are as follows:

- **Overall Protection of Human Health and the Environment**
  The various remedial alternatives were evaluated as to whether they are believed to be able to provide adequate protection of human health and the environment, once the remedial alternative has been completed.

- **Compliance with Clean-up Levels**
  The various remedial alternatives were evaluated as to whether or not they will be able to achieve the desired clean-up levels.

- **Reduction of Toxicity, Mobility or Volume of Contaminants**
  The various remedial alternatives were evaluated as to whether or not they will reduce the toxicity (T), mobility (M) or volume (V) of contaminants at the site.

- **Implementability**
  The various remedial alternatives were evaluated as to whether they are easy, moderate or difficult to implement. There are various factors which were taken into account when determining implementability. The factors include permit requirements, availability of needed equipment, complexity of remedial system, and maintenance.

- **Cost**
  In the cost analysis estimates of expenditures required to complete each measure were developed in terms of both capital and operation and maintenance costs. Once these figures were determined for each alternative, present worth and annual costs were calculated to facilitate comparative evaluation.

A primary goal when developing a remediation strategy for a hazardous waste site is to reduce or remove the contaminants that are the source of the problem. The first alternative, no action, is not further considered as the possible remedy for this site. Although the site is not an immediate health threat, a no action alternative will not reduce its present or future threat as an environmental problem.

By the same reasoning, the second alternative, containment, must also be eliminated. This alternative does offer the advantage of preventing offsite migration of contaminants with the construction of a slurry wall and a clay cap. However, it fails to reduce the toxicity or volume of the contamination and must be rejected.

The third alternative, vitrification, does satisfy requirements for reducing the toxicity, mobility, and volume of the hazardous waste. Vitrification is an innovative technology, and Department policy requires that new technologies be given the opportunity to be implemented when practical. Vitrification is complex and difficult to implement, has uncertainties associated with it and is one of the most expensive alternatives. Vitrification is a patented process and, as such, only one vendor is available to provide a bid.

The fourth alternative, containment with groundwater treatment and soil venting, satisfies the requirements for reducing the toxicity, mobility, and volume of the hazardous waste. The construction of a slurry wall and clay cap will effectively inhibit the infusion of rain water and the subsurface migration of contaminated groundwater. The soil venting and groundwater treatment systems will reduce the toxicity of the site by removing the contaminants and reducing the volume of the contaminated groundwater. As groundwater is lowered and upon exposure to air, any resin like material would likely solidify.

The fourth alternative also incorporates technology that have long term effectiveness in addressing the environmental problems and any minimal health risk posed by the site and will provide some degree of permanence by the reduction of contaminants captured in the groundwater collection and soil vapor recovery systems.

Source removal, the fifth alternative, is a technology that has been used successfully many times in the past. In the long term, this alternative is appealing because it completely removes the source of the contamination. On the other hand, the construction costs and problems associated with this technology make it impractical and cost prohibitive. Because of the large amount of material that would be excavated, up to two years may be required to finish the job. Contaminants would volatilize during excavation, impacting air quality. The contaminated soil would be incinerated, the ash disposed of at a RCRA approved landfill and groundwater would be collected and treated.

For a summary of the Department's evaluation of the various remedial alternatives, with respect to the preceding five criteria, see Table 2.

PREFERRED REMEDIAL ALTERNATIVE

After completion of the remedial investigation and feasibility study, the Remedial Alternative chosen by NYSDEC as the most appropriate for implementation is alternative number 4, Containment with Groundwater Treatment and soil venting. In this alternative, the industrial fill area would be isolated by a three foot thick soil-bentonite slurry wall installed to bedrock. This will prevent migration of groundwater contamination.

Groundwater will be extracted through a subsurface drain installed in the industrial fill. Groundwater will be initially stored in a large flow control tank on-site. The volume of groundwater anticipated is small so that it will be initially handled as a hazardous waste and managed by trucking to an off-site approved facility for disposal. Stored groundwater will be sampled and analyzed to determine to what levels the contaminated groundwater needs treatment and to develop disposal options.

