VOLUME 5

FRONTIER STONE, LLC
PROPOSED FRONTIER STONE QUARRY

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January 29, 2014

APPENDIX 7

- **Wetland Delineation Report**
- **Wetlands Impact Assessment**

WETLAND DELINEATION REPORT
FOR THE
SHELBY QUARRY SITE

TOWN OF SHELBY, ORLEANS COUNTY, NEW YORK

Prepared for:

CONTINENTAL PLACER, INC.
II Winners Circle
Albany, New York 12205

Prepared by:

TERRESTRIAL ENVIRONMENTAL SPECIALISTS, INC.
23 County Route 6, Suite A
Phoenix, New York 13135

Revised October 2007

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1.0 INTRODUCTION

Terrestrial Environmental Specialists, Inc. (TES) was contracted by Continental Placer Inc. to perform a wetland investigation at the Shelby Quarry site located in the Town of Shelby, Orleans County, New York. The study area consists of two parcels separated by a National Grid Electric transmission line right-of-way (ROW); it is approximately 268 acres in size and is located east of Sour Spring Road, south of Fletcher Chapel Road, and west of South Wood Road (Figure 1).

The TES wetland investigation consisted of a review of available background information and a field delineation of potential wetlands and other potentially regulated waters. This report presents the results of the background information review and the wetland delineation. A variety of figures are included with this report, along with photographs and field data sheets.

2.0 BACKGROUND INFORMATION REVIEW

Prior to the field investigation at the site, TES assembled and reviewed available background information. This information included:

- the New York State Department of Transportation (NYSDOT) topographic map (Knowlesville & Medina quadrangles) (Figure 1);
- the New York State Department of Environmental Conservation (NYSDEC) New York State Freshwater Wetlands map (Figure 2);
- the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) map (Figure 3);
- the Orleans County Soil Survey map prepared by the U.S. Soil Conservation Service (currently Natural Resources Conservation Service) (Figure 4);
- the New York State Stream Classification Map (Figure 5);
- the Federal Emergency Management Agency (FEMA) Flood Insurance Rate map (Figure 6); and
- a 2005 aerial photograph obtained from the New York State GIS Clearinghouse (Figure 7).

These background resource maps were developed into figures. All these figures are provided after the text of this report.

3.0 METHODS

The agency resource information maps, soils descriptions, and the aerial photograph discussed above were used during the field review of the site. These maps and information assisted in the initial identification of potential wetland areas.

Flagging of potential wetlands and other potentially regulated waters on the site and data collection along the boundaries were performed by TES on November 11, 2006. Field reviews were also performed in late May 2007 and October 4, 2007. The boundaries were delineated using the federal criteria for vegetation, soils, and hydrology (Environmental Laboratory 1987, Reed 1988, and USSCS 1989).

Surveyor's ribbons were placed along potential wetland boundaries based on observations of vegetation, soils, and hydrology conditions. These observations were made along transects located perpendicular to potential wetland boundaries. Additional observations of vegetation, soils, and hydrology were made at intermediate locations between the transects for the placement of additional flagging. Each wetland flag was labeled with a letter identifier of the potential wetland and was numbered consecutively (for example, A-1, A-2, A-3, etc.). Continental Placer Inc. surveyed the flagged wetland boundaries.

To further support the potential wetland boundaries, data on vegetation, soils, and hydrology were collected during the field effort in plots along transects located perpendicular to the potential wetland boundaries on the site. TES sampled 10 plots in and around the potential wetlands and in other representative areas of the site. Plots were generally located on the wetland and upland sides of the flagged boundaries. The plot data were recorded on data sheets similar to those used in the federal manual (Environmental Laboratory 1987).

Vegetation data were collected in all the plots. Ocular estimates of the percent areal cover by plant species for each vegetation layer (tree, shrub, and herbaceous layers) were recorded. The plots varied in size by vegetation layer being sampled. The sizes were: 30-foot diameter for the trees, 10-foot diameter for the shrubs, and 5-foot diameter for the herbaceous layer.

The presence of wetland vegetation was determined when more than 50 percent of the dominant species in a sample plot had an indicator status of obligate (OBL), facultative-wet (FACW), or facultative (FAC+, FAC), excluding FAC-. The dominant species for each layer in a plot were determined by ranking the species in decreasing order of percent cover and recording those species which, when cumulatively totaled, immediately exceeded 50 percent of the total cover of that layer. Additionally, any plant species that comprised 20 percent or more of the total cover for each layer was considered to be a dominant species.

Scientific nomenclature for plant species follows *A Checklist of New York State Plants* (Mitchell and Tucker 1997). The indicator status for each dominant plant species was determined using the *National List of Plants that Occur in Wetlands: Northeast (Region 1)* (Reed 1988) and the *1995 Supplement To the List Of Plant Species That Occur In Wetlands: Northeast (Region 1)* (Tiner *et al.* 1995). For any species not included in the list, the indicator status was designated using the *Manual of Vascular Plants of Northeastern United States and Adjacent Canada* (Gleason and Cronquist 1991), *New Britton and Brown Illustrated Flora* (Gleason 1952), and *Gray's Manual of Botany* (Fernald 1950).

Soil and hydrology data were collected in soil pits or soil borer holes to a minimum depth of 20 inches within each sample plot. Soil characteristics were noted along the soil profile at the depth specified by the Corps criteria (Environmental Laboratory 1987). Procedures for identifying hydric soils as outlined in the *Field Indicators of Hydric Soils in the United States*

(USDA NRCS 1995) were also followed. Soil colors were determined by using the Munsell color chart. Primary and secondary indicators of hydrology were also noted at each sample plot. The wetland boundaries were refined on the basis of intermediate soil borer holes along each transect.

4.0 RESULTS

The following section of the report provides a site description and wetland descriptions at the Shelby Quarry site.

4.1 Site Description

The site is located east of Sour Spring Road, south of Fletcher Chapel Road, and west of South Wood Road in the Town of Shelby, Orleans County, New York (Figure 1). The site is composed of two parcels separated by a National Grid electric transmission line ROW. An overhead electric line also borders the southern portion of the site, with the Iroquois National Wildlife Refuge just south of this electric line.

Elevations on the site range from approximately 650 feet mean sea level (msl) to 630 feet msl, sloping to the southwest (Figure 1). Surrounding land uses in the vicinity of the site are primarily agricultural.

The NYSDEC freshwater wetlands map (Figure 2) does not show any wetlands on the site, although Wetland OK-1 occurs on the National Wildlife Refuge property south of the site. The NWI map (Figure 3) does not show any wetlands on the site. Along the southeastern boundary of the site a wetland is mapped on the NWI as palustrine, forested, broad leaved deciduous, seasonal (PFOIC).

The Orleans County soil survey map (Figure 4) produced by the U.S. Soil Conservation Service (currently Natural Resources Conservation Service) primarily maps the following soil type on the site: Bombay fine sandy loam, 3 to 8 percent slopes; Canandaigua soils; Cayuga silt loam, 2 to 6 percent slopes; Churchville silt loam, 0 to 2 percent slopes; Cosad loamy fine sand; Hilton loam, 3 to 8 percent slopes; Lakemont silty clay loam; Odessa silt loam, 0 to 2 percent slopes; and Ontario loam, 3 to 8 percent slopes. Odessa silt loam is the most abundant soil on the site. Bombay fine sandy loam, Cayuga silt loam, Hilton loam, and Ontario loam are all upland soils. Bombay fine sandy loam is located in the south-central portion of the site. Cayuga silt loam, Hilton loam, and Ontario loam are all located along the northern boundary of the site. Churchville silt loam, Cosad loamy fine sand, and Odessa silt loam are soils with the potential for hydric inclusions. Churchville silt loam is located along the northern portion of the site as well as the south-central portion. Cosad loamy fine sand is located in the northeastern and the southeastern portion of the site. Odessa silt loam makes up the majority of the central section of the site and extends south along the eastern boundary of the site. Canandaigua soils and Lakemont silty clay loam are all hydric (wetland) soil types. These soils are located along the southwestern portion of the site.

Drainage on the site is generally to the southwest. The New York State Stream Classification map (Figure 5) does not show any tributaries, streams, or waterbodies on or near the site. According to the FEMA Flood Insurance Rate Map (Figure 6), the site is outside the 500-year flood area.

4.2 Site Ecology

The site consists of active cropland, open fields, scrub-shrub uplands, and ditches. These cover types are indicated on Figure 7. Acreage of each cover type is presented in Table 1.

Most of the site is cropland (Figure 7). Cropland covers 263 acres or 98.1% of the site (Table 1). The croplands contained soybean (*Glycine max*) and corn (*Zea mays*) during 2006, with common weed species of amaranth (*Amaranthus* sp.) and panic grass (*Panicum* sp.) in the fields. In 2007, the site was planted in corn and soybean.

The open field area is located in the eastern portion of the site. It is a narrow, linear strip, which was previously used as a landing strip. It is frequently mowed. It covers 2.3 acres or 0.9% of the site. Tall fescue (*Lolium arundinaceum*), sedge (*Carex* sp.), white clover (*Trifolium repens*), common dandelion (*Taraxacum officinale*), and wild carrot (*Daucus carota*) dominate the herbaceous layer.

The scrub-shrub upland cover type is located in patches in the eastern and southeastern portions of the site. It covers 2.0 acres or 0.7% of the site. The shrub layer in this cover type consists of gray dogwood (*Cornus foemina* ssp. *racemosa*) and common buckthorn (*Rhamnus cathartica*). The herbaceous layer is sparse and contains raspberry (*Rubus* sp.).

Three ditches were identified on the site in 2006. The wetland and ditches are described in detail in the following section of the report.

4.3 Wetland and Ditch Descriptions

Three ditches on the site are referred to as Ditch A, Ditch B, and Ditch D. The ditches contain wetland vegetation and were delineated; the boundaries of these areas are shown on Figure 8, and were surveyed by Continental Placer Inc. Ditches A, B, and D total 0.7 acre and 4,742 linear feet.

The three delineated ditches on site total approximately 0.7 acre. These ditches are agricultural ditches which drain upland areas such as the airport runway and agricultural fields and do not carry a relatively permanent flow of water. The Memorandum Guidance Letter – *"Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rappanos v. United States & Carabell v. United States"* issued on June 5, 2007 states *"ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry relatively permanent flow of water are generally not waters of the U.S. because they are not tributaries or they do not have a significant nexus to downstream traditional navigable waters."*

Wetland sample plot and photograph locations are shown on Figure 9. Photographs and field data sheets are provided in Appendix A and Appendix B, respectively.

Ditch A

Ditch A is dominated by wet meadow and emergent species; it totals 0.40 acre and 2,538 linear feet within the site boundary. Wetland A occurs along a ditch that bisects the site from west to east (Figure 8). This ditch continues offsite; it flows south within the National Grid transmission line ROW.

Ditch A contained emergent wetland vegetation dominated by rice cut grass (*Leersia oryzoides*), broad-leaf water plantain (*Alisma plantago-aquatica*), and narrow leaf cattail (*Typha angustifolia*) in the herbaceous layer.

Soils in Ditch A were mapped as soils with potential for hydric inclusions. These soils showed low matrix chromas with mottles, redoximorphic features and sulfidic odor.

Ditch A was created. Hydrology indicators included inundation, saturation in the upper 12 inches, and drainage patterns. As previously indicated, based on the June 5, 2007 guidance it is not considered a jurisdictional wetland.

Ditch B

Ditch B is dominated by wet meadow and emergent species; it totals 0.22 acre and 1,730 linear feet. This ditch occurs along the northern edge of the grass runway mapped as open field on the vegetation cover map (Figure 8). Culverts under the open field area (inactive grass runway) connect Ditch B to Ditch A. Ditch B is dominated by wet meadow vegetation. Bluegrass (*Poa* sp.) is the dominant herbaceous plant in Ditch B.

Soils in Ditch B were mapped as soils with potential for hydric inclusions. These soils showed low matrix chromas with mottles and redoximorphic features.

Ditch B is a created ditch. Hydrology indicators included inundation, saturation in upper 12 inches, and drainage patterns. As previously indicated, based on the June 5, 2007 guidance, it is not considered a jurisdictional wetland.

Ditch D

Ditch D is a created ditch; it totals 0.08 acre and 488 linear feet within the site boundary. Ditch D occurs in the southeastern portion of the site and extends off site to the south (Figure 8). It is primarily an emergent wetland. Rice cut grass and broad leaf cattail (*Typha latifolia*) dominate Ditch D.

Soils in Ditch D were mapped as soils with potential for hydric inclusions. These soils showed low matrix chromas with mottles and redoximorphic features.

Ditch D was created. Hydrology indicators included inundation, saturation in upper 12 inches, and drainage patterns. As previously indicated, based on the June 5, 2007 guidance, it is not considered a jurisdictional wetland.

5.0 SUMMARY

Terrestrial Environmental Specialists, Inc. (TES) was contracted by Continental Placer Inc. to perform a wetland investigation on the Shelby Quarry site located in the Town of Shelby, Orleans County, New York. The study area consists of two parcels separated by a National Grid electric transmission line right-of-way (ROW); the site is approximately 268 acres in size and is located east of Sour Spring Road, south of Fletcher Chapel Road, and west of South Wood Road (Figure 1).

TES collected and reviewed available background information and maps, including topographic map, wetland maps, soils maps and descriptions, stream classification map, flood insurance rate map, and an aerial photograph to locate potential wetlands on the site. TES delineated potential wetlands on the site on November 11, 2006 and October 4, 2007 using methods described in the U.S. Army Corps of Engineers 1987 Wetlands Delineation Manual.

There are no mapped state-regulated wetlands or NWI wetlands on the site. No streams, waterbodies, or floodplains occur on the site. Nearly all the site (98%) is cropland.

Three ditches were delineated on the site. They were referred to as Ditch A (0.40 acre and 2,538 linear feet), Ditch B (0.22 acre and 1,730 linear feet), and Ditch D (0.08 acre and 488 linear feet). The ditches are man-made ditches.

The ditches are not considered jurisdictional wetlands, in light of the recently issued (June 5, 2007) "Memorandum Guidance Letter – *"Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rappanos v. United States & Carabell v. United States,"* in which the Department of the Army and the U.S. Environmental Protection Agency clarified that the agencies will no longer assert jurisdiction over certain features in light of the Supreme Court's decision in the consolidated case *Rapanos v. United States* and *Carabell v. United States*. Specifically, the decision limited jurisdiction over certain ditches that may contain wetland characteristics.

6.0 REFERENCES

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

Corps. 2007. Practices for Documenting Jurisdiction under Section 404 of the Clean Water Act (CWA) and Sections 9 and 10 of the Rivers and Harbors Act (RHA) of 1899. RGL 07-01. U.S. Army Corps of Engineers, Washington, D.C.

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Reed, P. B. Jr. 1988. National List of Plant Species that Occur in Wetlands: Northeast (Region 1). U.S. Fish and Wildlife Service, Biological Report 88 (26.1), St. Petersburg, FL.

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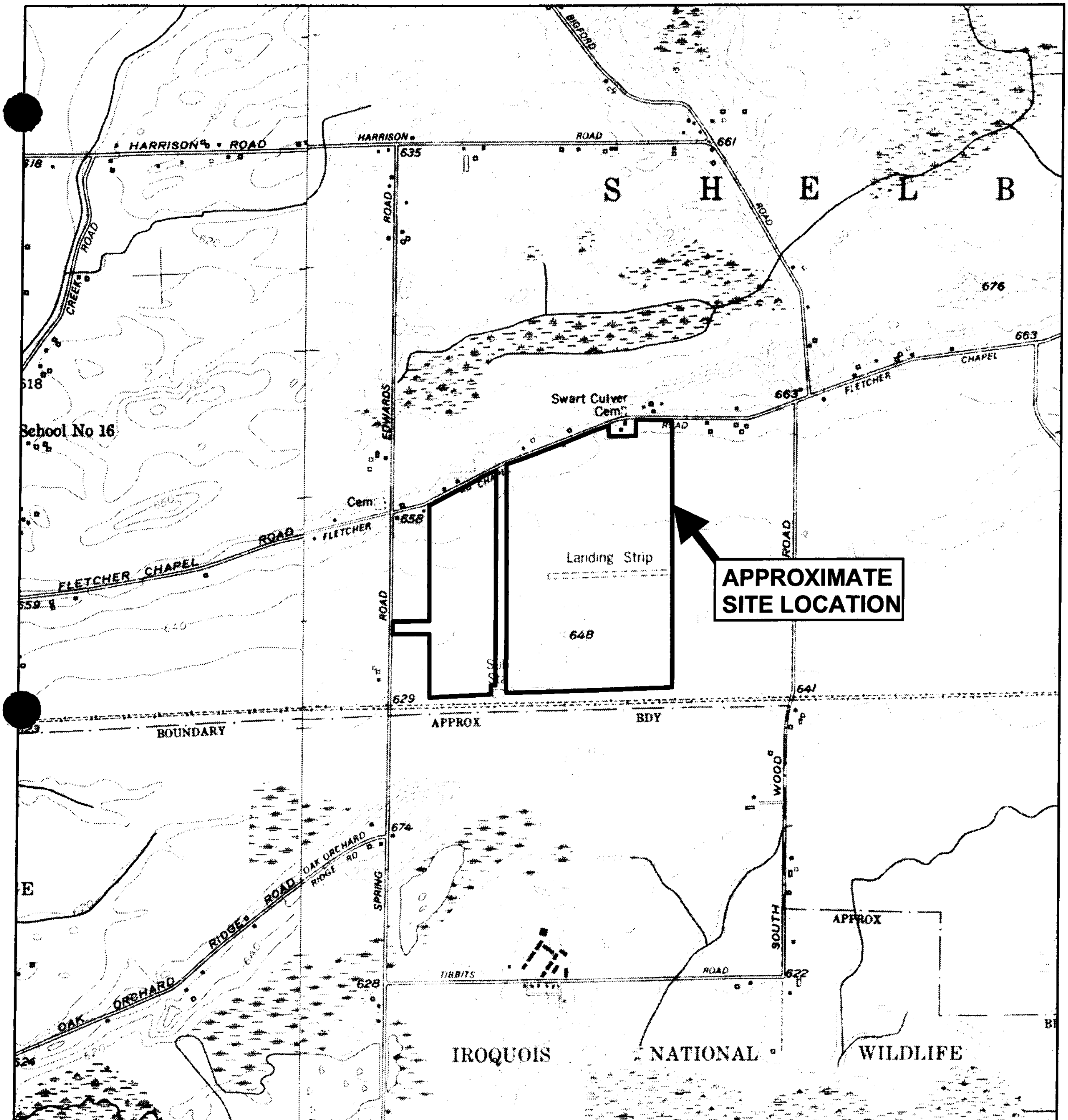
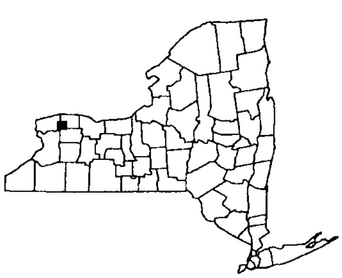
USDA NRCS. 1995. Field Indicators of Hydric Soils In the United States. USDA NRCS, Washington, D.C.

Table 1.

Acreage of Vegetation/Land Use Cover Types
Proposed Shelby Quarry Site, Town of Shelby, Orleans County, New York

Vegetation/Land Use Type	Acreage	% of Total Site
Agricultural Cropland	263.0	98.1%
Open Field	2.3	0.9%
Scrub-Shrub Upland	2.0	0.7%
Ditches	0.7	0.3%
Total	268.0	100.0%





QUADRANGLE LOCATION

0 1000' 2000'

SCALE 1" = 2000'

NORTH

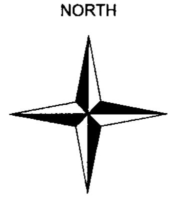


Figure 1. Site Location

NYS DOT Topographic Map

Knowlesville and Medina Quadrangles
1981 and 1976

Prepared by TERRESTRIAL ENVIRONMENTAL SPECIALISTS, Inc.

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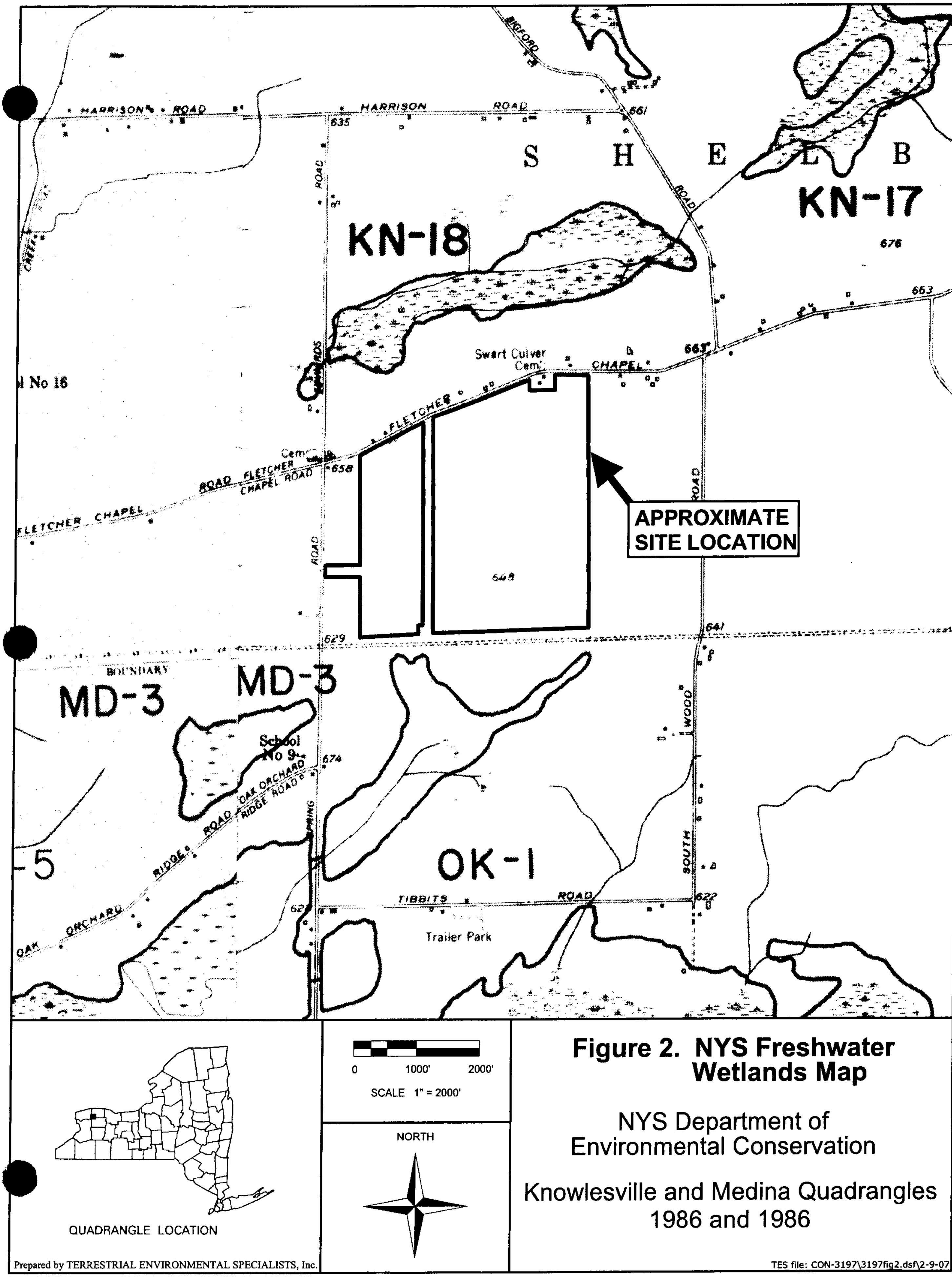

Figure 2. NYS Freshwater Wetlands Map

NYS Department of Environmental Conservation

Knowlesville and Medina Quadrangles 1986 and 1986

Prepared by TERRESTRIAL ENVIRONMENTAL SPECIALISTS, Inc.

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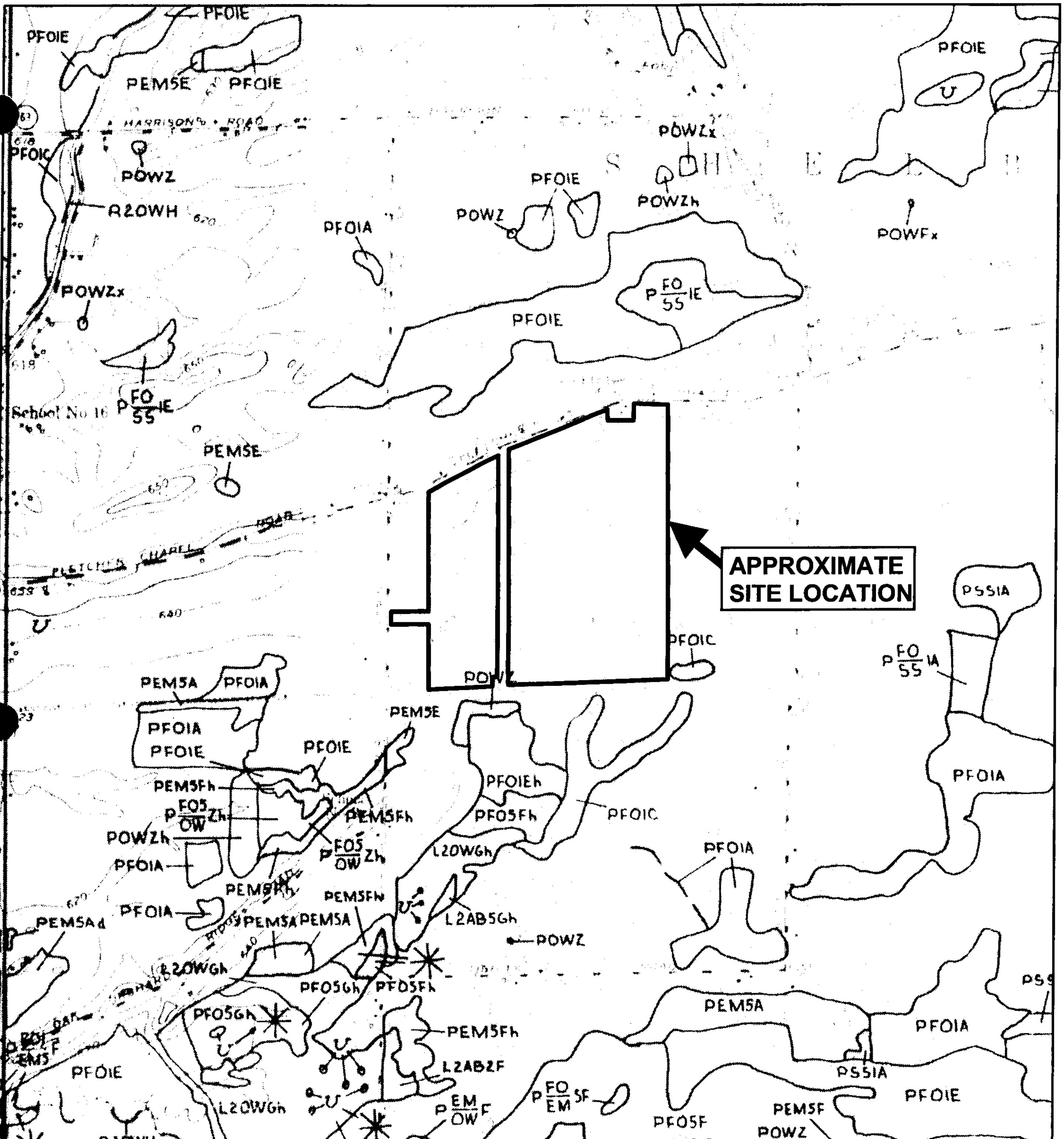

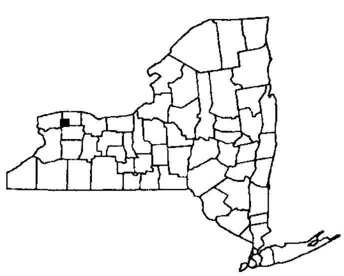

QUADRANGLE LOCATION

0 1000' 2000'

SCALE 1" = 2000'

NORTH

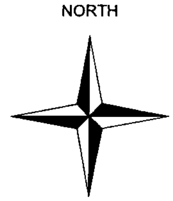

Figure 3. National Wetlands Inventory Map

U.S. Fish & Wildlife Service

Knowlesville and Medina Quadrangles 1971 and 1981

Prepared by TERRESTRIAL ENVIRONMENTAL SPECIALISTS, Inc.

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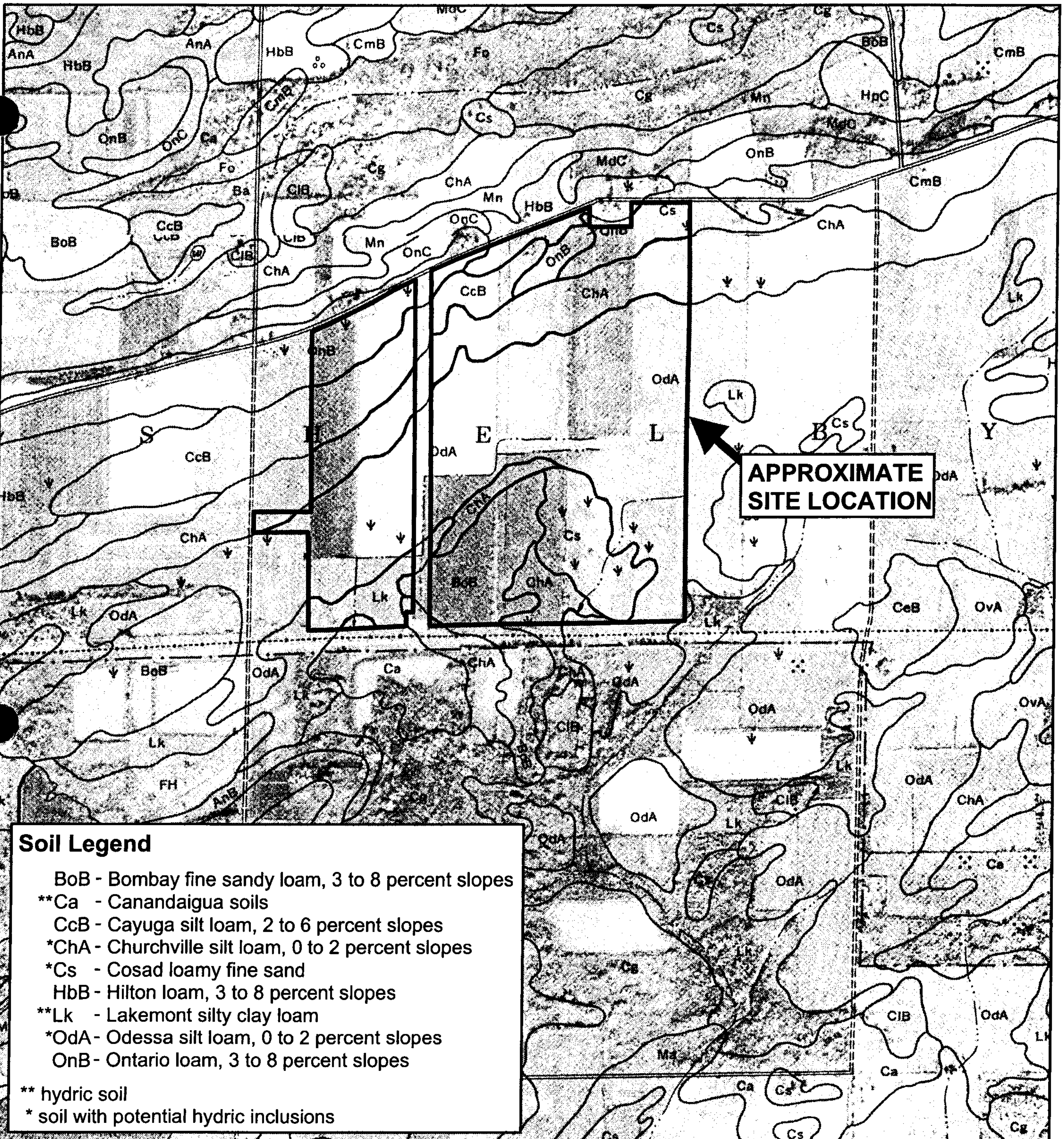


0 660' 1320'

SCALE 1" = 1320'

NORTH

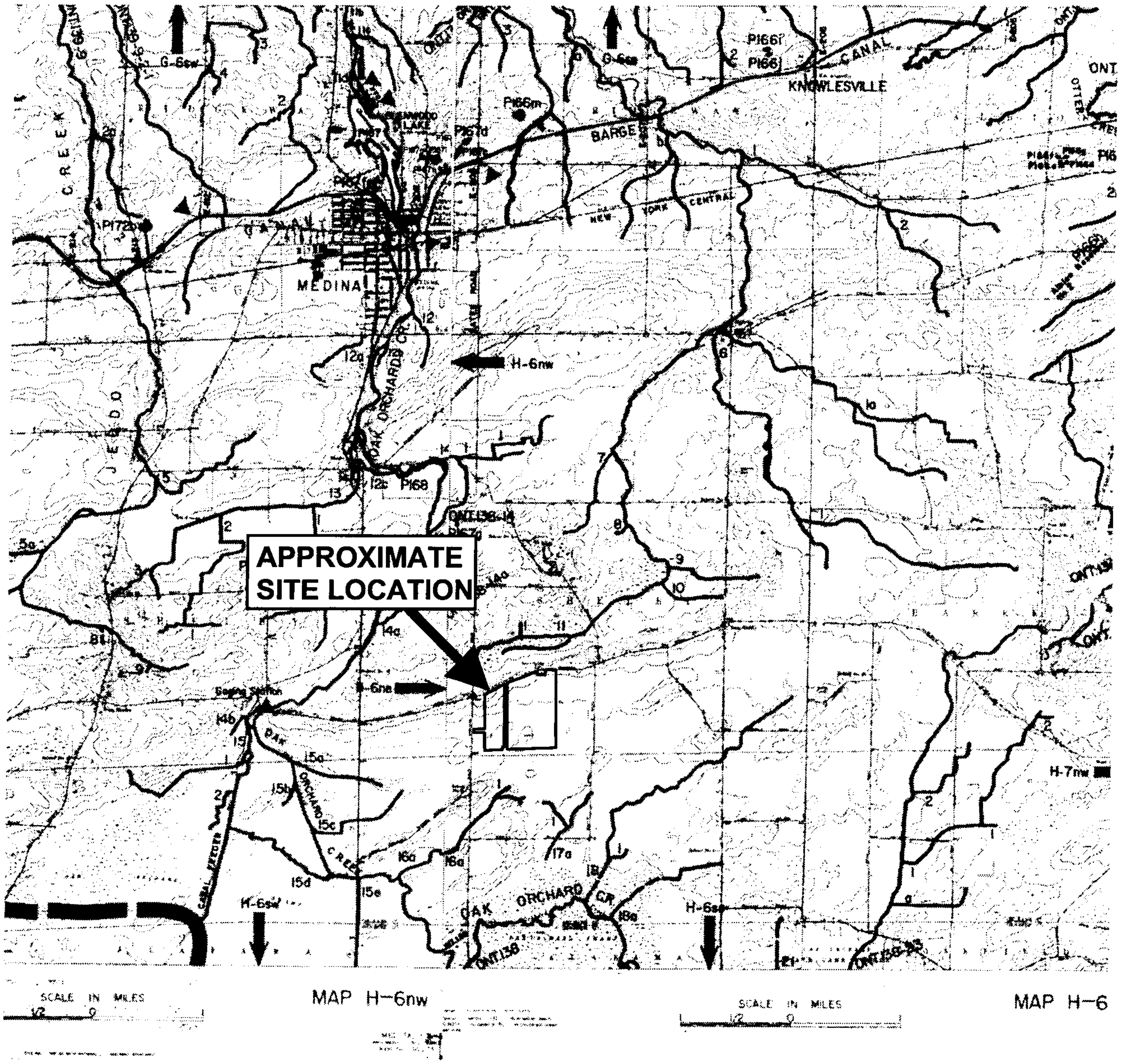
Figure 4. Soil Survey Map

U.S. Soil Conservation Service

Orleans County Soil Survey

1977

Sheets 36 and 42



Item No.	Waters Index Number	Name	Description	Map Ref. No.	Class	Standards

No streams present on site.

Title 6 NYCRR, Chapter X
Article 9, Part 847.9 (1992)

Map H-6nw
Map H-6ne

0 4000' 8000'
SCALE 1" = 8000'

NORTH

Figure 5. Stream Classification Map

NYSDEC

Knowlesville and Medina Quadrangles

Prepared by TERRESTRIAL ENVIRONMENTAL SPECIALISTS, Inc.

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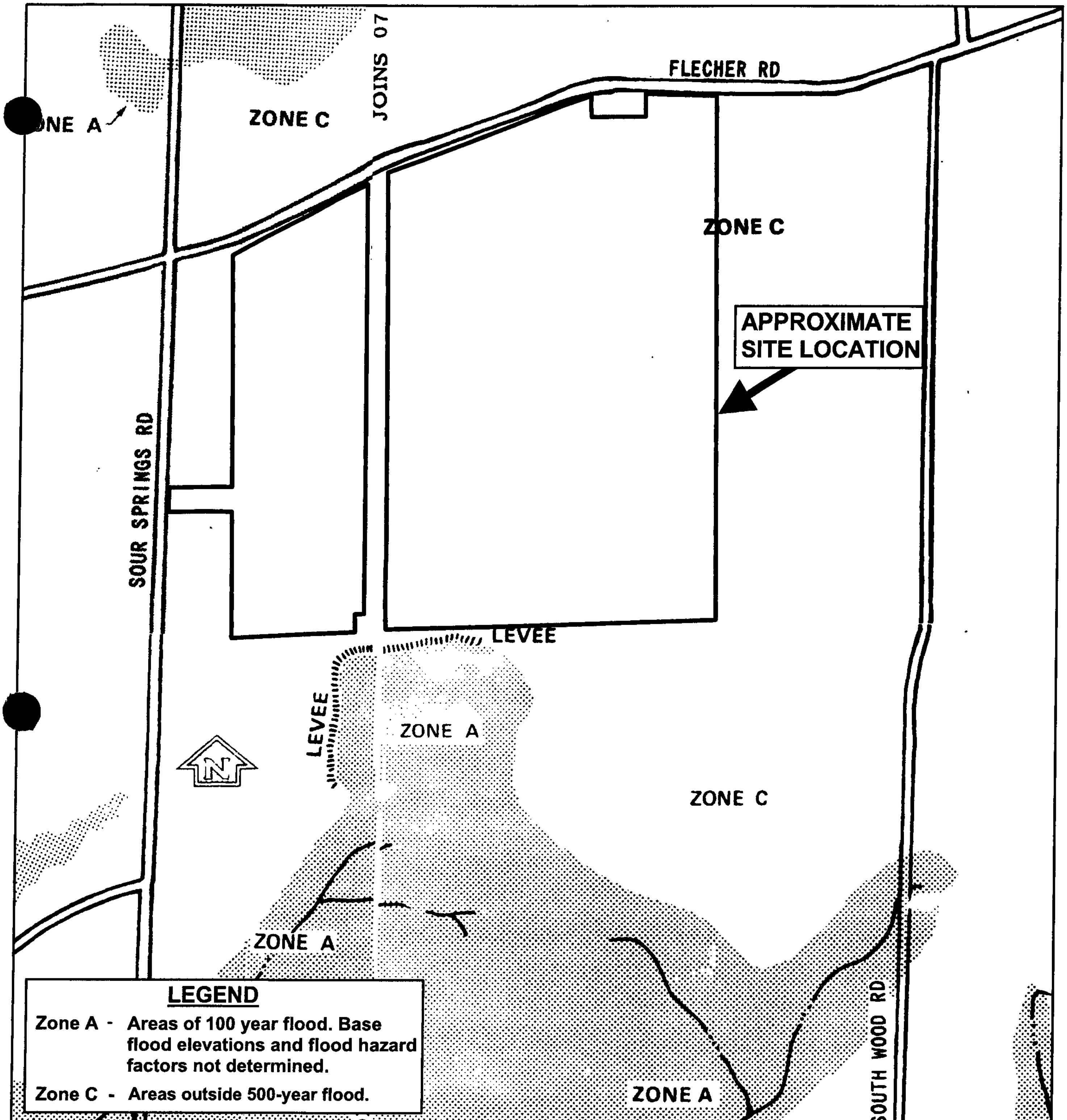


LEGEND

Zone A - Areas of 100 year flood. Base flood elevations and flood hazard factors not determined.

Zone C - Areas outside 500-year flood.

Panel Numbers:

361258B

(Effective Date 12/23/83)

0 500' 1000'

SCALE 1" = 1000'

NORTH

Figure 6. Flood Insurance Rate Map

Federal Emergency Management Agency

Town of Shelby, NY

Prepared by TERRESTRIAL ENVIRONMENTAL SPECIALISTS, Inc.

TES File: CON-3197\3197fig6.dsf\2-9-07

LEGEND

AC - Agricultural Cropland
OF - Open Field
SSU - Scrub-Shrub Upland

NORTH

0 200' 400'

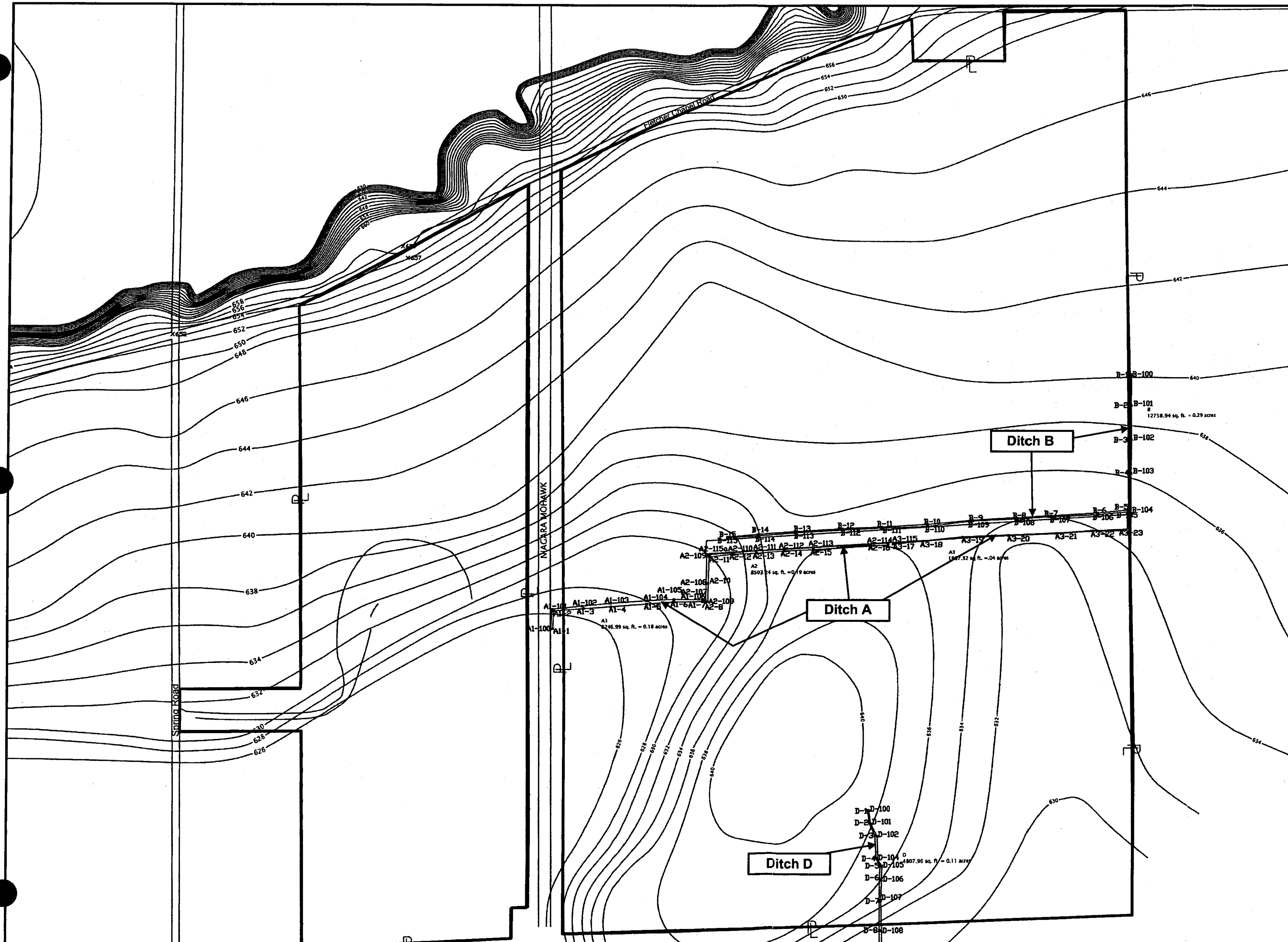
APPROXIMATE SCALE IN FEET

Aerial Photograph obtained from NYS GIS Clearinghouse 2005

Prepared by Terrestrial Environmental Specialists, Inc.

Figure 7. Vegetation/Land Use Cover Map

TES File: CON-3197\3197covertype-revised.dsf\10-9-07

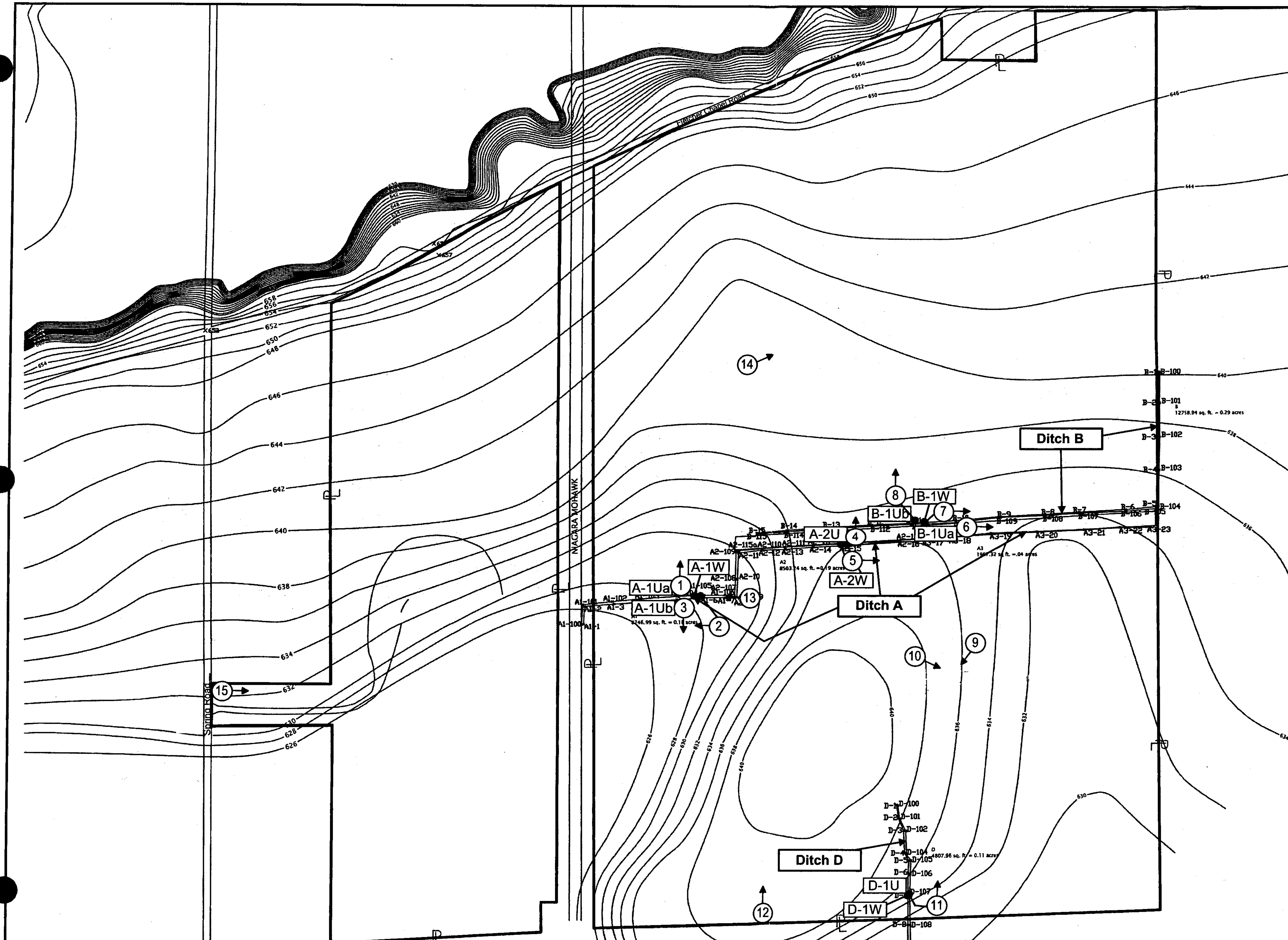


Base Map Provided Continental Placer Inc.

Figure Prepared by Terrestrial Environmental Specialists, Inc.

Figure 8. Wetland Delineation Survey Map

TES File: CON-3197\3197wetland-location-revised.dsf\10-9-07



LEGEND

Wetland

B-1W Sample Plot Location

1 Photo Location and Direction

NORTH

0 200' 400'

APPROXIMATE SCALE IN FEET

Base Map Provided by Continental Placer Inc.

Figure Prepared by Terrestrial Environmental Specialists, Inc.

Figure 9. Sample Plot and Photograph Locations

TES File: CON-3197\3197plot&photo-revised.dsf\10-9-07

APPENDIX A – Photographs


Photo 1.


Photo 2.


Photo 3.


Photo 4.

Photo 5.

Photo 6.

Photo 7.

Photo 8.

Photo 9.

Photo 10.

Photo 11.

Photo 12.


Photo 13.


Photo 14.


Photo 15.

APPENDIX B – Wetland Determination Data Sheets

WETLAND DETERMINATION DATA SHEET

Project: CON-3197 Shelby Site
Sample Plot No.: A-1Ua **Date:** 11/9/2006
Town/County/State Shelby / Orleans / NY
Community Type: Active Cropland (Soybean)
Investigators: J. McMullen, S. Sheridan
Flag No.: A-104 **Field Photo** (roll/frame): 1

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = 50% = 20% =

SHRUBS

Dominance = 50% = 20% =

HERBS

Dominance = 50% = 20% =

VINES

Dominance = 50% = 20% =

Percent of Dominant Species that are OBL, FACW, and/or FAC: 0.0%

☐ **Greater than 50% of plant species are FAC or wetter.**

☑ **Less than or equal to 50% of plant species are FAC or wetter.**

Remarks:

SOILS

Mapping Unit: Odessa silt loam

Different than mapped? No

The mapped soil type is recognized by the NRCS as:

☐ Hydric ☑ Soil with potential hydric inclusions ☐ Non-hydric

Depth of A horizon: 10 (in.)

Mottled Yes

A horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr
☐ 2.5 y ☐ 5 y Other -

4 / 2

B horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr
☐ 2.5 y ☐ 5 y Other -

5 / 4

B horizon mottle color, if present

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr
☐ 2.5 y ☐ 5 y Other -

5 / 6

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Clay

B horizon soil texture: (sand/silt/clay/loam/other) Silt/Clay

Mottle abundance: (few/common/many) Many

Mottle contrast: (faint/distinct/prominent) Distinct

Hydric soil indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Gleyed
- ☐ Aquic Moisture Regime
- ☐ Redoximorphic Features
- ☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:

☐ Matrix chroma of 2 without mottle ☑ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** ____ (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** ____ (in.) **or** ☐ **Surface**

Other evidence of hydrology? ☐ **Yes (see Hydrology Indicators)** ☑ **No**

Primary indicators:

- ☐ Inundated
- ☐ Water Marks
- ☐ Sediment Deposits
- ☐ Saturated in Upper 12 in.
- ☐ Drift Lines
- ☐ Drainage Patterns in Wetlands

Secondary indicators:

- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test

Upland Indicators:

☑ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met?	No
Is the Hydric Soil Criterion Met?	No
Is the Hydrology Criterion Met?	No
Is the Sample Plot a Wetland?	No

Additional Remarks:

WETLAND DETERMINATION DATA SHEET

Project: CON-3197 Shelby Site
Sample Plot No.: A-1Ub **Date:** 11/9/2006
Town/County/State Shelby / Orleans / NY
Community Type: Active Cropland (Corn)
Investigators: J. McMullen, S. Sheridan
Flag No.: A-5 **Field Photo** (roll/frame): 3

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = **50% =** **20% =**

SHRUBS

Dominance = **50% =** **20% =**

HERBS

Species	Cover	Status	*
Zea mays	90%	FACU	*
Amaranthus sp.	20%	FAC	
Panicum sp.	20%	FAC	
Setaria sp.	2%	FAC	
Taraxacum officinale	2%	FACU-	
Daucus carota	2%	FACU	
Trifolium pratense	1%	FACU-	

Dominance = 137 **50% =** 68.5 **20% =** 27.4

VINES

Dominance = **50% =** **20% =**

Percent of Dominant Species that are OBL, FACW, and/or FAC: 0.0%

Greater than 50% of plant species are FAC or wetter. ☐

Less than or equal to 50% of plant species are FAC or wetter. ☑

Remarks:

SOILS

Mapping Unit: Odessa silt loam

Different than mapped? No

The mapped soil type is recognized by the NRCS as:

☐ Hydric ☑ Soil with potential hydric inclusions ☐ Non-hydric

Depth of A horizon: 12 (in.)

Mottled Yes

A horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr
☐ 2.5 y ☐ 5 y Other -

3/2

B horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr
☐ 2.5 y ☐ 5 y Other -

4/6

B horizon mottle color, if present

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr
☐ 2.5 y ☐ 5 y Other -

5/2

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Clay/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Silt/Clay/Loam

Mottle abundance: (few/common/many) Many

Mottle contrast: (faint/distinct/prominent) Distinct

Hydric soil indicators:

☐ Histosol
☐ Histic Epipedon
☐ Sulfidic Odor
☐ Gleyed
☐ Aquic Moisture Regime
☐ Redoximorphic Features
☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:

☐ Matrix chroma of 2 without mottle ☑ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** ____ (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** ____ (in.) or ☐ **Surface**

Other evidence of hydrology? ☐ **Yes (see Hydrology Indicators)** ☑ **No**

Primary indicators:

☐ Inundated
☐ Water Marks
☐ Sediment Deposits
☐ Saturated in Upper 12 in.
☐ Drift Lines
☐ Drainage Patterns in Wetlands

Secondary indicators:

☐ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test

Upland Indicators:

☑ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? No

Is the Hydric Soil Criterion Met? No

Is the Hydrology Criterion Met? No

Is the Sample Plot a Wetland? No

Additional Remarks:

WETLAND DETERMINATION DATA SHEET

Project: CON-3197 Shelby Site
Sample Plot No.: A-1W **Date:** 11/9/2006
Town/County/State Shelby / Orleans / NY
Community Type: Emergent Wetland (Ditch)
Investigators: J. McMullen, S. Sheridan
Flag No.: A-104 **Field Photo** (roll/frame): 2

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = **50% =** **20% =**

SHRUBS

Dominance = **50% =** **20% =**

HERBS

Species	Cover	Status	*
Leersia oryzoides	90%	OBL	*
Alisma plantago-aquatica	20%	OBL	
Polygonum sp.	10%	FAC	
Phalaris arundinacea	10%	FACW	
Juncus effusus	2%	FACW+	
Salix sp.	2%	FACW	

Dominance = 134 **50% =** 67.0 **20% =**26.8

VINES

Dominance = **50% =** **20% =**

Percent of Dominant Species that are OBL, FACW, and/or FAC: 100.0%

Greater than 50% of plant species are FAC or wetter. ☑

Less than or equal to 50% of plant species are FAC or wetter. ☐

Remarks:

SOILS

Mapping Unit: Odessa silt loam
Different than mapped? Yes

The mapped soil type is recognized by the NRCS as:
☐ Hydric ☑ Soil with potential hydric inclusions ☐ Non-hydric

Depth of A horizon: 2 (in.)

Mottled Yes

A horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
4/1

B horizon matrix color
☐ 2.5 yr ☑ 5 yr ☐ 7.5 yr ☐ 10 yr
☐ 2.5 y ☐ 5 y Other -
5/2

B horizon mottle color, if present
☐ 2.5 yr ☐ 5 yr ☑ 7.5 yr ☐ 10 yr
☐ 2.5 y ☐ 5 y Other -
5/6

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Clay

Mottle abundance: (few/common/many) Many

Mottle contrast: (faint/distinct/prominent) Prominent

Hydric soil indicators:
- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Gleyed
- ☐ Aquic Moisture Regime
- ☑ Redoximorphic Features
- ☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:
☐ Matrix chroma of 2 without mottle ☐ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? Yes **Depth of surface water:** 16 (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☑ 76-100

Is soil saturated ? Yes **Depth to saturated soil:** ___ (in.) **or** ☑ **Surface**

Other evidence of hydrology? ☑ **Yes (see Hydrology Indicators)** ☐ **No**

Primary indicators:
- ☑ Inundated
- ☐ Water Marks
- ☐ Sediment Deposits
- ☑ Saturated in Upper 12 in.
- ☐ Drift Lines
- ☑ Drainage Patterns in Wetlands

Secondary indicators:
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test

Upland Indicators:
☐ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? Yes
Is the Hydric Soil Criterion Met? Yes
Is the Hydrology Criterion Met? Yes
Is the Sample Plot a Wetland? Yes
Additional Remarks: *Created ditch.*

Prepared by: Terrestrial Environmental Specialists, Inc.

Rev. 6/99

WETLAND DETERMINATION DATA SHEET

Project: CON-3197 Shelby Site | **Sample Plot No.:** A-2U | **Date:** 11/9/2006

Town/County/State Shelby / Orleans / NY | **Community Type:** Open Field

Investigators: J. McMullen, S. Sheridan | **Flag No.:** A-113 | **Field Photo** (roll/frame): 7

o normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = 50% = 20% =

SHRUBS

Dominance = 50% = 20% =

HERBS

Species	Cover	Status	*
Lolium arundinaceum	90%	FACU	*
Trifolium repens	30%	FACU-	*
lantago lanceolata	10%	UPL*	
axacum officinale	10%	FACU-	

Dominance = 140 50% = 70.0 20% =28.0

VINES

Dominance = 50% = 20% =

Percent of Dominant Species that are OBL, FACW, and/or FAC: 0.0%

Greater than 50% of plant species are FAC or wetter. ☐

Less than or equal to 50% of plant species are FAC or wetter. ☑

Remarks:

SOILS

Mapping Unit: Odessa silt loam

Different than mapped? No

The mapped soil type is recognized by the NRCS as:

☐ Hydric ☑ Soil with potential hydric inclusions ☐ Non-hydric

Depth of A horizon: 4 (in.)

Mottled Yes

A horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr ☐ 2.5 y ☐ 5 y Other -

3/3

B horizon matrix color

☐ 2.5 yr ☐ 5 yr ☑ 7.5 yr ☐ 10 yr ☐ 2.5 y ☐ 5 y Other -

4/3

B horizon mottle color, if present

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr ☐ 2.5 y ☐ 5 y Other -

3/2

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Clay

Mottle abundance: (few/common/many) Common

Mottle contrast: (faint/distinct/prominent) Prominent

Hydric soil indicators:

☐ Histosol ☐ Aquic Moisture Regime
☐ Histic Epipedon ☐ Redoximorphic Features
☐ Sulfidic Odor ☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer
☐ Gleyed

Upland soil indicators:

☐ Matrix chroma of 2 without mottle ☑ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** ____ (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** ____ (in.) or ☐ **Surface**

Other evidence of hydrology? ☐ **Yes (see Hydrology Indicators)** ☑ **No**

Primary indicators:

☐ Inundated ☐ Saturated in Upper 12 in.
☐ Water Marks ☐ Drift Lines
☐ Sediment Deposits ☐ Drainage Patterns in Wetlands

Secondary indicators:

☐ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test

Upland Indicators:

☑ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? No

Is the Hydric Soil Criterion Met? No

Is the Hydrology Criterion Met? No

Is the Sample Plot a Wetland? No

Additional Remarks:

Prepared by: Terrestrial Environmental Specialists, Inc. Rev. 6/99

WETLAND DETERMINATION DATA SHEET

Project: CON-3197 Shelby Site
Sample Plot No.: A-2W **Date:** 11/9/2006
Town/County/State Shelby / Orleans / NY
Community Type: Wet Meadow (Ditch)
Investigators: J. McMullen, S. Sheridan
Flag No.: A-113 **Field Photo** (roll/frame): 8

normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = **50% =** **20% =**

SHRUBS

Dominance = **50% =** **20% =**

HERBS

Species	Cover	Status	*
Leersia oryzoides	60%	OBL	*
Typha angustifolia	60%	OBL	*
Juncus effusus	5%	FACW+	

Dominance = 125 **50% =** 62.5 **20% =**25.0

VINES

Dominance = **50% =** **20% =**

Percent of Dominant Species that are OBL, FACW, and/or FAC: 100.0%

Greater than 50% of plant species are FAC or wetter. ☑

Less than or equal to 50% of plant species are FAC or wetter. ☐

Remarks:

SOILS

Mapping Unit: Odessa silt loam

Different than mapped? Yes

The mapped soil type is recognized by the NRCS as:
☐ Hydric ☑ Soil with potential hydric inclusions ☐ Non-hydric

Depth of A horizon: 2 (in.)

Mottled Yes

A horizon matrix color
☐ 2.5 yr ☐ 5 yr ☑ 7.5 yr ☐ 10 yr
☐ 2.5 y ☐ 5 y Other -
4 / 2

B horizon matrix color
☐ 2.5 yr ☐ 5 yr ☑ 7.5 yr ☐ 10 yr
☐ 2.5 y ☐ 5 y Other -
5 / 2

B horizon mottle color, if present
☐ 2.5 yr ☐ 5 yr ☑ 7.5 yr ☐ 10 yr
☐ 2.5 y ☐ 5 y Other -
4 / 4

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Clay

Mottle abundance: (few/common/many) Common

Mottle contrast: (faint/distinct/prominent) Distinct

Hydric soil indicators:
- ☐ Histosol
- ☐ Histic Epipedon
- ☑ Sulfidic Odor
- ☐ Gleyed
- ☐ Aquic Moisture Regime
- ☑ Redoximorphic Features
- ☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:
☐ Matrix chroma of 2 without mottle ☐ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? Yes **Depth of surface water:** 3 (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☑ 76-100

Is soil saturated ? Yes **Depth to saturated soil:** ____ (in.) or ☑ **Surface**

Other evidence of hydrology? ☑ **Yes (see Hydrology Indicators)** ☐ **No**

Primary indicators:
- ☑ Inundated
- ☐ Water Marks
- ☐ Sediment Deposits
- ☑ Saturated in Upper 12 in.
- ☐ Drift Lines
- ☐ Drainage Patterns in Wetlands

Secondary indicators:
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test

Upland Indicators:
☐ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? Yes
Is the Hydric Soil Criterion Met? Yes
Is the Hydrology Criterion Met? Yes
Is the Sample Plot a Wetland? Yes
Additional Remarks: *Created ditch.*

WETLAND DETERMINATION DATA SHEET

Project: CON-3197 Shelby Site **Sample Plot No.:** B-1Ua **Date:** 11/9/2006

Town/County/State Shelby / Orleans / NY **Community Type:** Open Field (mowed)

Investigators: J. McMullen, S. Sheridan **Flag No.:** B-111 **Field Photo** (roll/frame): 10

normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = **50% =** **20% =**

SHRUBS

Dominance = **50% =** **20% =**

HERBS

Species	Cover	Status	*
Trifolium repens	80%	FACU-	*
Lolium arundinaceum	40%	FACU	*
Taraxacum officinale	20%	FACU-	
Plantago lanceolata	2%	UPL*	

Dominance = 142 **50% =** 71.0 **20% =**28.4

VINES

Dominance = **50% =** **20% =**

Percent of Dominant Species that are OBL, FACW, and/or FAC: 0.0%

Greater than 50% of plant species are FAC or wetter. ☐

Less than or equal to 50% of plant species are FAC or wetter. ☑

Remarks:

SOILS

Mapping Unit: Odessa silt loam

Different than mapped? No

The mapped soil type is recognized by the NRCS as:

☐ Hydric ☑ Soil with potential hydric inclusions ☐ Non-hydric

Depth of A horizon: 4 (in.)

Mottled No

A horizon matrix color

☐ 2.5 yr ☐ 5 yr ☑ 7.5 yr ☐ 10 yr ☐ 2.5 y ☐ 5 y Other - 4/3

B horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr ☐ 2.5 y ☐ 5 y Other - 4/3

B horizon mottle color, if present

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr ☐ 2.5 y ☐ 5 y Other -

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

Mottle abundance: (few/common/many)

Mottle contrast: (faint/distinct/prominent)

Hydric soil indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Gleyed
- ☐ Aquic Moisture Regime
- ☐ Redoximorphic Features
- ☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:

☐ Matrix chroma of 2 without mottle ☑ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** ____(in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** ____(in.) **or** ☐ **Surface**

Other evidence of hydrology? ☐ **Yes (see Hydrology Indicators)** ☑ **No**

Primary indicators:

- ☐ Inundated
- ☐ Water Marks
- ☐ Sediment Deposits
- ☐ Saturated in Upper 12 in.
- ☐ Drift Lines
- ☐ Drainage Patterns in Wetlands

Secondary indicators:

- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test

Upland Indicators:

☑ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? No

Is the Hydric Soil Criterion Met? No

Is the Hydrology Criterion Met? No

Is the Sample Plot a Wetland? No

Additional Remarks:

WETLAND DETERMINATION DATA SHEET

Project: CON-3197 Shelby Site
Sample Plot No.: B-1Ub **Date:** 11/9/2006
Town/County/State Shelby / Orleans / NY
Community Type: Active Cropland
Investigators: J. McMullen, S. Sheridan
Flag No.: B-11 **Field Photo** (roll/frame): 12

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = **50% =** **20% =**

SHRUBS

Dominance = **50% =** **20% =**

HERBS

Species	Cover	Status	*
Zea mays	80%	FACU	*
Panicum sp.	20%	FAC	
Asclepias syriaca	10%	FACU-	
ucus carota	10%	FACU	
sium sp.	2%	FACU	
Taraxacum officinale	2%	FACU-	
Amaranthus sp.	2%	FAC	
Trifolium pratense	2%	FACU-	

Dominance = 128 **50% =** 64.0 **20% =**25.6

VINES

Dominance = **50% =** **20% =**

Percent of Dominant Species that are OBL, FACW, and/or FAC: 0.0%

☐ **Greater than 50% of plant species are FAC or wetter.**

☑ **Less than or equal to 50% of plant species are FAC or wetter.**

Remarks:

SOILS

Mapping Unit: Odessa silt loam

Different than mapped? No

The mapped soil type is recognized by the NRCS as:

☐ Hydric ☑ Soil with potential hydric inclusions ☐ Non-hydric

Depth of A horizon: 8 (in.)

Mottled No

A horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr
☐ 2.5 y ☐ 5 y Other -

4 / 2

B horizon matrix color

☐ 2.5 yr ☐ 5 yr ☑ 7.5 yr ☐ 10 yr
☐ 2.5 y ☐ 5 y Other -

5 / 4

B horizon mottle color, if present

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☐ 2.5 y ☐ 5 y Other -

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

Mottle abundance: (few/common/many)

Mottle contrast: (faint/distinct/prominent)

Hydric soil indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Gleyed
- ☐ Aquic Moisture Regime
- ☐ Redoximorphic Features
- ☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:

☐ Matrix chroma of 2 without mottle ☑ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** (in.) **or** ☐ **Surface**

Other evidence of hydrology? ☐ **Yes (see Hydrology Indicators)** ☑ **No**

Primary indicators:

- ☐ Inundated
- ☐ Water Marks
- ☐ Sediment Deposits
- ☐ Saturated in Upper 12 in.
- ☐ Drift Lines
- ☐ Drainage Patterns in Wetlands

Secondary indicators:

- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test

Upland Indicators:

☑ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? No

Is the Hydric Soil Criterion Met? No

Is the Hydrology Criterion Met? No

Is the Sample Plot a Wetland? No

Additional Remarks:

WETLAND DETERMINATION DATA SHEET

Project: CON-3197 Shelby Site
Sample Plot No.: B-1W **Date:** 11/9/2006
Town/County/State Shelby / Orleans / NY
Community Type: Wet Meadow (ditch)
Investigators: J. McMullen, S. Sheridan
Flag No.: B-111 **Field Photo** (roll/frame): 11

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = **50% =** **20% =**

SHRUBS

Dominance = **50% =** **20% =**

HERBS

Species	Cover	Status	*
Poa sp.	100%	FAC	*
Phalaris arundinacea	10%	FACW	

Dominance = 110 **50% =** 55.0 **20% =**22.0

VINES

Dominance = **50% =** **20% =**

Percent of Dominant Species that are OBL, FACW, and/or FAC: 100.0%

Greater than 50% of plant species are FAC or wetter. ☑

Less than or equal to 50% of plant species are FAC or wetter. ☐

Remarks:

SOILS

Mapping Unit: Odessa silt loam

Different than mapped? Yes

The mapped soil type is recognized by the NRCS as:

☐ Hydric ☑ Soil with potential hydric inclusions ☐ Non-hydric

Depth of A horizon: 2 (in.)

Mottled Yes

A horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr
☐ 2.5 y ☐ 5 y Other -

3 / 1

B horizon matrix color

☐ 2.5 yr ☐ 5 yr ☑ 7.5 yr ☐ 10 yr
☐ 2.5 y ☐ 5 y Other -

4 / 2

B horizon mottle color, if present

☐ 2.5 yr ☐ 5 yr ☑ 7.5 yr ☐ 10 yr
☐ 2.5 y ☐ 5 y Other -

6 / 3

A horizon soil texture: (sand/silt/clay/loam/other)
Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other)
Silt/Clay/Loam

Mottle abundance: (few/common/many)
Few

Mottle contrast: (faint/distinct/prominent)
Distinct

Hydric soil indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Gleyed
- ☐ Aquic Moisture Regime
- ☑ Redoximorphic Features
- ☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:

☐ Matrix chroma of 2 without mottle ☐ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? Yes **Depth of surface water:** 3 (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☑ 76-100

Is soil saturated ? Yes **Depth to saturated soil:** ____ (in.) **or** ☑ **Surface**

Other evidence of hydrology? ☑ **Yes (see Hydrology Indicators)** ☐ **No**

Primary indicators:

- ☑ Inundated
- ☐ Water Marks
- ☐ Sediment Deposits
- ☑ Saturated in Upper 12 in.
- ☐ Drift Lines
- ☑ Drainage Patterns in Wetlands

Secondary indicators:

- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test

Upland Indicators:

☐ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? Yes

Is the Hydric Soil Criterion Met? Yes

Is the Hydrology Criterion Met? Yes

Is the Sample Plot a Wetland? Yes

Additional Remarks: *Created ditch.*

Prepared by: Terrestrial Environmental Specialists, Inc.

Rev. 6/99

WETLAND DETERMINATION DATA SHEET

Project: CON-3197 Shelby Site **Sample Plot No.:** D-1U **Date:** 11/9/2006
Town/County/State Shelby / Orleans / NY **Community Type:** Scrub-Shrub Upland
Investigators: J. McMullen, S. Sheridan **Flag No.:** D-7 **Field Photo** (roll/frame): 18

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Species	Cover	Status	*
Quercus macrocarpa	10%	FAC-	*

Dominance = 10 50% = 5.0 20% =2.0

SHRUBS

Species	Cover	Status	*
Cornus foemina ssp. racemosa	60%	FAC-	*
Rhamnus cathartica	20%	FACU+	*
Fraxinus pennsylvanica	10%	FACW	
Lonicera tatarica	5%	FACU	

Dominance = 95 50% = 47.5 20% =19.0

HERBS

Species	Cover	Status	*
Rubus sp.	20%	FACU	*
Fragaria virginiana	5%	FACU	*

Dominance = 25 50% = 12.5 20% =5.0

VINES

Dominance = 50% = 20% =

Percent of Dominant Species that are OBL, FACW, and/or FAC: 0.0%

Greater than 50% of plant species are FAC or wetter. ☐

Less than or equal to 50% of plant species are FAC or wetter. ☑

Remarks:

SOILS

Mapping Unit: Churchville silt loam

Different than mapped? No

The mapped soil type is recognized by the NRCS as:
☐ Hydric ☑ Soil with potential hydric inclusions ☐ Non-hydric

Depth of A horizon: 6 (in.)

Mottled No

A horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr
☐ 2.5 y ☐ 5 y Other -
4 / 3

B horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr
☐ 2.5 y ☐ 5 y Other -
5 / 3

B horizon mottle color, if present
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☐ 2.5 y ☐ 5 y Other -

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

Mottle abundance: (few/common/many)

Mottle contrast: (faint/distinct/prominent)

Hydric soil indicators:
☐ Histosol ☐ Aquic Moisture Regime
☐ Histic Epipedon ☐ Redoximorphic Features
☐ Sulfidic Odor ☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer
☐ Gleyed

Upland soil indicators:
☐ Matrix chroma of 2 without mottle ☑ Matrix chroma greater than 2

Remarks: Leopard frogs.

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** ____ (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** ____ (in.) or ☐ Surface

Other evidence of hydrology? ☐ Yes (see Hydrology Indicators) ☑ No

Primary indicators:
☐ Inundated ☐ Saturated in Upper 12 in.
☐ Water Marks ☐ Drift Lines
☐ Sediment Deposits ☐ Drainage Patterns in Wetlands

Secondary indicators:
☐ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test

Upland Indicators:
☑ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? No
Is the Hydric Soil Criterion Met? No
Is the Hydrology Criterion Met? No

Is the Sample Plot a Wetland? No

Additional Remarks:

Prepared by: Terrestrial Environmental Specialists, Inc. Rev. 6/99

WETLAND DETERMINATION DATA SHEET

Project: CON-3197 Shelby Site
Sample Plot No.: D-1W **Date:** 11/9/2006
Town/County/State Shelby / Orleans / NY
Community Type: Emergent Wetland (ditch)
Investigators: J. McMullen, S. Sheridan
Flag No.: D-7 **Field Photo** (roll/frame): 17

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = 50% = 20% =

SHRUBS

Species	Cover	Status	*
Salix sp.	10%	FACW	*

Dominance = 10 50% = 5.0 20% =2.0

HERBS

Species	Cover	Status	*
Leersia oryzoides	80%	OBL	*
Typha latifolia	40%	OBL	*
Juncus effusus	5%	FACW+	

Dominance = 125 50% = 62.5 20% =25.0

VINES

Dominance = 50% = 20% =

Percent of Dominant Species that are OBL, FACW, and/or FAC: 100.0%

Greater than 50% of plant species are FAC or wetter. ☑

Less than or equal to 50% of plant species are FAC or wetter. ☐

Remarks:

SOILS

Mapping Unit: Churchville silt loam

Different than mapped? Yes

The mapped soil type is recognized by the NRCS as:
☐ Hydric ☑ Soil with potential hydric inclusions ☐ Non-hydric

Depth of A horizon: 1 (in.)

Mottled Yes

A horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr
☐ 2.5 y ☐ 5 y Other -
4 / 1

B horizon matrix color
☐ 2.5 yr ☐ 5 yr ☑ 7.5 yr ☐ 10 yr
☐ 2.5 y ☐ 5 y Other -
4 / 2

B horizon mottle color, if present
☐ 2.5 yr ☐ 5 yr ☑ 7.5 yr ☐ 10 yr
☐ 2.5 y ☐ 5 y Other -
6 / 4

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Clay

Mottle abundance: (few/common/many) Few

Mottle contrast: (faint/distinct/prominent) Faint

Hydric soil indicators:
- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Gleyed
- ☐ Aquic Moisture Regime
- ☑ Redoximorphic Features
- ☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:
☐ Matrix chroma of 2 without mottle ☐ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? Yes **Depth of surface water:** 3 (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☑ 76-100

Is soil saturated ? Yes **Depth to saturated soil:** ____ (in.) or ☑ **Surface**

Other evidence of hydrology? ☑ **Yes (see Hydrology Indicators)** ☐ **No**

Primary indicators:
- ☑ Inundated
- ☐ Water Marks
- ☐ Sediment Deposits
- ☑ Saturated in Upper 12 in.
- ☐ Drift Lines
- ☑ Drainage Patterns in Wetlands

Secondary indicators:
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test

Upland Indicators:
☐ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? Yes
Is the Hydric Soil Criterion Met? Yes
Is the Hydrology Criterion Met? Yes

Is the Sample Plot a Wetland? Yes

Additional Remarks: *Created ditch.*

WETLANDS IMPACT ASSESSMENT

PROPOSED SHELBY MINE
TOWN OF SHELBY, ORLEANS COUNTY, NEW YORK

Prepared for:

FRONTIER STONE, LLC
4172 East Lake Road
Wilson, New York 14172

And

CONTINENTAL PLACER, INC.
11 Winners Circle
Albany, New York 12205

Prepared by:

TERRESTRIAL ENVIRONMENTAL SPECIALISTS, INC.
23 County Route 6, Suite A
Phoenix, New York 13135

January 2013
(Revision of July 2011 Report)

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INTRODUCTION

Frontier Stone, LLC is proposing the Frontier Stone Quarry on a site in the Town of Shelby, Orleans County, New York. The site is approximately 268 acres in size and is located south of Fletcher Chapel Road, east of Sour Springs Road, and adjacent to the north side of an overhead electric right-of-way that parallels the Iroquois National Wildlife Refuge (INWR) (Figure 1). There is also an overhead electric right-of-way owned by National Grid that crosses the site in a north-south direction.

Terrestrial Environmental Specialists, Inc. (TES) was contracted by Continental Placer Inc. to perform environmental studies and assess impacts to ecological resources from the quarry development. TES prepared the following reports for the project: a wetland delineation report (TES 2007a), a vegetation and wildlife resources report (TES 2007b), an impact analysis of ecological resources report (TES 2007c), a wetland impact assessment report (TES 2009a), and a supplement to the ecological assessment report (TES 2009b). These reports were appended to the Draft Environmental Impact Statement (DEIS) for a Mine Land Use Plan Mining Permit prepared by Continental Placer (Continental Placer 2008 and 2009).

Comments were received on the DEIS from the New York State Department of Environmental Conservation (NYSDEC) and U.S. Fish and Wildlife Service (USFWS) relative to specific issues, including ecological resources. Subsequent to these comments, meetings were held with the NYSDEC and the USFWS personnel at the Iroquois National Wildlife Refuge. Additional assessments were also performed by TES, Alpha Geoscience, and Continental Placer on the proposed quarry site and the adjacent INWR. Alpha Geoscience produced a hydrogeologic investigation report based on these studies (Alpha Geoscience 2009), which TES utilized to produce the wetland assessment report (TES 2009a).

Subsequent to the wetland impact analysis report (TES 2009a), additional assessments were performed by Continental Placer and Alpha Geoscience. Continental Placer performed HydroCad analysis and water quality sampling for the area and Alpha Geoscience revised their 2009 hydrogeological investigation report as Alpha Geoscience (2012).

With this additional information and data, TES has produced the following revised wetland impact assessment report. This report addresses questions raised relative to the possible effects of the quarry development on wetlands in the adjacent properties, in particular the INWR, which occurs just south of the site adjacent to the overhead electric right-of-way.

SITE OVERVIEW

As indicated in TES (2007a and 2007b), the site is over 98% agricultural land, with a few patches of open uplands and agricultural ditches. No wetlands or streams are mapped on the site (Figures 2, 3, and 6) or found on the site, although agricultural ditches drain from the site to the south. One of the ditches drains due south in the north-south National Grid right-of-way and then drains across the east-west right-of-way into the INRW (Figure 1). Fairly large areas of wetlands are mapped south of the site in the INWR property (Figures 2 and 3).

Soils on the site are primarily silt loam and sandy loams of Odessa silt loam, Churchville silt loam, Cosad loamy fine sand, and Bombay fine sandy loam (Figure 4). Wet spots are indicated on the soil survey map for the site.

Drainage from the site is to the south. The drainage is into two subbasins, identified in Alpha Geoscience (2011) as Basin 1 and Basin 2 (Figure 5). Basin 1 includes the western portion of the site and Basin 2 a smaller part in the eastern portion. Fletcher Chapel Road, which borders the northern portion of the site, generally follows the northern edge of these basins and essentially forms a drainage divide. As a result, there is very little water that drains onto the site from off-site sources, with the exception of a small area of Basin 2 (Figure 5).

WETLANDS/WATERS

As indicated, water from the site drains south into large wetland complexes in the INWR and then southwest eventually entering Oak Orchard Creek (Figures 6 and 7). Prior to entering Oak Orchard Creek, there are dams with control structures that the USFWS uses to control water levels in the wetland complexes in the INWR. For Basin 1, there is a dam at Schoolhouse Marsh and for Basin 2 there is a dam at Center Marsh and a larger downstream structure at Ringneck Marsh (Figures 5 and 7). According to the Comprehensive Conservation Plan for the INWR (USFWS 2011), water levels are manipulated to meet certain objectives usually on a 5-year cycle.

The extent of wetlands within the Basin 1 and Basin 2 drainage areas on the INWR is shown on Figures 2 and 3, with a more refined mapping of the wetland extent shown on Figure 7. Most of the wetlands are a mix of deciduous forested, scrub-shrub, wet meadow, and open water types. Forested and scrub-shrub types are more abundant in the upper portions of the basins and open water and emergent types more abundant near the dam structures.

Based on the mapping provided on Figure 7, the total area of wetlands south of the site in Basin 1 above the Schoolhouse Marsh dam is approximately 74 acres, and the total area of contiguous wetlands south of the site in Basin 2 above the Center Marsh dam is approximately 118 acres.

As indicated in Alpha Geoscience (2011), the wetlands that receive water from the proposed quarry site are not associated with the bedrock ground water. They conclude that the thick glaciolacustrine silt and clay layer that overlies the bedrock aquifer holds water in the wetlands in a shallow water level, but separates the water from the deeper lying aquifer water table in the bedrock.

PROPOSED MINING PLAN

The proposed mining plan indicates the development of the quarry in four phases over an approximately 75-year period (Figure 8). Phase 1 of the plan, which would be developed over about 5 to 10 years, consists of about 12 acres in the southern end of the property west of the National Grid right-of-way (Figure 9). Phase 2 consists of 67.6 acres in the southern portion of the property east of the right-of-way. The land to be mined in the future phases will remain in agricultural production until mining commences.

Quarry development would consist of removal of soil and overburden (approximately 30 feet deep) to reach the underlying bedrock. This overburden material would be used to create berms around the mining limits. The rock would be quarried to a depth of approximately 146± feet to an elevation of 485 to 490 feet. The mine would not be operated during the winter months.

Surface water would be diverted around the quarry where possible and best management practices utilized to control erosion and sedimentation. Ground water and water from precipitation that collects in the quarry would be pumped out and discharged to the surface. During Phase 1 development, this water will be discharged into stormwater basins that would outlet into a ditch that drains south from the site in Basin 1. The amount of water entering the quarry varies during the year, with the greatest amount in the late winter/early spring time period when snow and ice are melting and evaporation is low. Once the Phase 1 quarry is established, it will be used to store water during maximum periods of runoff from the basins. Water will be pumped continuously from the Phase 1 quarry and discharged into Basin 1. This will smooth out seasonal quarry discharges.

Calculations of the amount of discharge are provided in Alpha Geoscience (2012). These calculations were prepared for the development of the first phase of the proposed mining and full quarry development. Because of the ability to use the Phase 1 quarry for water storage once it is completed, assessing the discharge impact when the Phase 1 quarry is at its maximum size may be of most interest.

Once the quarry has reached its maximum size after completion of Phase 4, the quarry will fill with water and become a pond. No pump-out will occur after completion.

WETLANDS/WATERS IMPACTS

On-Site Impacts

There are no streams or other waterbodies on the site. There are no state regulated wetlands on the site. A few farm ditches do occur. The site generally slopes to the south towards the Iroquois National Wildlife Refuge. However, the northern boundary of the site is at the edge of the drainage area. As a result, except for a small portion of Basin 2, there is very little surface water contributed from off-site areas onto the site.

The U.S. Army Corps of Engineers (Corps) issued a Jurisdictional Determination (JD) on July 20, 2011. This JD is valid for a period of five years. Two ditches, a 0.16 acre portion of Ditch A, and all of Ditch D (0.11 acre) were considered to be regulated wetlands. Neither of these wetland areas would be affected during the first five years of mining.

Best management practices, such as erosion and sediment control, and a stormwater management plan are proposed as part of the plans. Areas developed as berms from overburden material will be seeded and restored. These practices will help minimize surface water impacts. Also, as previously discussed, the proposed quarry will be developed in phases over an expected life of 75 years. Phases that are not to be developed until future years will remain in agricultural use. This approach will minimize impacts over time.

Off-Site Impacts

Although direct and indirect impacts to wetlands/waters on the site are negligible, questions were raised relative to the impacts of the proposed quarry development to downstream/basin wetlands/water systems in the INWR. Potential surface water and ground water alterations were of concern.

Mining is proposed below the ground water level and water that accumulates in the quarry from surface water and ground water sources will be directed into a sump and pumped out into stormwater basins that discharge to the ditches that drain away from the site. How this pump-out may potentially affect habitats down-drainage from the quarry will depend upon the volume and timing of pump-out water and the nature and size of the down-drainage systems. After the Phase 1 quarry is complete, use of the Phase 1 mining area to receive pump-out water from additional phases would reduce the fluctuations in the volume of water leaving the site.

As previously indicated, expected surface water alterations from the proposed quarry development are minor primarily because of the location of the proposed quarry in the drainage basin. Surface water that drains from the fields now in agriculture production would be intercepted as the quarry is developed. This water would be pumped out along with any ground water and added back into the drainage system. Alpha Geoscience (2012) concludes that *"There will be a change in the volume of surface water discharge to the Wildlife Refuge through the two surface water drainage basins that originate at the mine site (Basin 1 and Basin 2)."*

Effects of the quarry development on ground water drawdown at full mining development are presented in Alpha Geoscience (2012) report. Ground water will be drawn down in the vicinity of the quarry. The effect of this ground water drawdown on the adjacent wetlands is discussed. They conclude the following.

> *"The Wildlife Refuge will not be impacted by ground water drawdown by the quarry. This conclusion is predicated on the observations that the water levels in the wetlands are associated with the shallow water table, that a thick (30 ft) deposit of underlying, low permeability, silt and clay isolate the wetlands from the bedrock aquifer, and that the water levels in the bedrock are already below the levels in the wetland; consequently, any potential drawdown has already occurred naturally."*

Water contributions from the pump-out of the quarry at its maximum size could add additional water to the system. Alpha Geoscience (2012) indicates as follows.

"An initial water budget analysis was conducted for the maximum quarry size to assess the potential impacts if no mitigation was undertaken to control quarry discharge rates. This analysis for the full development yields a small reduction of 10.44 gpm of flow through Basin 2 and an increase of 898.20 gpm (increase from 185.33 gpm to 1083.53 gpm) of flow through Basin 1. These changes will be mitigated by using the Phase 1 quarry for storage and to control pumping discharge rates; consequently, it may be more reasonable to assess the potential impact from discharge when the Phase 1 quarry is at its maximum size, prior to its use for water storage."

The above estimates are from full quarry development, and much lower estimates are expected in the first phase of the quarry. For comparison, Alpha Geoscience calculated that development of the first phase of the western quarry will result in the following.

"An analysis of the water budget for the Phase 1 quarry at its maximum size yielded no change to Basin 2, since the Phase 1 quarry is contained entirely within Basin 1. The mining of the Phase 1 quarry is calculated to result in an increase of 259.67 gpm through Basin 1. This is an increase from the existing flow through of 185.33 gpm to 445.0 gpm.

Alpha's report (2012) provides a Water Budget Summary Table that presents the increase in the flow to Basin 1 after the full development of Phase I. Based 00 this table, the increase in flow rate is as follows: average annual flow rate is 259.67 gallons per minute (gpm), season high March flow rate is 366.22 (gpm); and season low flow rate is 190.72 gpm in July and 190.56 gpm in September.

An increase in pump-out water would add water to the down-basin wetland systems. Water levels in these systems are controlled and manipulated for various reasons by the USFWS by structures in dams at Schoolhouse Marsh for Basin 1 and Center Marsh for Basin 2. These systems currently undergo changes in water levels based on this manipulation.

The addition of water to the systems is not expected to significantly affect the wetlands or the use of the areas by plant and animal species. If continuous pumping is not performed, the amount of water contribution will be seasonal, with the greatest contribution in late winter. This would be at a time when the wetlands are normally at their highest water levels. It is also before the growing season when plant species can withstand additional flooding and before nesting of most wildlife species occur. So impacts of a slight increase in water levels, if it occurred, would be minor.

At full quarry development the projected average annual change in the volume of water being added to Basin 1 is from 185 gallons per minute (gpm) to 1083 gpm, or an increase of 898 gpm. This assumes that none of this water is diverted into Basin 2, or either stored in the Phase 1 quarry area or the larger (143 acres) combined Phase 2 and Phase 3 quarry, which will be available while Phase 4 is completed.

Using a calculated wetland area above Schoolhouse Marsh of 74 acres, this increase in discharge of 898 gpm would add 0.6 inch to the water elevation of the wetland system in a 24-hour period. This assumes that all of the water is held in the system and none is lost to downstream discharge, evaporation, or transpiration. This appears to be a rather minor increase, but may result in slight shifts in the wetness of the wetland system and could increase the amount of wetland area slightly. Even these small changes are unlikely to occur due to the fact that the combined 143 acres of Phase 2 and Phase 3 will be able to hold several years of inflow while the final Phase 4 is mined. This storage capacity will allow for lower and continuous rates of discharges to Basins 1 and 2.

The pump-out estimates for the western Phase 1 quarry development were used to assess potential impacts during the period when water must be discharged to maintain a dry quarry. The calculated discharge change would be an increase of 260 gpm to Basin 1. Using a calculated wetland area above the Schoolhouse Marsh dam of 74 acres, this discharge would add 0.2 inches to the water elevation of the wetland system in a 24-hour period or roughly one-quarter of the estimate for full quarry development. Correspondingly, using the seasonal discharge rates reported by Alpha (2012) results in 0.26 inch for the March high discharge of 366 gpm; and 0.14 inch using the July/September seasonal discharge rate of 191 gpm.

Although the incremental water level variations in wetland hydrology are extremely minor, the effect of any change in wetland hydrology should also consider the time of year of the change. Although minor, the greatest change in flow is projected to be in March when wetland systems naturally have high water levels, which are tolerated by wetland vegetation because it is well before the start of the growing season. This chance is also tolerated by animals because it is before the breeding season. Water level changes of significance, in July in the middle of the growing season, could potentially affect vegetation and wildlife, but this is when the discharge and any potential water level fluctuations are at their lowest. The calculated 0.14 inch rise in water level in July would not have a noticeable effect on the wetland.

Relative to the potential change in wetland size, a calculation was made of the potential increase in wetland area that would result using the above estimated water level changes, length of the perimeter of the wetland, and an assumed wetland side slope. The perimeter of the 74-acre wetland was calculated to be approximately 10,900 feet. Side slopes around the edge of the wetland vary, but an average side slope of 1 foot vertical in a horizontal distance of 50 feet was assumed. Using this wetland perimeter and assumed side slope, the potential area increase in the size of the wetland would be as follows: 0.20 acre using the 0.26 inch estimated change in water level from projected March seasonal high discharge; and 0.14 acre using the 0.14 inch estimated change in water level from projected July/September season low discharge.

Ditches and culverts below the USFWS-controlled Schoolhouse Marsh dam were assessed and found to be of more than sufficient capacity to accommodate the quarry water discharge. Little to no change is expected over existing conditions in these downstream systems as the result of the quarry discharge. It should be noted that, in the downstream direction, the size of the drainage basin and existing surface water runoff become progressively larger. For example based on information provided by Alpha Geoscience, the existing calculated. March surface water drainage for Basin 1 at the Schoolhouse Marsh dam is 653 gpm, but increases within this basin to a calculated discharge of 962 gpm at State Route 63. This is an increase in existing drainage discharge of 47%. With the progressively larger surface water runoff, the additional quarry water discharge amount becomes progressively smaller when expressed as a percentage of total runoff. As a result, any potential for a change from the additional quarry water discharge decreases as you progress downstream in the basin.

In light of the normal seasonal variation in wetland systems, the controlled nature of Schoolhouse Marsh wetland, and the very minor projected increase in water levels, this additional water will not have a noticeable effect on the Schoolhouse Marsh wetland or areas farther downstream. If there is any effect, it would be a very slight increase in the wetness of the wetland and perhaps a very slight increase in the wetland size.

As previously indicated, once Phase 1 of the mining plan is completed, the proposed option is to reduce the ground water discharge volume by using the Phase 1 portion of the quarry to receive pumpout water from the mining of Phases 2 and 3. Phase 2 and 3 will be used to store water during mining of Phase 4. Phase 2 can also be used as a temporary basin to store major storm events while the upper lifts are mined in Phase 3. This approach could further reduce the fluctuations in pumpout discharges.

Water Quality Assessment

As indicated in Alpha Geoscience (2011), water samples were collected by Continental Placer in 2010 from both groundwater wells and surface water sources and were analyzed by Test America for various water quality parameters. Shallow and deep groundwater samples were obtained from on-site sources from the Barn well and well DH5-05, respectively. Surface water samples were obtained in an agricultural ditch near the center of the site and just above the wier at Schoolhouse Marsh.

Alpha Geoscience (2012) concludes the following from an assessment of the analytical results of the water samples.

> *"The analytical results, which are summarized on Table 10 and included in Appendix G, show that the ground water is suitable for potable purposes, though some parameters indicate aesthetic issues. For example, iron in the deep well (DH5-05) is slightly above the New York State drinking water standard. The iron standard of 0.3 mg/L has been set due to the staining that 0.3 mg/L and higher can cause to household fixtures. The level of 0.351 mg/L in the deep well is exceeded by both surface water samples.*
>
> *The total dissolved solids (TDS) in the Barn well was at 652 mg/L, which is slightly above the EPA standard of 500 mg/L. There is no drinking water standard for TDS in New York. A value of 652 is also an aesthetic value that is tied to taste, but does not pose a threat to the environment. All the rest of the parameters, including sulfate, are well*

within the drinking water standards and pose no environmental threat to surface water or the refuge."

As a result of this analysis and conclusions by Alpha Geoscience, the quality of the water from groundwater sources is not considered a threat to plants and animals in the areas that would receive water discharges.

Hydrogen sulfide (H_2S) in the ground water has been raised as a possible nuisance issue. Hydrogen sulfide is a gas created when sulfur is in a reducing environment. It is readily dissipated into the atmosphere.

Hydrogen sulfide is common in wetlands and is actually used as a positive field indicator in the federal wetland delineation manual to indicate the presence of hydric (wetland) soils. It will not affect the wetland systems.

CONCLUSION

An assessment was made of the potential effects of the proposed Frontier Stone quarry development on the adjacent wetlands/water resources. The proposed quarry site is currently primarily agricultural croplands that drain into the adjacent wetland complex on the Iroquois National Wildlife Refuge (INWR). Questions were raised relative to the potential effect of the quarry development on the adjacent wetland systems.

Assessment of these questions was based on the wetlands/waters studies performed by TES and the hydrogeologic assessment prepared by Alpha Geoscience and Continental Placer. These assessments included work on the site and adjacent INWR.

Other than agricultural ditches, no wetlands or waters occur on the site. Ditch D and a small portion of Ditch A are regulated by the U.S. Army Corps of Engineers. No mining will occur in the vicinity of these areas during Phase 1 of the mine use plan. Drainage from the site is southerly into the INWR. The site is at the upper limit of the drainage area. There are two sub-basins that the site contributes water to. Basin 1 drains into the approximately 74-acre Schoolhouse Marsh complex and Basin 2 drains into the approximately 118-acre Center Marsh complex in the INWR. Water levels in both wetland complexes are controlled and manipulated by the USFWS for management purposes.

Alpha Geoscience concluded that the wetlands on the refuge were not connected to the groundwater. This conclusion was based on the thick low permeable layer over the bedrock.

As the quarry is developed it will intercept precipitation and ground water, which will be pumped out of the quarry to maintain dry working conditions. Estimates of pump-out water are provided. The rate water will collect in the quarry will vary seasonally, but the actual rate of discharge to the surface water basins will be more uniform as a result of continuous pumping throughout the year.

No impact to wetlands or waterbodies will occur on site from the quarry development as a result of groundwater drawdown. Because ground water is not connected to adjacent wetlands, the drawdown of groundwater levels around the quarry will not affect these resources.

Using projected pump-out estimates, potential increases in water levels in adjacent wetlands is expected to be very minor. Measures to further reduce discharges by using completed phases of the quarry for water storage are discussed. With partial quarry development (Phase 1 of the western quarry) in the initial 5 to 10 year time period, the water level change in Schoolhouse Marsh is estimated to be about 0.2 inch. Although these changes are rather minor, the increase in water contribution to the wetlands may result in a slight increase in wetness in portions of the complex and perhaps increase the wetland edges slightly. For future quarry phases, possible changes can be reduced by diverting a portion of the pump-out water from Basin 1 to Basin 2 and use of completed quarry phases for water storage. These changes must also be viewed in light of the fact that the water levels in the wetlands are maintained by dams and manipulated for management purposes by the USFWS.

Ground water in the area was historically used for drinking water. Analytical results of groundwater samples demonstrate no issues with water quality. Sulfate is present in the ground water and is expected to give off hydrogen sulfide gas, which will quickly dissipate. This is common gas in wetland systems and is not expected to affect plants or animals in the area.

LITERATURE CITED

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Alpha Geoscience. 2012. Hydrogeologic Investigation of the Proposed Frontier Stone Quarry, Town of Shelby, NY. Alpha Geoscience, Clifton Park, NY.

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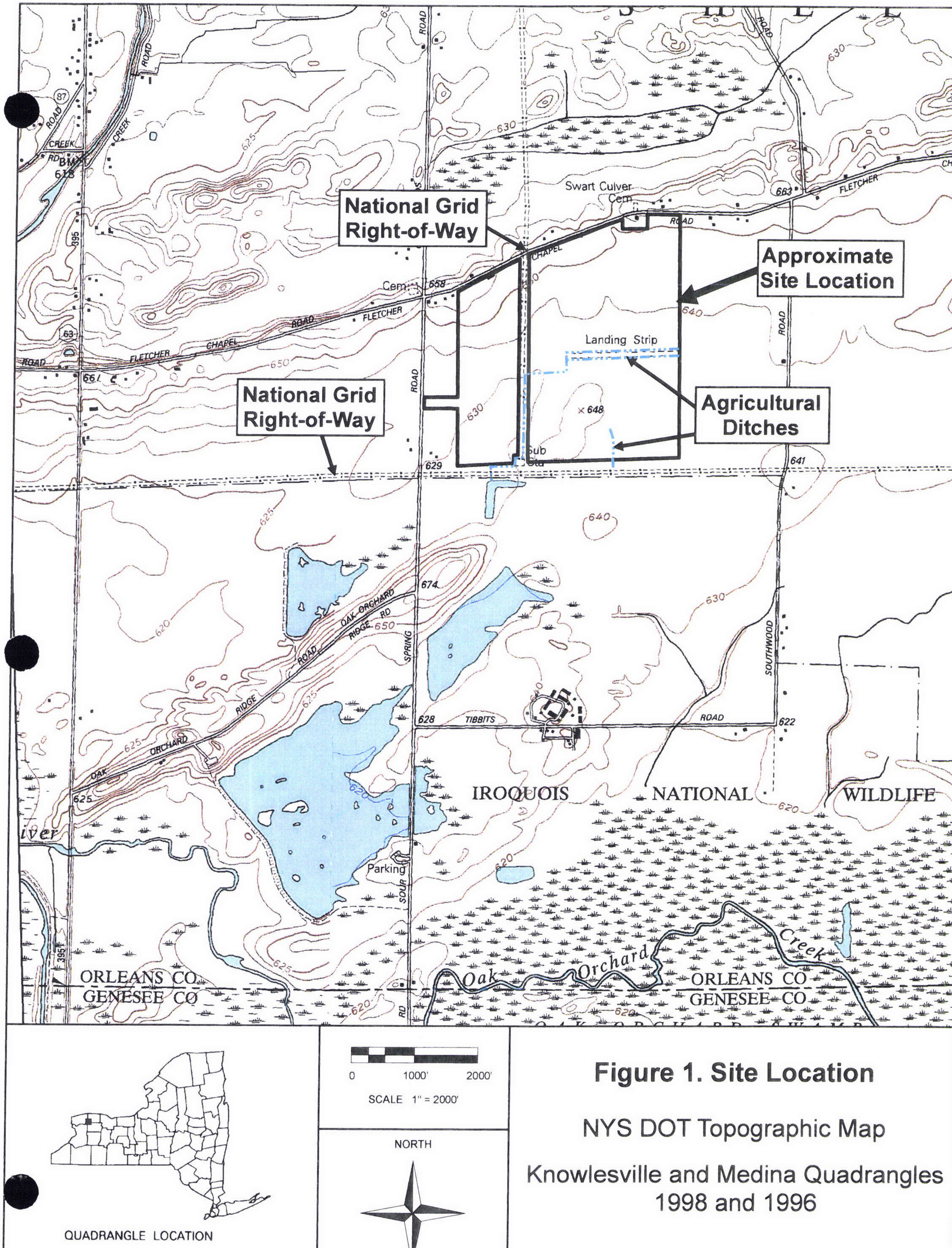


Figure 1. Site Location

NYS DOT Topographic Map

Knowlesville and Medina Quadrangles
1998 and 1996

Prepared by TERRESTRIAL ENVIRONMENTAL SPECIALISTS, Inc.

TES file: CON-3197/3197fig1new.dsf\5-28-09

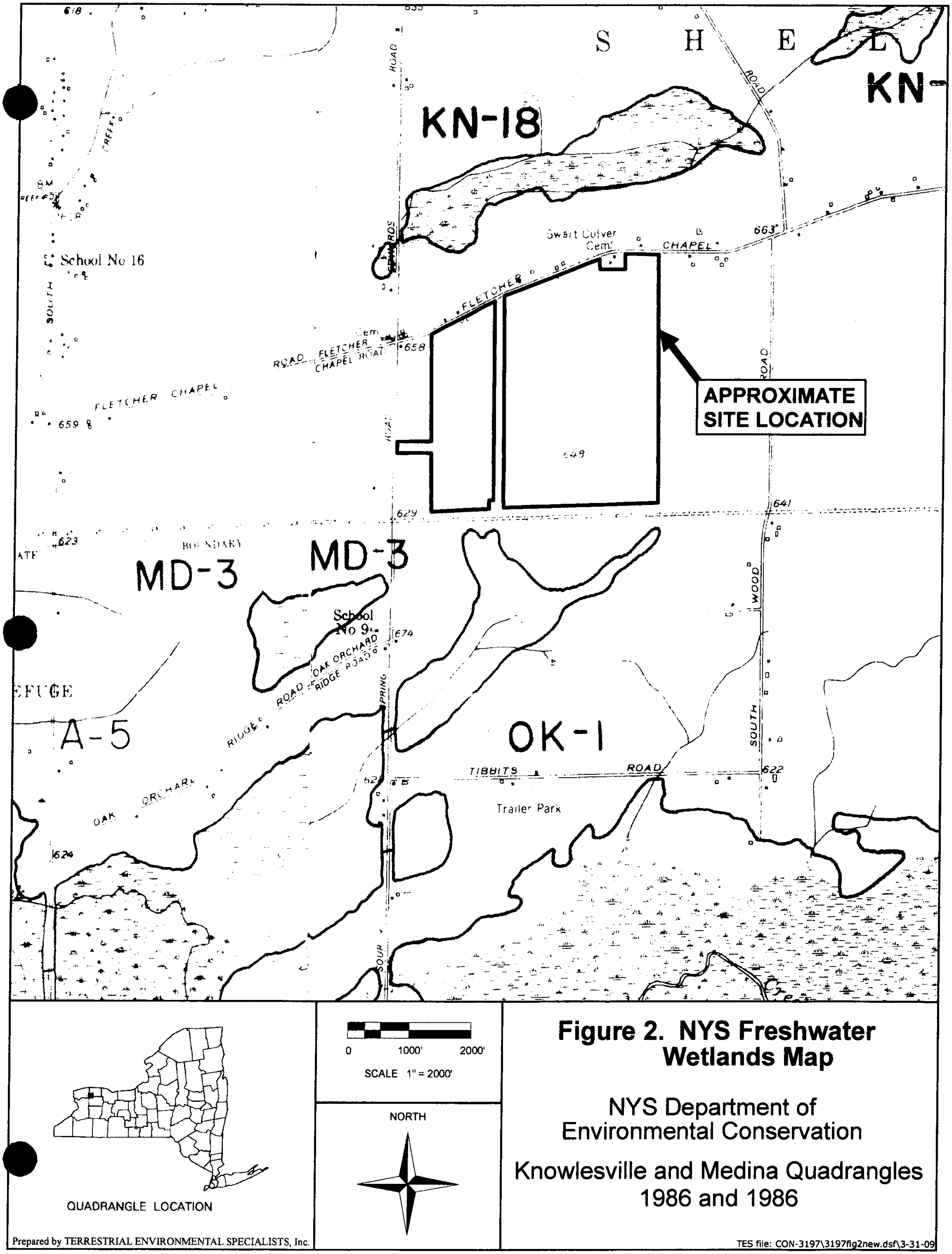


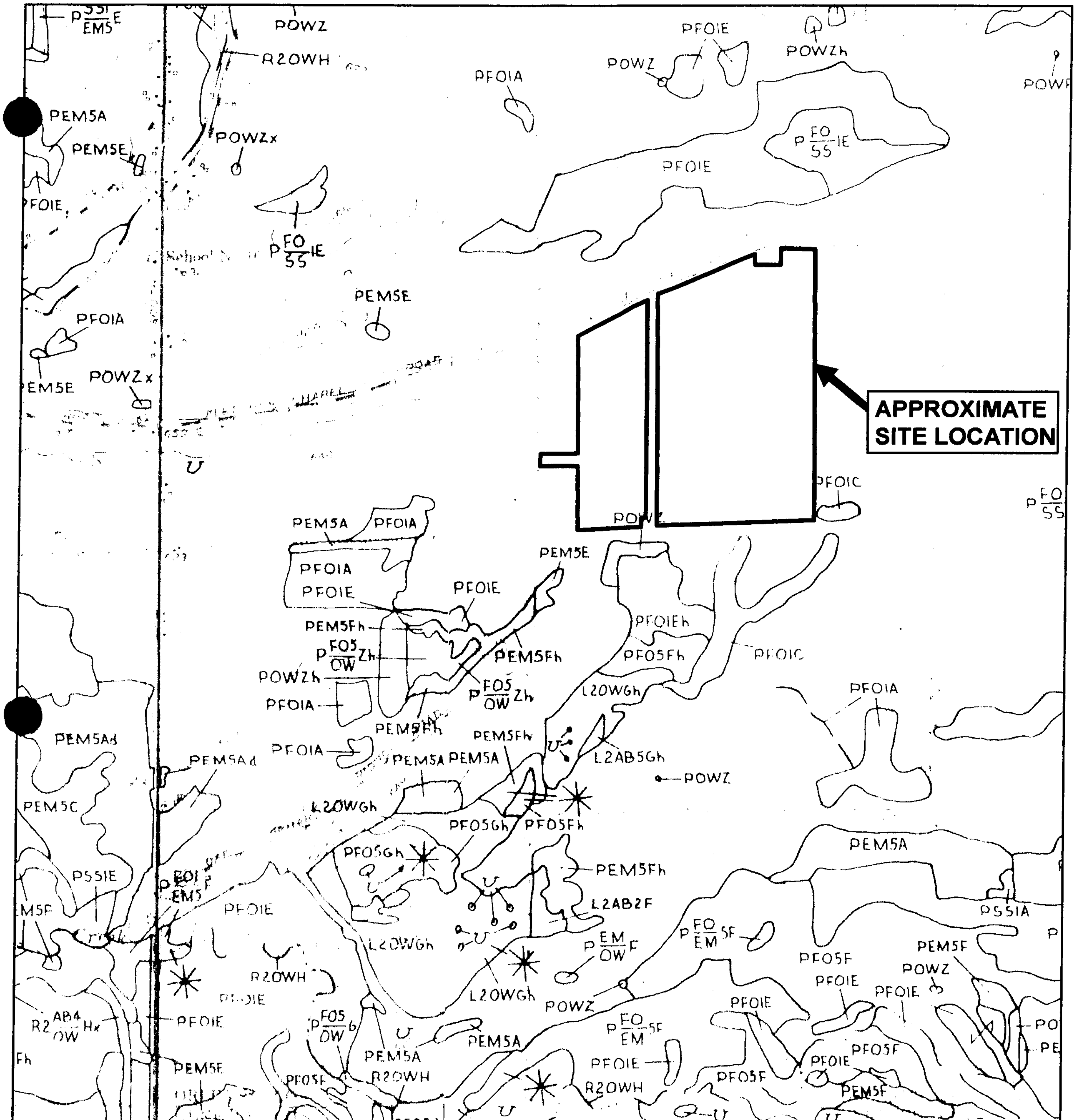
Figure 2. NYS Freshwater Wetlands Map

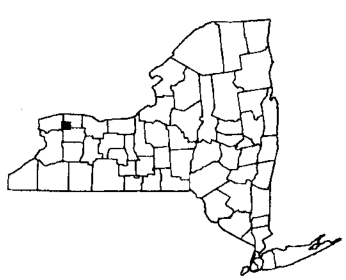
NYS Department of Environmental Conservation

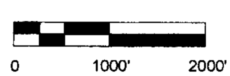
Knowlesville and Medina Quadrangles 1986 and 1986

Prepared by TERRESTRIAL ENVIRONMENTAL SPECIALISTS, Inc.

TES file: CON-3197\3197fig2new.dsf\3-31-09







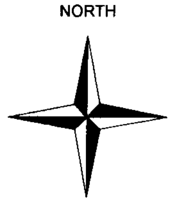


Figure 3. National Wetlands Inventory Map

U.S. Fish & Wildlife Service

Knowlesville and Medina Quadrangles
1971 and 1981

Prepared by TERRESTRIAL ENVIRONMENTAL SPECIALISTS, Inc.

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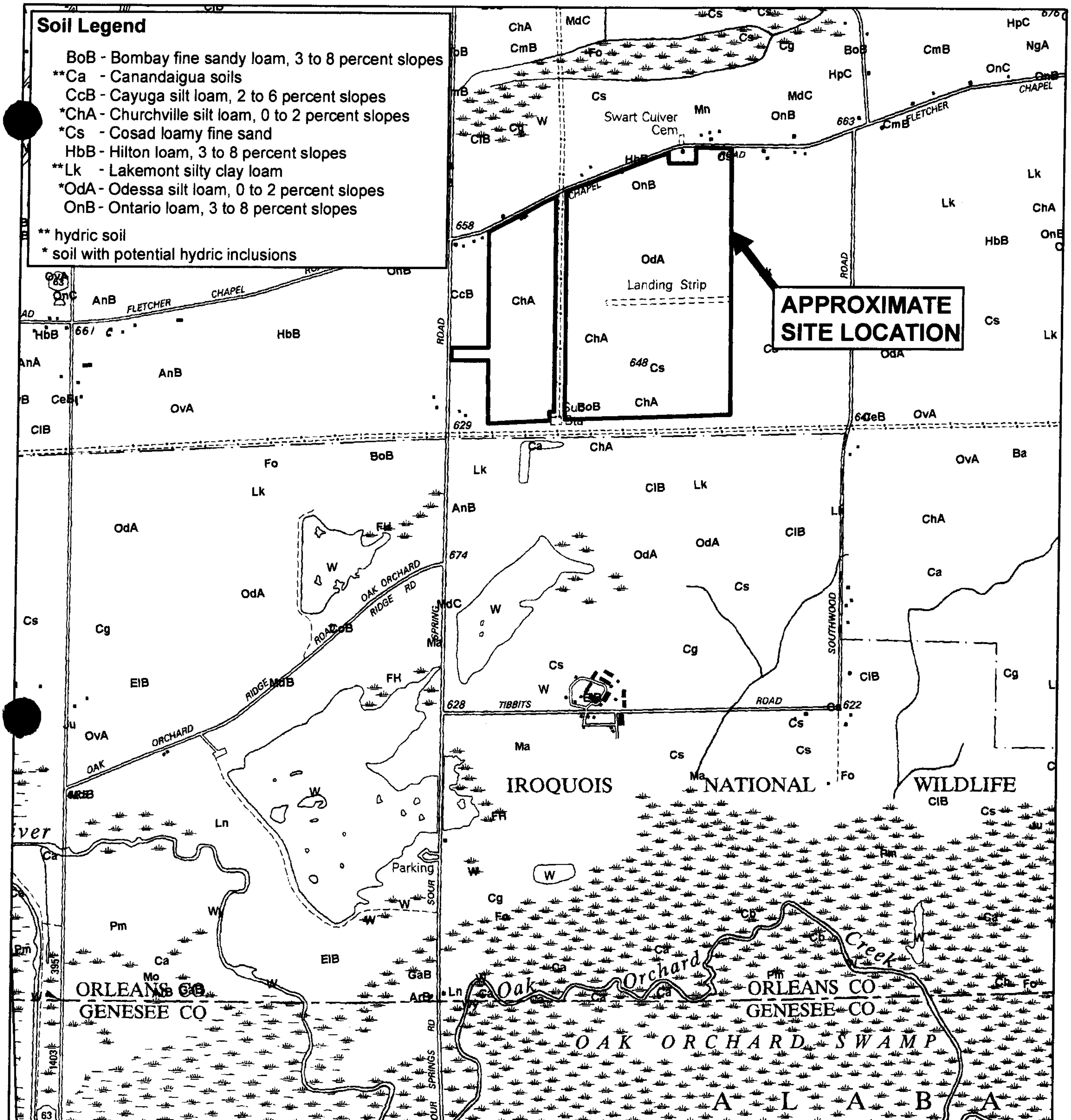


0 1000' 2000'

SCALE 1" = 2000'

NORTH

Figure 4. Soil Survey Map

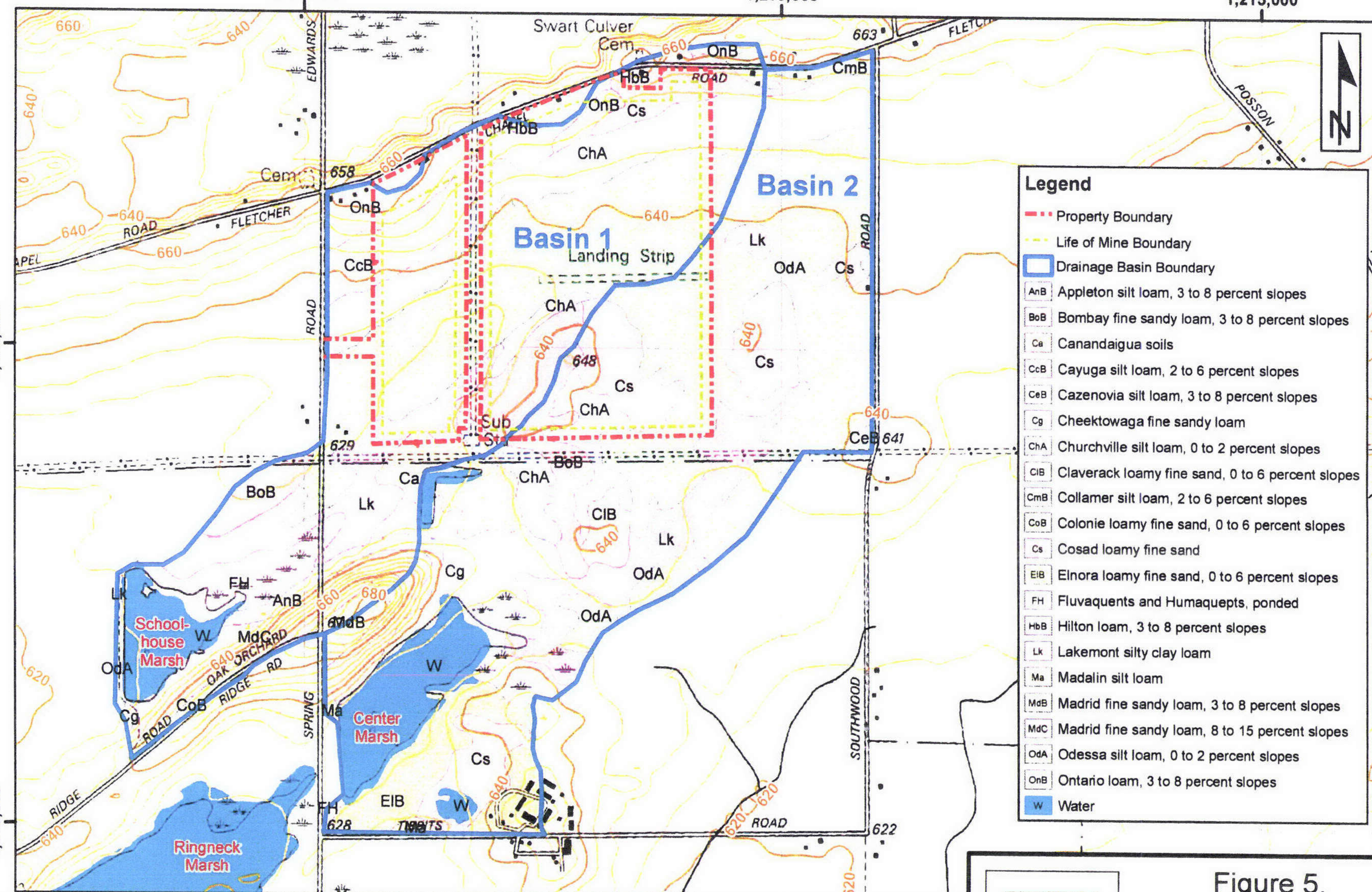
Natural Resources Conservation Service
SoilDataMart.nrcs.usda.gov

Orleans County Soil Survey

2006

Prepared by TERRESTRIAL ENVIRONMENTAL SPECIALISTS, Inc.

TES file: CON-3197/3197fig4new.dsf/4-1-09



Notes:
- Basemap - NYS Department of Transportation Raster planimetric layer (Knowlesville and Medina quadrangles)
- Topographic contours based on New York State Digital Elevation Models (DEM). U.S. Geological Survey.
- Water features based on USDA Soil Survey and orthoimagry (1994-1999), NYS Office of Cyber Security & Critical Infrastructure Coordination.
- Soil Survey Geographic (SSURGO) database for Orleans County New York, U.S. Department of Agriculture, Natural Resources Conservation Service.

1,210,000

0 1,500 3,000 Feet

ALPHA GEOSCIENCE
Alpha Proj. No. 08122

Figure 5.

EXISTING SURFACE WATER DRAINAGE BASINS

Frontier Stone Quarry
Frontier Stone LLC

Town of Shelby
Orleans County, New York

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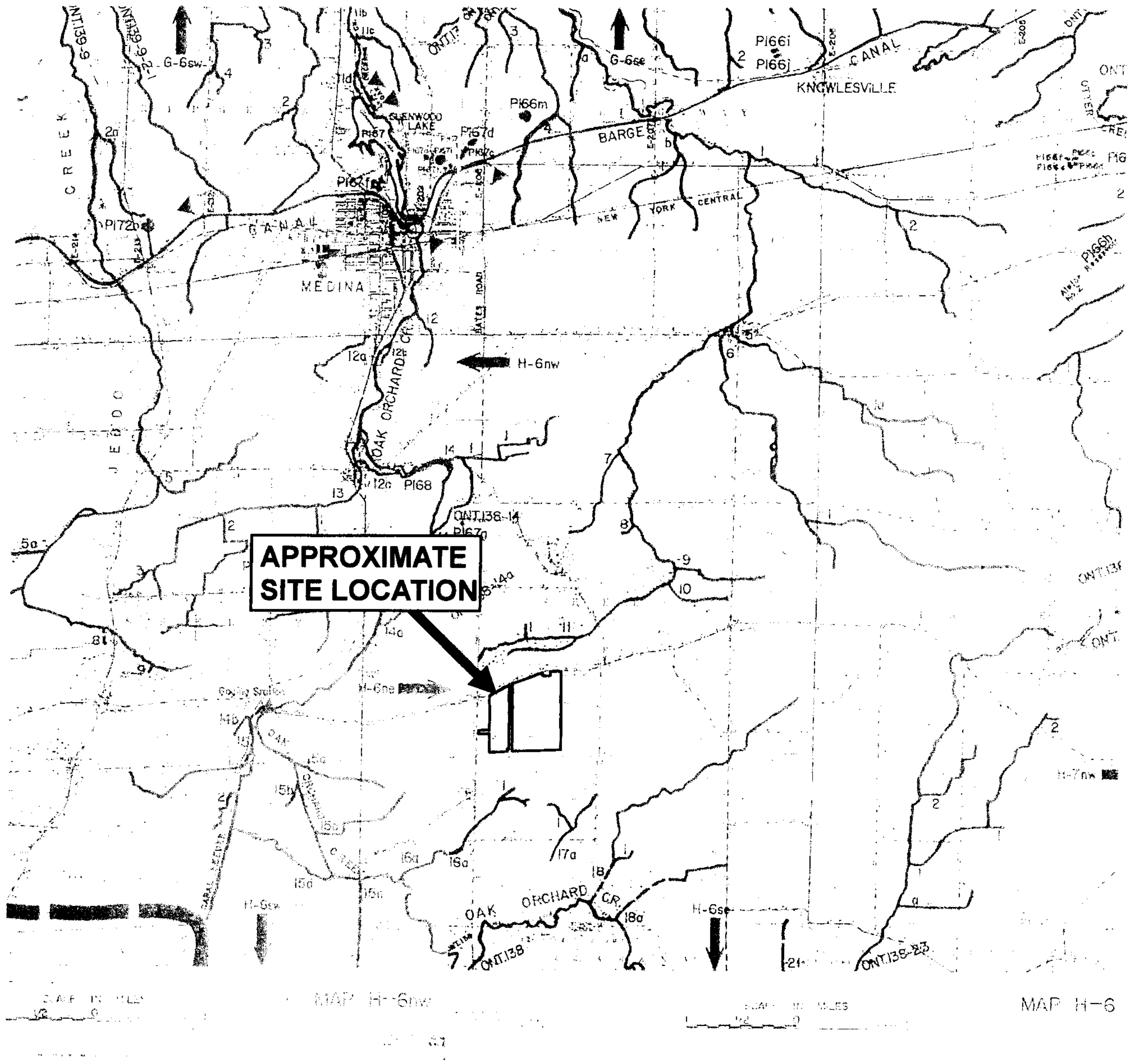


Item No.	Waters Index Number	Name	Description	Map Ref. No.	Class	Standards

No streams present on site.

Title 6 NYCRR, Chapter X
Article 9, Part 847.9 (1992)

Map H-6nw
Map H-6ne

0 4000' 8000'
SCALE 1" = 8000'

NORTH

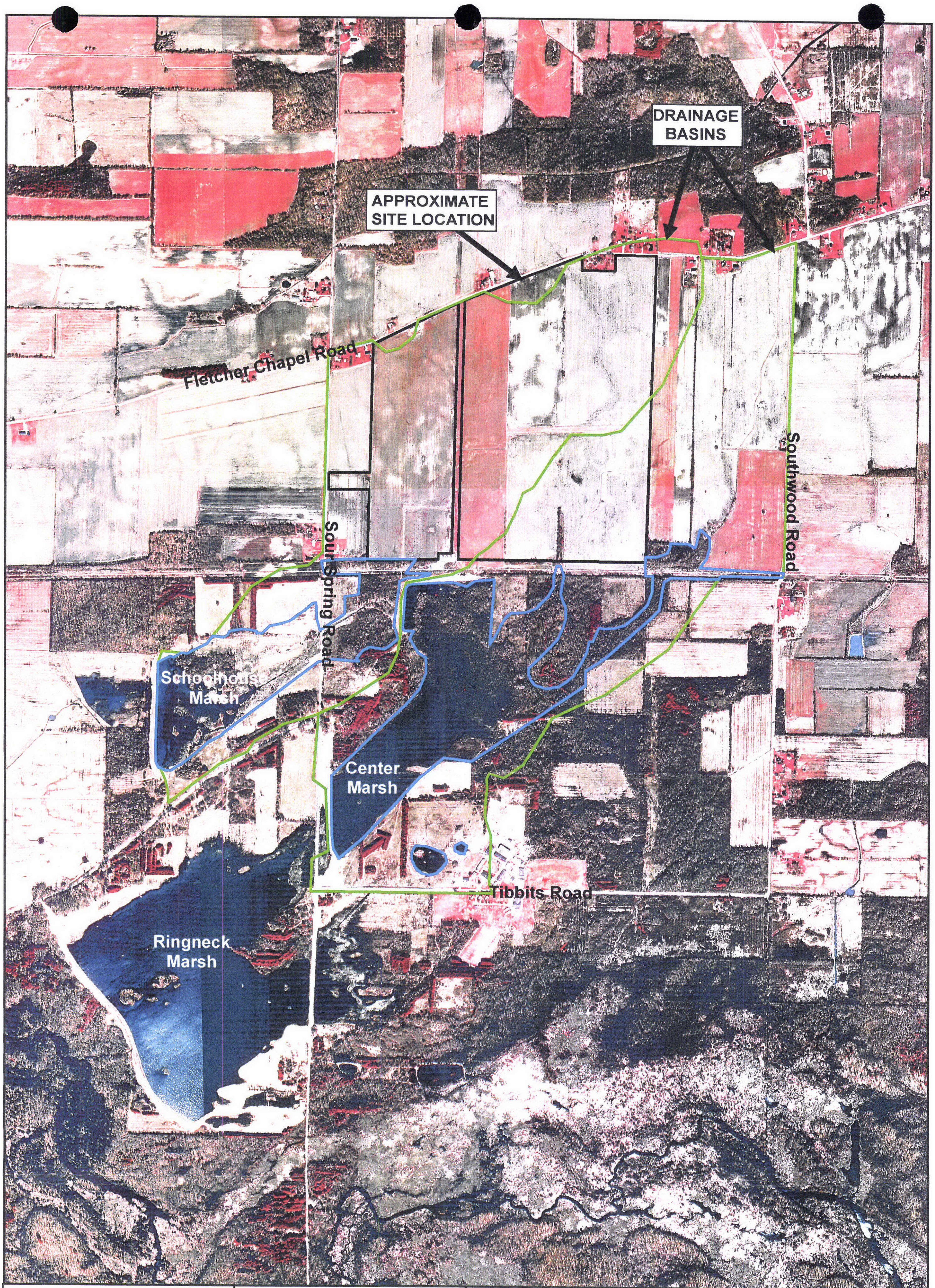
Figure 6. Stream Classification Map

NYSDEC

Knowlesville and Medina Quadrangles

Prepared by TERRESTRIAL ENVIRONMENTAL SPECIALISTS, Inc.

TES file: CON-3197\3197fig6new.dsf\3-31-09



LEGEND

Drainage Basins

Approximate Wetland Areas

NORTH

0 600' 1200'

APPROXIMATE SCALE IN FEET

Figure Prepared by Terrestrial Environmental Specialists, Inc.

Aerial Photograph Obtained from NYS GIS Clearinghouse 1994-1996

Figure 7.

Aerial Photograph of Site with Approximate Adjacent Wetlands

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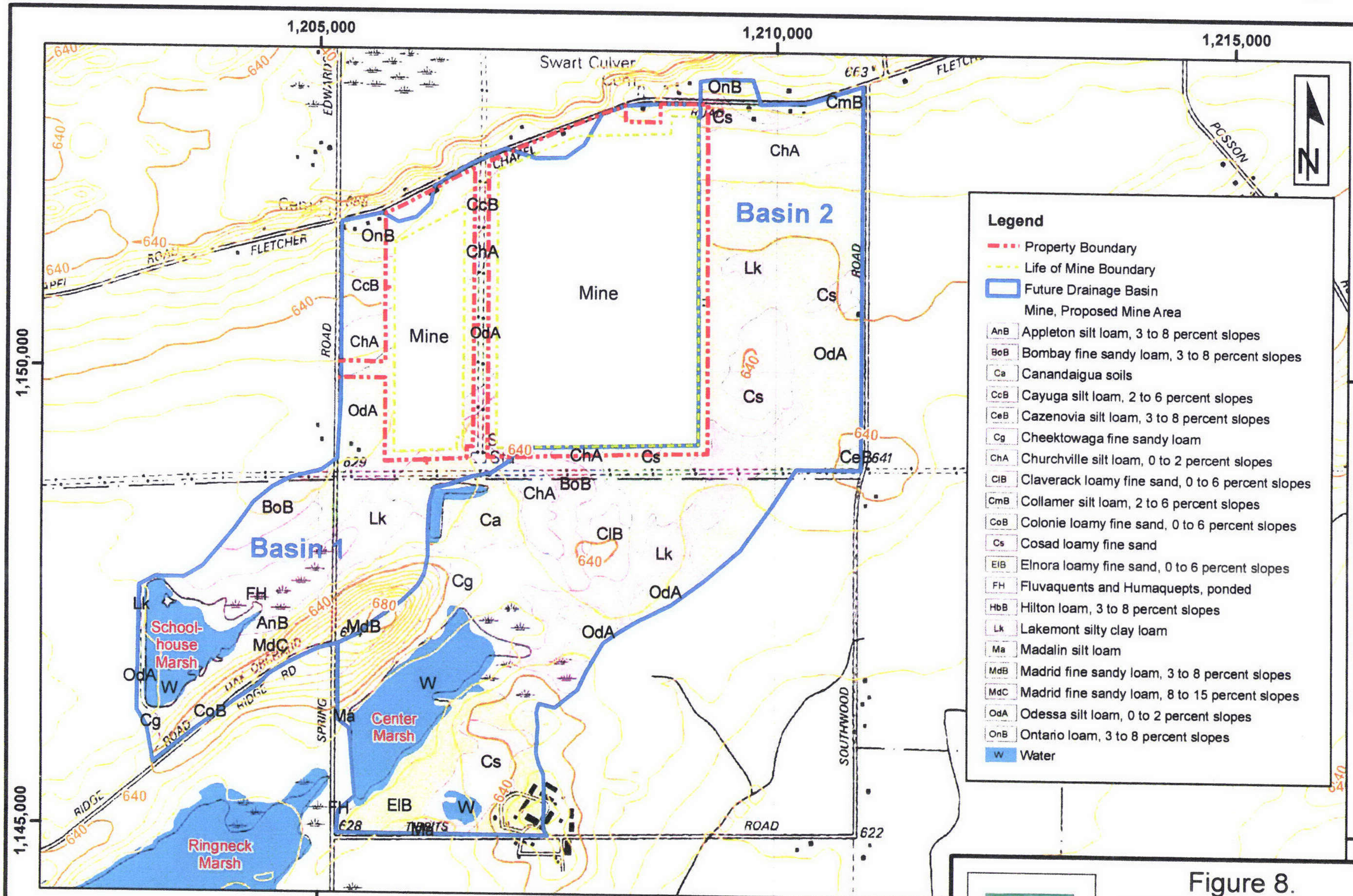


Notes:
- Basemap - NYS Department of Transportation Raster planimetric layer (Knowlesville and Medina quadrangles)
- Topographic contours based on New York State Digital Elevation Models (DEM). U.S. Geological Survey and modified by Alpha Geoscience.
- Water features based on USDA Soil Survey and orthoimagry (1994-1999), NYS Office of Cyber Security & Critical Infrastructure Coordination.
- Soil Survey Geographic (SSURGO) database for Orleans County New York, U.S. Department of Agriculture, Natural Resources Conservation Service and modified by Alpha Geoscience.

0 1,500 3,000 Feet

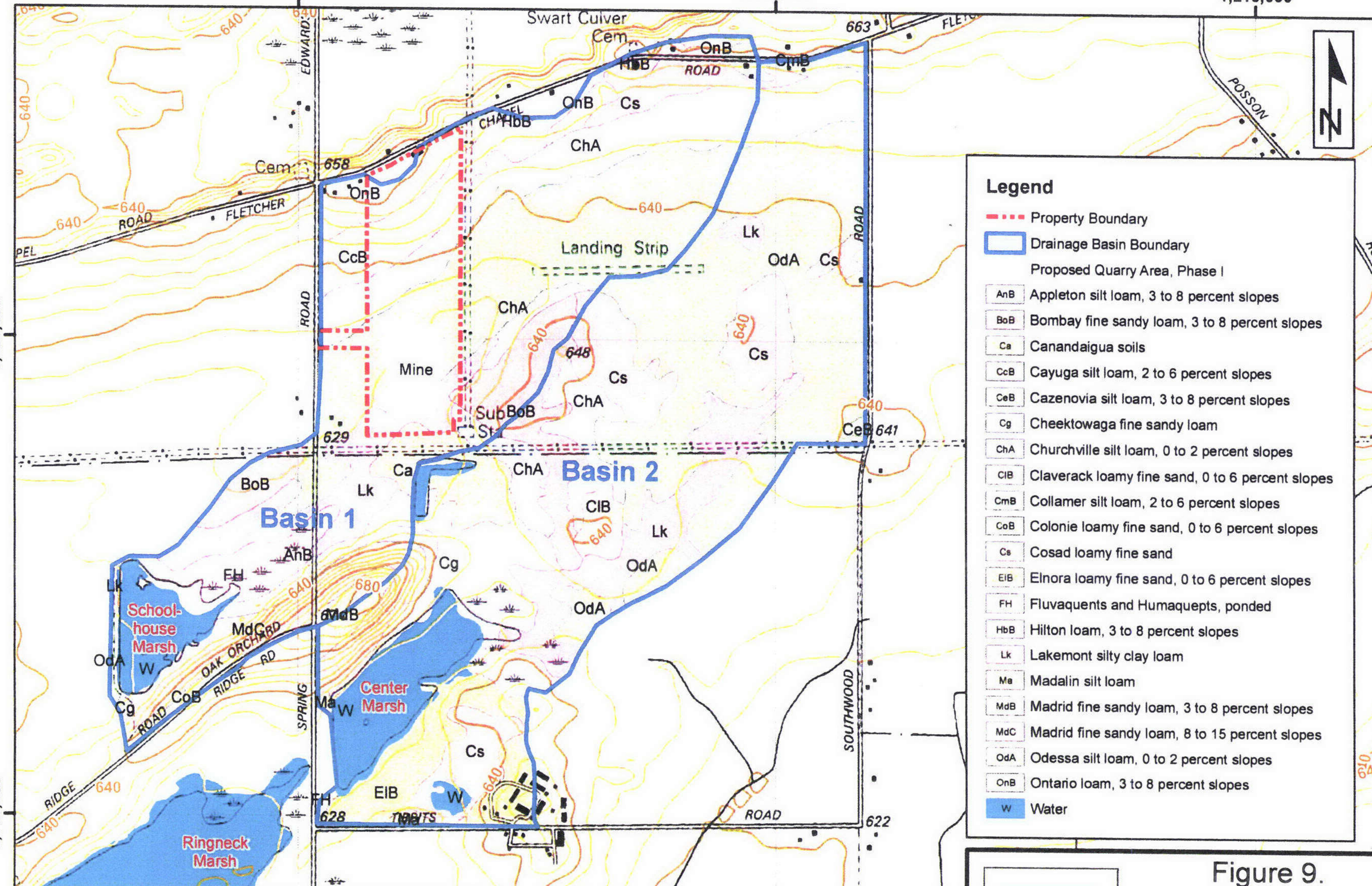
ALPHA GEOSCIENCE
Alpha Proj. No. 08122

Figure 8.
FUTURE SURFACE WATER DRAINAGE BASINS

Frontier Stone Quarry
Frontier Stone LLC

Town of Shelby
Orleans County, New York

TES File: CON-3197\3197-fig8new.dsf\2-28-11



Notes:
- Basemap - NYS Department of Transportation Raster planimetric layer (Knowlesville and Medina quadrangles)
- Topographic contours based on New York State Digital Elevation Models (DEM). U.S. Geological Survey and modified by Alpha Geoscience.
- Water features based on USDA Soil Survey and orthoimagry (1994-1999), NYS Office of Cyber Security & Critical Infrastructure Coordination.
- Soil Survey Geographic (SSURGO) database for Orleans County New York, U.S. Department of Agriculture, Natural Resources Conservation Service and modified by Alpha Geoscience.

0 1,500 3,000 Feet

1,210,000

Figure 9.

FUTURE SURFACE WATER DRAINAGE BASINS AT THE END OF PHASE 1 MINING

Frontier Stone Quarry
Frontier Stone LLC

Town of Shelby
Orleans County, New York

ALPHA GEOSCIENCE
Alpha Proj. No. 08122

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APPENDIX A - Correspondence

DEPARTMENT OF THE ARMY
BUFFALO DISTRICT, CORPS OF ENGINEERS
1776 NIAGARA STREET
BUFFALO, NEW YORK 14207-3199

COPY

REPLY TO

July 20, 2011

Regulatory Branch

SUBJECT: Acceptance of Wetland Delineation, Application No. 2006-01186, New York State Department of Environmental Conservation No. 8-3436-00033

Mr. John Hellert
Continental Placer, Inc.
II Winners Circle.
Albany, New York 12205

Dear Mr. Hellert:

This pertains to the proposed Frontier Stone, LLC Shelby Quarry, located south of Fletcher Road in the Town of Shelby, Orleans County, New York.

The Corps of Engineers regulatory responsibilities under Section 404 of the Clean Water Act establishes jurisdiction over the discharge of dredged or fill material into waters of the United States, including wetlands.

The wetland delineation you submitted confirms that wetlands under Federal jurisdiction exist on the property, but I understand that you do not intend to impact them at this time. In this regard, I would like to point out that the Federal wetland boundary located on your property, as shown on the attached drawings, was confirmed on July 20, 2011 and will remain valid for a period of five (5) years from the date of this correspondence unless new information warrants revision of the delineation before the expiration. Further, this delineation/determination has been conducted to identify the limits of the Corps Clean Water Act jurisdiction for the particular site identified in this request. This delineation/determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985, as amended. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resource Conservation Service prior to starting work.

Based upon my review of the submitted delineation and on-site observations, I have determined that the downstream reaches of Ditch A, and the entire reach of Ditch D on the subject parcel are part of a surface water tributary system to a navigable water of the United States as noted on the attached Jurisdictional Determination form. Therefore, the water features on the subject parcel are regulated under Section 404 of the Clean Water Act. Department of the Army authorization is required if you propose a discharge of dredged or fill material in this area.

COPY

Regulatory Branch
SUBJECT: Acceptance of Wetland Delineation, Application No. 2006-01186, New York State Department of Environmental Conservation No. 8-3436-00033

In addition, I have determined that there is no clear surface water connection or ecological continuum between Wetland C (0.22 acres) on the parcel and a surface tributary system to a navigable water of the United States. Therefore, Wetland C is considered to be an isolated, non-navigable, intrastate water and not regulated under Section 404 of the Clean Water Act. I have also determined that the upper reach of Ditch A, and Ditch B are active agricultural ditches that are not tributaries, nor do they have a significant nexus to a TNW. Therefore, these waters are not regulated under Section 404 of the Clean Water Act. Accordingly, you do not need Department of the Army authorization to commence work in these areas.

Finally, this letter contains an approved jurisdictional determination for the subject parcel. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and Request for Appeal (RFA) form. If you request to appeal the above determination, you must submit a completed RFA form within 60 days of the date on this letter to the Great Lakes/Ohio River Division Office at the following address:

Ms. Pauline Thorndike, Review Officer
Great Lakes and Ohio River Division
CELRD-PDS-O
550 Main Street, Room 10032
Cincinnati, OH 45202-3222
Phone: 513-684-6212

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 C.F.R. part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by **September 20, 2011**.

It is not necessary to submit an RFA to the Division office if you do not object to the determination in this letter.

A copy of this correspondence without enclosures has been forwarded to your consultant – Terrestrial Environmental Specialists, Inc.

Frontier Stone LLC
D/A Pro[illegible]ing No. 2006-01186
Orleans County, New York
Quad: Knowlesville
Sheet 2 of 5

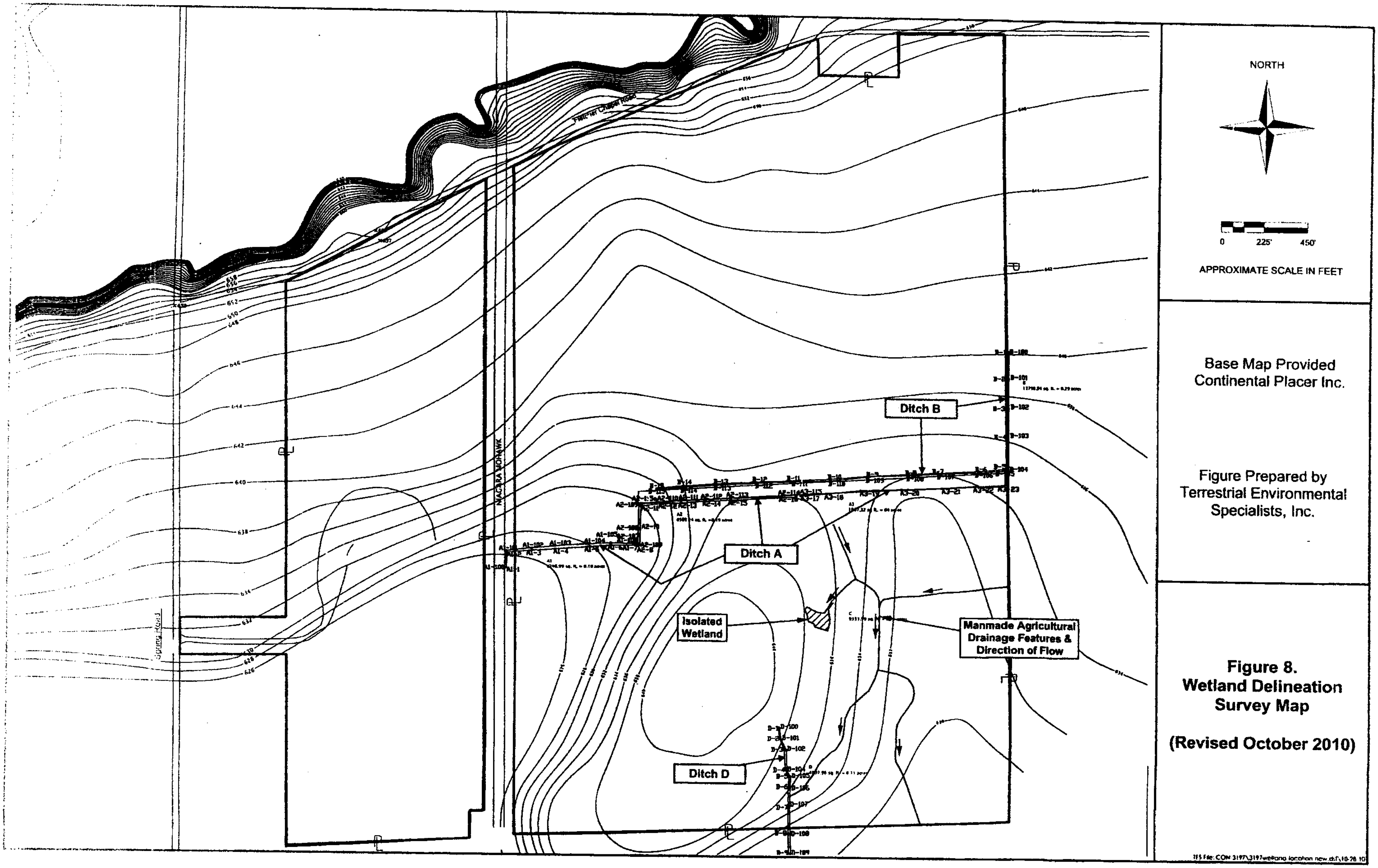
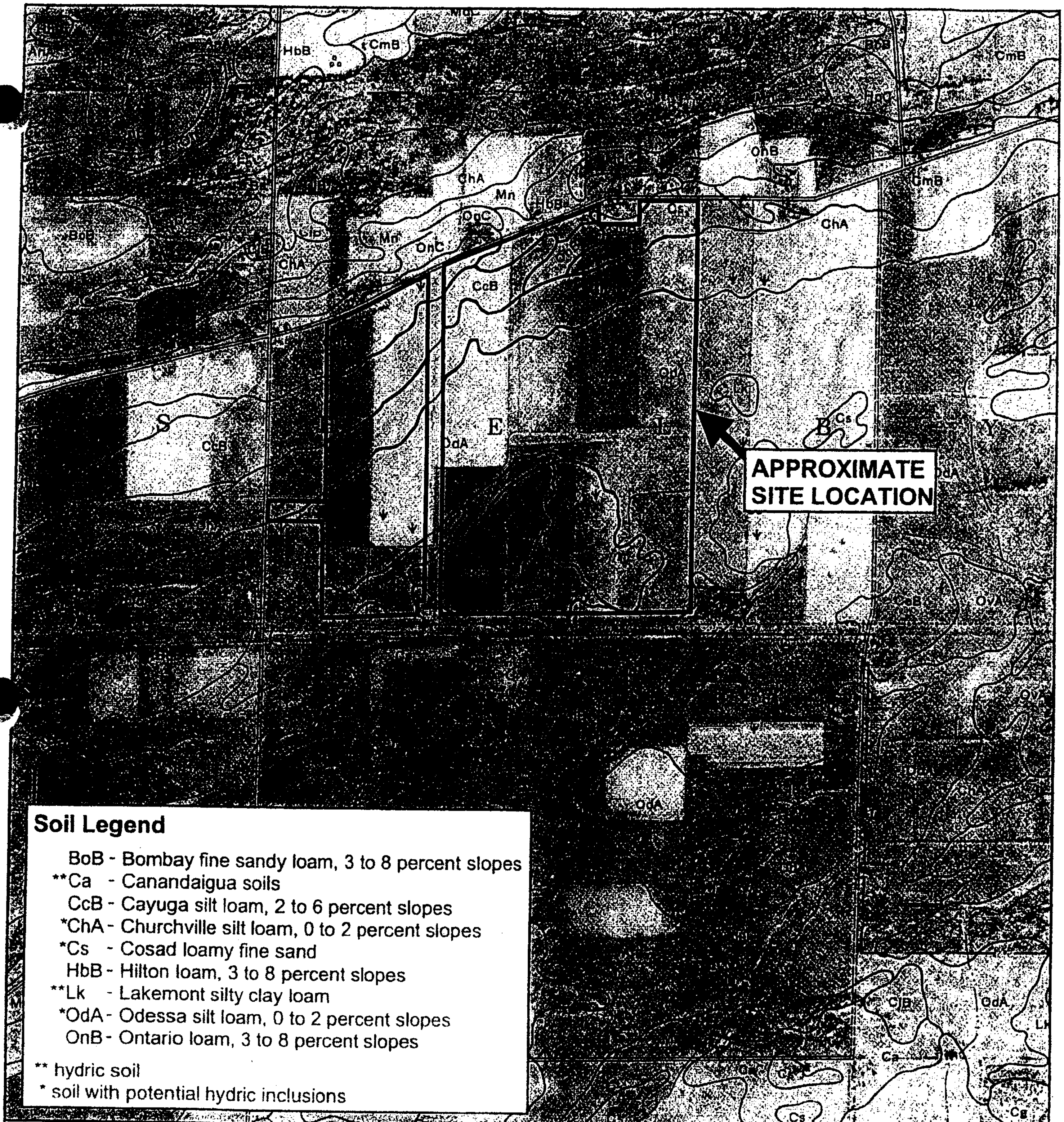


Figure 8.
Wetland Delineation Survey Map

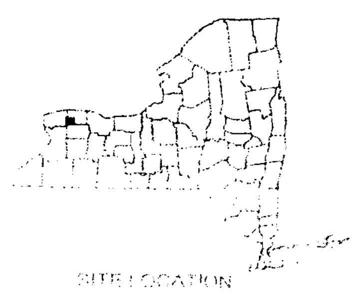
(Revised October 2010)



Soil Legend

BoB - Bombay fine sandy loam, 3 to 8 percent slopes
**Ca - Canandaigua soils
CcB - Cayuga silt loam, 2 to 6 percent slopes
*ChA - Churchville silt loam, 0 to 2 percent slopes
*Cs - Cosad loamy fine sand
HbB - Hilton loam, 3 to 8 percent slopes
**Lk - Lakemont silty clay loam
*OdA - Odessa silt loam, 0 to 2 percent slopes
OnB - Ontario loam, 3 to 8 percent slopes

** hydric soil
* soil with potential hydric inclusions



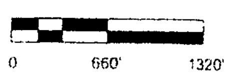


Figure 4. Soil Survey Map

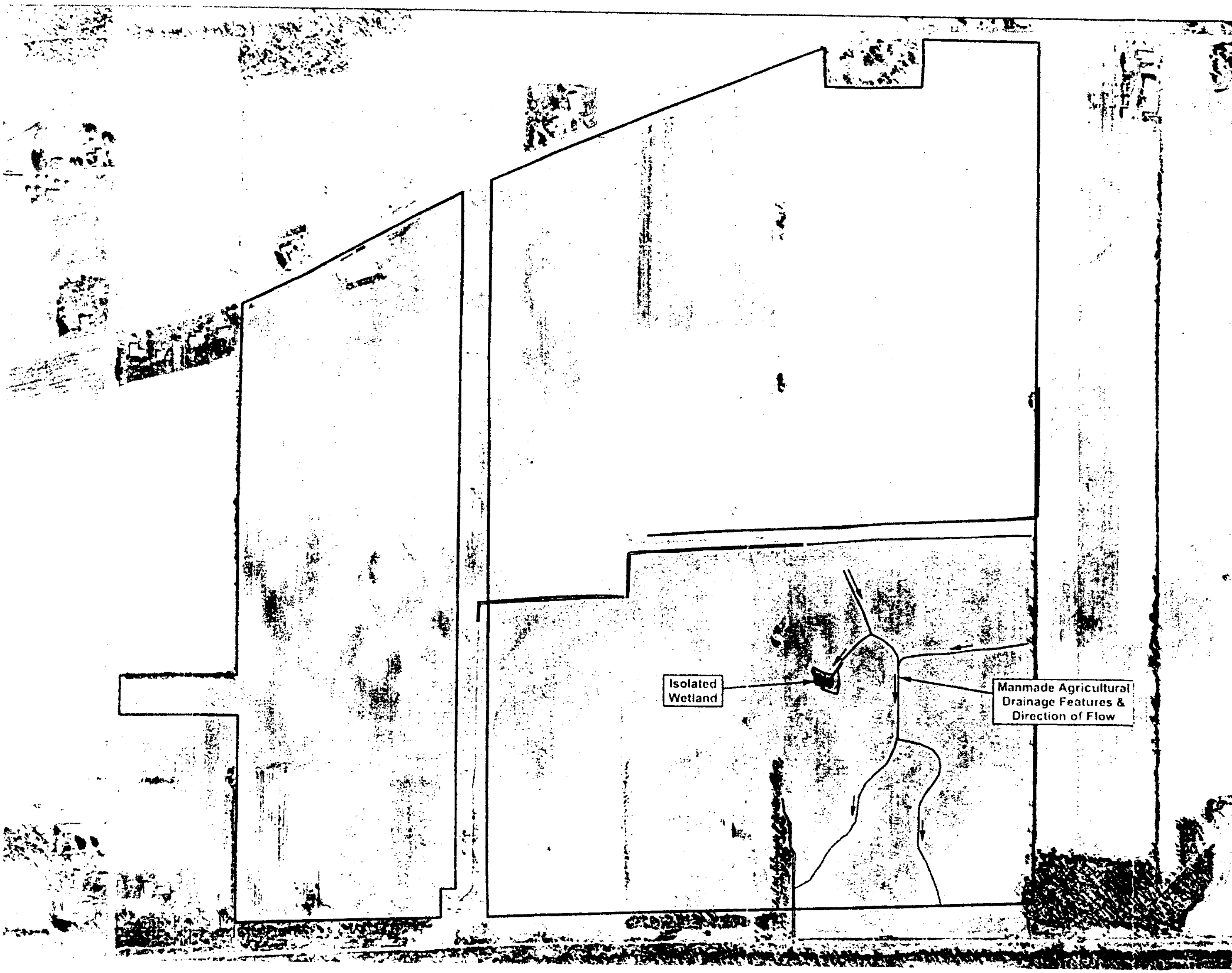
U.S. Soil Conservation Service

Orleans County Soil Survey

1977

Frontier Stone LLC
D.A Processing No. [illegible]
Orleans County, New York
Quad: Knowlesville

Frontier Stone LLC
DA Processing No. 2006-01186
Orleans County, New York
Quad: Knowlesville
Sheet 4 of 5



Aerial Photograph obtained from NYS GIS Clearinghouse 2005

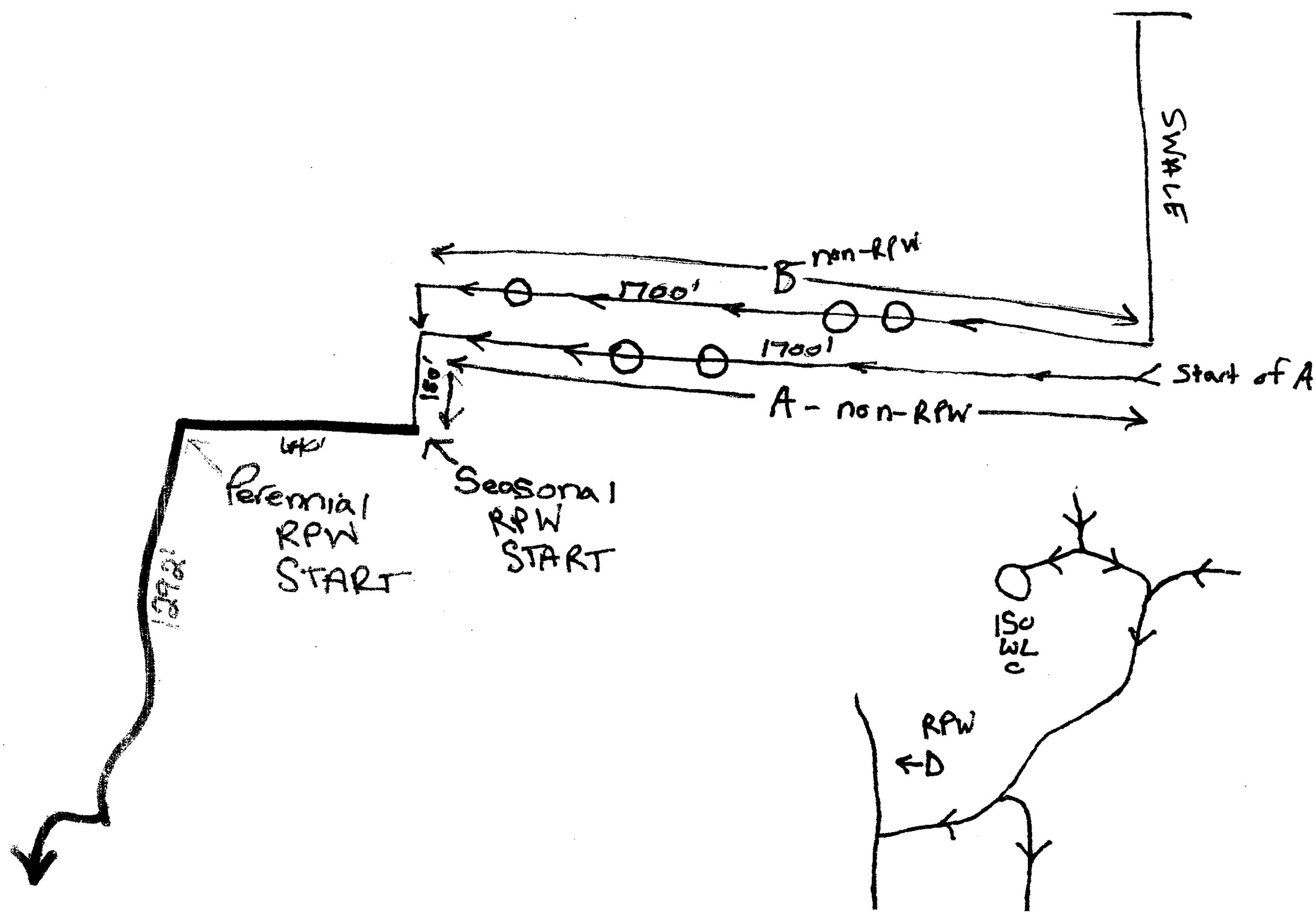
Prepared by Terrestrial Environmental Specialists, Inc.

Figure 7.
Aerial Photograph of Site

(Revised October 2010)

D/A Processing No. 2006-01186
Orleans County, New York
Quad: Knowlesville
Sheet 5 of 5

Key: = Wetland Pocket



APPENDIX 8

- **Traffic Studies**

Transportation Impact Study
for the proposed

Frontier Stone Quarry

Town of Shelby
Orleans County, New York

June 2007
Revised January 2013

Project No. 27030

Prepared For:

CONTINENTAL PLACER INC.
Consultants to the Mining and Minerals Industry

Continental Placer
26 Computer Drive West
Albany, New York 12205

Prepared By:

SRF
ASSOCIATES
WWW.SRFA.NET
Traffic Engineering & Planning Consultants

3495 Winton Place
Building E, Suite 110
Rochester, New York 14623

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1. Special Report 209: Highway Capacity Manual. Transportation Research Board. National Research Council, Washington, DC: 2000.
2. A Policy on Geometric Design of Highways and Streets. The American Association of State Highway Transportations Officials (AASHTO). Washington, DC: 2001.
3. Traffic Volume Report. NYSDOT. Albany, New York: 2004.
4. Highway Sufficiency Ratings. NYSDOT. Albany, New York: 2005.
5. New York State Department of Transportation Traffic Data Viewer. 2007. Retrieved from https://www.nysdot.gov/portal/page/portal/divisions/engineering/applications/traffic-data-viewer.htm

EXECUTIVE SUMMARY

OVERVIEW

The purpose of this report is to identify the potential transportation impacts that would result from the operation of the proposed Frontier Stone Quarry in the Town of Shelby, Orleans County, New York. This report investigates the existing and projects the future weekday AM and PM peak hour travel conditions at the intersection affected by the operation.

The proposed Frontier Stone Quarry mining site is located on the southeast corner of Sour Springs Road/Fletcher Chapel Road intersection in the Town of Shelby, Orleans County, New York. The affected area boundary for the mine site encompasses approximately 215.5 ± acres during the life of the mining operation. Access is proposed via a new driveway on Sour Springs Road approximately 1600± feet south of Fletcher Chapel Road. The operating characteristics of the site drive and impacts to the adjacent roadway network are identified. The study area consists of two existing intersections - Oak Orchard Ridge Road at NYS Route 63 and Sour Springs Road.

A background growth rate was derived based on historical growth rates determined using historical NYSDOT traffic volume information. A growth rate of 5% year for one year was applied to the existing traffic volumes to estimate future background traffic volumes.

Since the Frontier Stone Quarry is a unique use, information provided by the developer regarding the truck traffic was used to generate peak hour traffic volumes. Business traffic for the proposed mine operation was based on an estimated production rate of 350,000 tons per year. The Frontier Stone Quarry is anticipated to generate approximately 65 trips per day with 8 trucks entering and exiting the site during the peak hours based on 220 working days/year, 8 hours shift day, and an average truck capacity of 25 tons.

The distribution of the site-generated traffic was based upon the expected truck travel route to and from the mining site is based on information provided by the developer. Most of the traffic exiting the site will travel south to the Thruway via Sour Springs Road, Oak Orchard Ridge Road and NYS Route 63. The operating characteristics of the roadway network are identified and recommendations are provided to minimize any capacity or safety concerns.

CONCLUSIONS AND RECOMMENDATIONS

This report addresses the traffic impact that would result from the operation of the proposed Frontier Stone Quarry in the Town of Shelby as described in this report. It has been shown that the transportation network can adequately accommodate the projected traffic volumes and resulting impacts to the study area intersection, without significant adverse impacts to traffic operations.

The following list summarizes the conclusions and recommendations to be considered as a result of the proposed mining operation:

1. Full depth reclamation is recommended on Oak Orchard Ridge Road between NYS Route 63 and Sour Springs Road. Shoulder treatment is also recommended on Sour Springs Road to accommodate the southbound right turn radius at the Sour Springs Road/ Oak Orchard Ridge Road intersection.

2. Construct the site drive on Sour Springs Road with one stop-controlled exiting lane and one entering lane. The site drive must provide adequate truck turning radii, and driveway width, for both entering and exiting traffic.

3. The proposed site driveway on Sour Springs Road exceeds the recommended sight distance guidelines.

4. The Oak Orchard Ridge Road intersection at Sour Springs Road and NYS Route 63 provides adequate truck turning radii.

5. The additional truck traffic will not significantly impact the Route 63/Oak Orchard Ridge Road intersection.

6. No changes in levels of service are anticipated at the Route 63/Oak Orchard Ridge Road intersection.

7. No inherent safety deficiencies were identified at the Route 63/Oak Orchard Ridge Road intersection.

I. INTRODUCTION

The purpose of this report is to identify the potential transportation impact associated with the operation of the proposed Frontier Stone Quarry in the Town of Shelby, Orleans County, New York.

In an effort to define traffic impact, this analysis determines the extent of existing traffic conditions, projects background traffic flow including area growth, and projects changes in traffic flow due to the proposed operation.

II. PROJECT LOCATION AND STUDY AREA

The proposed site is bounded by Fletcher Chapel Road to the north, Sour Springs Road to the west, and vacant lands to the east and south in the Town of Shelby, Orleans County, New York.

The study area consists of two existing intersections - Oak Orchard Ridge Road at NYS Route 63 and Sour Springs Road. The site location is illustrated in **Figure 1** - Site Location and Study Area (all figures are included in Section VIII at the end of this report).

III. EXISTING HIGHWAY SYSTEM

The roadway system identified for investigation includes the portions of NY Route 63, Oak Orchard Ridge Road and Sour Springs Road near the proposed site. The Route 63/ Oak Orchard Ridge Road intersection has been identified for detailed traffic volume analysis. Also, a turning maneuvering analysis for the southbound right turn movement was done at Sour Springs Road/ Oak Orchard Ridge Road intersection using AutoTurn software. The lane geometry at the intersection is depicted in **Figure 2**.

NYS Route 63 (S Gravel Road) is owned and maintained by NYSDOT within the vicinity of the project. The highway is functionally classified as a north/south rural minor arterial highway. The highway generally consists of one travel lane in each direction with no posted speed limit sign. Route 63 carries average daily traffic volume of 5,000 vpd between the Orleans County line and RT 31A Start 31 OLAP based on the most recent NYSDOT data collected in 2004.

IV. EXISTING TRAFFIC CONDITIONS

A. Peak Intervals for Analysis

Given the functional characteristics of the corridor and the land use proposed for the site (gravel mining operation), the peak hours selected for analysis are the weekday AM and PM peaks. The combination of site traffic and adjacent through traffic produces the greatest demand during these time periods.

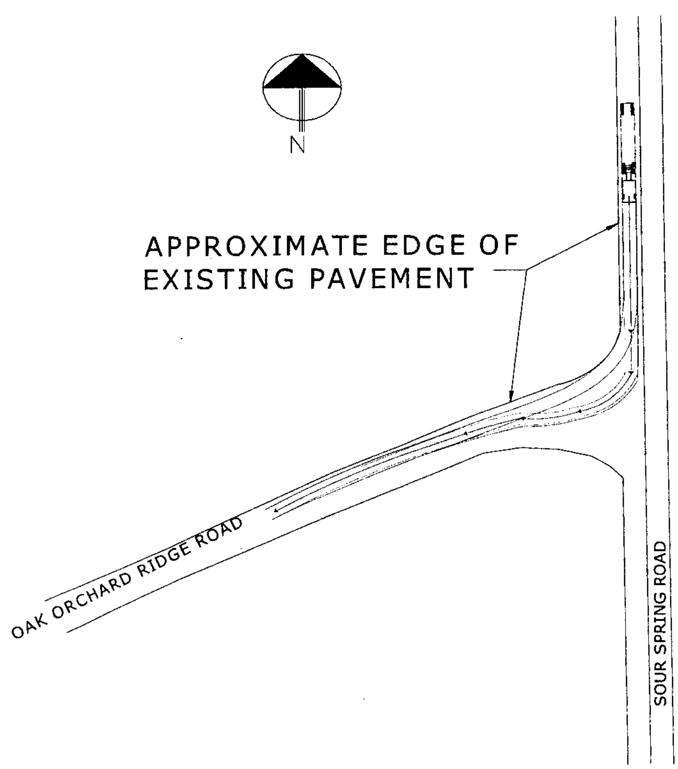
B. ***Existing Traffic Volume Data***

Weekday AM (7:00-9:00am) and PM (4:00-6:00pm) peak traffic counts were collected by SRF & Associates (SRF) at the NYS Route 63/ Oak Orchard Ridge Road intersection on Tuesday May 30, 2007 and on Wednesday May 31, 2007. The traffic volume at the Oak Orchard Ridge Road/ Sour Springs Road intersection was not collected due to very low volumes. However, vehicular turning maneuver was analysed in detail at this intersection as shown in the figure below.

These time frames were selected since they represent the greatest combination of traffic on the adjacent highways of use for the site. The peak hour traffic periods generally occurred between 7:00 to 8:00 AM and 4:00 to 5:00 PM. The existing peak hour volumes are depicted in **Figure 3**.

C. ***AutoTurn Analysis***

AutoTURN software represents the latest in cutting-edge technology for performing vehicle turning maneuver analysis. Review of vehicular turning paths at the Sour Springs Road/ Oak Orchard Ridge Road intersection, as illustrated in the figure below, indicates that the existing pavement width is sufficient to accommodate flow-boy trucks for making the southbound right-turn maneuver.



D. *Area Growth*

The mining operation is expected to start within one year. A review of historical NYSDOT traffic volume data on NYS Route 63 in the vicinity of the site indicates that traffic has increased at approximately 5.0% per year between 1998 and 2004. To account for normal increases in background traffic growth, including any unforeseen developments in the project study area, a growth rate of 5.0% per year has been applied to the existing traffic volumes in the study area. The background traffic volumes anticipated at the time of full operation of the mining site is depicted in **Figure 4**. Supporting documentation is included in the appendix of this Study.

E. *Existing Accident Investigation*

A brief accident review included the intersection of NYS Route 63/ Oak Orchard Ridge Road intersections with NYS Route 63 and Sour Springs Road. Accident data was obtained from the Orleans County Sheriff's Department for the period between May, 2004 and May, 2007. There were no reportable accidents that occurred on both study intersections (Oak Orchard Ridge Road/NYS Route 63 and Oak Orchard Ridge Road/Sour Springs Road) over a 3 year period. The nearest accident occurred on NYS Route 63, 0.3 miles south of Oak Orchard Ridge Road.

V. *PROPOSED DEVELOPMENT*

A. *Mining Operation*

The proposed mining site is located on the southeast corner of Sour Springs Road/Fletcher Chapel Road intersection in the Town of Shelby, Orleans County, New York. The affected area boundary for the mine site encompasses approximately 215.5 ± acres during the life of the mining operation. Access is proposed via a new driveway on Sour Springs Road approximately 1600± feet south of Fletcher Chapel Road.

B. *Site Traffic Generation*

The volume of traffic generated by a site is dependent on the intended land use and size of the development. Trip generation is an estimate of the number of trips generated by a specific building or land use. These trips represent the volume of new traffic that will be added to the roadways due to the proposed development.

Since the Frontier Stone Quarry is a unique use, information provided by the developer regarding the truck traffic was used to generate peak hour traffic volumes. Business traffic for the proposed mine operation were based on an estimated production rate of 350,000 tons per year. The Frontier Stone Quarry is anticipated to generate approximately 65 trips per day with 8 trucks entering and exiting the site during the peak hours based on 220 working days/year, 8 hours shift day, and an average truck capacity of 25 tons.

Under an unlikely worst case scenario, the quarry was assumed to generate a maximum 30 vehicles entering and exiting the site during the peak hours totaling 60 total truck trips generated during the AM and PM peak hours. This hypothetical worst case condition was also evaluated.

TABLE I: SITE GENERATED TRAFFIC VOLUMES

Land Use	AM Peak		PM Peak	
	Enter	Exit	Enter	Exit
Future Haulage at Project Site*	8	8	8	8

**Based on information provided by the developer*

C. ***Site Traffic Distribution***

The cumulative effect of site traffic on the transportation network is dependent on the origins and destinations of that traffic and the location of the access drive serving the site.

The distribution of the site-generated traffic was based upon the expected truck travel route to and from the mining site based on information provided by the developer. Most of the traffic exiting the site will travel south to the Thruway via Sour Springs Road, Oak Orchard Ridge Road and NYS Route 63.

Figure 5 shows the anticipated trip distribution pattern percentages for the proposed development and **Figure 6** illustrates the peak hour site generated traffic based on those percentages including pass-by trips.

D. ***Projected Future Traffic Volumes***

The projected design hour traffic volumes for the mining site were created for each peak by combining background conditions (Figure 4) with the projected site generated volumes (Figure 6) to yield the traffic volumes under full development conditions. **Figure 7** shows the total weekday PM and Saturday midday peak hour volumes anticipated for the proposed mining operation under full build out conditions.

VI. ***OPERATIONAL ANALYSES***

A. ***Capacity Analyses***

Capacity analysis is a technique used for determining a measure of effectiveness for a section of roadway and/or intersection based on the number of vehicles during a specific time period. The measure of effectiveness used for the capacity analysis is referred to as a Level of Service (LOS). Levels of Service are calculated to provide an indication of the amount of delay that a motorist experiences while traveling along a roadway or through an intersection. Since the most amount of delay to motorists usually occurs at intersections, the capacity analysis specifically focuses on intersections.

Six Levels of Service are defined for analysis purposes. They are assigned letter designations, from "A" to "F", with LOS "A" representing operating conditions with the least time delay. LOS "F" is the least desirable operating condition where longer delays are experienced by motorists. Suggested ranges of service capacity and an explanation of Levels of Service are included in the Appendix.

The standard procedure for capacity analysis of signalized and unsignalized intersections is outlined in the 2000 Highway Capacity Manual (HCM 2000). Traffic analysis software, SYNCHRO (Build 614), which is based on procedures and methodologies contained in the HCM 2000, was used to analyze operating conditions at study area intersections. The procedure yields a Level of Service (LOS) based on the HCM 2000 as an indicator of how well intersections operate. Existing operating conditions during the peak study periods are evaluated to determine a basis for comparison with the projected future conditions.

Table II indicates the level of service results for existing, background and full development conditions for the proposed mining operation. The discussion following the table summarizes the existing, background, and future capacity conditions.

TABLE II: INTERSECTION CAPACITY ANALYSIS RESULTS

INTERSECTION	***EXISTING CONDITIONS***		***BACKGROUND CONDITIONS***		***FULL DEVELOPMENT CONDITIONS***	
	AM	***PM***	***AM***	***PM***	***AM***	***PM***
NYS Route 63/Oak Orchard Ridge Road(U)						
Westbound - *Oak Orchard Ridge Road*	B	B	B	B	B	B
Southbound Left - *NYS Route 63*	A	A	A	A	A	A

The NYS Route 63/ Oak Orchard Ridge Road intersection operates at an above average LOS ("B" or better) on all approaches during both peak periods under existing, background and full development conditions. No changes in levels of service are anticipated and no improvements are warranted or recommended at this intersection.

Additionally, analysis of the assumed worst case scenario with a maximum of 30 trucks entering and exiting the site during a peak hour period, indicates that there are no changes in levels of service between the previously described full development conditions. The capacity analysis results for the expected conditions and worst case scenario is included in the report appendix.

B. *Sight Distance Investigation*

Sight distances were investigated at the proposed driveway along Sour Springs Road. Sight distance is provided at intersections to allow drivers to perceive the presence of potentially conflicting vehicles. This should occur in sufficient time for a motorist to stop or adjust their speed, as appropriate, to avoid a collision at the intersection. Sight distance is also provided at intersections to allow the drivers of stopped vehicles a sufficient view of the intersecting highway to anticipate and avoid potential incidents. If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road.

A Policy on Geometric Design of Highways and Streets was used as a reference to establish the required stopping sight distance and desirable intersection sight distance for the site access drives. Required stopping distances and desirable intersection sight distances are based on the design speed for a given section of roadway, generally the design speed is the posted speed limit plus 5 mph. Although not posted with a speed limit sign on Sour Springs Road, it is assumed to be 55 mph. Therefore, 60 mph is used as the design speed along Sour Springs Road. The required stopping distance and desirable intersection sight distance based on the design speed are compared to the actual sight distances measured at the intersections and summarized in Table III.

TABLE III: SIGHT DISTANCE REQUIREMENTS AND MEASUREMENTS

INTERSECTION	Desirable Intersection Sight Distance for Left Turn from Stop (ft)	Required Stopping Sight Distance (ft)	Available Sight Distance (ft) to the:	
			Left	Right
Sour Springs Road @ site drive	665’	570’	>1000’	>1000’

The available sight distance from the proposed site access drive on Sour Springs Road is in excess of the desirable requirement for intersection sight distance and stopping sight distance.

VII. *CONCLUSIONS AND RECOMMENDATIONS*

This report addresses the traffic impact that would result from the operation of the proposed Frontier Stone Quarry in the Town of Shelby as described in this report. It has been shown that the transportation network can adequately accommodate the projected traffic volumes and resulting impacts to the study area intersection, without significant adverse impacts to traffic operations.

The following list summarizes the conclusions and recommendations to be considered as a result of the proposed mining operation:

1. Full depth reclamation is recommended on Oak Orchard Ridge Road between NYS Route 63 and Sour Springs Road. Shoulder treatment is also recommended on Sour Springs Road to accommodate the southbound right turn radius at the Sour Springs Road/ Oak Orchard Ridge Road intersection.

2. Construct the site drive on Sour Springs Road with one stop-controlled exiting lane and one entering lane. The site drive must provide adequate truck turning radii, and driveway width, for both entering and exiting traffic.

3. The proposed site driveway on Sour Springs Road exceeds the recommended sight distance guidelines.

4. The Oak Orchard Ridge Road intersection at Sour Springs Road and NYS Route 63 provides adequate truck turning radii.

5. The additional truck traffic will not significantly impact the Route 63/Oak Orchard Ridge Road intersection.

6. No changes in levels of service are anticipated at the Route 63/Oak Orchard Ridge Road intersection.

7. No inherent safety deficiencies were identified at the Route 63/Oak Orchard Ridge Road intersection.

VIII. *FIGURES*

Figures 1 through 7 are included on the following pages.

APPENDICES

A1

Collected Traffic Volume Data

SRF & Associates

3495 Winton Place, Building E, Suite 110
Rochester, NY 14623

File Name : Route63.OakOrchard.AM
Site Code : 02703079
Start Date : 5/30/2007
Page No : 1

Groups Printed- Unshifted - Bank 1

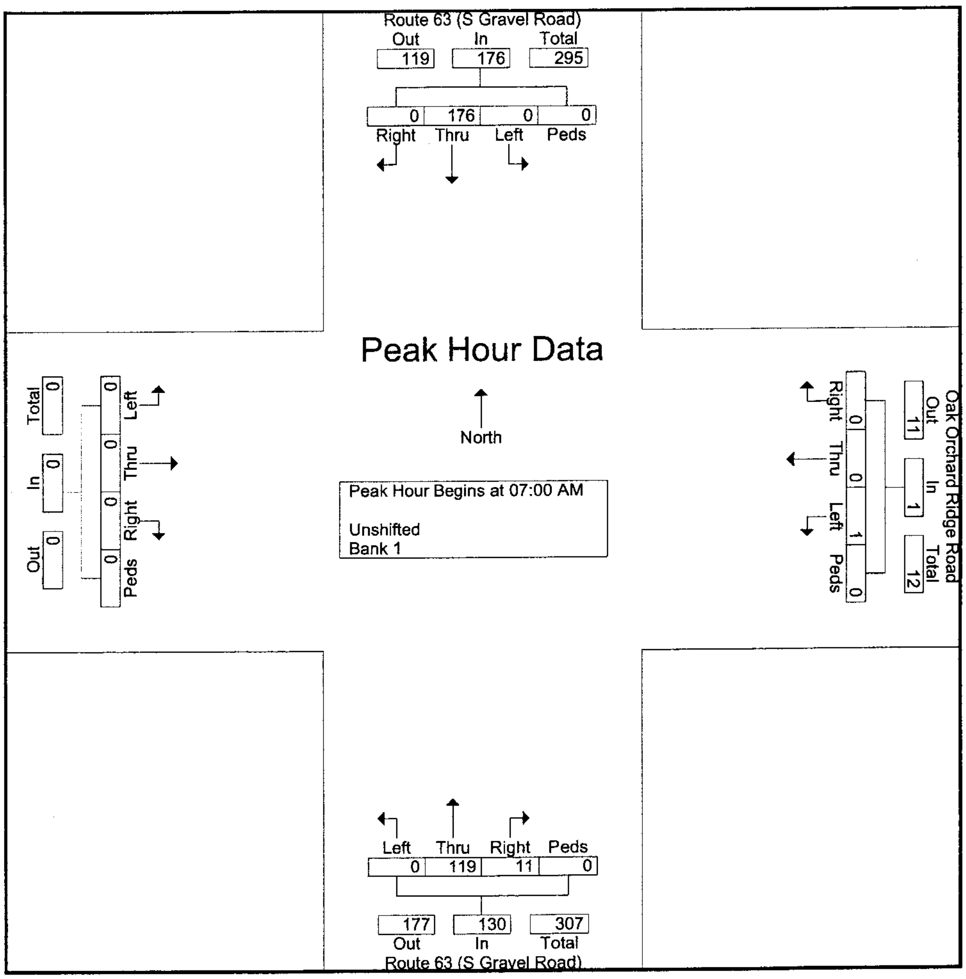
	Route 63 (S Gravel Road) From North				Oak Orchard Ridge Road From East				Route 63 (S Gravel Road) From South				From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	39	0	0	0	0	0	0	2	32	0	0	0	0	0	0	73
07:15 AM	0	57	0	0	0	0	0	0	1	36	0	0	0	0	0	0	94
07:30 AM	0	45	0	0	0	0	0	0	3	25	0	0	0	0	0	0	73
07:45 AM	0	35	0	0	0	0	1	0	5	26	0	0	0	0	0	0	67
Total	0	176	0	0	0	0	1	0	11	119	0	0	0	0	0	0	307
08:00 AM	0	26	1	0	0	0	2	0	4	20	0	0	0	0	0	0	53
08:15 AM	0	30	1	0	1	0	2	0	2	19	0	0	0	0	0	0	55
08:30 AM	0	25	0	0	0	1	0	0	2	21	0	0	0	1	0	0	50
08:45 AM	0	23	0	0	0	0	2	0	1	23	0	0	0	0	0	0	49
Total	0	104	2	0	1	1	6	0	9	83	0	0	0	1	0	0	207
Grand Total	0	280	2	0	1	1	7	0	20	202	0	0	0	1	0	0	514
Apprch %	0	99.3	0.7	0	11.1	11.1	77.8	0	9	91	0	0	0	100	0	0	
Total %	0	54.5	0.4	0	0.2	0.2	1.4	0	3.9	39.3	0	0	0	0.2	0	0	
Unshifted	0	280	2	0	1	1	7	0	20	202	0	0	0	1	0	0	514
% Unshifted	0	100	100	0	100	100	100	0	100	100	0	0	0	100	0	0	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

SRF & Associates

3495 Winton Place, Building E, Suite 110
Rochester, NY 14623

File Name : Route63.OakOrchard.AM
Site Code : 02703079
Start Date : 5/30/2007
Page No : 2

	Route 63 (S Gravel Road) From North					Oak Orchard Ridge Road From East					Route 63 (S Gravel Road) From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	39	0	0	39	0	0	0	0	0	2	32	0	0	34	0	0	0	0	0	73
07:15 AM	0	**57**	0	0	**57**	0	0	0	0	0	1	**36**			**37**	0	0	0	0	0	**94**
07:30 AM	0	45	0	0	45	0	0	0	0	0	3	25	0	0	28	0	0	0	0	0	73
07:45 AM	0	35	0	0	35	0	0	**1**		**1**	**5**										
Total Volume	0	176	0	0	176	0	0	1	0	1	11	119	0	0	130	0	0	0	0	0	307
% App. Total	0	100	0	0		0	0	100	0		8.5	91.5	0	0		0	0	0	0		
PHF	.000	.772	.000	.000	.772	.000	.000	.250	.000	.250	.550	.826	.000	.000	.878	.000	.000	.000	.000	.000	.816



SRF ASSOCIATES

SRF & Associates

3495 Winton Place, Building E, Suite 110
Rochester, NY 14623

File Name : Route63.OakOrchard.PM
Site Code : 02703046
Start Date : 5/29/2007
Page No : 1

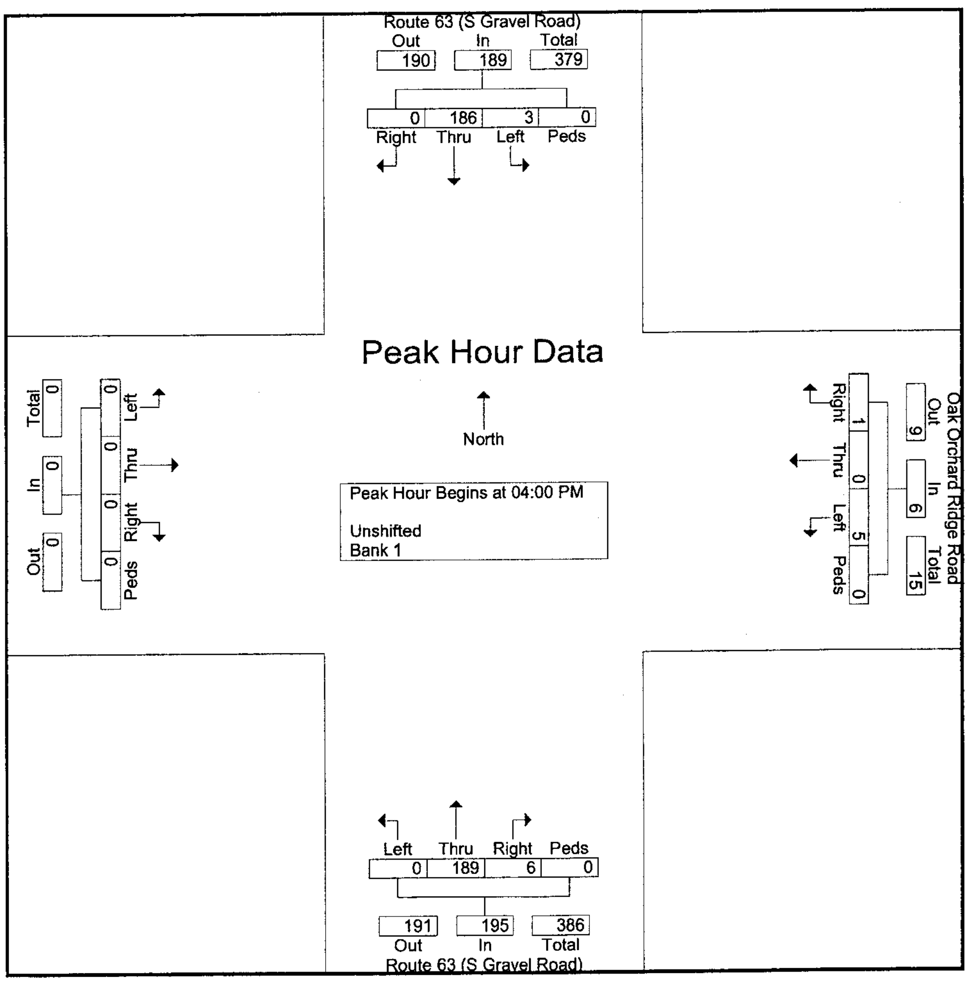
Groups Printed- Unshifted - Bank 1

	Route 63 (S Gravel Road) From North				Oak Orchard Ridge Road From East				Route 63 (S Gravel Road) From South				From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	41	1	0	0	0	1	0	1	58	0	0	0	0	0	0	102
04:15 PM	0	54	1	0	0	0	2	0	2	49	0	0	0	0	0	0	108
04:30 PM	0	37	0	0	0	0	2	0	2	43	0	0	0	0	0	0	84
04:45 PM	0	54	1	0	1	0	0	0	1	39	0	0	0	0	0	0	96
Total	0	186	3	0	1	0	5	0	6	189	0	0	0	0	0	0	390
05:00 PM	0	24	1	0	0	0	1	0	2	40	0	0	0	0	0	0	68
05:15 PM	0	36	0	0	1	0	5	0	0	55	0	0	0	0	0	0	97
05:30 PM	0	29	0	0	0	0	1	0	0	39	0	0	0	0	0	0	69
05:45 PM	0	21	1	0	0	0	1	0	1	48	0	0	0	0	0	0	72
Total	0	110	2	0	1	0	8	0	3	182	0	0	0	0	0	0	306
Grand Total	0	296	5	0	2	0	13	0	9	371	0	0	0	0	0	0	696
Apprch %	0	98.3	1.7	0	13.3	0	86.7	0	2.4	97.6	0	0	0	0	0	0	
Total %	0	42.5	0.7	0	0.3	0	1.9	0	1.3	53.3	0	0	0	0	0	0	
Unshifted	0	296	5	0	2	0	13	0	9	371	0	0	0	0	0	0	696
% Unshifted	0	100	100	0	100	0	100	0	100	100	0	0	0	0	0	0	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

SRF & Associates
3495 Winton Place, Building E, Suite 110
Rochester, NY 14623

File Name : Route63.OakOrchard.PM
Site Code : 02703046
Start Date : 5/29/2007
Page No : 2

	Route 63 (S Gravel Road) From North					Oak Orchard Ridge Road From East					Route 63 (S Gravel Road) From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	41	**1**									**58**			**59**	0	0	0	0	0	102
04:15 PM	0	**54**	1	0	**55**	0	0	**2**		**2**	**2**										**108**
04:30 PM	0	37	0	0	37	0	0	2	0	2	2	43	0	0	45	0	0	0	0	0	84
04:45 PM	0	54	1	0	55	**1**	0	0	0	1	1	39	0	0	40	0	0	0	0	0	96
Total Volume	0	186	3	0	189	1	0	5	0	6	6	189	0	0	195	0	0	0	0	0	390
% App. Total	0	98.4	1.6	0		16.7	0	83.3	0		3.1	96.9	0	0		0	0	0	0		
PHF	.000	.861	.750	.000	.859	.250	.000	.625	.000	.750	.750	.815	.000	.000	.826	.000	.000	.000	.000	.000	.903



A2

Miscellaneous Traffic Data and Calculations

PROPOSED FRONTIER STONE
TOWN OF SHELBY, ORLEANS COUNTY, NY

AM PEAK

Num of yrs [redacted]

LOCATION NUMBER	INTERSECTION DESCRIPTION	Existing Volume	Bkgd Volume	TOTAL TRUCK TRIPS				% Heavy Vehicles	Total Site Trips	Full Build Volumes
				Enter Dist. %	Exit Dist. %	Trips IN [redacted]	Trips OUT [redacted]			
1	Route 63/Oak Orchard Ridge Road									
	SR									
	ST	176	185					10%		185
	SL			20%		2		100%	2	2
	WR	0			20%		2	100%	2	2
	WT									
	WL	1	1		80%		6	86%	6	7
	NR	11	12	80%		6		35%	6	18
	NT	119	125					10%		125
	NL									
	ER									
	ET									
	EL									

PM PEAK

Num of yrs [redacted]

LOCATION NUMBER	INTERSECTION DESCRIPTION	Existing Volume	Bkgd Volume	TOTAL PRIMARY TRIPS				% Heavy Vehicles	Total Site Trips	Full Build Volumes
				Enter Dist. %	Exit Dist. %	Trips IN [redacted]	Trips OUT [redacted]			
1	Route 63/Oak Orchard Ridge Road									
	SR									
	ST	186	195					10%		195
	SL	3	3	20%		2		35%	2	5
	WR	1	1		20%		2	62%	2	3
	WT									
	WL	5	5		80%		6	56%	6	11
	NR	6	6	80%		6		52%	6	12
	NT	189	198					10%		198
	NL									
	ER									
	ET									
	EL									

SRF ASSOCIATES
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Traffic Engineering & Planning Consultants

6/28/2007

A3

Level of Service: Criteria and Definitions

Level of Service Criteria

Highway Capacity Manual 2000

SIGNALIZED INTERSECTIONS

Level of Service is a qualitative measure describing operational conditions within a traffic stream, based on service measures such as speed and travel time, freedom to maneuver, traffic interruptions, comfort, and convenience. Level of Service for signalized intersections is defined in terms of delay specifically, average total delay per vehicle for a 15 minute analysis period. The ranges are as follows:

Level of Service	Control Delay per vehicle (seconds)
A	< 10
B	10 – 20
C	20 – 35
D	35 – 55
E	55 – 80
F	>80

UNSIGNALIZED INTERSECTIONS

Level of Service for unsignalized intersections is also defined in terms of delay. However, the delay criteria are different from a signalized intersection. The primary reason for this is driver expectation that a signalized intersection is designed to carry higher volumes than an unsignalized intersection. The total delay threshold for any given Level of Service is less for an unsignalized intersection than for a signalized intersection. The ranges are as follows:

Level of Service	Control Delay per vehicle (seconds)
A	< 10
B	10 – 15
C	15 – 25
D	25 – 35
E	35 - 50
F	>50

A4

Level of Service Calculations: Existing Conditions

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	1	0	119	11	0	176
Peak Hour Factor	0.25	0.25	0.88	0.88	0.77	0.77
Hourly flow rate (vph)	4	0	135	12	0	229
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	370	141			148	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	370	141			148	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	630	906			1434	

[illegible]	WB 1	NB 1	SB 1
Volume Total	4	148	229
Volume Left	4	0	0
Volume Right	0	12	0
cSH	630	1700	1434
Volume to Capacity	0.01	0.09	0.00
Queue Length (ft)	0	0	0
Control Delay (s)	10.7	0.0	0.0
Lane LOS	B		
Approach Delay (s)	10.7	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	19.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	5	1	189	6	3	186
Peak Hour Factor	0.75	0.75	0.83	0.83	0.86	0.86
Hourly flow rate (vph)	7	1	228	7	3	216
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	455	231			235	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	455	231			235	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	562	808			1332	

Volume Total	8	235	220
Volume Left	7	0	3
Volume Right	1	7	0
cSH	592	1700	1332
Volume to Capacity	0.01	0.14	0.00
Queue Length (ft)	1	0	0
Control Delay (s)	11.2	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	11.2	0.0	0.1
Approach LOS	B		

Average Delay	0.3		
Intersection Capacity Utilization	22.2%	ICU Level of Service	A
Analysis Period (min)	15		

A5

Level of Service Calculations: Background Conditions

[illegible]								
Lane Configurations								
Sign Control	Stop		Free			Free		
Grade	0%		0%			0%		
Volume (veh/h)	1	0	126	12	0	185		
Peak Hour Factor	0.25	0.25	0.88	0.88	0.77	0.77		
Hourly flow rate (vph)	4	0	142	14	0	240		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type	None							
Median storage veh)								
Upstream signal (ft)								
pX, platoon unblocked								
vC, conflicting volume	389	149			156			
vC1, stage 1 conf vol								
vC2, stage 2 conf vol								
vCu, unblocked vol	389	149			156			
tC, single (s)	6.4	6.2			4.1			
tC, 2 stage (s)								
tF (s)	3.5	3.3			2.2			
p0 queue free %	99	100			100			
cM capacity (veh/h)	615	898			1424			

[illegible]						
Volume Total	4	156	240			
Volume Left	4	0	0			
Volume Right	0	14	0			
cSH	615	1700	1424			
Volume to Capacity	0.01	0.09	0.00			
Queue Length (ft)	0	0	0			
Control Delay (s)	10.9	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	10.9	0.0	0.0			
Approach LOS	B					
[illegible]						
Average Delay			0.1			
Intersection Capacity Utilization			19.7%	ICU Level of Service		A
Analysis Period (min)			15			

Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	5	1	198	6	3	195
Peak Hour Factor	0.75	0.75	0.83	0.83	0.86	0.86
Hourly flow rate (vph)	7	1	239	7	3	227
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	476	242			246	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	476	242			246	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	546	797			1320	

Volume Total	8	246	230
Volume Left	7	0	3
Volume Right	1	7	0
cSH	576	1700	1320
Volume to Capacity	0.01	0.14	0.00
Queue Length (ft)	1	0	0
Control Delay (s)	11.3	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	11.3	0.0	0.1
Approach LOS	B		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	22.7%	ICU Level of Service	A
Analysis Period (min)	15		

A6

Level of Service Calculations: Full Development Conditions

Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	7	2	125	18	2	185
Peak Hour Factor	0.85	0.85	0.88	0.88	0.77	0.77
Hourly flow rate (vph)	8	2	142	20	3	240
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	398	152			162	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	398	152			162	
tC, single (s)	7.3	7.2			5.1	
tC, 2 stage (s)						
tF (s)	4.3	4.2			3.1	
p0 queue free %	98	100			100	
cM capacity (veh/h)	473	690			989	

Volume Total	11	162	243
Volume Left	8	0	3
Volume Right	2	20	0
cSH	508	1700	989
Volume to Capacity	0.02	0.10	0.00
Queue Length (ft)	2	0	0
Control Delay (s)	12.2	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	12.2	0.0	0.1
Approach LOS	B		

Average Delay	0.4		
Intersection Capacity Utilization	21.3%	ICU Level of Service	A
Analysis Period (min)	15		

[illegible]						
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	11	3	198	12	5	195
Peak Hour Factor	0.75	0.75	0.83	0.83	0.86	0.86
Hourly flow rate (vph)	15	4	239	14	6	227
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	484	246			253	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	484	246			253	
tC, single (s)	7.0	6.8			4.4	
tC, 2 stage (s)						
tF (s)	4.0	3.9			2.5	
p0 queue free %	97	99			99	
cM capacity (veh/h)	454	666			1142	

[illegible]			
Volume Total	19	253	233
Volume Left	15	0	6
Volume Right	4	14	0
cSH	487	1700	1142
Volume to Capacity	0.04	0.15	0.01
Queue Length (ft)	3	0	0
Control Delay (s)	12.7	0.0	0.3
Lane LOS	B		A
Approach Delay (s)	12.7	0.0	0.3
Approach LOS	B		

[illegible]			
Average Delay	0.6		
Intersection Capacity Utilization	24.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	25	6	125	36	6	185
Peak Hour Factor	0.25	0.25	0.88	0.88	0.77	0.77
Hourly flow rate (vph)	100	24	142	41	8	240
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	418	162			183	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	418	162			183	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	83	97			99	
cM capacity (veh/h)	588	882			1392	

Volume Total	124	183	248
Volume Left	100	0	8
Volume Right	24	41	0
cSH	629	1700	1392
Volume to Capacity	0.20	0.11	0.01
Queue Length 95th (ft)	18	0	0
Control Delay (s)	12.1	0.0	0.3
Lane LOS	B		A
Approach Delay (s)	12.1	0.0	0.3
Approach LOS	B		

Average Delay	2.8		
Intersection Capacity Utilization	24.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	29	7	198	30	9	195
Peak Hour Factor	0.75	0.75	0.83	0.83	0.86	0.86
Hourly flow rate (vph)	39	9	239	36	10	227
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	504	257			275	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	504	257			275	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	99			99	
cM capacity (veh/h)	523	782			1288	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	48	275	237
Volume Left	39	0	10
Volume Right	9	36	0
cSH	559	1700	1288
Volume to Capacity	0.09	0.16	0.01
Queue Length 95th (ft)	7	0	1
Control Delay (s)	12.0	0.0	0.4
Lane LOS	B		A
Approach Delay (s)	12.0	0.0	0.4
Approach LOS	B		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	27.6%	ICU Level of Service	A
Analysis Period (min)	15		

Traffic Impact Study

for the proposed

Frontier Stone Quarry

Town of Shelby
Orleans County, New York

June 2012

Project No. 32020

Prepared For:

Continental Placer Inc.