An in-situ vacuum extraction system will collect contaminated soil vapor within the industrial fill. Installed under a clay cap, this will be used to withdraw air containing volatile organic compounds (VOCs) from the soil. This air will be treated using activated carbon filters for treatment to air quality standards prior to discharge to the atmosphere. Spent carbon will be either regenerated on-site or transported off-site for regeneration or disposal.

A clay-soil cap will be placed and keyed to the bentonite slurry wall to prevent infiltration of water and provide a seal for proper operation of the in-situ vacuum extraction unit.

TABLE 2

Evaluation of the Various Remedial Alternatives

Alternative	Overall Protection of Human Health and the Environment	Compliance with Cleanup levels	Reduction of Toxicity (T) Mobility (M) or Volume (V) of contaminants	Implementability	Estimated Total Cost
1 - No action	NO	NO	NONE	EASY	UNKNOWN
2 - Containment	YES	NO	M	MODERATE	$2,260,000
3 - Vitrification	YES	YES	T,M,V	DIFFICULT	$61,160,000
4 - Containment with Groundwater treatment & soil vapor extraction	YES	YES	T,M,V	MODERATE	$7,190,000
5 Source Removal	YES	YES	T,M,V	DIFFICULT	$71,685,000

TABLE 3

PRESENT WORTH COST ESTIMATES FOR
REMEDIAL ALTERNATIVES AT THE NORTON COMPANY SITE

No.	Alternatives Description	Estimated Capital Costs	O&M Costs As Present Worth	Total Estimated Cost (Present Worth)
1	No Action	0	Unknown	Unknown
2	Containment	$ 2,000,000	$ 260,000	$ 2,260,000
3	Vitrification	$61,000,000	$ 160,000	$61,160,000
4	Containment with Groundwater Treatment	$ 3,700,000	$3,490,000	$ 7,190,000
5	Source Removal	$71,525,000	$ 160,000	$71,685,000

Deed restrictions will be used at the site to regulate land use.

Monitoring and sampling of the site will be done to determine the effectiveness of the technology and the progress of the remediation. Monitoring will include air quality, groundwater quality, effectiveness of groundwater collection and quality of extracted groundwater.

By containing the contaminants and by reducing the toxicity, mobility, and volume of the hazardous waste, this alternative further reduces the public health and environmental risks discussed earlier.

This alternative provides the advantage of including both source control and management of migration to obtain a comprehensive remedy. This alternative also provides source reduction. Only two of the other alternatives have this advantage. This alternative effectively controls emissions during the construction and operation phase, where the other alternatives make emission controls more difficult. This alternative is more reasonable in cost than the other alternatives that provide for source reduction. Finally, the preferred remedial alternative has the advantage that the site can be returned to productive industrial use with minor restrictions.

PUBLIC PARTICIPATION

As part of the remedial investigation process, a citizen participation plan was developed for the Norton Company Site in 1988. The principle objectives of the Citizen Participation Plan were:

- Promote public understanding of the Department's responsibilities, planning activities and remedial activities.
- Provide opportunity for the Department to learn from public information that would facilitate a comprehensive program, protective of both public health and the environment.

The following public participation activities have since been carried out:

- Public repository was established at the Watervliet Library and the Region 4 Office in Schenectady in March 1988 to contain documents available for public review.
- The results of the Phase II investigation was the focus of a public meeting at 7:00 PM, April 5, 1988 at the Watervliet High School.

- Work plan for the remedial investigation (RI) and feasibility study (FS) was placed in public repository.

- On February 11, 1991 a copy of the RI, FS, and the Department's proposed remedial action plan were placed in both public repositories.

- A public notice of the availability of the RI, FS and the proposed remedial action plan was published and a public meeting was scheduled for February 25.

- A Press Release was also distributed from the Regional Office. Public comment period would be open until March 15, 1991.

- A public meeting was held on the remedial investigation, feasibility study, and proposed remedial action plan at the Watervliet High School Auditorium on February 25, 1991. Questions and answers recorded during this meeting are used to develop the Responsiveness Summary presented in Appendix B of this document.

LEGAL STATUS

The remediation of the Norton Company Site is being completed under administrative Order on Consent with the Norton Company, Coated Abrasives Division, Watervliet. Norton has complied with the Consent Order dated July 24, 1989 which outlined the requirements through the remedial investigation and feasibility study stage. The Department and Norton will be entering into negotiations for a new Consent Order to carry the remedial project through the design phase into construction and operation of the remedial program.