11 Winners Circle
Albany, NY 12205

Prepared By:

SRF ASSOCIATES
WWW.SRFA.NET
Transportation Engineering & Planning Consultants

3495 Winton Place
Building E, Suite 110
Rochester, New York 14623

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2. A Policy on Geometric Design of Highways and Streets. The American Association of State Highway Transportation Officials (AASHTO). Washington, DC: 2011
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EXECUTIVE SUMMARY

OVERVIEW

The purpose of this report is to identify the potential transportation impacts that would result from the operation of the proposed Frontier Stone Quarry in the Town of Shelby, Orleans County, New York. This report investigates the existing traffic volumes and projects the future weekday AM and PM peak hour travel conditions at the intersections affected by the operation.


Location of proposed mining operation

The proposed Frontier Stone Quarry mining site is located on the southeast corner of the Sour Springs Road/Fletcher Chapel Road intersection in the Town of Shelby, Orleans County, New York. The affected area boundary for the mine site encompasses approximately 215.5± acres during the life of the mining operation. Access is proposed via a new driveway on Sour Springs Road approximately 1,600± feet south of Fletcher Chapel Road. An alternative option proposes an access road on Fletcher Chapel Road approximately 1,580± feet east of Sour Springs Road. The operating characteristics of the site driveway and impacts to the adjacent roadway network are identified. The study area consists of two existing intersections - NYS Route 63 at Fletcher Chapel Road and Fletcher Chapel Road at Sour Springs Road.


Intersection adjacent to proposed site

A background growth rate was derived based on historical growth rates determined using historical NYSDOT traffic volume information. Orleans County Planning Department officials were contacted to discuss projects within the study area that are under construction and/or approved. No such projects were identified. A growth rate of 0.5% per year was applied to the existing traffic volumes for one year to estimate future background traffic volumes.

Since the Frontier Stone Quarry is a unique use, information provided by the developer regarding the truck traffic was used to generate peak hour traffic volumes. Business traffic for the proposed mine operation was based on an estimated production rate of 350,000 tons per year. The Frontier Stone Quarry is anticipated to generate approximately 240 trips per day with a maximum of 30 trucks entering and exiting the site during the peak hours based on 220 working days/year, 8 hour daily shifts, and an average truck capacity of 25 tons.

The distribution of the site-generated traffic for the expected truck travel route to and from the mining site is based on information provided by the developer. All of the traffic exiting the site will travel west along Fletcher Chapel Road to NYS Route 63. The operating characteristics of the roadway network are identified and recommendations are provided to minimize any capacity or safety concerns.

CONCLUSIONS AND RECOMMENDATIONS

This report addresses the traffic impact that would result from the operation of the proposed Frontier Stone Quarry in the Town of Shelby as described in this report. It has been shown that the transportation network can adequately accommodate the projected traffic volumes and resulting impacts to the study area intersection, without significant adverse impacts to traffic operations.

The following list summarizes the conclusions and recommendations to be considered as a result of the proposed mining operation:

1. The vehicle turning maneuver analysis indicates that truck movements can be accommodated at the Fletcher Chapel Road/Route 63 intersection.

2. Right turn truck traffic from Fletcher Chapel Road to Sour Springs Road cannot be accommodated within the existing road width. Therefore, it is recommended that the site drive be constructed in the alternate location on Fletcher Chapel Road with one stop-controlled exiting lane and one entering lane. The site drive must provide adequate truck turning radii, and driveway width, for both entering and exiting traffic.

3. Both the proposed and alternate site driveways exceed the recommended minimum sight distance guidelines.

4. The additional truck traffic will not significantly impact the study intersections.

5. No changes in LOS are anticipated at the Route 63/Fletcher Chapel Road and Fletcher Chapel Road/Sour Springs Road intersections as a result of the additional truck traffic.

I. INTRODUCTION

The purpose of this report is to identify the potential transportation impact associated with the operation of the proposed Frontier Stone Quarry in the Town of Shelby, Orleans County, New York. This report investigates the existing traffic volumes and projects the future weekday AM and PM peak hour travel conditions at the intersections affected by the development.

In an effort to define traffic impact, this analysis determines the extent of existing traffic conditions, projects background traffic flow including area growth, and projects changes in traffic flow due to the proposed operation. The operating characteristics of the roadway network are identified and recommendations are provided to minimize any capacity or safety concerns.

II. LOCATION

The proposed site is bounded by Fletcher Chapel Road to the north, Sour Springs Road to the west, and agricultural lands to the east, and the Iroquois National Wildlife Refuge to the south in the Town of Shelby, Orleans County, New York.

The study area consists of two existing intersections - NYS Route 63 at Fletcher Chapel Road and Fletcher Chapel Road at Sour Springs Road. The site location is illustrated in **Figure 1** - Site Location and Study Area (all figures are included at the end of this report).

III. EXISTING HIGHWAY SYSTEM

NYS Route 63 (South Gravel Road) is owned and maintained by the New York State Department of Transportation (NYSDOT) within the vicinity of the project. The highway is functionally classified as a north/south rural minor arterial highway. The highway generally consists of one travel lane in each direction with no posted speed limit. Route 63 carries an average daily traffic (ADT) volume of 4,475 vehicles per day (vpd) between the Orleans County line and RT 31A Start 31 OLAP based on the most recent NYSDOT data collected in 2007.


Fletcher Chapel Road pavement and shoulder condition

Fletcher Chapel Road is owned and maintained by the Town of Shelby within the vicinity of the project and is functionally classified as a local roadway. The highway consists of one travel lane in an east/west direction with no posted speed limit. Fletcher Chapel Road carries approximately 650 vpd between the study area intersections based upon data collected by SRF & Associates (SRF). The rated weight limit is listed at five tons.

Existing Average Daily Traffic (ADT) information was obtained from the NYSDOT *Traffic Volume Report 2010 and NYSDOT Traffic Data Viewer Website.* **Figure 2** illustrates the lane geometry at each of the study intersections and the ADT volumes on the study roadways.

IV. EXISTING TRAFFIC CONDITIONS

A. *Peak Intervals for Analysis*

Given the functional characteristics of the corridor and the land use proposed for the site (mining operation), the peak hours selected for analysis are the weekday AM and PM peaks. The combination of site traffic and adjacent through traffic produces the greatest demand during these time periods.

B. *Existing Traffic Volume Data*

Weekday AM (7:00-8:00AM) and PM (4:00-5:00PM) peak hour traffic counts were collected by SRF at the NYS Route 63/Fletcher Chapel Road and Fletcher Chapel Road/Sour Springs Road intersections on Wednesday May 16, 2012. These peak hours were identified through turning movement counts that were conducted by SRF in 2007.

The existing peak hour volumes are depicted in **Figure 3**.

C. *Field Observations*

The study intersections were observed during both peak intervals to assess current traffic operations. Sight distances were measured at the proposed site access driveways. Roadway and shoulder conditions were documented and travel lane widths were measured.

V. FUTURE AREA DEVELOPMENT AND LOCAL GROWTH

A background growth rate was derived based on historical growth rates determined using historical NYSDOT traffic volume information. Orleans County Planning Department officials were contacted to discuss projects within the study area that are under construction and/or approved. No such projects were identified. A growth rate of 0.5% for one year was applied to the existing traffic volumes to estimate future background traffic volumes.

The background traffic volumes are depicted in **Figure 4**.

VI. PROPOSED DEVELOPMENT

A. Mining Operation

The proposed Frontier Stone Quarry mining site is located on the southeast corner of Sour Springs Road/Fletcher Chapel Road intersection in the Town of Shelby, Orleans County, New York. The affected area boundary for the mine site encompasses approximately 215.5± acres during the life of the mining operation. Access is proposed via a new driveway on Sour Springs Road approximately 1,600± feet south of Fletcher Chapel Road. An alternative option proposes an access road on Fletcher Chapel Road approximately 1,580± feet east of Sour Springs Road.

B. Site Traffic Generation

The volume of traffic generated by a site is dependent on the intended land use and size of the development. Trip generation is an estimate of the number of trips generated by a specific building or land use. These trips represent the volume of new traffic that will be added to the roadways due to the proposed development.


Sour Springs Road facing south

Since the Frontier Stone Quarry is a unique use, information provided by the developer regarding the truck traffic was used to generate peak hour traffic volumes. Business traffic for the proposed mine operation was based on an estimated production rate of 350,000 tons per year. The Frontier Stone Quarry is anticipated to generate approximately 240 trips per day with a maximum of 30 trucks entering and exiting the site during the peak hours based on 220 working days/year, 8 hour daily shifts, and an average truck capacity of 25 tons.

Table I summarizes the volume of projected trips for the weekday AM and PM peak hours. All trip generation calculations are included in Appendix A2 of this report.

TABLE I
SITE GENERATED TRIPS

DESCRIPTION	AM PEAK		PM PEAK	
	ENTER	EXIT	ENTER	EXIT
Future haulage at project site*	30	30	30	30

**Based on information provided by the developer*

C. ***Site Traffic Distribution***

The cumulative effect of site traffic on the transportation network is dependent on the origins and destinations of that traffic and the location of the access drives serving the site.

The distribution of the site-generated traffic was based upon the expected truck travel route to and from the mining site based on information provided by the developer. All of the traffic exiting the site will travel west along Fletcher Chapel Road to NYS Route 63.

Figures 5a and 5b show the anticipated trip distribution pattern percentages for full build out of the proposed Frontier Stone Quarry under the proposed and alternate access scenarios, respectively. **Figures 6a & 6b** show the resulting total site generated traffic as assigned to the site driveways and study area intersections for the weekday AM and PM peak hour periods under full build out conditions under the two access scenarios.

VII. FULL DEVELOPMENT VOLUMES

The projected design hour traffic volumes were developed for the weekday AM and PM peak hours by combining the future background traffic conditions (Figure 4), and projected site generated volumes for full build out of the proposed stone quarry (Figures 6a & 6b) to yield the total traffic conditions expected at full development. **Figures 7a & 7b** show the total weekday AM and PM peak hour volumes anticipated for the proposed site under full build out conditions under both access scenarios.

VIII. CAPACITY ANALYSIS

Capacity analysis is a technique used for determining a measure of effectiveness for a section of roadway and/or intersection based on the number of vehicles during a specific time period. The measure of effectiveness used for the capacity analysis is referred to as a Level of Service (LOS). Levels of Service are calculated to provide an indication of the amount of delay that a motorist experiences while traveling along a roadway or through an intersection. Since the most amount of delay to motorists usually occurs at intersections, capacity analysis typically focuses on intersections, as opposed to highway segments.

Six Levels of Service are defined for analysis purposes. They are assigned letter designations, from "A" to "F", with LOS "A" representing the best conditions and LOS "F" the worst. Suggested ranges of service capacity and an explanation of Levels of Service are included in the Appendix.

The standard procedure for capacity analysis of signalized and un-signalized intersections is outlined in the Highway Capacity Manual (HCM 2000) published by the Transportation Research Board. Traffic analysis software, Synchro 7, which is based on procedures and methodologies contained in the HCM 2000, was used to analyze operating conditions at study area intersections. The procedure yields a Level of Service (LOS) based on the HCM 2000 as an indicator of how well intersections operate.

Existing operating conditions during the peak study periods are evaluated to determine a basis for comparison with the projected future conditions. The future traffic conditions generated by the development were analyzed to assess the operations of the intersections in the study area. Capacity results for existing, background, and full development conditions are listed in **Table II**. The discussion following the table summarizes capacity conditions. All capacity analysis calculations are included in the Appendix.

TABLE II

CAPACITY ANALYSIS RESULTS

INTERSECTION	EXISTING CONDITIONS		BACKGROUND CONDITIONS		FULL DEVELOPMENT CONDITIONS	
	AM	PM	AM	PM	AM	PM
NYS Route 63/Fletcher Chapel Road (U)						
Eastbound – Dunlop Road	B (11.2)	B (11.8)	B (11.2)	B (11.9)	B (11.4)	B (12.1)
Westbound – Fletcher Chapel Road	B (11.3)	B (11.8)	B (11.4)	B (11.9)	B (12.7)	B (13.5)
Northbound – Route 63	A (0.1)	A (0.1)	A (0.1)	A (0.1)	A (0.1)	A (0.1)
Southbound – Route 63	A (0.5)	A (0.1)	A (0.5)	A (0.1)	A (0.5)	A (0.1)
Fletcher Chapel Road/Sour Springs Road – Proposed Access (U)						
Eastbound – Fletcher Chapel Road	A (0.0)	A (0.7)	A (0.0)	A (0.7)	A (0.0)	A (0.4)
Westbound – Fletcher Chapel Road	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)
Northbound – Sour Springs Road	A (9.0)	A (9.3)	A (9.0)	A (9.3)	A (9.6)	A (9.5)
Southbound – Edwards Road	A (9.3)	A (9.0)	A (9.3)	A (9.0)	A (9.5)	A (9.1)
Sour Springs Road/ Proposed Site Driveway (U)						
Westbound – Proposed Driveway	N/A		N/A		A (8.4)	A (8.5)
Northbound – Sour Springs Road					A (0.0)	A (0.0)
Southbound – Sour Springs Road					A (4.5)	A (7.1)
Fletcher Chapel Road/ Sour Springs Road – Alternative Access (U)						
Eastbound – Fletcher Chapel Road	*Same as Primary Access*		*Same as Primary Access*		A (0.0)	A (0.4)
Westbound – Fletcher Chapel Road					A (0.0)	A (0.0)
Northbound – Sour Springs Road					A (9.9)	A (9.8)
Southbound – Edwards Road					A (10.)	A (9.4)
Fletcher Chapel Road/ Alternative Site Access (U)						
Eastbound – Fletcher Chapel Road	N/A		N/A		A (0.0)	A (0.0)
Westbound – Fletcher Chapel Road					A (0.0)	A (0.0)
Northbound – Alternative Site Access					A (8.9)	A (9.1)

NOTE: "U" signifies un-signalized intersection

<u>*NYS Route 63/Fletcher Chapel Road*</u>

The capacity analysis results indicate that all approaches operate at LOS "B" or better during both peak hours. No changes in LOS are anticipated as a result of the proposed development and no improvements are warranted or recommended at this intersection.

<u>*Fletcher Chapel Road/Sour Springs Road*</u>

The analysis indicates that all approaches during the AM and PM peak hours will operate at LOS "A" under existing, background, and full development conditions. These results apply to both options for access to the site on either Sour Springs Road or Fletcher

Chapel Road. No changes in levels of service are anticipated and no improvements are warranted or recommended at this intersection.

Sour Springs Road/Proposed Site Driveway
The intersection operates at LOS "A" for all approaches during both peak hours under full development conditions. No improvements are warranted or recommended for this intersection.

Fletcher Chapel Road/Alternative Site Driveway
The intersection at LOS "A" for all approaches during both peak hours under full development conditions. No improvements are warranted or recommended for this intersection.

IX. SIGHT DISTANCE ANALYSIS

Sight distances were investigated at the proposed site driveways on Sour Springs Road and Fletcher Chapel Road. Sight distance is provided at intersections to allow drivers to perceive the presence of potentially conflicting vehicles. This should occur in sufficient time for a motorist to stop or adjust their speed, as appropriate, to avoid a collision at the intersection. Sight distance is also provided at intersections to allow the drivers of stopped vehicles a sufficient view of the intersecting highway to anticipate and avoid potential incidents. If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road.

A Policy on Geometric Design of Highways and Streets published by AASHTO (2011) was used as a reference to establish the required stopping sight distance and desirable intersection sight distance for the proposed site driveway.

Required stopping sight distances and desirable intersection sight distances are based on the design speed for a given section of roadway; generally the design speed is the posted speed limit plus 5 mph. Given that the speed limit is not posted, the statutory speed limit is 55 MPH, hence a design speed of 60 MPH was used. The required stopping distance and desirable intersection sight distance based on the design speed are shown in **Table III**.

TABLE III
SIGHT DISTANCE REQUIREMENTS AND MEASUREMENTS

INTERSECTION	Speed Limit (mph)	Design Speed (mph)	Desirable Intersection Sight Distance (ISD) for Left Turn from Stop in feet	Required Stopping Sight Distance (SSD) in feet	Available Sight Distance (ft) to the:	
					Left	Right
Sour Springs Road/ Site Driveway	55	60	665'	570'	>700'	>800'
Fletcher Chapel Road/ Alternative Site Driveway	55	60	665'	570'	>700'	>800'

The available sight distances from the proposed site access drive on Sour Springs Road and the alternative site access drive on Fletcher Chapel Road both exceed the desirable intersection sight distance and required stopping sight distance.

X. TURNING MANEUVER ANALYSIS

Review of vehicular turning paths were performed at the intersections of Fletcher Chapel Road/Route 63 and Fletcher Chapel Road/Sour Springs Road. This analysis is performed to evaluate the roadway width needed for a particular length vehicle to make a safe turning movement.

The existing pavement width is sufficient to accommodate flow-boy trucks making the northbound right-turn maneuver at the Fletcher Chapel Road/Route 63 intersection.

Trucks making the eastbound right-turn movement at the intersection of Fletcher Chapel Road/Sour Springs Road do not have the required pavement width to successfully make a turning movement onto Sour Springs Road to access the proposed driveway. However, the proposed alternative driveway located on Fletcher Chapel Road will meet the space needed to perform a turning movement, provided the driveway to the site is designed to accommodate such vehicles.

Therefore, the alternate access on Fletcher Chapel Road is recommended as the ideal location for the proposed site driveway instead of the proposed driveway location on Sour Springs Road.

XI. CONCLUSIONS & RECOMMENDATIONS

This report addresses the traffic impact that would result from the operation of the proposed Frontier Stone Quarry in the Town of Shelby as described in this report. It has been shown that the transportation network can adequately accommodate the projected traffic volumes and resulting impacts to the study area intersection, without significant adverse impacts to traffic operations.

The following list summarizes the conclusions and recommendations to be considered as a result of the proposed mining operation:

1. The vehicle turning maneuver analysis indicates that truck movements can be accommodated at the Fletcher Chapel Road/Route 63 intersection.

2. Right turn truck traffic from Fletcher Chapel Road to Sour Springs Road cannot be accommodated within the existing road width. Therefore, it is recommended that the site drive be constructed in the alternate location on Fletcher Chapel Road with one stop-controlled exiting lane and one entering lane. The site drive must provide adequate truck turning radii, and driveway width, for both entering and exiting traffic.

3. Both the proposed and alternate site driveways exceed the recommended minimum sight distance guidelines.

4. The additional truck traffic will not significantly impact the study intersections.

5. No changes in LOS are anticipated at the Route 63/Fletcher Chapel Road and Fletcher Chapel Road/Sour Springs Road intersections as a result of the additional truck traffic.

XII. FIGURES

Figures 1 through 7 are included on the following pages.

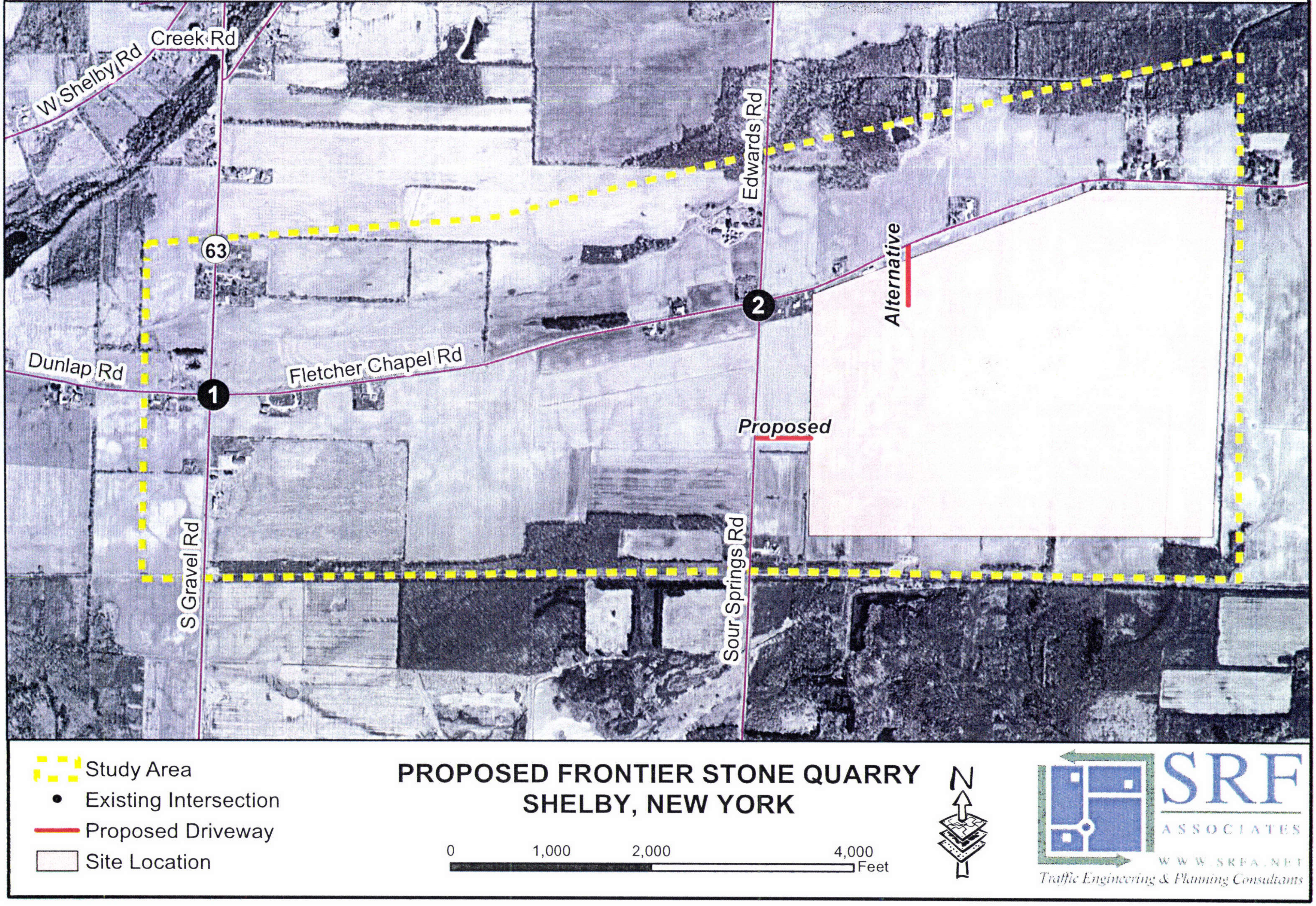

Fletcher Chapel Road shoulder condition


Sour Springs Road at Fletcher Chapel Road facing north

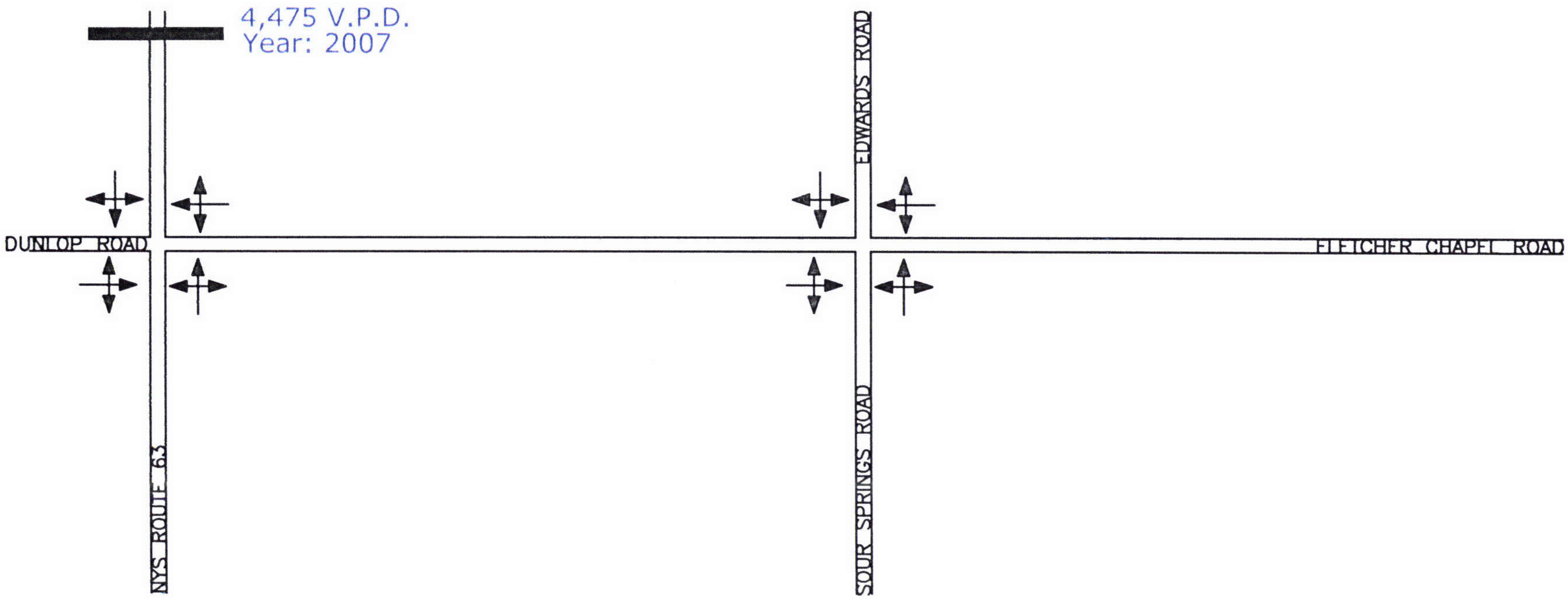

Fletcher Chapel Road at Route 63 facing north


Fletcher Chapel Road facing east from site

FIGURE 1 - SITE LOCATION AND STUDY AREA



Note:
All counts by NYS Dept of Transportation
V.P.D = Vehicles Per Day



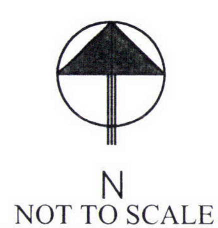


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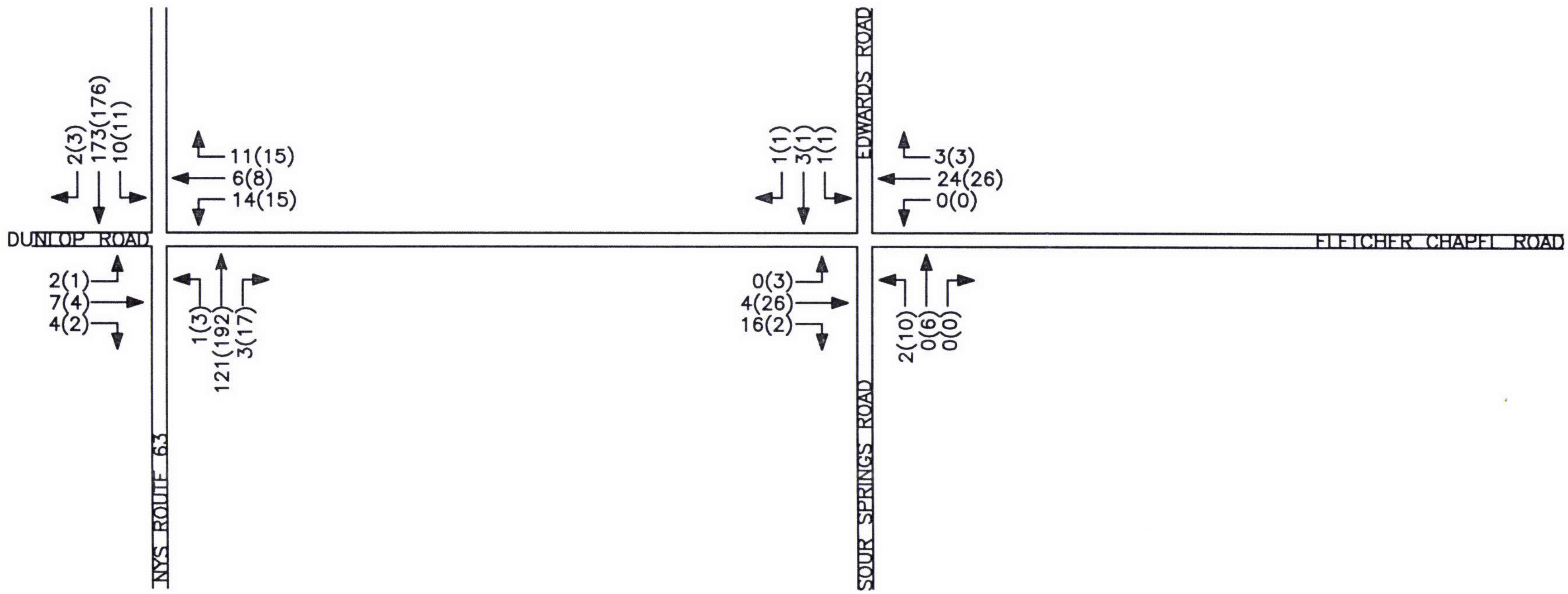
FIGURE 2

LANE GEOMETRY &
AVERAGE DAILY TRAFFIC

PROPOSED FRONTIER STONE QUARRY
SHELBY, NY

KEY



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N
NOT TO SCALE

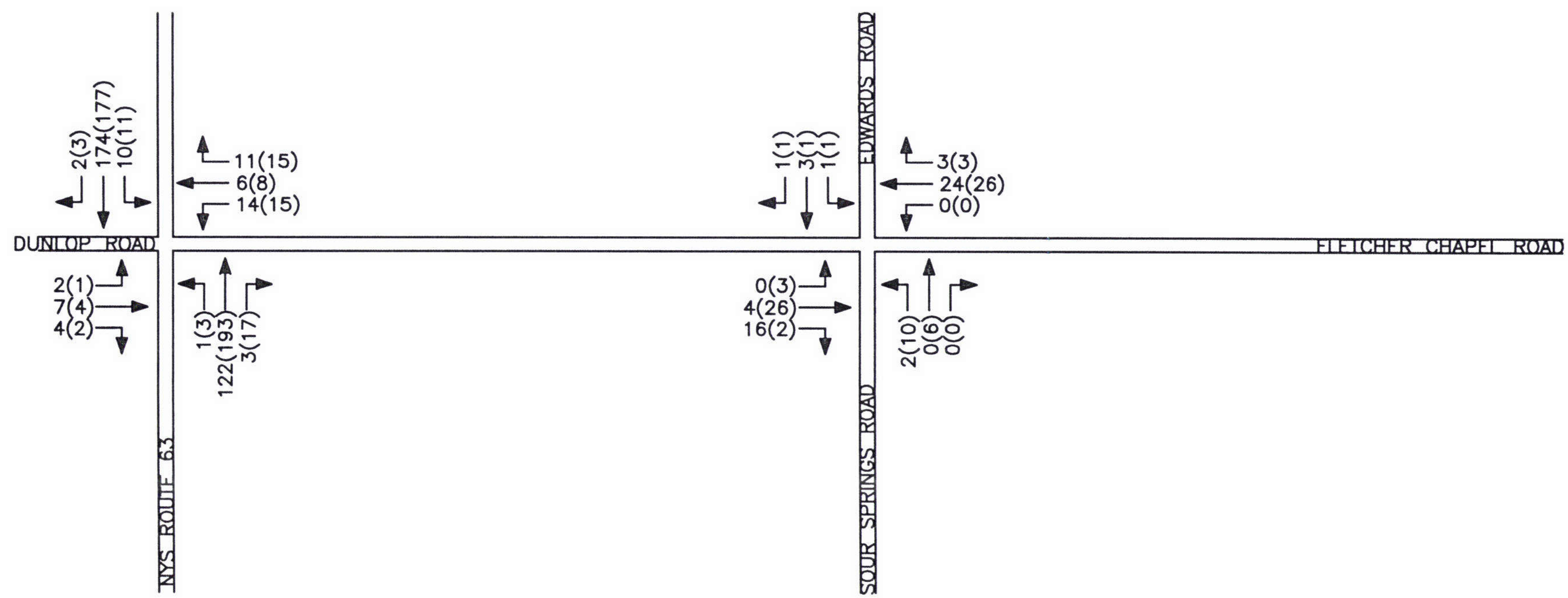
FIGURE 3

PEAK HOUR VOLUMES
2012 EXISTING CONDITIONS

PROPOSED FRONTIER STONE QUARRY
SHELBY, NY

KEY

00(00) = AM(PM)



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N
NOT TO SCALE

FIGURE 4

PEAK HOUR VOLUMES
2013 BACKGROUND CONDITIONS

PROPOSED FRONTIER STONE QUARRY
SHELBY, NY

KEY

00(00) = AM(PM)

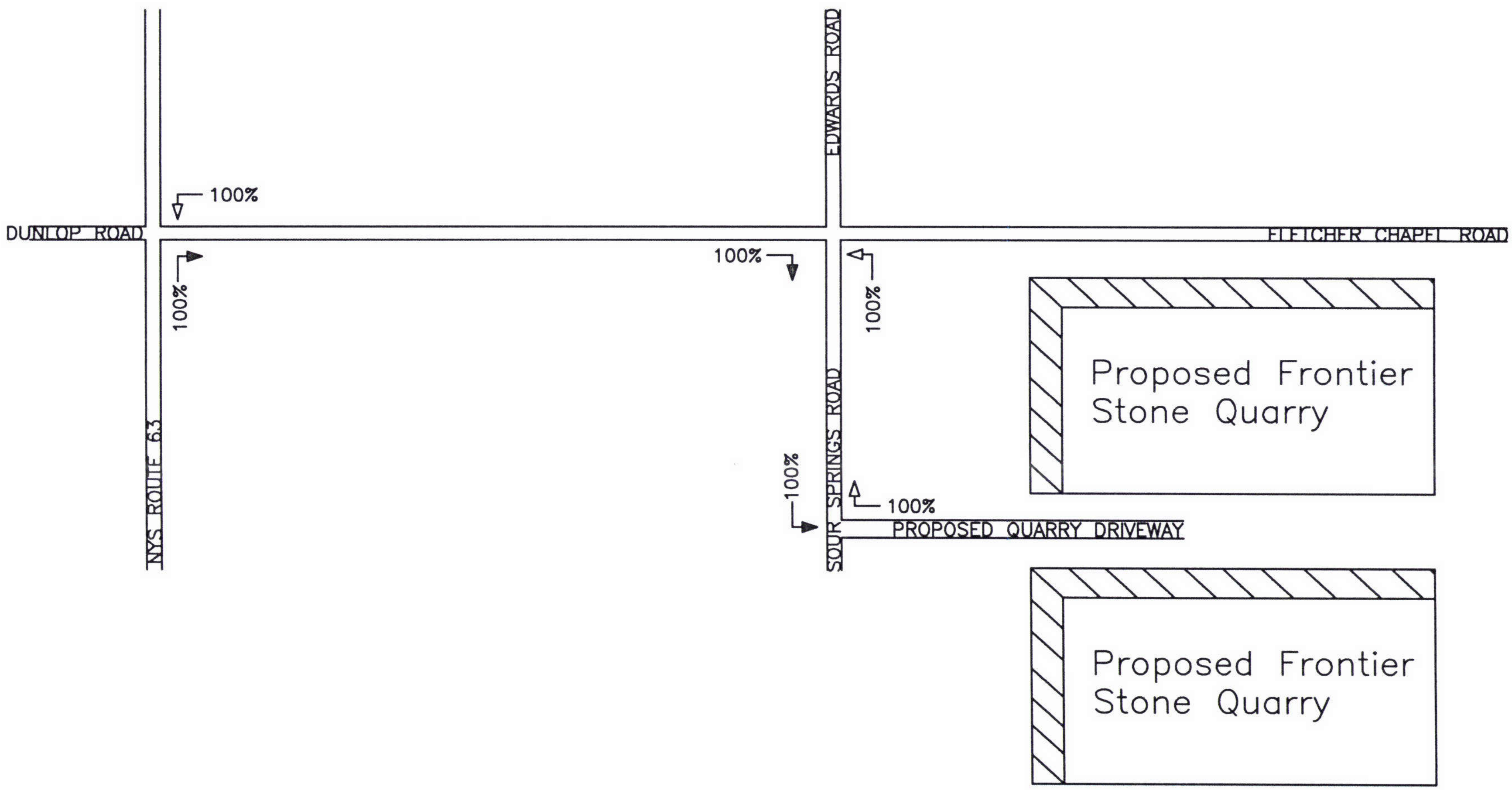

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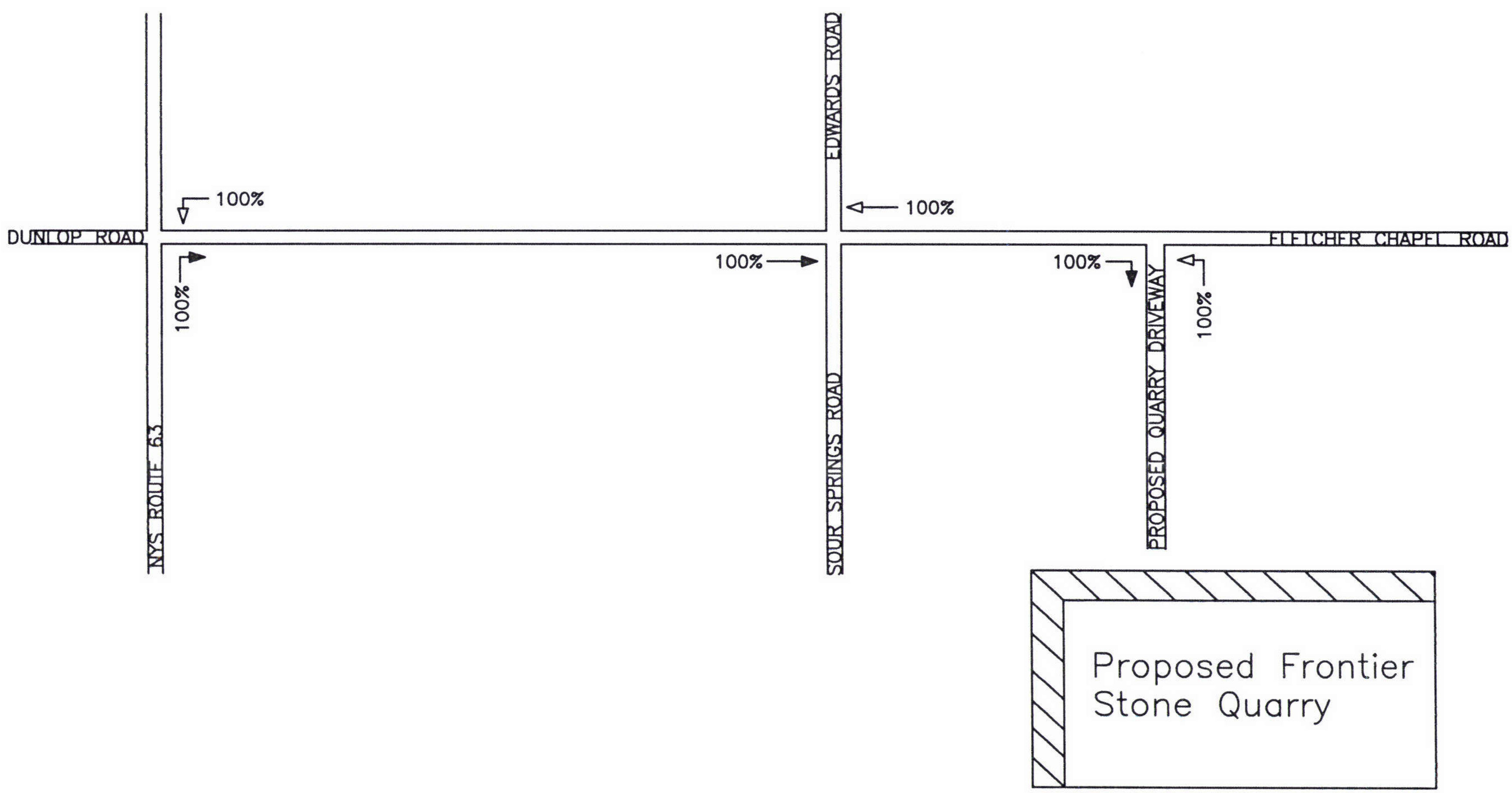
FIGURE 5A - PROPOSED ACCESS

TRIP DISTRIBUTION

PROPOSED FRONTIER STONE QUARRY
SHELBY, NY

KEY

→ = ENTERING TRIPS
→ = EXITING TRIPS



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N
NOT TO SCALE

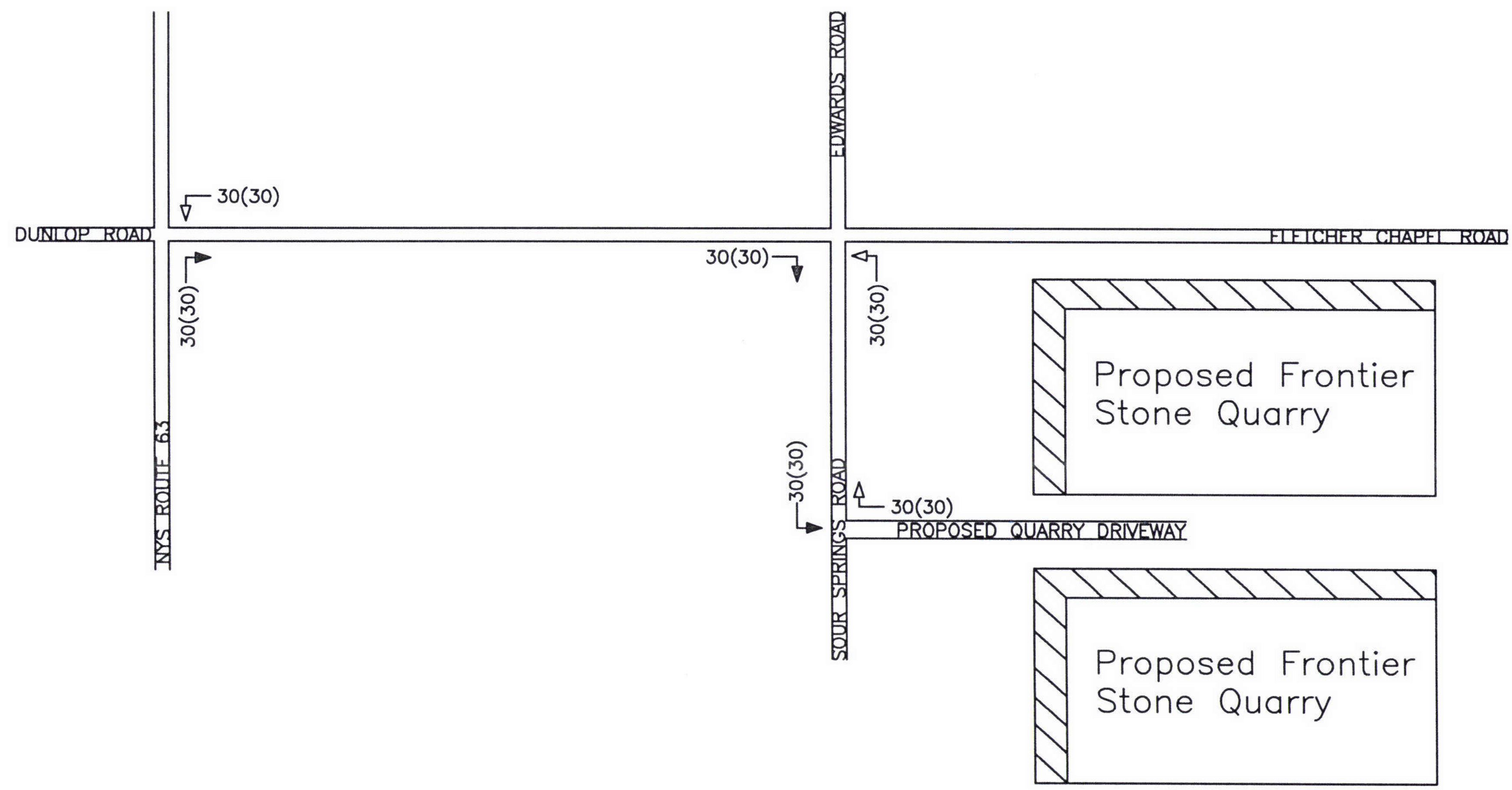
FIGURE 5B - ALTERNATIVE ACCESS

TRIP DISTRIBUTION

PROPOSED FRONTIER STONE QUARRY
SHELBY, NY

KEY

→ = ENTERING TRIPS
▻ = EXITING TRIPS



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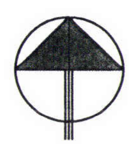


NOT TO SCALE

FIGURE 6A - PROPOSED ACCESS

SITE GENERATED TRIPS

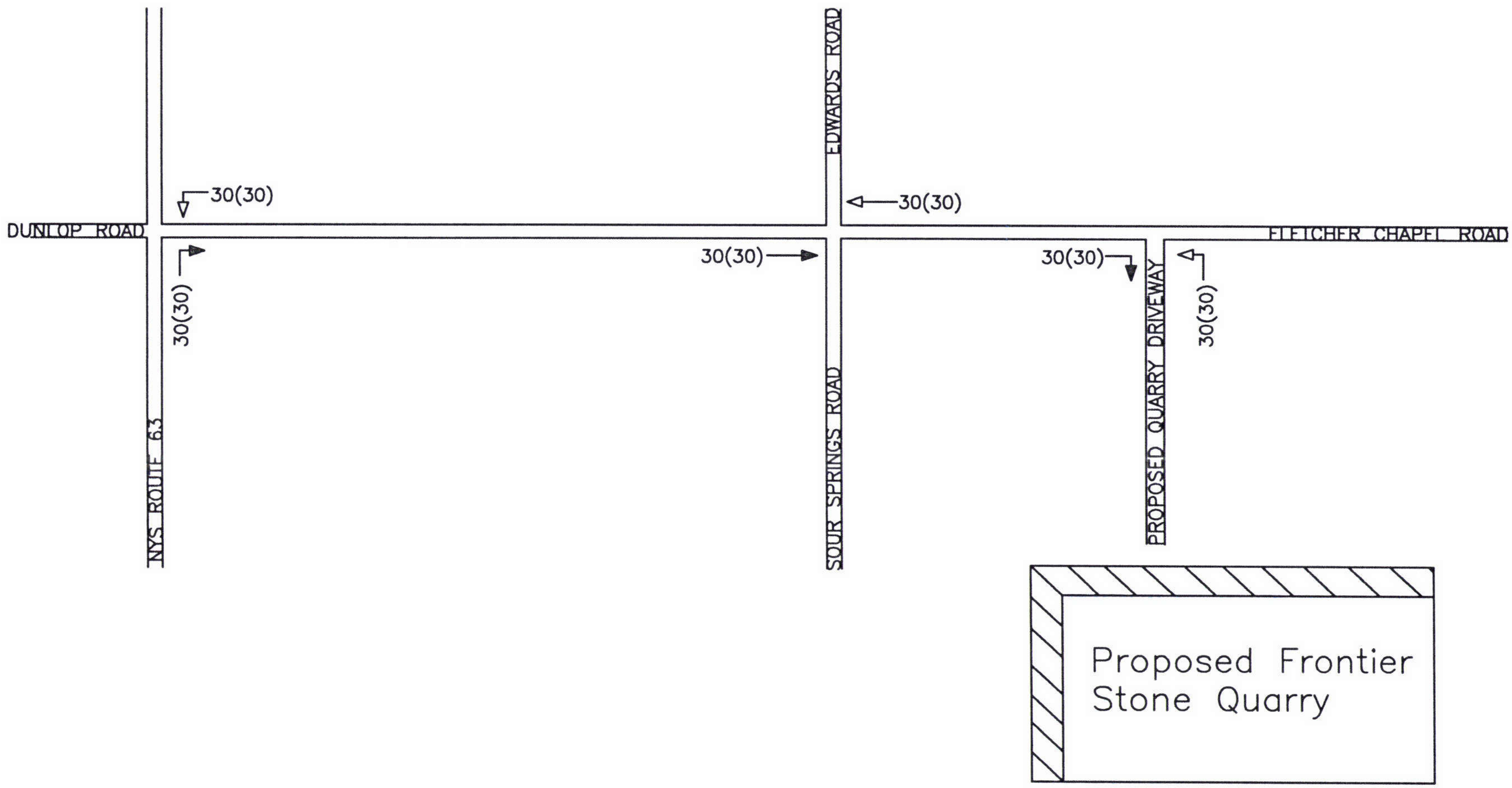
PROPOSED FRONTIER STONE QUARRY
SHELBY, NY

KEY

00(00) = AM(PM)

→ = ENTERING TRIPS

▷ = EXITING TRIPS



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N
NOT TO SCALE

FIGURE 6B - ALTERNATIVE ACCESS

SITE GENERATED TRIPS

PROPOSED FRONTIER STONE QUARRY
SHELBY, NY

KEY

00(00) = AM(PM)
→ = ENTERING TRIPS
⇾ = EXITING TRIPS

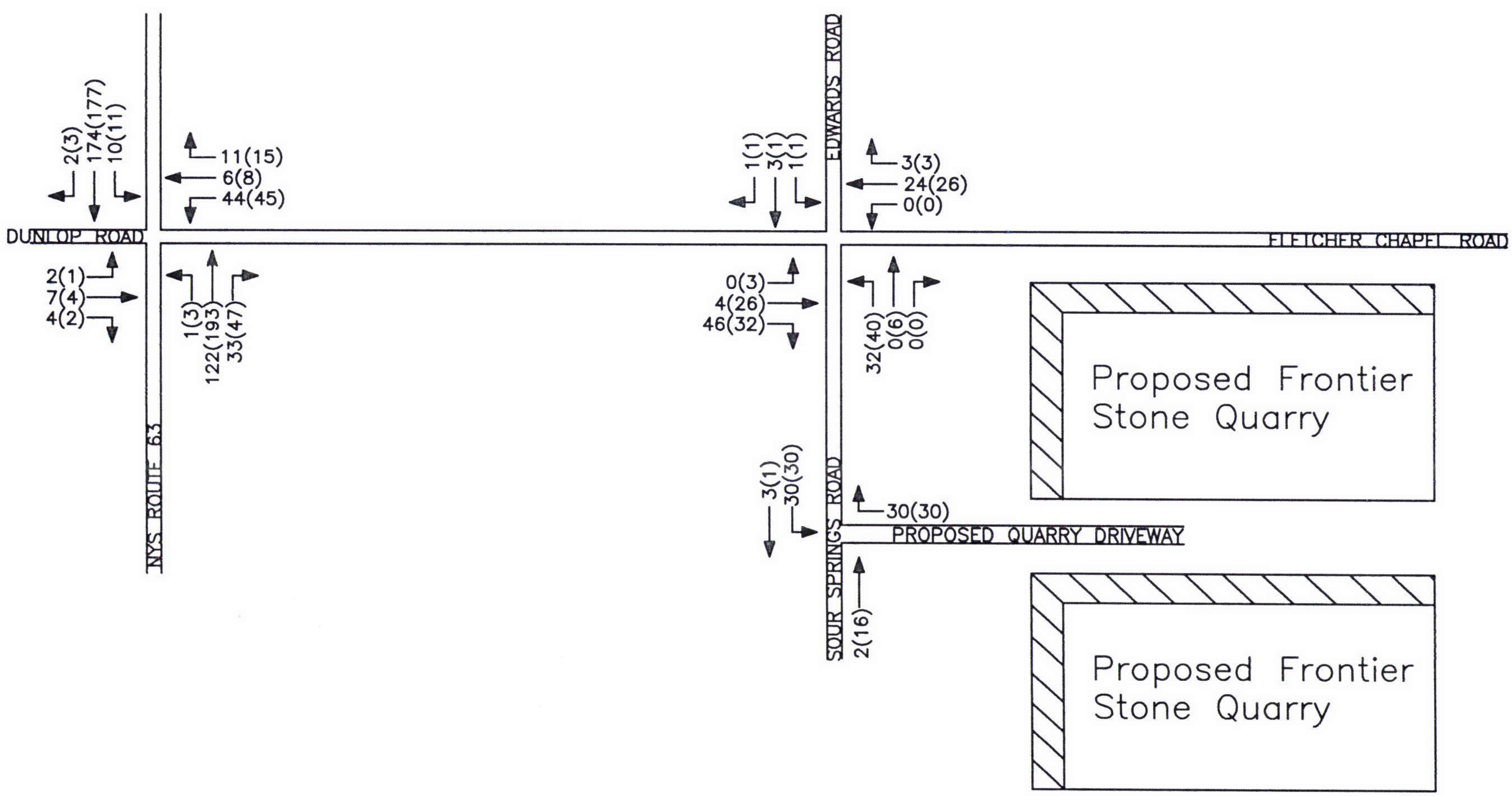

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FIGURE 7A - PROPOSED ACCESS

PEAK HOUR VOLUMES
FULL DEVELOPMENT CONDITIONS

PROPOSED FRONTIER STONE QUARRY
SHELBY, NY

KEY

00(00) = AM(PM)

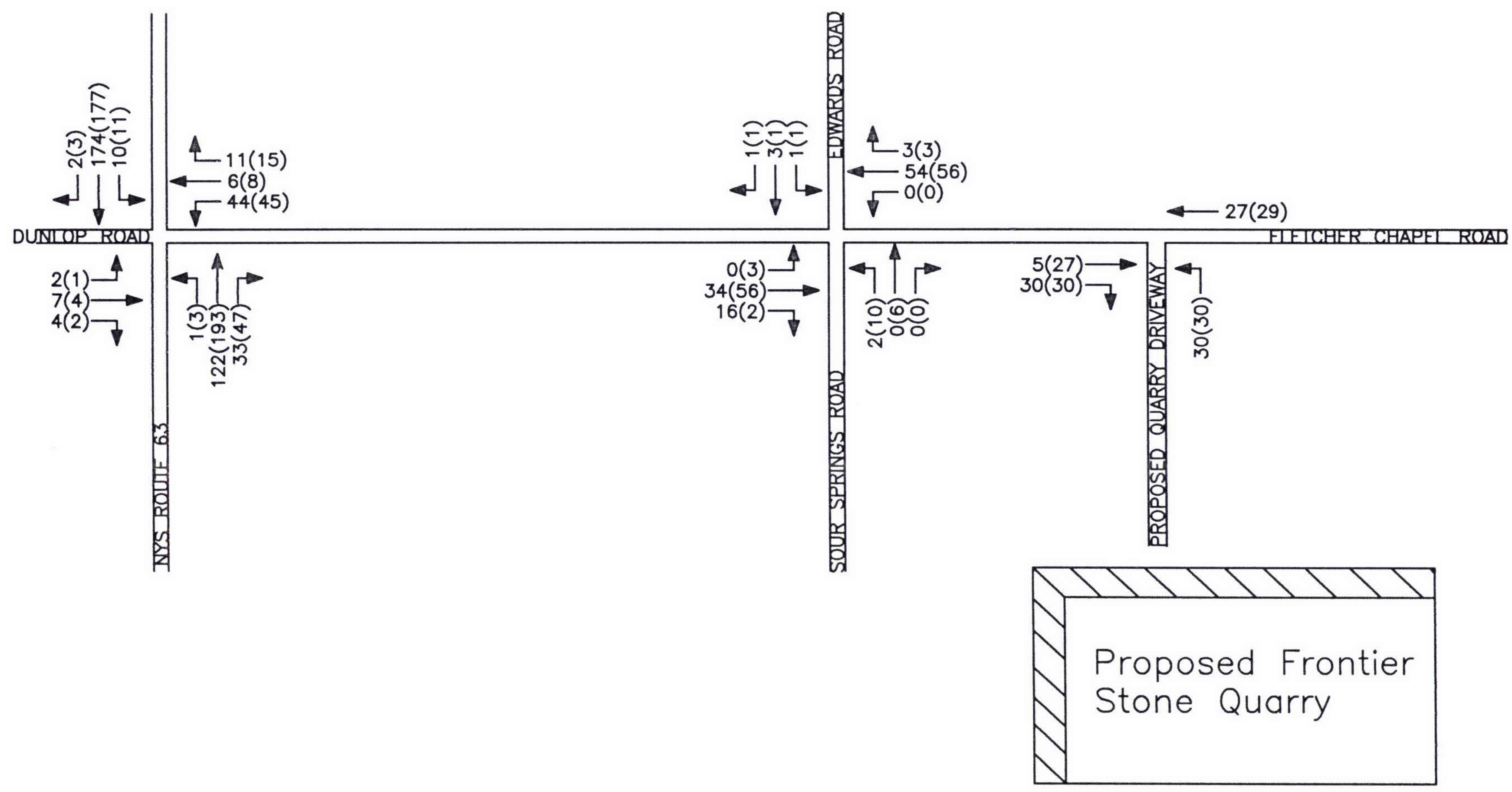

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FIGURE 7B - ALTERNATIVE ACCESS

PEAK HOUR VOLUMES
FULL DEVELOPMENT CONDITIONS

PROPOSED FRONTIER STONE QUARRY
SHELBY, NY

KEY

00(00) = AM(PM)

APPENDICES

A1

Collected Traffic Volume Data

SRF & Associates
3495 Winton Place, Building E, Suite 110
Rochester, NY 14623

File Name : Fletcher.Route63.AM.Peak
Site Code : 00320201
Start Date : 5/16/2012
Page No : 1

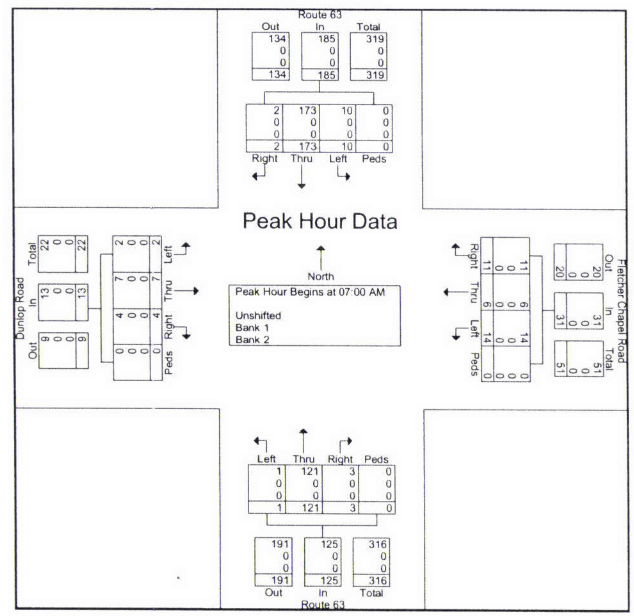
Groups Printed- Unshifted - Bank 1 - Bank 2

	Route 63 Southbound				Fletcher Chapel Road Westbound				Route 63 Northbound				Dunlop Road Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	38	0	0	2	2	3	0	1	23	1	0	2	1	0	0	73
07:15 AM	1	58	1	0	4	1	7	0	1	33	0	0	0	0	0	0	106
07:30 AM	0	44	5	0	1	2	3	0	1	33	0	0	1	4	1	0	95
07:45 AM	1	33	4	0	4	1	1	0	0	32	0	0	1	2	1	0	80
Total	2	173	10	0	11	6	14	0	3	121	1	0	4	7	2	0	354
Grand Total	2	173	10	0	11	6	14	0	3	121	1	0	4	7	2	0	354
Apprch %	1.1	93.5	5.4	0	35.5	19.4	45.2	0	2.4	96.8	0.8	0	30.8	53.8	15.4	0	
Total %	0.6	48.9	2.8	0	3.1	1.7	4	0	0.8	34.2	0.3	0	1.1	2	0.6	0	
Unshifted	2	173	10	0	11	6	14	0	3	121	1	0	4	7	2	0	354
% Unshifted	100	100	100	0	100	100	100	0	100	100	100	0	100	100	100	0	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

SRF & Associates
3495 Winton Place, Building E, Suite 110
Rochester, NY 14623

File Name : Fletcher.Route63.AM.Peak
Site Code : 00320201
Start Date : 5/16/2012
Page No : 2

	Route 63 Southbound					Fletcher Chapel Road Westbound					Route 63 Northbound					Dunlop Road Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	38	0	0	38	2	**2**	3	0	7	**1**		**1**			**2**					
07:15 AM	**1**	**58**	**1**	0	**60**	**4**	**1**	**7**	**0**	**12**	1	**33**	0	0	**34**	0	0	0	0	0	**106**
07:30 AM	0	44	**5**														**4**	**1**		**6**	95
07:45 AM	1	33	4	0	38	4	1	1	0	6	0	32	0	0	32	1	2	1	0	4	80
Total Volume	2	173	10	0	185	11	6	14	0	31	3	121	1	0	125	4	7	2	0	13	354
% App. Total	1.1	93.5	5.4	0		35.5	19.4	45.2	0		2.4	96.8	0.8	0		30.8	53.8	15.4	0		
PHF	.500	.746	.500	.000	.771	.688	.750	.500	.000	.646	.750	.917	.250	.000	.919	.500	.438	.500	.000	.542	.835
Unshifted	2	173	10	0	185	11	6	14	0	31	3	121	1	0	125	4	7	2	0	13	354
% Unshifted																					
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



SRF & Associates
3495 Winton Place, Building E, Suite 110
Rochester, NY 14623

File Name : Fletcher.Route63.PM.Peak
Site Code : 00320202
Start Date : 5/16/2012
Page No : 1

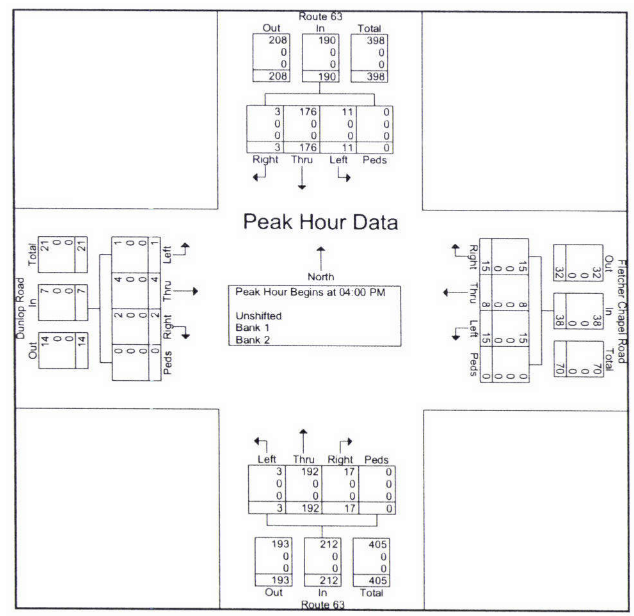
Groups Printed- Unshifted - Bank 1 - Bank 2

	Route 63 Southbound				Fletcher Chapel Road Westbound				Route 63 Northbound				Dunlop Road Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	2	40	2	0	3	2	0	0	6	46	0	0	0	0	0	0	101
04:15 PM	1	59	3	0	2	6	6	0	2	49	2	0	1	3	0	0	134
04:30 PM	0	40	4	0	5	0	3	0	3	53	0	0	0	0	0	0	108
04:45 PM	0	37	2	0	5	0	6	0	6	44	1	0	1	1	1	0	104
Total	3	176	11	0	15	8	15	0	17	192	3	0	2	4	1	0	447
Grand Total	3	176	11	0	15	8	15	0	17	192	3	0	2	4	1	0	447
Apprch %	1.6	92.6	5.8	0	39.5	21.1	39.5	0	8	90.6	1.4	0	28.6	57.1	14.3	0	
Total %	0.7	39.4	2.5	0	3.4	1.8	3.4	0	3.8	43	0.7	0	0.4	0.9	0.2	0	
Unshifted	3	176	11	0	15	8	15	0	17	192	3	0	2	4	1	0	447
% Unshifted	100	100	100	0	100	100	100	0	100	100	100	0	100	100	100	0	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

SRF & Associates
3495 Winton Place, Building E, Suite 110
Rochester, NY 14623

File Name : Fletcher.Route63.PM.Peak
Site Code : 00320202
Start Date : 5/16/2012
Page No : 2

	Route 63 Southbound					Fletcher Chapel Road Westbound					Route 63 Northbound					Dunlop Road Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	**2**										**6**										
04:15 PM	**1**	**59**	3	0	**63**	2	**6**	**6**	**0**	**14**	2	49	**2**	**0**	**53**	**1**	**3**	0	0	**4**	**134**
04:30 PM	0	40	**4**			**5**						**53**	0	0	**56**	0	0	0	0	0	108
04:45 PM	0	37	2	0	39	5	0	6	0	11	6	44	1	0	51	1	1	**1**			
Total Volume	3	176	11	0	190	15	8	15	0	38	17	192	3	0	212	2	4	1	0	7	447
% App. Total	1.6	92.6	5.8	0		39.5	21.1	39.5	0		8	90.6	1.4	0		28.6	57.1	14.3	0		
PHF	.375	.746	.688	.000	.754	.750	.333	.625	.000	.679	.708	.906	.375	.000	.946	.500	.333	.250	.000	.438	.834
Unshifted	3	176	11	0	190	15	8	15	0	38	17	192	3	0	212	2	4	1	0	7	447
% Unshifted																					
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



SRF & Associates
3495 Winton Place, Building E, Suite 110
Rochester, NY 14623

File Name : Fletcher.Sour.AM.Peak
Site Code : 11111111
Start Date : 5/16/2012
Page No : 1

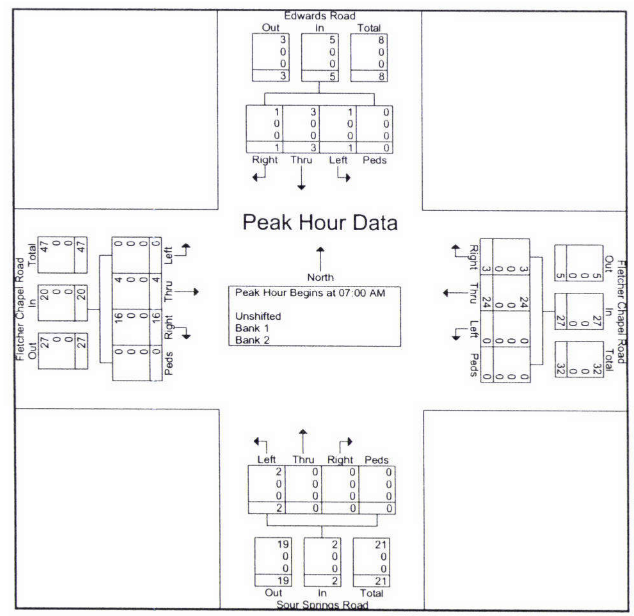
Groups Printed- Unshifted - Bank 1 - Bank 2

	Edwards Road Southbound				Fletcher Chapel Road Westbound				Sour Springs Road Northbound				Fletcher Chapel Road Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	1	1	1	0	1	4	0	0	0	0	1	0	0	2	0	0	11
07:15 AM	0	1	0	0	0	13	0	0	0	0	0	0	1	1	0	0	16
07:30 AM	0	1	0	0	2	4	0	0	0	0	1	0	10	1	0	0	19
07:45 AM	0	0	0	0	0	3	0	0	0	0	0	0	5	0	0	0	8
Total	1	3	1	0	3	24	0	0	0	0	2	0	16	4	0	0	54
Grand Total	1	3	1	0	3	24	0	0	0	0	2	0	16	4	0	0	54
Apprch %	20	60	20	0	11.1	88.9	0	0	0	0	100	0	80	20	0	0	
Total %	1.9	5.6	1.9	0	5.6	44.4	0	0	0	0	3.7	0	29.6	7.4	0	0	
Unshifted	1	3	1	0	3	24	0	0	0	0	2	0	16	4	0	0	54
% Unshifted	100	100	100	0	100	100	0	0	0	0	100	0	100	100	0	0	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

SRF & Associates
3495 Winton Place, Building E, Suite 110
Rochester, NY 14623

File Name : Fletcher.Sour.AM.Peak
Site Code : 11111111
Start Date : 5/16/2012
Page No : 2

	Edwards Road Southbound					Fletcher Chapel Road Westbound					Sour Springs Road Northbound					Fletcher Chapel Road Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	**1**	**1**	**1**		**3**	1	4	0	0	5	0	0	**1**		**1**	0	**2**	0	0	2	11
07:15 AM	0	1	0	0	1	0	**13**	0	0	**13**	0	0	0	0	0	1	1	0	0	2	16
07:30 AM	0	1	0	0	1	**2**										**10**				**11**	**19**
07:45 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	5	0	0	0	5	8
Total Volume	1	3	1	0	5	3	24	0	0	27	0	0	2	0	2	16	4	0	0	20	54
% App. Total	20	60	20	0		11.1	88.9	0	0		0	0	100	0		80	20	0	0		
PHF	.250	.750	.250	.000	.417	.375	.462	.000	.000	.519	.000	.000	.500	.000	.500	.400	.500	.000	.000	.455	.711
Unshifted	1	3	1	0	5	3	24	0	0	27	0	0	2	0	2	16	4	0	0	20	54
% Unshifted																					
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



SRF & Associates
3495 Winton Place, Building E, Suite 110
Rochester, NY 14623

File Name : Fletcher.SourSprings.PM.Peak
Site Code : 22222222
Start Date : 5/16/2012
Page No : 1

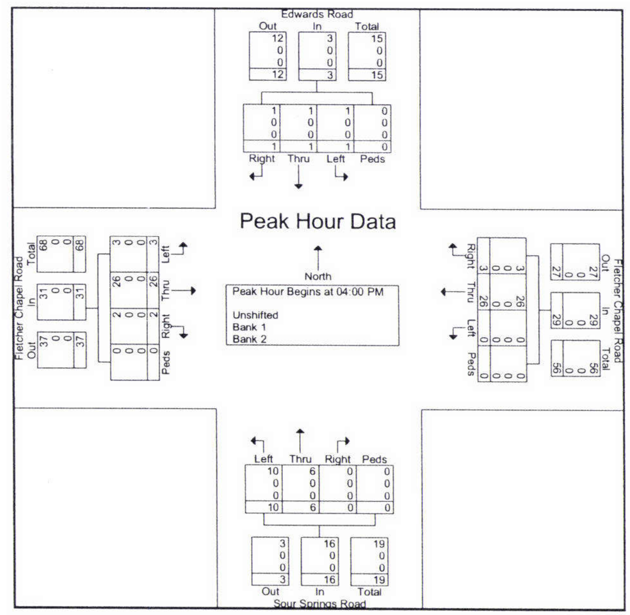
Groups Printed- Unshifted - Bank 1 - Bank 2

	Edwards Road Southbound				Fletcher Chapel Road Westbound				Sour Springs Road Northbound				Fletcher Chapel Road Eastbound				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	1	0	1	8	0	0	0	1	4	0	0	7	2	0	24
04:15 PM	0	0	0	0	2	5	0	0	0	2	1	0	0	6	0	0	16
04:30 PM	0	1	0	0	0	11	0	0	0	1	4	0	1	6	1	0	25
04:45 PM	1	0	0	0	0	2	0	0	0	2	1	0	1	7	0	0	14
Total	1	1	1	0	3	26	0	0	0	6	10	0	2	26	3	0	79
Grand Total	1	1	1	0	3	26	0	0	0	6	10	0	2	26	3	0	79
Apprch %	33.3	33.3	33.3	0	10.3	89.7	0	0	0	37.5	62.5	0	6.5	83.9	9.7	0	
Total %	1.3	1.3	1.3	0	3.8	32.9	0	0	0	7.6	12.7	0	2.5	32.9	3.8	0	
Unshifted	1	1	1	0	3	26	0	0	0	6	10	0	2	26	3	0	79
% Unshifted	100	100	100	0	100	100	0	0	0	100	100	0	100	100	100	0	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

SRF & Associates
3495 Winton Place, Building E, Suite 110
Rochester, NY 14623

File Name : Fletcher.SourSprings.PM.Peak
Site Code : 22222222
Start Date : 5/16/2012
Page No : 2

	Edwards Road Southbound					Fletcher Chapel Road Westbound					Sour Springs Road Northbound					Fletcher Chapel Road Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	**1**		**1**	1	8	0	0	9	0	1	**4**		**5**	0	**7**	**2**		**9**	24
04:15 PM	0	0	0	0	0	**2**						**2**	1	0	3	0	6	0	0	6	16
04:30 PM	0	**1**	0	0	1	0	**11**	0	0	**11**	0	1	4	0	5	**1**					**25**
04:45 PM	**1**																				
Total Volume	1	1	1	0	3	3	26	0	0	29	0	6	10	0	16	2	26	3	0	31	79
% App. Total	33.3	33.3	33.3	0		10.3	89.7	0	0		0	37.5	62.5	0		6.5	83.9	9.7	0		
PHF	.250	.250	.250	.000	.750	.375	.591	.000	.000	.659	.000	.750	.625	.000	.800	.500	.929	.375	.000	.861	.790
Unshifted	1	1	1	0	3	3	26	0	0	29	0	6	10	0	16	2	26	3	0	31	79
% Unshifted																					
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



A2

Miscellaneous Traffic Data and Calculations

Proposed Frontier Stone Trip Generation
Town of Shelby, NY

Jun-12

Total Site Production Rate: **350,000 tons/year**
Total Trips: **240 trips/day @ 30 trucks entering and exiting during peak hours**

SRF ASSOCIATES
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Transportation Engineering & Planning Consultants

PROPOSED FRONTIER STONE, SHELBY, NY

AM PEAK

LOCATION NUMBER	INTERSECTION DESCRIPTION	Existing Volume	Num of yrs 1 Bkgd Volume 0.5%	TOTAL TRUCK TRIPS Enter Dist. %	Exit Dist. %	Trips IN 30	Trips OUT 30	% Heavy Vehicles	Total Site Trips	Full Build Volumes
1	Route 63/ Fletcher Chapel Road									
	SR	2	2							2
	ST	173	174							174
	SL	10	10							10
	WR	11	11							11
	WT	6	6							6
	WL	14	14		100%		30	68%	30	44
	NR	3	3	100%		30		91%	30	33
	NT	121	122							122
	NL	1	1							1
	ER	4	4							4
	ET	7	7							7
	EL	2	2							2
2	Fletcher Chapel Road/ Sour Springs Road									
	SR	1	1							1
	ST	3	3							3
	SL	1	1							1
	WR	3	3							3
	WT	24	24							24
	WL									
	NR									
	NT									
	NL	2	2		100%		30	94%	30	32
	ER	16	16	100%		30		65%	30	46
	ET	4	4							4
	EL									
3	Sour Springs Road/ Proposed Site Driveway									
	SR									
	ST	19	19							19
	SL			100%		30		100%	30	30
	WR				100%		30	100%	30	30
	WT									
	WL									
	NR									
	NT	2	2							2
	NL									
	ER									
	ET									
	EL									
4	Fletcher Chapel Road/ Alternative Site Driveway									
	SR									
	ST									
	SL									
	WR									
	WT	27	27							27
	WL									
	NR									
	NT									
	NL				100%		30	100%	30	30
	ER			100%		30		100%	30	30
	ET	5	5							5
	EL									
5	Fletcher Chapel Road/ Sour Springs Road *Alternative Site Driveway*									
	SR	1	1							1
	ST	3	3							3
	SL	1	1							1
	WR	3	3							3
	WT	24	24		100%		30	56%	30	54
	WL									
	NR									
	NT									
	NL	2	2							2
	ER	16	16							16
	ET	4	4	100%		30		88%	30	34
	EL									

PROPOSED FRONTIER STONE, SHELBY, NY

PM PEAK

Num of yrs 1

LOCATION NUMBER	INTERSECTION DESCRIPTION	Existing Volume	Bkgd Volume 0.5%	TOTAL TRUCK TRIPS				% Heavy Vehicles	Total Site Trips	Full Build Volumes
				Enter Dist. %	Exit Dist. %	Trips IN 30	Trips OUT 30			
1	Route 63/ Fletcher Chapel Road									
	SR	3	3							3
	ST	176	177							177
	SL	11	11							11
	WR	15	15							15
	WT	8	8							8
	WL	15	15		100%		30	67%	30	45
	NR	17	17	100%		30		64%	30	47
	NT	192	193							193
	NL	3	3							3
	ER	2	2							2
	ET	4	4							4
	EL	1	1							1
2	Fletcher Chapel Road/ Sour Springs Road									
	SR	1	1							1
	ST	1	1							1
	SL	1	1							1
	WR	3	3							3
	WT	26	26							26
	WL									
	NR									
	NT	6	6							6
	NL	10	10		100%		30	75%	30	40
	ER	2	2	100%		30		94%	30	32
	ET	26	26							26
	EL	3	3							3
3	Sour Springs Road/ Proposed Site Driveway									
	SR									
	ST	3	3							3
	SL			100%		30		100%	30	30
	WR				100%		30	100%	30	30
	WT									
	WL									
	NR									
	NT	16	16							16
	NL									
	ER									
	ET									
	EL									
4	Fletcher Chapel Road/ Alternative Site Driveway									
	SR									
	ST									
	SL									
	WR									
	WT	29	29							29
	WL									
	NR									
	NT									
	NL				100%		30	100%	30	30
	ER			100%		30		100%	30	30
	ET	27	27							27
	EL									
5	Fletcher Chapel Road/ Sour Springs Road *Alternative Site Driveway*									
	SR	1	1							1
	ST	1	1							1
	SL	1	1							1
	WR	3	3							3
	WT	26	26		100%		30	54%	30	56
	WL									
	NR									
	NT	6	6							6
	NL	10	10							10
	ER	2	2							2
	ET	26	26	100%		30		54%	30	56
	EL	3	3							3

SRF ASSOCIATES
WWW.SRFA.NET
Traffic Engineering & Planning Consultants

Proposed Frontier Stone, Town Of Shelby, Orleans County

Documentation of Ambient Traffic Volume Growth

Roadway	Segment starts at	Segment ends at	2001	2004	2007	Annual Growth
NYS Route 63	Orleans Co Line	RT 31A Start 31 Olap	4,550	5,000	4,480	-0.26%
					Average	-0.26%

A3

Level of Service: Criteria and Definitions

Level of Service Criteria

Highway Capacity Manual 2000

SIGNALIZED INTERSECTIONS

Level of Service is a qualitative measure describing operational conditions within a traffic stream, based on service measures such as speed and travel time, freedom to maneuver, traffic interruptions, comfort, and convenience. Level of Service for signalized intersections is defined in terms of delay specifically, average total delay per vehicle for a 15 minute analysis period. The ranges are as follows:

Level of Service	Control Delay per vehicle (seconds)
A	< 10
B	10 – 20
C	20 – 35
D	35 – 55
E	55 – 80
F	>80

UNSIGNALIZED INTERSECTIONS

Level of Service for unsignalized intersections is also defined in terms of delay. However, the delay criteria are different from a signalized intersection. The primary reason for this is driver expectation that a signalized intersection is designed to carry higher volumes than an unsignalized intersection. The total delay threshold for any given Level of Service is less for an unsignalized intersection than for a signalized intersection. The ranges are as follows:

Level of Service	Control Delay per vehicle (seconds)
A	< 10
B	10 – 15
C	15 – 25
D	25 – 35
E	35 - 50
F	>50

A4

Level of Service Calculations: Existing Conditions

Proposed Frontier Stone Quarry
1: Dunlop Road & Route 63

Existing Conditions - AM Peak Hour
5/18/2012

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		+			+			+			+	
Volume (vph)	2	7	4	14	6	11	1	121	3	10	173	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.961			0.962			0.997			0.998	
Flt Protected		0.992			0.975						0.997	
Satd. Flow (prot)	0	1776	0	0	1747	0	0	1857	0	0	1853	0
Flt Permitted		0.992			0.975						0.997	
Satd. Flow (perm)	0	1776	0	0	1747	0	0	1857	0	0	1853	0
Link Speed (mph)		30			45			55			55	
Link Distance (ft)		296			584			770			710	
Travel Time (s)		6.7			8.8			9.5			8.8	
Peak Hour Factor	0.54	0.54	0.54	0.65	0.65	0.92	0.92	0.92	0.92	0.77	0.77	0.77
Adj. Flow (vph)	4	13	7	22	9	12	1	132	3	13	225	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	24	0	0	43	0	0	136	0	0	241	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 26.7% ICU Level of Service A
Analysis Period (min) 15

Proposed Frontier Stone Quarry
1: Dunlop Road & Route 63

Existing Conditions - AM Peak Hour
5/18/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		+			+			+			+	
Volume (veh/h)	2	7	4	14	6	11	1	121	3	10	173	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.54	0.54	0.54	0.65	0.65	0.92	0.92	0.92	0.92	0.77	0.77	0.77
Hourly flow rate (vph)	4	13	7	22	9	12	1	132	3	13	225	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	404	389	226	401	389	133	227			135		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	404	389	226	401	389	133	227			135		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	98	99	96	98	99	100			99		
cM capacity (veh/h)	539	541	813	540	541	916	1341			1450		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	24	43	136	240
Volume Left	4	22	1	13
Volume Right	7	12	3	3
cSH	603	610	1341	1450
Volume to Capacity	0.04	0.07	0.00	0.01
Queue Length 95th (ft)	3	6	0	1
Control Delay (s)	11.2	11.3	0.1	0.5
Lane LOS	B	B	A	A
Approach Delay (s)	11.2	11.3	0.1	0.5
Approach LOS	B	B		

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	26.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (vph)	0	4	16	0	24	3	2	0	0	1	3	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.893			0.984						0.975	
Flt Protected								0.950			0.991	
Satd. Flow (prot)	0	1663	0	0	1833	0	0	1770	0	0	1800	0
Flt Permitted								0.950			0.991	
Satd. Flow (perm)	0	1663	0	0	1833	0	0	1770	0	0	1800	0
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		1944			533			517			373	
Travel Time (s)		29.5			8.1			10.1			7.3	
Peak Hour Factor	0.46	0.46	0.46	0.52	0.52	0.52	0.50	0.50	0.50	0.42	0.42	0.42
Adj. Flow (vph)	0	9	35	0	46	6	4	0	0	2	7	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	44	0	0	52	0	0	4	0	0	11	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 13.3% — ICU Level of Service A
Analysis Period (min) 15

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (veh/h)	0	4	16	0	24	3	2	0	0	1	3	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.46	0.46	0.46	0.52	0.52	0.52	0.50	0.50	0.50	0.42	0.42	0.42
Hourly flow rate (vph)	0	9	35	0	46	6	4	0	0	2	7	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	52			43			81	78	26	75	93	49
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	52			43			81	78	26	75	93	49
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	99	100
cM capacity (veh/h)	1554			1565			898	812	1050	915	798	1020

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	43	52	4	12
Volume Left	0	0	4	2
Volume Right	35	6	0	2
cSH	1554	1565	898	857
Volume to Capacity	0.00	0.00	0.00	0.01
Queue Length 95th (ft)	0	0	0	1
Control Delay (s)	0.0	0.0	9.0	9.3
Lane LOS			A	A
Approach Delay (s)	0.0	0.0	9.0	9.3
Approach LOS			A	A

Intersection Summary

Average Delay	1.3		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Proposed Frontier Stone Quarry
1: Dunlop Road & Route 63

Existing Conditions - PM Peak Hour
5/18/2012

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	4	2	15	8	15	3	192	17	3	176	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.958			0.947			0.989			0.992	
Flt Protected		0.994			0.981			0.999			0.999	
Satd. Flow (prot)	0	1774	0	0	1731	0	0	1840	0	0	1846	0
Flt Permitted		0.994			0.981			0.999			0.999	
Satd. Flow (perm)	0	1774	0	0	1731	0	0	1840	0	0	1846	0
Link Speed (mph)		30			45			55			55	
Link Distance (ft)		296			584			770			710	
Travel Time (s)		6.7			8.8			9.5			8.8	
Peak Hour Factor	0.44	0.44	0.44	0.68	0.68	0.68	0.95	0.95	0.95	0.75	0.75	0.75
Adj. Flow (vph)	2	9	5	22	12	22	3	202	18	4	235	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	0	0	56	0	0	223	0	0	254	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 24.2% ICU Level of Service A
Analysis Period (min) 15

Proposed Frontier Stone Quarry
1: Dunlop Road & Route 63

Existing Conditions - PM Peak Hour
5/18/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	4	2	15	8	15	3	192	17	3	176	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.44	0.44	0.44	0.68	0.68	0.68	0.95	0.95	0.95	0.75	0.75	0.75
Hourly flow rate (vph)	2	9	5	22	12	22	3	202	18	4	235	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	495	476	242	476	475	211	249			220		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	495	476	242	476	475	211	249			220		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	98	99	95	98	97	100			100		
cM capacity (veh/h)	461	485	797	487	486	829	1316			1349		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	16	56	223	253
Volume Left	2	22	3	4
Volume Right	5	22	18	15
cSH	541	581	1316	1349
Volume to Capacity	0.03	0.10	0.00	0.00
Queue Length 95th (ft)	2	8	0	0
Control Delay (s)	11.8	11.8	0.1	0.1
Lane LOS	B	B	A	A
Approach Delay (s)	11.8	11.8	0.1	0.1
Approach LOS	B	B		

Intersection Summary

Average Delay	1.7		
Intersection Capacity Utilization	24.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✢			✢			✢			✢	
Volume (vph)	3	26	3	0	26	3	10	6	0	1	1	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.989			0.985						0.955	
Flt Protected		0.996						0.971			0.984	
Satd. Flow (prot)	0	1835	0	0	1835	0	0	1809	0	0	1750	0
Flt Permitted		0.996						0.971			0.984	
Satd. Flow (perm)	0	1835	0	0	1835	0	0	1809	0	0	1750	0
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		1944			533			517			373	
Travel Time (s)		29.5			8.1			10.1			7.3	
Peak Hour Factor	0.86	0.86	0.86	0.66	0.66	0.66	0.80	0.80	0.80	0.75	0.75	0.75
Adj. Flow (vph)	3	30	3	0	39	5	13	8	0	1	1	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	36	0	0	44	0	0	20	0	0	3	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 14.1% — ICU Level of Service A
Analysis Period (min) 15

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✢			✢			✢			✢	
Volume (veh/h)	3	26	3	0	26	3	10	6	0	1	1	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.66	0.66	0.66	0.80	0.80	0.80	0.75	0.75	0.75
Hourly flow rate (vph)	3	30	3	0	39	5	12	8	0	1	1	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	44			34			83	83	32	84	82	42
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	44			34			83	83	32	84	82	42
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	99	100	100	100	100
cM capacity (veh/h)	1564			1578			901	805	1042	894	806	1029

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	37	44	20	4
Volume Left	3	0	12	1
Volume Right	3	5	0	1
cSH	1564	1578	862	901
Volume to Capacity	0.00	0.00	0.02	0.00
Queue Length 95th (ft)	0	0	2	0
Control Delay (s)	0.7	0.0	9.3	9.0
Lane LOS	A		A	A
Approach Delay (s)	0.7	0.0	9.3	9.0
Approach LOS			A	A

Intersection Summary

Average Delay	2.4		
Intersection Capacity Utilization	14.1%	ICU Level of Service	A
Analysis Period (min)	15		