The remedial program carried out thus far at the Norton Company Site and the chosen remedy outlined in this document, comply with Article 27, Title 13 of the New York State Environmental Conservation Law, and with Public Law 96-510 and Public Law 99-489, the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) and the Superfund Amendments Reauthorization Act of 1986 (SARA), respectively. These laws provide the legal basis for the New York State hazardous site remedial program.

APPENDIX A

List of Documents in the Administrative Record

1. "Phase I Investigation Report, Norton Company Landfill, Colonie (T) Albany County, New York," Wehran Engineering, P. C. - September 1984

2. Order on Consent, "In a Matter of a Field Investigation to Identify Any Threat to the Environment...," December 4, 1987

3. "Work Plan, Phase II Investigation, Norton Company Landfill, Albany County, New York," ERM-Northeast - Revised August 1987

4. "Phase II Investigation, Norton Company Landfill, Colonie, New York," ERM-Northeast - March 1988

5. "Draft Citizen Participation Plan, Norton Company Site," Department of Environmental Conservation (undated)

6. "Remedial Studies Work Plan, Norton Company Restoration Site, Colonie, New York," ERM-Northeast - September 1988

7. "Appendix A, Standard Operating Procedures for the Collection of Environmental Samples, Norton Company Restoration Site," ERM-Northeast - October 1988

8. "Appendix B, Health and Safety Plan, Remedial Study, Norton Company Restoration Site, Colonie, New York," ERM-Northeast - September 1988

9. "Appendix C, Quality Assurance and Qualify Control (QA/QC) Protocol For Collection of Environmental Samples, Norton Company Restoration Site, Remedial Studies," ERM-Northeast - October 1988

10. Order on Consent "In the Matter of the Development and Implementation of a Remedial Investigation and Feasibility Study...," July 24, 1989

11. "Remedial Investigation Report, Norton Company Restoration Site, Watervliet, New York," ERM-Northeast - January 19, 1990

12. "Feasibility Study, Norton Company Restoration Site, Watervliet, New York," ERM - Northeast - October 31, 1990 revised January 18, 1991

13. "Proposed Remedial Action Plan for Norton Company Site No. 401010," New York State Department of Environmental Conservation - February 1991

14. Legal Notice, "Norton Company Site Public Meeting February 25, 1991...," The Times Union, Albany, February 13, 1991

15. "The Stenographic Record, State of New York, Department of Environmental Conservation in the Matter of a Proposed Remedial Action Plan for Norton Company Site No. 401010," Pauline E. Williman - February 1991.

APPENDIX B

RESPONSIVENESS SUMMARY

The New York State Department of Environmental Conservation (NYSDEC) held a public meeting February 25, 1991 in the Watervliet High School Auditorium to discuss the findings of the Norton Company Remedial Investigation and Feasibility Study (RI/FS) and the Proposed Remedial Action Plan.

The RI/FS documents have been available for public review since February 11, 1991 at the following locations:

Watervliet Public Library - Watervliet, NY
NYSDEC, Region 4 Office - Schenectady, NY

Summary of Public Concerns & NYSDEC Responses

Q1. Approximately four acres will be remediated. What will happen to the remainder of the 22 acres site?

A. No contamination was found outside of the 4 acre area that contains the industrial waste. There is fill in this area consisting of iron slag, coal ash, brick fragments, cinders, and soils ranging from silts to gravels. Low levels of semi-volatile organics indicative of the combustion process were found in this material. These semi-volatile organics are in such low concentrations that they will not migrate or impact public health or the environment.

The site is completely fenced and access is controlled by the Norton Company. Access to the site will continue to be controlled during the remedial project. Norton has indicated that they may use part of the site to construct warehouse capacity.

Q2. What will happen to the material excavated during installation of the slurry wall? Will any of the materials be non-hazardous and will anything end up in the Town of Colonie Landfill?

A. Materials excavated will be placed in the interior of the industrial fill area - inside the slurry wall. If hazardous waste is encountered, it would be handled as a hazardous waste and shipped off-site for disposal at an approved hazardous waste treatment and disposal facility.