A5

Level of Service Calculations: Background Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	7	4	14	6	11	1	122	3	10	174	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.961			0.962			0.997			0.998	
Flt Protected		0.992			0.975						0.997	
Satd. Flow (prot)	0	1776	0	0	1747	0	0	1857	0	0	1853	0
Flt Permitted		0.992			0.975						0.997	
Satd. Flow (perm)	0	1776	0	0	1747	0	0	1857	0	0	1853	0
Link Speed (mph)		30			45			55			55	
Link Distance (ft)		296			584			770			710	
Travel Time (s)		6.7			8.8			9.5			8.8	
Peak Hour Factor	0.54	0.54	0.54	0.65	0.65	0.92	0.92	0.92	0.92	0.77	0.77	0.77
Adj. Flow (vph)	4	13	7	22	9	12	1	133	3	13	226	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	24	0	0	43	0	0	137	0	0	242	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 26.7% ICU Level of Service A
Analysis Period (min) 15

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	7	4	14	6	11	1	122	3	10	174	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.54	0.54	0.54	0.65	0.65	0.92	0.92	0.92	0.92	0.77	0.77	0.77
Hourly flow rate (vph)	4	13	7	22	9	12	1	133	3	13	226	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	406	391	227	404	391	134	229			136		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	406	391	227	404	391	134	229			136		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	98	99	96	98	99	100			99		
cM capacity (veh/h)	537	539	812	538	539	915	1340			1448		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	24	43	137	242
Volume Left	4	22	1	13
Volume Right	7	12	3	3
cSH	601	609	1340	1448
Volume to Capacity	0.04	0.07	0.00	0.01
Queue Length 95th (ft)	3	6	0	1
Control Delay (s)	11.2	11.4	0.1	0.5
Lane LOS	B	B	A	A
Approach Delay (s)	11.2	11.4	0.1	0.5
Approach LOS	B	B		

Intersection Summary

Average Delay	2.0		
Intersection Capacity Utilization	26.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Volume (vph)	0	4	16	0	24	3	2	0	0	1	3	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.893			0.984						0.975	
Flt Protected								0.950			0.991	
Satd. Flow (prot)	0	1663	0	0	1833	0	0	1770	0	0	1800	0
Flt Permitted								0.950			0.991	
Satd. Flow (perm)	0	1663	0	0	1833	0	0	1770	0	0	1800	0
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		1944			533			517			373	
Travel Time (s)		29.5			8.1			10.1			7.3	
Peak Hour Factor	0.46	0.46	0.46	0.52	0.52	0.52	0.50	0.50	0.50	0.42	0.42	0.42
Adj. Flow (vph)	0	9	35	0	46	6	4	0	0	2	7	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	44	0	0	52	0	0	4	0	0	11	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 13.3% ICU Level of Service A
Analysis Period (min) 15

Proposed Frontier Stone Quarry
2: Fletcher Chapel Road & Edwards Road
Background Conditions - AM Peak Hour
5/18/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Volume (veh/h)	0	4	16	0	24	3	2	0	0	1	3	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.46	0.46	0.46	0.52	0.52	0.52	0.50	0.50	0.50	0.42	0.42	0.42
Hourly flow rate (vph)	0	9	35	0	46	6	4	0	0	2	7	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	52			43			81	78	26	75	93	49
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	52			43			81	78	26	75	93	49
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	99	100
cM capacity (veh/h)	1554			1565			898	812	1050	915	798	1020

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	43	52	4	12
Volume Left	0	0	4	2
Volume Right	35	6	0	2
cSH	1554	1565	898	857
Volume to Capacity	0.00	0.00	0.00	0.01
Queue Length 95th (ft)	0	0	0	1
Control Delay (s)	0.0	0.0	9.0	9.3
Lane LOS			A	A
Approach Delay (s)	0.0	0.0	9.0	9.3
Approach LOS			A	A

Intersection Summary

Average Delay	1.3		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	4	2	15	8	15	3	193	17	3	177	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.958			0.947			0.989			0.992	
Flt Protected		0.994			0.981			0.999			0.999	
Satd. Flow (prot)	0	1774	0	0	1731	0	0	1840	0	0	1846	0
Flt Permitted		0.994			0.981			0.999			0.999	
Satd. Flow (perm)	0	1774	0	0	1731	0	0	1840	0	0	1846	0
Link Speed (mph)		30			45			55			55	
Link Distance (ft)		296			584			770			710	
Travel Time (s)		6.7			8.8			9.5			8.8	
Peak Hour Factor	0.44	0.44	0.44	0.68	0.68	0.68	0.95	0.95	0.95	0.75	0.75	0.75
Adj. Flow (vph)	2	9	5	22	12	22	3	203	18	4	236	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	0	0	56	0	0	224	0	0	255	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 24.3% ICU Level of Service A
Analysis Period (min) 15

Proposed Frontier Stone Quarry
1: Dunlop Road & Route 63

Background Conditions - PM Peak Hour
5/18/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	4	2	15	8	15	3	193	17	3	177	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.44	0.44	0.44	0.68	0.68	0.68	0.95	0.95	0.95	0.75	0.75	0.75
Hourly flow rate (vph)	2	9	5	22	12	22	3	203	18	4	236	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	498	479	243	479	477	212	251			221		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	498	479	243	479	477	212	251			221		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	98	99	95	98	97	100			100		
cM capacity (veh/h)	459	483	795	485	484	828	1315			1348		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	16	56	224	255
Volume Left	2	22	3	4
Volume Right	5	22	18	15
cSH	540	580	1315	1348
Volume to Capacity	0.03	0.10	0.00	0.00
Queue Length 95th (ft)	2	8	0	0
Control Delay (s)	11.9	11.9	0.1	0.1
Lane LOS	B	B	A	A
Approach Delay (s)	11.9	11.9	0.1	0.1
Approach LOS	B	B		

Intersection Summary

Average Delay	1.7		
Intersection Capacity Utilization	24.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	26	2	0	26	3	10	6	0	1	1	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992			0.985						0.955	
Flt Protected		0.996						0.971			0.984	
Satd. Flow (prot)	0	1840	0	0	1835	0	0	1809	0	0	1750	0
Flt Permitted		0.996						0.971			0.984	
Satd. Flow (perm)	0	1840	0	0	1835	0	0	1809	0	0	1750	0
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		1944			533			517			373	
Travel Time (s)		29.5			8.1			10.1			7.3	
Peak Hour Factor	0.86	0.86	0.86	0.66	0.66	0.66	0.80	0.80	0.80	0.75	0.75	0.75
Adj. Flow (vph)	3	30	2	0	39	5	13	8	0	1	1	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	35	0	0	44	0	0	20	0	0	3	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 14.0% ICU Level of Service A
Analysis Period (min) 15

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	26	2	0	26	3	10	6	0	1	1	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.66	0.66	0.66	0.80	0.80	0.80	0.75	0.75	0.75
Hourly flow rate (vph)	3	30	2	0	39	5	12	8	0	1	1	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	44			33			82	82	31	84	81	42
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	44			33			82	82	31	84	81	42
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	99	100	100	100	100
cM capacity (veh/h)	1564			1579			902	806	1043	895	807	1029

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	36	44	20	4
Volume Left	3	0	12	1
Volume Right	2	5	0	1
cSH	1564	1579	863	902
Volume to Capacity	0.00	0.00	0.02	0.00
Queue Length 95th (ft)	0	0	2	0
Control Delay (s)	0.7	0.0	9.3	9.0
Lane LOS	A		A	A
Approach Delay (s)	0.7	0.0	9.3	9.0
Approach LOS			A	A

Intersection Summary

Average Delay	2.4		
Intersection Capacity Utilization	14.0%	ICU Level of Service	A
Analysis Period (min)	15		

A6

Level of Service Calculations: Full Development Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	7	4	44	6	11	1	122	33	10	174	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.961			0.982			0.971			0.998	
Flt Protected		0.992			0.963						0.997	
Satd. Flow (prot)	0	1776	0	0	1762	0	0	1809	0	0	1853	0
Flt Permitted		0.992			0.963						0.997	
Satd. Flow (perm)	0	1776	0	0	1762	0	0	1809	0	0	1853	0
Link Speed (mph)		30			45			55			55	
Link Distance (ft)		296			584			770			710	
Travel Time (s)		6.7			8.8			9.5			8.8	
Peak Hour Factor	0.54	0.54	0.54	0.65	0.65	0.92	0.92	0.92	0.92	0.77	0.77	0.77
Adj. Flow (vph)	4	13	7	68	9	12	1	133	36	13	226	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	24	0	0	89	0	0	170	0	0	242	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 33.0% — ICU Level of Service A
Analysis Period (min) 15

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	7	4	44	6	11	1	122	33	10	174	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.54	0.54	0.54	0.65	0.65	0.92	0.92	0.92	0.92	0.77	0.77	0.77
Hourly flow rate (vph)	4	13	7	68	9	12	1	133	36	13	226	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	423	424	227	420	407	151	229			168		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	423	424	227	420	407	151	229			168		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	97	99	87	98	99	100			99		
cM capacity (veh/h)	523	517	812	524	528	896	1340			1409		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	24	89	170	242
Volume Left	4	68	1	13
Volume Right	7	12	36	3
cSH	583	556	1340	1409
Volume to Capacity	0.04	0.16	0.00	0.01
Queue Length 95th (ft)	3	14	0	1
Control Delay (s)	11.4	12.7	0.1	0.5
Lane LOS	B	B	A	A
Approach Delay (s)	11.4	12.7	0.1	0.5
Approach LOS	B	B		

Intersection Summary

Average Delay	2.9		
Intersection Capacity Utilization	33.0%	ICU Level of Service	A
Analysis Period (min)	15		

Proposed Frontier Stone Quarry Full Development Conditions (Primary) - AM Peak Hour
2: Fletcher Chapel Road & Edwards Road 5/21/2012

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (vph)	0	4	46	0	24	3	32	0	0	1	3	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.876			0.984						0.975	
Flt Protected								0.950			0.991	
Satd. Flow (prot)	0	1632	0	0	1833	0	0	1770	0	0	1800	0
Flt Permitted								0.950			0.991	
Satd. Flow (perm)	0	1632	0	0	1833	0	0	1770	0	0	1800	0
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		1944			533			1406			373	
Travel Time (s)		29.5			8.1			27.4			7.3	
Peak Hour Factor	0.46	0.46	0.46	0.52	0.52	0.52	0.50	0.50	0.50	0.42	0.42	0.42
Adj. Flow (vph)	0	9	100	0	46	6	64	0	0	2	7	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	109	0	0	52	0	0	64	0	0	11	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 16.6% ICU Level of Service A
Analysis Period (min) 15

Proposed Frontier Stone Quarry Full Development Conditions (Primary) - AM Peak Hour
2: Fletcher Chapel Road & Edwards Road 5/21/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (veh/h)	0	4	46	0	24	3	32	0	0	1	3	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.46	0.46	0.46	0.52	0.52	0.52	0.50	0.50	0.50	0.42	0.42	0.42
Hourly flow rate (vph)	0	9	100	0	46	6	64	0	0	2	7	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	52			109			114	111	59	108	158	49
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	52			109			114	111	59	108	158	49
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			93	100	100	100	99	100
cM capacity (veh/h)	1554			1482			855	780	1007	871	734	1020

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	109	52	64	12
Volume Left	0	0	64	2
Volume Right	100	6	0	2
cSH	1554	1482	855	805
Volume to Capacity	0.00	0.00	0.07	0.01
Queue Length 95th (ft)	0	0	6	1
Control Delay (s)	0.0	0.0	9.6	9.5
Lane LOS			A	A
Approach Delay (s)	0.0	0.0	9.6	9.5
Approach LOS			A	A

Intersection Summary

Average Delay	3.1		
Intersection Capacity Utilization	16.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	30	2	0	30	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.865					
Flt Protected						0.970
Satd. Flow (prot)	1611	0	1863	0	0	1807
Flt Permitted						0.970
Satd. Flow (perm)	1611	0	1863	0	0	1807
Link Speed (mph)	10		35			35
Link Distance (ft)	554		984			1406
Travel Time (s)	37.8		19.2			27.4
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	0	35	2	0	35	22
Shared Lane Traffic (%)						
Lane Group Flow (vph)	35	0	2	0	0	57
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 19.3% ICU Level of Service A
Analysis Period (min) 15

Proposed Frontier Stone Quarry Full Development Conditions (Primary) - AM Peak Hour
3: Proposed Access Driveway & Sour Springs Road 5/21/2012

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	30	2	0	30	19
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	35	2	0	35	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	95	2			2	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	95	2			2	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	97			98	
cM capacity (veh/h)	885	1082			1620	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	35	2	58
Volume Left	0	0	35
Volume Right	35	0	0
cSH	1082	1700	1620
Volume to Capacity	0.03	0.00	0.02
Queue Length 95th (ft)	3	0	2
Control Delay (s)	8.4	0.0	4.5
Lane LOS	A		A
Approach Delay (s)	8.4	0.0	4.5
Approach LOS	A		

Intersection Summary

Average Delay	5.9		
Intersection Capacity Utilization	19.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	4	2	45	8	15	3	193	47	3	177	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.958			0.970			0.974			0.992	
Flt Protected		0.994			0.968			0.999			0.999	
Satd. Flow (prot)	0	1774	0	0	1749	0	0	1812	0	0	1846	0
Flt Permitted		0.994			0.968			0.999			0.999	
Satd. Flow (perm)	0	1774	0	0	1749	0	0	1812	0	0	1846	0
Link Speed (mph)		30			45			55			55	
Link Distance (ft)		296			584			770			710	
Travel Time (s)		6.7			8.8			9.5			8.8	
Peak Hour Factor	0.44	0.44	0.44	0.68	0.68	0.68	0.95	0.95	0.95	0.75	0.75	0.75
Adj. Flow (vph)	2	9	5	66	12	22	3	203	49	4	236	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	0	0	100	0	0	255	0	0	255	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 31.9% ICU Level of Service A
Analysis Period (min) 15

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	4	2	45	8	15	3	193	47	3	177	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.44	0.44	0.44	0.68	0.68	0.68	0.95	0.95	0.95	0.75	0.75	0.75
Hourly flow rate (vph)	2	9	5	66	12	22	3	203	49	4	236	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	513	510	243	495	493	228	251			253		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	513	510	243	495	493	228	251			253		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	98	99	86	98	97	100			100		
cM capacity (veh/h)	448	464	795	473	475	811	1315			1313		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	16	100	256	255
Volume Left	2	66	3	4
Volume Right	5	22	49	15
cSH	524	521	1315	1313
Volume to Capacity	0.03	0.19	0.00	0.00
Queue Length 95th (ft)	2	18	0	0
Control Delay (s)	12.1	13.5	0.1	0.1
Lane LOS	B	B	A	A
Approach Delay (s)	12.1	13.5	0.1	0.1
Approach LOS	B	B		

Intersection Summary

Average Delay	2.6		
Intersection Capacity Utilization	31.9%	ICU Level of Service	A
Analysis Period (min)	15		

Proposed Frontier Stone Quarry Full Development Conditions (Alternative) - PM Peak Hour
2: Fletcher Chapel Road & Edwards Road 5/21/2012

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		+			+			+			+	
Volume (vph)	3	26	32	0	26	3	40	6	0	1	1	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.929			0.985						0.955	
Flt Protected		0.998						0.959			0.984	
Satd. Flow (prot)	0	1727	0	0	1835	0	0	1786	0	0	1750	0
Flt Permitted		0.998						0.959			0.984	
Satd. Flow (perm)	0	1727	0	0	1835	0	0	1786	0	0	1750	0
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		1944			533			1406			373	
Travel Time (s)		29.5			8.1			27.4			7.3	
Peak Hour Factor	0.86	0.86	0.86	0.66	0.66	0.66	0.80	0.80	0.80	0.75	0.75	0.75
Adj. Flow (vph)	3	30	37	0	39	5	50	8	0	1	1	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	70	0	0	44	0	0	58	0	0	3	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 18.4% ICU Level of Service A
Analysis Period (min) 15

Proposed Frontier Stone Quarry Full Development Conditions (Alternative) - PM Peak Hour
2: Fletcher Chapel Road & Edwards Road 5/21/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		+			+			+			+	
Volume (veh/h)	3	26	32	0	26	3	40	6	0	1	1	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.66	0.66	0.66	0.80	0.80	0.80	0.75	0.75	0.75
Hourly flow rate (vph)	3	30	37	0	39	5	50	8	0	1	1	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	44			67			99	100	49	101	116	42
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	44			67			99	100	49	101	116	42
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			94	99	100	100	100	100
cM capacity (veh/h)	1564			1534			878	789	1020	872	772	1029

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	71	44	58	4
Volume Left	3	0	50	1
Volume Right	37	5	0	1
cSH	1564	1534	865	879
Volume to Capacity	0.00	0.00	0.07	0.00
Queue Length 95th (ft)	0	0	5	0
Control Delay (s)	0.4	0.0	9.5	9.1
Lane LOS	A		A	A
Approach Delay (s)	0.4	0.0	9.5	9.1
Approach LOS			A	A

Intersection Summary

Average Delay	3.4		
Intersection Capacity Utilization	18.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	30	16	0	30	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.865					
Flt Protected						0.954
Satd. Flow (prot)	1611	0	1863	0	0	1777
Flt Permitted						0.954
Satd. Flow (perm)	1611	0	1863	0	0	1777
Link Speed (mph)	10		35			35
Link Distance (ft)	566		482			1406
Travel Time (s)	38.6		9.4			27.4
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	0	35	19	0	35	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	35	0	19	0	0	36
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 18.4% ICU Level of Service A
Analysis Period (min) 15

Proposed Frontier Stone Quarry Full Development Conditions (Alternative) - PM Peak Hour
3: Proposed Access Driveway & Sour Springs Road 5/21/2012

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	30	16	0	30	1
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	35	19	0	35	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	91	19			19	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	91	19			19	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	97			98	
cM capacity (veh/h)	890	1059			1598	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	35	19	36
Volume Left	0	0	35
Volume Right	35	0	0
cSH	1059	1700	1598
Volume to Capacity	0.03	0.01	0.02
Queue Length 95th (ft)	3	0	2
Control Delay (s)	8.5	0.0	7.1
Lane LOS	A		A
Approach Delay (s)	8.5	0.0	7.1
Approach LOS	A		

Intersection Summary

Average Delay	6.2		
Intersection Capacity Utilization	18.4%	ICU Level of Service	A
Analysis Period (min)	15		

Proposed Frontier Stone Quarry — Full Development Conditions (Alternative) - AM Peak Hour
1: Dunlop Road & Route 63 — 5/18/2012

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	7	4	44	6	11	1	122	33	10	174	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.961			0.982			0.971			0.998	
Flt Protected		0.992			0.963						0.997	
Satd. Flow (prot)	0	1776	0	0	1762	0	0	1809	0	0	1853	0
Flt Permitted		0.992			0.963						0.997	
Satd. Flow (perm)	0	1776	0	0	1762	0	0	1809	0	0	1853	0
Link Speed (mph)		30			45			55			55	
Link Distance (ft)		296			584			770			710	
Travel Time (s)		6.7			8.8			9.5			8.8	
Peak Hour Factor	0.54	0.54	0.54	0.65	0.65	0.92	0.92	0.92	0.92	0.77	0.77	0.77
Adj. Flow (vph)	4	13	7	68	9	12	1	133	36	13	226	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	24	0	0	89	0	0	170	0	0	242	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 33.0% — ICU Level of Service A
Analysis Period (min) 15

Proposed Frontier Stone Quarry — Full Development Conditions (Alternative) - AM Peak Hour
1: Dunlop Road & Route 63 — 5/18/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	7	4	44	6	11	1	122	33	10	174	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.54	0.54	0.54	0.65	0.65	0.92	0.92	0.92	0.92	0.77	0.77	0.77
Hourly flow rate (vph)	4	13	7	68	9	12	1	133	36	13	226	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	423	424	227	420	407	151	229			168		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	423	424	227	420	407	151	229			168		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	97	99	87	98	99	100			99		
cM capacity (veh/h)	523	517	812	524	528	896	1340			1409		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	24	89	170	242
Volume Left	4	68	1	13
Volume Right	7	12	36	3
cSH	583	556	1340	1409
Volume to Capacity	0.04	0.16	0.00	0.01
Queue Length 95th (ft)	3	14	0	1
Control Delay (s)	11.4	12.7	0.1	0.5
Lane LOS	B	B	A	A
Approach Delay (s)	11.4	12.7	0.1	0.5
Approach LOS	B	B		

Intersection Summary

Average Delay	2.9		
Intersection Capacity Utilization	33.0%	ICU Level of Service	A
Analysis Period (min)	15		

Proposed Frontier Stone Quarry — Full Development Conditions (Alternative) - AM Peak Hour
2: Fletcher Chapel Road & Edwards Road
5/18/2012

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (vph)	0	34	16	0	54	3	2	0	0	1	3	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.957			0.993						0.975	
Flt Protected								0.950			0.991	
Satd. Flow (prot)	0	1783	0	0	1850	0	0	1770	0	0	1800	0
Flt Permitted								0.950			0.991	
Satd. Flow (perm)	0	1783	0	0	1850	0	0	1770	0	0	1800	0
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		1938			533			1385			373	
Travel Time (s)		29.4			8.1			27.0			7.3	
Peak Hour Factor	0.46	0.46	0.46	0.52	0.52	0.52	0.50	0.50	0.50	0.42	0.42	0.42
Adj. Flow (vph)	0	74	35	0	104	6	4	0	0	2	7	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	109	0	0	110	0	0	4	0	0	11	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 13.3% — ICU Level of Service A
Analysis Period (min) 15

Proposed Frontier Stone Quarry — Full Development Conditions (Alternative) - AM Peak Hour
2: Fletcher Chapel Road & Edwards Road
5/18/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (veh/h)	0	34	16	0	54	3	2	0	0	1	3	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.46	0.46	0.46	0.52	0.52	0.52	0.50	0.50	0.50	0.42	0.42	0.42
Hourly flow rate (vph)	0	74	35	0	104	6	4	0	0	2	7	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	110			109			204	201	91	198	215	107
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	110			109			204	201	91	198	215	107
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	100	100	99	100
cM capacity (veh/h)	1481			1482			746	695	966	761	682	947

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	109	110	4	12
Volume Left	0	0	4	2
Volume Right	35	6	0	2
cSH	1481	1482	746	739
Volume to Capacity	0.00	0.00	0.01	0.02
Queue Length 95th (ft)	0	0	0	1
Control Delay (s)	0.0	0.0	9.9	10.0
Lane LOS			A	A
Approach Delay (s)	0.0	0.0	9.9	10.0
Approach LOS			A	A

Intersection Summary

Average Delay	0.7		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	5	30	0	27	30	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.885					
Flt Protected					0.950	
Satd. Flow (prot)	1649	0	0	1863	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	1649	0	0	1863	1770	0
Link Speed (mph)	45			45	10	
Link Distance (ft)	1035			470	454	
Travel Time (s)	15.7			7.1	31.0	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	6	35	0	32	35	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	41	0	0	32	35	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 13.3% ICU Level of Service A
Analysis Period (min) 15

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	5	30	0	27	30	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	6	35	0	32	35	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			41		55	24
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			41		55	24
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		96	100
cM capacity (veh/h)			1568		952	1053

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	41	32	35
Volume Left	0	0	35
Volume Right	35	0	0
cSH	1700	1568	952
Volume to Capacity	0.02	0.00	0.04
Queue Length 95th (ft)	0	0	3
Control Delay (s)	0.0	0.0	8.9
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.9
Approach LOS			A

Intersection Summary

Average Delay	2.9		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Proposed Frontier Stone Quarry   Full Development Conditions (Alternative) - PM Peak Hour
1: Dunlop Road & Route 63   5/18/2012

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		+			+			+			+	
Volume (vph)	1	4	2	45	8	15	3	193	47	3	177	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.958			0.970			0.974			0.992	
Flt Protected		0.994			0.968			0.999			0.999	
Satd. Flow (prot)	0	1774	0	0	1749	0	0	1812	0	0	1846	0
Flt Permitted		0.994			0.968			0.999			0.999	
Satd. Flow (perm)	0	1774	0	0	1749	0	0	1812	0	0	1846	0
Link Speed (mph)		30			45			55			55	
Link Distance (ft)		296			584			770			710	
Travel Time (s)		6.7			8.8			9.5			8.8	
Peak Hour Factor	0.44	0.44	0.44	0.68	0.68	0.68	0.95	0.95	0.95	0.75	0.75	0.75
Adj. Flow (vph)	2	9	5	66	12	22	3	203	49	4	236	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	0	0	100	0	0	255	0	0	255	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 31.9%   ICU Level of Service A
Analysis Period (min) 15

Proposed Frontier Stone Quarry   Full Development Conditions (Alternative) - PM Peak Hour
1: Dunlop Road & Route 63   5/18/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		+			+			+			+	
Volume (veh/h)	1	4	2	45	8	15	3	193	47	3	177	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.44	0.44	0.44	0.68	0.68	0.68	0.95	0.95	0.95	0.75	0.75	0.75
Hourly flow rate (vph)	2	9	5	66	12	22	3	203	49	4	236	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	513	510	243	495	493	228	251			253		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	513	510	243	495	493	228	251			253		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	98	99	86	98	97	100			100		
cM capacity (veh/h)	448	464	795	473	475	811	1315			1313		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	16	100	256	255
Volume Left	2	66	3	4
Volume Right	5	22	49	15
cSH	524	521	1315	1313
Volume to Capacity	0.03	0.19	0.00	0.00
Queue Length 95th (ft)	2	18	0	0
Control Delay (s)	12.1	13.5	0.1	0.1
Lane LOS	B	B	A	A
Approach Delay (s)	12.1	13.5	0.1	0.1
Approach LOS	B	B		

Intersection Summary

Average Delay	2.6		
Intersection Capacity Utilization	31.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (vph)	3	56	2	0	56	3	10	6	0	1	1	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.993						0.955	
Flt Protected		0.998						0.971			0.984	
Satd. Flow (prot)	0	1852	0	0	1850	0	0	1809	0	0	1750	0
Flt Permitted		0.998						0.971			0.984	
Satd. Flow (perm)	0	1852	0	0	1850	0	0	1809	0	0	1750	0
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		1937			533			1377			373	
Travel Time (s)		29.3			8.1			26.8			7.3	
Peak Hour Factor	0.86	0.86	0.86	0.66	0.66	0.66	0.80	0.80	0.80	0.75	0.75	0.75
Adj. Flow (vph)	3	65	2	0	85	5	13	8	0	1	1	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	70	0	0	90	0	0	20	0	0	3	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 15.5%   ICU Level of Service A
Analysis Period (min) 15

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (veh/h)	3	56	2	0	56	3	10	6	0	1	1	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.66	0.66	0.66	0.80	0.80	0.80	0.75	0.75	0.75
Hourly flow rate (vph)	3	65	2	0	85	5	12	8	0	1	1	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	89			67			162	163	66	164	162	87
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	89			67			162	163	66	164	162	87
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	99	100	100	100	100
cM capacity (veh/h)	1506			1534			799	728	997	793	729	971

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	71	89	20	4
Volume Left	3	0	12	1
Volume Right	2	5	0	1
cSH	1506	1534	771	819
Volume to Capacity	0.00	0.00	0.03	0.00
Queue Length 95th (ft)	0	0	2	0
Control Delay (s)	0.4	0.0	9.8	9.4
Lane LOS	A		A	A
Approach Delay (s)	0.4	0.0	9.8	9.4
Approach LOS			A	A

Intersection Summary

Average Delay	1.4		
Intersection Capacity Utilization	15.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	27	30	0	29	30	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.929					
Flt Protected					0.950	
Satd. Flow (prot)	1730	0	0	1863	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	1730	0	0	1863	1770	0
Link Speed (mph)	45			45	10	
Link Distance (ft)	1038			361	442	
Travel Time (s)	15.7			5.5	30.1	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	32	35	0	34	35	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	67	0	0	34	35	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 13.3% ICU Level of Service A
Analysis Period (min) 15

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	27	30	0	29	30	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	32	35	0	34	35	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			67		84	49
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			67		84	49
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		96	100
cM capacity (veh/h)			1534		918	1019

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	67	34	35
Volume Left	0	0	35
Volume Right	35	0	0
cSH	1700	1534	918
Volume to Capacity	0.04	0.00	0.04
Queue Length 95th (ft)	0	0	3
Control Delay (s)	0.0	0.0	9.1
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.1
Approach LOS			A

Intersection Summary

Average Delay	2.3		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX 9

- **Sound Level Data**

ZELASNY RECEPTOR S-1 AM

Information Panel

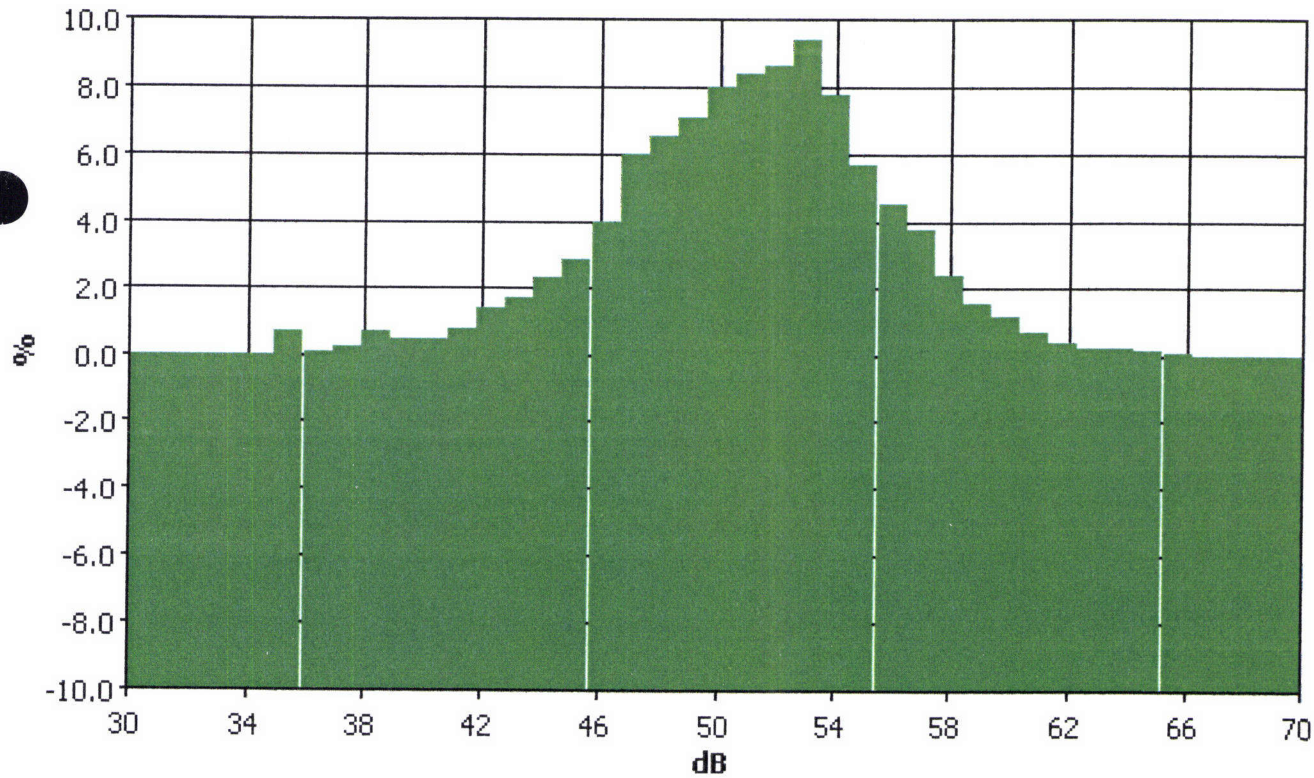
Name	ZELASNY LOCATION S-1 FILE S035
Start Time	Tuesday, March 20, 2007 07:51:52
Stop Time	Tuesday, March 20, 2007 08:51:54
Device Model Type	SoundPro DL
Comments	LOCATION S-1 AM READING
Device Certification Frequency	
Device Name	BIG010010
Device Serial Number	BIG010010
Location	SHELBY, NY RECEPTOR S-1
User Name	JOE KING
Description	RECEPTOR S-1 AM READING
Company Name	CONTINENTAL PLACER INC.

General Data Panel

Description	Meter/Sensor	Value
Lpk	1	107.6 dB
Lmin	1	35.3 dB
Exchange Rate	1	3 dB
Response	1	SLOW
Exchange Rate	2	3 dB
Response	2	SLOW

Description	Meter/Sensor	Value
Leq	1	53.9 dB
Lmax	1	67.7 dB
Weighting	1	A
Bandwidth	1	1/1
Weighting	2	C

Statistics Chart



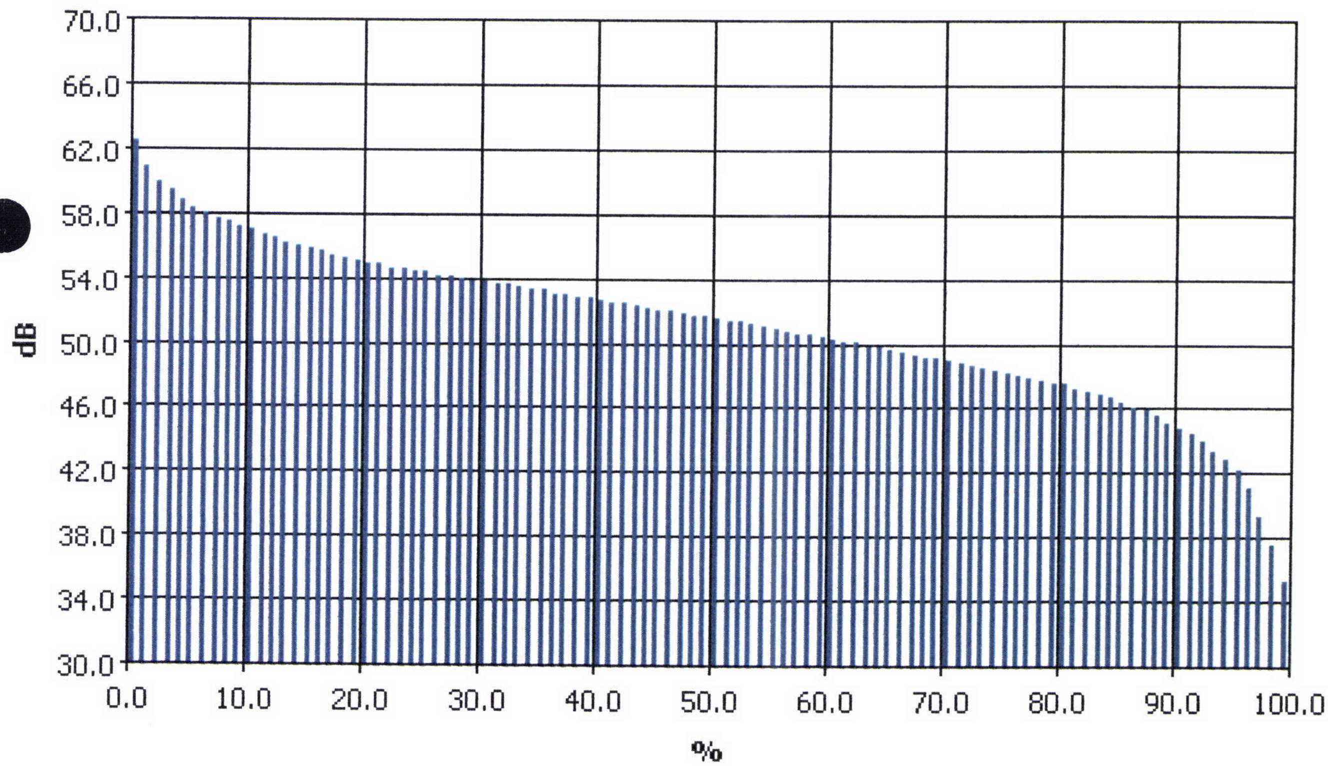
Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35.0	0.0	0.0	0.0	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.8
36.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
[illegible]	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.7
[illegible]	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.5
40.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.5

Statistics Table (cont'd)

[illegible]	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
[illegible]	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8
[illegible]	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.2	0.2	1.5
43.0	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	1.8
44.0	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.3	2.4
45.0	0.3	0.3	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.4	2.9
46.0	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	4.1
47.0	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.8	6.1
48.0	0.7	0.8	0.6	0.4	0.7	0.7	0.6	0.7	0.7	0.7	6.6
49.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	7.1
50.0	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	8.1
51.0	0.8	0.9	0.8	0.4	0.9	1.0	0.9	0.9	0.9	0.9	8.5
52.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.9	8.7
53.0	0.9	0.9	0.9	0.9	1.0	1.0	1.1	1.0	1.0	1.0	9.5
54.0	1.0	1.0	0.9	0.3	0.9	0.8	0.8	0.8	0.7	0.7	7.9
55.0	0.7	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.5	0.5	5.8
56.0	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.5	4.6
57.0	0.5	0.5	0.4	0.1	0.4	0.4	0.4	0.4	0.4	0.3	3.8
58.0	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	2.4
59.0	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.2	1.6
60.0	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.2
61.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.7
62.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.4
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
66.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
67.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
68.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
69.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

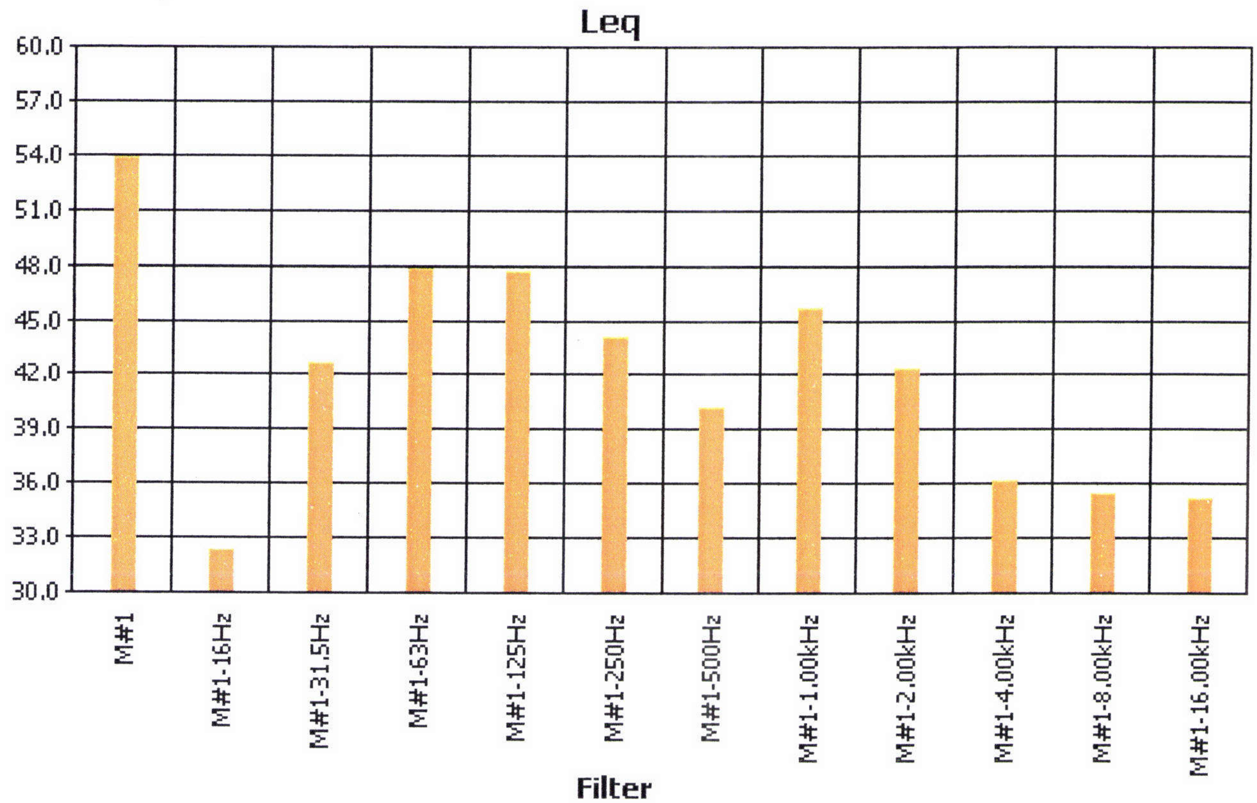
Exceedance Chart



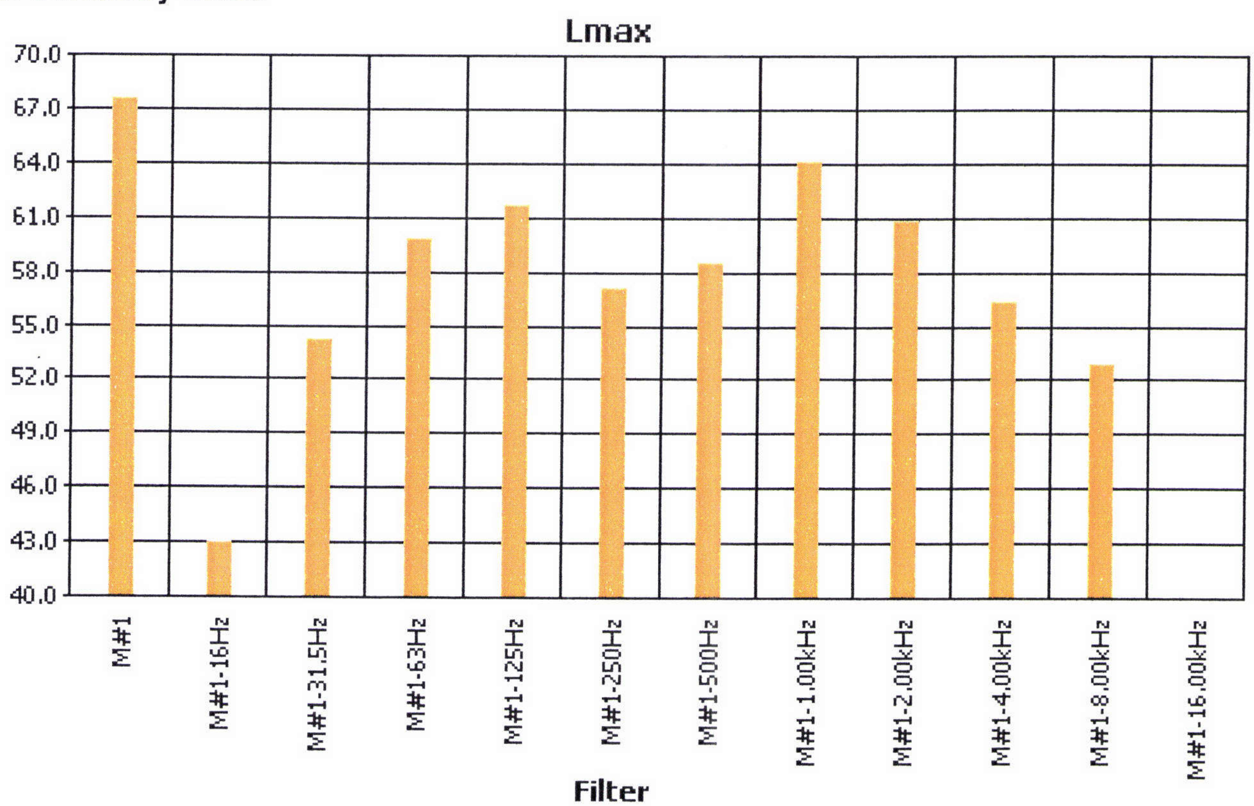
Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		62.6	61.0	60.1	59.5	58.9	58.5	58.1	57.8	57.6
10%	57.3	57.1	56.8	56.6	56.4	56.2	56.0	55.8	55.6	55.4
20%	55.3	55.1	55.0	54.8	54.7	54.6	54.5	54.3	54.2	54.1
30%	54.0	53.9	53.8	53.7	53.6	53.5	53.4	53.2	53.1	53.0
40%	52.9	52.8	52.7	52.6	52.5	52.3	52.2	52.1	52.0	51.9
50%	51.8	51.7	51.6	51.5	51.3	51.2	51.0	50.9	50.8	50.7
60%	50.5	50.4	50.3	50.2	50.0	49.9	49.8	49.6	49.5	49.3
70%	49.2	49.1	48.9	48.8	48.6	48.5	48.3	48.1	48.0	47.9
[illegible]	47.7	47.6	47.4	47.2	47.0	46.8	46.5	46.3	46.0	45.7
[illegible]	45.3	45.0	44.6	44.1	43.5	43.0	42.3	41.3	39.4	37.7
[illegible]	35.4									

Filter Summary Chart



Filter Summary Chart



Study 1
Information Panel

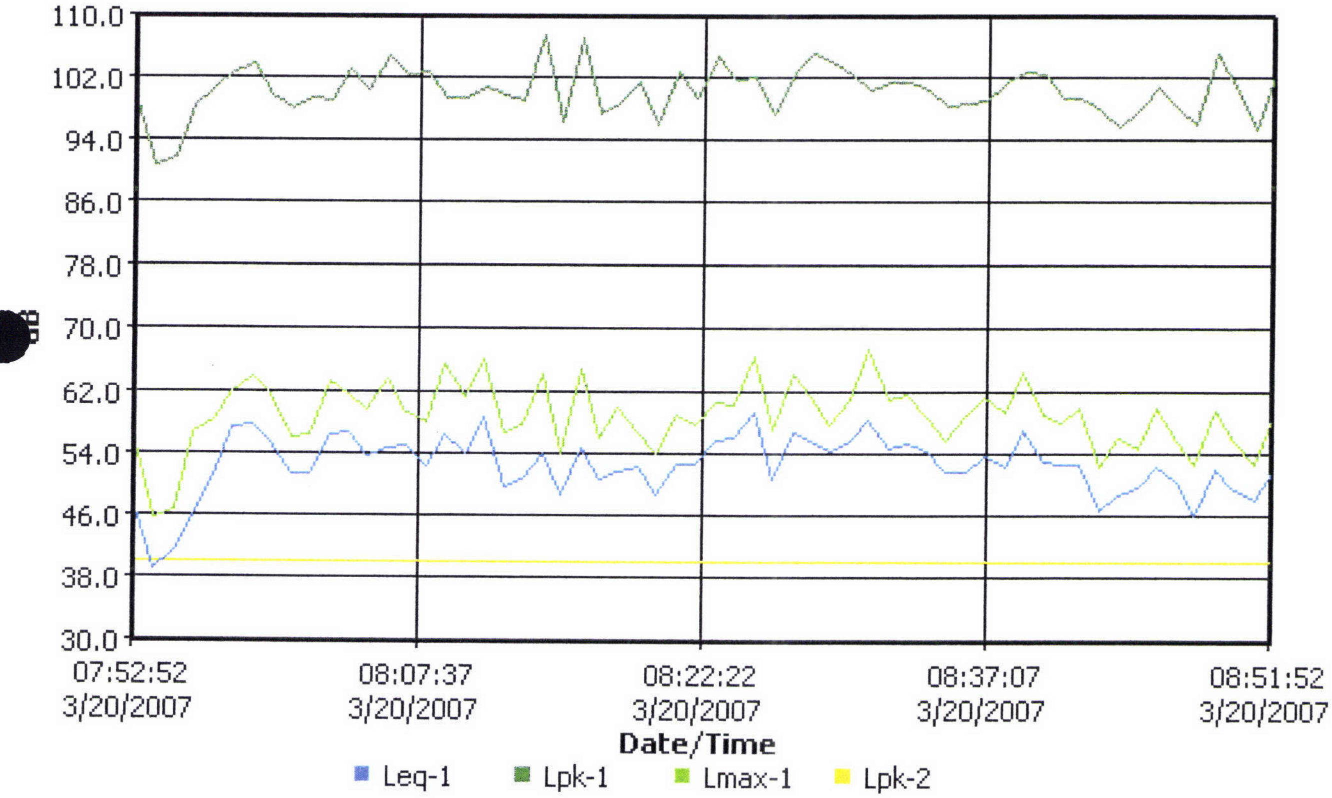
Name	Study 1
Location	
Comments	
Start Time	Tuesday, March 20, 2007 07:51:52
Stop Time	Tuesday, March 20, 2007 08:51:54
User Name	

General Data Panel

Description	Meter/Sensor	Value
Dose	1	0 %
Lmax	1	67.7 dB
Response	1	SLOW
Exchange Rate	1	3 dB
Log Rate	1	60 s
Integrating Threshold	2	80 dB
Response	2	SLOW

Description	Meter/Sensor	Value
Lpk	1	107.6 dB
Weighting	1	A
Bandwidth	1	1/1
Integrating Threshold	1	80 dB
Exchange Rate	2	3 dB
Weighting	2	C

Logged Data Chart



ZELASNY RECEPTOR S-1 PM

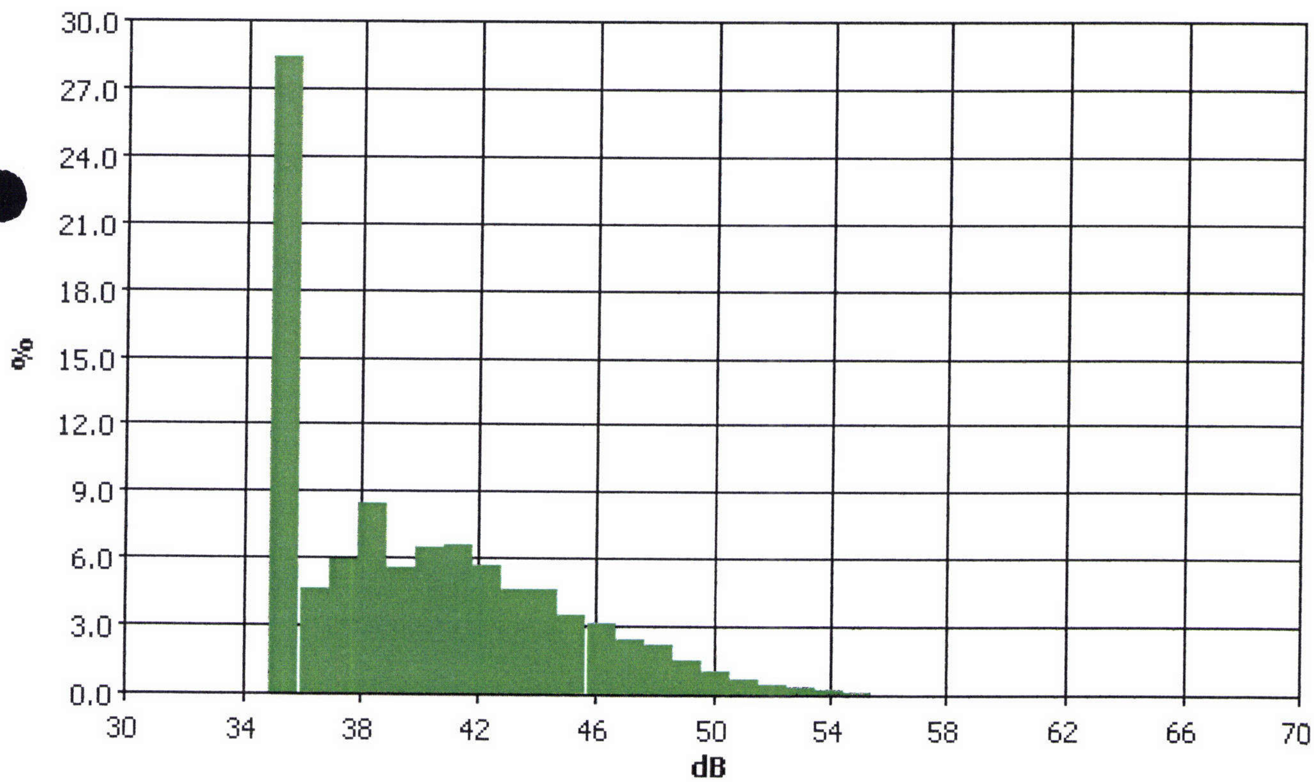
Information Panel

Name	ZELASNY LOCATION S-1 FILE S042
Start Time	Tuesday, March 20, 2007 14:44:20
Stop Time	Tuesday, March 20, 2007 15:44:21
Device Model Type	SoundPro DL
Comments	
Device Certification Frequency	
Device Name	BIG010010
Device Serial Number	BIG010010
Location	SHELBY, NY RECEPTOR S-1
User Name	JOE KING
Description	RECEPTOR S-1 PM READING
Company Name	CONTINENTAL PLACER INC.

General Data Panel

Description	Meter/Sensor	Value	Description	Meter/Sensor	Value
Lpk	1	103.6 dB	Leq	1	44.7 dB
Lmin	1	35.3 dB	Lmax	1	63.8 dB
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	SLOW	Bandwidth	1	1/1
Exchange Rate	2	3 dB	Weighting	2	C
Response	2	SLOW			

Statistics Chart



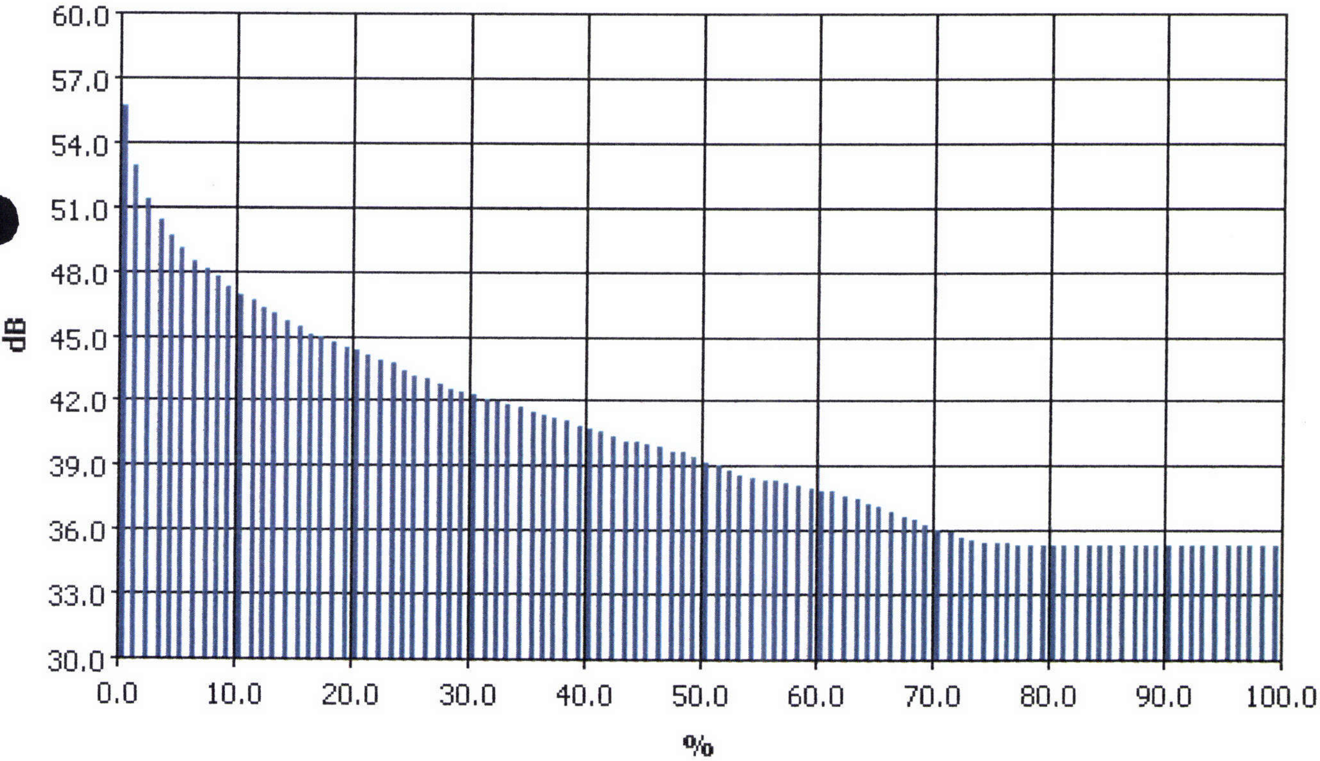
Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35.0	0.0	0.0	0.0	22.4	2.2	1.1	0.8	0.7	0.7	0.7	28.5
36.0	0.6	0.6	0.2	0.5	0.5	0.5	0.5	0.5	0.4	0.5	4.7
[illegible]	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.8	6.0
[illegible]	0.9	1.0	1.3	2.0	0.9	0.6	0.5	0.5	0.5	0.5	8.6
39.0	0.6	0.6	0.3	0.5	0.6	0.6	0.6	0.6	0.6	0.8	5.7
40.0	0.9	1.0	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.6	6.6

Statistics Table (cont'd)

[illegible]	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
[illegible]	0.6	0.6	0.7	0.9	0.8	0.7	0.6	0.6	0.6	0.7	6.7
[illegible]	0.6	0.7	0.5	0.7	0.6	0.5	0.5	0.5	0.5	0.5	5.8
43.0	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.4	4.7
44.0	0.4	0.4	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	4.8
45.0	0.5	0.5	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	3.6
46.0	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	3.3
47.0	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	2.6
48.0	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	2.3
49.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	1.6
50.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.1
51.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.8
52.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.6
53.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.5
54.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
57.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
58.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
59.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
66.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
67.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
68.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
69.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

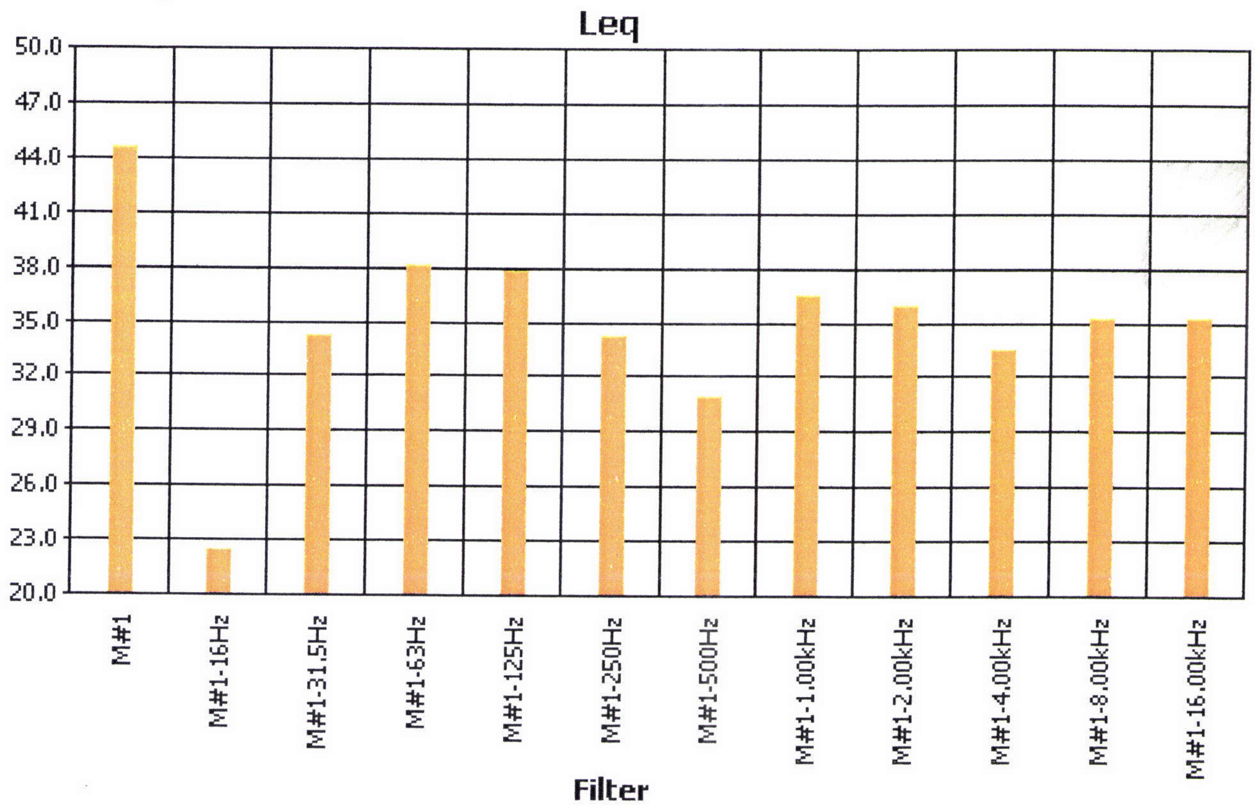
Exceedance Chart



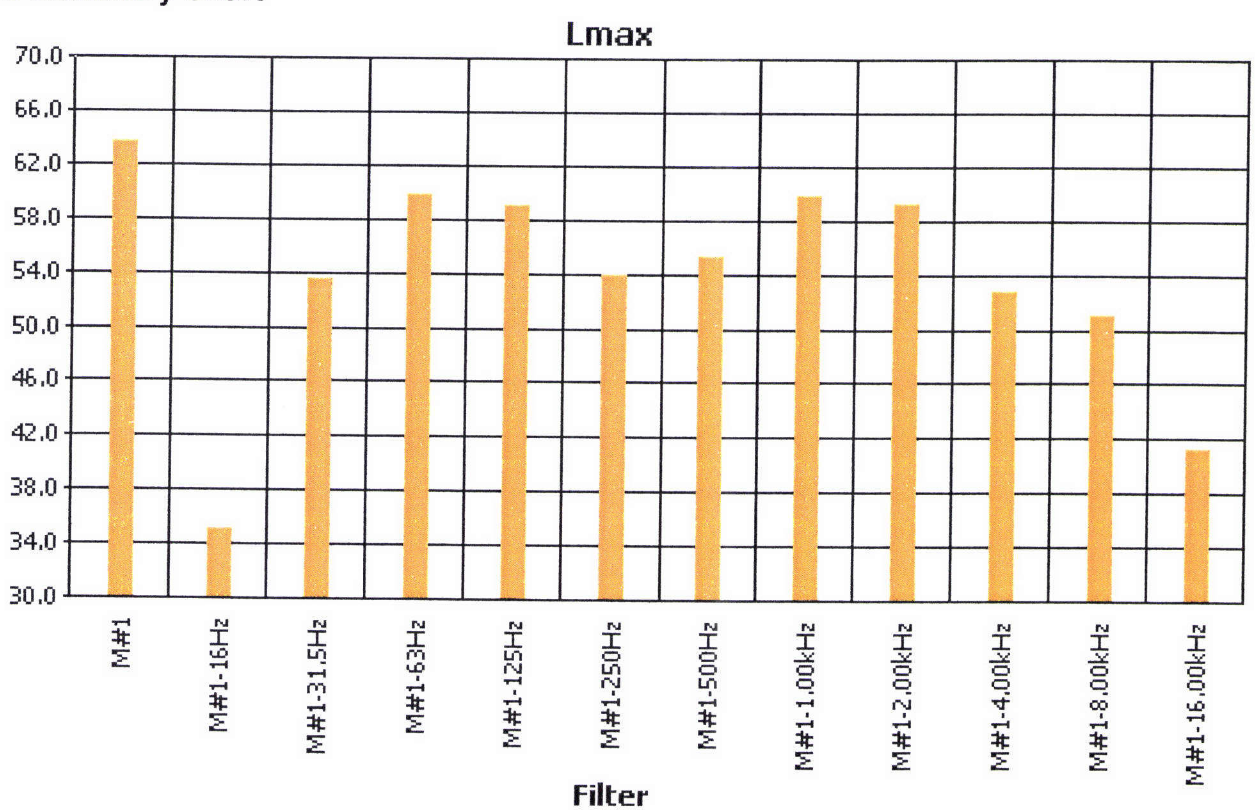
Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		55.8	53.0	51.5	50.5	49.7	49.1	48.6	48.2	47.8
10%	47.4	47.0	46.7	46.4	46.1	45.8	45.5	45.2	45.0	44.8
20%	44.6	44.4	44.2	44.0	43.8	43.5	43.3	43.1	42.9	42.7
30%	42.5	42.4	42.2	42.1	41.9	41.8	41.6	41.5	41.3	41.2
40%	41.0	40.8	40.7	40.5	40.3	40.2	40.1	40.0	39.8	39.7
50%	39.5	39.3	39.1	38.9	38.7	38.5	38.4	38.4	38.3	38.2
60%	38.1	38.0	37.9	37.7	37.6	37.4	37.2	37.0	36.8	36.6
70%	36.4	36.1	36.0	35.8	35.7	35.6	35.5	35.5	35.4	35.4
[illegible]	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4
[illegible]	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4
[illegible]	35.4									

Filter Summary Chart



Filter Summary Chart



Study 1
Information Panel

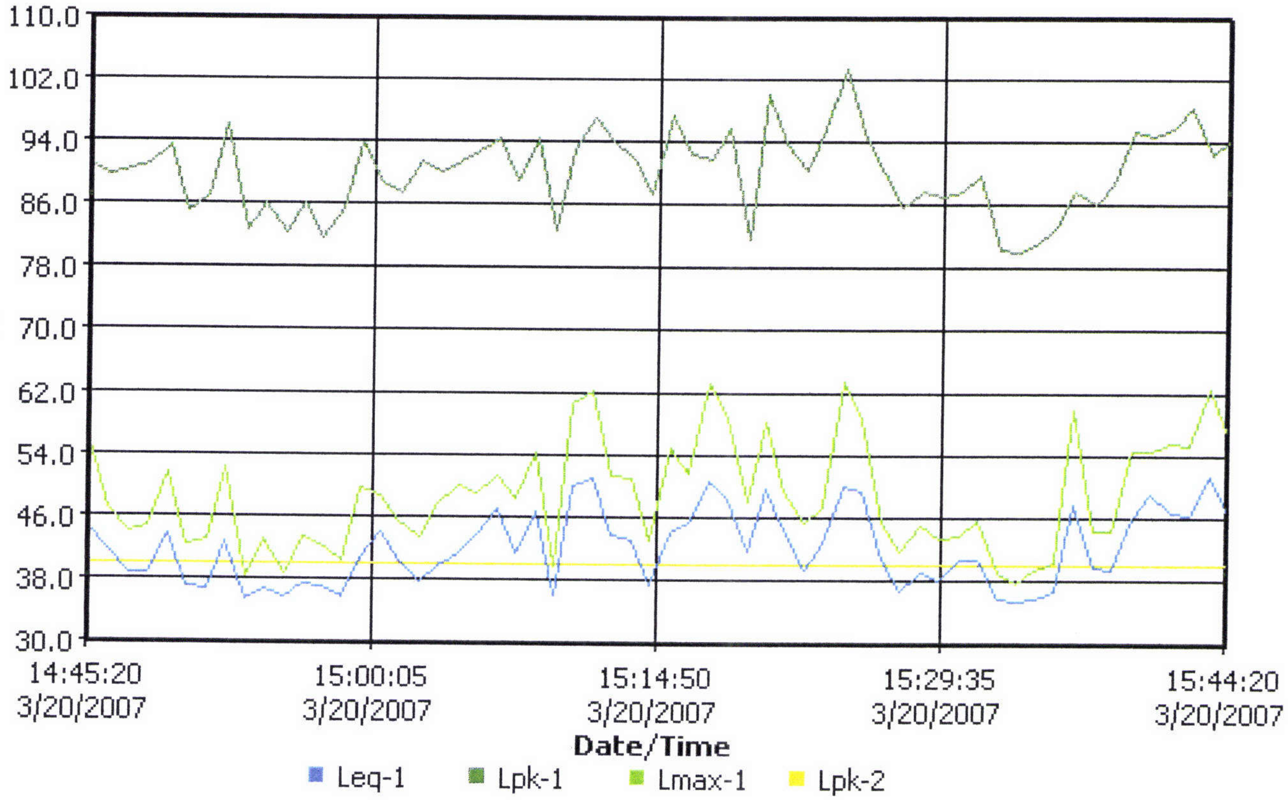
Name	Study 1
Location	
Comments	
Start Time	Tuesday, March 20, 2007 14:44:20
Stop Time	Tuesday, March 20, 2007 15:44:21
User Name	

General Data Panel

Description	Meter/Sensor	Value
Dose	1	0 %
Lmax	1	63.8 dB
Response	1	SLOW
Exchange Rate	1	3 dB
Log Rate	1	60 s
Integrating Threshold	2	80 dB
Response	2	SLOW

Description	Meter/Sensor	Value
Lpk	1	103.6 dB
Weighting	1	A
Bandwidth	1	1/1
Integrating Threshold	1	80 dB
Exchange Rate	2	3 dB
Weighting	2	C

Logged Data Chart



ZELASNY RECEPTOR S-2 AM

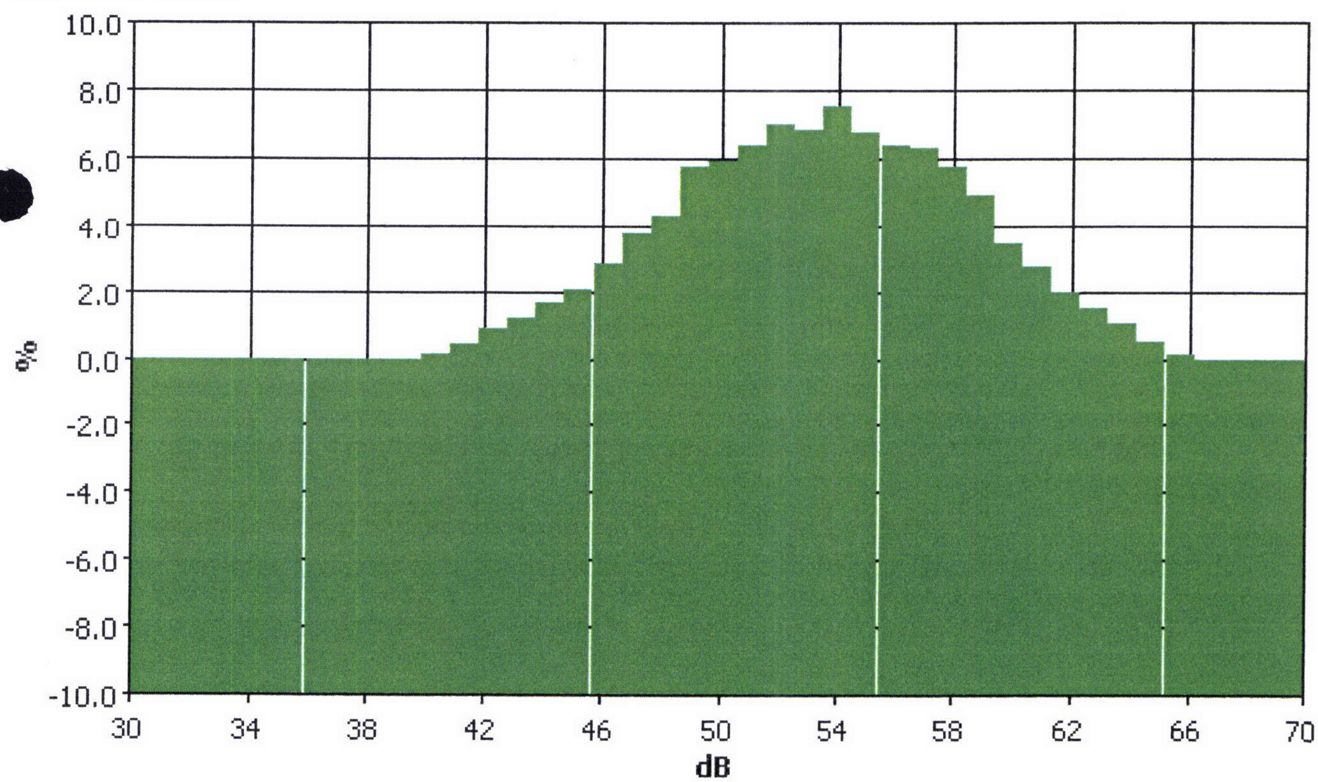
Information Panel

Name	ZELASNY LOCATION S-2, FILE S037
Start Time	Tuesday, March 20, 2007 08:57:55
Stop Time	Tuesday, March 20, 2007 09:57:56
Device Model Type	SoundPro DL
Comments	LOCATION S-2 AM READINGS
Device Certification Frequency	
Device Name	BIG010010
Device Serial Number	BIG010010
Location	SHELBY, NY. RECEPTOR S-2
User Name	JOE KING
Description	RECEPTOR S-2 AM READING
Company Name	CONTINENTAL PLACER INC.

General Data Panel

Description	Meter/Sensor	Value	Description	Meter/Sensor	Value
Lpk	1	109.9 dB	Leq	1	56.6 dB
Lmin	1	39.7 dB	Lmax	1	67.6 dB
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	SLOW	Bandwidth	1	1/1
Exchange Rate	2	3 dB	Weighting	2	C
Response	2	SLOW			

Statistics Chart



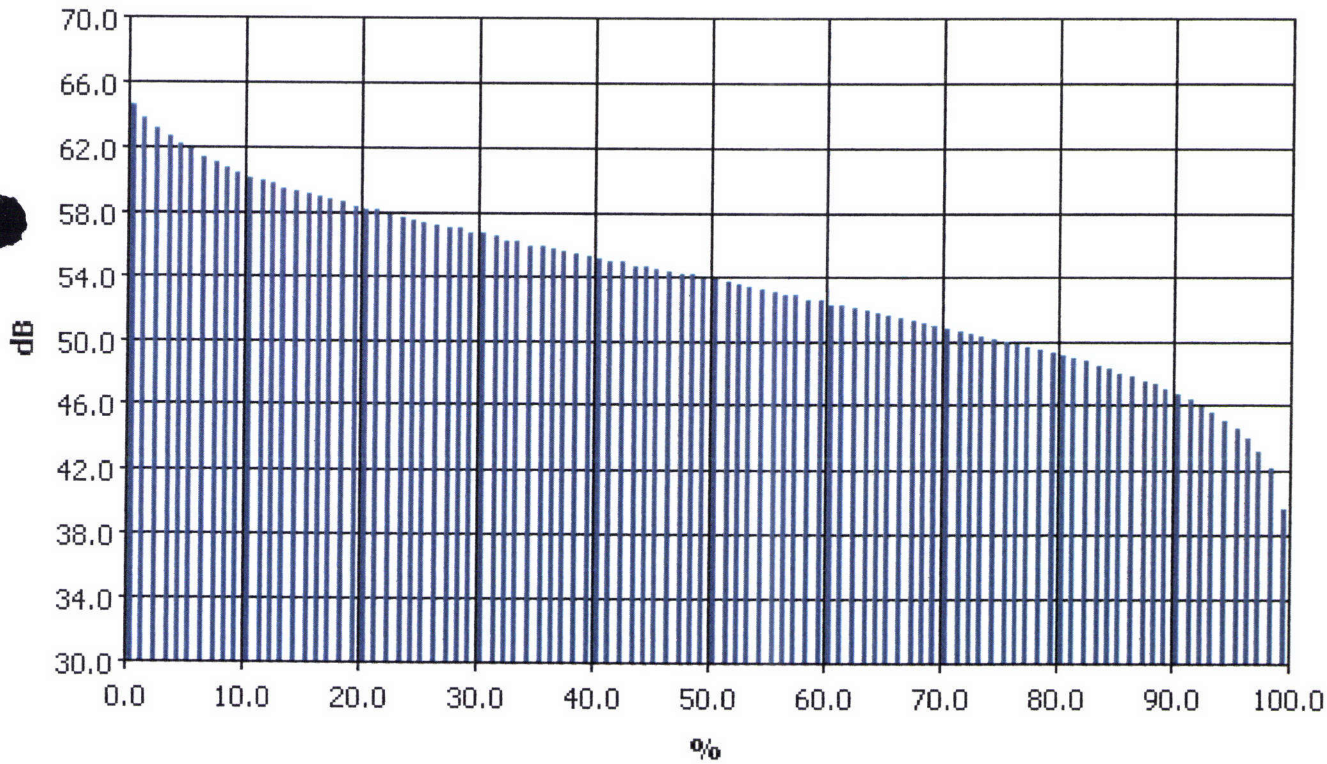
Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2

Statistics Table (cont'd)

[illegible]	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
[illegible]	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.5
[illegible]2.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0
43.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	1.2
44.0	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	1.7
45.0	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	2.1
46.0	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	2.9
47.0	0.3	0.3	0.3	0.4	0.3	0.4	0.4	0.4	0.5	0.5	3.8
48.0	0.5	0.5	0.4	0.3	0.4	0.5	0.5	0.5	0.4	0.5	4.4
49.0	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	5.9
50.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	6.0
51.0	0.7	0.8	0.6	0.3	0.7	0.6	0.7	0.7	0.7	0.7	6.5
52.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	7.1
53.0	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.8	6.9
54.0	0.8	0.9	0.9	0.3	0.9	0.8	0.8	0.8	0.7	0.7	7.6
55.0	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.7	0.7	0.7	6.8
56.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.7	6.4
57.0	0.7	0.8	0.8	0.2	0.7	0.7	0.7	0.6	0.6	0.7	6.4
58.0	0.7	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	5.8
59.0	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	5.0
60.0	0.5	0.4	0.4	0.1	0.4	0.4	0.3	0.3	0.3	0.3	3.5
61.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	2.8
62.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.1
63.0	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.1	1.6
64.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.1
65.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.6
66.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
67.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
68.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
69.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

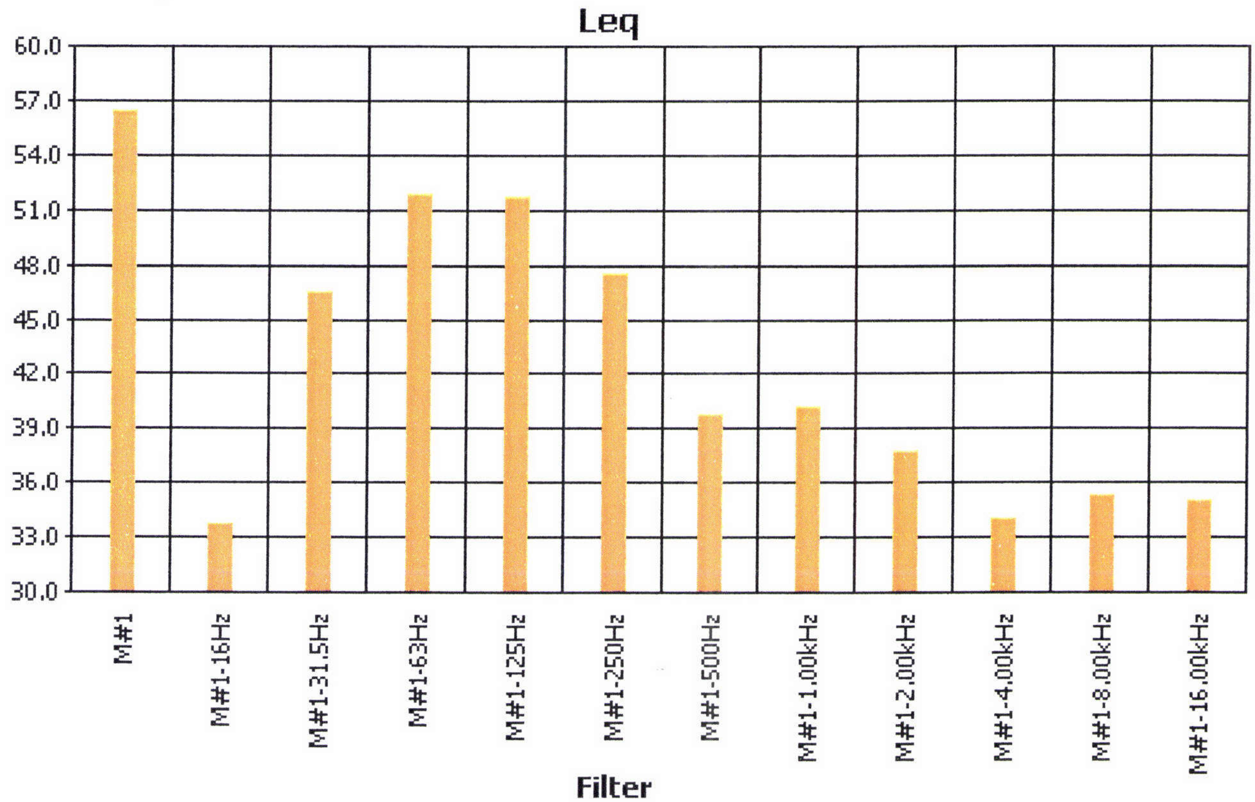
Exceedance Chart



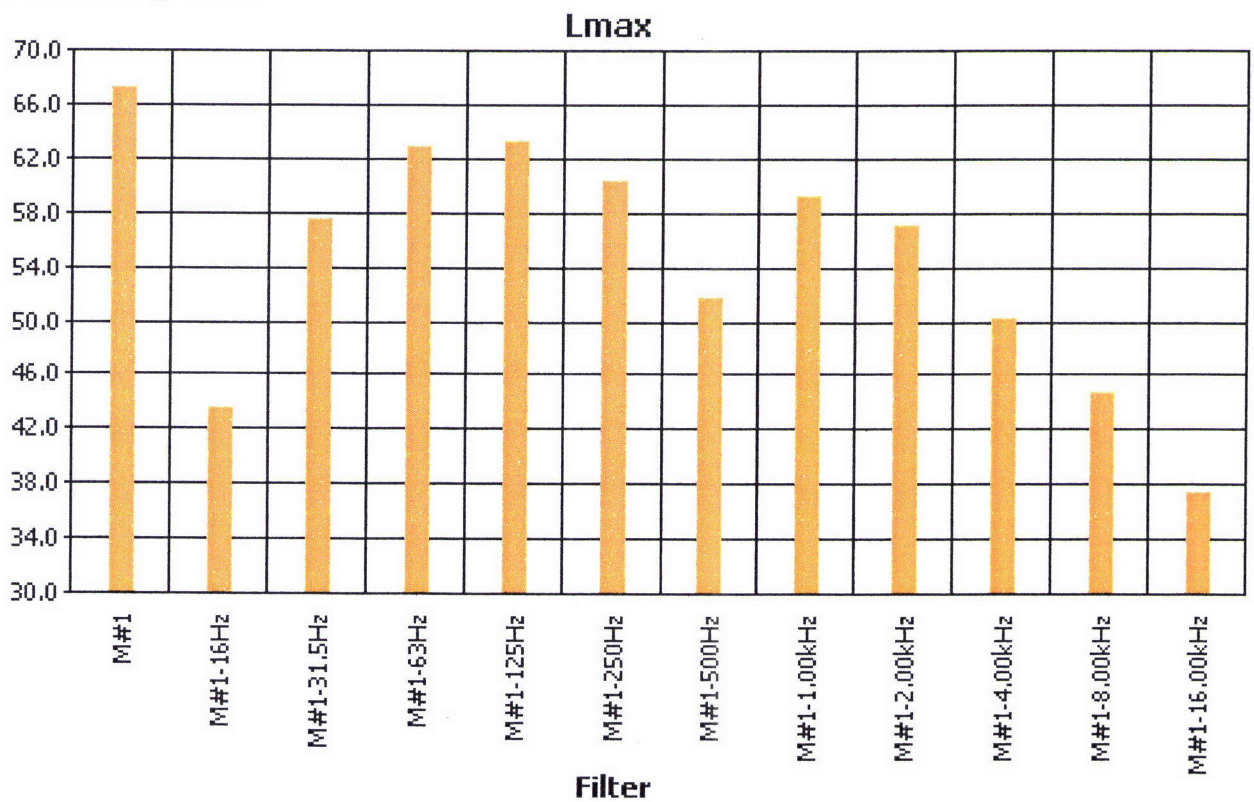
Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		64.7	63.9	63.3	62.8	62.3	61.9	61.5	61.2	60.9
10%	60.6	60.2	60.0	59.8	59.6	59.4	59.2	59.0	58.9	58.7
20%	58.5	58.3	58.2	58.0	57.8	57.7	57.5	57.3	57.2	57.1
30%	56.9	56.8	56.6	56.4	56.3	56.1	56.0	55.8	55.7	55.5
40%	55.4	55.2	55.1	55.0	54.8	54.7	54.6	54.4	54.3	54.2
50%	54.0	53.9	53.8	53.6	53.5	53.3	53.2	53.0	52.9	52.7
60%	52.6	52.4	52.3	52.2	52.0	51.9	51.7	51.6	51.4	51.2
70%	51.1	50.9	50.8	50.6	50.4	50.3	50.1	49.9	49.8	49.6
[illegible]%	49.5	49.3	49.1	48.9	48.6	48.4	48.2	48.0	47.7	47.5
[illegible]	47.2	46.8	46.5	46.1	45.7	45.2	44.7	44.1	43.3	42.4
[illegible]%	39.8									

Filter Summary Chart



Filter Summary Chart



Study 1

Information Panel

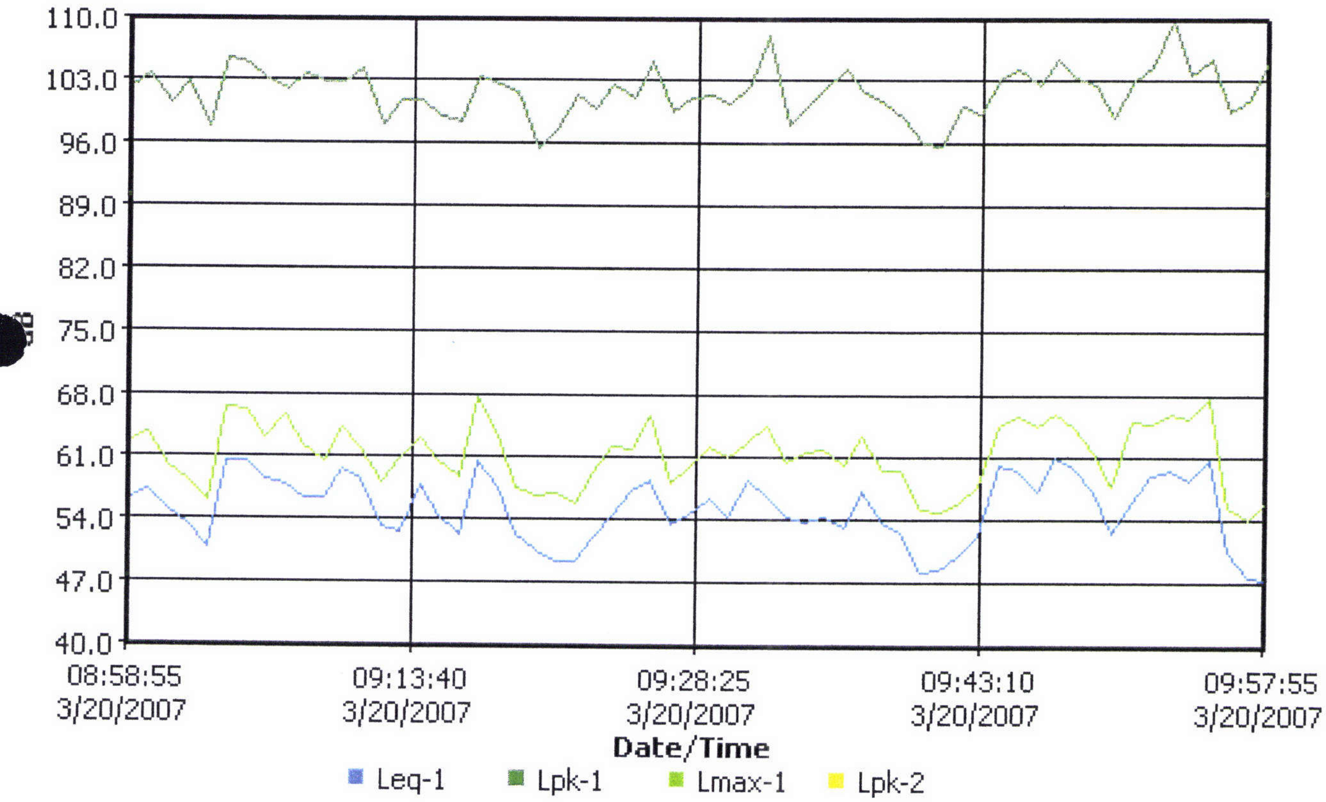
Name	Study 1
Location	
Comments	
Start Time	Tuesday, March 20, 2007 08:57:55
Stop Time	Tuesday, March 20, 2007 09:57:56
User Name	

General Data Panel

Description	Meter/Sensor	Value
Dose	1	0 %
Lmax	1	67.6 dB
Response	1	SLOW
Exchange Rate	1	3 dB
Log Rate	1	60 s
Integrating Threshold	2	80 dB
Response	2	SLOW

Description	Meter/Sensor	Value
Lpk	1	109.9 dB
Weighting	1	A
Bandwidth	1	1/1
Integrating Threshold	1	80 dB
Exchange Rate	2	3 dB
Weighting	2	C

Logged Data Chart



ZELASNY RECEPTOR S-2 PM

Information Panel

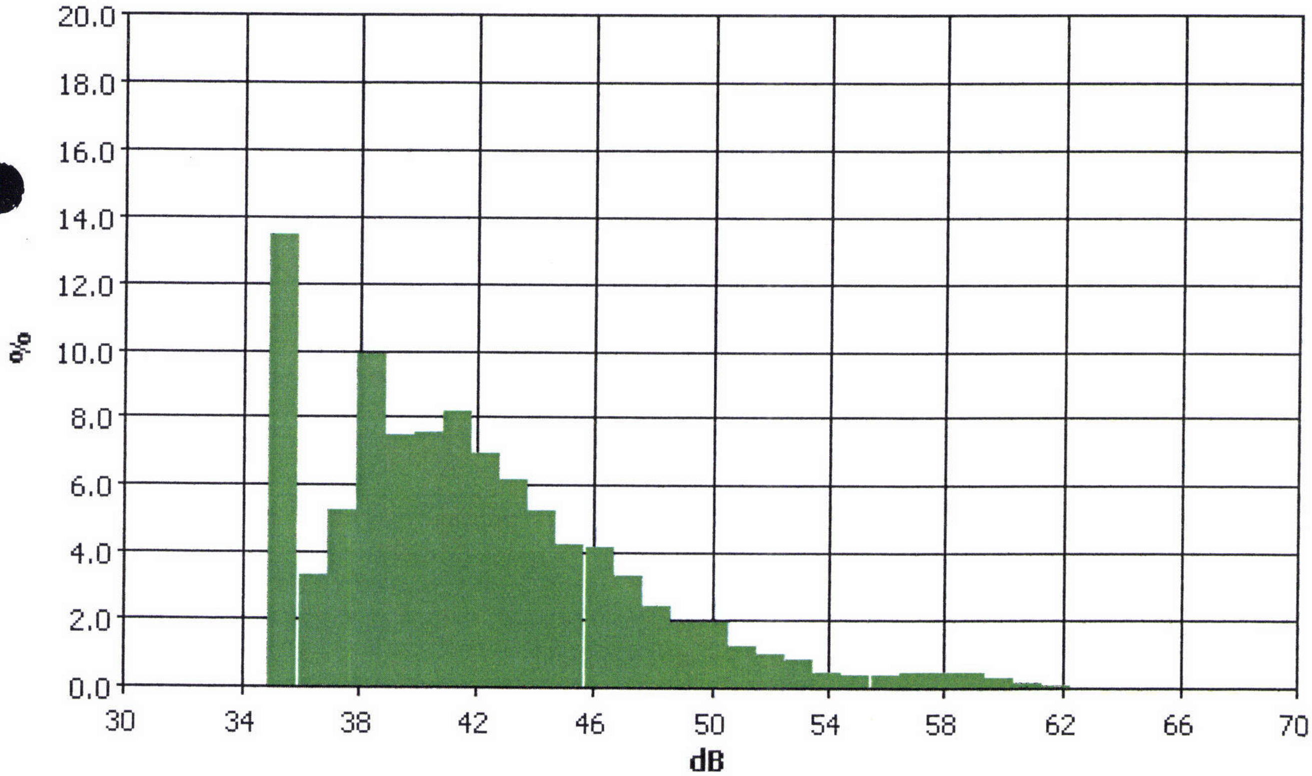
Name	ZELASNY LOCATION S-2 FILE S043
Start Time	Tuesday, March 20, 2007 15:47:35
Stop Time	Tuesday, March 20, 2007 16:48:10
Device Model Type	SoundPro DL
Comments	LOCATION S-2 PM READING
Device Certification Frequency	
Device Name	BIG010010
Device Serial Number	BIG010010
Location	SHELBY, NY RECEPTOR S-2
User Name	JOE KING
Description	RECEPTOR S-2 PM READING
Company Name	CONTINENTAL PLACER INC.

General Data Panel

Description	Meter/Sensor	Value
Lpk	1	99.8 dB
Lmin	1	35.3 dB
Exchange Rate	1	3 dB
Response	1	SLOW
Exchange Rate	2	3 dB
Response	2	SLOW

Description	Meter/Sensor	Value
Leq	1	47.7 dB
Lmax	1	68.8 dB
Weighting	1	A
Bandwidth	1	1/1
Weighting	2	C

Statistics Chart



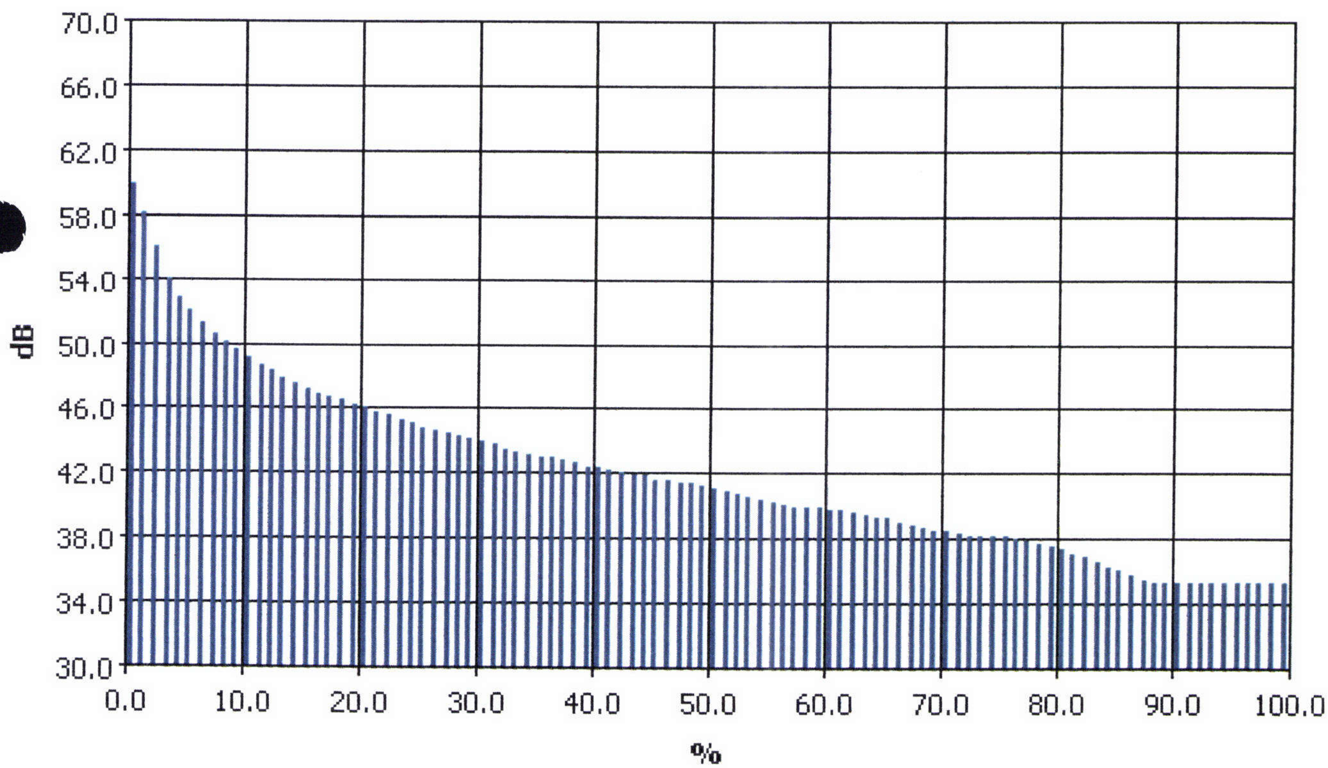
Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35.0	0.0	0.0	0.0	9.4	1.6	0.7	0.6	0.4	0.4	0.4	13.5
[illegible]	0.4	0.4	0.1	0.3	0.3	0.3	0.3	0.3	0.4	0.4	3.4
[illegible]	0.4	0.4	0.5	0.4	0.5	0.5	0.6	0.6	0.6	0.8	5.3
[illegible]	0.8	0.8	1.1	2.7	1.3	0.8	0.7	0.6	0.6	0.6	10.0
39.0	0.6	0.7	0.3	0.6	0.7	0.8	0.9	0.9	0.9	1.0	7.6
40.0	1.2	1.4	0.8	0.7	0.6	0.6	0.6	0.6	0.5	0.7	7.7

Statistics Table (cont'd)

[illegible]	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
[illegible]	0.8	0.8	0.9	1.1	0.9	0.7	0.7	0.8	0.8	0.8	8.2
[illegible]	0.8	0.9	0.5	0.8	0.7	0.7	0.6	0.6	0.7	0.8	7.0
43.0	0.8	0.8	0.6	0.6	0.5	0.5	0.6	0.6	0.6	0.5	6.2
44.0	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.5	5.3
45.0	0.6	0.6	0.4	0.3	0.4	0.4	0.4	0.5	0.4	0.4	4.3
46.0	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4	4.2
47.0	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	3.4
48.0	0.3	0.3	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.2	2.4
49.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.0
50.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.0
51.0	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.3
52.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.1
53.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.9
54.0	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.5
55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
56.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
57.0	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.5
58.0	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.5
59.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.5
60.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
66.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
67.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
68.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
69.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

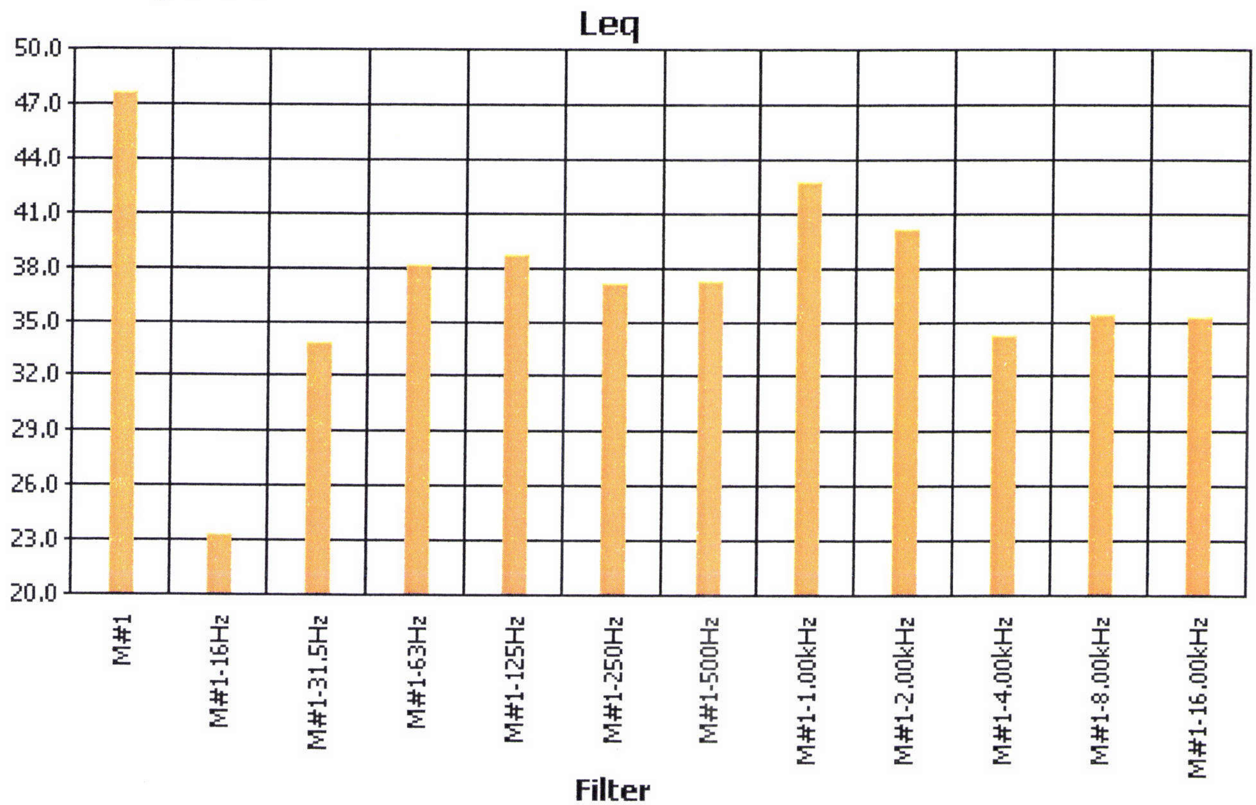
Exceedance Chart



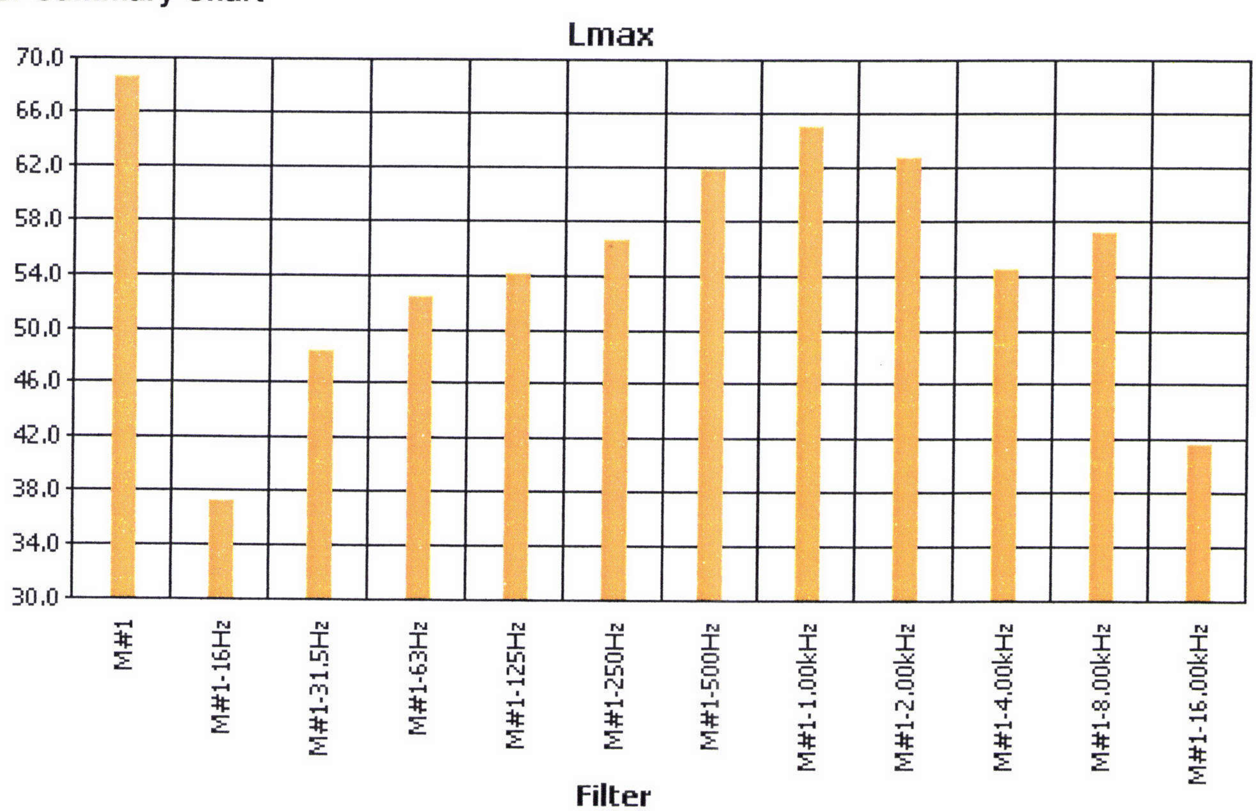
Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		60.1	58.2	56.2	54.1	53.0	52.1	51.3	50.7	50.2
10%	49.7	49.2	48.8	48.4	48.0	47.7	47.4	47.1	46.9	46.7
20%	46.4	46.2	45.9	45.7	45.4	45.2	45.0	44.8	44.6	44.4
30%	44.3	44.1	43.9	43.7	43.5	43.4	43.2	43.1	43.0	42.8
40%	42.6	42.5	42.4	42.2	42.1	42.0	41.8	41.7	41.6	41.5
50%	41.4	41.3	41.1	41.0	40.8	40.6	40.5	40.3	40.2	40.2
60%	40.1	40.0	39.9	39.8	39.6	39.5	39.4	39.2	39.0	38.9
70%	38.7	38.6	38.5	38.4	38.4	38.4	38.3	38.2	38.0	37.9
[illegible]	37.7	37.5	37.3	37.1	36.8	36.5	36.2	35.9	35.7	35.5
[illegible]	35.5	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4
[illegible]%	35.4									

Filter Summary Chart



Filter Summary Chart



Study 1

Information Panel

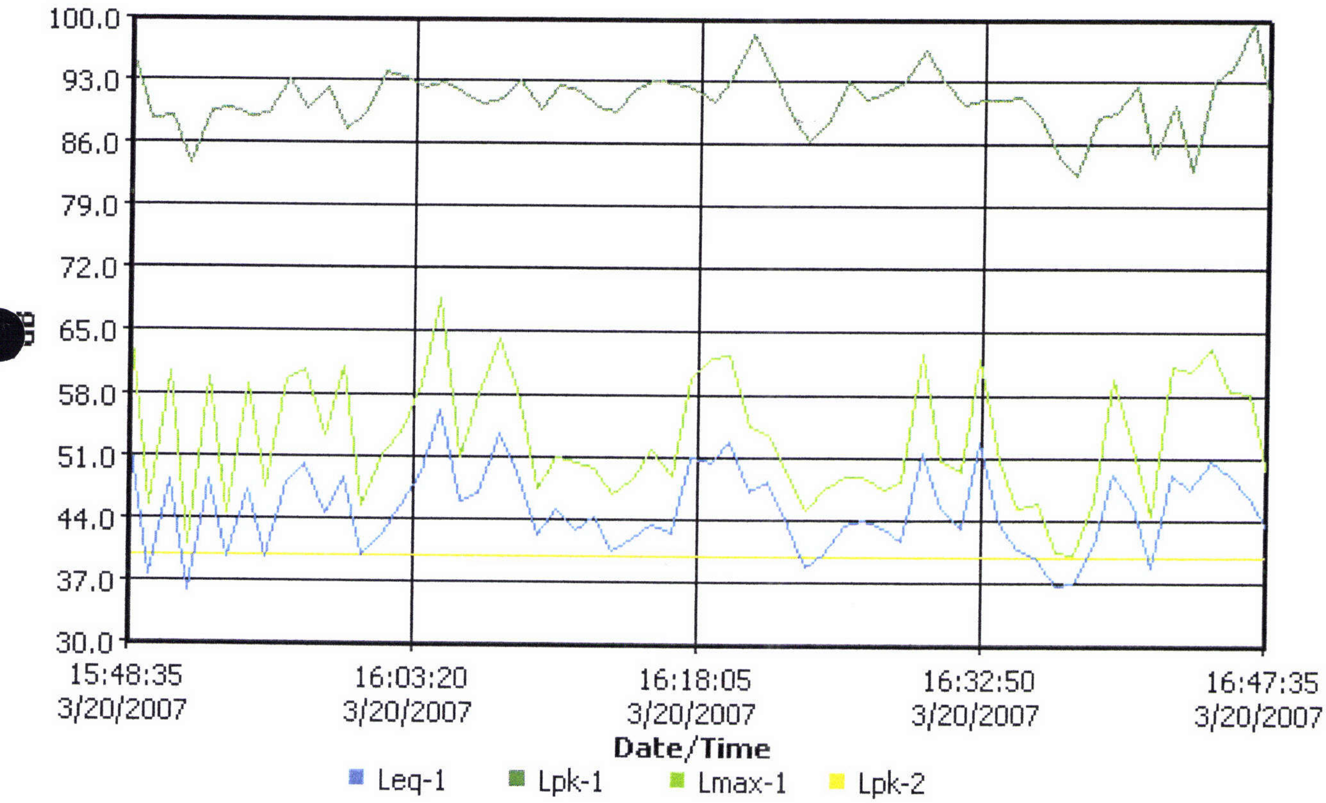
Name	Study 1
Location	
Comments	
Start Time	Tuesday, March 20, 2007 15:47:35
Stop Time	Tuesday, March 20, 2007 16:48:10
User Name	

General Data Panel

Description	Meter/Sensor	Value
Dose	1	0 %
Lmax	1	68.8 dB
Response	1	SLOW
Exchange Rate	1	3 dB
Log Rate	1	60 s
Integrating Threshold	2	80 dB
Response	2	SLOW

Description	Meter/Sensor	Value
Lpk	1	99.8 dB
Weighting	1	A
Bandwidth	1	1/1
Integrating Threshold	1	80 dB
Exchange Rate	2	3 dB
Weighting	2	C

Logged Data Chart



ZELASNY RECEPTOR S-3 AM

Information Panel

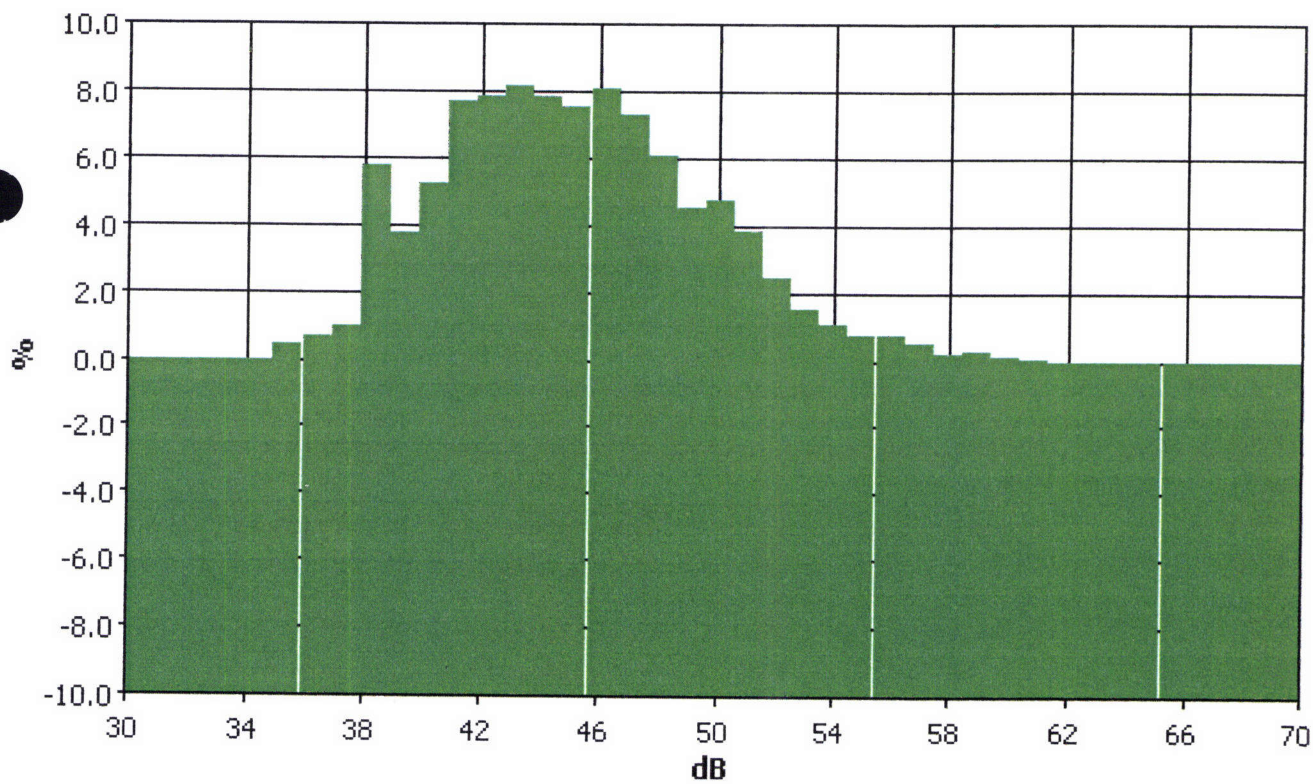
Name	ZELASNY LOCATION S-3 FILE S039
Start Time	Tuesday, March 20, 2007 10:04:36
Stop Time	Tuesday, March 20, 2007 11:04:37
Device Model Type	SoundPro DL
Comments	LOCATION S-3 AM READING
Device Certification Frequency	
Device Name	BIG010010
Device Serial Number	BIG010010
Location	SHELBY, NY RECEPTOR S-3
User Name	JOE KING
Description	RECEPTOR S-3 AM READING
Company Name	CONTINENTAL PLACER INC.

General Data Panel

Description	Meter/Sensor	Value
Lpk	1	99.6 dB
Lmin	1	35.3 dB
Exchange Rate	1	3 dB
Response	1	SLOW
Exchange Rate	2	3 dB
Response	2	SLOW

Description	Meter/Sensor	Value
Leq	1	48.2 dB
Lmax	1	62.8 dB
Weighting	1	A
Bandwidth	1	1/1
Weighting	2	C

Statistics Chart



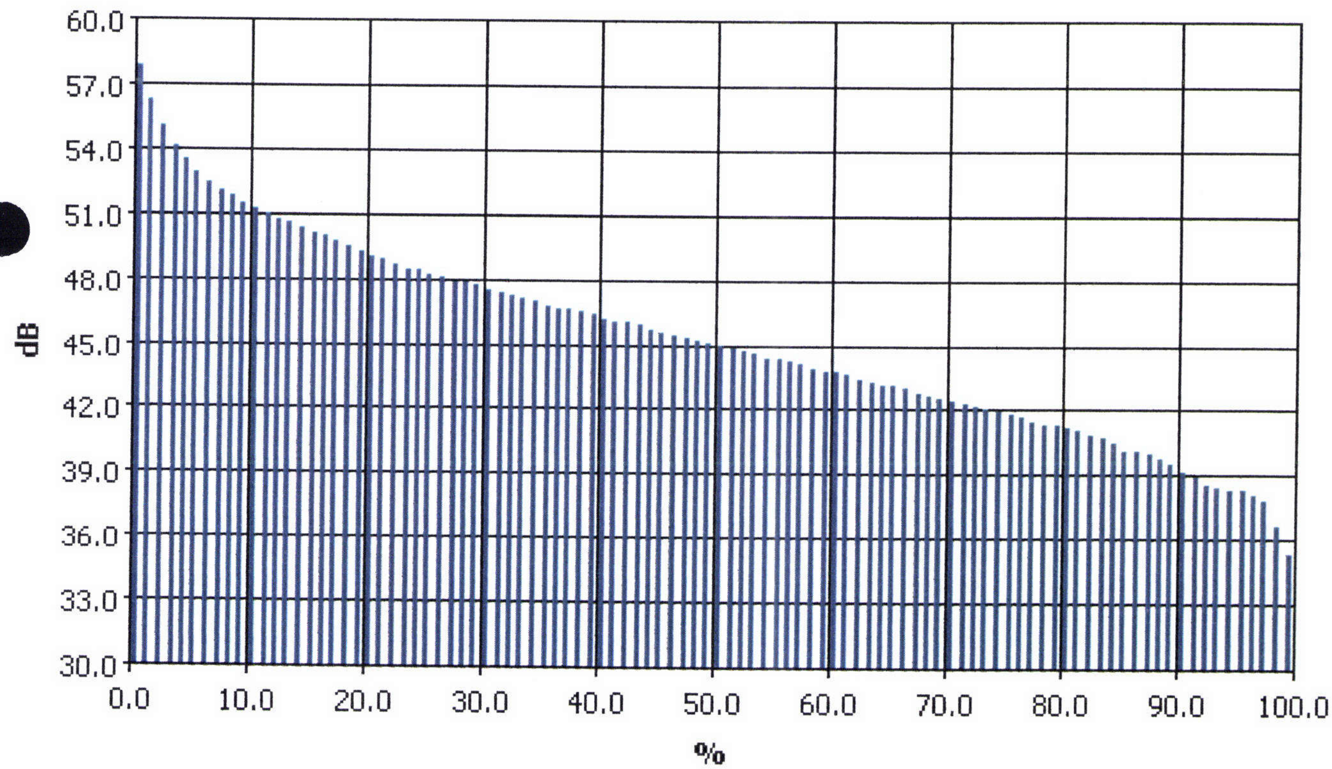
Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35.0	0.0	0.0	0.0	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.5
36.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7
[illegible]	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	1.0
[illegible]	0.3	0.4	0.6	2.1	0.7	0.4	0.3	0.3	0.3	0.3	5.9
39.0	0.4	0.4	0.2	0.3	0.3	0.4	0.4	0.5	0.4	0.6	3.8
40.0	0.7	0.9	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.5	5.3

Statistics Table (cont'd)

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
[illegible]	0.7	0.7	0.8	1.1	0.9	0.7	0.7	0.7	0.7	0.8	7.8
[illegible]	0.8	1.0	0.6	0.9	0.8	0.8	0.7	0.7	0.8	0.8	7.9
43.0	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.7	8.2
44.0	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	7.9
45.0	0.8	0.9	0.6	0.7	0.8	0.8	0.8	0.8	0.8	0.7	7.6
46.0	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.8	8.1
47.0	0.7	0.7	0.7	0.7	0.8	0.7	0.8	0.7	0.8	0.8	7.4
48.0	0.7	0.8	0.6	0.4	0.7	0.7	0.6	0.6	0.5	0.5	6.2
49.0	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.5	0.5	4.6
50.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	4.8
51.0	0.5	0.5	0.4	0.2	0.5	0.4	0.4	0.4	0.4	0.3	3.9
52.0	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	2.5
53.0	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.1	1.6
54.0	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	1.1
55.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8
56.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.8
57.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.5
58.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
59.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
66.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
67.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
68.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
69.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

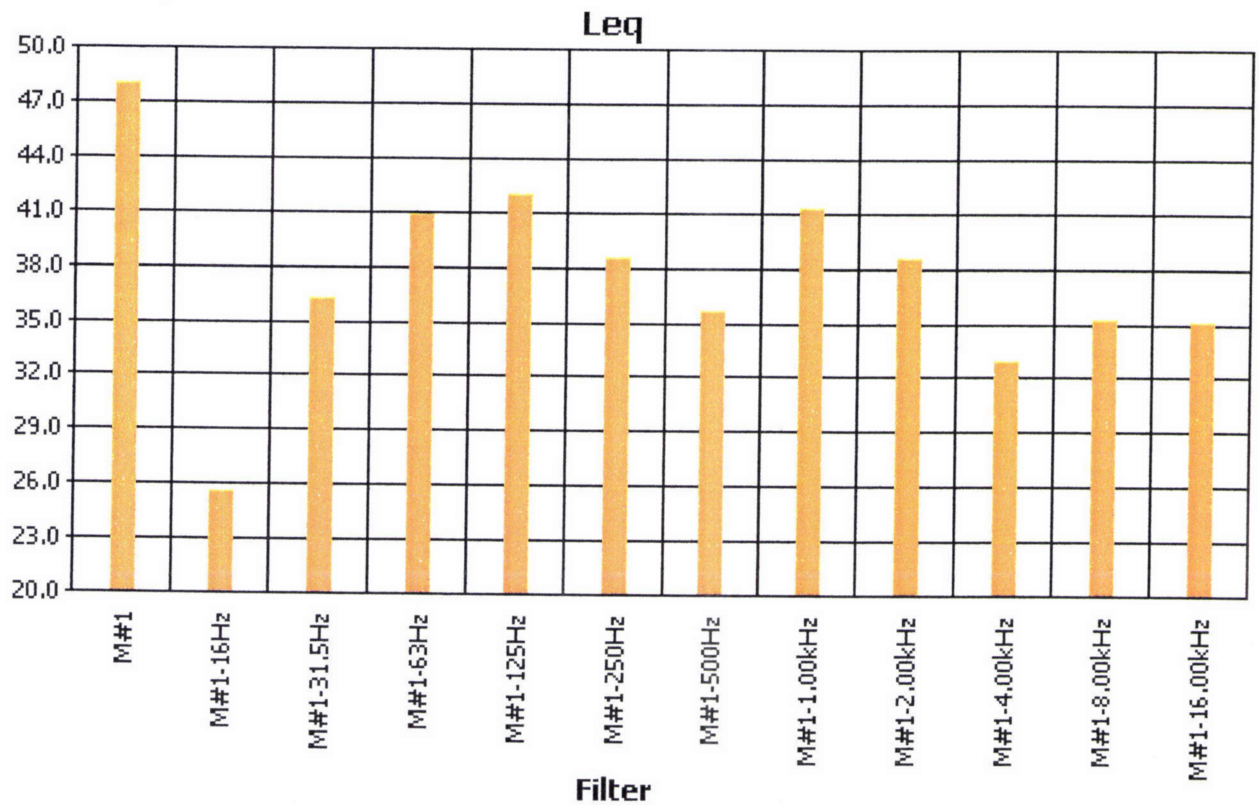
Exceedance Chart



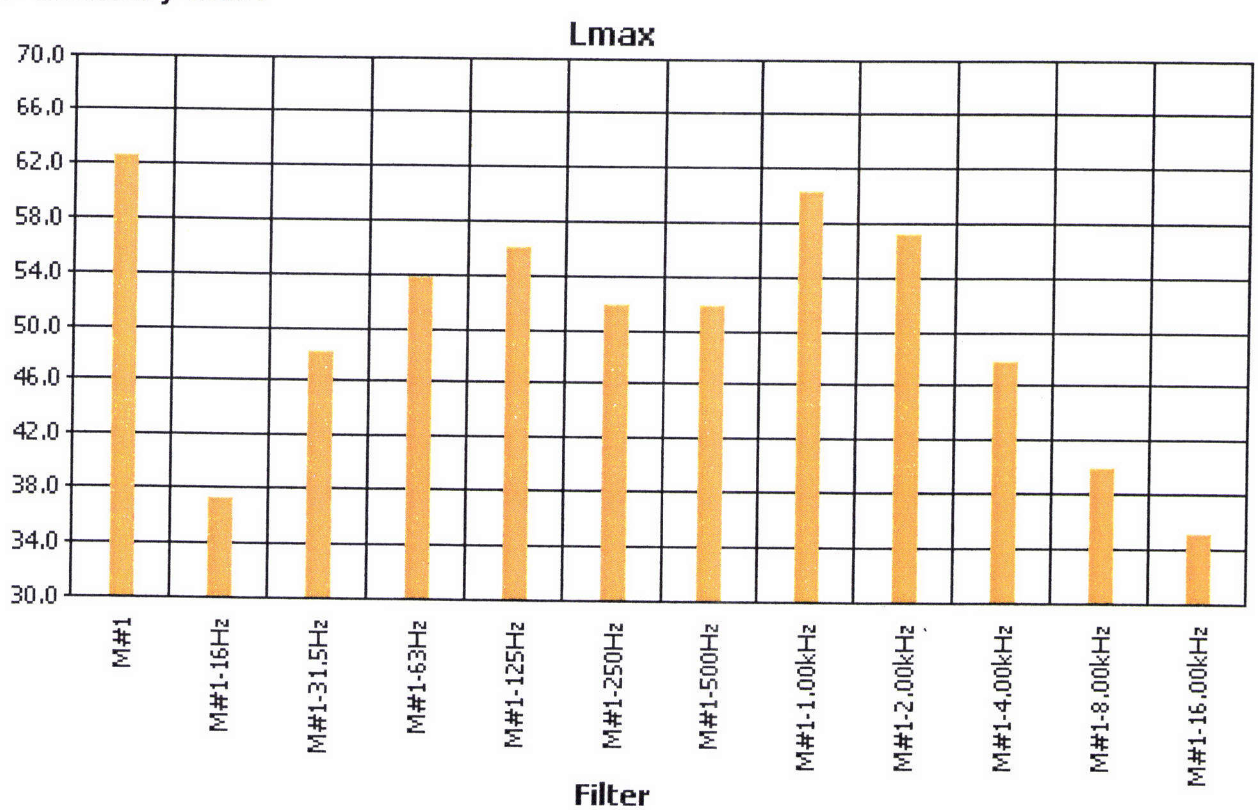
Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		58.0	56.4	55.2	54.2	53.6	53.0	52.5	52.2	51.9
10%	51.6	51.3	51.1	50.9	50.7	50.5	50.3	50.1	49.9	49.6
20%	49.4	49.2	49.0	48.8	48.6	48.5	48.3	48.2	48.0	47.9
30%	47.8	47.6	47.5	47.4	47.2	47.1	46.9	46.8	46.7	46.6
40%	46.5	46.3	46.2	46.1	46.0	45.8	45.7	45.6	45.4	45.3
50%	45.2	45.0	44.9	44.8	44.7	44.5	44.4	44.3	44.2	44.0
60%	43.9	43.8	43.7	43.5	43.4	43.3	43.2	43.1	42.9	42.8
70%	42.7	42.5	42.4	42.3	42.2	42.0	41.9	41.8	41.6	41.5
[illegible]	41.4	41.3	41.2	41.0	40.8	40.6	40.3	40.2	40.1	39.9
[illegible]	39.6	39.3	39.0	38.7	38.5	38.4	38.4	38.2	37.9	36.8
[illegible]	35.4									

Filter Summary Chart



Filter Summary Chart



Study 1
Information Panel

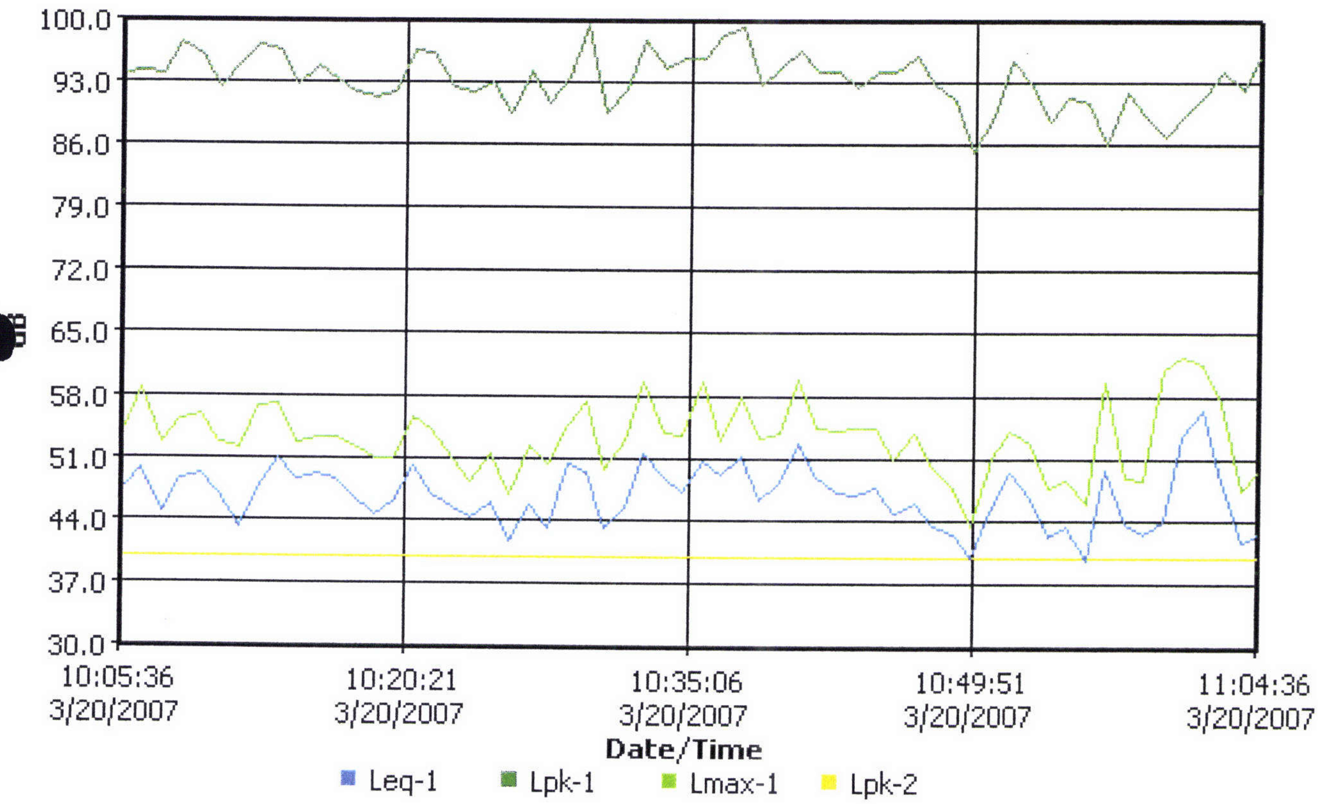
Name	Study 1
Location	
Comments	
Start Time	Tuesday, March 20, 2007 10:04:36
Stop Time	Tuesday, March 20, 2007 11:04:37
User Name	

General Data Panel

Description	Meter/Sensor	Value
Dose	1	0 %
Lmax	1	62.8 dB
Response	1	SLOW
Exchange Rate	1	3 dB
Log Rate	1	60 s
Integrating Threshold	2	80 dB
Response	2	SLOW

Description	Meter/Sensor	Value
Lpk	1	99.6 dB
Weighting	1	A
Bandwidth	1	1/1
Integrating Threshold	1	80 dB
Exchange Rate	2	3 dB
Weighting	2	C

Logged Data Chart



ZELASNY RECEPTOR S-3 PM

Information Panel

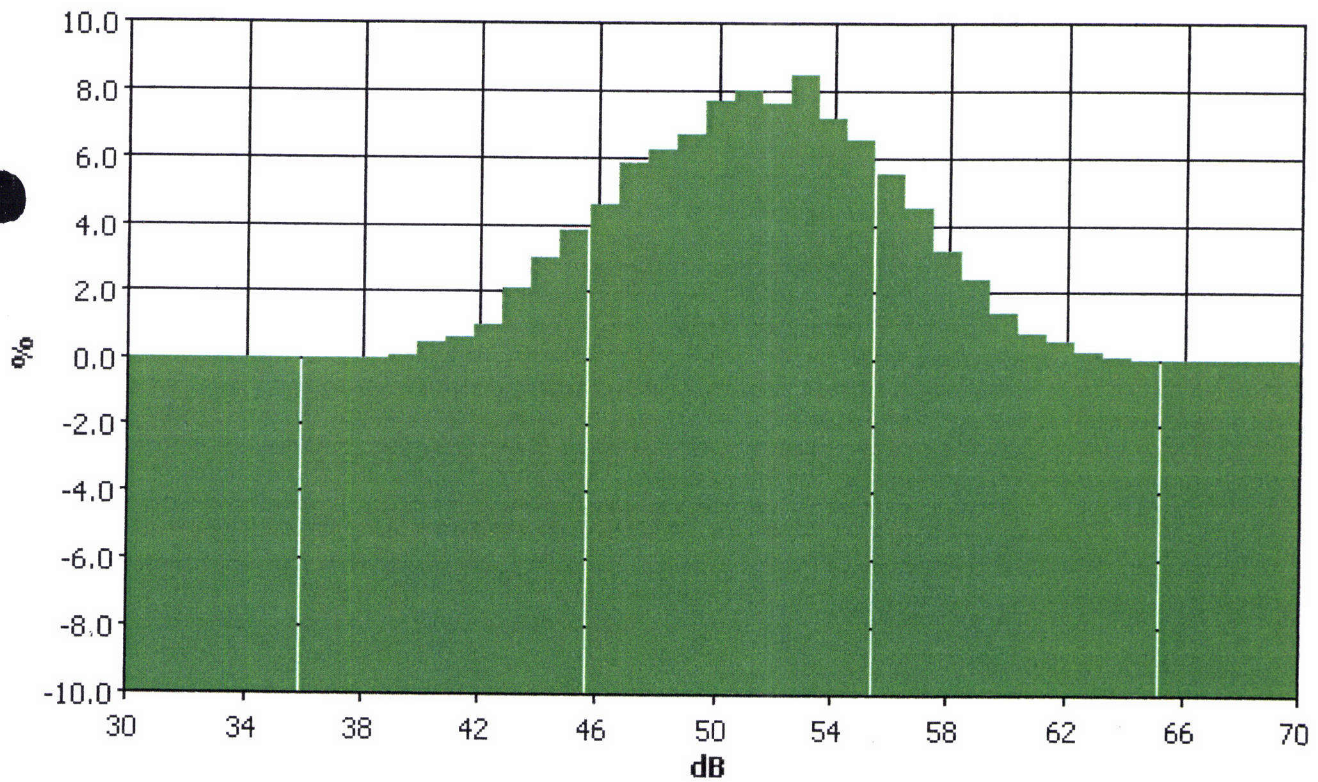
Name	ZELASNY LOCATION S-3 FILE S032
Start Time	Monday, March 19, 2007 15:54:41
Stop Time	Monday, March 19, 2007 16:54:45
Device Model Type	SoundPro DL
Comments	LOCATION S-3 PM READING
Device Certification Frequency	
Device Name	BIG010010
Device Serial Number	BIG010010
Location	SHELBY, NY RECEPTOR S-3
User Name	JOE KING
Description	RECEPTOR S-3 PM READING
Company Name	CONTINENTAL PLACER INC.

General Data Panel

Description	Meter/Sensor	Value
Lpk	1	104.4 dB
Lmin	1	38.5 dB
Exchange Rate	1	3 dB
Response	1	SLOW
Exchange Rate	2	3 dB
Response	2	SLOW

Description	Meter/Sensor	Value
Leq	1	54 dB
Lmax	1	64.6 dB
Weighting	1	A
Bandwidth	1	1/1
Weighting	2	C

Statistics Chart



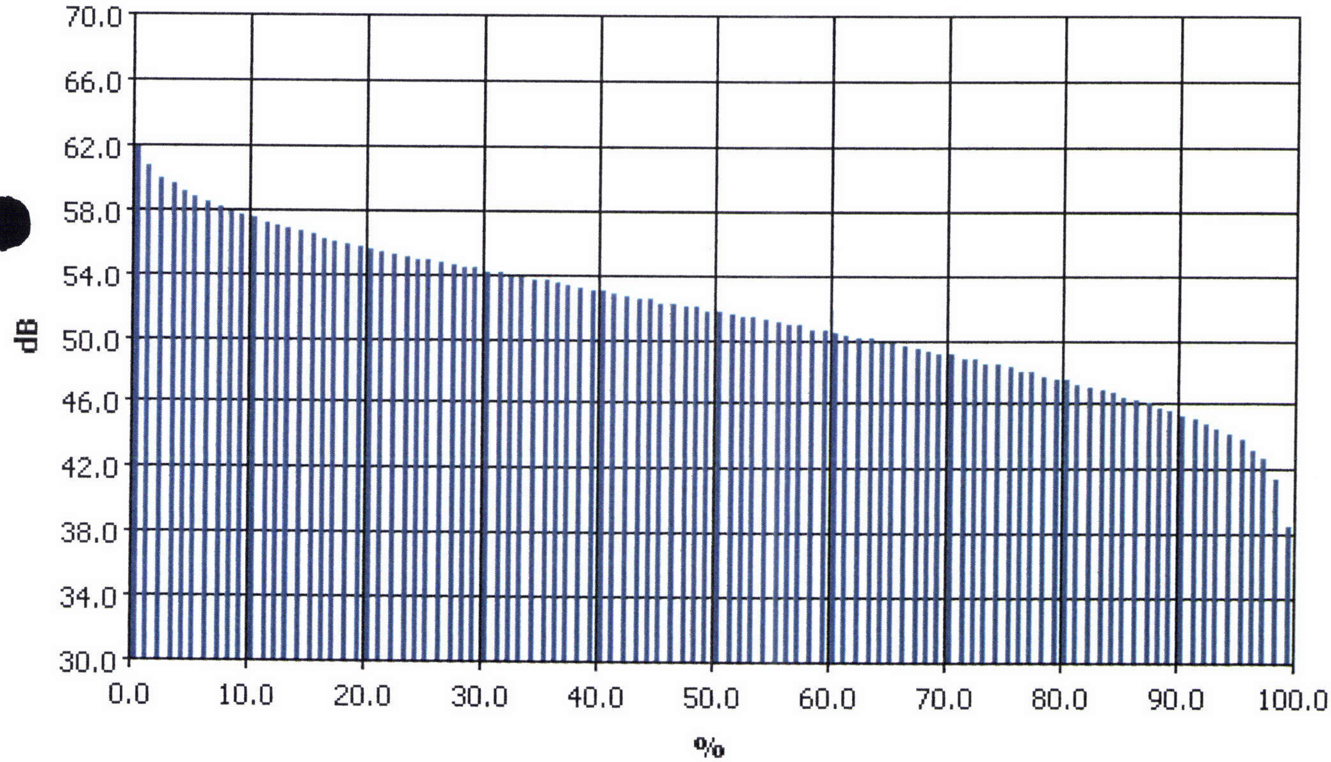
Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
36.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
40.0	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.5

Statistics Table (cont'd)

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
41.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.7
42.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	1.0
43.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	2.1
44.0	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	3.1
45.0	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.5	0.4	0.4	3.9
46.0	0.4	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	4.7
47.0	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.7	5.9
48.0	0.7	0.7	0.6	0.4	0.6	0.7	0.7	0.7	0.7	0.6	6.3
49.0	0.6	0.7	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.7	6.7
50.0	0.7	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.8	0.9	7.8
51.0	0.9	1.0	0.8	0.4	0.8	0.8	0.8	0.9	0.8	0.8	8.1
52.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	7.7
53.0	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.8	0.8	8.5
54.0	0.8	0.8	0.8	0.2	0.7	0.8	0.8	0.8	0.8	0.8	7.2
55.0	0.7	0.7	0.7	0.6	0.7	0.7	0.6	0.7	0.6	0.6	6.6
56.0	0.6	0.5	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.6	5.6
57.0	0.5	0.6	0.5	0.1	0.5	0.5	0.5	0.5	0.5	0.4	4.6
58.0	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	3.3
59.0	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.2	2.4
60.0	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	1.4
61.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8
62.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.6
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
66.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
67.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
68.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
69.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

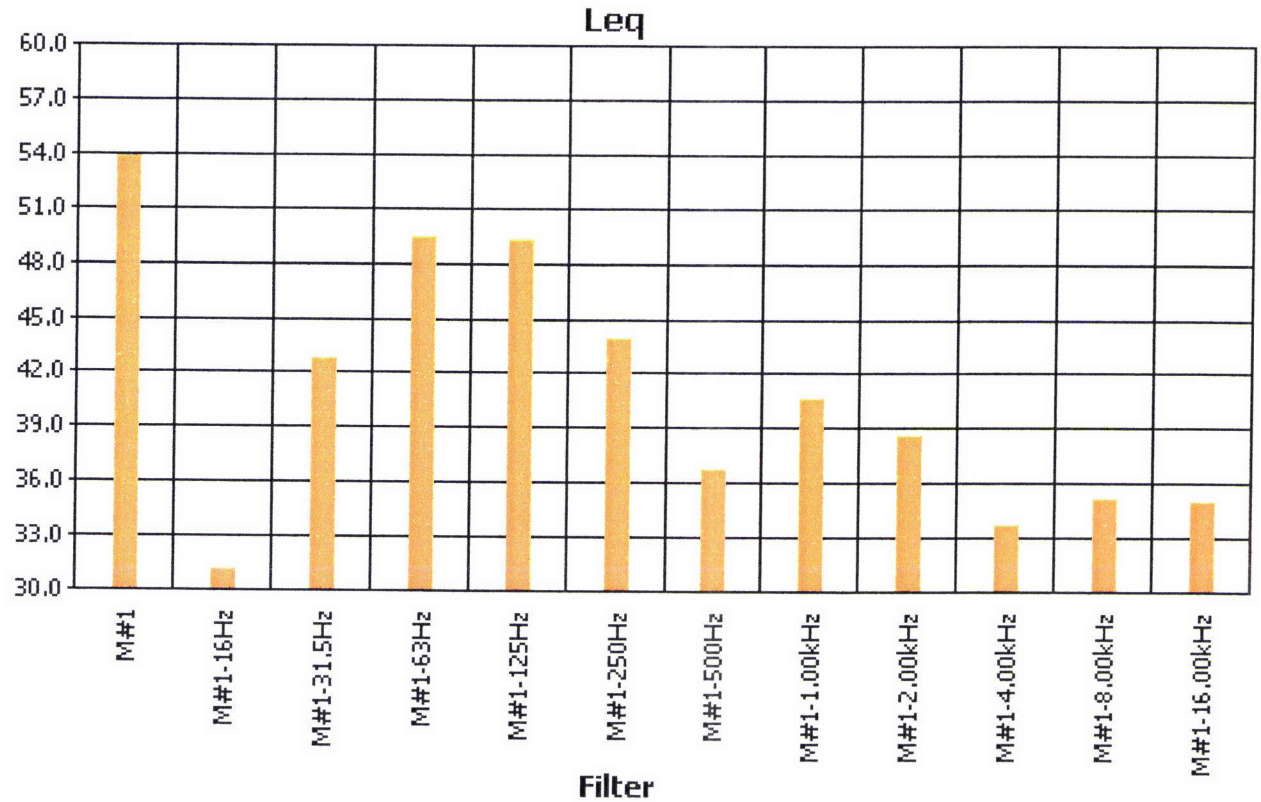
Exceedance Chart



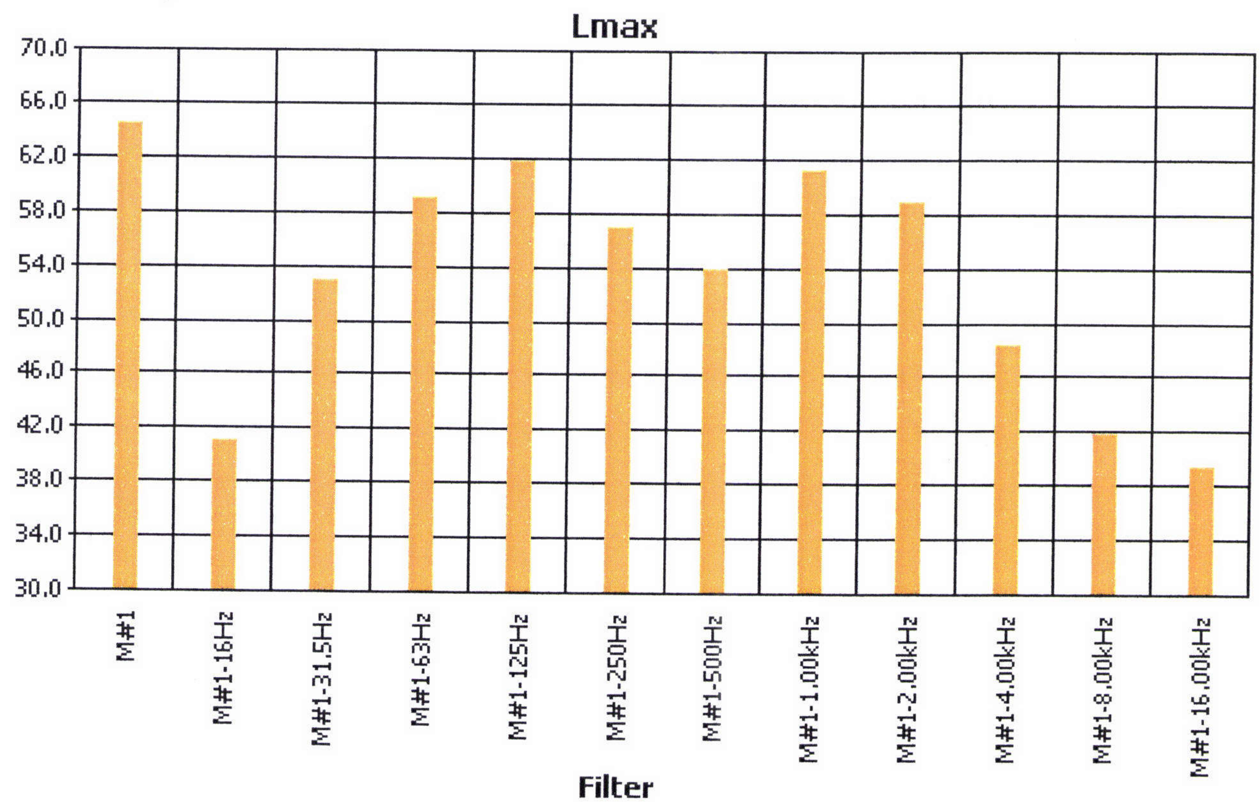
Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		61.9	60.8	60.1	59.7	59.3	58.9	58.6	58.3	58.0
10%	57.8	57.6	57.3	57.1	57.0	56.8	56.6	56.4	56.2	56.1
20%	55.9	55.7	55.6	55.4	55.3	55.1	55.0	54.9	54.7	54.6
30%	54.5	54.3	54.2	54.0	53.9	53.8	53.7	53.6	53.5	53.3
40%	53.2	53.1	53.0	52.8	52.7	52.6	52.4	52.3	52.2	52.1
50%	51.9	51.8	51.7	51.6	51.5	51.3	51.2	51.1	51.0	50.8
60%	50.7	50.6	50.4	50.3	50.2	50.0	49.9	49.8	49.6	49.5
70%	49.3	49.2	49.0	48.9	48.7	48.6	48.4	48.2	48.1	47.9
80%	47.7	47.6	47.4	47.2	47.0	46.8	46.6	46.4	46.2	45.9
90%	45.7	45.5	45.2	44.9	44.6	44.3	43.9	43.4	42.8	41.5
100%	38.6									

Filter Summary Chart



Filter Summary Chart



Study 1
Information Panel

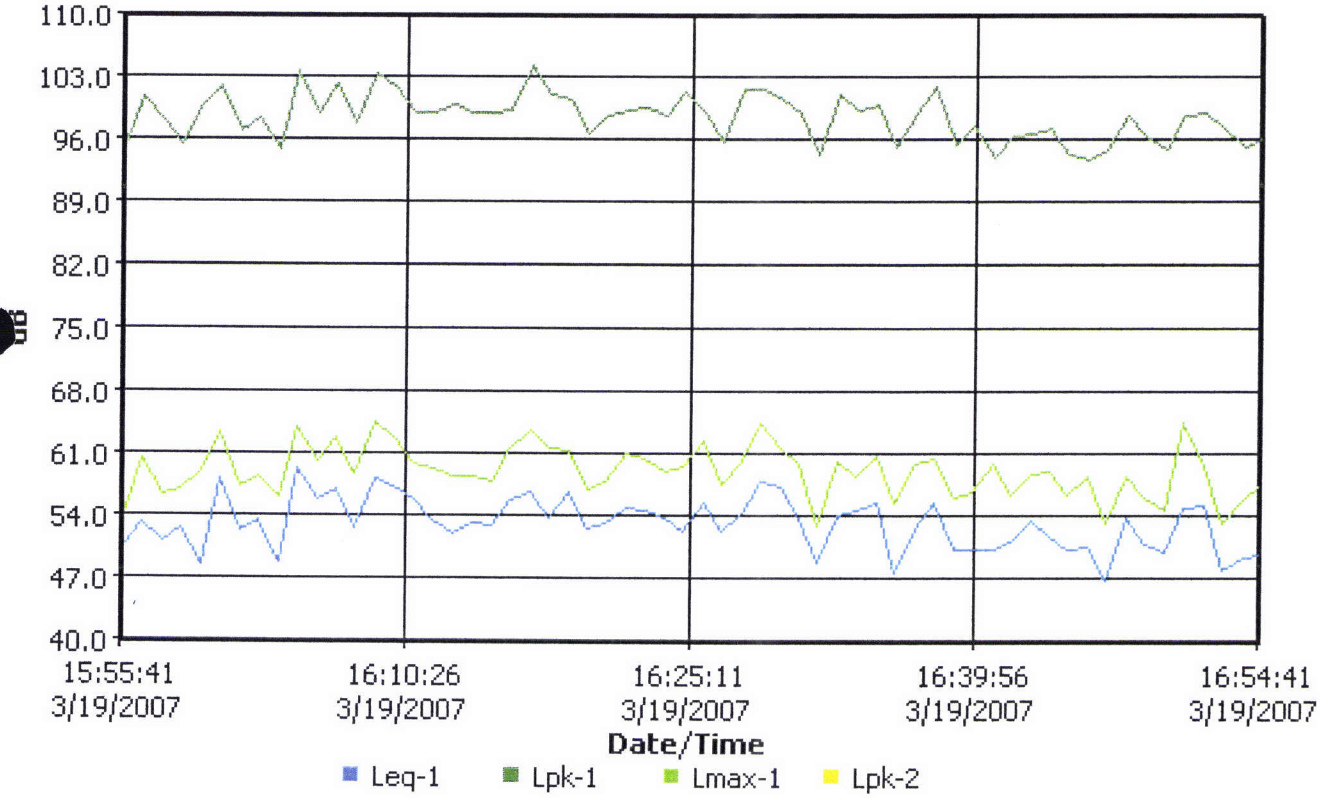
Name	Study 1
Location	
Comments	
Start Time	Monday, March 19, 2007 15:54:41
Stop Time	Monday, March 19, 2007 16:54:45
User Name	

General Data Panel

Description	Meter/Sensor	Value
Dose	1	0 %
Lmax	1	64.6 dB
Response	1	SLOW
Exchange Rate	1	3 dB
Log Rate	1	60 s
Integrating Threshold	2	80 dB
Response	2	SLOW

Description	Meter/Sensor	Value
Lpk	1	104.4 dB
Weighting	1	A
Bandwidth	1	1/1
Integrating Threshold	1	80 dB
Exchange Rate	2	3 dB
Weighting	2	C

Logged Data Chart



ZELASNY RECEPTOR S-4

Information Panel

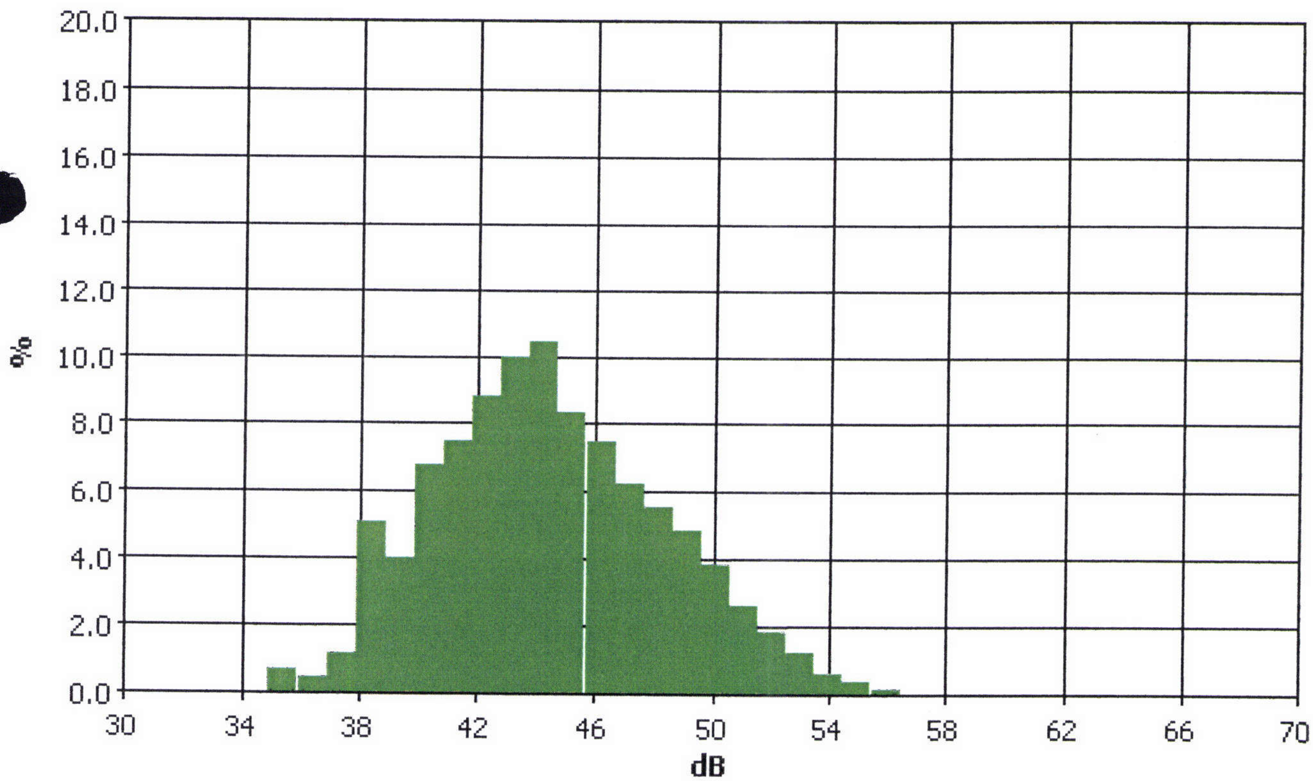
Name	ZELASNY LOCATION S-4 FILE S040
Start Time	Tuesday, March 20, 2007 11:26:44
Stop Time	Tuesday, March 20, 2007 12:28:32
Device Model Type	SoundPro DL
Comments	LOCATION S-4
Device Certification Frequency	
Device Name	BIG010010
Device Serial Number	BIG010010
Location	SHELBY, NY RECEPTOR S-4
User Name	JOE KING
Description	RECEPTOR S-4 11:30-12:30 READING
Company Name	CONTINENTAL PLACER INC.

General Data Panel

Description	Meter/Sensor	Value
Lpk	1	102 dB
Lmin	1	35.3 dB
Exchange Rate	1	3 dB
Response	1	SLOW
Exchange Rate	2	3 dB
Response	2	SLOW

Description	Meter/Sensor	Value
Leq	1	46.8 dB
Lmax	1	64.6 dB
Weighting	1	A
Bandwidth	1	1/1
Weighting	2	C

Statistics Chart



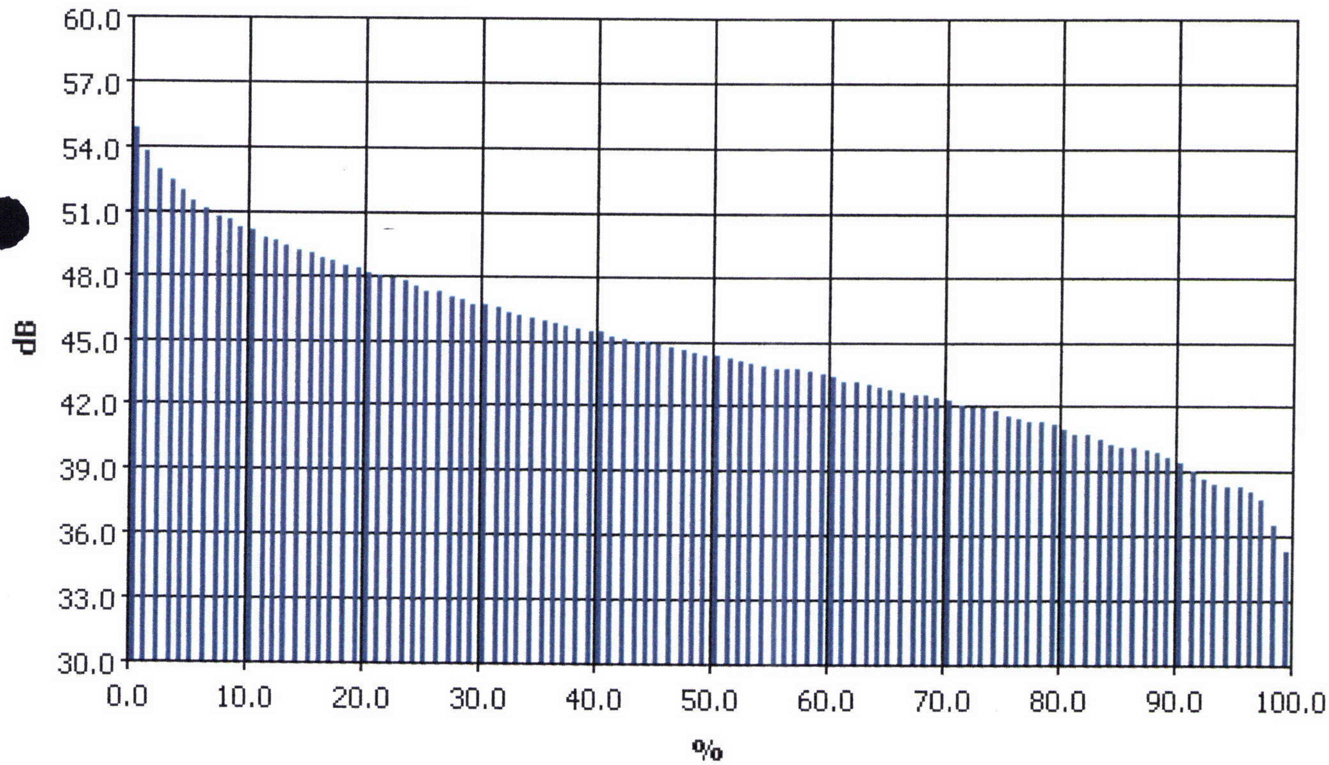
Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35.0	0.0	0.0	0.0	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.8
36.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.5
[illegible]	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	1.2
[illegible]	0.3	0.3	0.5	1.5	0.8	0.4	0.3	0.3	0.3	0.3	5.2
39.0	0.4	0.4	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.8	4.1
40.0	1.1	1.3	0.6	0.5	0.5	0.5	0.6	0.5	0.5	0.6	6.8

Statistics Table (cont'd)

[illegible]	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
[illegible]0	0.7	0.7	0.8	1.2	0.9	0.7	0.6	0.6	0.7	0.7	7.6
[illegible]2.0	0.8	1.0	0.6	0.9	0.9	0.9	0.9	0.9	0.9	0.9	8.9
43.0	1.0	1.1	0.9	0.9	0.9	1.0	1.0	1.1	1.1	1.0	10.1
44.0	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.1	1.0	10.5
45.0	1.0	1.0	0.6	0.6	0.8	0.9	0.8	0.9	0.8	0.8	8.4
46.0	0.8	0.9	0.8	0.7	0.7	0.7	0.8	0.7	0.8	0.7	7.6
47.0	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	6.3
48.0	0.6	0.6	0.6	0.4	0.6	0.6	0.6	0.6	0.5	0.6	5.6
49.0	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	4.9
50.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	4.0
51.0	0.3	0.3	0.3	0.1	0.3	0.3	0.3	0.2	0.2	0.3	2.7
52.0	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	1.9
53.0	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.3
54.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.7
55.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
57.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
58.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
59.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
66.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
67.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
68.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
69.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

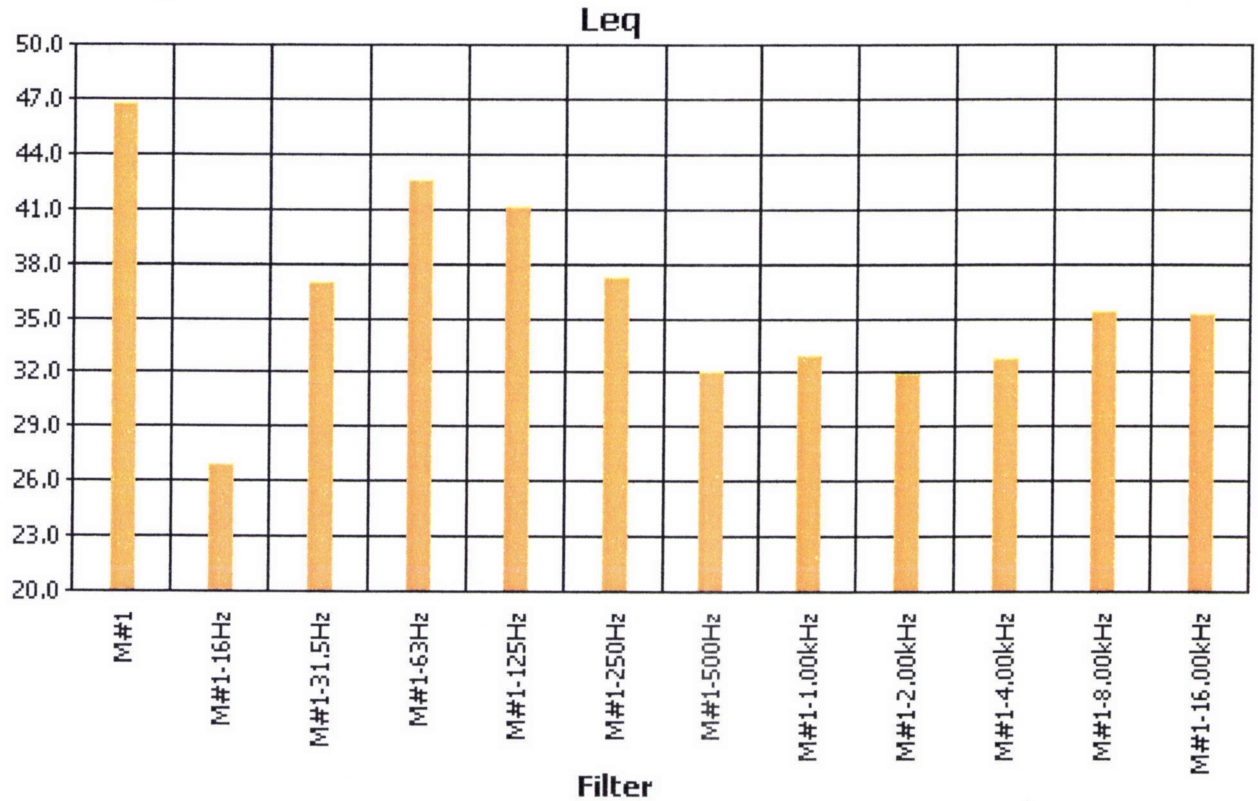
Exceedance Chart



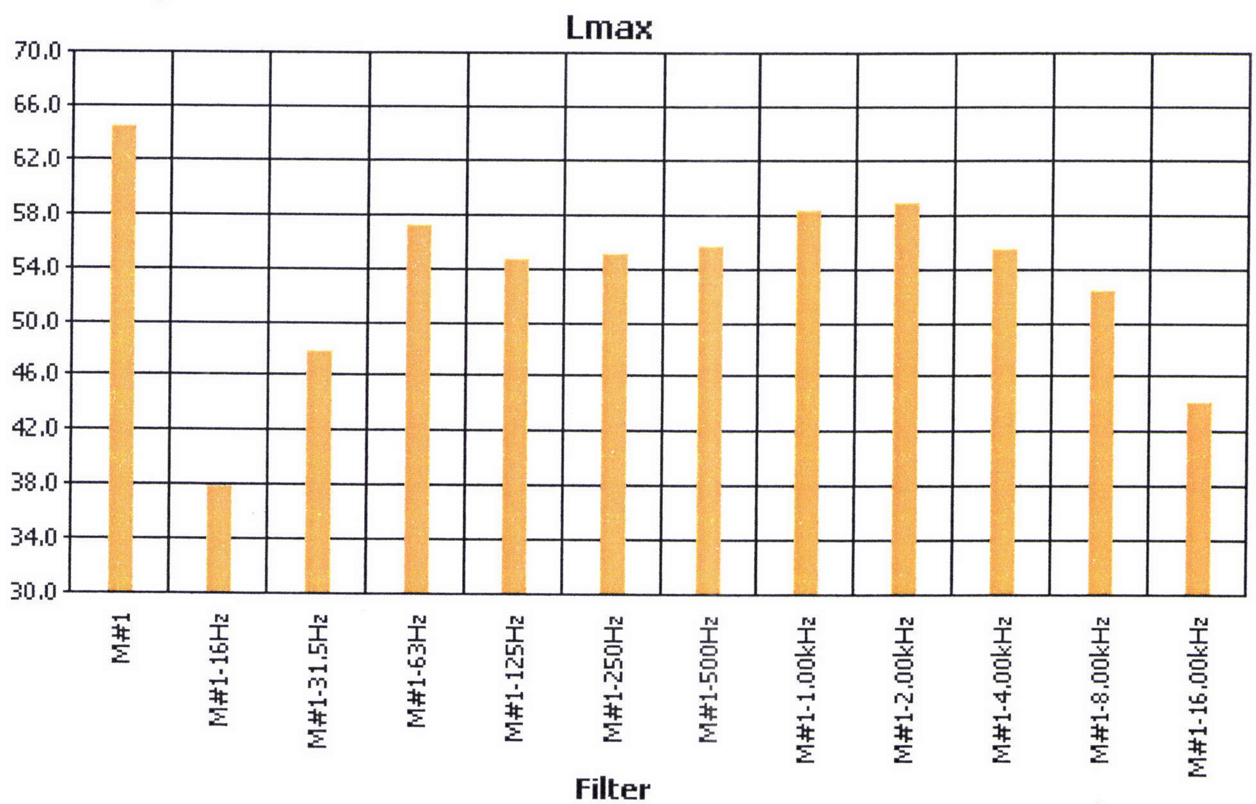
Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		54.9	53.8	53.0	52.5	52.0	51.6	51.2	50.9	50.7
10%	50.4	50.2	49.9	49.7	49.5	49.3	49.1	48.9	48.8	48.6
20%	48.4	48.2	48.1	47.9	47.8	47.6	47.4	47.3	47.1	47.0
30%	46.8	46.7	46.6	46.4	46.3	46.2	46.0	45.9	45.8	45.7
40%	45.6	45.5	45.3	45.2	45.1	45.0	44.9	44.8	44.7	44.6
50%	44.5	44.4	44.3	44.2	44.1	44.0	43.9	43.9	43.8	43.7
60%	43.6	43.5	43.3	43.2	43.1	43.0	42.9	42.8	42.7	42.6
70%	42.5	42.4	42.2	42.1	42.0	41.9	41.7	41.6	41.5	41.4
[illegible]%	41.3	41.1	40.9	40.8	40.6	40.4	40.2	40.2	40.1	40.0
[illegible]	39.7	39.5	39.1	38.8	38.6	38.4	38.4	38.2	37.8	36.6
[illegible]%	35.4									

Filter Summary Chart



Filter Summary Chart



Study 1
Information Panel

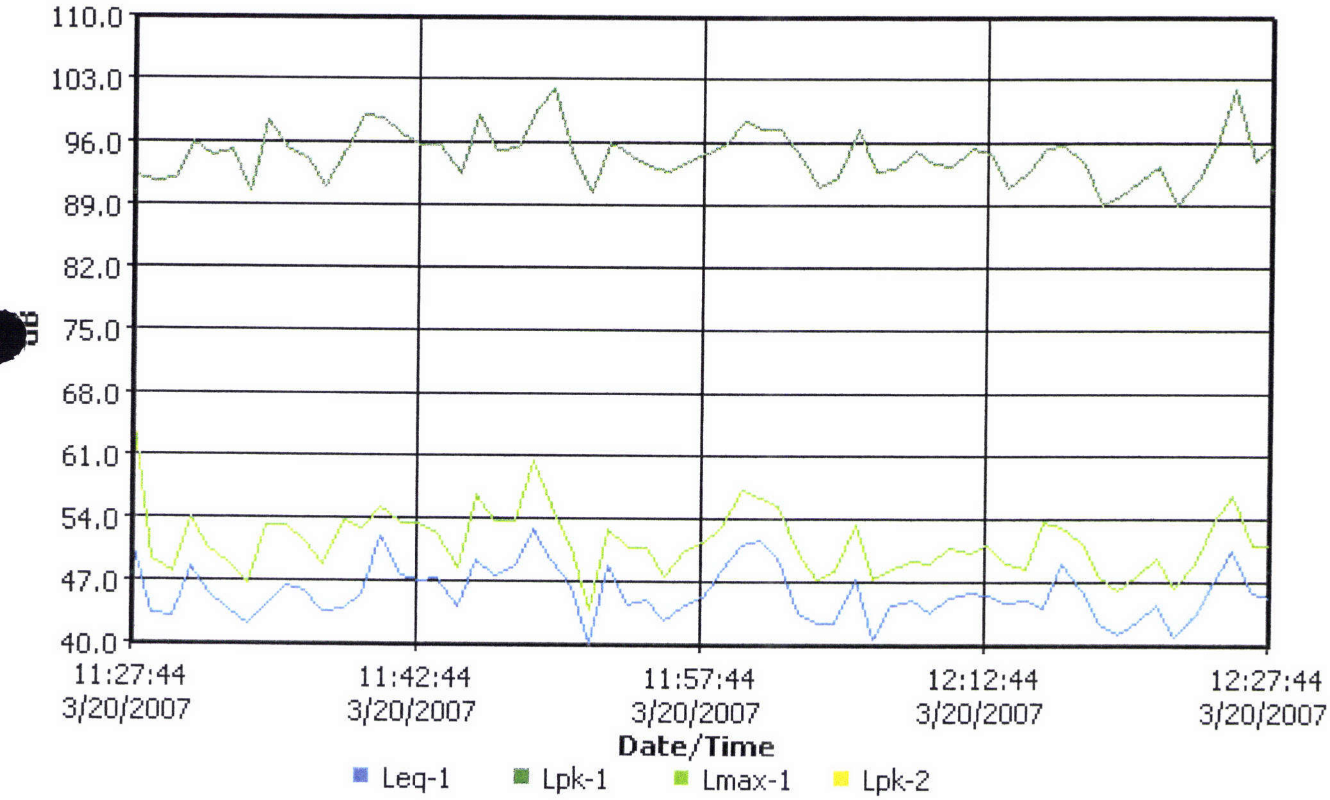
Name	Study 1
Location	
Comments	
Start Time	Tuesday, March 20, 2007 11:26:44
Stop Time	Tuesday, March 20, 2007 12:28:32
User Name	

General Data Panel

Description	Meter/Sensor	Value
Dose	1	0 %
Lmax	1	64.6 dB
Response	1	SLOW
Exchange Rate	1	3 dB
Log Rate	1	60 s
Integrating Threshold	2	80 dB
Response	2	SLOW

Description	Meter/Sensor	Value
Lpk	1	102 dB
Weighting	1	A
Bandwidth	1	1/1
Integrating Threshold	1	80 dB
Exchange Rate	2	3 dB
Weighting	2	C

Logged Data Chart



ZELASNY RECEPTOR S-5

Information Panel

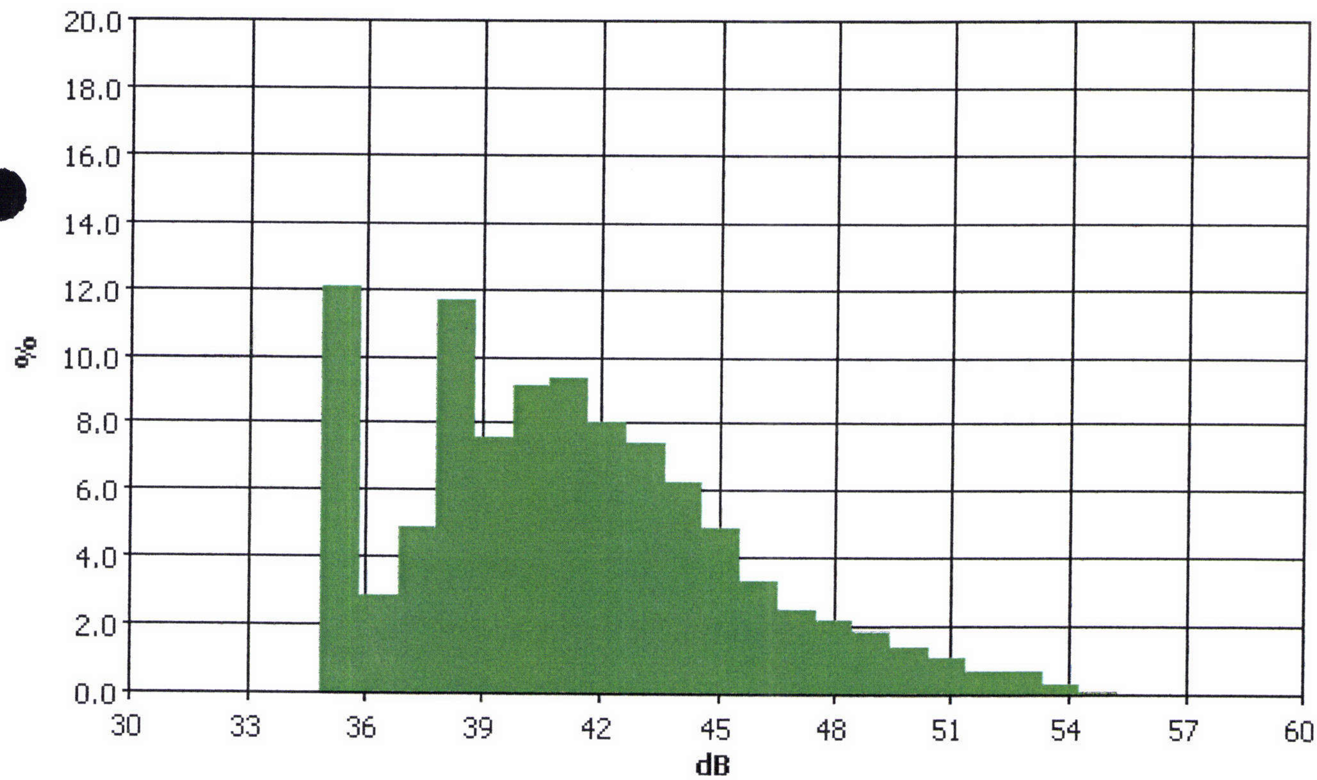
Name	ZELSNEY RECEPTOR S-5 FILE S031
Start Time	Monday, March 19, 2007 13:44:50
Stop Time	Monday, March 19, 2007 14:44:53
Device Model Type	SoundPro DL
Comments	LOCATION S-5
Device Certification Frequency	
Device Name	BIG010010
Device Serial Number	BIG010010
Location	SHELBY, NY RECEPTOR S-5
User Name	JOE KING
Description	RECEPTOR S-5 2-3PM
Company Name	CONTINENTAL PLACER INC.

General Data Panel

Description	Meter/Sensor	Value
Lpk	1	99.7 dB
Lmin	1	35.3 dB
Exchange Rate	1	3 dB
Response	1	SLOW
Exchange Rate	2	3 dB
Response	2	SLOW

Description	Meter/Sensor	Value
Leq	1	44.3 dB
Lmax	1	59.2 dB
Weighting	1	A
Bandwidth	1	1/1
Weighting	2	C

Statistics Chart



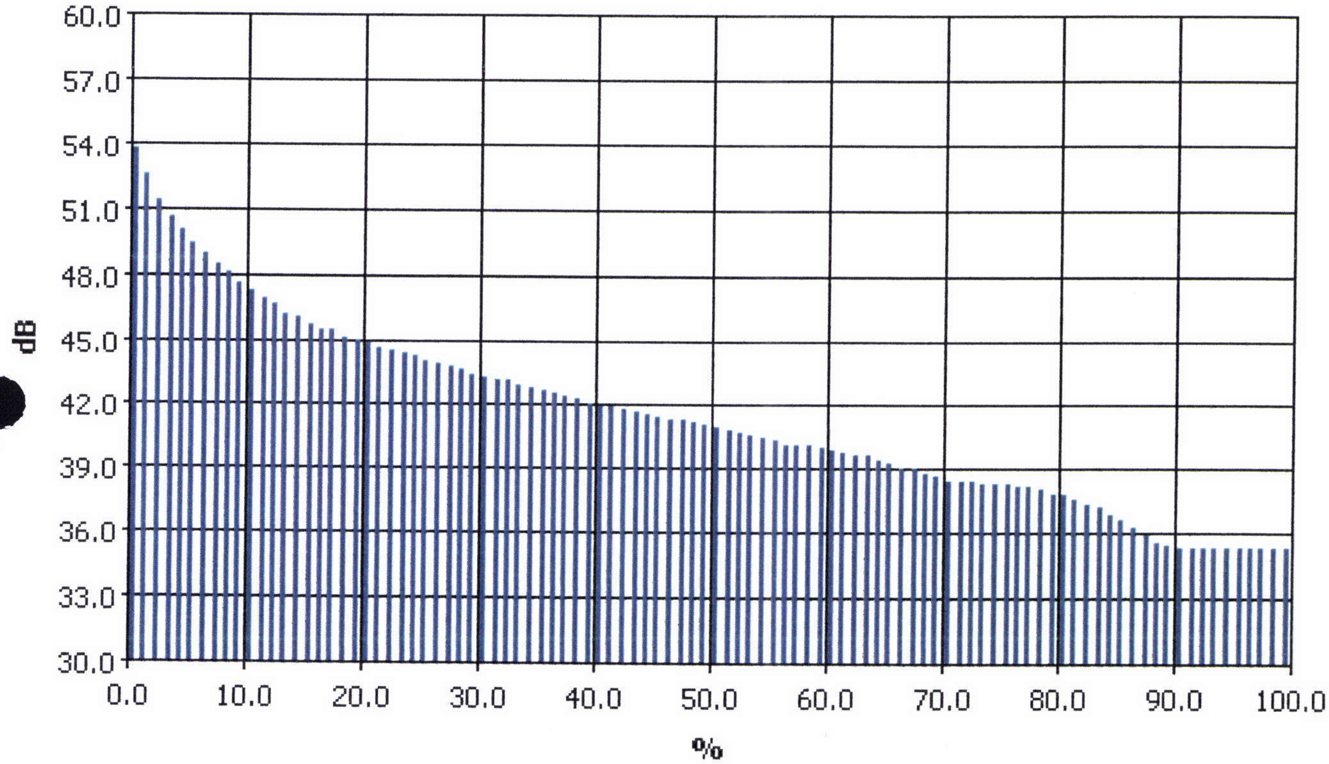
Statistics Table

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35.0	0.0	0.0	0.0	9.3	1.0	0.5	0.4	0.4	0.3	0.3	12.2
36.0	0.3	0.4	0.1	0.3	0.3	0.3	0.3	0.4	0.3	0.4	3.0
[illegible]	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.7	4.9
[illegible]	0.9	1.0	1.5	3.5	1.3	0.8	0.8	0.7	0.7	0.6	11.8
39.0	0.7	0.7	0.4	0.7	0.8	0.7	0.8	0.8	0.9	1.1	7.6
40.0	1.3	1.4	0.9	0.8	0.8	0.7	0.8	0.8	0.8	0.8	9.2

Statistics Table (cont'd)

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
[illegible].0	0.9	1.0	1.1	1.3	1.0	0.8	0.9	0.8	0.8	0.9	9.4
42.0	1.0	1.0	0.6	0.9	0.9	0.8	0.7	0.7	0.7	0.7	8.1
43.0	0.8	0.9	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.7	7.5
44.0	0.7	0.7	0.6	0.7	0.6	0.6	0.6	0.6	0.7	0.6	6.3
45.0	0.6	0.6	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	4.9
46.0	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	3.4
47.0	0.3	0.3	0.2	0.3	0.2	0.3	0.3	0.3	0.2	0.2	2.6
48.0	0.2	0.2	0.2	0.1	0.3	0.2	0.2	0.2	0.2	0.2	2.2
49.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.0
50.0	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	1.5
51.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.1
52.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8
53.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8
54.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
56.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
57.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
58.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
59.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

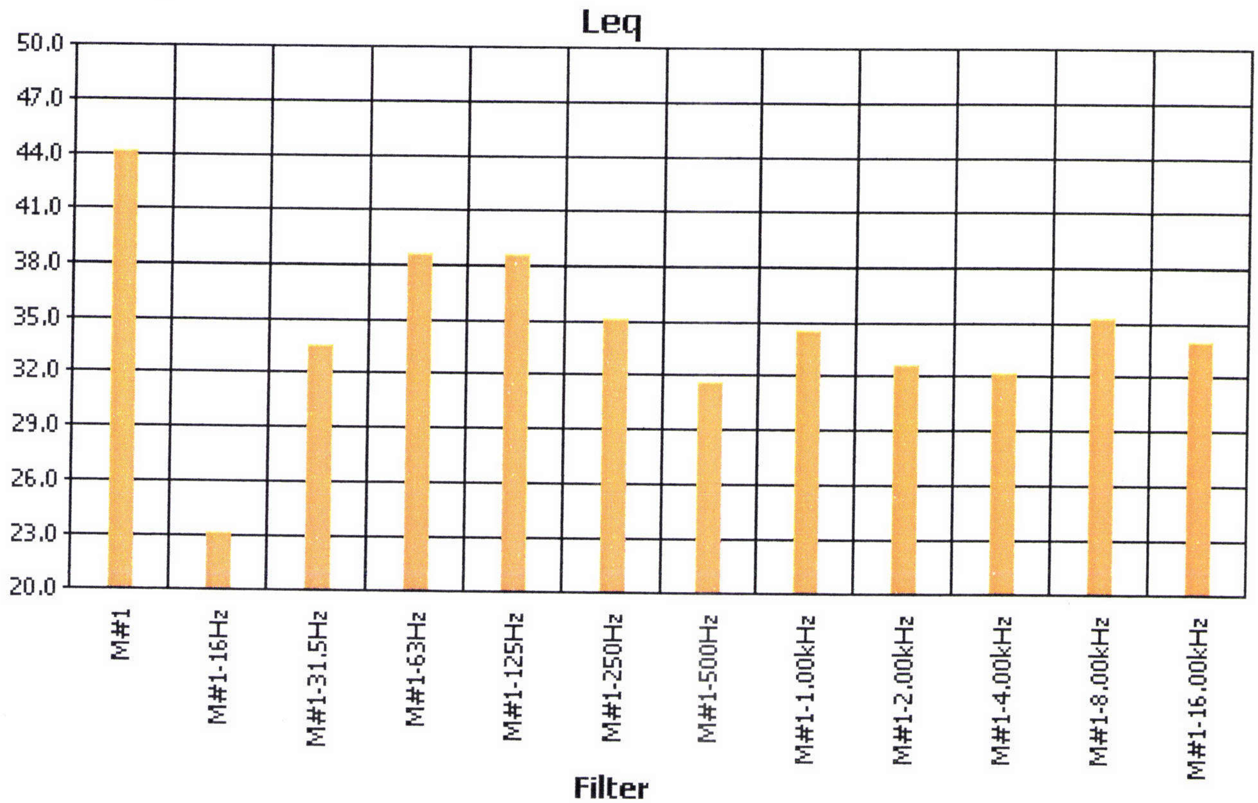
Exceedance Chart



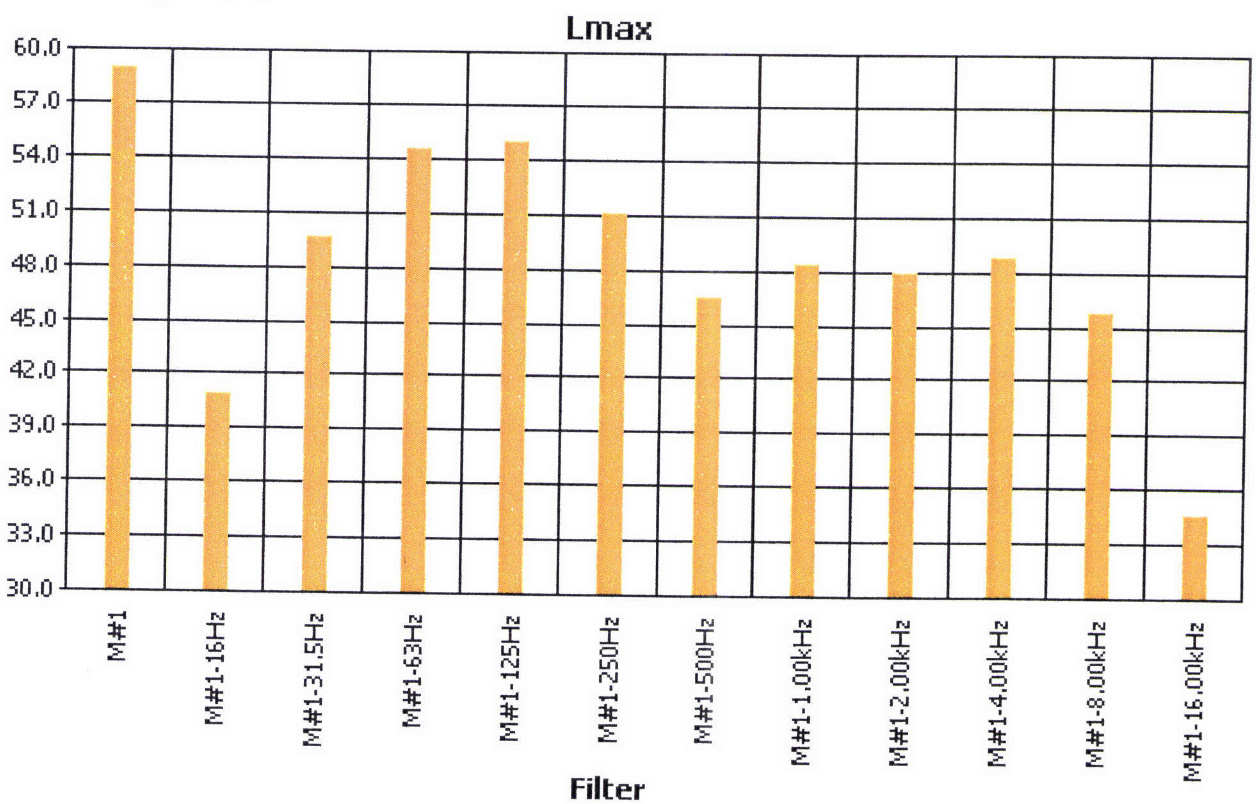
Exceedance Table

	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		53.8	52.6	51.5	50.7	50.1	49.5	49.0	48.6	48.2
10%	47.7	47.3	47.0	46.7	46.3	46.1	45.8	45.6	45.5	45.2
20%	45.1	44.9	44.7	44.6	44.4	44.3	44.1	44.0	43.8	43.7
30%	43.5	43.4	43.3	43.2	43.0	42.9	42.8	42.6	42.5	42.4
40%	42.2	42.1	42.0	41.9	41.8	41.7	41.6	41.5	41.4	41.3
50%	41.2	41.1	41.0	40.8	40.7	40.6	40.5	40.3	40.2	40.2
60%	40.1	40.0	39.9	39.8	39.7	39.5	39.4	39.2	39.1	38.9
70%	38.8	38.6	38.5	38.5	38.4	38.4	38.4	38.3	38.3	38.2
80%	38.0	37.9	37.7	37.5	37.3	37.0	36.7	36.4	36.0	35.7
90%	35.5	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4	35.4
100%	35.4									

Filter Summary Chart



Filter Summary Chart



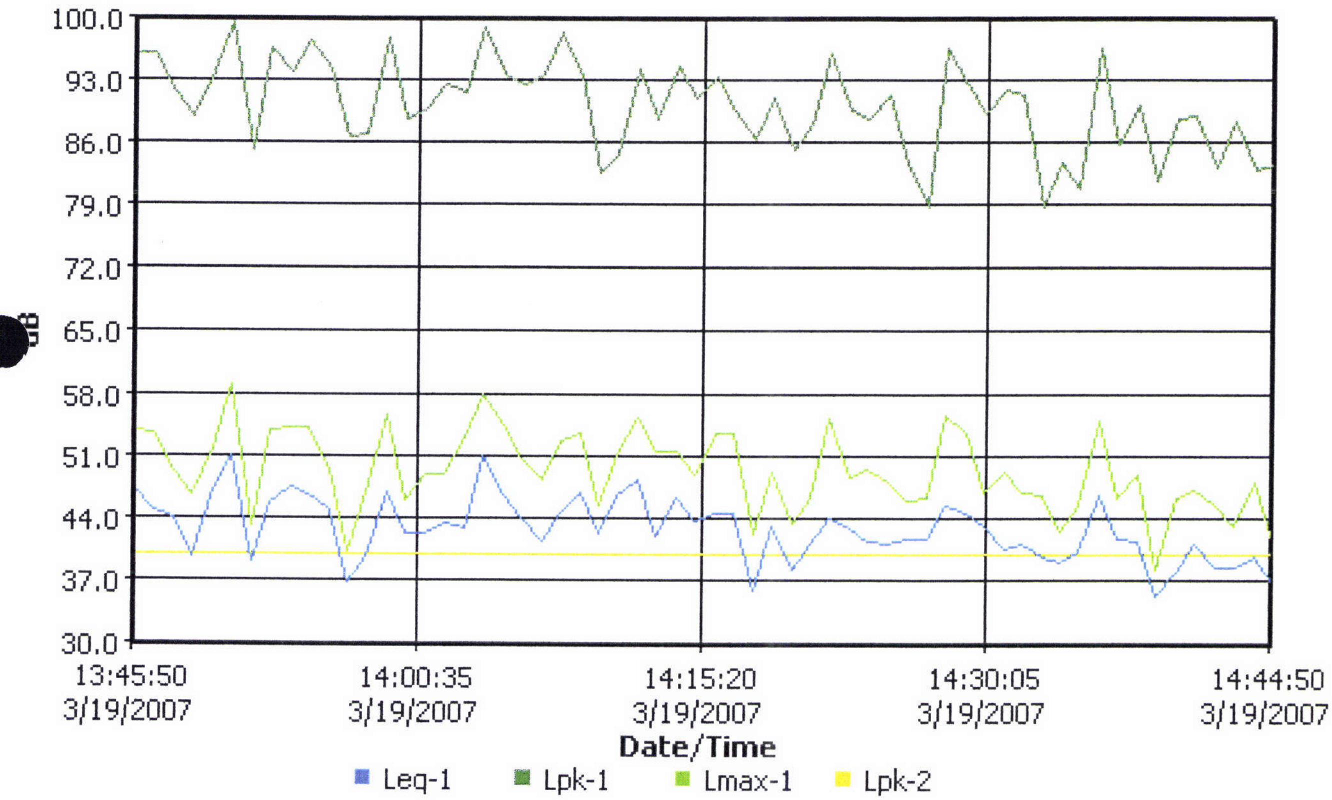
Study 1
Information Panel

Name	Study 1
Location	
Comments	
Start Time	Monday, March 19, 2007 13:44:50
Stop Time	Monday, March 19, 2007 14:44:53
User Name	