Q3. What is the time table for the remedial project?

A. We have not entered into negotiations with Norton Company or work beyond the RI/FS stage. However, in informal discussions, Norton has indicated that construction will start during the 1992 construction season. It is also anticipated that the construction will be complete by the send of the season. The actual construction time frame will be worked out in the design phase.

Q4. Vapors will be extracted from beneath the clay cap. Will there be any significant health hazards?

A. Vented gases will be treated by activated carbon absorption before discharge to the atmosphere. The actual air quality criteria or emission standards will be developed during the design and construction phase.

Q5. How long will monitoring continue?

A. Monitoring of the extracted gases will continue as long as volatile organics are extracted. Monitoring of the groundwater collected from the industrial fill area and the effectiveness of the groundwater collection system will continue as long as the collected groundwater continues to show levels of contamination above groundwater standards. Monitoring of groundwater quality outside the industrial fill area will continue even after the remedial action is complete to assure that the remediation was effective. Specifics of the monitoring programs will be developed during the design phase of the project and a long term monitoring program will be implemented after construction.

Q6. What is the total tonnage of waste that was disposed here?

A. We have no idea how much industrial waste or how much hazardous waste was disposed of here. The total volume is four acres by a 15 foot depth. Only a small fraction of this is hazardous waste since contaminants are found in the parts per billion range.

Q7. Is Norton in agreement with the proposed remedial action plan?

A. A great deal of material in the remedial action plan was obtained from the remedial investigation and feasibility study completed by Norton's consultant ERM. We have had some discussions with Norton on particular points. Basically, the proposed alternative is the alternative that Norton and their consultants proposed.

Q8. What is the cost of the proposed remedial alternative?

A. Cost is estimated at $7.2 Million (present worth).

NOTE: Following the public meeting one of the people attending visited the Region 4 Office to gain more information about the site location. The DEC representative presiding at the meeting was not aware that there is a Lansing Lane in Watervliet that borders the western extremity of the Norton Coated Abrasives Division plant and is an access to the Callanan plant to the West of the site. When describing the site location, he referred to the Lansing and Archibald Avenue residential area in

NORTON COMPANY SITE

REMEDIAL INVESTIGATION/FEASIBILITY STUDY

Public Meeting

Watervliet High School Auditorium

February 25, 1991

7:30 PM

Name	Address	Representing
Gary Johnston	2176 Guilderland Ave.	DEC
David Sedia	3434 Carman Rd.	PATS, Inc.
Mark O'Keefe	413 Kenwood Avenue	Atlantic ESI
John Sheehan	NYSDOH	NYSDOH
Ruth & Bill Egan	1330 - 3rd Ave.	Self
Pat Vartigian	Watervliet	Norton Co.
Doris Steminsky	84 Cohoes Rd.	Self
Steve Lukowski	502 Acre Dr., Sch'dy	ACHD
George Perry	25th St. & 10th Ave.	W'vliet Schools
M.A. Daruak	52 Lansing Lane	Watervliet
John McGahn	3520 Lydius St.	Schenectady, NY
Nebraska Brace	LOB #809	Ken Nolan
Anita M. Gobalski	2 University Place, Alb.	NYSDOH
Jim Ridenour	3-24 Farnsworth Dr.	Slingerlands
Jeff Frazer	51 Evergreen Ave. Clifton Park	Laidlaw
Eric Hamilton	2176 Guilderland Ave. Schenectady, NY	DEC - Region 4
Darwin Roosa	"	"
Tom O'Brien	Watervliet	Norton Co.
Paul Rentz	Watervliet	Norton Co.
Paul Rappelyea	Watervliet	Norton Co.
Frank Doherty	Worcester, MA	Norton Co.
Robert Varnum	Watervliet	Norton Co.
Neal Durkee	Watervliet	Norton Co.

the Maplewood Section of the Town of Colonie. Once the difference between the two - Lansing Lane, Watervliet and Lansing Avenue - were determined, the meeting attendee's concerns were mitigated. The meeting attendee lives on Lansing Lane in Watervliet.

There were no written questions or comments received during the 30 day comment period which ended March 15, 1991 nor since that date.