General Data Panel

Description	Meter/Sensor	Value	Description	Meter/Sensor	Value
Dose	1	0 %	Lpk	1	99.7 dB
Lmax	1	59.2 dB	Weighting	1	A
Response	1	SLOW	Bandwidth	1	1/1
Exchange Rate	1	3 dB	Integrating Threshold	1	80 dB
Log Rate	1	60 s	Exchange Rate	2	3 dB
Integrating Threshold	2	80 dB	Weighting	2	C
Response	2	SLOW			

Logged Data Chart



SET-UP #1

3/23/2010

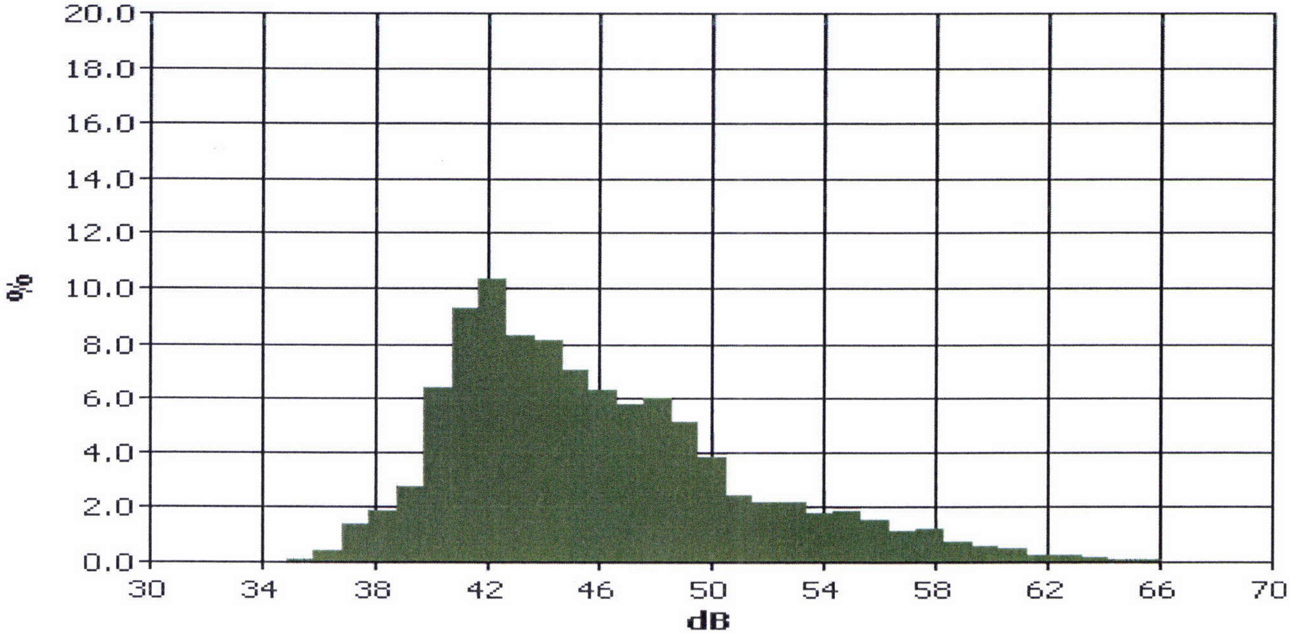
Information Panel

Name	SET-UP #1
Start Time	Monday, March 22, 2010 12:11:47
Stop Time	Monday, March 22, 2010 12:41:51
Device Model Type	SoundPro DL
Comments	

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	50.5 dB	Exchange Rate	1	3 dB
Weighting	1	A	Response	1	SLOW
Bandwidth	1	OFF	Exchange Rate	2	5 dB
Weighting	2	C	Response	2	SLOW

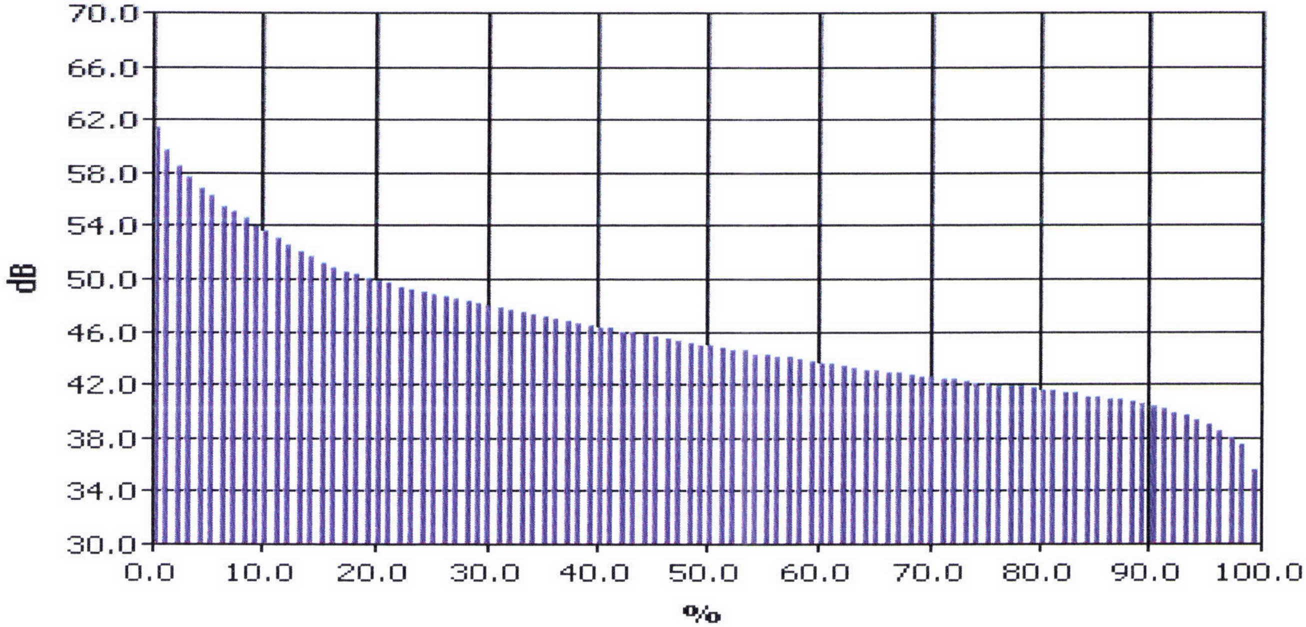
Statistics Chart



dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
36.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.4
37.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.2	1.4
38.0	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	1.9
39.0	0.2	0.2	0.3	0.2	0.3	0.3	0.2	0.3	0.4	0.4	2.7
40.0	0.6	0.6	0.4	0.6	0.5	0.6	0.6	0.7	0.8	1.0	6.4
41.0	0.8	0.8	0.8	0.8	0.8	0.9	1.2	1.0	1.1	1.2	9.3
42.0	1.2	1.0	1.0	0.9	0.9	1.0	1.1	1.1	1.0	1.0	10.3
43.0	1.1	1.1	0.6	0.9	0.8	0.7	0.8	0.8	0.8	0.8	8.3
44.0	0.9	1.0	0.9	0.8	0.7	0.7	0.8	0.8	0.8	0.8	8.1
45.0	0.8	0.8	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.6	7.1
46.0	0.7	0.7	0.5	0.6	0.6	0.6	0.7	0.6	0.6	0.6	6.3
47.0	0.7	0.5	0.5	0.6	0.5	0.5	0.7	0.6	0.6	0.6	5.8
48.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	6.0
49.0	0.5	0.6	0.4	0.5	0.6	0.6	0.6	0.5	0.5	0.4	5.1
50.0	0.4	0.4	0.5	0.5	0.3	0.3	0.4	0.3	0.3	0.3	3.8
51.0	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	2.4
52.0	0.3	0.2	0.3	0.1	0.3	0.2	0.2	0.2	0.2	0.2	2.2
53.0	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	2.2
54.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.8
55.0	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.2	1.9
56.0	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.1	1.6
57.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	1.2
58.0	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.2
59.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
60.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.6
61.0	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.5
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
66.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
67.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
68.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
69.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exceedance Chart



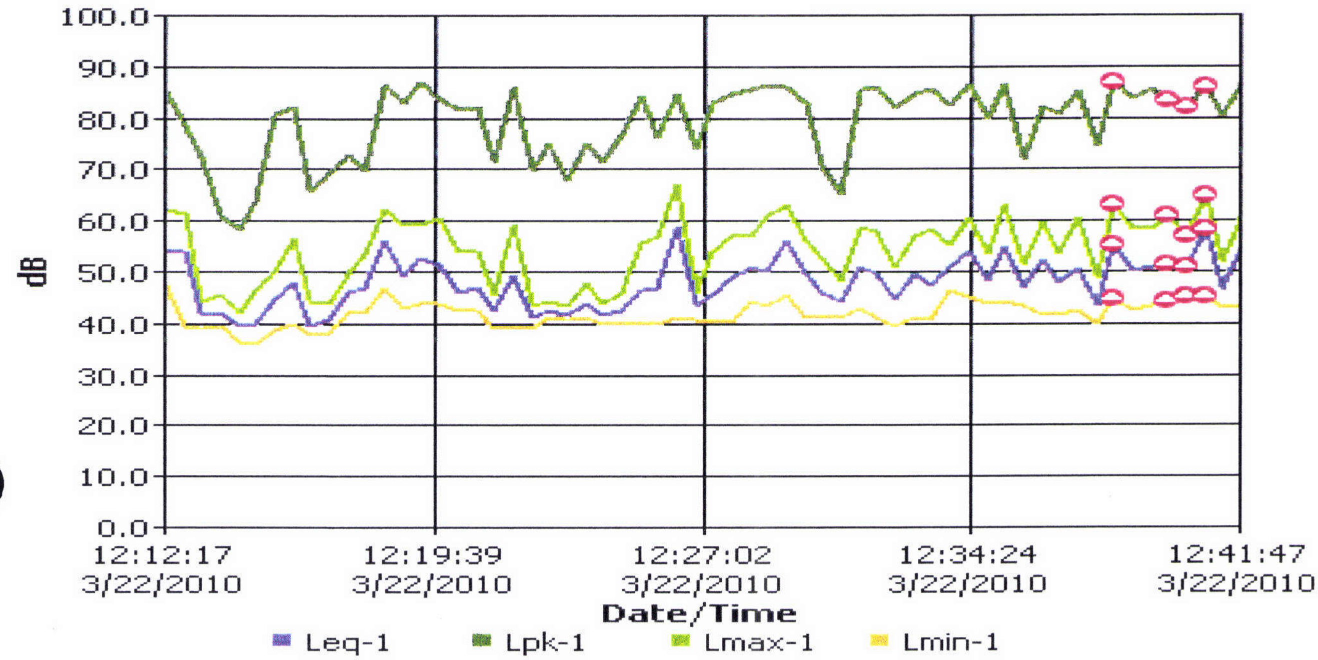
	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		61.3	59.6	58.5	57.7	56.8	56.2	55.5	55.0	54.5
10%	53.9	53.5	53.0	52.6	52.1	51.7	51.2	50.9	50.5	50.3
20%	50.0	49.8	49.6	49.4	49.2	49.0	48.8	48.7	48.5	48.3
30%	48.2	48.0	47.8	47.7	47.5	47.3	47.2	47.0	46.8	46.6
40%	46.5	46.3	46.2	46.0	45.9	45.7	45.6	45.4	45.3	45.1
50%	45.0	44.9	44.7	44.6	44.5	44.3	44.2	44.1	44.0	43.9
60%	43.8	43.6	43.5	43.4	43.2	43.1	43.0	42.9	42.8	42.7
70%	42.6	42.5	42.4	42.3	42.2	42.1	42.0	41.9	41.8	41.8
80%	41.7	41.6	41.5	41.4	41.3	41.1	41.0	40.9	40.8	40.6
90%	40.5	40.3	40.1	39.9	39.7	39.4	39.0	38.5	38.0	37.4
100%	35.6									

S-7

General Data Panel

Description	Meter	Value	Description	Meter	Value
Lpk	1	95.8 dB	Lmax	1	66.9 dB
Lmin	1	35.7 dB	Leq	1	50.5 dB
LDN	1	50.5 dB	Weighting	1	A
Response	1	SLOW	Bandwidth	1	OFF
Exchange Rate	1	3 dB	Int Threshold	1	100 dB
Log Rate	1	30 s	Exchange Rate	2	5 dB
Int Threshold	2	100 dB	Weighting	2	C
Response	2	SLOW	Ln1	1	3 %
Ln2	1	10 %	Ln3	1	50 %
Ln4	1	90 %			

Logged Data Chart



Information Panel

Comments	
Location	
Parent Session	SET-UP #1
Start Time	Monday, March 22, 2010 12:11:47
Stop Time	Monday, March 22, 2010 12:41:51
User Name	

SET-UP #2

3/23/2010

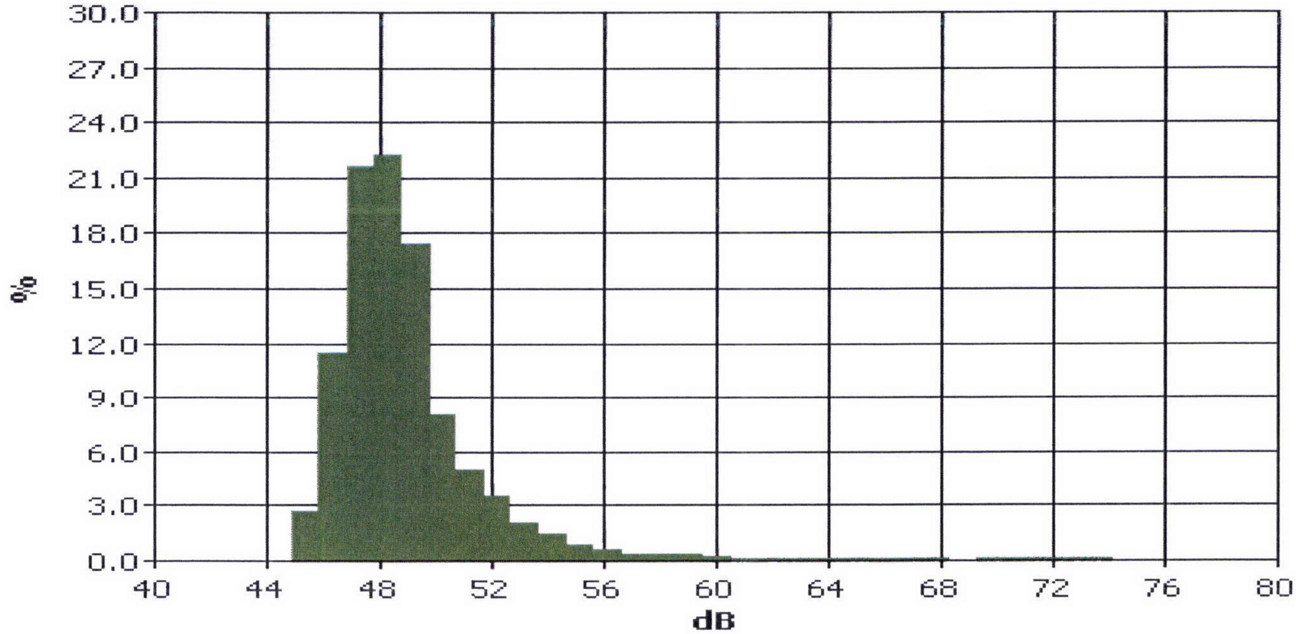
Information Panel

Name	SET-UP #2
Start Time	Monday, March 22, 2010 12:21:30
Stop Time	Monday, March 22, 2010 12:51:34
Device Model Type	SoundPro DL
Comments	

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	53.7 dB	Exchange Rate	1	3 dB
Weighting	1	A	Response	1	FAST
Bandwidth	1	OFF	Exchange Rate	2	5 dB
Weighting	2	C	Response	2	FAST

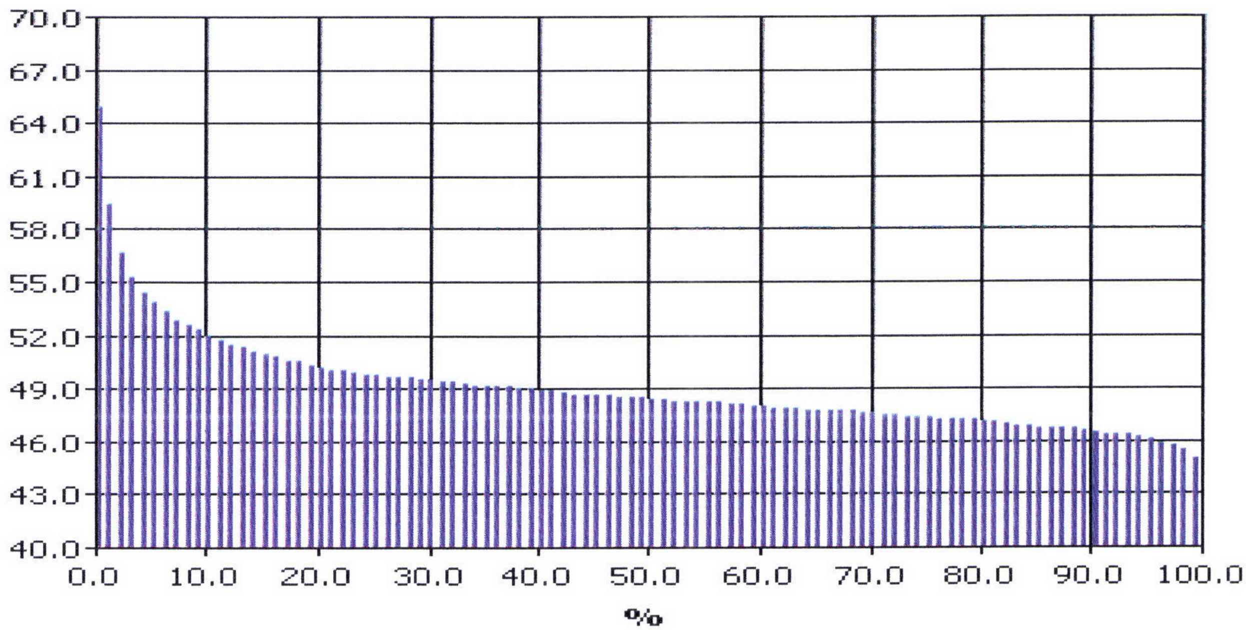
Statistics Chart



dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
43.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
44.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
45.0	0.0	0.0	0.1	0.1	0.3	0.3	0.4	0.4	0.5	0.5	2.6
46.0	0.6	0.7	0.9	1.0	1.1	1.2	1.4	1.4	1.5	1.7	11.5
47.0	1.9	1.3	2.0	2.1	2.2	2.4	2.4	2.4	2.5	2.5	21.6
48.0	2.4	2.4	2.4	2.3	2.3	2.3	2.2	2.1	2.0	1.9	22.2
49.0	1.8	1.8	1.7	1.8	1.8	1.9	1.8	1.7	1.7	1.5	17.5
50.0	1.4	0.7	0.9	0.8	0.8	0.8	0.7	0.7	0.7	0.7	8.0
51.0	0.6	0.6	0.6	0.5	0.5	0.5	0.4	0.5	0.4	0.4	5.0
52.0	0.4	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.4	3.5
53.0	0.4	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.1
54.0	0.2	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	1.5
55.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.9
56.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.6
57.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
58.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
59.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
66.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
67.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
68.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
69.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
70.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
71.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
72.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
73.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
74.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
75.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
76.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
77.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
78.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
79.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exceedance Chart



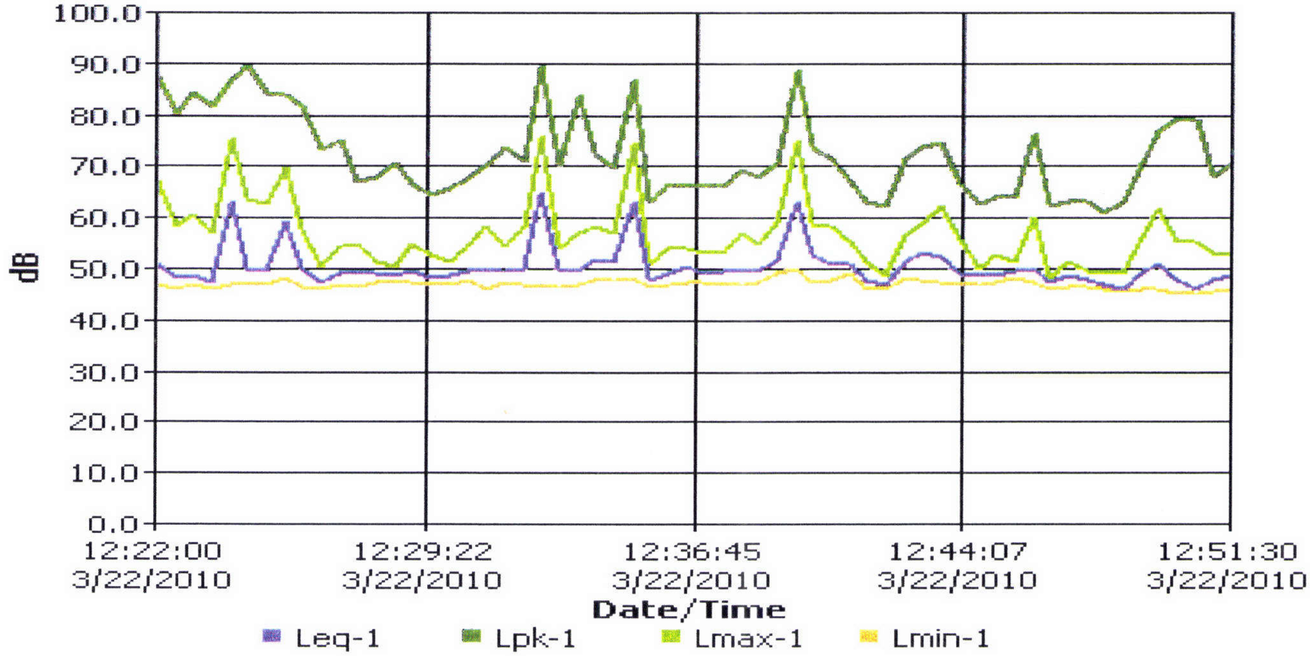
	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		64.9	59.5	56.7	55.3	54.4	53.8	53.3	52.8	52.6
10%	52.3	52.0	51.7	51.5	51.3	51.1	50.9	50.8	50.6	50.5
20%	50.3	50.2	50.1	50.0	49.9	49.8	49.8	49.7	49.6	49.6
30%	49.5	49.5	49.4	49.4	49.3	49.2	49.2	49.1	49.1	49.0
40%	49.0	48.9	48.9	48.8	48.7	48.7	48.6	48.6	48.5	48.5
50%	48.5	48.4	48.4	48.3	48.3	48.2	48.2	48.2	48.1	48.1
60%	48.0	48.0	47.9	47.9	47.9	47.8	47.8	47.7	47.7	47.7
70%	47.6	47.6	47.5	47.5	47.4	47.4	47.4	47.3	47.3	47.2
80%	47.2	47.1	47.1	47.0	46.9	46.9	46.8	46.8	46.7	46.7
90%	46.6	46.5	46.4	46.3	46.3	46.2	46.1	45.9	45.7	45.5
100%	44.9									

S-45

General Data Panel

Description	Meter	Value	Description	Meter	Value
Lpk	1	89.4 dB	Lmax	1	75.8 dB
Lmin	1	45 dB	Leq	1	53.7 dB
LDN	1	53.7 dB	Weighting	1	A
Response	1	FAST	Bandwidth	1	OFF
Exchange Rate	1	3 dB	Int Threshold	1	124 dB
Log Rate	1	30 s	Exchange Rate	2	5 dB
Int Threshold	2	80 dB	Weighting	2	C
Response	2	FAST	Ln1	1	5 %
Ln2	1	25 %	Ln3	1	50 %
Ln4	1	90 %			

Logged Data Chart



Information Panel

Comments	
Location	
Parent Session	SET-UP #2
Start Time	Monday, March 22, 2010 12:21:30
Stop Time	Monday, March 22, 2010 12:51:34
User Name	

SET-UP #3

3/23/2010

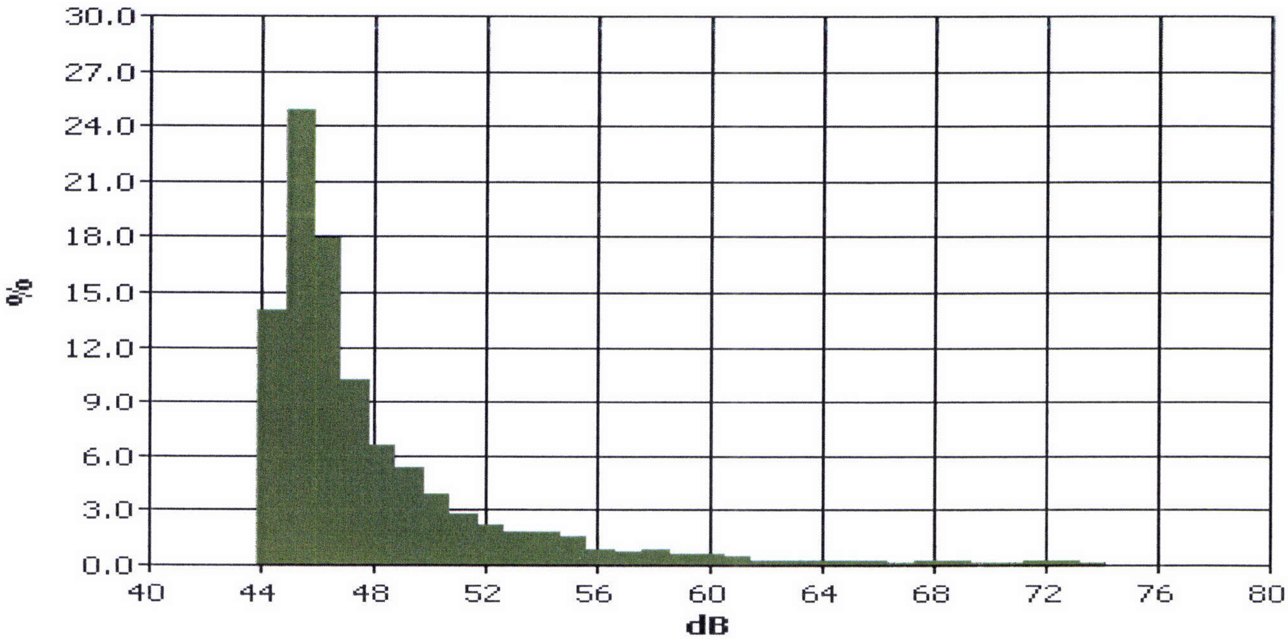
Information Panel

Name	SET-UP #3
Start Time	Monday, March 22, 2010 11:45:59
Stop Time	Monday, March 22, 2010 12:16:05
Device Model Type	SoundPro DL
Comments	

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	55.3 dB	Exchange Rate	1	3 dB
Weighting	1	A	Response	1	FAST
Bandwidth	1	OFF	Exchange Rate	2	5 dB
Weighting	2	C	Response	2	FAST

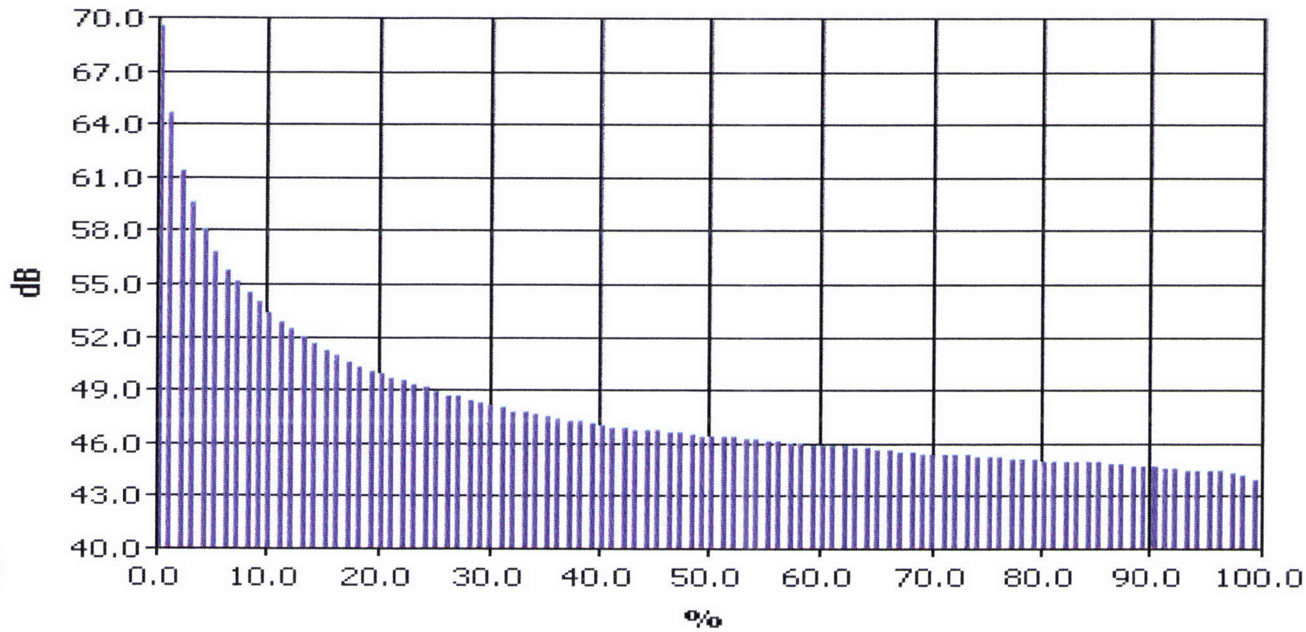
Statistics Chart



dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
43.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
44.0	0.0	0.1	0.3	0.7	1.2	1.8	2.2	2.4	2.6	2.7	14.0
45.0	2.9	2.8	2.8	2.7	2.6	2.4	2.3	2.3	2.2	2.0	24.9
46.0	2.1	2.0	1.9	1.8	1.9	1.7	1.8	1.7	1.6	1.5	17.9
47.0	1.3	0.9	1.2	1.1	1.1	1.0	1.0	0.9	0.9	0.9	10.3
48.0	0.9	0.8	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.5	6.6
49.0	0.5	0.5	0.5	0.6	0.6	0.5	0.6	0.5	0.5	0.6	5.4
50.0	0.6	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	3.9
51.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	2.8
52.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.2
53.0	0.3	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.8
54.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.9
55.0	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.1	1.6
56.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8
57.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7
58.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8
59.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.6
60.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.6
61.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.5
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
66.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
67.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
68.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
69.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
70.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
71.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
72.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
73.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
74.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
75.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
76.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
77.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
78.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
79.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exceedance Chart



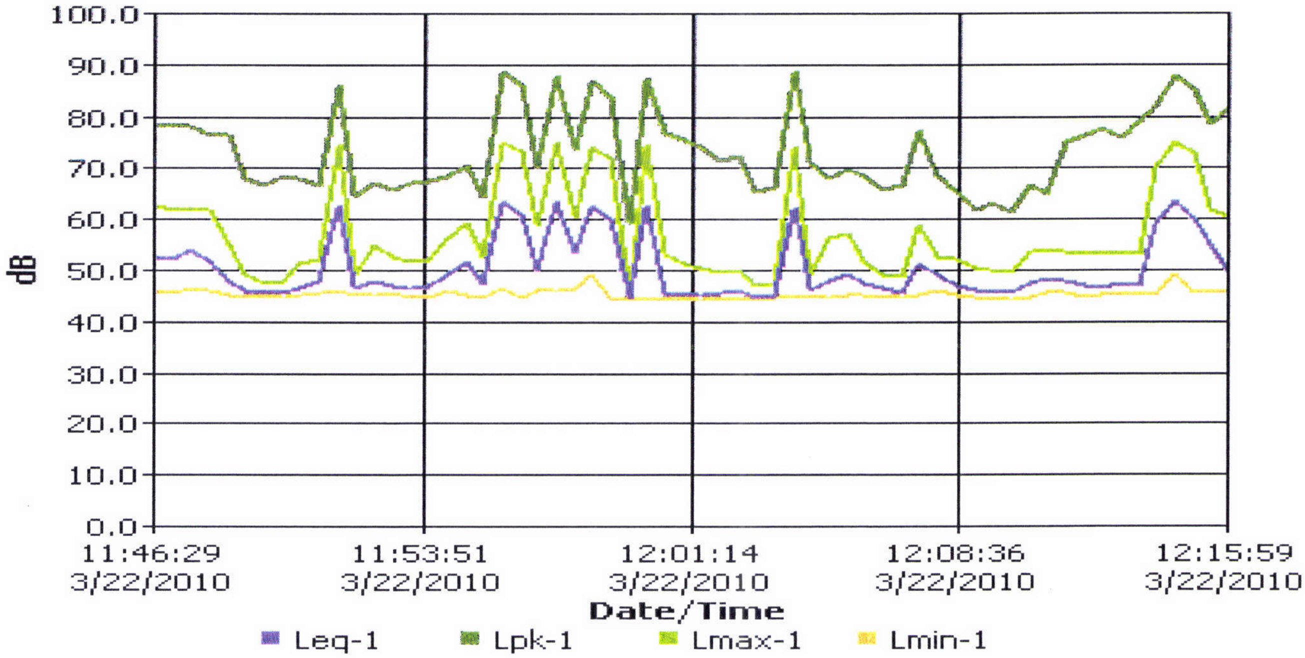
	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		69.5	64.7	61.4	59.6	58.1	56.8	55.7	55.1	54.5
10%	54.0	53.4	52.9	52.4	52.0	51.6	51.2	50.9	50.6	50.3
20%	50.1	49.9	49.7	49.5	49.3	49.1	48.9	48.7	48.6	48.4
30%	48.2	48.1	48.0	47.8	47.7	47.6	47.5	47.4	47.3	47.2
40%	47.1	47.0	46.9	46.9	46.8	46.7	46.7	46.6	46.6	46.5
50%	46.4	46.4	46.3	46.3	46.2	46.2	46.1	46.1	46.0	46.0
60%	45.9	45.9	45.8	45.8	45.7	45.7	45.6	45.6	45.5	45.5
70%	45.4	45.4	45.4	45.3	45.3	45.2	45.2	45.2	45.1	45.1
80%	45.1	45.0	45.0	45.0	44.9	44.9	44.9	44.8	44.8	44.7
90%	44.7	44.7	44.6	44.6	44.5	44.5	44.4	44.4	44.3	44.2
100%	43.9									

S-44

General Data Panel

Description	Meter	Value	Description	Meter	Value
Lpk	1	88.3 dB	Lmax	1	75 dB
Lmin	1	44 dB	Leq	1	55.3 dB
LDN	1	55.3 dB	Weighting	1	A
Response	1	FAST	Bandwidth	1	OFF
Exchange Rate	1	3 dB	Int Threshold	1	124 dB
Log Rate	1	30 s	Exchange Rate	2	5 dB
Int Threshold	2	80 dB	Weighting	2	C
Response	2	FAST	Ln1	1	5 %
Ln2	1	25 %	Ln3	1	50 %
Ln4	1	90 %			

Logged Data Chart



Information Panel

Comments	
Location	
Parent Session	SET-UP #3
Start Time	Monday, March 22, 2010 11:45:59
Stop Time	Monday, March 22, 2010 12:16:05
User Name	

SET-UP #4

3/23/2010

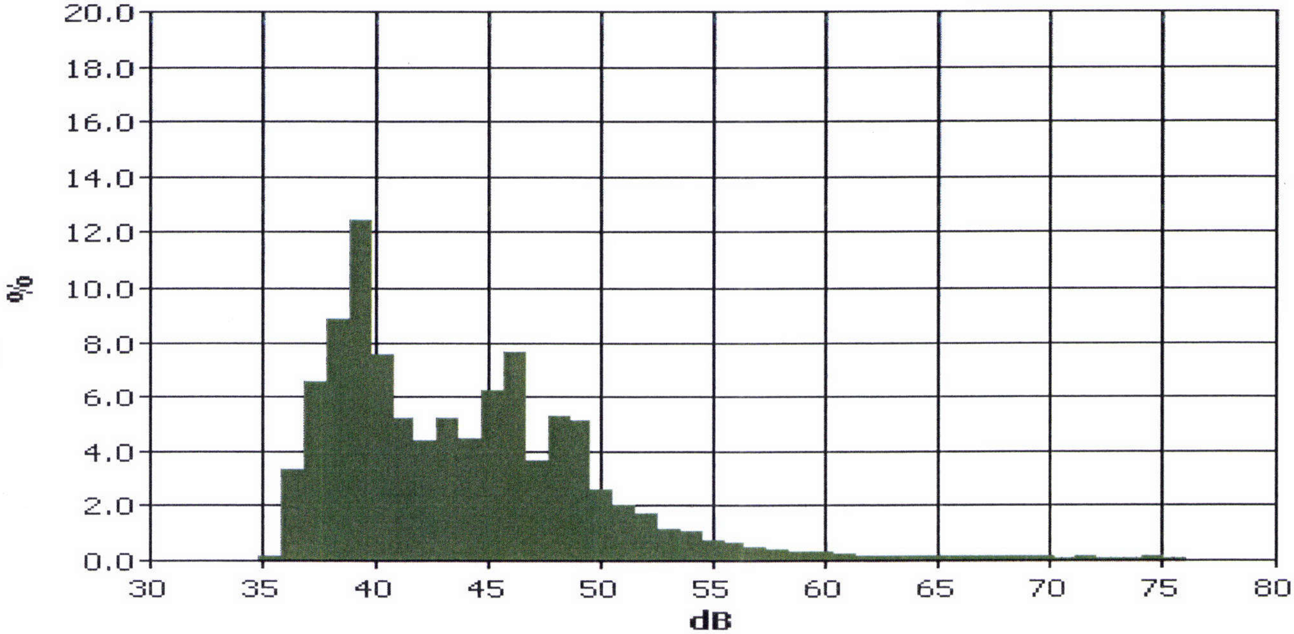
Information Panel

Name	SET-UP #4
Start Time	Monday, March 22, 2010 11:37:07
Stop Time	Monday, March 22, 2010 12:07:14
Device Model Type	SoundPro DL
Comments	

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	54.8 dB	Exchange Rate	1	3 dB
Weighting	1	A	Response	1	SLOW
Bandwidth	1	OFF	Exchange Rate	2	5 dB
Weighting	2	C	Response	2	SLOW

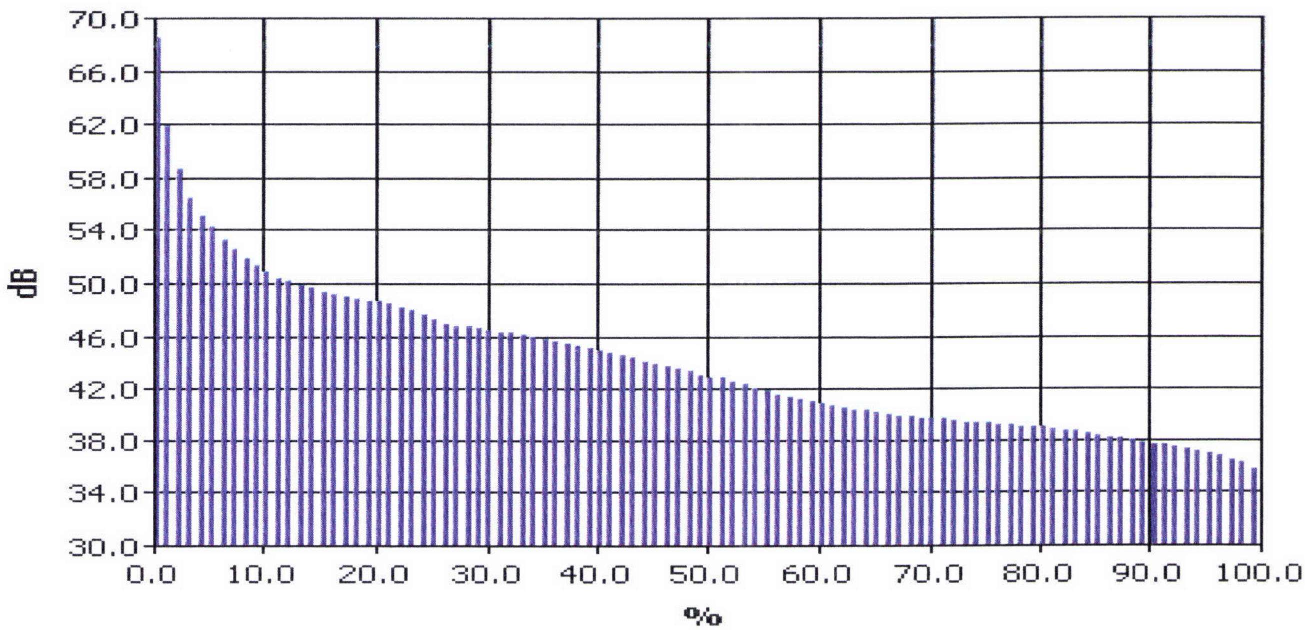
Statistics Chart



dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2
36.0	0.1	0.1	0.1	0.2	0.3	0.5	0.5	0.6	0.5	0.4	3.3
37.0	0.5	0.6	0.4	0.7	0.9	0.8	0.6	0.7	0.7	0.7	6.6
38.0	0.8	0.8	0.9	0.9	0.9	0.7	0.6	0.8	1.1	1.3	8.8
39.0	1.0	1.4	1.3	1.2	1.5	1.3	1.1	1.1	1.3	1.1	12.4
40.0	1.1	1.0	0.7	0.9	0.9	0.8	0.6	0.5	0.5	0.7	7.5
41.0	0.8	0.6	0.5	0.4	0.4	0.6	0.6	0.4	0.5	0.5	5.2
42.0	0.5	0.5	0.4	0.4	0.3	0.4	0.4	0.3	0.5	0.6	4.4
43.0	0.6	0.6	0.4	0.4	0.5	0.5	0.6	0.5	0.6	0.5	5.2
44.0	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.6	0.5	4.5
45.0	0.6	0.7	0.6	0.7	0.6	0.5	0.6	0.7	0.6	0.7	6.3
46.0	0.7	0.7	0.6	0.8	0.8	0.9	0.9	0.8	0.8	0.6	7.6
47.0	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.3	3.7
48.0	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.7	0.9	0.9	5.3
49.0	0.8	0.6	0.5	0.6	0.5	0.5	0.5	0.4	0.4	0.4	5.1
50.0	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	2.6
51.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.0
52.0	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	1.7
53.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.1
54.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.1
55.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7
56.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.7
57.0	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.5
58.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
59.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
66.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
67.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
68.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
69.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
70.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
71.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
72.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
73.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
74.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
75.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
76.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
77.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
78.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
79.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exceedance Chart



	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		68.5	61.9	58.6	56.5	55.1	54.2	53.2	52.5	51.9
10%	51.4	50.9	50.4	50.1	49.8	49.6	49.4	49.2	49.0	48.8
20%	48.7	48.6	48.4	48.2	47.9	47.6	47.3	47.0	46.8	46.7
30%	46.6	46.5	46.3	46.2	46.1	45.9	45.8	45.6	45.5	45.3
40%	45.1	45.0	44.8	44.6	44.4	44.1	43.9	43.7	43.5	43.4
50%	43.1	42.9	42.8	42.5	42.3	42.0	41.8	41.6	41.4	41.2
60%	41.0	40.9	40.7	40.5	40.4	40.3	40.1	40.0	39.9	39.8
70%	39.7	39.7	39.6	39.5	39.4	39.3	39.3	39.2	39.1	39.0
80%	39.0	38.9	38.8	38.7	38.6	38.4	38.3	38.2	38.1	38.0
90%	37.8	37.7	37.6	37.4	37.3	37.2	37.0	36.7	36.5	36.3
100%	35.7									

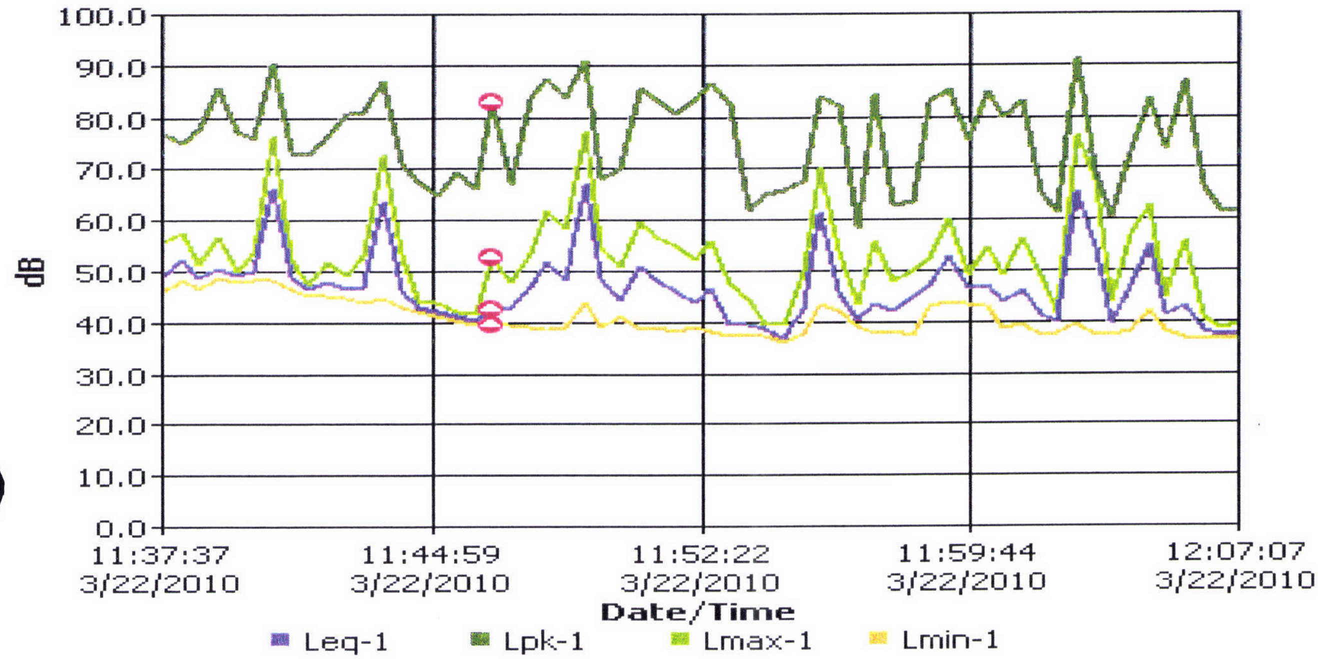
S-6

General Data Panel

Description	Meter	Value
Lpk	1	91 dB
Lmin	1	35.8 dB
LDN	1	54.8 dB
Response	1	SLOW
Exchange Rate	1	3 dB
Log Rate	1	30 s
Int Threshold	2	100 dB
Response	2	SLOW
Ln2	1	10 %
Ln4	1	90 %

Description	Meter	Value
Lmax	1	77.1 dB
Leq	1	54.8 dB
Weighting	1	A
Bandwidth	1	OFF
Int Threshold	1	100 dB
Exchange Rate	2	5 dB
Weighting	2	C
Ln1	1	3 %
Ln3	1	50 %

Logged Data Chart



Information Panel

Comments	
Location	
Parent Session	SET-UP #4
Start Time	Monday, March 22, 2010 11:37:07
Stop Time	Monday, March 22, 2010 12:07:14
User Name	

SET-UP 5A

3/23/2010

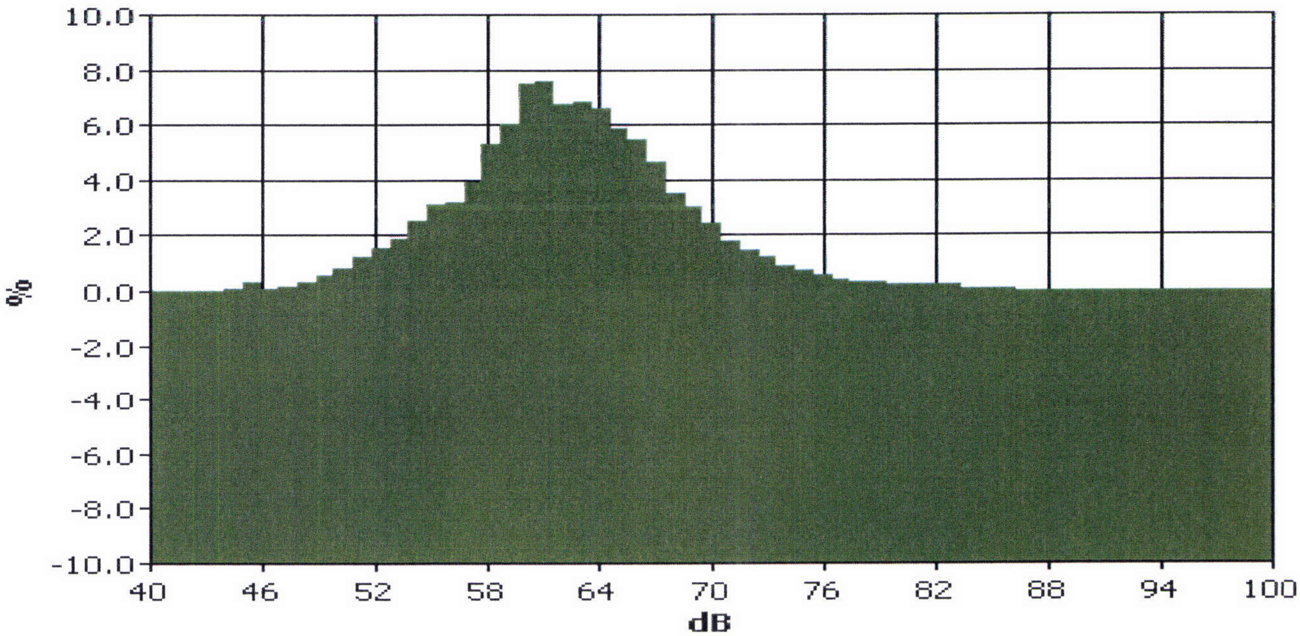
Information Panel

Name	SET-UP #5A
Start Time	Monday, March 22, 2010 10:51:58
Stop Time	Monday, March 22, 2010 11:29:42
Device Model Type	SoundPro DL
Comments	

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	68.7 dB	Exchange Rate	1	3 dB
Weighting	1	A	Response	1	SLOW
Bandwidth	1	OFF	Exchange Rate	2	5 dB
Weighting	2	C	Response	2	SLOW

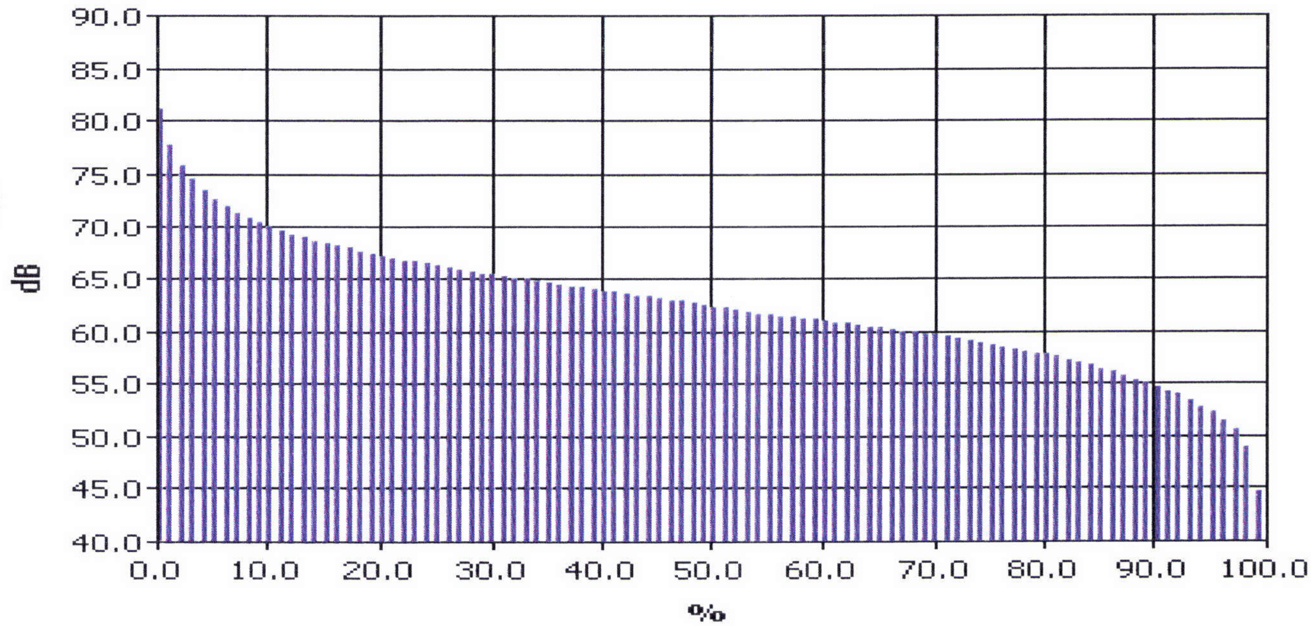
Statistics Chart



dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
43.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
44.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
45.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3
46.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
47.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
48.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
49.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.6
50.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8
51.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.2
52.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	1.5
53.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.9
54.0	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	2.5
55.0	0.3	0.4	0.4	0.2	0.3	0.3	0.3	0.3	0.3	0.3	3.1
56.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	3.1
57.0	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	3.9
58.0	0.5	0.5	0.6	0.4	0.5	0.5	0.6	0.6	0.6	0.6	5.3
59.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	6.0
60.0	0.7	0.7	0.7	0.7	0.8	0.7	0.8	0.8	0.8	0.8	7.5
61.0	0.8	0.8	0.9	0.6	0.8	0.7	0.7	0.7	0.7	0.7	7.5
62.0	0.7	0.7	0.7	0.7	0.6	0.7	0.6	0.7	0.6	0.7	6.7
63.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	6.8
64.0	0.7	0.8	0.8	0.5	0.7	0.6	0.6	0.6	0.6	0.6	6.6
65.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	5.8
66.0	0.6	0.6	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.5	5.5
67.0	0.5	0.5	0.5	0.4	0.5	0.5	0.4	0.4	0.4	0.4	4.6
68.0	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	3.5
69.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	3.0

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
70.0	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.4
71.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.8
72.0	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	1.5
73.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.2
74.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.9
75.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7
76.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.6
77.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
78.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
79.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
80.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
81.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
82.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
83.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
84.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
85.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
86.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
87.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
88.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
89.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
92.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
94.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
98.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exceedance Chart



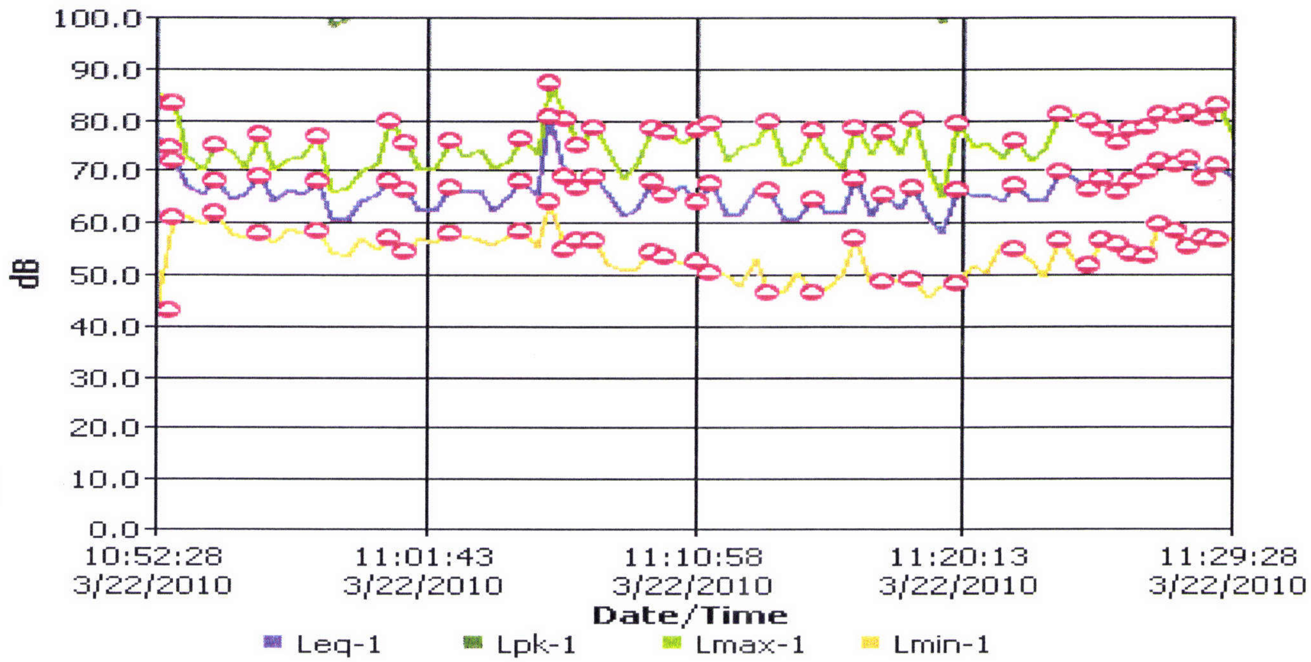
	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		81.0	77.7	75.8	74.5	73.5	72.7	72.0	71.4	70.9
10%	70.5	70.0	69.7	69.3	69.0	68.7	68.4	68.1	67.9	67.6
20%	67.4	67.2	67.0	66.8	66.6	66.4	66.2	66.1	65.9	65.7
30%	65.5	65.4	65.2	65.0	64.9	64.7	64.5	64.4	64.2	64.1
40%	63.9	63.8	63.7	63.5	63.4	63.2	63.1	62.9	62.8	62.6
50%	62.5	62.3	62.2	62.0	61.9	61.7	61.6	61.5	61.3	61.2
60%	61.1	60.9	60.8	60.7	60.6	60.4	60.3	60.2	60.0	59.9
70%	59.7	59.6	59.4	59.2	59.1	58.9	58.7	58.5	58.3	58.1
80%	57.9	57.7	57.5	57.2	56.9	56.7	56.3	56.0	55.7	55.3
90%	55.0	54.7	54.3	53.9	53.4	52.8	52.2	51.4	50.5	49.0
100%	44.6									

S-5

General Data Panel

Description	Meter	Value	Description	Meter	Value
Lpk	1	109.5 dB	Lmax	1	91.8 dB
Lmin	1	44.7 dB	Leq	1	68.7 dB
LDN	1	68.7 dB	Weighting	1	A
Response	1	SLOW	Bandwidth	1	OFF
Exchange Rate	1	3 dB	Int Threshold	1	100 dB
Log Rate	1	30 s	Exchange Rate	2	5 dB
Int Threshold	2	100 dB	Weighting	2	C
Response	2	SLOW	Ln1	1	3 %
Ln2	1	10 %	Ln3	1	50 %
Ln4	1	90 %			

Logged Data Chart



Information Panel

Comments	
Location	
Parent Session	SET-UP #5A
Start Time	Monday, March 22, 2010 10:51:58
Stop Time	Monday, March 22, 2010 11:29:42
User Name	

SET-UP #5B

3/23/2010

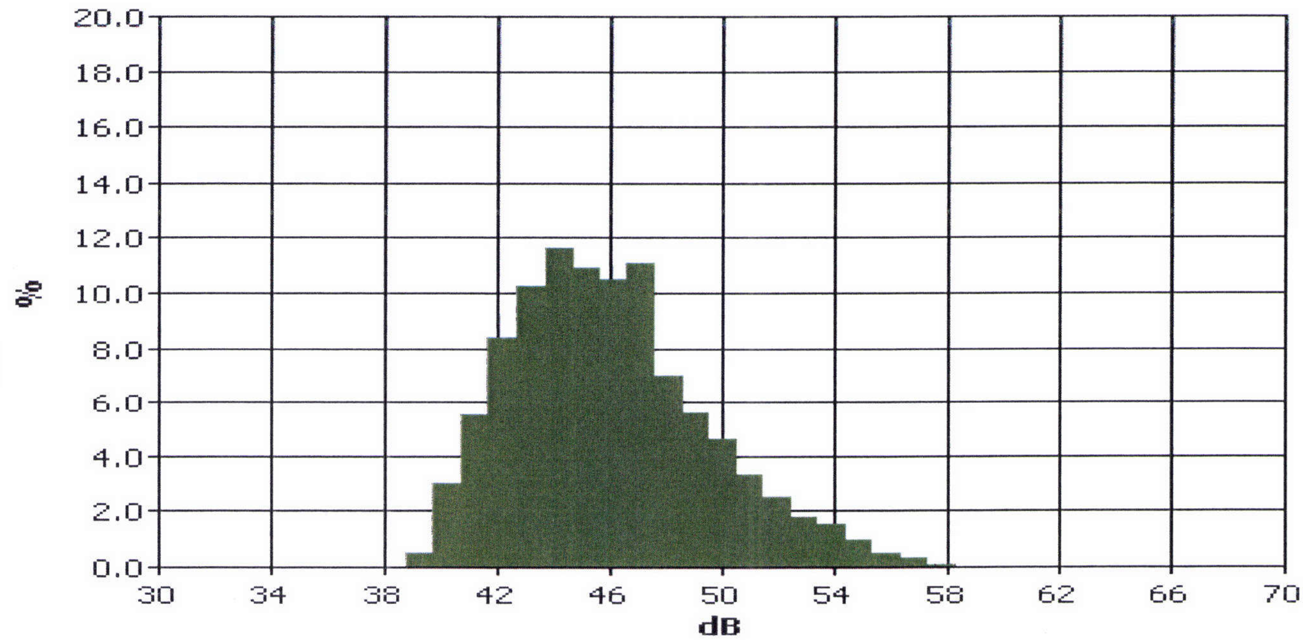
Information Panel

Name	SET-UP #5B
Start Time	Monday, March 22, 2010 12:47:27
Stop Time	Monday, March 22, 2010 13:11:03
Device Model Type	SoundPro DL
Comments	

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	48 dB	Exchange Rate	1	3 dB
Weighting	1	A	Response	1	SLOW
Bandwidth	1	OFF	Exchange Rate	2	5 dB
Weighting	2	C	Response	2	SLOW

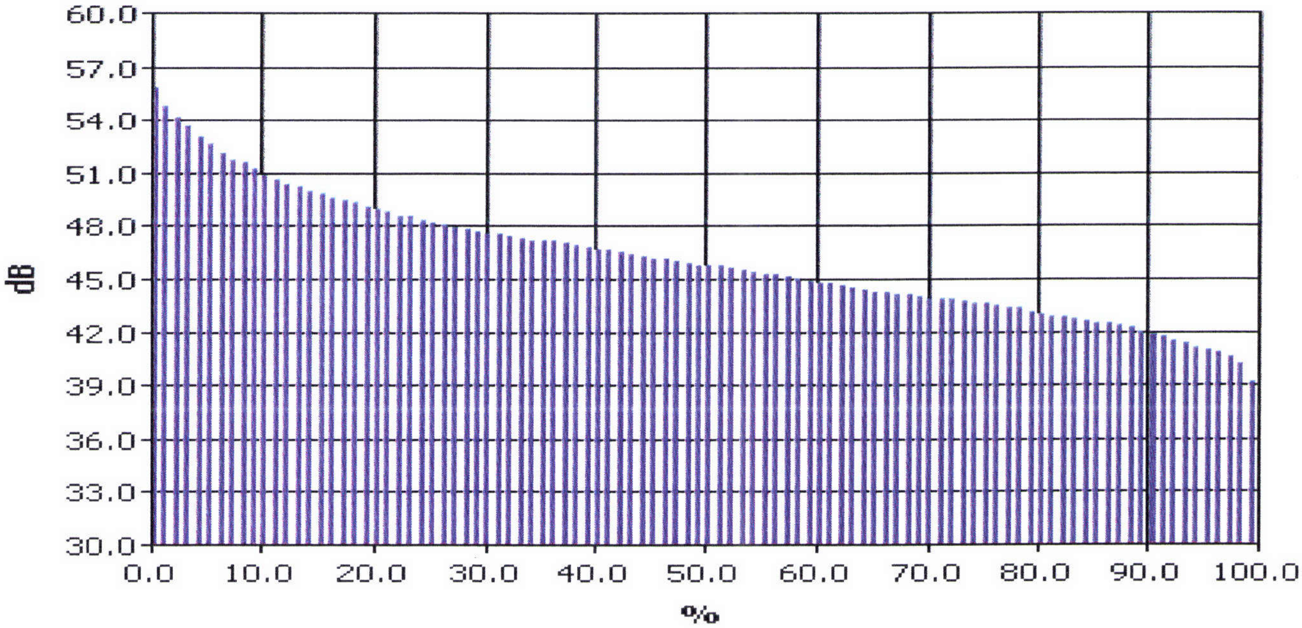
Statistics Chart



dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
36.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
37.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
38.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.5
40.0	0.1	0.1	0.2	0.4	0.3	0.4	0.4	0.3	0.4	0.5	3.0
41.0	0.5	0.5	0.5	0.7	0.5	0.3	0.5	0.7	0.6	0.7	5.5
42.0	0.6	0.6	0.6	0.7	0.8	1.0	1.0	0.8	1.1	1.0	8.3
43.0	1.1	0.9	0.7	0.7	0.8	1.1	1.1	1.2	1.3	1.3	10.3
44.0	1.7	1.4	1.3	1.2	1.1	0.9	1.1	0.9	0.9	1.0	11.6
45.0	0.9	1.0	1.2	1.2	1.0	0.9	1.0	1.2	1.3	1.2	10.9
46.0	1.3	1.1	0.9	1.0	1.0	1.2	1.1	0.8	0.9	1.0	10.5
47.0	0.9	1.3	1.4	1.2	1.1	1.0	1.0	1.0	1.2	0.9	11.0
48.0	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	7.0
49.0	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.5	5.6
50.0	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.4	4.6
51.0	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	3.4
52.0	0.3	0.3	0.2	0.1	0.3	0.2	0.3	0.2	0.2	0.2	2.5
53.0	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	1.8
54.0	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	1.5
55.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0
56.0	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.5
57.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
58.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
66.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
67.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
68.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
69.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
70.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exceedance Chart



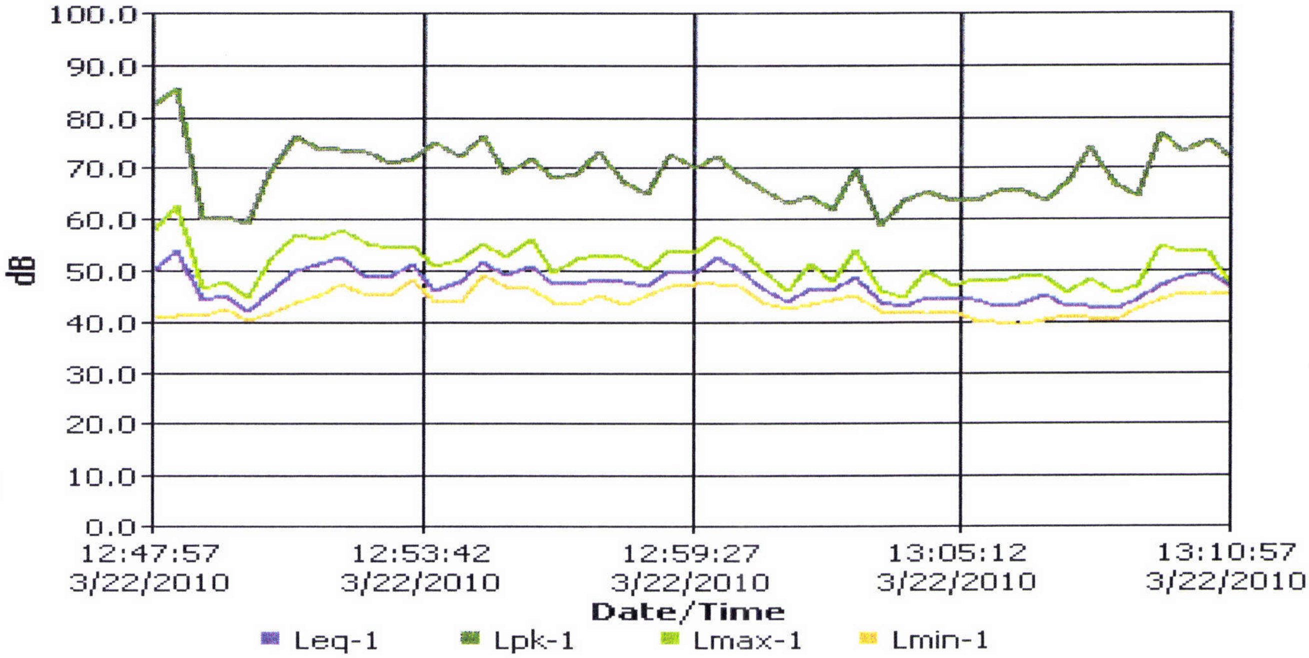
	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		55.8	54.8	54.1	53.6	53.0	52.6	52.1	51.8	51.6
10%	51.2	50.9	50.6	50.4	50.2	50.0	49.8	49.6	49.4	49.3
20%	49.1	48.9	48.8	48.6	48.5	48.3	48.2	48.0	47.9	47.8
30%	47.7	47.6	47.5	47.4	47.3	47.2	47.1	47.1	47.0	46.9
40%	46.8	46.7	46.6	46.5	46.4	46.3	46.2	46.1	46.0	45.9
50%	45.8	45.8	45.7	45.6	45.5	45.4	45.3	45.2	45.1	45.0
60%	44.9	44.8	44.7	44.6	44.5	44.4	44.3	44.2	44.1	44.1
70%	44.0	43.9	43.9	43.8	43.7	43.6	43.6	43.5	43.4	43.3
80%	43.1	43.0	42.9	42.8	42.7	42.6	42.5	42.4	42.3	42.2
90%	42.0	41.8	41.7	41.5	41.3	41.1	40.9	40.8	40.5	40.2
100%	39.2									

S-8

General Data Panel

Description	Meter	Value	Description	Meter	Value
Lpk	1	85.3 dB	Lmax	1	62.7 dB
Lmin	1	39.3 dB	Leq	1	48 dB
LDN	1	48 dB	Weighting	1	A
Response	1	SLOW	Bandwidth	1	OFF
Exchange Rate	1	3 dB	Int Threshold	1	100 dB
Log Rate	1	30 s	Exchange Rate	2	5 dB
Int Threshold	2	100 dB	Weighting	2	C
Response	2	SLOW	Ln1	1	3 %
Ln2	1	10 %	Ln3	1	50 %
Ln4	1	90 %			

Logged Data Chart



Information Panel

Comments	
Location	
Parent Session	SET-UP #5B
Start Time	Monday, March 22, 2010 12:47:27
Stop Time	Monday, March 22, 2010 13:11:03
User Name	

SET-UP #6

3/23/2010

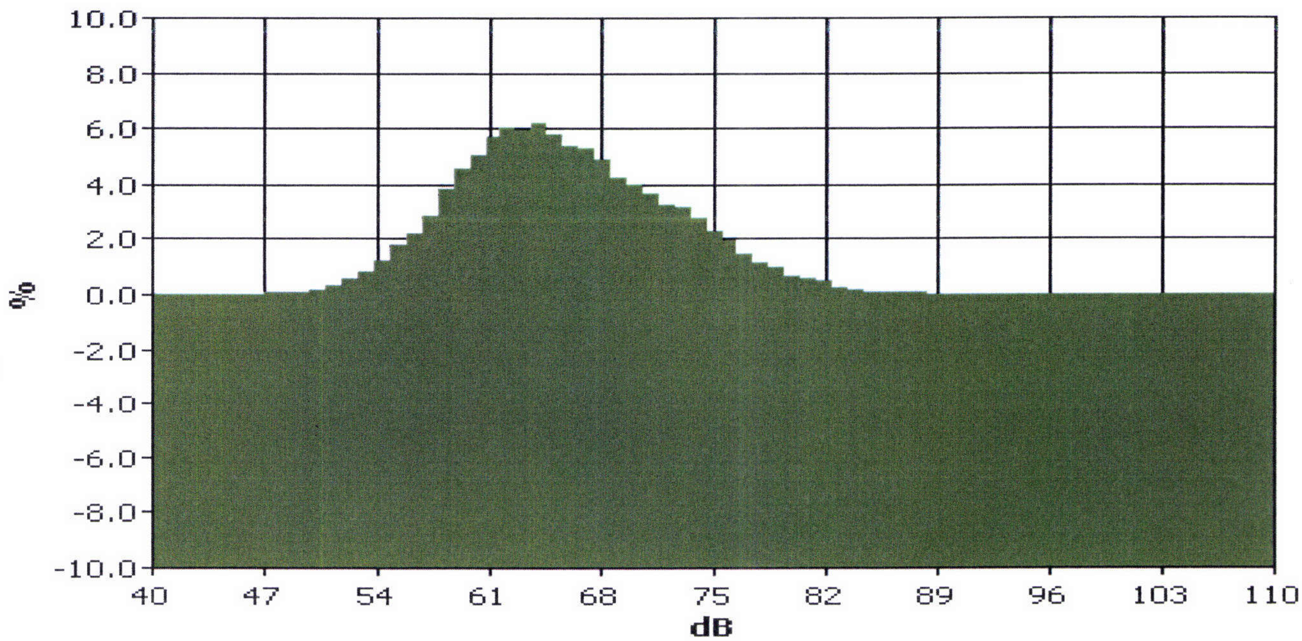
Information Panel

Name	Set-up #6
Start Time	Monday, March 22, 2010 10:55:45
Stop Time	Monday, March 22, 2010 11:38:10
Device Model Type	SoundPro DL
Comments	

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	72.1 dB	Exchange Rate	1	3 dB
Weighting	1	A	Response	1	FAST
Bandwidth	1	OFF	Exchange Rate	2	5 dB
Weighting	2	C	Response	2	FAST

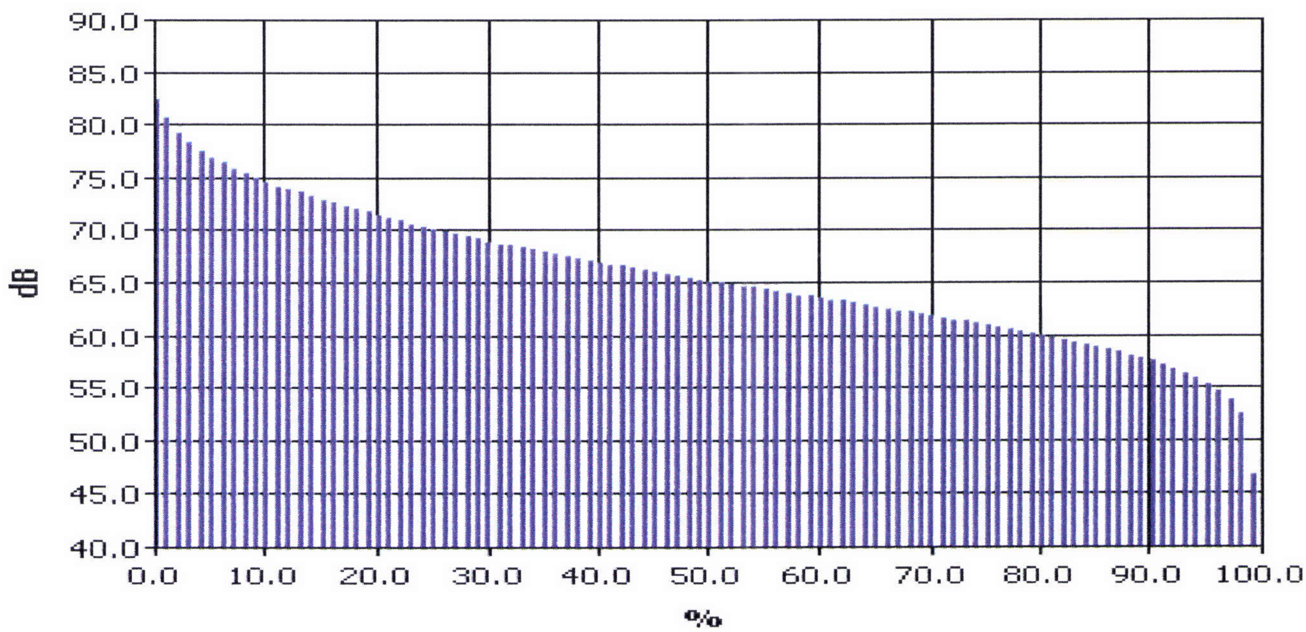
Statistics Chart



dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
43.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
44.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
45.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
46.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
47.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
48.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
49.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
51.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
52.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.5
53.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8
54.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.2
55.0	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.8
56.0	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.2
57.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	2.8
58.0	0.3	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.5	3.8
59.0	0.5	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	4.5
60.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	5.0
61.0	0.5	0.5	0.6	0.5	0.5	0.6	0.6	0.6	0.7	0.7	5.7
62.0	0.7	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	6.0
63.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	5.9
64.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	6.2
65.0	0.7	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	5.8
66.0	0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.5	0.5	5.4
67.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.6	5.3
68.0	0.6	0.6	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.4	4.9
69.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	4.2

dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
70.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	4.0
71.0	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.4	0.3	3.7
72.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	3.3
73.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	3.1
74.0	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	2.7
75.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.3
76.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.0
77.0	0.2	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	1.5
78.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.2
79.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.0
80.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7
81.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.6
82.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.4
83.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
84.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
85.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
86.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
87.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
88.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
89.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
92.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
94.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
98.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
101.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
102.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
103.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
104.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
105.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
106.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
107.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
108.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
109.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
110.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exceedance Chart

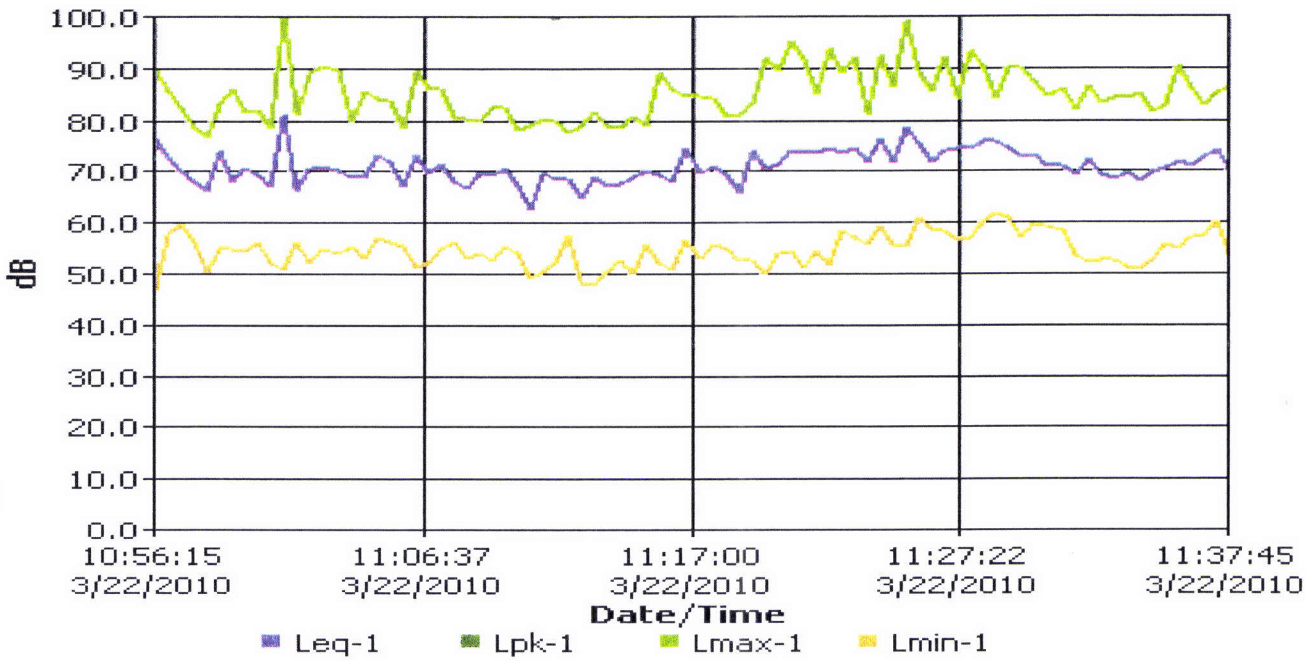


	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		82.3	80.6	79.3	78.4	77.6	76.9	76.4	75.9	75.4
10%	75.0	74.6	74.2	73.9	73.6	73.2	72.9	72.6	72.3	72.0
20%	71.7	71.4	71.2	70.9	70.6	70.4	70.1	69.9	69.7	69.4
30%	69.2	68.9	68.7	68.5	68.3	68.1	67.9	67.7	67.5	67.3
40%	67.1	67.0	66.8	66.6	66.4	66.2	66.0	65.8	65.6	65.5
50%	65.3	65.1	64.9	64.8	64.6	64.5	64.3	64.2	64.0	63.8
60%	63.7	63.5	63.3	63.2	63.0	62.8	62.6	62.5	62.3	62.2
70%	62.0	61.8	61.7	61.5	61.3	61.1	60.9	60.8	60.6	60.4
80%	60.2	60.0	59.8	59.5	59.3	59.1	58.9	58.6	58.4	58.1
90%	57.8	57.5	57.1	56.7	56.3	55.8	55.3	54.6	53.7	52.4
100%	46.7									

S-43
General Data Panel

Description	Meter	Value	Description	Meter	Value
Lpk	1	124.2 dB	Lmax	1	100.1 dB
Lmin	1	46.8 dB	Leq	1	72.1 dB
LDN	1	72.1 dB	Weighting	1	A
Response	1	FAST	Bandwidth	1	OFF
Exchange Rate	1	3 dB	Int Threshold	1	124 dB
Log Rate	1	30 s	Exchange Rate	2	5 dB
Int Threshold	2	80 dB	Weighting	2	C
Response	2	FAST	Ln1	1	5 %
Ln2	1	25 %	Ln3	1	50 %
Ln4	1	90 %			

Logged Data Chart



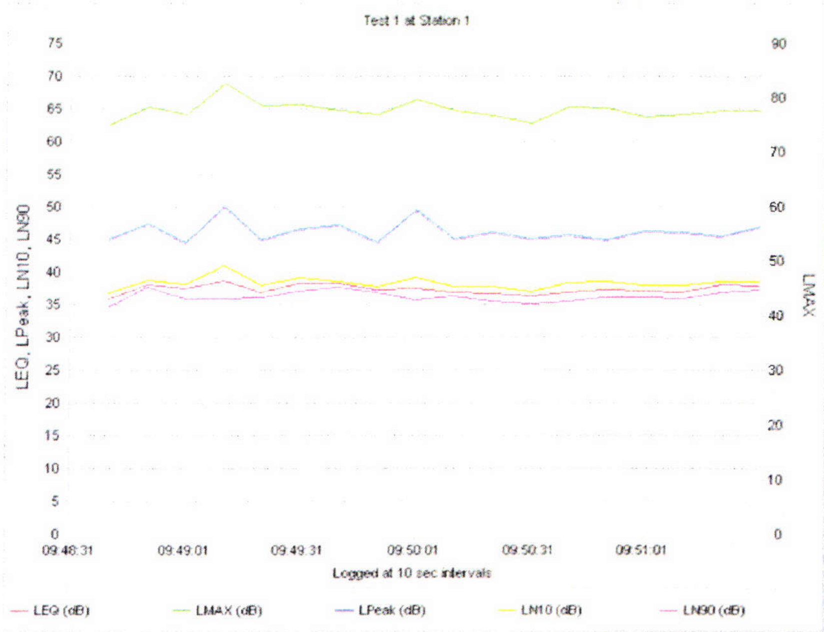
Information Panel

Comments	
Location	
Name	S-43
Parent Session	Set-up #6
Start Time	Monday, March 22, 2010 10:55:45
Stop Time	Monday, March 22, 2010 11:38:10
User Name	

Quarry Equipment Study
Test 1

Station 1

Test Started:	11/3/2005 9:48:31 AM
Test Ended:	11/3/2005 9:51:31 AM
Run Time:	00:03:00 Minutes



Measuring Parameters

Range:	50 - 110 dB
Weighting:	A
Time Constant:	Slow
Threshold:	Off
Exchange Rate:	3 dB
Peak Weighting:	A

Summary

Peak Level:	99.8 dB, 11/3/2005 9:49:08AM
Overload:	0.00%
Min Level:	69.5 dB, 11/3/2005 9:48:35AM
Max Level:	82.5 dB, 11/3/2005 9:49:08AM

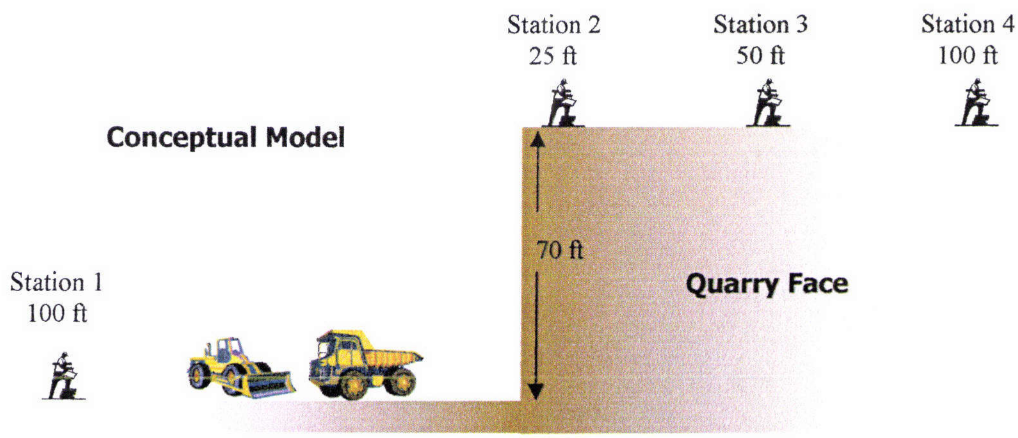
LEQ:	75.1 dB	SEL(3):	97.6 dB	TWA:	53.1 dB	TAKM5:	76.8 dB
LDN:	75.1 dB	CNEL:	75.1 dB	Pa2Sec:	2.3		
L5:	77.8 dB	L10:	77.2 dB	L50:	74.5 dB	L90:	72.0 dB

Comments:

The source of noise disturbance recorded at this facility include a 988 CAT Loader and a 769 Haul Truck loading material at the quarry face.

Work Area:	Station 1 - On Quarry Floor
Description:	Approximately 100 feet from equipment.

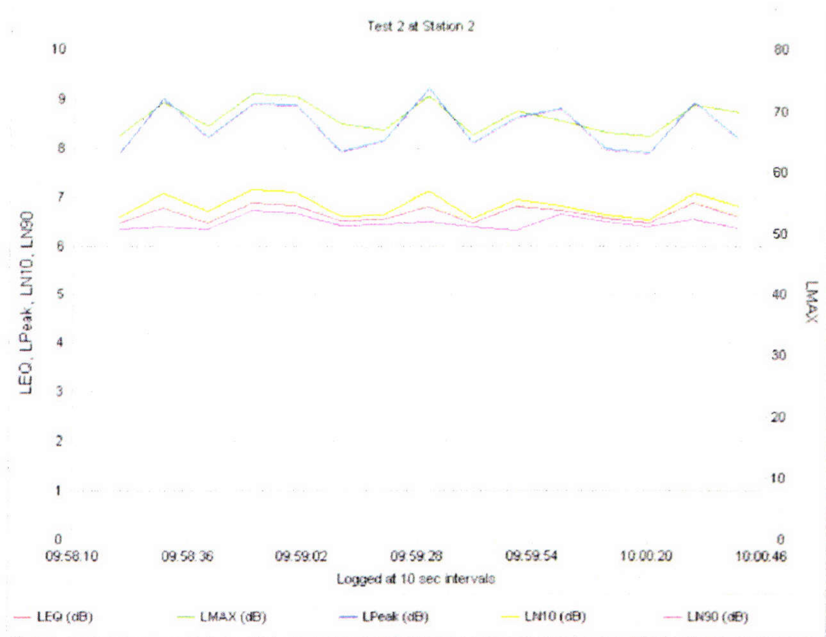
FW Version:	02.4
Instrument:	2900 Integrating/Logging Sound Level Meter
Serial Number:	CD030035



Quarry Equipment Study
Test 2

Station 2

Test Started: 11/3/2005 9:58:10 AM
Test Ended: 11/3/2005 10:00:46 AM
Run Time: 00:02:35 Minutes



Measuring Parameters

Range: 50 - 110 dB
Weighting: A
Time Constant: Slow
Threshold: Off
Exchange Rate: 3 dB
Peak Weighting: A

Summary

Peak Level: 92.0 dB, 11/3/2005 9:59:25AM
Overload: 0.00%
Min Level: 62.8 dB, 11/3/2005 9:59:40AM
Max Level: 72.8 dB, 11/3/2005 9:58:43AM

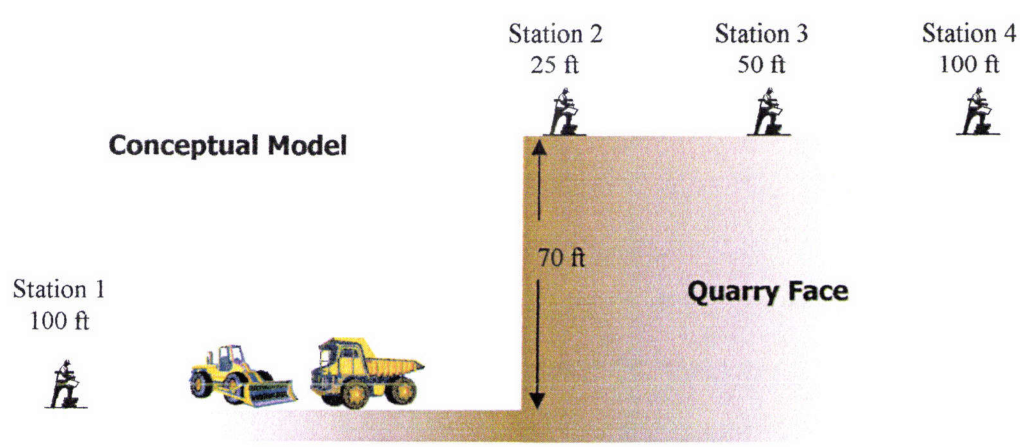
LEQ:	66.8 dB	SEL(3):	88.6 dB	TWA:	44.2 dB	TAKM5:	68.9 dB
LDN:	66.8 dB	CNEL:	66.8 dB	Pa2Sec:	0.3		
L5:	70.4 dB	L10:	69.5 dB	L50:	65.8 dB	L90:	64.1 dB

Comments:

The source of noise disturbance recorded at this facility include a 988 CAT Loader and a 769 Haul Truck loading material at the quarry face.

Work Area: Station 2 - Atop Quarry Face
Description: Approximately 25 feet from equipment.

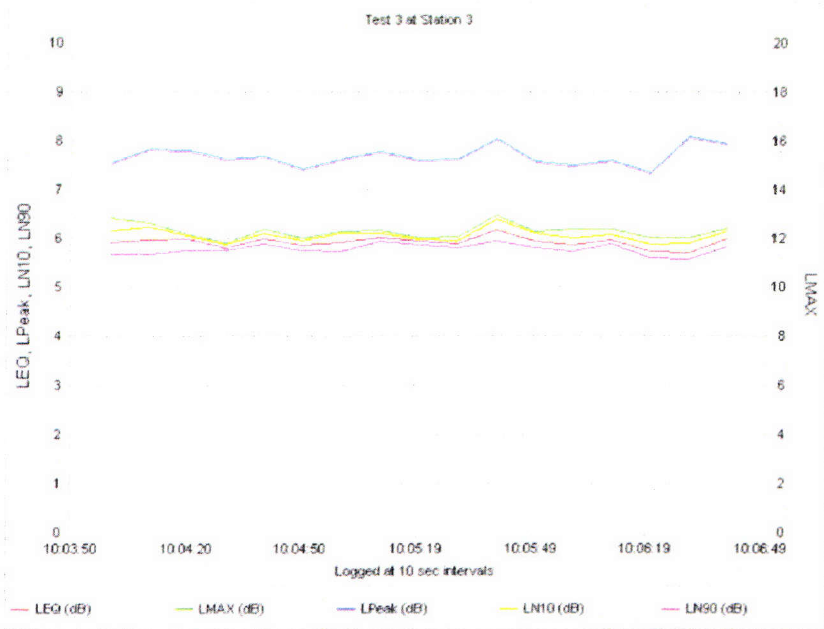
FW Version: 02.4
Instrument: 2900 Integrating/Logging Sound Level Meter
Serial Number: CD030035



Quarry Equipment Study
Test 3

Station 3

Test Started:	11/3/2005 10:03:50 AM
Test Ended:	11/3/2005 10:06:49 AM
Run Time:	00:02:58 Minutes



Measuring Parameters

Range:	50 - 110 dB
Weighting:	A
Time Constant:	Slow
Threshold:	Off
Exchange Rate:	3 dB
Peak Weighting:	A

Summary

Peak Level:	80.6 dB, 11/3/2005 10:06:29AM
Overload:	0.00%
Min Level:	55.3 dB, 11/3/2005 10:06:23AM
Max Level:	64.5 dB, 11/3/2005 10:05:36AM

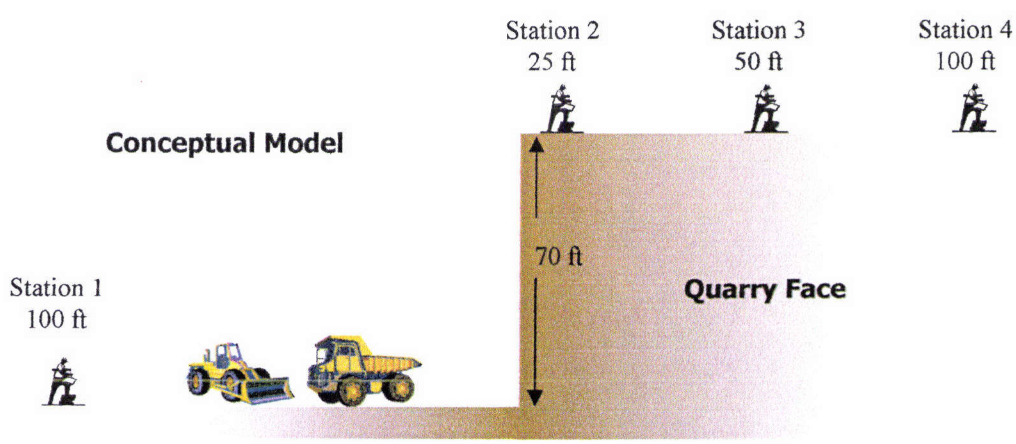
LEQ:	59.3 dB	SEL(3):	81.7 dB	TWA:	37.3 dB	TAKM5:	60.7 dB
LDN:	59.3 dB	CNEL:	59.3 dB	Pa2Sec:	0.1		
L5:	61.5 dB	L10:	60.9 dB	L50:	59.1 dB	L90:	56.9 dB

Comment

The source of noise disturbance recorded at this facility include a 988 CAT Loader and a 769 Haul Truck loading material at the quarry face.

Work Area:	Station 3 - Atop Quarry Face
Description:	Approximately 50 feet from quarry face edge and equipment.

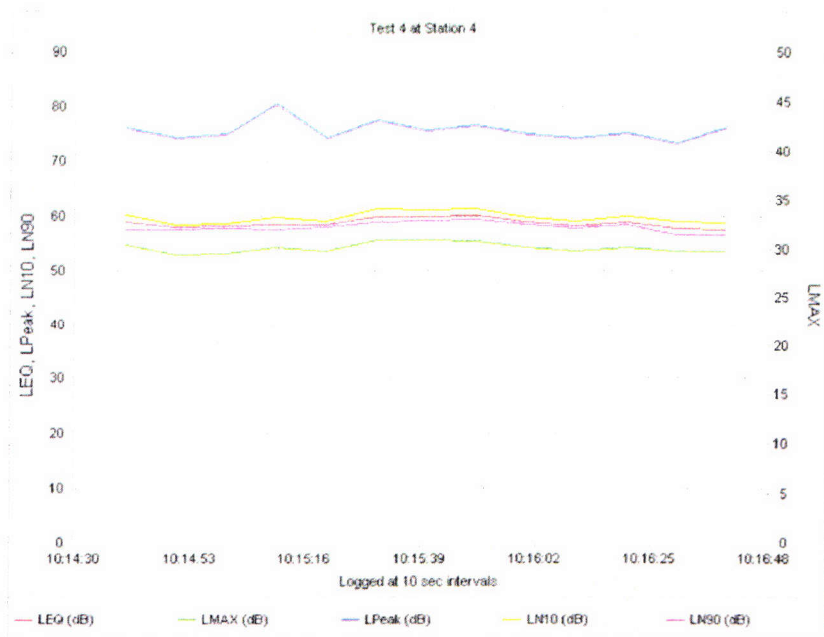
FW Version:	02.4
Instrument:	2900 Integrating/Logging Sound Level Meter
Serial Number:	CD030035



Quarry Equipment Study
Test 4

Station 4

Test Started:	11/3/2005 10:14:30 AM
Test Ended:	11/3/2005 10:16:48 AM
Run Time:	00:02:17 Minutes



Measuring Parameters

Range:	50 - 110 dB
Weighting:	A
Time Constant:	Slow
Threshold:	Off
Exchange Rate:	3 dB
Peak Weighting:	A

Summary

Peak Level:	80.5 dB, 11/3/2005 10:15:01AM
Overload:	0.00%
Min Level:	56.4 dB, 11/3/2005 10:16:26AM
Max Level:	61.6 dB, 11/3/2005 10:15:26AM

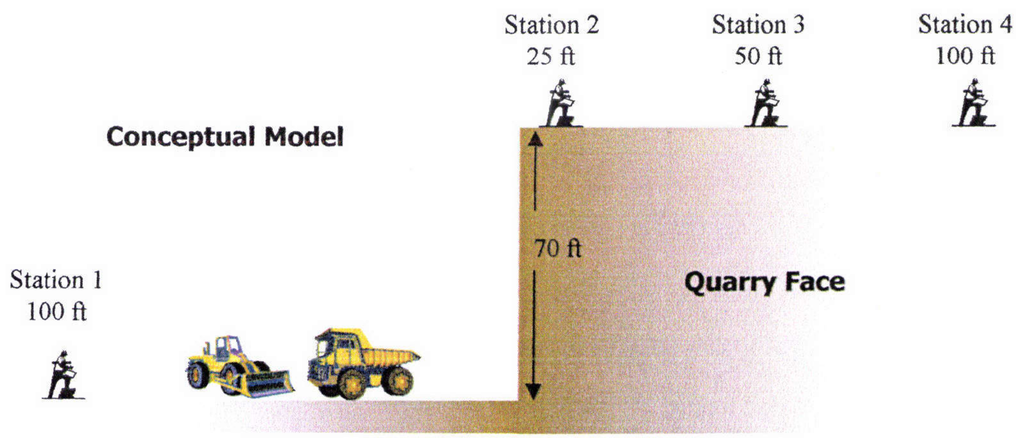
LEQ:	58.8 dB	SEL(3):	80.2 dB	TWA:	35.7 dB	TAKM5:	59.5 dB
LDN:	58.8 dB	CNEL:	58.8 dB	Pa2Sec:	0.0		
L5:	60.6 dB	L10:	60.1 dB	L50:	58.7 dB	L90:	57.7 dB

Comment

The source of noise disturbance recorded at this facility include a 988 CAT Loader and a 769 Haul Truck loading material at the quarry face.

Work Area:	Station 4 - Atop Quarry Face
Description:	Approximately 100 feet from quarry face edge and equipment.

FW Version:	02.4
Instrument:	2900 Integrating/Logging Sound Level Meter
Serial Number:	CD030035



SOUND LEVEL CALCULATIONS

LEVEL 1

Receptor Station 1, Scenario 1

Formula: SPL2 = SPL1 + 20 log (d1/d2)

Assume:

Process Plant	71.9 dB(A) @ 200 ft.
In-pit Loader and crusher	74 dB(A) @ 200 ft.
Rock Drill	68.8 dB(A) @ 200 ft.
SLD to structure:	1300' from plant
SLD to structure:	700' from pit

SPL2 = 71.9 + 20 log (200/1300)
SPL2 = 55.6 dB(A) from process plant

SPL1 = 68.8 dB(A) + 74 dB(A) = 75 dB(A)

SPL2 = 75 + 20 log (200/700)

SPL2 = 64.1 dB(A) from loader, crusher and drill

TOTAL @ receptor = 55.6 dB(A) + 64.1 dB(A) + *49.3 dB(A) = 65.1 dB(A) *receptor average

Receptor Station 2, Scenario 2

Assume:

Process Plant	71.9 dB(A) @ 200 ft.
In-pit Loader and crusher	74 dB(A) @ 200 ft.
Rock Drill	68.8 dB(A) @ 200 ft.
SLD to structure:	1300' from plant
SLD to structure:	300' from pit

SPL2 = 71.9 + 20 log (200/1300)
SPL2 = 55.6 dB(A) from process plant

SPL1 = 68.8 dB(A) + 74 dB(A) = 75 dB(A)

SPL2 = 75 + 20 log (200/300)

SPL2 = 71.5 dB(A) from loader, crusher and drill

TOTAL @ receptor = 55.6 dB(A) + 71.5 dB(A) + *52.2 dB(A) = 71.5 dB(A) *receptor average

Receptor Station 3, Scenario 3

Assume:

Process Plant	71.9 dB(A) @ 200 ft.
In-pit Loader and crusher	74 dB(A) @ 200 ft.
Rock Drill	68.8 dB(A) @ 200 ft.
SLD to structure:	3700' from plant
SLD to structure:	300' from pit

SPL2 = 71.9 + 20 log (200/3700)
SPL2 = 46.6 dB(A) from process plant

SPL1 = 68.8 dB(A) + 74 dB(A) = 75 dB(A)

SPL2 = 75 + 20 log (200/300)

SPL2 = 71.5 dB(A) from pit

TOTAL @ receptor = 46.6 dB(A) + 71.5 dB(A) + *51.1 dB(A) = 71.5 dB(A) *receptor average

LEVEL 2

Scenario 1, Receptor 1

Formula: $Z = \frac{H^2}{D}$

Assume: H = 68 feet
D = 700 feet

$Z = \frac{(68)^2}{700} = 6.6$

From table: 18 dB(A) reduction
dB(A) reduction: 64.1 dB(A) - 18 dB(A) = 46.1 dB(A)

TOTAL @ receptor = 46.1 dB(A) + 55.6 (from plant) = 56.6 dB(A)

Scenario 2, Receptor 2

Formula: $Z = \frac{H^2}{D}$

Assume: H = 80 feet
D = 300 feet

$Z = \frac{(80)^2}{300} = 21.3$

From table: 24 dB(A) reduction
dB(A) reduction: 71.5 dB(A) - 24 dB(A) = 47.5 dB(A)

TOTAL @ receptor = 47.5 dB(A) + 55.6 (from plant) = 56.6 dB(A)

Scenario 3, Receptor 3

Formula: $Z = \frac{H^2}{D}$

Assume: H = 80 feet
D = 300 feet

$Z = \frac{(80)^2}{300} = 21.3$

From table: 24 dB(A) reduction
dB(A) reduction: 71.5 dB(A) - 24 dB(A) = 47.5 dB(A)

TOTAL @ receptor = 47.5 dB(A) + 46.6 (from plant) = 50.5 dB(A)

LEVEL 3

Scenario 1, Receptor 1

Assume: 600 ft from process plant to berm
700 ft from berm to receptor (process plant)
500 ft from berm to receptor (pit activity)

71.9 dB(A) - 6 dB(A) distance - 10 dB(A) berm = 55.9 dB(A)
55.9 dB(A) - 15 dB(A) distance to receptor from back side of berm = 40.9 dB(A) @ receptor from process plant

Drill activity = 68.8 dB(A)

68.8 dB(A) - 10 dB(A) berm = 58.8 dB(A) at back side of berm
58.8 dB(A) - 12 dB(A) distance from backside of berm to receptor = 46.8 dB(A) @ receptor from drill

In pit activity (crusher and loader) = 66 dB(A) @ 25′ from highwall edge (74 - 8 dBA typical @ 25′ back)

66 dB(A) - 10 dB(A) berm = 56 dB(A) at back side of berm
56 dB(A) - 12 dB(A) distance from backside of berm to receptor = 44 dB(A) @ receptor from crusher and loader

TOTAL = 40.9 dB(A) from plant + 46.8 dB(A) from drill + 44 dB(A) from pit activity

TOTAL = 49.8 dB(A)

Scenario 2, Receptor 2

Assume: 400 ft from process plant to berm
600 ft from berm to receptor (process plant)
400 ft from berm to receptor (pit activity)

71.9 dB(A) - 6 dB(A) distance - 10 dB(A) berm = 55.9 dB(A)
55.9 dB(A) - 14 dB(A) distance to receptor from back side of berm = 41.9 dB(A) @ receptor from process plant

Drill activity = 68.8 dB(A)

68.8 dB(A) - 10 dB(A) berm = 58.8 dB(A) at back side of berm
58.8 dB(A) - 12 dB(A) distance from backside of berm to receptor = 46.8 dB(A) @ receptor from drill

In pit activity (crusher and loader) = 66 dB(A) @ 25′ from highwall (74-8 dBA typical @ 25′ back)

66 dB(A) - 10 dB(A) berm = 56 dB(A) at back side of berm
56 dB(A) - 12 dB(A) distance from backside of berm to receptor = 44 dB(A) @ receptor from crusher and loader

TOTAL = 41.9 dB(A) from plant + 46.8 dB(A) from drill + 44 dB(A) from pit activity

TOTAL = 49.8 dB(A)

Scenario 3, Receptor 3

Assume: 3200 ft from process plant to berm
400 ft from berm to receptor (process plant)
400 ft from berm to receptor (pit activity)

71.9 dB(A) - 24 dB(A) distance - 10 dB(A) berm = 37.9 dB(A)
37 dB(A) - 12 dB(A) = 25.9 dB(A) @ receptor from process plant

Drill activity = 68.8 dB(A)

68.8 dB(A) - 10 dB(A) berm = 58.8 dB(A) at back side of berm
58.8 dB(A) - 12 dB(A) distance = 46.8 dB(A) @ receptor from drill

In pit activity (crusher and loader) = 66 dB(A) @ 25′ from highwall (74 - 8 dBA typical 25′ back)

66 dB(A) - 10 dB(A) berm = 56 dB(A) at back side of berm
56 dB(A) - 12 dB(A) distance = 44 dB(A) @ receptor from crusher and loader

TOTAL = 25.9 dB(A) from plant + 46.8 dB(A) from drill + 44 dB(A) from pit activity

TOTAL = 48.8 dB(A)

Summary of Processing Plant Sound Pressure Level Data - Normalized to 200 Feet

Data Type	Data Source	Reference Distance	L(A)eq	L(A)eq Sound Pressure Level by Octave-Band										
				16 Hz	32 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	16 kHz
			dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
Normalized	Table 19: Station 1	200 ft	75.5	35.6	36.1	50.6	59.4	65.0	64.6	70.4	71.3	66.0	56.2	36.0
	Table 19: Station 2		69.6	35.6	35.6	44.6	56.2	57.5	58.6	63.7	64.7	62.8	54.7	38.6
	Table 19: Station 3		71.8	35.6	36.1	46.5	61.0	61.7	64.1	65.6	66.0	62.5	55.0	36.9
	Average of Stations 1-3		73.0	35.6	35.9	48.0	59.3	62.4	63.1	67.5	68.3	64.1	55.3	37.3
Normalized	Table 21: Sample U	200 ft	72.1	-	-	-	-	-	-	-	-	-	-	-
Normalized	Table 22: Sample 5	200 ft	70.2	23.0	31.8	51.5	52.7	60.0	63.5	66.5	63.0	57.8	47.9	29.7
Overall Average			**71.9**											

Summary of Rock Drill Sound Pressure Level Data - Normalized to 200 Feet

Data Type	Data Source	Reference Distance	L(A)eq	L(A)eq Sound Pressure Level by Octave-Band										
				16 Hz	32 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	16 kHz
			dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
Normalized	Table 20: Station 1	200 ft	69.1	-	-	-	-	-	-	-	-	-	-	-
Normalized	Table 22: Sample 4	200 ft	68.6	-6.4	20.0	38.6	56.1	55.6	59.7	64.2	63.4	58.5	49.7	39.0
Overall Average			**68.8**											

Notes:
Normalization' based on geometric spreading (drop-off with distance) only
Average' refers to "energy (logarithmic) average"

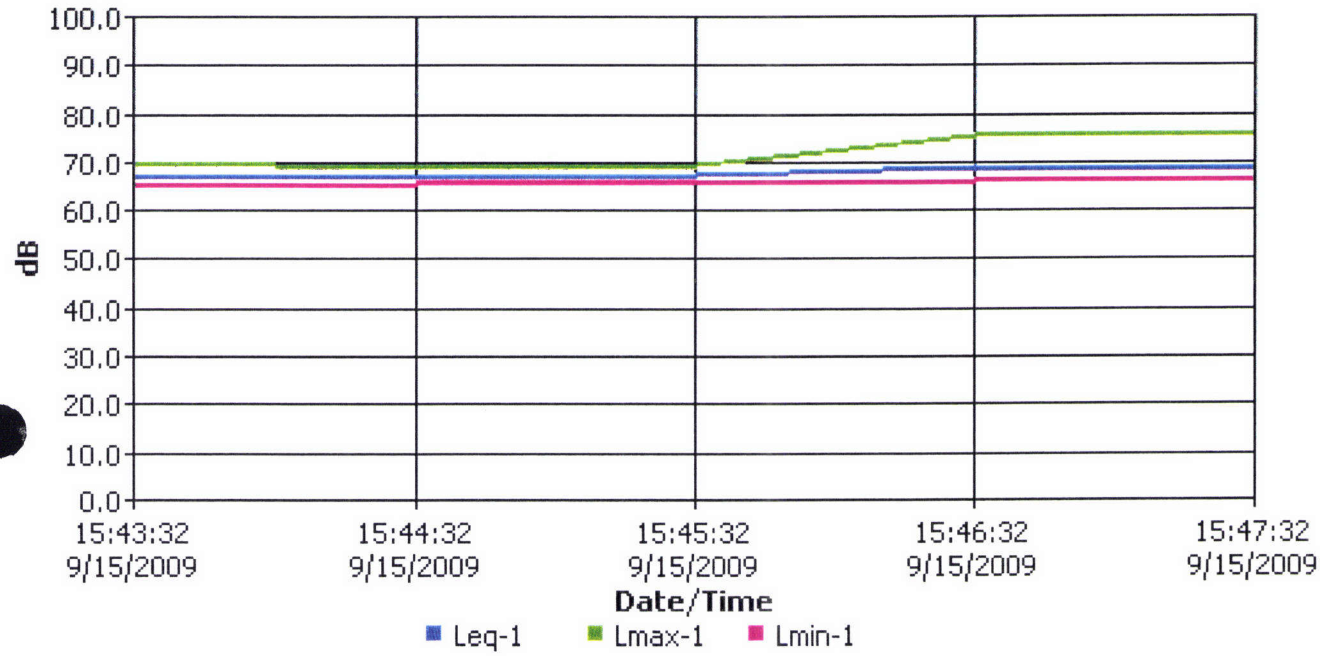
Primary Crusher, 200 Ft, 9-15-09

10/6/2009

General Data Panel

Description	Meter	Value	Description	Meter	Value
Lpk	1	95.8 dB	Lmax	1	75.4 dB
Lmin	1	64.6 dB	Leq	1	67.2 dB
LDN	1	--	Weighting	1	A
Response	1	SLOW	Bandwidth	1	1/1
Exchange Rate	1	3 dB	Int Threshold	1	100 dB
Log Rate	1	60 s	Exchange Rate	2	5 dB
Int Threshold	2	100 dB	Weighting	2	A
Response	2	SLOW	Ln1	1	3 %
Ln2	1	10 %	Ln3	1	50 %
Ln4	1	90 %			

Logged Data Chart



Information Panel

Comments	Primary Crusher, 200 ft back, 9-15-09
Parent Session	primary crusher 200' back 9-15-09
Start Time	Tuesday, September 15, 2009 15:42:32
Stop Time	Tuesday, September 15, 2009 15:47:33
User Name	Brent Tardif

Primary Crusher, 200 Ft, 9-15-09

10/6/2009

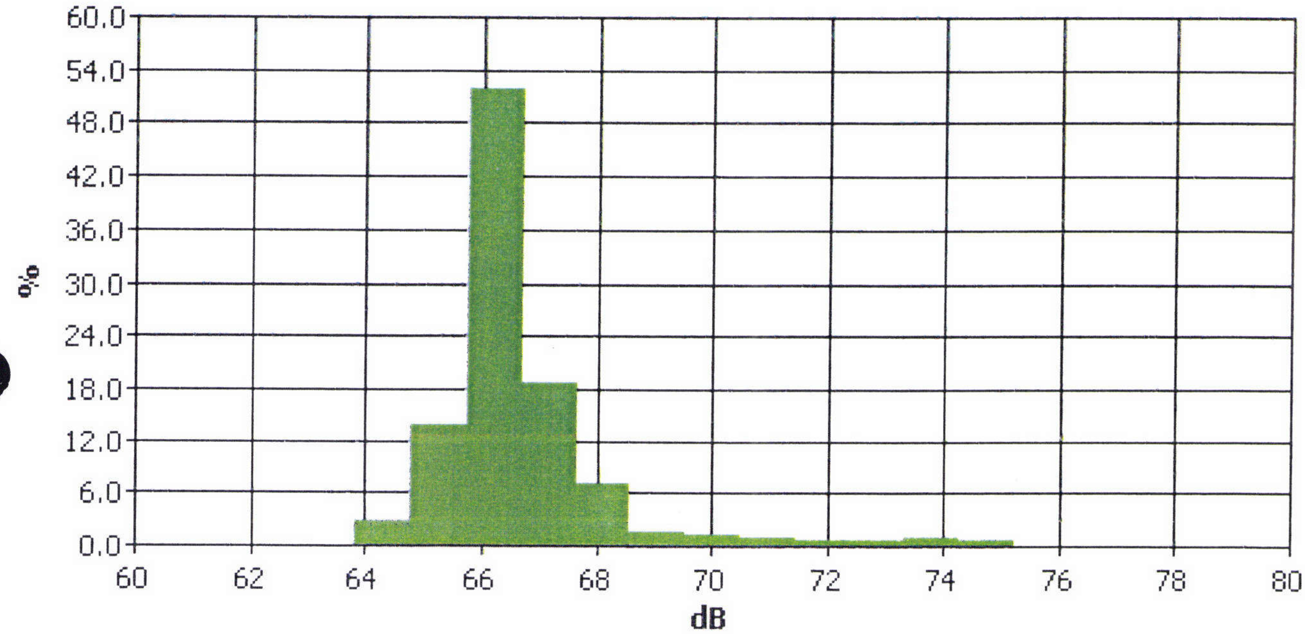
Information Panel

Name	primary crusher 200' back 9-15-09
Start Time	Tuesday, September 15, 2009 15:42:32
Stop Time	Tuesday, September 15, 2009 15:47:33
Device Model Type	SoundPro DL
Comments	

General Data Panel

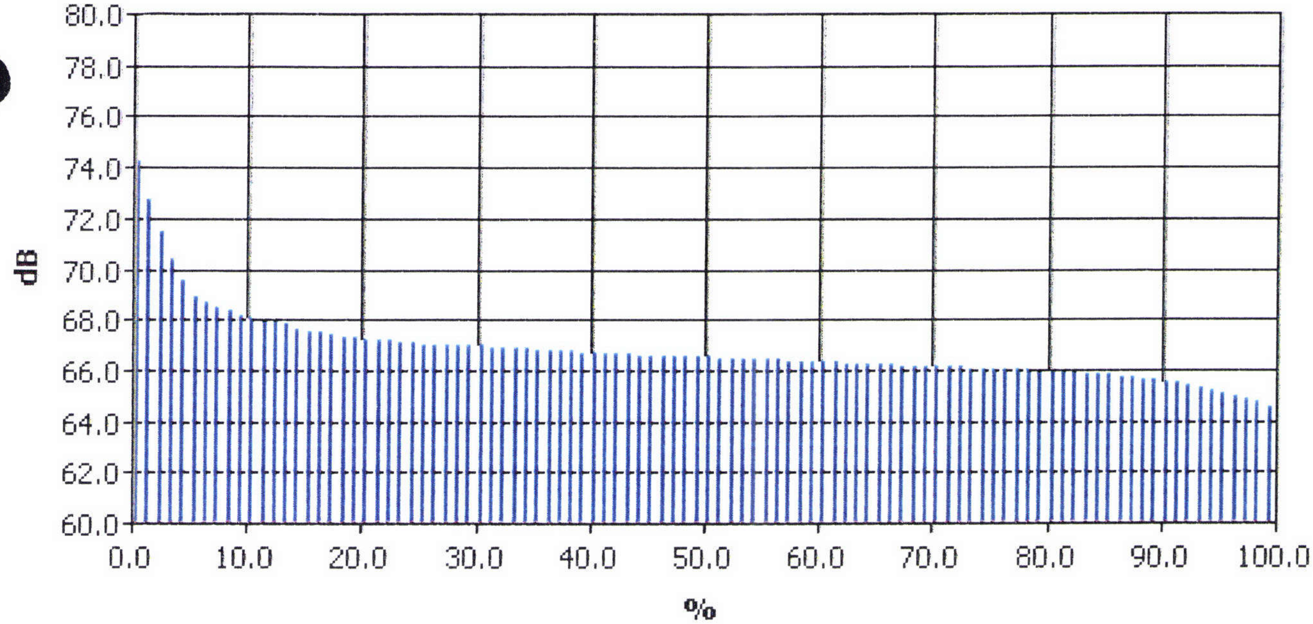
Description	Meter	Value	Description	Meter	Value
Leq	1	67.2 dB	Exchange Rate	1	3 dB
Weighting	1	A	Response	1	SLOW
Bandwidth	1	1/1	Exchange Rate	2	5 dB
Weighting	2	A	Response	2	SLOW

Statistics Chart



dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	1.0	1.4	2.7
65.0	0.8	1.1	0.8	0.7	0.6	1.0	1.6	2.0	2.1	3.1	13.7
66.0	4.6	5.2	6.0	5.2	5.4	5.9	6.4	5.1	4.0	3.9	51.7
67.0	2.9	3.1	2.9	2.2	1.9	1.4	1.6	0.9	0.8	0.8	18.7
68.0	1.3	1.1	0.8	0.6	0.6	0.8	0.6	0.5	0.4	0.5	7.1
69.0	0.3	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.1	1.6
70.0	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	1.2
71.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.8
72.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.7
73.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.2	0.1	0.1	0.7
74.0	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.8
75.0	0.0	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5
76.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
77.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
78.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
79.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
80.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exceedance Chart



	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		74.2	72.7	71.4	70.4	69.5	68.9	68.7	68.5	68.3
10%	68.1	68.0	67.9	67.9	67.8	67.6	67.5	67.5	67.4	67.3
20%	67.3	67.2	67.2	67.2	67.1	67.1	67.0	67.0	67.0	67.0
30%	66.9	66.9	66.8	66.8	66.8	66.8	66.7	66.7	66.7	66.7
40%	66.6	66.6	66.6	66.6	66.6	66.5	66.5	66.5	66.5	66.5
50%	66.5	66.5	66.4	66.4	66.4	66.4	66.4	66.4	66.3	66.3
60%	66.3	66.3	66.3	66.2	66.2	66.2	66.2	66.2	66.1	66.1
70%	66.1	66.1	66.1	66.1	66.0	66.0	66.0	66.0	66.0	66.0
80%	65.9	65.9	65.9	65.9	65.8	65.8	65.8	65.7	65.7	65.6
90%	65.6	65.5	65.5	65.4	65.2	65.1	65.0	64.9	64.8	64.7
100%	64.5									

John Deere 8410 Cultivating 100 ft.

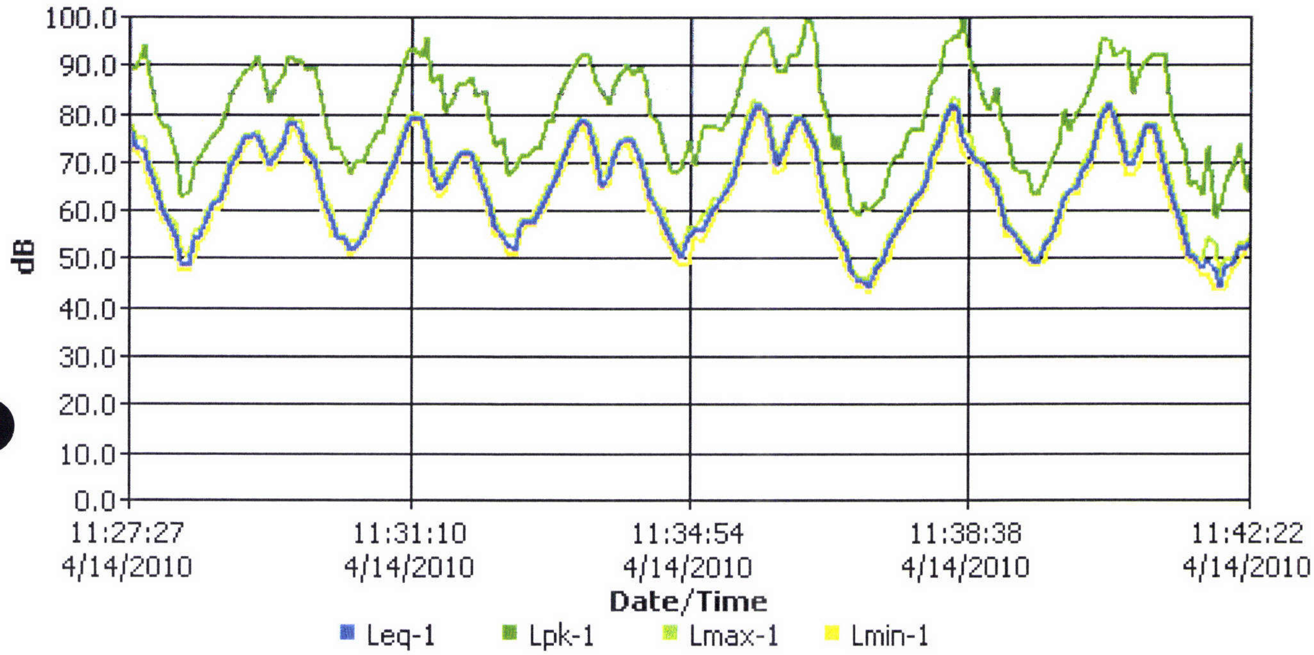
4/16/2010

General Data Panel

Description	Meter	Value
Lpk	1	101.6 dB
Lmin	1	43.1 dB
LDN	1	71.9 dB
Response	1	SLOW
Exchange Rate	1	3 dB
Log Rate	1	5 s
Int Threshold	2	100 dB
Response	2	FAST
Ln2	1	10 %
Ln4	1	90 %

Description	Meter	Value
Lmax	1	82.6 dB
Leq	1	71.9 dB
Weighting	1	A
Bandwidth	1	1/1
Int Threshold	1	100 dB
Exchange Rate	2	3 dB
Weighting	2	C
Ln1	1	5 %
Ln3	1	50 %

Logged Data Chart



Information Panel

Comments	
Location	
Parent Session	John Deere 8410 plowing 100-200 ft
Start Time	Wednesday, April 14, 2010 11:27:22
Stop Time	Wednesday, April 14, 2010 11:42:24
User Name	

Session Report

4/16/2010

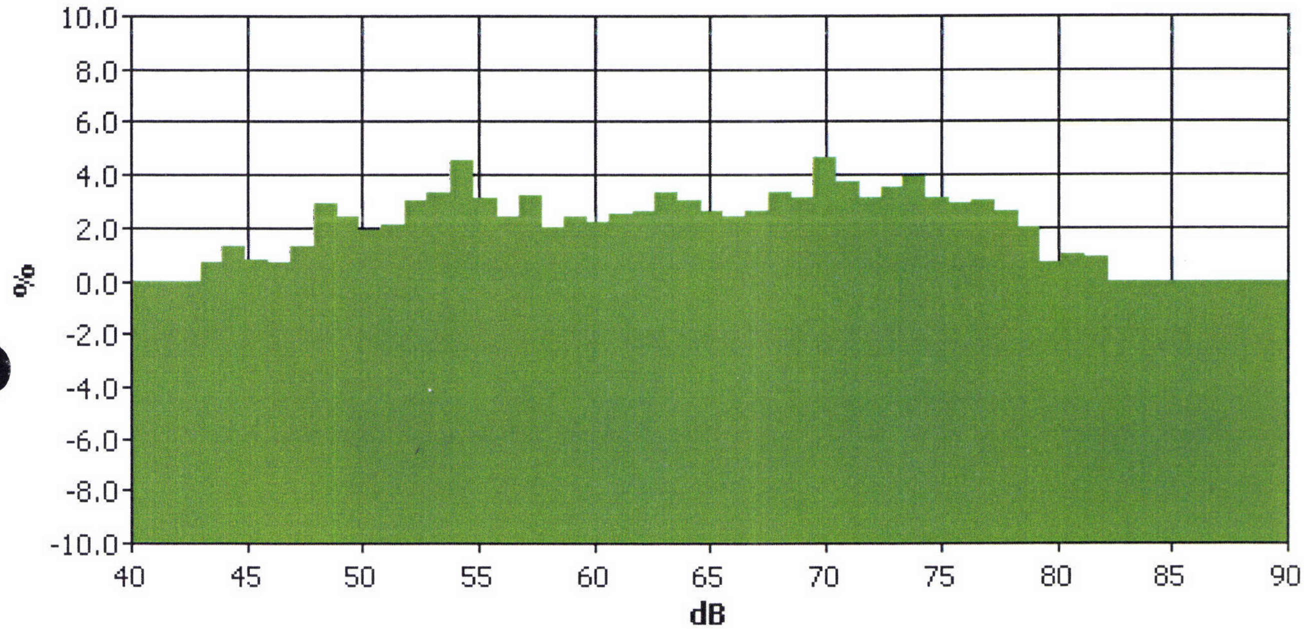
Information Panel

Name	John Deere 8410 plowing 100-200 ft
Start Time	Wednesday, April 14, 2010 11:27:22
Stop Time	Wednesday, April 14, 2010 11:42:24
Device Model Type	SoundPro DL
Comments	

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	71.9 dB	Exchange Rate	1	3 dB
Weighting	1	A	Response	1	SLOW
Bandwidth	1	1/1	Exchange Rate	2	3 dB
Weighting	2	C	Response	2	FAST

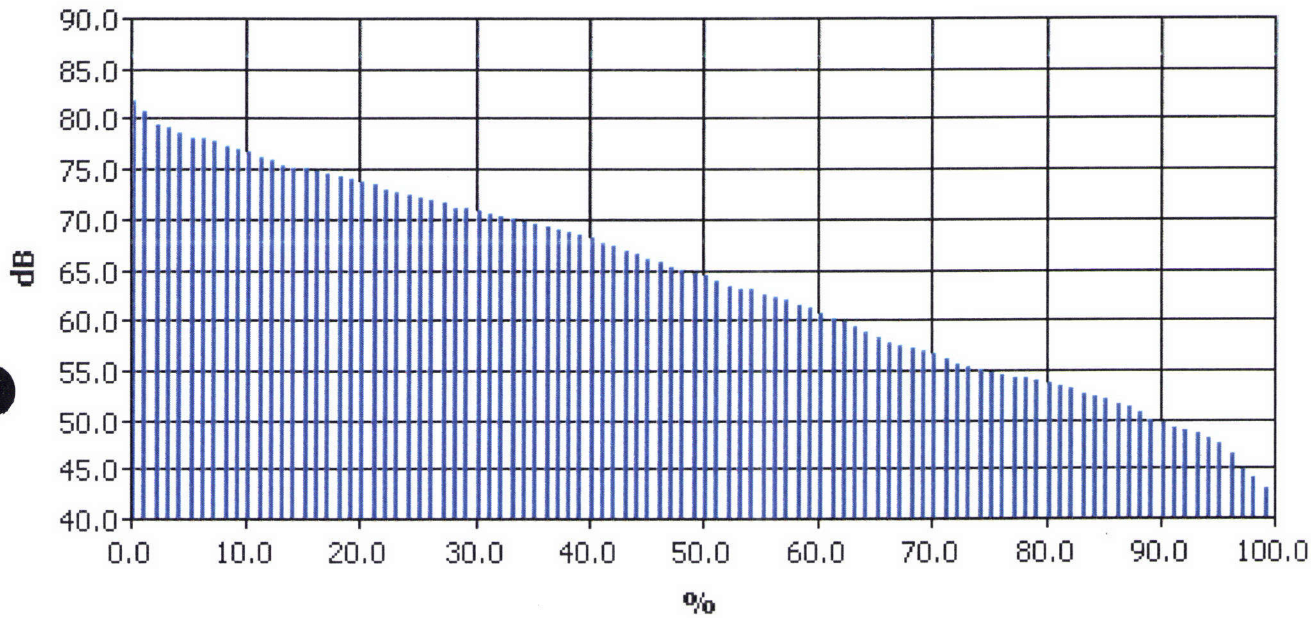
Statistics Chart



dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
43.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.7
44.0	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	1.2
45.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.7
46.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.6
47.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	1.2
48.0	0.3	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.5	0.4	2.9
49.0	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.4
50.0	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	1.9
51.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	2.1
52.0	0.4	0.4	0.2	0.3	0.3	0.4	0.3	0.2	0.3	0.3	3.0
53.0	0.2	0.3	0.3	0.1	0.4	0.4	0.5	0.4	0.3	0.3	3.3
54.0	0.4	0.4	0.5	0.5	0.6	0.5	0.5	0.4	0.5	0.3	4.5
55.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.2	0.3	3.1
56.0	0.2	0.2	0.3	0.1	0.3	0.2	0.2	0.2	0.4	0.3	2.4
57.0	0.3	0.3	0.3	0.2	0.3	0.4	0.5	0.5	0.2	0.2	3.2
58.0	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.1	2.0
59.0	0.2	0.2	0.1	0.1	0.2	0.3	0.3	0.3	0.3	0.4	2.4
60.0	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.2	0.3	2.1
61.0	0.2	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.3	2.5
62.0	0.3	0.3	0.3	0.1	0.4	0.2	0.2	0.3	0.2	0.3	2.6
63.0	0.4	0.5	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.2	3.3
64.0	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	3.0
65.0	0.3	0.3	0.3	0.1	0.3	0.2	0.3	0.2	0.3	0.3	2.5
66.0	0.2	0.3	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.2	2.4
67.0	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.3	0.2	0.3	2.6
68.0	0.3	0.3	0.3	0.1	0.2	0.3	0.4	0.4	0.5	0.4	3.3
69.0	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	3.1

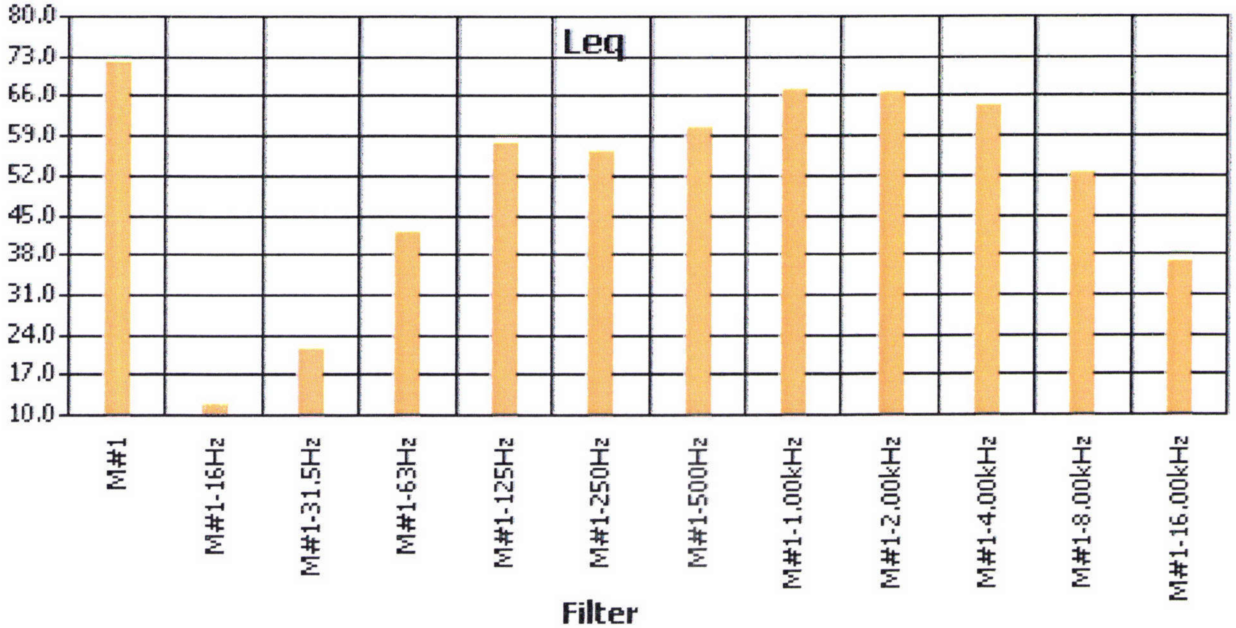
dB	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	%
70.0	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.4	0.4	4.6
71.0	0.4	0.4	0.5	0.3	0.3	0.3	0.4	0.4	0.3	0.3	3.7
72.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.4	3.1
73.0	0.3	0.2	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	3.5
74.0	0.3	0.4	0.3	0.3	0.3	0.4	0.5	0.5	0.5	0.6	3.9
75.0	0.4	0.4	0.5	0.3	0.2	0.3	0.2	0.2	0.3	0.2	3.1
76.0	0.2	0.3	0.2	0.2	0.3	0.4	0.2	0.3	0.3	0.3	2.9
77.0	0.3	0.3	0.3	0.2	0.2	0.3	0.4	0.4	0.5	0.2	3.0
78.0	0.2	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	2.6
79.0	0.3	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	2.0
80.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.7
81.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	1.0
82.0	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.9
83.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
84.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
86.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
87.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
88.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
89.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Exceedance Chart



	0%	1%	2%	3%	4%	5%	6%	7%	8%	9%
0%		81.6	80.6	79.4	79.0	78.5	78.1	77.9	77.6	77.2
10%	76.9	76.6	76.2	75.8	75.4	75.1	74.9	74.7	74.5	74.2
20%	73.9	73.6	73.3	73.0	72.7	72.4	72.0	71.7	71.5	71.1
30%	70.9	70.7	70.5	70.2	70.0	69.8	69.5	69.2	68.9	68.6
40%	68.4	68.0	67.6	67.3	66.8	66.4	66.0	65.6	65.1	64.8
50%	64.5	64.2	63.7	63.3	63.1	62.9	62.5	62.1	61.8	61.3
60%	61.0	60.6	60.0	59.7	59.3	58.7	58.2	57.7	57.5	57.2
70%	56.8	56.5	56.0	55.6	55.3	55.0	54.7	54.5	54.3	54.1
80%	53.9	53.6	53.4	53.0	52.6	52.3	51.9	51.6	51.1	50.6
90%	50.0	49.5	49.1	48.8	48.5	48.1	47.6	46.5	44.9	44.1
100%	43.0									

Filter Summary Chart



Certificate of Calibration

Certificate No: R0236BIG010010

Submitted By: QUEST TECHNOLOGIES INC.
1060 CORPORATE CENTER DRIVE
OCONOMOWOC, WI 53066

Serial Number: BIG010010
Model: SOUNDPRO DL-2-1/3 SLM

Date Issued: 2/20/2007
Valid Until: 2/20/2008

Test Conditions:

Temperature: 18°C to 29°C
Humidity: 20% to 80%
Barometric Pressure: 890 mbar to 1050 mbar

Model Conditions:

As Found: IN TOLERANCE
As Left: IN TOLERANCE

SubAssemblies:

Description:	Serial Number:
TYPE 2 PREAMP	01070614
MICROPHONE QE 7052 1/2 IN. ELECTRET	22953

Calibrated per Procedure:53V899

Reference Standard(s):

I.D. Number	Device	Last Calibration	Date Calibration Due
ET0000389	FLUKE 45 MULTIMETER	3/24/2005	3/24/2007
ET0000523	B&K / QUEST ENSEMBLE	6/15/2006	6/15/2007

Measurement Uncertainty:

+/- 3.6% ACOUSTIC (0.3DB)
Estimated at 95% Confidence Level (k=2)

Calibrated By: Brian A Bayer 2/20/2007
BRIAN BAYER Service Technician

This report certifies that all calibration equipment used in the test is traceable to NIST, and applies only to the unit identified under equipment above. This report must not be reproduced except in its entirety without the written approval of Quest Technologies.

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Certificate of Calibration

Certificate Number: 231137BLI050003

Model: SoundPro SP DL 1-1/3 **Date Issued:** 20-May-2009

S/N: BLI050003

Quest Technologies, Inc. certifies that the above listed product meets or exceeds the requirements of the following standard(s):

IEC 61672-1-2002 Class 1 Sound Level Meter Type 1

ANSI S1.4-1983 (R2001) Specification For Sound Level Meters

IEC61260:2001 Octave Band Filters Class 1

ANSI S1.43-1997 (R2002) for Sound Level Meters Type 1

Test Procedure: S053-899

Subassemblies:

B&K 4936	S/N: 2672798
SPro Preamp	S/N: 05093372

Test Conditions:

Temperature:	18-25°C
Humidity:	20-80% R.H.
Barometric Pressure:	950-1050 mBar

Reference Standard(s):

Device	Cal Due Date	Uncertainty - Estimated at 95% Confidence Level (k=2)
B&K Ensemble	3-July-2009	+/- 2.2% Acoustic (0.19dB)
Fluke 45	3-March-2011	+/- 1.4% AC Voltage, +/-0.1% DC Voltage

Calibrated By: Patricia Pease

Patty Pease Assembler

In order to maintain best instrument performance over time and in the event of inspection, audit or litigation, we recommend the instrument be recalibrated annually. Any number of factors may cause the calibration item to drift out of calibration before the recommended interval has expired.

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APPENDIX 10

- **Phase I Archeological Report**

Phase I Archeological Report

for the

Frontier Stone Quarry

Town of Shelby

Orleans County, New York

by

Kirk W. Butterbaugh, M.A.
Principal Investigator
Hilary Joseph Dafoe
Field Director

February 12, 2007

Prepared for

Mr. John Hellert
Continental Placer, Inc.
26 Computer Drive West
Albany, New York 12205

Butterbaugh Archeological Consulting, Inc.
P.O. Box 716
Buffalo, New York 14213
716-882-3584

Table of Contents

Management Summary

SHPO Project Review Number (if available): not available

Involved State and Federal Agencies (DEC, CORPS, FHWA, etc.): DEC, possibly Army Corps.

Phase of Survey: IA on entire property, IB on subarea

Location Information
Location: Sour Springs and Fletcher Chapel Roads
Minor Civil Division: Town of Shelby
County: Orleans

Survey Area (Metric & English)
Length: Phase IA: ±1,036 m (3,400 ft) north-south; Phase IB: ±853 m (2,800 ft) north-south
Width: Phase IA: ±1,189 m (3,900 ft) east-west; Phase IB ±274 m (900 ft) east-west
Depth: (when appropriate)
Number of Acres Surveyed: Phase IA: 215.5 acres; Phase IB: 43.7 acres
Number of Square Meters & Feet Excavated (Phase II, Phase III only):
Percentage of the Site Excavated (Phase II, Phase III only):

USGS 7.5 Minute Quadrangle Map: Knowlesville, N.Y. (1950)

Archeological Survey Overview
Number and Interval of Shovel Tests:
Number & Size of Units:
Width of Plowed Strips: 3 m (10 ft)
Surface Survey Transect Interval: strips 15 m (50 ft) apart

Results of Archeological Survey
Number & name of prehistoric sites identified: 0
Number & name of historic sites identified: 0
Number & name of sites recommended for Phase II/Avoidance:

Results of Architectural Survey
Number of buildings/structures/cemeteries within project area: 0
Number of buildings/structures/cemeteries adjacent to project area: 12
Number of previously determined NR listed or eligible buildings/structures/cemeteries/districts: 0
Number of identified eligible buildings/structures/cemeteries/districts: 0

Report Author(s): Kirk Butterbaugh, M.A., Principal Investigator; Hilary Joseph Dafoe, Field Director

Date of Report: February 12, 2007

Phase I Archeological Report

1.0 Introduction: The purpose of this Phase I archeological investigation is to determine whether the proposed Frontier Stone Quarry and access road might impact archeological sites that may be listed on, or are potentially eligible for listing on, the National or State Registers of Historic Places (N/SRHP)

1.1 Project Sponsor: This investigation was conducted by Butterbaugh Archeological Consultants, Inc. (BAC) at the request of John Hellert of Continental Placer, Inc., 26 Computer Drive West, Albany, New York 12205 (telephone 518-458-9203, fax 518-458-9203). No project identifier number has been assigned to this project.

1.2 Project Description: The project area is located along the south side of Fletcher Chapel Road between Sour Spring and Southwood Roads in the southwest corner of the Town of Shelby, Orleans County. The proposed project consists of a quarry for the extraction and processing of Lockport dolomite. The mining will be conducted in four phases over a number of years, and eventually cover ± 87.2 hectares (± 215.5 acres). Impacts will include excavation; grading; overburden storage within the property; construction of a settling pond, an office, and a processing plant; and, storage of equipment. Berms may be constructed along the boundaries of the two parcels, which are separated by a Niagara Mohawk easement. While the entire property was the subject of this investigation, at this time only Phases 1 and 4, measuring ±17.7 hectares (±43.7 acres), were the subject of Phase IB archeological evaluation.

Attachment 1 shows the project location in western New York. Attachment 2 shows the project location on the 7.5 minute Knowlesville, N.Y. quadrangle (U.S.G.S. 1950). Attachment 3 is a detailed project map. Photographs keyed to that map can be found in Attachment 4.

1.3 Scope of Work: The client contacted the New York State Department of Conservation and, who indicated that a Phase I archeological investigation following the guidelines of the New York State Office of Parks, Recreation and Historic Preservation (OPRHP) would be required prior to the start of construction. Therefore, background research was conducted at the OPRHP, the Buffalo and Erie County Public Library, the University of Buffalo, and local sources in Orleans County to determine if any known archeological resources are in the vicinity, if any properties listed on the N/SRHP are nearby, and to generate a sensitivity assessment for the project area. A site visit was conducted at the entire property to document substantial ground disturbance and to photograph field conditions and structures built before 1950. Surface inspection following the standards accepted by OPRHP was conducted in Phases 1 and 4, where mining activities will first occur. The data for this project will be temporarily stored at BAC until an appropriate permanent repository can be identified.

2.0 Environmental Background: The impact area is located in a recently harvested field, and is situated on the Erie – Ontario Lowlands in the beech-maple forest zone (Miller 1973). The project area is drained by small intermittent streams that empty into Oak Orchard Creek, which flows to Lake Ontario. The project area is situated between 191 and 198 meters (m) (626 and 648 feet [ft]) above sea level (SEE PLANS AND CONTOURS). Elevation within 1.6 kilometers (km) (1 mile [mi]) of the project area ranges from about 189 m (620 ft) at Oak Orchard Creek to 206 m (676 ft) east of the property.

The topographic features of the area were created by glaciation (Van Diver 1985; U.S.D.A. 1994). The project area is underlain by Lockport group dolostone (Van Diver 1985). Soils at the project area consist of Bombay fine sandy loam, Canandaigua silt loam, Cayuga silt loam, Churchville silt loam, Cosad loamy sand, Hilton loam, Lakemont silty clay loam, Odessa silt loam, and Ontario loam. All of the soils were formed in glacial till and are very poorly to well drained. A soil map showing the project area and an accompanying soil description table can be found in Attachment 5. There is very little chance that buried former ground surfaces are present in the project area.

3.0 Land Use and Disturbance

3.1 Land Use: Human occupation of the area began during the Paleoindian period, soon after the final retreat of the glaciers. It is not clear who occupied the area until 1656, when the Seneca took control. No substantial Euroamerican settlement occurred in the area until after the Revolutionary War. Orleans County was formed in 1824 from Genesee County. The Town of Shelby was formed from the Town of Ridgeway in 1818 and was, and remains, a largely agricultural community.

The earliest available map of the area (Beers 1881, Attachment 6a) shows the present road network. A structure owned by T. and J.H. Fearby is situated in the northeast corner of the property. Another structure is on the south side of Fletcher Chapel Road near the northwest corner of Phase 3; this structure is owned by J. Culver. Both of these structures are shown on the 1897 Medina quadrangle (Attachment 6b). The next available map (New Century 1913), which could not be reproduced for this report, shows these two structures, and the present Niagara Mohawk power line is shown as the Lockport Ontario Power Co. line. However, S. Culver now owns the Fearby residence, and a cemetery is across the street. Elizabeth Swart now owns the former Culver property. Both structures are shown on the 1950 quadrangle (Attachment 2), but the Swart structure was razed prior to this investigation.

3.2 Disturbances: Other than past clearing and continuing agricultural usage, the project area is undisturbed.

4.0 Background Research and Sensitivity Statement: The OPRHP site files were consulted to identify known sites in the vicinity and any site location tendencies relevant to the project area. Background research on the prehistory and history of the area was conducted, also.

4.1 Prehistoric and Protohistoric Site Information: Generally, evidence from New York State suggests that aboriginal inhabitants showed a preference for stream, river and marsh association, knolls, and small bluffs. Regarding more specific data from the area obtained by Ed Curtin Archeological Consulting, the OPRHP site files show four prehistoric or protohistoric sites within 1.6 km (1 mi) of project area (Attachment 7). None are near the project area.

4.2 Historic Site Information: Sixteen historic archeological sites were recorded in the OPRHP site files within 1.6 km (1 mi) of the project area. Only one is in close proximity to the property. Reference #1 is a razed historic structure located near the southwest corner of the project area.

4.3 National and State Registers of Historic Places (N/SRHP): BAC was provided with a SPHINX printout by Ed Curtin. No inventoried, eligible or listed sites are near the project area.

4.4 Previous Surveys: The OPRHP site files show that four surveys have been conducted in the vicinity, but none in proximity to the project area (see Attachment 7).

4.5 Sensitivity Statements

4.5.1 Prehistoric: Overall, the project area is considered to have a low to moderate sensitivity rating, since it is some distance away from a permanent source of water.

4.5.2 Historic: Overall, the property is considered to have a low probability of yielding historic cultural materials. Sensitivity is higher near Fletcher Chapel Road, especially near the extant former Fearby property and, especially, the former Culver/Swart property that has been razed.

5.0 Phase IA Recommendations: BAC recommends that all four Phases of the project area should be surveyed prior to being subjected to mining. Following OPRHP standards, vegetated portions of the property should be shovel tested at a 15 m (50 ft) interval and the soil sifted through .635 centimeter (cm) (1/4 inch [in]) hardware cloth. In plowed areas, surface inspection can be conducted at no greater than a 5 m (16 ft) interval if visibility reaches 70%.

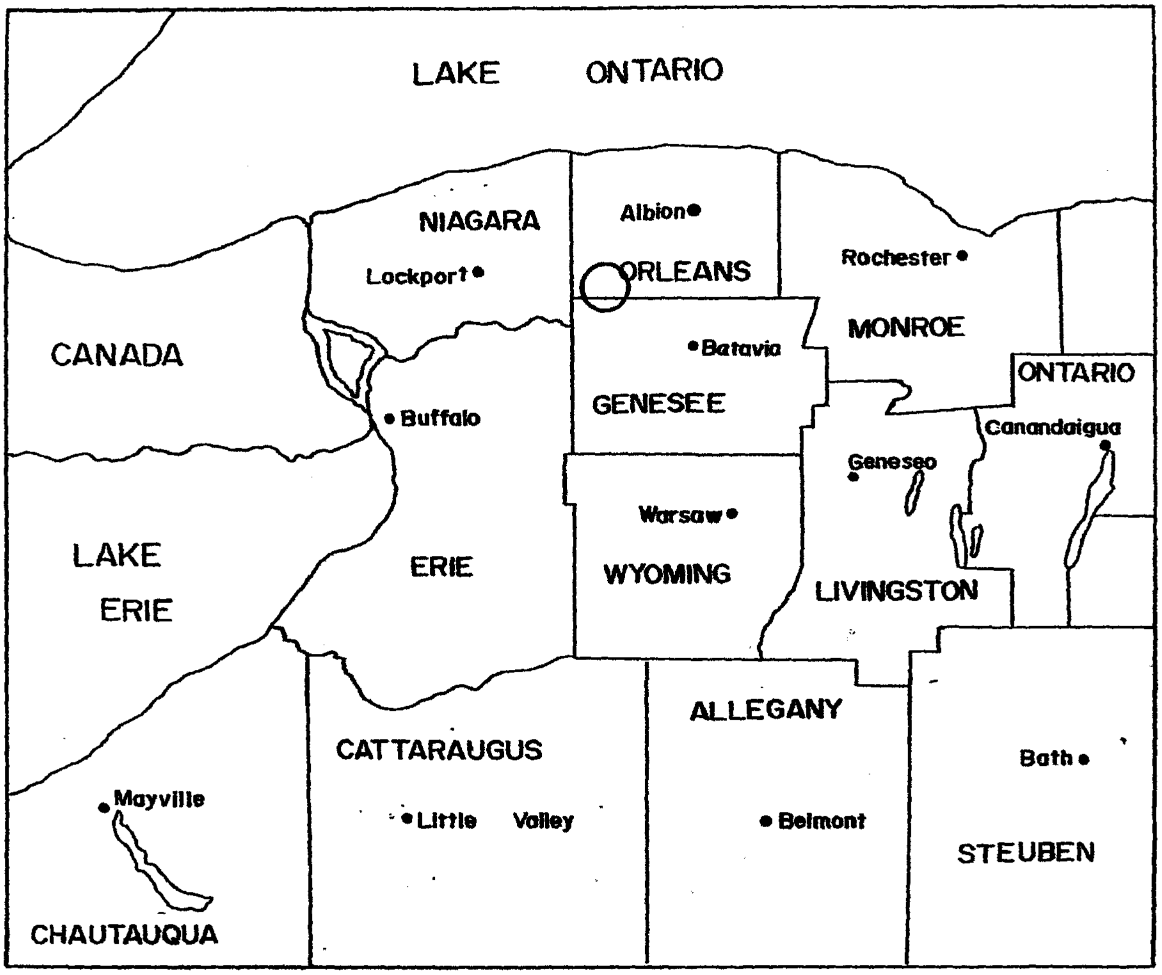
6.0 Phase IB Field Investigations: Phases 1 and 4 are the only components where mining is proposed in the near future. Following NYSHPO standards, the harvested agricultural field was plowed in strips measuring at least 3 m (10 ft) wide. The strips were no more than 15 m (50 ft) apart. Each strip was surface inspected twice. Visibility was 100%. Extra efforts were made in the southwest corner of the property, in the vicinity of the razed historic farmstead. The field work was conducted by an experienced field director and field technician on December 22, 27, and 28, 2006. The weather and ground conditions were excellent. Five shovel tests were excavated in different topographic areas in order to evaluate the soils at the property. The soils found share the same characteristics presented in Attachment 5.

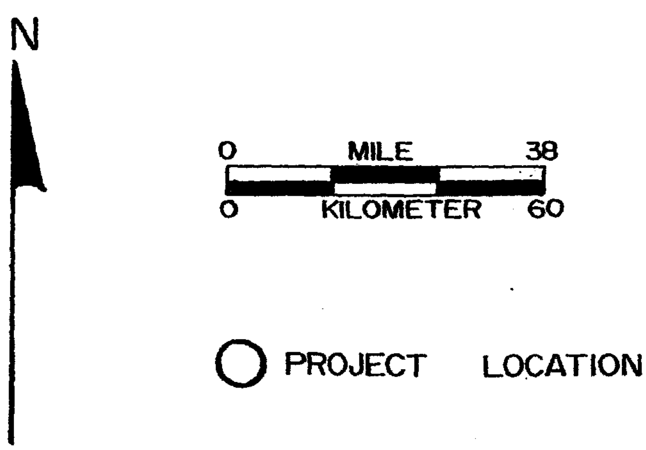
6.1 Results: No artifacts, evidence of subsurface features, or structural remains were discovered during the field investigation.

7.0 Summary and Recommendations: No artifacts, archeological deposits, or structural remains were discovered in the project area. No problems which might have affected the results of the investigation were encountered. Since the work was conducted by qualified personnel following OPRHP guidelines, BAC recommends that the proposed project will not impact any properties that are potentially eligible to the N/SRHP, and that the project may proceed as planned.

ATTACHMENT I:

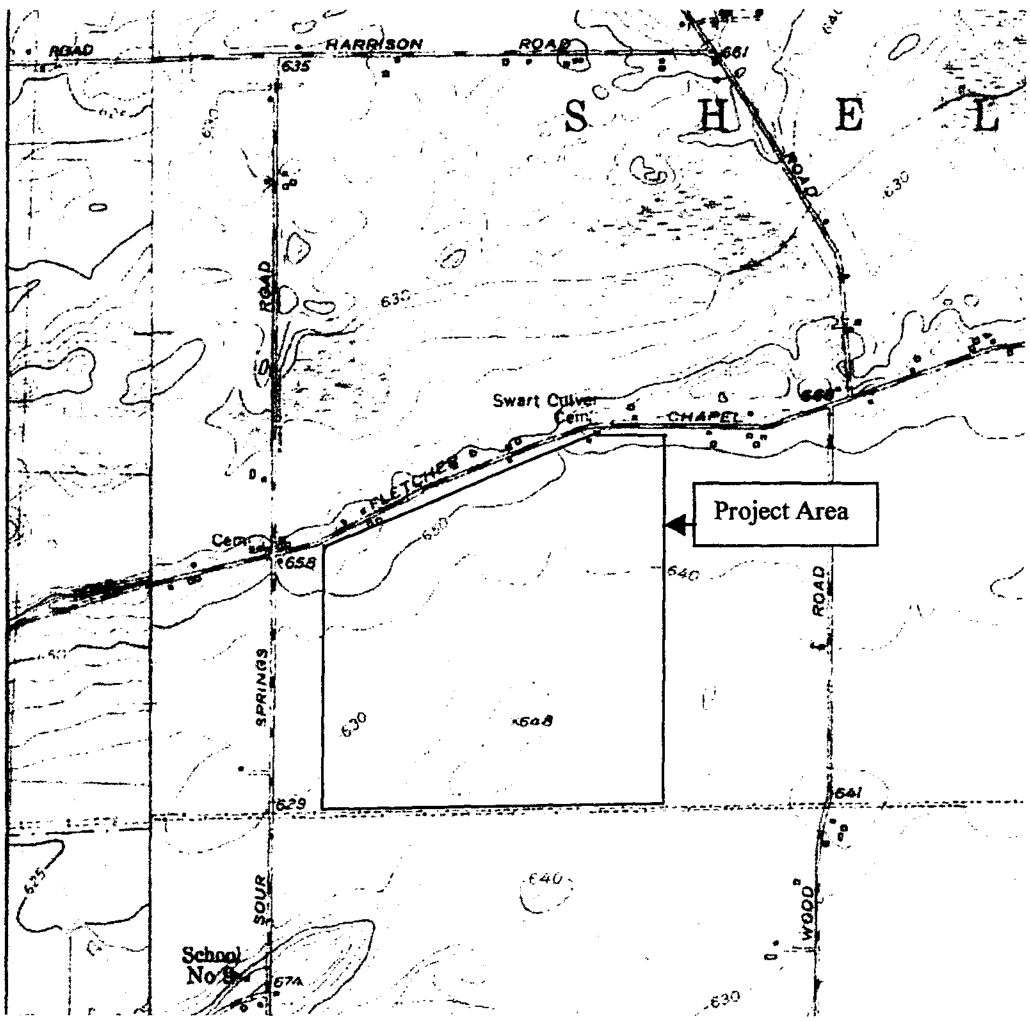
PROJECT LOCATION IN WESTERN NEW YORK





Attachment 2

Location of the Project Area on the Knowlesville 7.5' Quadrangle (U.S.G.S. 1950)



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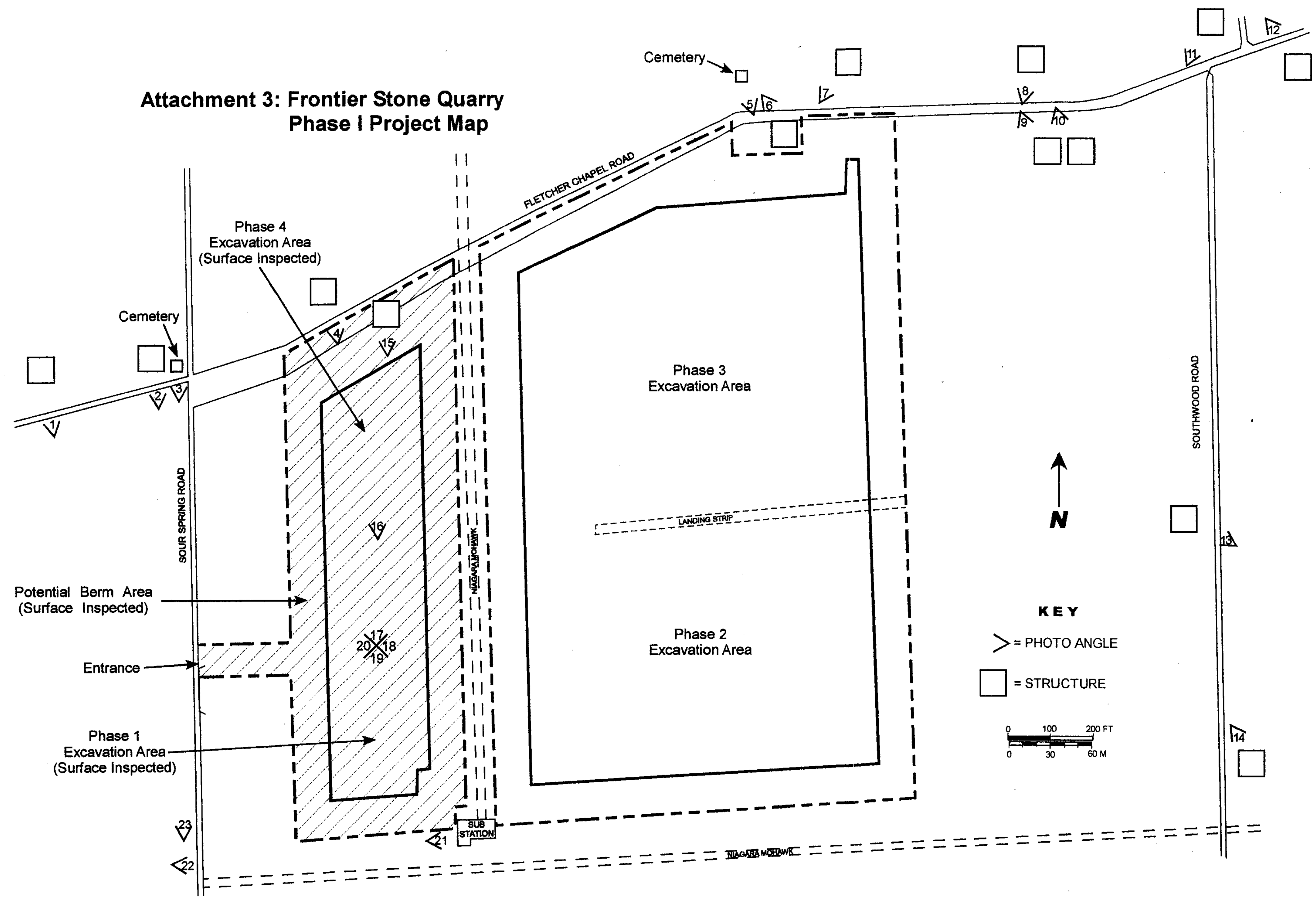
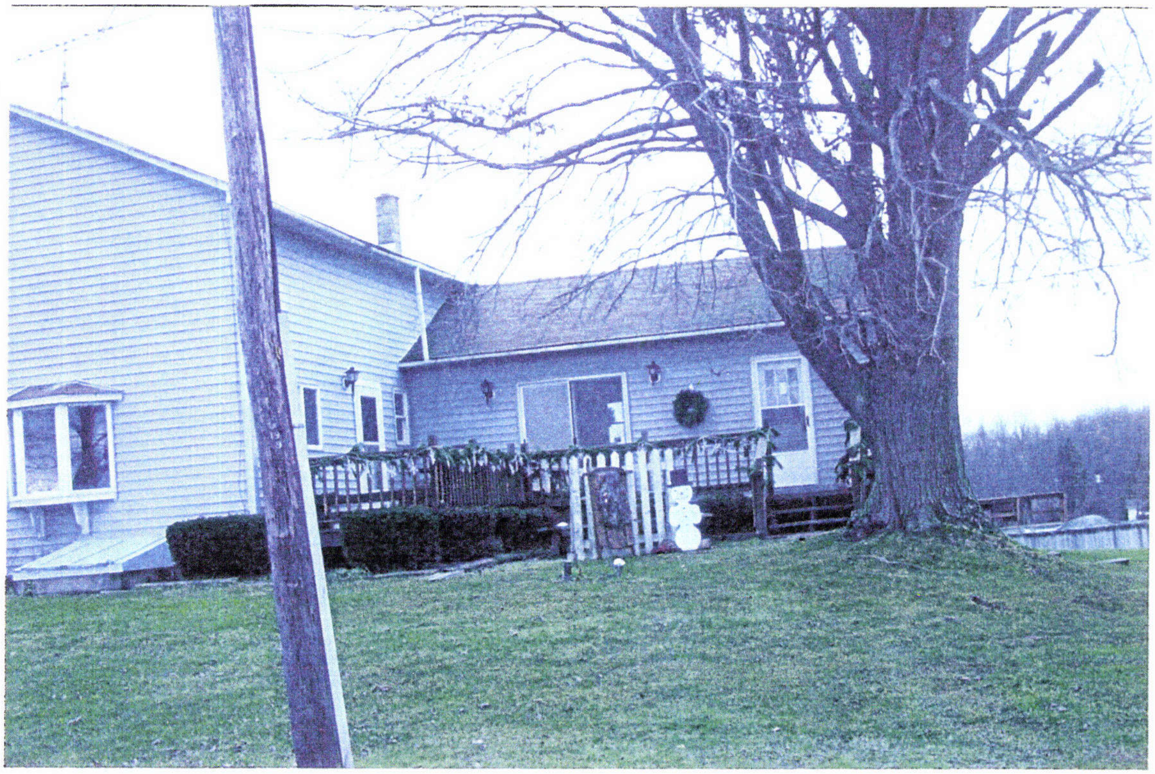
Attachment 3: Frontier Stone Quarry Phase I Project Map



Attachment 4

Photographs of the Project Area, Adjacent Structures, and Surroundings

Photograph 1
11599 Fletcher Chapel Road Looking North



Photograph 2
11633 Fletcher Chapel Road Looking North

Photograph 3
Cemetery at Corner of Sour Springs Road and Fletcher Chapel Road Looking North

Photograph 4
11582 Fletcher Chapel Road Looking North

Photograph 5
Cemetery Near 11875 Fletcher Chapel Road Looking North

Photograph 6
Unmarked Residence (Fletcher Chapel Road) Looking Southeast

Photograph 7
11875 Fletcher Chapel Road Looking North

Photograph 8
Unmarked Residence (Fletcher Chapel Road) Looking North

Photograph 9
Unmarked Residence (Fletcher Chapel Road) Looking Southeast

Photograph 10
Barn Associated with Unmarked Residence (Fletcher Chapel Road) Looking Southeast

Photograph 11
12001 Fletcher Chapel Road Looking North

Photograph 12
12016 Fletcher Chapel Road Looking Southeast

Photograph 13
5232 South Woods Road Looking Northwest

Photograph 14
5317 South Woods Road Looking South

Photograph 15
Barn North of Project Area Looking North

Photograph 16
Surface Inspection on Project Area Looking North

Photograph 17
Project Area Looking North

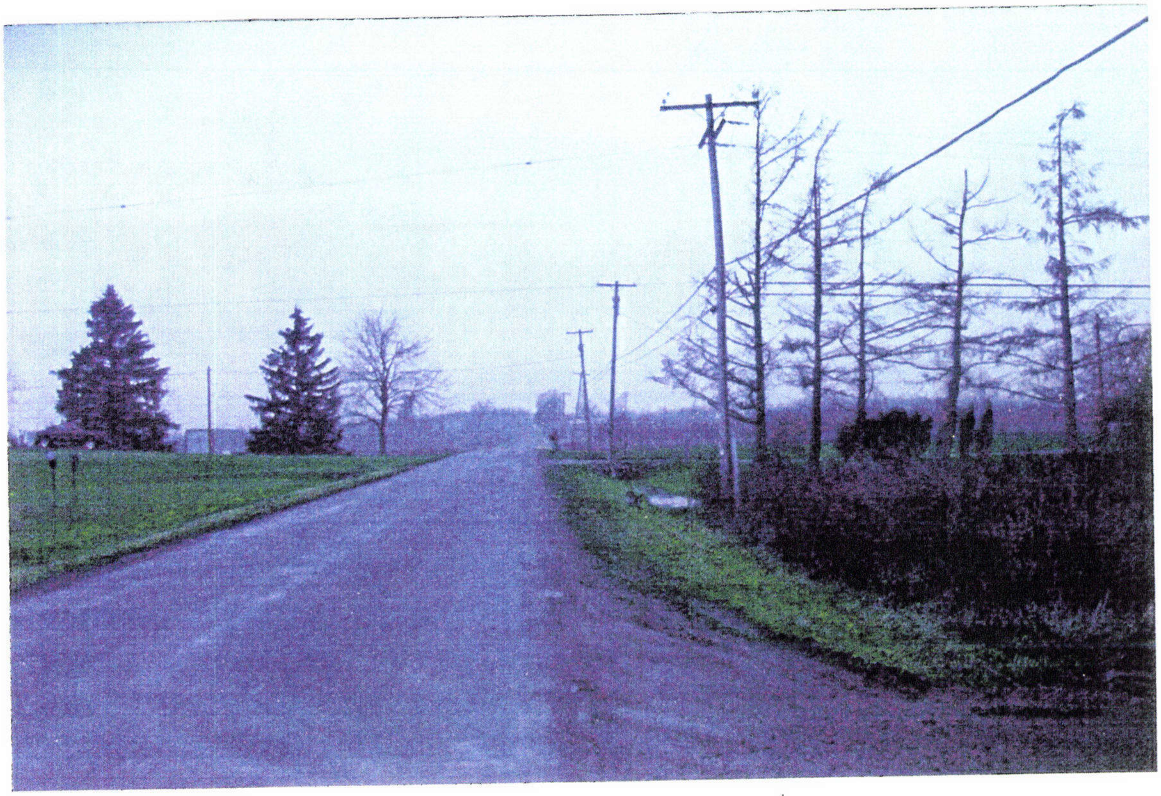
Photograph 18
Project Area Looking East

Photograph 19
Project Area Looking South

Photograph 20
Project Area Looking West

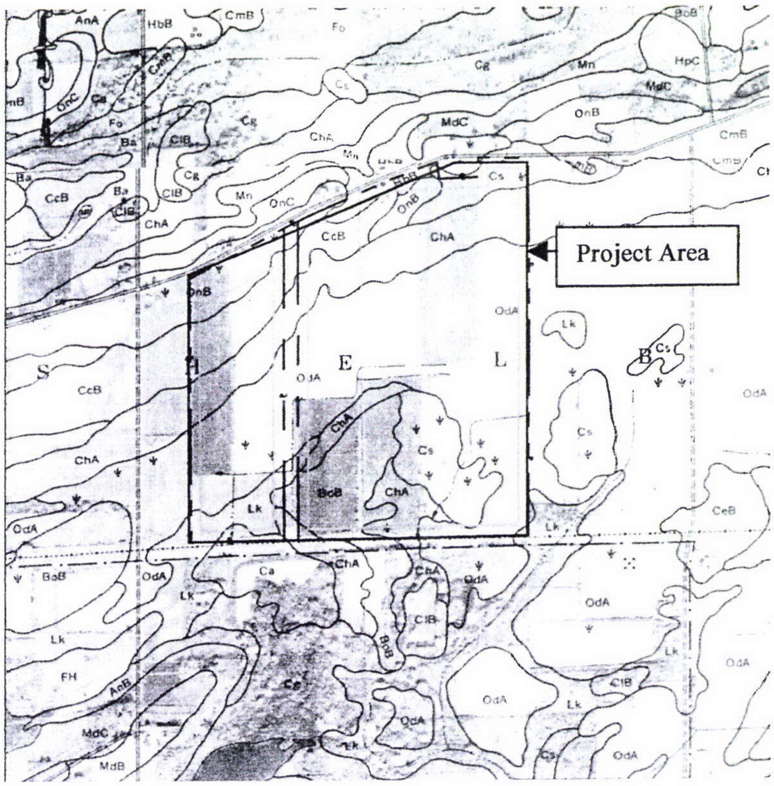
Photograph 21
Substation at Southeastern Corner (Project Area) Looking West

Photograph 22
Driveway for Substation (Sour Springs Road) Looking West



Photograph 23
Project Corridor (Sour Springs Road) Looking North

Attachment 5
Location of the Project Area on the Orleans County, N.Y. Soil Map (U.S.D.A. 1977)



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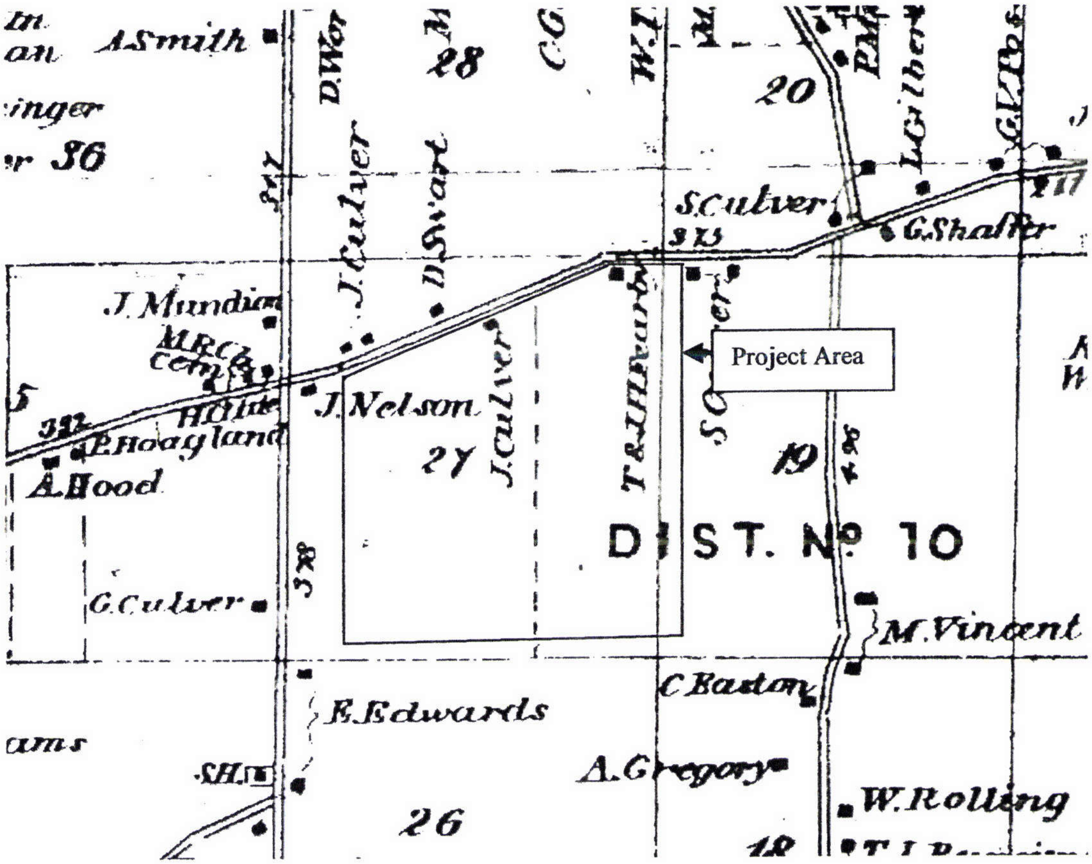
Attachment 5
Soils in the Project Area from the Orleans County, N.Y. Soil Survey (U.S.D.A 1977)

Soil	Depth	Color	Texture	Slope	Drainage	Landform
Bombay fine sandy loam (Bob)	A: 0-10 in B: 10-32 in C: 32-50 in	Dk GBrn/Brn Brn/RBrn RBrn	Sa Lo Sa Lo/Lo Lo	3-8%	Moderately well drained	Glacial till plains
Canandaigua Series (Ca)	A: 0-8 in B: 8-30 in C: 30-50in	V Dk Gry Lt BGry/Str Brn Lt Gry	Si lo Si lo Sa lo	Nearly level	Poorly to very poorly drained	Lake plains
Cayuga silt loam (CcB)	A: 0-12 in B: 12-25 in C: 25-60 in	Dk GBrn/Brn/Str Brn RBrn Brn/Str Brn	Si Lo Si Cl Lo/Grvl Sa Lo	2-6%	Moderately well to well drained	Lake deposits in till plains
Churchville silt loam (ChA)	A: 0-9 in B: 9-22 in C: 22-52 in	Dk GBrn RBrn/RGry RBrn/YRd	Si Lo Si Cl Si Cl lo/Lo	0-2%	Somewhat poorly drained	Lake deposits in till plains
Cosad loamy sand (Cs)	A: 0-8 in B: 8-24 in C: 24-51 in	V Dk GBrn PBrn/RBrn Str Brn	Lo sa Lo Sa Si Cl lo	Nearly level	Poorly drained	Lacustrine deposits
Hilton loam (HbB)	A: 0-10 in B: 10-37 in C: 37-64 in	Dk GBrn Dk Brn/RBrn RBrn	Si Lo Si Lo Sa Lo	3-8%	Moderately well drained	Till plains
Lakemont silty clay loam (Lk)	A: 0-12 in B: 12-30 in C: 30-60 in	V Dk Gry/Lt Gry Dk RGry/RBrn RBrn	Si Cl lo Si Cl Si Cl	0-2%	Poorly to very poorly drained	Glacial lake plains
Odessa silt loam (OdA)	A: 0-8 in B: 8-41 in C: 41-50 in	Dk GBrn/Lt BGry Brn/YBrn RGry/YBrn	Si Lo Si Cl Lo/Si Cl Si Cl	0-2%	Somewhat poorly drained	Glacial lake plains
Ontario loam (OnB)	A: 0-16 in B: 16-38 in C: 38-72 in	Dk GBrn Brn/RBrn Brn	Lo Lo Grvl Lo	3-8%	Well drained	Till plains

Key:

Color: Brn – Brown, BGry - Brownish Gray, Gry - Gray, GBrn – Grayish Brown, PBrn - Pale Brown, RBrn – Reddish Brown, RGry – Reddish Gray, YBrn – Yellowish Brown, YRd – Yellowish Red
Shade: Dk – Dark, V – Very, Lt – Light, Str - Strong
Soil: Cl – Clay, Grvl – Gravel, Lo – Loam, Sa – Sand, Si - Silt

Attachment 6a
Location of the Project Area on Beers Atlas (1881)



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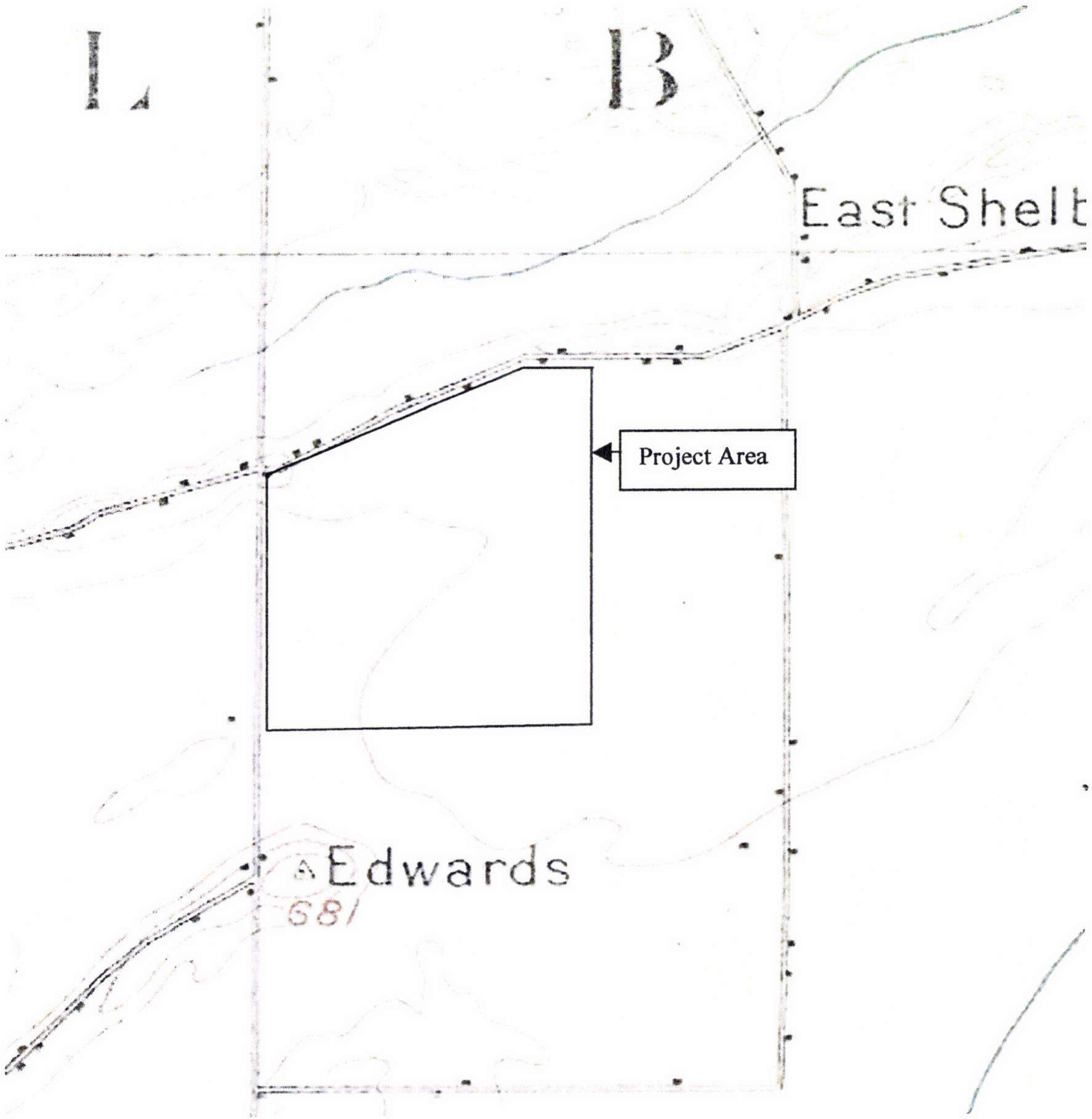
Attachment 6b
Location of the Project Area on the Medina 15' minute Quadrangle (U.S.G.S. 1897)



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Attachment 7
Frontier Quarry OPRHP Site File Information
Knowlesville Quad

Reference #	NYSOPRHP Site #	Additional Site Name	Distance to APE m(ft)	Time Period	Site Type
1	07309.000039	IRQ-061H, also MCI 04/101-1	466 (1529)	Pre-1875, gone by 1950	Farm
2	07309.000037	School #9 (IRQ-059H)	833 (2733)	By 1875	School, became camp in 1957
3	07309.000038	Ellijah Chubbuck Farm (IRQ-060H)	920 (3018)	Pre-1875	Farm (briefly used as Refuge quarters in the late 1960s)
4	07309.000098	Missing File	831 (2726)	Missing File	Missing File
5	07309.000010	O-IRQ-093P	747 (2451)	Unknown Prehistoric	No Info
6	07309.000013	IRQ-058PIB	1154 (3786)	No Info	Previously discovered human skull
7	07309.000035	G. Stetson Farm (IRQ-056H)	1440 (4724)	Pre-1875, gone by 1957	Farm
8	07309.000034	H. Chubbock Farm (IRQ-055H)	1633 (5358)	Pre-1875, gone pre-1957	Farm
9	07309.000040	Peter D. Vroman Farm (IRQ-063H)	1410 (4626)	Pre-1850	Farm, chicken house built 1954
10	07309.000041	James Bailey Farm (IRQ-064H)	1472 (4829)	1835	Farm
11	07309.000064	Ogden Bailey Farm	1571 (5154)	Pre- 1875	Farm & hunting camp
12	07309.000046	Charles Cain Farm	1187 (3894)	1869?	Farm
13	07309.000007	Job Corps Center Site (3 loci)	1454 (4770)	No Info	No Info
14	07309.000012	William Dye Farm	1284 (4213)	1867?	Dump

Reference #	NYSOPRHP Site #	Additional Site Name	Distance to APE m(ft)	Time Period	Site Type
15	07309.000066	William Dye Site UB259U	1534 (5033)	Unidentified Prehistoric	Camp?
16	07309.000063	William Dye Site (UB2590)	1340 (4396)	No Info	Camp?
17	07309.000051	Richard G. Rollings Farm (IRQ-077H)	1279 (4196)	Pre-1875	Farm
18	07309.000047	James Hannay Jr. Farm (IRQ-073H)	1351 (4432)	Pre-1875	Farm
19	07309.000048	James Hannay Farm (IRQ-074H)	1402 (4600)	c. 1852, gone by 1913	Farm
20	07309.000050	Seth Ransom Farm (IRQ-076H)	1489 (4885)	1845?	Farm
21	07309.000052	Asa Gregory Farm (IRQ-078H)	739 (2425)	1873?	Farm
22	07309.000053	Easton Farm (IRQ-079H)	613 (2011)	1875?	Farm

Previous Archaeological Research

Dean & Barbour Associates, Inc.
2000 Report of the Stage 1 Cultural Resources Investigation for Water District No. 6, Town of Shelby, Orleans County, New York.

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New York State Office of Parks, Recreation and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island, PO Box 189, Waterford, New York 12188-0189 518-237-8643

March 5, 2007

John R. Hellert
Continental Placer, Inc.
26 Computer Drive West
Albany, New York 12205

Re: DEC
Frontier Stone Quarry (Phases 1 & 4)
Town of Shelby, Orleans County
07PR01138

Dear Mr. Hellert:

Thank you for requesting the comments of the Office of Parks, Recreation and Historic Preservation (OPRHP). We have reviewed the Phase I Cultural Resources Investigation Report, prepared by Butterbaugh Archaeological Consulting and dated February 2007, in accordance with the New York State Parks, Recreation and Historic Preservation Law, Section 14.09.

Based upon this review, it is the OPRHP's opinion that your project will have **No Impact** upon cultural resources in or eligible for inclusion in the State and National Registers of Historic Places.

The OPRHP appreciates the opportunity to comment on this information. It should be noted that further consultation with the OPRHP will be necessary if there are any changes to the project. Please telephone me at ext. 3280 with any questions you may have. Please also refer to the PR# above in any future correspondence for this project.

Sincerely,

Nancy Herter

Nancy Herter
Historic Preservation Program Analyst,
Archaeology

cc. Kirk Butterbaugh

APPENDIX 11

- **Town of Shelby Residents Survey**

Town of Shelby Residents Survey 2007

SUMMARY REPORT

Prepared for the Shelby Town Board

April 26, 2007

Stuart I. Brown Associates, Inc.
Planning and Management Consultants

Town of Shelby Residents Survey – 2007
Summary Report

The Summary Report from the Town of Shelby Residents' Survey contains the following components:

- Narrative Summary
- Tabular Summary
- Graphs
- Written Comments

Narrative Summary

Methodology

In February 2007, the Town of Shelby mailed a residents' survey to approximately 1,800 property owners in the Town, including those in the Village of Medina. Two copies of the surveys were mailed to each address in order to allow spouses to respond independently of the owner of record. Although this method may have resulted in some respondents submit duplicate questionnaires, it was determined that this concern was outweighed by the ability of up to two adults per household to participate in the survey.

A total of 1,180 surveys were returned. Approximately 90% of the responses included two surveys. The response rate is estimated at 33% (1,800 ÷ 3,600 = 32.8%) This is an excellent response rate for a mail-in survey.

Of the 1,180 responses, a total of 666 (56%) were from households in the Town of Shelby outside the Village. A total of 304 (26%) were from households in the Village of Medina and 103 (9%) were from non-resident property owners. A total of 96 surveys either did not indicate place of residence or indicated more than one response (such as, resident of Medina <u>and</u> property owner in the Town outside the Village.)

Wind Energy

The survey results indicate that residents are generally in favor of wind energy facilities and would encourage the Town to secure a favorable payment in lieu of taxes to reduce Town taxes. However, residents strongly encourage the Town to work with wind energy companies to minimize the impact of projects on the environment and residents.

A total of 62% of the survey respondents "strongly agree" and 19% "somewhat agree" that the Town should <u>encourage</u> wind energy facilities to locate in the Town. Conversely, 56% of respondents "strongly disagree" and 12% "somewhat disagree" that wind energy facilities should not be permitted to locate in the Town. There was no significant difference among respondents from the Village of Medina, the Town of Shelby outside the Village, and non-resident property owners.

A total of 70% of respondents "strongly agree" and 14% "somewhat agree" that, "The Town should work with wind energy companies to secure a favorable payment in lieu of taxes to reduce Town taxes." There was no significant difference among respondents from the Village of Medina, the Town of Shelby outside the Village, and non-resident property owners.

A total of 76% of respondents "strongly agree" and 13% "somewhat agree" that, "The Town should work with wind energy companies to ensure that their projects have the least possible impact on the environment and residents." Among residents of the Town of Shelby outside the Village, 78% "strongly agree" and 12% "somewhat agree" with this statement.

Written comments generally expressed support for wind energy, with several respondents indicating that the facilities should be designed to have a minimal impact on wildlife.

Mining

Based on survey results, residents do not support a complete prohibition of mining throughout the Town, but suggest that the Town should designate certain areas where mining would be permitted and others where it would be prohibited. In addition, residents would support regulations that specify the type of mining that would be permitted. Residents strongly encourage the Town to work with mining companies to minimize impact on residents and neighboring properties, and suggest that the Town Board, rather than the Planning Board, should be responsible for approving or denying requests to establish new mining operations in the Town.

A majority (58%) of respondents disagree (39% "strongly" and 19% "somewhat") that, "All types of mining and excavation operations should be prohibited in the Town." Respondents who agree that all types of mining should be prohibited represent a minority (30%) of respondents. The proportion of respondents who "strongly agree" that mining should be prohibited was 25% among residents of the Town of Shelby outside the Village, 18% among Village residents, and 15% among non-resident property owners.

A total of 51% of respondents "strongly agree" and 20% "somewhat agree" that, "The Town should designate certain areas where mining would be permitted and where mining would be prohibited." Disagreement with this statement was registered by 19% of Town residents (15% "strongly"), 13% of Village residents (8% "strongly") and 14% of non-resident property owners (7% "strongly).

A majority (58%) of respondents agreed (35% "strongly") that, "Certain types of mining and excavation operations should be permitted, while others should be prohibited in the Town." A total of 25% of respondents disagreed (16% "strongly") with this statement. A larger majority (64%) of respondents from the Village of Medina agreed with this statement (42% "strongly.")

A large majority (82%) of respondents agreed (72% "strongly") with the statement, "The Town should work with mining companies to ensure that mining projects have the least possible impact on residents and neighboring properties." Responses from the Town outside the Village and from Village residents were similar.

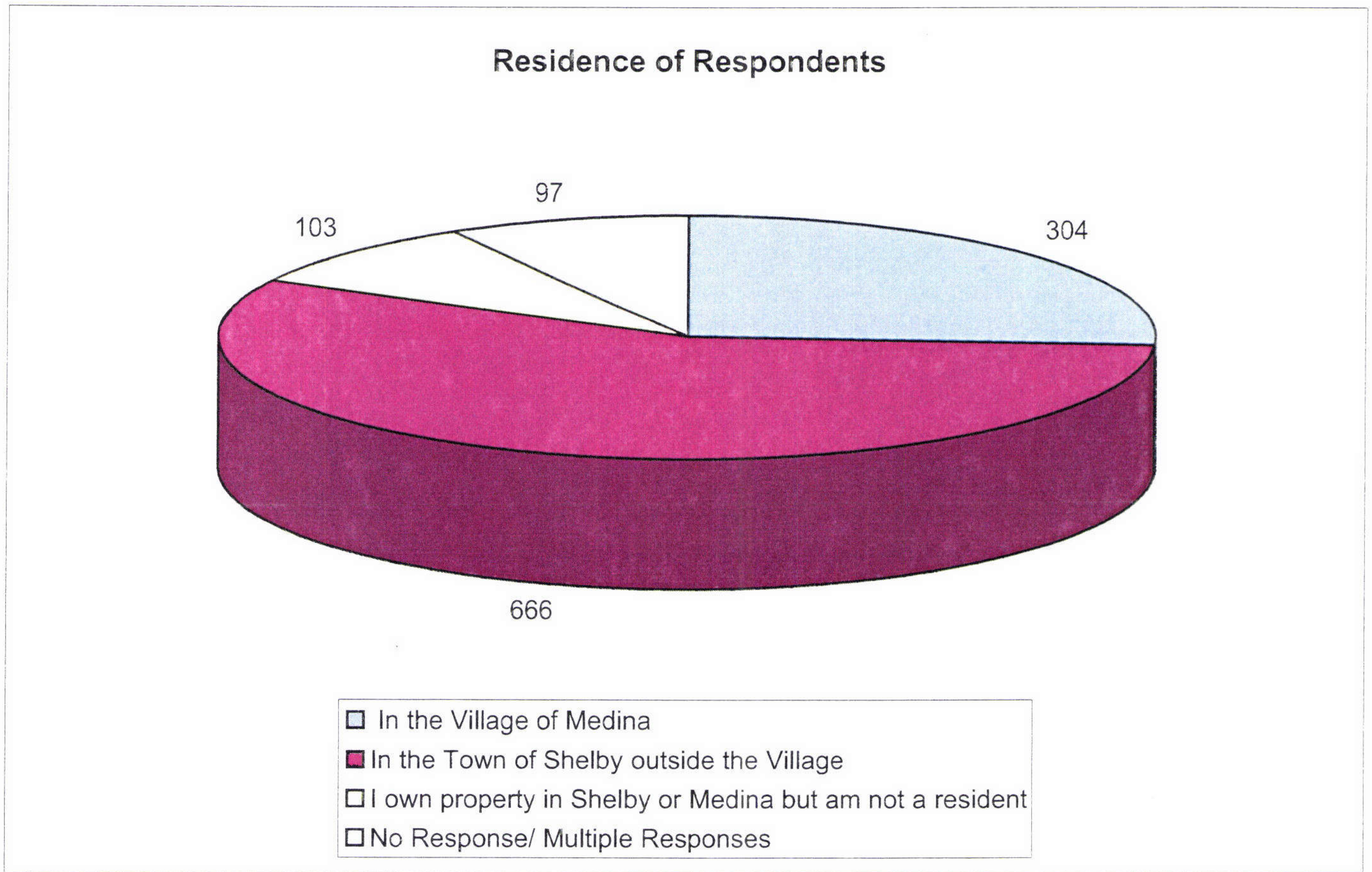
A majority (55%) of respondents agreed (38% "strongly") that, "The Town Board, rather than the Planning Board, should be responsible for approving or denying requests to establish new mining operations in the Town." A total of 32% disagreed (20% "strongly") with this statement and 20% had no opinion. Among residents of the Town outside the Village, 59% agreed (41% "strongly") with this statement, while 16% had no opinion.

Town of Shelby Residents' Survey - 2007

RESPONDENTS' PLACE OF RESIDENCE

My residence is:

A	In the Village of Medina	304
B	In the Town of Shelby outside the Village	666
C	I own property in Shelby or Medina but am not a resident	103
	No Response/ Multiple Responses	97
		1170



Town of Shelby Residents Survey - 2007

WIND ENERGY

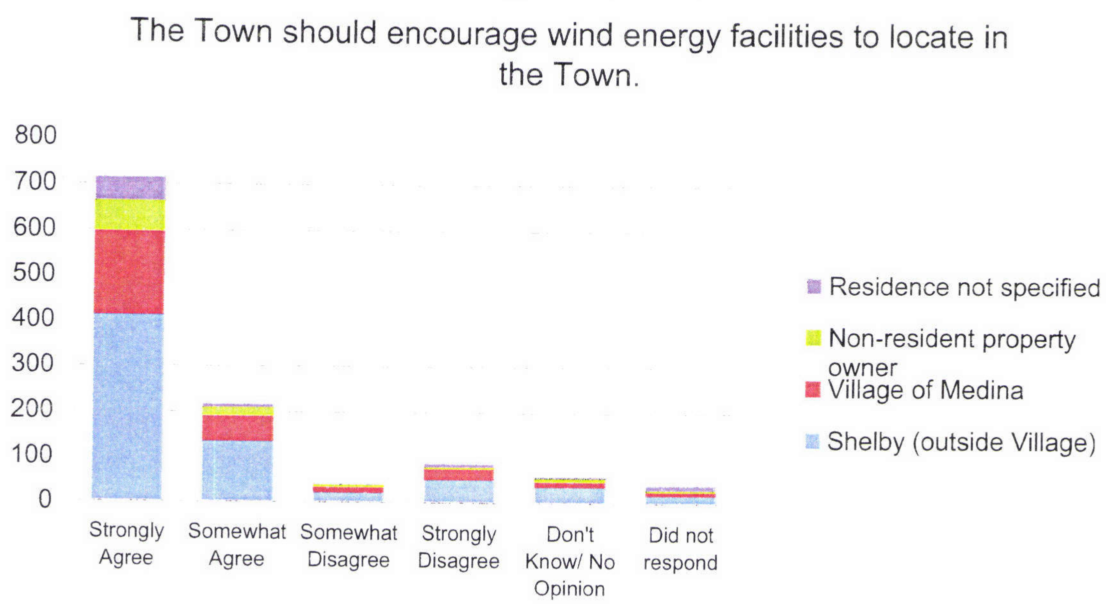
	The Town should encourage wind energy facilities to locate in the Town.		Wind energy towers should not be permitted to locate in the Town.		The Town should work with wind energy companies to secure a favorable payment in lieu of taxes to reduce Town taxes.		The Town should work with wind energy companies to ensure that their projects have the least possible impact on the environment and residents.		
Strongly Agree	410	61.6%	76	11.4%	468	70.3%	522	78.4%	**SHELBY RESIDENTS (OUTSIDE VILLAGE)**
Somewhat Agree	133	20.0%	48	7.2%	101	15.2%	78	11.7%	
Somewhat Disagree	21	3.2%	84	12.6%	18	2.7%	10	1.5%	
Strongly Disagree	50	7.5%	370	55.6%	38	5.7%	18	2.7%	
Don't Know/ No Opinion	35	5.3%	42	6.3%	23	3.5%	13	2.0%	
Did not respond*	17	2.6%	46	6.9%	18	2.7%	25	3.8%	
Total	**666**	**100.0%**	**666**	**100.0%**	**666**	**100.0%**	**666**	**100.0%**	
Strongly Agree	186	61.2%	39	12.8%	225	74.0%	225	74.0%	**MEDINA RESIDENTS**
Somewhat Agree	57	18.8%	20	6.6%	40	13.2%	43	14.1%	
Somewhat Disagree	13	4.3%	39	12.8%	4	1.3%	3	1.0%	
Strongly Disagree	26	8.6%	172	56.6%	17	5.6%	17	5.6%	
Don't Know/ No Opinion	13	4.3%	17	5.6%	12	3.9%	7	2.3%	
Did not respond*	9	3.0%	17	5.6%	6	2.0%	9	3.0%	
Total	**304**	**100.0%**	**304**	**100.0%**	**304**	**100.0%**	**304**	**100.0%**	
Strongly Agree	66	64.1%	8	7.8%	71	68.9%	74	71.8%	**OWN PROPERTY BUT NOT A RESIDENT**
Somewhat Agree	19	18.4%	4	3.9%	16	15.5%	16	15.5%	
Somewhat Disagree	5	4.9%	10	9.7%	2	1.9%	4	3.9%	
Strongly Disagree	3	2.9%	68	66.0%	0	0.0%	0	0.0%	
Don't Know/ No Opinion	7	6.8%	8	7.8%	9	8.7%	4	3.9%	
Did not respond*	3	2.9%	5	4.9%	5	4.9%	5	4.9%	
Total	**103**	**100.0%**	**103**	**100.0%**	**103**	**100.0%**	**103**	**100.0%**	
Strongly Agree	724	61.9%	133	11.4%	825	70.5%	889	76.0%	**TOTAL - ALL SURVEYS RECEIVED ****
Somewhat Agree	220	18.8%	79	6.8%	170	14.5%	147	12.6%	
Somewhat Disagree	44	3.8%	143	12.2%	24	2.1%	17	1.5%	
Strongly Disagree	88	7.5%	663	56.7%	61	5.2%	39	3.3%	
Don't Know/ No Opinion	59	5.0%	69	5.9%	47	4.0%	25	2.1%	
Did not respond*	35	3.0%	83	7.1%	43	3.7%	53	4.5%	
Total	**1170**	**100.0%**	**1170**	**100.0%**	**1170**	**100.0%**	**1170**	**100.0%**	

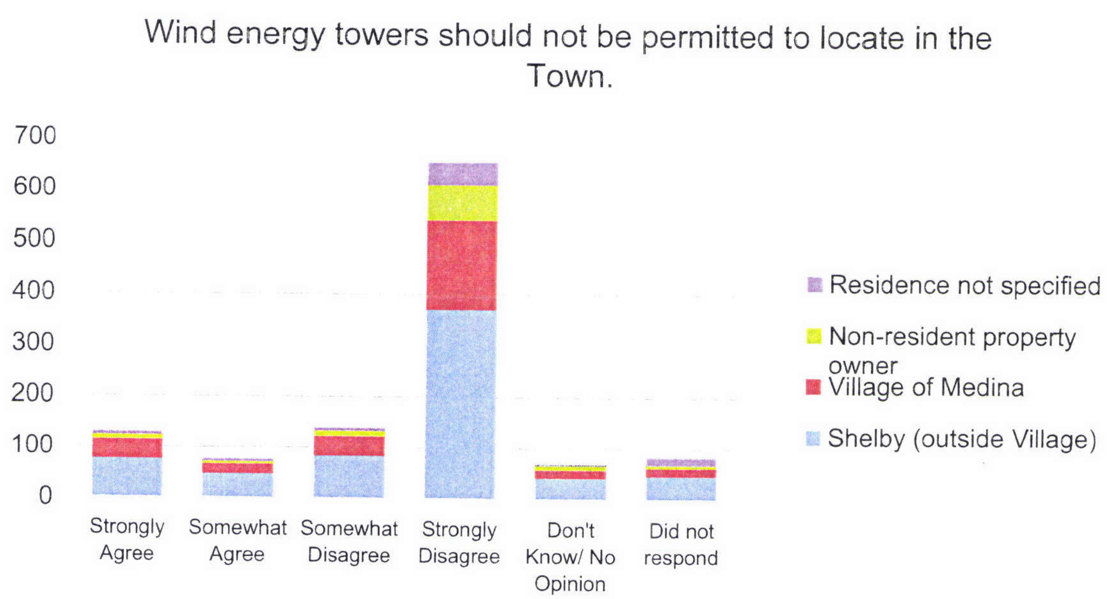
* Includes multiple responses

** Includes responses where multiple places of residence were indicated

Town of Shelby Residents Survey - 2007

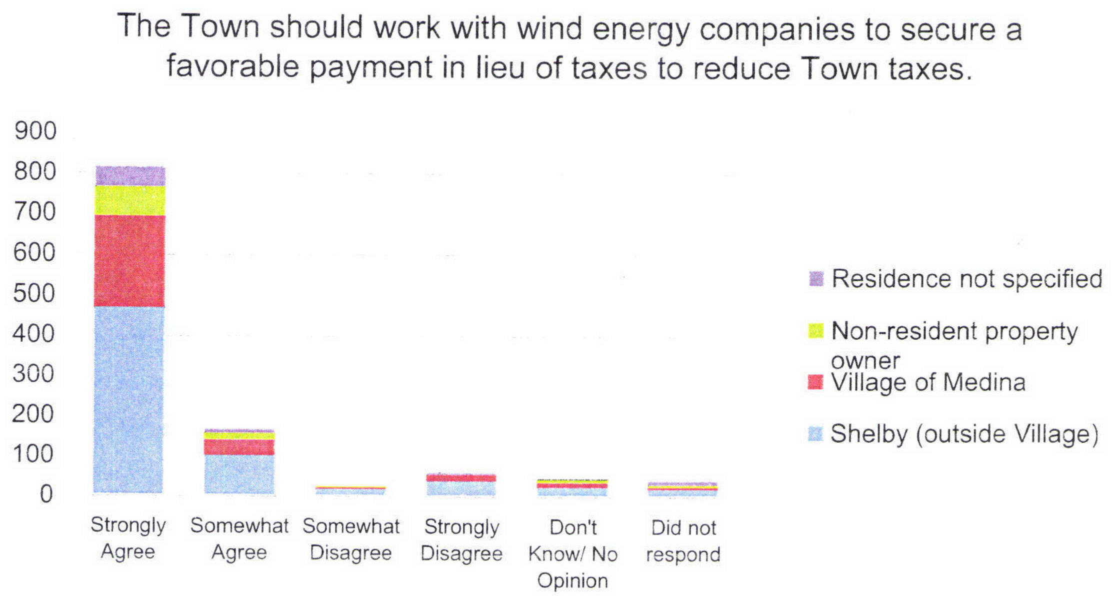
WIND ENERGY

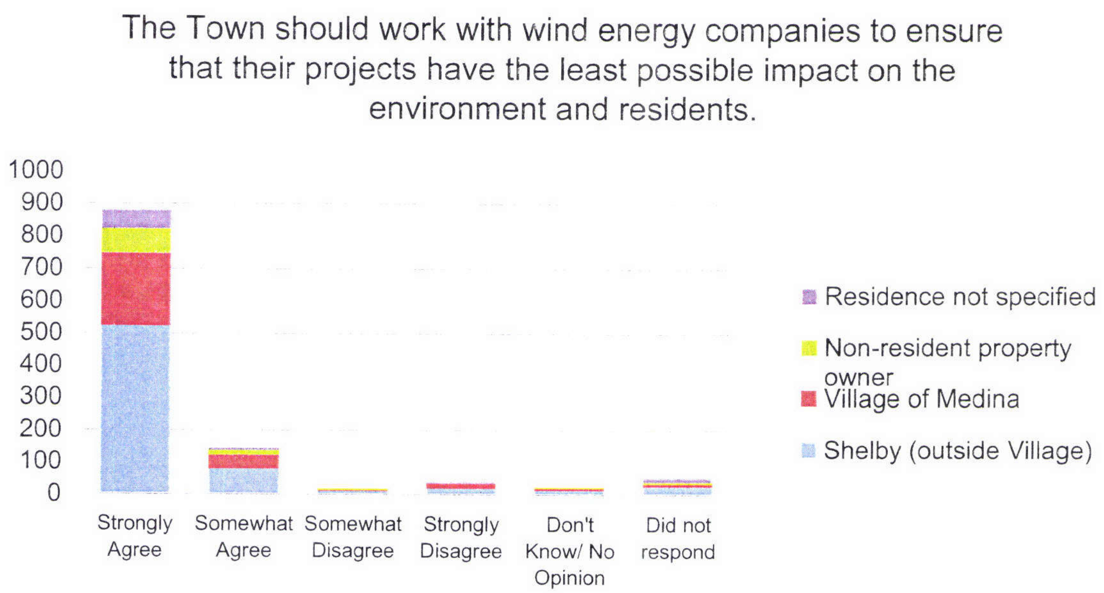




Town of Shelby Residents Survey - 2007

WIND ENERGY





Town of Shelby Residents Survey - 2007
MINING

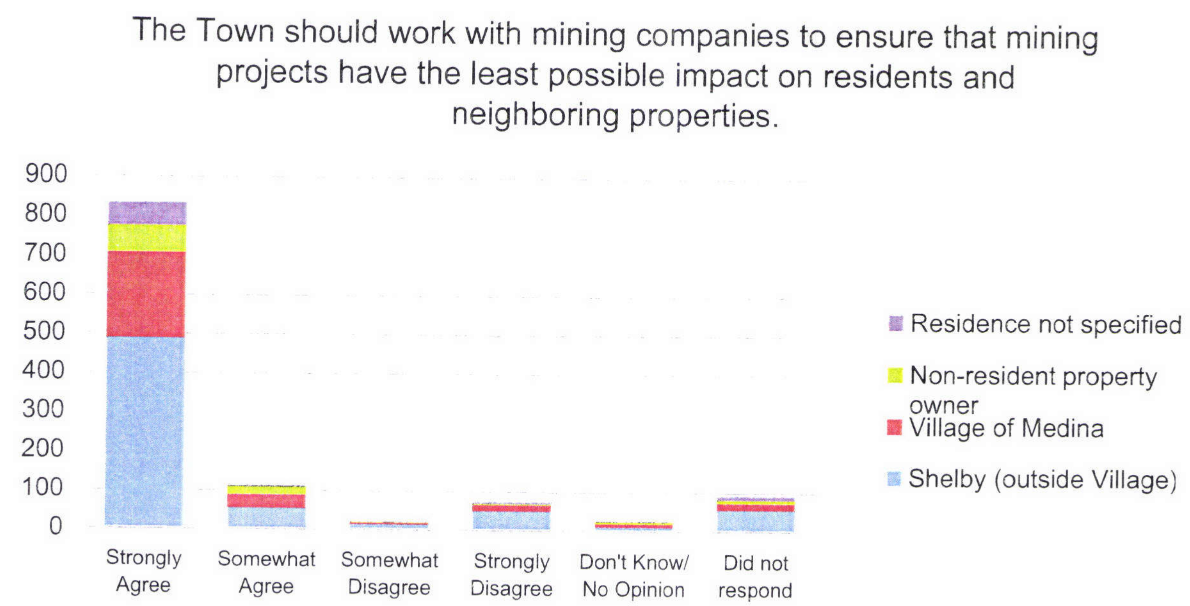
	The Town should designate certain areas where mining would be permitted and where mining would be prohibited.		The Town should work with mining companies to ensure that mining projects have the least possible impact on residents and neighboring properties.		Certain types of mining and excavation operations should be permitted, while others should be prohibited in the Town.		All types of mining and excavation operations should be prohibited in the Town.		The Town Board, rather than the Planning Board, should be responsible for approving or denying requests to establish new mining operations in the Town.	
SHELBY RESIDENTS (OUTSIDE VILLAGE)										
Strongly Agree	334	50.2%	487	73.1%	223	33.5%	167	25.1%	275	41.3%
Somewhat Agree	138	20.7%	53	8.0%	148	22.2%	58	8.7%	117	17.6%
Somewhat Disagree	29	4.4%	13	2.0%	62	9.3%	126	18.9%	54	8.1%
Strongly Disagree	98	14.7%	49	7.4%	126	18.9%	257	38.6%	65	9.8%
Don't Know/ No Opinion	14	2.1%	9	1.4%	45	6.8%	27	4.1%	108	16.2%
Did not respond*	53	8.0%	55	8.3%	62	9.3%	31	4.7%	47	7.1%
Total	**666**	**100.0%**	**666**	**100.0%**	**666**	**100.0%**	**666**	**100.0%**	**666**	**100.0%**
MEDINA RESIDENTS										
Strongly Agree	175	57.6%	220	72.4%	127	41.8%	56	18.4%	106	34.9%
Somewhat Agree	55	18.1%	36	11.8%	66	21.7%	23	7.6%	42	13.8%
Somewhat Disagree	14	4.6%	4	1.3%	32	10.5%	62	20.4%	30	9.9%
Strongly Disagree	25	8.2%	16	5.3%	31	10.2%	119	39.1%	21	6.9%
Don't Know/ No Opinion	13	4.3%	10	3.3%	29	9.5%	24	7.9%	84	27.6%
Did not respond*	22	7.2%	18	5.9%	19	6.3%	20	6.6%	21	6.9%
Total	**304**	**100.0%**	**304**	**100.0%**	**304**	**100.0%**	**304**	**100.0%**	**304**	**100.0%**
OWN PROPERTY BUT NOT A RESIDENT										
Strongly Agree	43	41.7%	67	65.0%	25	24.3%	15	14.6%	27	26.2%
Somewhat Agree	27	26.2%	19	18.4%	31	30.1%	6	5.8%	21	20.4%
Somewhat Disagree	7	6.8%	2	1.9%	7	6.8%	19	18.4%	10	9.7%
Strongly Disagree	7	6.8%	3	2.9%	9	8.7%	45	43.7%	11	10.7%
Don't Know/ No Opinion	8	7.8%	5	4.9%	21	20.4%	9	8.7%	27	26.2%
Did not respond*	11	10.7%	7	6.8%	10	9.7%	9	8.7%	7	6.8%
Total	**103**	**100.0%**	**103**	**100.0%**	**103**	**100.0%**	**103**	**100.0%**	**103**	**100.0%**
TOTAL - ALL SURVEYS RECEIVED**										
Strongly Agree	600	51.3%	843	72.1%	414	35.4%	260	22.2%	445	38.0%
Somewhat Agree	238	20.3%	113	9.7%	263	22.5%	92	7.9%	197	16.8%
Somewhat Disagree	51	4.4%	22	1.9%	105	9.0%	221	18.9%	98	8.4%
Strongly Disagree	143	12.2%	73	6.2%	181	15.5%	461	39.4%	108	9.2%
Don't Know/ No Opinion	40	3.4%	27	2.3%	103	8.8%	66	5.6%	236	20.2%
Did not respond*	98	8.4%	92	7.9%	104	8.9%	70	6.0%	86	7.4%
Total	**1,170**	**100%**	**1,170**	**100%**	**1,170**	**100%**	**1,170**	**100%**	**1,170**	**100%**

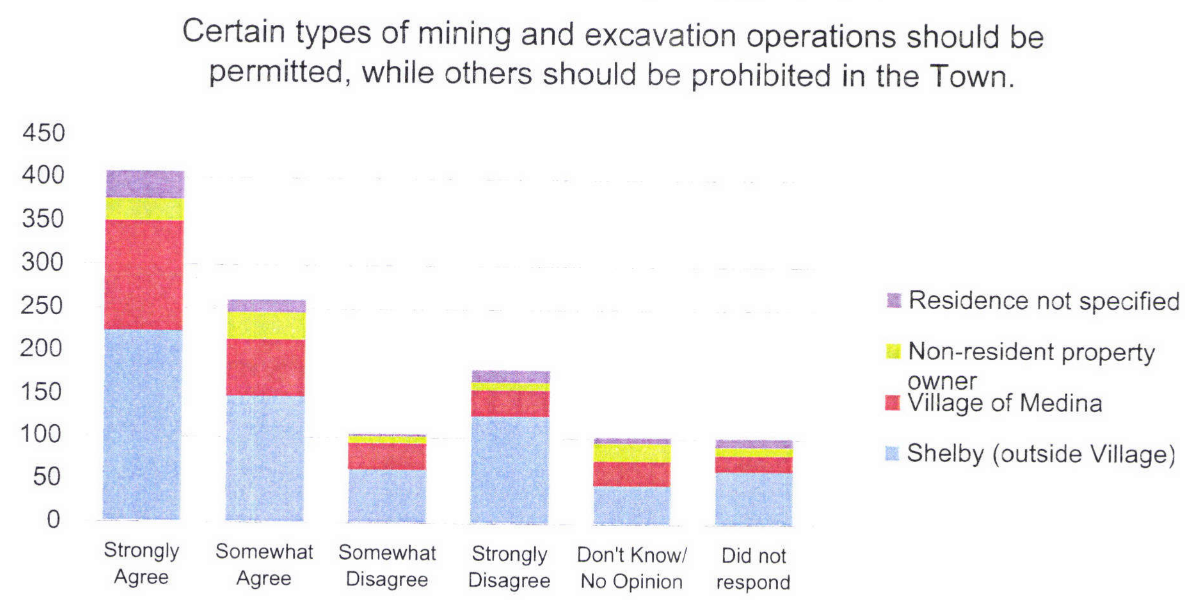
* Includes multiple responses

** Includes responses where more than one place of residence was indicated

Town of Shelby Residents Survey - 2007

MINING

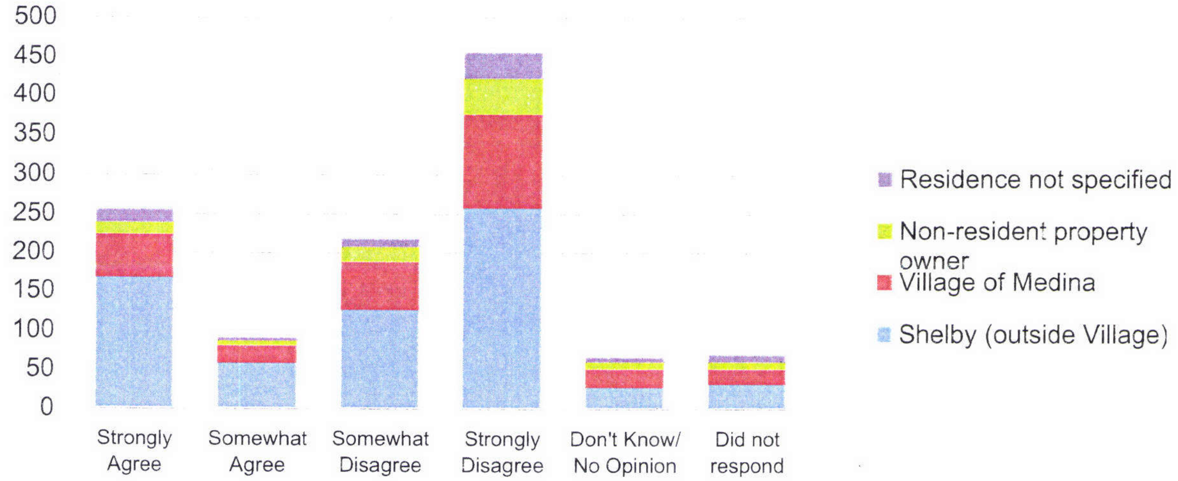




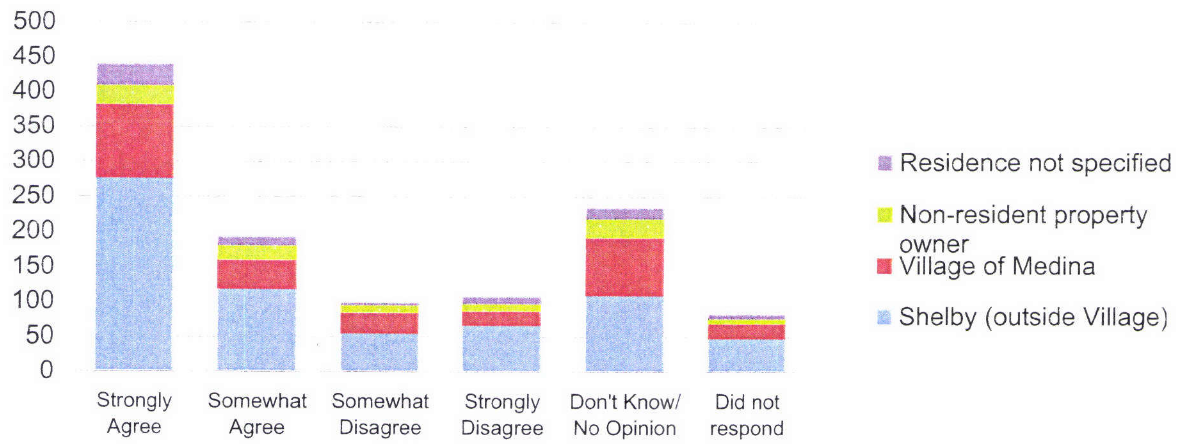
Town of Shelby Residents Survey - 2007

MINING

All types of mining and excavation operations should be prohibited in the Town.



The Town Board, rather than the Planning Board, should be responsible for approving or denying requests to establish new mining operations in the Town.



Town of Shelby Residents Survey - 2007

Comments on Wind Energy

1) Legal expertise in the name of wind energy is needed. I attended an information meeting 2/26/07 at Albion High School. The law firm of Hodgson Russ LLC conducted the meeting sponsored by the Towns of Albion, and Gaines. There are legal, environmental and geological issues involved. I would be more confident about a **County Wide** approach.

2) Wind turbines require the same roads and infrastructure as cell towers, which are posing significant problems for migrating birds. Wind turbines are noisy (to those near them) and aesthetically ugly. Wind turbines have yet to close down any coal fired plants, and are unreliable; not able to provide capacity. Solar power is the future because of its negative carbon emissions. Wind power is not the desired route.

3) I do not have enough information to voice an opinion. Perhaps the Town Board could have a public meeting w/ reps from another Town to share facts about the pros and cons of the Wind Towers, and then we could comment intelligently.

4) I believe that the Town of Shelby should strongly consider allowing Wind Energy Towers/Facilities in our area. This is an opportunity for the Town to move towards the "wave of where the future of energy production" is heading!!

5) Orleans County is part of the Atlantic flyway for migratory birds. Wind energy towers should not be encouraged at all. The level of taxes does not matter as much as looking at the damn things.

6) Do not want any wind energy towers. (2)

7) I am concerned about killing birds.

8) The key words Reduce Town Taxes. If Wind Power is to locate to the town. Please use the tax money to reduce taxes not spend more.

9) I think it is a good idea when you can make energy without having to worry about pollution, plus less taxes is always a good thing.

10) I am very much opposed to wind towers in the Town of Shelby, as I doubt they will do anything to benefit the tax payers.

11) We think wind energy projects are beneficial to Shelby residents so long as they are profitable (i.e., Not government subsidized).

12) Wind Energy should be looked into if it is actually viable to other unknown sources of energy. I think the Town should investigate thoroughly and proceed with caution, but proceed.

13) We should consider residential as well as commercial installations.

14) Energy should be encouraged to, hopefully lower all Village and Town energy costs and reduce taxes.

15) Wind farms isolated in the country – YES; Wind farms among buildings and homes – NO.

16) It seems as if to be progressive, you must go with this energy saving idea. I feel we have a capable board that can seek out information and make a correct decision on this production of clean electricity. It is not possible not everybody is happy on this subject.

17) This seems to be a smart way to decrease our dependence on oil!!!

18) The Town of Shelby is a migratory bird sanctuary and an agricultural community, not a wind energy facilities location.

19) The only ones who make anything from these deals are the ones in office. The tax payers never get what is promised. I moved here in 1991 to live in the country not a business area. If I wanted that I'd be in Buffalo. My kids grew up here and now my grandkids in the "Natural Country".

20) Less oil is better for everyone, mostly the world.

21) I think that any agreement we sign with a wind energy company should provide for the future removal, at the company's expense, of defunct wind towers and peripherals.

22) Appropriate places would be fine.

23) If it helps lower electric bills or helps with taxes!

24) On if it offsets our electricity bills in lowering them.

25) Although this area is a heavily populated wildlife area, towers would be a great source of alternate energy and lowering taxes are a major plus.

26) Your saying lower taxes – if it is going to be 5% - No; if it is 35% or more – Yes

27) Clean electricity = good and Lower taxes=good

28) Town should set rules. Companies should follow them.

29) There are a lot of empty properties to be used; to lower the cost of energy use; it's cleaner; what harm can a wind mill do?

30) I don't know enough about this yet, but overall I feel somewhat positive about this.

31) Don't have them now, so don't let them in and we won't have problems.

32) Let's keep a beautiful countryside environment. I have a hill behind my house and Chester owns it! He would most likely let a wind facility in there.

33) Much research and data collection, not rushed decision based on projected tax income. Look at Town of Somerset. What they thought was to be tax windfall for life, is a Town disaster. Too many factors need to be assessed and long-term impact a must.

34) I would have to see more solid, scientific evidence to make a good decision. I would not like to see the beauty of our countryside and wildlife harmed in any way, as this is why I moved here from the suburbs where I grew up.

35) I believe wind is one of the cleanest ways to produce energy or water. It doesn't bother me to see a windmill, especially if it is making money to lower our taxes.

36) Wind farms are something that should be looked into very strongly. Due to fuel prices going up due to the lack of fossil fuel in the future. Get every resident within 5 miles of site to give their opinions; they will have to see them.

37) I don't have a lot of information on this, but if it can be done without causing harm to the community and if it can lower taxes, I think it should be looked into.

38) No wind towers! These can be 500+' tall!

39) I strongly disagree as I don't believe we should be working with them at all! Do people realize how big these towers are?

40) If wind towers would lower taxes and energy costs, they should seriously be considered. I've been to other places in NY that have them and it doesn't seem to be a problem with them.

41) Any cost for infrastructure improvements or upgrades and maintenance should be borne by the business.

42) Do we have enough wind here to make it worth while?

43) Locate towers so they could not fall on people's homes.

44) Locate towers such that impossible to fall on a residence or road!

45) Bring on the wind energy towers.

46) Bring 'em on.

47) I think that as long as the land owner has an agreed upon set back and with any neighbors, it would be alright.

48) Our land is too flat for Wind Energy Wind Mills, to try to blend them into countryside view (300+').

49) No space for Wind Turbines.

50) Would we be distributing out our wind power to this area only or would we subsidize and add others? (Unlike the Medina Falls or Glenwood Lake Facility who we all could benefit from but the power is delivered elsewhere).

51) The only way that wind generation is viable is by getting grant monies to pay for the majority of the upfront capitol and the tax credits from the government. Businesses should be required to show that they can be viable without all of the government monies before they are allowed to get any.

52) Only if residents get lower priced energy and taxes.

53) Very favorable of wind energy, not in the Township, but anywhere in the surrounding agricultural area.

54) Let's solve the energy problem before it gets completely out of hand!!!

55) It is so important to help people in low income and retired people in trailer parks who struggle to survive, all the people deserve help!

56) Any project will have some impact on neighbors let the wind people negotiate with individual. We are in favor of wind power.

57) I am a strong supporter of wind energy. In today's world, we need to start looking and using alternative energy products. Other counties have advanced in this field and have cut their dependency on oil. It's not like we don't have windy days. My concern is will the wind companies overcharge for their products?

58) I would hate to have them in my backyard.

59) There is no near future need for wind energy in this area. It's just a money making scheme in the name of ecology. Let's look at water power when the time comes that we need more energy.

60) Safety and environmental impacts are concerns as well as neighborhood impact.

61) Wind mills on farms have been around a long time. Zoning should not exclude old windmills or new wind mills that pump water on a farm. Windmills also can be used to aerate ponds. Wind Energy companies should pay TAXES and Property Taxes.

62) Taxes should be paid on the value of the generators/turbines

63) The wind turbines will be here a long time, 30 plus years, if allowed to come. Put them somewhere else.

64) Tax the wind turbines high and they will go some place else, which is ok.

65) If adding a few wind mills to the Town would effect the cost of the Town's energy use, I'm for being more of a self sufficient village

66) You should contact the Towns of Lowville, Martinsburg, and Lewis County where the large Maple wind farm was developed over the last 2 years. They could make a presentation to the community.

67) We have to start reducing our dependence on fossil fuel, especially foreign oil. Our country only uses about 8 % renewable energy, we have to start converting the other 92% to Wind, Solar, etc.; Wind energy has some problems but it is a start we should make. As it is the only renewable, this is viable right now.

68) I need to know more about the Wind Energy facilities. Not sure why other Towns seems to be against them. Please schedule a meeting to understand if we want them.

69) This is not a very good idea. The Towers will be an eyesore to everyone living or just passing through this area. Plus the space it takes to run the wind mills will be just too much. Please this is a very bad idea.

70) We should be looking towards newer ways to make and store energy. Prices of gas and fuel sources have sky rocketed. It is time we tell other countries to keep their fuel because we have other good sources now. It would be a sad mistake if we say no to Wind Energy.

71) If wind energy is viable and it will bring revenue to town, I am strongly for it. Taxes in Medina are almost at an unbearable level now. Look at the number of properties in foreclosure and ill repair because residents can't pay the tax, water and sewer burden.

72) I think it would be worth looking into.

73) Towers should not interfere with residents' quality of life, property values, or the environment.

74) I will go along with you, if we get cheaper electric power.

75) If this helps the Town prosper and improve the quality of life for the Town, Amen.

76) I would rather see a good clean incinerating process for garbage, to produce steam generating power.

77) Whatever is better for the environment, least cutting down of trees, we need to get out of oil. I am willing to talk if necessary about using my property. Thank you. Simon (516) 695-4204.

78) I have not heard of anybody in favor of Wind Towers and feel that they have no benefit to the Town. The only people to benefit from the towers would be landowners with towers on their land. Plus, they may produce "clean" energy, but are very efficient, so how much benefit do they really provide?

79) Wind Energy is cleaner and cheaper.

80) Wind Energy may be an excellent way to reduce property taxes as well as providing a cheap pollution free energy source.

81) If windmills are allowed when they are not operational, they should be removed and land restored to the original use. This shouldn't cost the Town anything to restore the property. Set back from Road or buildings and homes to be at least 500ft.

82) We have travelled in Germany and have seen many windmills from a distance and up close. They are not an eyesore, they are quiet and they are certainly a clean source of energy that we should use as much as possible.

83) A study or survey of the current places that have windmill farms should be taken along with the proposed location where they are to be erected.

84) I am in favor of wind energy if all parties involved (including wildlife-most of all) are not harmed in anyway. We need to do something to help our energy situation, and it seems like wind energy benefits the environment. Thank you.

85) If it came to choosing between wind turbines and a nuclear power plant, my choice would be the wind turbines. I am not thrilled with the huge turbines "decorating" the countryside, but I do feel they are more environmentally friendly.

86) More birds/bats are killed each year by autos. Are we going to ban driving? I think not. Invest in renewable energy to get out of foreign oil dependency.

87) I would like to see wind energy developed in Shelby. Possibly lower my taxes and lower my electric bill.

88) Town residents should be allowed to buy low cost power from wind companies. Town acquired monies should be used to lower town taxes.

89) I feel strongly in the benefits of wind energy. I would like the Town to investigate the possibility of a wind energy company providing energy to the Town.

February 23, 2007
To: Town Of Shelby Board

From:Celeste Morien
12534 Hemlock Ridge Road
Medina, NY 14103

Dear Town Of Shelby:

I am writing to voice my strong objection to the planned Frontier Stone Quarry in the Town of Shelby. I am objecting for several reasons.

Foremost, as a frequent user of the Iroquois National Wildlife Refuge and volunteer for Iroquois Observations, I object because this proposal would have negative impacts on a sensitive area. Hydrology, trucking noise, blasting disturbances and topology changes of this project will have negative impacts on the wildlife of the refuge as well as the wildlife of the land proposed for quarry use, which is used by Short-eared Owl and Northern Harrier for both nesting and hunting. Many other ground nesting grassland birds, which all face loss of habitat currently survive in some of these fields, including Horned Lark, Savannah Sparrow, Bobolink, Upland Sandpiper, Eastern Meadowlark, Vesper Sparrow, Henslow's Sparrow, Grasshopper Sparrow and Field Sparrow. The section of land specified for use by the stone quarry is massive and is directly adjacent to the Forrestal Flats north of Oak Orchard Ridge Road, a part of the refuge which is well known as a grassland bird habitat. Use of the land close by for a quarry further isolates the populations of birds on the refuge genetically from surrounding populations, making the remaining birds subject to further species decline.
Our volunteer group has used the Oak Orchard Ridge Road refuge overlooks and stretches of the Oak Orchard Ridge Road for Birding By Car tours in spring and fall since 1990. We bring 100 people as visitors on our tours to this location. I believe the location will no longer be safe for observers of wildlife if it is used by quarry trucks. It will also be a disturbed area and subject to species decline.

At the least, if this quarry is approved, the management of the quarry should be required to create a natural grassland habitat with the affected area, maintaining it as unmowed field through to September, rather than as a mowed, groomed site. This should be required from the onset of operations, not waiting for the 75 year usage to be over, as mentioned in the proposal.

Secondly, our home is located 1.5 miles from the proposed quarry site. We are very concerned that truck traffic, blasting vibrations and noise and air emissions will have a negative impact on our house value and on the health and quality of life in the entire neighborhood.

Third, there are already two existing quarries, one in Barre and one in Shelby. Why disrupt more agricultural land when limestone can be obtained already from two other sources?

Thank you for registering my strong objections to this project.
Sincerely,
Celeste Morien

July 29, 2006

Mr. David Bimber
Dept. Regional Permit Administrator
Division of Environmental Permits
6274 East Avon-Lima Road
Avon, NY 14414-9519

Celeste Morien/ Thomas Morien
12534 Hemlock Ridge Road
Medina, NY 14103

Dear Mr. Bimber:

My husband and I are writing to voice our strong objection to the planned Frontier Stone Quarry in the Town of Shelby. We are objecting for several reasons.

Foremost, we are frequent users of the Iroquois National Wildlife Refuge and think the hydrology of this project will have negative impacts on the water levels and therefore, the wildlife of the refuge as well as the wildlife of the land proposed for quarry use, which is used by Short-eared Owl and Northern Harrier for both nesting and hunting. Many other ground nesting grassland birds, which all face loss of habitat currently survive in some of these fields, including Horned Lark, Savannah Sparrow, Bobolink, Upland Sandpiper, Eastern Meadowlark, Vesper Sparrow, Henslow's Sparrow, Grasshopper Sparrow and Field Sparrow. The section of land specified for use by the stone quarry is massive and is directly adjacent to the Forrestal Flats north of Oak Orchard Ridge Road, a part of the refuge which is well known as a grassland bird habitat. Use of the land close by for a quarry further isolates the populations of birds on the refuge genetically from surrounding populations, making the remaining birds subject to further species decline. At the least, if this quarry is approved, the management of the quarry should be required to create a natural grassland habitat with the affected area, maintaining it as unmowed field through to September, rather than as a mowed, groomed site. This should be required from the onset of operations, not waiting for the 75 year usage to be over, as mentioned in the proposal.

Secondly, our home is located 1.5 miles from the proposed quarry site. We are very concerned that truck traffic, blasting vibrations and noise and air emissions will have a negative impact on our house value and quality of life in the entire neighborhood.

Third, there are already two existing quarries, one in Barre and one in Shelby. Why disrupt more agricultural land when limestone can be obtained already from two other sources?

Thank you for registering our objections to this project.

Sincerely,
Celeste S. Morien
Thomas E. Morien

Unlike wind power, mining is a non-renewable resource. Once the mining operation has taken place the consequences of that action affect not only this generation, but also future generations. While I would like to think that we could ban all mining in the town, it is a necessary evil. We all benefit from the crushed stone we get from our current sources. However, letting a very few individuals benefit at a great expense to the rest of the town residents needs to be avoided. It is therefore important for the Town Board, as elected representatives of the people, to take control of the decision making process in such matters. We depend on you to protect our rights and our land.

Thank you for the opportunity to have some input on these important matters.

February 24, 2007

Shelby Town Board
4062 Salt Works Road
Medina, New York 14103

Dear Board Members:

We are very concerned with the potential impact of any excavation or mining operations in the Town of Shelby.

One of our concerns is the impact on the water table, quality of water, and how wells are affected by mining operations. It would seem to us that excavating a large area that fills with water, and then pumping the water out will be detrimental to residents who depend on wells for their water supply, as we do. Is this company, or the town, prepared to install public water throughout all of Shelby?

Additionally, we are concerned with the effects of excavation projects on the nearby nature preserves and how wildlife in the area will be impacted. Wildlife cannot speak for itself. Therefore, it is our responsibility to take the necessary steps to ensure the environment is able to support the wildlife we all enjoy.

Another concern we have as nearby residents to the proposed mining site is its potential negative impact on our property values. Increased noise levels, blasting, truck traffic, and pollution seem to be at odds with the peace and quiet we now enjoy. We would ask that the town board do all in its power to preserve this rural way of life. We do not feel that an industry such as mining as a good fit for an agricultural district.

With the above reasons in mind, we would recommend that the town board move to enact legislation prohibiting mining operations within the Town of Shelby. As our elected officials, we depend on you to act in the best interests of our community.

Town of Shelby Residents Survey - 2007

General Comments:

1) The owner should have some input with the Planning Board, on mining or wind energy.

2) Residents anywhere in the Town should not be adversely affected by wind or mining project, whether it's noise, pollution or heavy truck traffic. The Planning Board doesn't or at least shouldn't have the authority to approve or deny requests…about anything.

3) Town and Planning Board should work together.

4) No break should be given to companies for taxes, they should all pay their share, so my property taxes don't continue to increase.

5) How close to homes would it be located?

6) To be notified when there are meeting or additional information to be put in newspaper.

7) We live in the country because of the tranquil setting!!!!

8) I think the Town Board should make all responsible decisions on any major development coming to our Town. We the people elected you all to do the right things. The other boards like Planning and Zoning Boards, are APPOINTED people and may not be fair in making decisions. Thank you.

9) You the board must consider the big picture – you all live in this area too. Please don't change the peace, quiet and the serenity we have come to know and love. Thank you.

10) I think the Town Board must take into consideration many important things, one being the people living around the proposed mine and put yourselves (the board) into the people's shoes (lives). Many have lived here for decades because of the serenity, peace, quiet beautiful area. Next to the Wildlife Refuge itself is such a big issue. Deer, turkey and many animals are using this area also as a refuge. Young and old people will be affected if this mine is allowed to come to this particular area, we would have to give up the serenity we have, along with losing value of our homes. Imagine losing all of this-life is to short. People in our area do not want to leave. I have personally given up my life savings and built a new home here even though I will have to pay $7,000 a year in taxes. How unfair to lose the life style (serenity of this area) to blasting, dust and looking at this everyday mine.

11) Should be restricted on land that is immediately adjacent to the Wildlife Refuge.

12) We agree with these policies, but when we suggested turning our Creek Road from dirt to pavement, no one seems to care. (why?) Driving on Creek Road is like driving on a scrub board.

13) Would it reduce taxes?

14) Consider Environmental Impact!!!!

15) If you make them start a fund to repair the land after the mine plays out.

16) If explosives are to be a part of the mining and excavating, all possible impact on the area should be fully investigated and the area residents given full opportunity to make their concerns known and considered.

17) What is allowed should be the choice of the people.

18) Plan was updated in 2003 with no changes made. What is the reasoning behind spending $2000 + of taxpayers money to update again?

19) The people or residents should be notified of meeting and it should be voted on. After all the Town Board people aren't the only one's it will affect.

20) Environmental issues need to be first and foremost! As with all large companies the impact on how it is presented to the community. Well groomed and pleasing should be considered and demanded. No one wants an eyesore in their community!!!

21) I do not vote for Planning Board members to make decisions for me. The Town Board should take on the responsibilities.

22) Need water down East Shelby Rd, Smith Rd.

23) Its just like the Alaskan pipeline, these people should be compensated, not just special interest!!!!!!!

Shelby Survey - attachment (1)

Wind Engergy

1) I'm getting the feeling that you are not asking about residentially owned wind generators. There should be a minimum lot size say 20-30 acres. Also, what if 80 individuals wanted to put up wind generators? There has to be a time to say no more!! It would start to ugly up the Town.

2) One or two clusters of wind generators in the Town is about enough.

Mining

1) That could be a real hot issue. This would be have to be based on a public hearing and comment period.

Town Laws should be added to. Your "major mining" section in your Zoning Law, it leaves it up to the DEC. The DEC Laws don't do enough. Residential well protection, priliminary well testing/static water levels and then all through construction and on are needed in Local Laws. The facility should be responsible for well degredation. The Town should take a good look at the DEC Law and make local additions to it.

3) What are you talking about? Major vs Minor Mining? The local pit for mining sand is usually not a big harm to the area. Sand vs Stone?

4) That's not realistic. See above. Sooner or later, the three rock quarries in Orleans County will run out. That's the time to consider another rock quarry. Little sand pits are a local necessity.

Survey - attachment cont.

8) I thought that goes without saying. The Town Bd is elected. The Planning Bd serves the Town Bd. The Planning Bd should be making recommendations and the Town Bd has the final say and that's it!!!

Now please let me explain a situation that we have regarding our Planning Bd: the chairman has been making some very unprofessional comments. He has become an embarassment to the Town. He is a liability to the Town. He is going to get the Town sued. Example: The Quarry issue, he was heard yelling at a local resident who openly opposed the proposed ~~the~~ quarry, in a local store. Telling him he was "wasting his time. The the proposed quarry was definately going to be a go." "To quit wasting his time." He is supposed to be impartial, unbiased. The last Planning Bd meeting which I attended, a local farmer was trying to get a special use permit, to build a house and house migrant workers. 3-4 Times he kept giving the application back to him, telling him, "It's just a house", you don't have to go through all that. The rest of the board was going nuts trying to correct him. To put it bluntly, the Town Planning Board Chairman is an "Idiot"!!!!! You want him directing a board, making decisions whether or not to grant mining in the Town?, or anything else?

90) People that I know who have put up a windmill on their own are very happy. Also, with today terrorist problems we could be setting someday with no back-up even with generators they are only short lived.

91) No wind towers to interrupt the landscape.

92) This is clean energy, and anything that can reduce taxes should be approved.

Saturday, February 24, 2007

Mr. Merle Draper
Shelby Town Supervisor
County of Orleans
4062 Salt Works Road
Medina, NY 14103

Dear Mr. Draper;

There is too much unsubstantiated news in the media about wind energy, most of it is written by incompetent journalists. Rather than making an uninformed decision on a hype, the town should hire an "unbiased consultant", preferably a University Professor who specialize on the subject and a graduate student, to study the impact of wind energy sector on town based on experiences of other towns around the NY State, sound environmental science and long term financial analysis. This is an important decision should not be made hastily based on emotions and anecdotal evidence. As someone who has worked in US Nuclear Industry for many years, I have first hand knowledge of what misinformed public can do.

Ethanol plant under construction may be the beginning of an economy based on alternative energy production in the Town of Shelby. In this context, wind farms may complement ethanol production and be a major contribution to the local economy. Of Course, next step would be to ask the State University of New York to house an alternative energy research center in Shelby. Presently, SUNY does not have an alternative energy research center of excellence. Centers of Excellences are usually funded by the state by $5 million per year grants in five to ten year terms, continuously.

I do not know what the feasibility study will recommend, but I would rather make an informed decision rather than blindly. I hope my fellow neighbors agree with me.

Best regards

C Basaran

Dr. Cemal Basaran
Professor of Engineering and Director of Graduate Studies
Dept. of Civil, Structural and Environmental Engineering
University at Buffalo
Tel: 716-645-2114 ext. 2429

Winter Residence: 4909 Salt Works Road
Medina, NY 14103
Tel: 585-798-4639

Summer Residence: 10317 Chaffee Lane
Lyndonville, NY 14098

FROM A PERSON THAT HAS STOOD AT THE BASE OF A WIND TOWER, AND MANY OF THEM AT TUG HILL IN THE SUMMER OF 2006, I THOUGHT THEY WERE THE COOLEST THINGS I HAVE EVER LAID MY EYES ON.

AS FAR AS NOISE GOES, THERE IS'NT ANY!!! PUT ONE ON MY PROPERTY PLEASE!

I WISH YOU WOULD OF HAD A SURVEY ON THE ETHANOL PLANT. I WENT TO MEETINGS TO FIND OUT IF THEY PRODUCED ANY SMELL, AND WAS TOLD "WE ARE NOT HERE TO ANSWER QUESTIONS", WELL I AM (AS YOU GUESSED) DIRECTLY "DOWN WIND" OF THE PLANT" AND FROM WHAT I'VE READ IN THE EDITORIALS IN THE MEDINA JOURNAL, IT SOUNDS LIKE IT IS GONNA SMELL. IF IT DOES, MY HOUSE WILL BE "FOR SALE" HOPE I DON'T HAVE TO MOVE.

SINCERELY
WILLIAM MARYJANOWSKI

12033 MAPLE RIDGE RD
MEDINA, NY. 14103

Additional comments on Wind mills

1. I am in favor of windmills that will not be near residents and will not disturb neighbors.
2. The information that I have read never classified this region as one that would be feasible to have windmills. Wind charts never seem to regard this area as having a lower amount of wind.
3. With the amount of migratory birds that fly through this area, we should be very limiting to the use of windmills to see how the birds adjust. This should also apply to bats. Bats don't get a lot of good press but I definitely can appreciate how many mosquitoes they can eat.

THE BIRDS AND THE BREEZE

Making wind power safe for wildlife

BY FRANCES CERRA WHITTELSEY

ALTAMONT, CALIFORNIA, gave wind farms a bad reputation. At least 22,000 birds, including some 400 golden eagles, have collided with wind turbines (or been electrocuted by power lines) there, leading some to call the machines "Cuisinarts of the air."

Had studies been done before the 5,400-turbine facility was built in the 1980s, they would have shown that the Altamont Pass is an important migration route and wintering area for raptors. Better placement of wind farms and individual turbines is key to reducing bird fatalities. "We support appropriately sited wind power projects," insists Jeff Miller, a spokesperson for the Center for Biological Diversity, which is suing for restitution for bird deaths at Altamont. Laurie Jodziewicz, representing the American Wind Energy Association, says, "It's standard practice now to do bird studies prior to construction." Jodziewicz also notes that today's turbines are taller—above the flight paths of many birds—and more efficient than earlier models. Over the next decade at Altamont, one new turbine will replace every 15 old ones, producing the same amount of power.

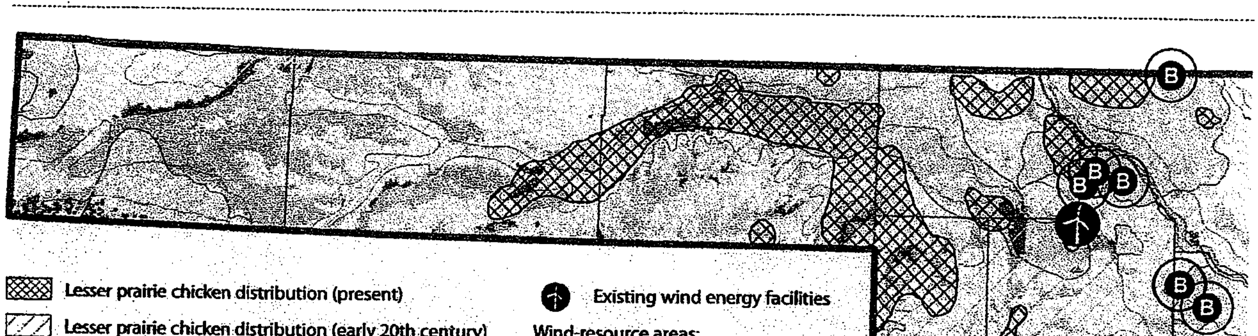
To help minimize risks at its proposed 140-megawatt wind farm off the south shore of Long Island, New York, the Long Island Power Authority conducted an environmental assessment. The review eliminated sites near inlets and at the island's tip at Montauk Point because of high concentrations of birds. Pending a final environmental impact statement, local conservation groups have so far supported building the project 3.6 miles off the popular Jones Beach State Park. Some residents, however, remain opposed on aesthetic grounds.

Bats too have been hurt by wind turbines, but mitigation studies began only in 2005, a year after the discovery that thousands had died at wind farms in the mountains of West Virginia and Pennsylvania. Work is now under way to find a means to warn bats away from the spinning blades.

Efforts to make turbines safer for birds seem to be working. According to a 2003 study of 4,700 turbines located outside California, each killed 2.3 birds per year. That's a tiny number compared with the hundreds of millions of birds that fall prey to cats every year, or the 4 million, at minimum, that collide with communication towers. And it pales in comparison to the number of birds and other creatures that would be killed by catastrophic global warming.

Siting wind farms far from avian flight paths can greatly reduce bird kills; taller turbines with fewer arms also help.

SMART SITING PROTECTS ENDANGERED BIRDS



Lesser prairie chicken distribution (present)
Lesser prairie chicken distribution (early 20th century)
Western Oklahoma bat caves and five-mile buffer
Untilled landscapes
Nature Conservancy areas of conservation significance
Protected natural-resource areas
Existing wind energy facilities
Wind-resource areas:
Class 5 "excellent"
Class 4 "good"
Class 3 "fair"

The map above was developed by the Nature Conservancy to encourage responsible wind power in Oklahoma. (This fragment shows the state's panhandle.) It highlights areas with strong winds and ecologically sensitive habitat. Talk about sensitive: Endangered prairie chickens aren't at risk of flying into turbines because they shy away from tall objects that might serve as raptor perches. For an interactive version of the entire map, visit *www2.ocgi.okstate.edu/website/wildwind/viewer.htm.*

Town of Shelby Residents Survey - 2007

Residents' Comments on Mining

1) Mining operations must be responsible for their operations, inspected by outside groups and be required to help finance water lines when wells are ruined by the disruption of underground aquifers. Shelby crushed stone ruined many wells to their North, but denied it and residents were forced to pay in full for water lines.

2) Wetlands, Wildlife, Refuge are priceless and irreplaceable!!!

3) Mining should definitely **not** be allowed near the Iroquois Wildlife Refuge. We need to protect the environment. I am inclined to oppose any mining. Our entire house shakes when they blast on Blair Rd. Although we are not on that road, I know this to be true from Furness Pkwy to Ryan Rd (at least). I believe that some problems we have had with our foundation was due to this, but it could not be proved, of course, so we are responsible.

4) I am against any mining operations in the Town of Shelby because of the environmental impact it will have on the area.

a. The truck traffic will increase air pollution from the exhausts, noise and create more dust.

b. As well as the more rapid breakdown of the road system for the heavy traffic

c. The explosives, etc., used in the mining process will disrupt the wildlife in nearby areas and most likely cause problems with the water tables and building foundations.

d. We are moving back to the country to enjoy fresh air and peacefulness and get away from the traffic and pollution.

5) The mining companies should document damage they have caused to homes, well, water and well depletion in areas adjacent to their existing projects. The Town should have independent hydrologists and geologists to do a study showing the impact of this proposed quarry on the refuge and on real estate adjacent to the proposed site. Acreages should be limited to a reasonable size.

6) The mining co. should provide uncontaminated water. Ours is quite a ways from the Blair Rd. Mine, but our water is often riled by mining.

7) Again, I feel the public needs factual (not political or biased) information on the short and long term effects on our environment. Answer this question: Will our children be proud of your decisions?

8) I do not want our beautiful rural character destroyed! Money can not trump everything! Preserve our Wild acres as much as possible. This is why I live here! No Mining!

9) As a full time Charter Captain in Point Breeze, I depend on Oak Orchard Creek. Mining will impact the headwaters and the creek. This is unacceptable....NO MINING.

10) We don't want further mining in this area because it has affected our well in Shelby. We did have excellent well water until the mining on Blair Road. We are on Ryan Road.

11) The Town needs to look closely at **all** life that is affected when considering mining operations. Whether it be animals or a handful of people, all life is important and it is unfair to impair quality of life of residents just so a land owner can make a buck. They should also consider if this mining is necessary or is there enough already in the Town and even the County.

12) If they mine, and it wrecks my well water, will they supply me with Town water free of charge?

13) Residing in the vicinity of mine excavation does have its differences: for instance – the equipment noise from 7:00 am – 5:00 pm (perhaps longer on summer days); the constant barrage of truck traffic; roads –a re they capable enough to handle the weight of the equipment (vehicles); Salt Works Road is beginning to show sign of wear, driver awareness due to loose gravel at intersections; where would responsibility be drawn in and accountability be upheld – not just for today but the tomorrows?

14) One of our only economic resources in Orleans County is tourism based off of our rural resources. Mining and excavation would be a severe detriment to our rural character. I AM OPPOSED!

15) Mining could affect too many wells; it should NOT be permitted until EVERYONE has Village Water!

16) Keep it as clean as possible. No mining within 5 miles of a residence or farms. Resale of homes may go down due to mining around residential homes.

17) I see to much politics involved. There are multi-million dollar decisions to environment, Town and County. Who are these planning board members? What education do they have to make these kinds of decisions (ditto for the Town board)? Good intentions of good people don't always make best decisions (how many have read all information and actually understand the information – not just have it explained to them by some emotionally involved person).

18) Mining is dangerous, and that should be 1st for both below and the ground covering above.

19) There are 3 quarries within 10 miles of Shelby and Medina. A fourth is less than 15 miles (WHY) do we need to endanger our Wildlife Refuge or groundwater Table…etc.

20) There are already 2 stone quarries in Orleans County. We don't need more. Almost everyone I have talked to who live near the one in Shelby, are unhappy with some aspects of the operation. I believe enormous cost to maintain the Town's infrastructure of roads to support mining would be detrimental to the Town's operating Budget leading to increased taxes. I believe the new proposed mine is in an environmentally sensitive area next to the National Wildlife Refuge and should be rejected.

21) Shelby crushed stone has already impacted residents' water supply and Town of Shelby has not been able to implement water districts to address these problems. Vehicle traffic from this business has negatively impacted the conditions of area roads. These issues need to be considered when mining is discussed. Heavy truck traffic and safety and noise issues need to be addressed.

22) I don't think we need another stone quarry in Shelby. Let's get the Ethanol Plant up and running before we take on something else that will impact the Town of Shelby. More planning needs to take place before we change the Town forever!

23) That's what your planning board is for. Should we replace or circumvent a board because we disagree with them. No.

24) Bottom line, no more mining or stone quarries in the Town of Shelby. Haven't we learned enough problems with Shelby crushed stone? Look what they have done to our roads and the speed of these tri-axle trucks on Salt Rd going south with all curves and no shoulder left!!! Let's get our priorities in order, like getting city water lines to the rest of the Town, where wells have been ruined by mining.

25) Mining should only be allowed where it will not adversely affect residential areas.

26) Final approval of both activities should be subject to public hearing and possibly referendum on very large projects.

27) The citizens should be allowed time to research these issues prior to any decisions being made.

28) We are opposed to any mining operations in Shelby.

29) Our household is STRONGLY AGAINST any mining in Shelby. We have enough mining facilities in Orleans Co.

30) We need to encourage both mining and wind industries and facilities along with other businesses, we are not the agricultural base that we once were, there are only a few major farms and the rest is being sold off. We need to encourage growth in our area.

31) Town attorney has conflict of interest. Zelany's are his clients; he should not represent the Town on this. Need another unbiased attorney. Planning board chair is in Frontier's pocket. He needs to be replaced.

32) Elected officials should make decisions not appointed one. Mines should have to prove beyond DEC permit that they won't affect refuge. Their science is junk. Paid for by them, Engineers handpicked by them. DEC permit not worth the paper it's written on. NO QUARRY by the REFUGE. No quarry unless industrial zone for large scale quarrying.

33) The Town Board should have some input in the decision, NOT the final say. If they have the final say, why have a planning board?

34) I have a well for all water needs – don't want to have to worry about the fresh clean water I use and drink each day; someday if a quarry is allowed in Fletcher Chapel Rd.

35) With the Town of Shelby already having a mining operation on Blair Rd. I believe the board really needs to consider the pros for another. How many mines should be in operation in one Township? One, two, ten, I don't know the answer, but it should be looked into.

36) No concerns on wind energy, however mining is a concern for the safety of our children w/ heavy traffic and blasting, allergy sufferers w/ excessive dust and glowing can be extremely harmful to them, especially children.

37) Mining in the county would only benefit a few people and have been shown to cause problems with the environment (i.e., foul run-off into the watershed, loud and slow truck traffic).

38) I have a great concern about the Wildlife Refuge and the impact a quarry would have on it. Also the noise factor and dust from the convoy of trucks coming and going. And what about the water supply to our wells?

39) Mining in sensitive environmental areas should not be allowed. Our watersheds need to be protected!

40) Do not want any mining of any kind. (2)

41) You should have a large input from homeowners and wildlife restrictions. But the people in the areas should have equal rights with those deciding on the Town Board.

42) Proposed mine would only benefit one man in Town.

43) The proposed mining quarry on Chester's land only benefits Chester, no other people in the Town. We already pay his health insurance, that's enough for someone who turns on his friends and neighbors.

44) All requests for mining operations should be subject to resident vote.

45) Mining should be kept away from refuge. (2)

46) I think the proposed mining operation between South Springfield, South Woods Rd, and Fletcher Chapel Rd should be prohibited because to close to residences and Job Corp. – I am concerned about the water table.

47) Worry about water in wells.

48) Do not allow any mining if there is any possible chance of any ones well being affected at all by the mining.

49) We have one stone mining in the Town of Shelby and I think that is enough. The dust covers my house and I will have to clean it. The new one would be closer and might do damage to the foundation of the house. I do not think we need other mining.

50) Every one should debate with an open mind and come to a conclusion with everyone's best interests in mind.

51) Both the Town Board and Planning Board should be responsible for approving or denying requests to establish new mining operations in the Town. (2)

52) Water sheds? Will the mining have any impact on drainage of them, or change the quality of the water that is produced from them or wells?

53) We don't need any more stone quarries in Town of Shelby.

54) I think a new stone quarry would be good for Shelby. It would open up some new jobs in the area.

55) Don't need it at all, extra traffic and trucks and tearing up the roads. We don't need it!

56) My property is in wetlands and was so designated for wildlife. I would appreciate it if mining of any form was permitted in a more commercial environmental district. If zoning for commercial mining then why the wetlands and wildlife preserves in this area? All the traffic and noise would surely displace the migrating birds and have effect on water in the area.

57) I am strongly against the proposed mine off Salt Rd. It is near existing homes, farms, and the Game Preserve. Other space would be much better.

58) Town residents should be allowed a vote on such operations.

59) Some mining sites could be cleaned up and returned to Town residents as building property or park land (such as fishing). Sites that have passed their use for mining.

60) The board needs to do more to regulate them, better than Shelby Stone Quarry is currently regulated.

61) Trucks coming and going from these areas should be policed since stop signs are **frequently** ignored by these trucks.

62) I think that if possible wind facilities & mines are interested in building in Town, residents should again be surveyed and their opinion should factor into approval or disapproval by the Town Board. Specific sites should be listed or residents should have input on possible sites.

63) While mining should not be totally prohibited, we need to be very careful as a poorly operated facility is difficult to remediate.

64) Pilots do not reduce taxes. They shift the tax burden to those who can't afford them. The Town of Shelby, particularly West Shelby has more than enough mining operations. We don't want the noise, truck traffic, and dust! No New Operations Please!!

65) Mining would probably cut into our water tables, hurting us with wells on our properties.

66) For stone quarry off of Fletcher Chapel Rd.

67) The Town and Planning Boards should both work together on this matter not against each other; let's get something done together for the good of the community. Let's get politics out of this!

68) I agree on having another gravel pit 'cause the other one won't be around forever.

69) There should be a policy on mining. It seems to me that this is a must.

70) Didn't you learn anything after FMC came in? How this help Shelby residents. The only improvements were when they cleaned up their own messes.

71) There are not that many sites that won't affect someone. We don't need them.

72) It is difficult to predict which Town sites may seems desirable to mining companies in the future. Each future request for mining operations should be judged on its individual merits by the elected Town Board.

73) DEC has good Regulations for this area; I believe we could follow these.

74) More control needed so blasting doesn't affect windows or cause cracks or damage to homes!

75) Some mining blasts have shaken our windows, which we aren't keen on. Needs more control!

76) I would hope that any developments in mining would add to our economy and create more jobs in this area.

77) I don't think they should be mining next to a wildlife refuge!

78) We have a stone quarry let them operate within the law. We don't need another stone quarry. This big of a project needs to be planned out for a long time to make sure there are no problems in the future.

79) I think mining should be allowed in certain areas and all members should have a say in it, and all costs should be the responsibility of a mine. Such as roads and any other setbacks that anyone has, as a result of a mine.

80) The quarry operation on Fletcher Chapel Rd should NOT be permitted because:

a. It might lower the local water table.

b. It could affect the wildlife refuge.

c. Waste water from the quarry could change the chemistry of Oak Orchard Creek. It has the potential to devastate the local economy.

d. Do not trust the promises of quarry owners – once it's in-we are stuck with it and all of the problems it might create!

81) The planning board is okay, but Mr. Fuller needs to go.

82) In the end, only the people are hurt. Taxes stay the same or increase. Let them mine elsewhere

83) The negative effects of mining are going too far to outweigh the positive effects. We do not want water table issues like in Barre.

84) Again, this is an eyesore and NO ONE benefits besides the landowner, which the mine is on. Everyone else gets to look at a big hole in the ground, or maybe all the trees they remove to strip mine the land. Let's use your heads!

85) No mining in the area – we have enough!!!

86) I don't want any more mining operations. I feel we have enough in area. Please do not let any mining in our area.

87) Mining may help the industrial industry in the Township, but may also cause environmental problems with natural growth in the area.

88) We have a stone quarry and several sand pits in our town. Why do we need new ones? There is several other quarries close by and it is not like there is a building boom going on in Shelby, where lots of stone is needed.

89) We DO NOT need more mining than we have. The ones that we have are adequate for the building needs of the area. Current mining should be monitored for least amount of impact.

90) Mining operations should be concentrated in existing mined areas. Mining is not strategic to the future of Town of Shelby. Ethanol production has greater economic benefits to the area.

91) All mining should be evaluated for each circumstance. Road traffic, road conditions, noise, environment effect...etc., need to be addressed.

92) We have too much mining in the Town of Shelby now. The quarry on Blair Rd has hurt our water table. Also, the trucks have damaged roads, speed on roadways, and pull in on side roads in front of traffic and constant noise!

93) Mined land reclamation should be planned to enhance future use (i.e., fish/wildlife habitat, recreation, other industrial/residential development). Mining plans, mined land reclamation plans, DEIS should be reviewed by qualified professionals contracted by the Town and paid by applicant.

94) Existing business should not be zone out of business, should be allowed to expand, nor over regulated.

95) Stone has to come from somewhere.

96) We are a small County. It would be a shame to disrupt valuable, tillable land.

97) I was under the impression that the intent was to CLARIFY existing regulations.

98) I feel that all mining and excavation operations should be all treated the same through out the Town of Shelby.

99) Anything to lower our tax base and bring money and jobs to the area has my vote.

100) I live on RT 63, South Gravel Rd., one road away from present stone mining is located – Blair Rd. My home "shakes" every time drilling/dynamiting is done. I don't feel any

more drilling should be done anywhere residential/facilities are sorely affected. (Wonder what blasting is doing to my foundation?) I do believe the Town should do the prohibiting of such efforts anywhere in the Town!

101) In order to promote this area for young people staying and moving back to. We need to make this Town an attractive place to do business. By putting restrictions on certain business you are restricting commerce and in-turn giving young people no option by to move out of the area to seek employment that will let them sustain a family.

102) Due to the fact that mining is a great way to generate wealth in this community, while providing jobs and tax revenue, I am strongly in favor of mining in the Town of Shelby.

103) They are ugly and only take away from our lovely little "Norman Rockwell" picture perfect Village. We don't live in the old west where we could keep these things out of sight.

104)Mines create WASTELANDS. We don't need more wastelands!!!!

105)Mining is neutral. I guess you will have to decide if the gains for the Town as a whole off-set the losses for the Town as a whole/ then there is the problem of individual damages or loss of value of property and whether their rights should be protected, or compensated or ignored.

106)The noise of mining would have a negative impact on the community.

107)NO GRAVEL PITS, NO LANDFILL, Protect the WATERSHED and the REFUGE SYSTEM.

108)Shelby and surrounding area should be left for farming NOT gravel pits. We have the beauty of the refuge system and you want to scare the land with a gravel pit.

109)As long as the Town has no plans to provide water to the entire Town and at the rate the mine is going to use water, I strongly disagree with the opening of another mine in the Town. I'm taxed at pretty good rate now –and if we lose our wells my property isn't worth a cent.

110)Mining should not be allowed on Fletcher Chapel.

111)No Mines!!!!!

112)Our water has been ruined by mining on Blair Road! We don't want more.

113)We are in favor of mining in the Town, conducted in accordance with existing State and Federal laws. New industry is needed in this town to increase tax base and provide employment to area residents.

114)Whatever has to be done to make the US more independent from foreign countries for energy should be!

115)I totally disagree about any mining in Shelby!!!!!

116)Should not be located in wetlands or near any homes or wildlife refuge.

117)If you wouldn't want it in your backyard, don't put it in ours.

118)Shelby is not a bedroom community and any business that is bringing new jobs and is a viable business should be welcome in Shelby.

119)Mining near homes causes damage to our wells. If mining is done in these locations there should be subsidies for public water well a reduced cost to home owners. Our wells are /were fine until mining efforts changes the water system. If the Planning Board is going to allow mining in residential areas, then the Town Board should step in to keep the Town of Shelby at its possible best.

120)There should be no further mining allowed in Shelby. What's here should stay, but no future mining sites should be allowed to come in. This includes the proposed mining site off of Fletcher Chapel Road. There is too much at risk environmentally to allow that site to go in.

121)We should help maintain mines that are established currently (Shelby Crush Stone). We have plenty of mines in this area. We DO NOT NEED any new mines. Especially near the REFUGE.

122)I have concerns as a nearby resident about the impact on well water, as that is the only source that is available to me!

123)We are concerned about our wells. We need much water for farming operation and to date have a plentiful supply and always have had good quality water for home use.

124)People who pay taxes should be able to do with their land whatever they want.

125)No plant off Fletcher Chapel Road!!!!!

126)Establish hours of operation and noise guidelines for existing mining operations. Prohibit any expansion of existing mining operations.

127)Already have one mine in area, don't need another one.

128)Another quarry in the area is totally not needed!

129)You can only mine for a product if it is in the Town. Unless someone test bores the whole town, you cannot say only mine here or there. You cannot have a Mine District unless you know what is there.

130)Any facility that will create jobs in this town, should be encouraged.

131)Approval or denial of requests should be voted on by both the Planning and Town Boards with a ¾ (majority) win.

132)Orleans County and Shelby already have too many gravel pits.

133)I do not believe mining or excavation should be permitted in the Town. But if it does go through, I believe the Town should work with the mining companies to ensure that there is minimal impact on residents and neighboring properties.

134)I have grave concern about the Environment, groundwater, specifically my well. Also birds and animals-opening the ground , blasting, trucking all create NOISE, VIBRATION. The impact on the environment would outweigh any gain. If any mining were allowed, the company would clearly have to be responsible for all environmental impact.

135)I strongly oppose any mining in the Town of Shelby. I have well water only and fear both contaminations of my well and/or losing water from my well. I think if any mining is ever allowed again in Shelby, the company should bring water to **all** the roads affected by the mine, either directly or indirectly. I also worry about the birds and other wildlife possibly affected by any mining activity.

136)Who will pay when my well is dry or contaminated? Me and my family. That is wrong. You, as elected officials need to protect the taxpayers. Without us, there would be no town. If the mine goes through, who will make up the tax difference when my house assessment is lowered by 10's of thousands, especially if my well is ruined? The mine would drastically affect the swamp and the animals, protect the history of the area, the beauty and the wildlife. Will the environment study be trustworthy since Frontier Stone is conducting it? I feel that the National Government should get involved to protect the swamp and the Town of Shelby residents. NO MINE IN SHELBY!!! Change the law to protect the taxpayer.

137)We have been blessed with an unusual area for nature – many, many acres of refuge where so many birds and animals can live free of infringement by any type of construction. It's very special – our entire region needs to maintain preservation. Thank you.

138)One thing I'm certain about is that mining should not be allowed anywhere near a major wildlife refuge.

139)If a mine were ever to be allowed, not only the land owner should be compensated, but anyone affected should be compensated handsomely for the loss of property value and quality of life. It should be above and beyond property value.

140)Mining operations devalue property in the surrounding areas. It destroys much needed valuable farm land, which will never be replaced. Destroys wildlife habitats, water shed areas and also the quality of life.

141)If this only helps the special interests of certain individuals, then I'm against it!

142)We all need to work together. Maybe this will revitalize this community.

143)There should be a town-wide referendum to approve or disapprove mining operations. Town and Planning Boards should abide by the people's decision.

Shelby Crushed Stone, Inc.

10830 Blair Road
Medina, New York 14103
585.798.4501
fax 585.798.1451

March 9, 2007

Town of Shelby
County of Orleans
4062 Salt Works Road
Medina, New York 14103

Dear Shelby Town Board:

This is in response to the Town of Shelby Residence Survey sent out by the Shelby Town Board. Shelby Crushed Stone, Inc. operates a quarry in the Town of Shelby located at Blair Road. This quarry has been in existence for many years and was purchased by Shelby Crushed Stone, Inc. in 2005.

Existence of quarrying facilities in the area are desirable for the continued economic stability and growth of western Orleans County. Numerous studies indicate that a large component of the cost of such things as road building, infrastructure, and industrial and commercial development are directly related to the availability of products from quarrying activities. Transportation is a very large component of the price of such materials.

During the term of the ownership of the quarrying operation by Shelby Crushed Stone, Inc., its owners have endeavored to increase the efficiency and viability of the operation. It supplies crushed stone and commodities for much of the development that has taken place in the area. The Western Orleans Comprehensive Plan specifically recognizes the value of the mining operations by Shelby Crushed Stone, Inc. It indicates that,

> "Areas designated for industrial uses include the land currently devoted to industrial uses...as well as adjoining land that may be suitable for additional industrial use. This land also includes land devoted to mining uses (Town of Shelby)." See Western Orleans Comprehensive Plan Chapter 4, Comprehensive Plan Synopsis 4-2.

Please note this speaks of land currently devoted to industrial uses (including mining) including adjoining land that may be suitable. It is respectfully submitted that what this comprehensive plan does is to recognize the need for the mine operated by Shelby Crushed Stone, Inc., as well as the ability to expand this use on adjacent properties which are suitable. It does not recognize a need for creation of mining areas in other parts of the Town.

The Shelby Crushed Stone, Inc. operation does not involve impingement on environmentally sensitive areas. It is an existing and needed industrial use which has been co-existing with its neighbors for 25 years and which provides not only jobs, but needed commodity for the area.

For these reasons, it is requested that the Town Board, in drafting legislation relating to zoning for mining operations, recognize the existence of the Shelby Crushed Stone, Inc. mining operation, its need for future expansion on adjacent properties and its desirability to the Town and the area for economic development.

The owners of Shelby Crushed Stone, Inc. are hereby requesting the opportunity to meet with the Town Board and its advisors during the formation of its zoning regulations to further develop its position and to provide input into the development of legislation which authorizes its continued operation and growth in a regulated atmosphere and in a manner that is compatible with its neighbors. We believe this can be accomplished in one of several ways including, 1) designation of mining district, and/or 2) establishment of special use permit for mining, and/or 3) establishment of overlay district allowing mining under certain conditions.

Thank you for considering this response.

SHELBY CRUSHED STONE, INC.

Thomas S. Biamonte - President

Paul D. Pass – Vice President

If there is any chance at all even the slimmest that any harm at all will come to anyone's well we are totally against the stone quarry from coming to the Fletcher Chapel road sight.

In addition if the quarry is allowed to come to the area and there is any problem with anyone's well created by the quarry.

The quarry should be totally responsible for:

- The cost of drilling and maintaining a new well forever.
- The total expense of bringing city water to any house, as well as having the water bill free forever.
- The total cost of all taxes.(property and school forever)

We now have a very good well with very good water. We never have run out and have never had any problems at all with our well. We don't want to create any either.

Members of the Shelby Town Board:

I am writing you this letter in reference to the proposed stone quarry in the Town of Shelby. As a resident, living only 1/3 of a mile from the proposed site, I have my concerns about my well, the noise, and dust from the production of crushed stone being produced at the quarry. In addition my concerns are for the truck traffic and the effect it may have on the wildlife in the Irquois National Wildlife Refuge which could be devastating.

Having been in the construction business over 30 years I do have knowledge of how a quarry works. They can say they will do this and not do that but we all know how that goes sometimes.

The main reason for my writing you this letter is in response to something that was presented to the Shelby Town board meeting on June 13, 2006, and the Shelby Town planning board meeting January 02,2007. A Syracuse law firm, Gilbenti, Stinziano, Heintz and Smith were there on behalf of Frontier Stone Llc. An environmental attorney with this law firm got up and said that new blasting technology helps to focus the blasts, reducing noise, and pinpointing the energy. That could still be pinpointed at my water source. He also said that western N.Y. contractors and municipalities would benefit from the stone to build homes and roads.

On January 02,2007 at the planning board meeting, Mr Mahar ,principal owner of Frontier Stone LLC., also emphasized the need for new quarries to keep costs down from trucking stone and other building materials to fulfill the need of road construction and building construction.

He talked about the high cost of asphalt to build roads due to the stone quarry's closing because of lack of stone and having to haul the blacktop at an average of 30 miles away. We do not have that problem here in Shelby. I did my homework and this is what I came up with as to how far away our quarry's actually are.

COMPAMY	LOCATION	MATERIALS	YRS LEFT
Barre Stone Products	(East of proposed site) 6.5 miles	stone & asphalt	60 YRS
County Line Stone	(south of Proposed site) 15.45 miles	stone & 2 asphalt plant	
Buffalo Stone Corp.	(South of proposed site) 10.58 miles	stone & asphalt plant (not producing)	
Shelby Crushed Stone	(west of proposed site) 5.11 miles	stone only	50 YRS
Lafarge	(west of proposed site) 9.2 miles	stone only	
Lafarge North American	(west of proposed site) 15.14 miles	stone & 2 aspahlt plants	20 YRS
Hanson Stone Product	(east of proposed site) 22.6 miles	stone only	
Hanson Stone Product	(south east of proposed site) 25 miles	stone & 2 asphalt plants	
Fruit Ave Sandstone	(north of proposed site) 6.1 miles	Crushed stone	25 YRS

There are also 7 active sand wash and gravel pits in operation within a 10 mile radius of the proposed site.

In closing I know that some of my information may not be environmental concerns, and may not have an inpact on you decision, but if your decision could sway either way that my concerns may help in your decision to deny the permit application. Is this quarry Need or Greed..

Thank you in advance for your time and consideration.

Yours truly,

Kenneth L Printup Sr.
5097 Bigford Road
Medina, NY 14103
585-798-2639 Cell (585)704-7674
E-mail – unit3074@yahoo.com

Wind Energy Comment:

The Town should support local businesses of all sizes in the installation of their own wind energy facilities to off set electric cost in an effort to reduce their operating expenses. Especially if the business is located in a rural commercial or agricultural zoned area.

The Town should be careful and extremely cautious in approving wind energy facilities for the sole use of providing power to the masses. I am referring to wind mill farms that will simply sell power and ultimately have a net effect of 0% on reducing electricity costs to the community residents and businesses.

Mining Comment:

Each mining project request should be examined independently by the Town Planning Board. The board should approve or deny a request based on current and future impacts on the community and environment. Such as; what will the site look like while mining is in progress, what will the duration of the mining project be, what effects will it have on the environment, will it bring a significant number of jobs to the community, will it be a significant tax contributor to the community, what will the site look like upon completion of the project, etc.

General Comment:

When approving a wind mill farm (large wind energy facility with multiple wind mills) or a large mining project there must be some direct and noticeable benefit to the community. For example: The development of several well paying jobs within the community, reduction in taxes across the board due to the added tax base to the community, etc.

I think you should have solicited information from the public in this same format before you backed the " Right to Farm" law and also gave the go ahead to the ethanol plant. Based on those actions the town board must allow the windmills and mines with no restrictions. The ethanol plant and right to farm decisions have the same effect on property values and environmental issues, such as noise, traffic and possible pollution.

I see no reason to include property owners in the village portion of the Town of Shelby as part of this survey. Windmills or mines in the town will have little impact on those who live in the village. The trains for the ethanol plant as well as the town spending on road improvement or future tax abatement for the ethanol facility will indeed affect those property owners in the village portion of the Town of Shelby.

I feel that decisions are not being made in the interest of what is best for the town, but in what is best for the individual property owner or groups of property owners. Codes or town laws that are in place should be followed and not changed by knee jerk reaction to individuals or groups that have something to gain by a change in the code.

APPENDIX 12

- NSSGA Air Study

FRONTIER STONE, LLC
DEC ID #8-3436-00033
AIR EMISSIONS CALCULATIONS

Processing Plant
Emissions calculations for PM2.5

		Thruput	Emission Factor	PM2.5 Emissions	Control Efficiency	PM2.5 Emissions	
Primary Crusher*	CR-1	350,000	1.00E-05	3.5	0%	3.5	0.00175
Secondary Crusher*	CR-2	350,000	1.00E-05	3.5	0%	3.5	0.00175
Triple Deck Screen	SCR-3	350,000	5.00E-05	52.5	0%	52.5	0.02625
Single Deck Screen	SCR-1	350,000	5.00E-05	17.5	0%	17.5	0.00875
Single Deck Screen	SCR-2	350,000	5.00E-05	17.5	0%	17.5	0.00875
Conveyor Belts (5 controlled)		350,000	1.30E-05	22.75	0%	22.75	0.011375
					TOTAL PM2.5 (lbs/yr)	117	0.058625
					TOTAL PM2.5 (tons/yr)	**0.058625**	

***No AP42 Emission factor available, AIRS uncontrolled factor used for primary & secondary crusher**

Emissions calculations for PM10

		Thruput	Emission Factor	PM10 Emissions	Control Efficiency	PM10 Emissions	
Primary Crusher*	CR-1	350,000	5.40E-04	189	0%	189	0.0945
Secondary Crusher*	CR-2	350,000	5.40E-04	189	0%	189	0.0945
Triple Deck Screen	SCR-3	350,000	7.40E-04	777	0%	777	0.3885
Single Deck Screen	SCR-1	350,000	7.40E-04	259	0%	259	0.1295
Single Deck Screen	SCR-2	350,000	7.40E-04	259	0%	259	0.1295
Conveyor Belts (5 controlled)		350,000	4.60E-05	80.5	0%	80.5	0.04025
					TOTAL PM10 (lbs/yr)	1,754	0.8768
					TOTAL PM10 (tons/yr)	**0.8768**	

Facility will run on line-power (no stationary combustion sources)

FRONTIER STONE, LLC
DEC ID #8-3436-00033
STORAGE PILES- WIND EROSION-PM-2.5

$E_{PM2.5}$ = 0.13 (s/1.5) (f/15) lb/day/acre of surface

4 storage piles - No. 2, No.1, No. 1A, screenings

s= silt content (weight %)
f= percentage of time unobstructed wind speed is greater than 12 mph at mean pile height

s= 1.6 (from APR-42 Table 13.2.4-1)
f= 15 (Using 2012 NOAA data, 55 days average speed above 12 mph)

$E_{PM2.5}$ = 0.13 (s/1.5) (f/15) lb/day/acre of surface
0.13 1.07 1

$E_{PM2.5}$ = 0.14 lb/day/acre

Approximate height of storage pile =		25	ft
Approximate base radius of pile =		33.5	ft
Total surface area	=	4399.2	ft^2
	=	0.100992	acres of surface

Emissions	=	0.014	lb/day	5.11	lb/year
Total emissions (4 piles) =				20.45	lb/year
				0.01	**tons/year**

FRONTIER STONE, LLC
DEC ID #8-3436-00033
STORAGE PILES- WIND EROSION- PM-10

$$E_{PM10} = 0.85\ (s/1.5)\ (f/15) \quad \text{lb/day/acre of surface}$$

4 storage piles - No. 2, No.1, No. 1A, screenings

s= silt content (weight %)
f= percentage of time unobstructed wind speed is greater than 12 mph at mean pile height

s=	1.6	(from APR-42 Table 13.2.4-1)
f=	15	(Using 2012 NOAA data, 55 days average speed above 12 mph)

E_{PM10} =	**0.85**	**(s/1.5)**	**(f/15)**	**lb/day/acre of surface**
=	0.85	1.07	1	

E_{PM10}= 0.91 lb/day/acre

Approximate height of storage pile =		25	ft
Approximate base radius of pile =		33.5	ft
Total surface area	=	4399.2	ft^2
	=	0.100992	acres of surface

Emissions	=	0.09157	lb/day	33.42	lb/year
Total Emissions (4 piles)			=	133.6861	lb/year
				0.07	**ton/year**

FRONTIER STONE, LLC
DEC ID #8-3436-00033
AP-42 13.2.4
PM-10 STORAGE PILE-HANDLING

$$E = k(0.0032)\left|\frac{[U/5]^{1.3}}{[M/2]^{1.4}}\right| \text{lb/ton}$$

k = particle size multiplier
U = Mean Wind Speed
M = Material moisture Content %

U=	10 mph	(see NOAA Wind data)
M=	0.7 %	(Table 13.2.4-1)
k=	0.35	(dimensionless)

$$0.00112 \quad \frac{[2.0]^{1.3}}{[.35]^{1.4}}$$

$$0.00112 \quad \frac{2.46}{0.23}$$

0.00112 10.71 **E= 0.011991 lb/ton**

350,000 tons per year 4,196.91 lbs

PM10 **2.10 tons per year**

FRONTIER STONE, LLC
DEC ID #8-3436-00033
AP42 Section 13.2.2-4- Equation for estimating emissions on industrial unpaved roads
PM-2.5 Calculation (Loader to Crusher)

$E=k\ (s/12)^a\ (w/3)^b \times [(365-P)/365]$

E = emission factor (lb/VMT)
k =.15 (for PM-2.5) k=1.5 (for PM-10)
a =.9 (for both PM-2.5 and PM-10)
b =.45
s = silt content % **Mean=8.3** for haul road to pit Mean=10 for plant road
W = mean vehicle weight (in tons) Operating weight empty+Operating weight full /2
P= number of days in a year with at least .01 inches precipitation
Approximate distance (in feet) from face (muck pile) to primary crusher = 500
Caterpillar 988 loader specifications:
Operating weight = 110,549 lb
Max bucket capacity = 10 yd^3

Conversion factor~ 1.3 tons (limestone) per cubic yard= 13 tons
Rated payload = 12.5 tons (used this figure for calculations)

	$.15\ (8.3/12)^{.9}$ x (110,549+135,549/2/2000/3)$^{.45}$		x	(365-160) /365	
E=	0.15 $(.692)^{.9}$ x	$(20.5)^{.45}$	205	365	
		$(13.5)^{.45}$	0.56		
E=	0.15 0.717952 x	3.23	0.195 lbs/vmt	(haul roads)	
VMT=	350,000 12.5 tons per payload	28,000 trips full 28,000 trips empty	56,000 total trips	28,000,000 ft = 5,303 miles	

1034.72 lbs PM-2.5 generated on haul road per year
0.52 tons PM-2.5 generated on haul road per year

FRONTIER STONE, LLC
DEC ID #8-3436-00033
AP42 Section 13.2.2-4- Equation for estimating emissions on industrial unpaved roads
PM-10 Calculation (Loader to Crusher)

$$E=k\ (s/12)^{a}\ (w/3)^{b} \times\ [(365-P)/365]$$

E = emission factor (lb/VMT)
k =.15 (for PM-2.5) **k=1.5 (for PM-10)**
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W = mean vehicle weight (in tons) Operating weight empty+Operating weight full /2
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Caterpillar 988 loader specifications:
Operating weight = 110,549 lb
Max bucket capacity = 10 yd^3

Conversion factor~ 1.3 tons (limestone) per cubic yard= 13 tons
Rated payload = 12.5 tons (used this figure for calculations)

$1.5\ (8.3/12)^{.9} \times (110{,}549+135{,}549/2/2000/3)^{.45}$ x (365-160) /365

E=	$1.5\ (.692)^{.9}$	x	$(20.5)^{.45}$	205	365	
			$(13.5)^{.45}$	0.56		
E=	1.5 0.717952 x		3.23	1.95 lbs/vmt		(haul roads)
VMT=	350,000	12.5 tons per payload	28,000 trips full 28,000 trips empty	56,000 total trips	28,000,000 ft =	 5,303 miles

10347.18 lbs PM-10 generated on haul road per year
5.17 tons PM-10 generated on haul road per year

FRONTIER STONE, LLC
DEC ID #8-3436-00033
AP42 Section 13.2.2-4- Equation for estimating emissions on industrial unpaved roads
PM-2.5 Calculation (Plant Road from Sour Springs Road)

E=k (s/12)a (w/3)b (365-P/365)

E = emission factor (lb/VMT)
k =.15 (for PM-2.5)   k=1.5 (for PM-10)
a =.9 (for both PM-2.5 and PM-10)
b =.45
s = silt content %   Mean=8.3 for haul road to pit   Mean=**10** for plant road
W = mean vehicle weight (in tons)   Operating weight empty+Operating weight full /2
P= number of days in a year with at least .01 inches precipitation
Distance of entrance road to stockpiles = 1000 ft
Customer Truck ≈ 28 tons GVW
53 tons with 25 ton payload

E=	0.15 $(10/12)^{.9}$ x $(28+53/2/3)^{.45}$	x	(365-160) /365		
E=	0.15 $(.833)^{.9}$ x	$(40.5/3)^{.45}$	205	365	
		$(13.5)^{.45}$	0.56		
E=	0.15 0.848361 x	3.225895		**0.23** lbs/vmt	(haul roads)
VMT=		14,000 trips full	28,000 total trips	28,000,000 ft	
		14,000 trips empty		=	5,303 miles

1,222.66 lbs PM-2.5 generated on plant road per year
0.61 tons PM-2.5 generated on plant road per year
305.67 lbs PM-2.5 with 75% control applied

FRONTIER STONE, LLC
DEC ID #8-3436-00033
AP42 Section 13.2.2-4- Equation for estimating emissions on industrial unpaved roads
PM-10 Calculation (Plant Road from Sour Springs Road)

$E=k\ (s/12)^a\ (w/3)^b\ (365\text{-}P/365)$

E = emission factor (lb/VMT)
k =.15 (for PM-2.5) **k=1.5 (for PM-10)**
a =.9 (for both PM-2.5 and PM-10)
b =.45
s = silt content % Mean=8.3 for haul road to pit Mean=**10** for plant road
W = mean vehicle weight (in tons) Operating weight empty+Operating weight full /2
P= number of days in a year with at least .01 inches precipitation

Distance of entrance road to stockpiles =		1000 ft		
Customer Truck	≈	28 tons	GVW	
		53 tons		25 ton payload
Production	350,000 tpy	14,000 trips		

E=	$1.5\ (10/12)^{.9}\ \text{x}\ (28+53/2/3)^{.45}$	x	(365-160) /365		
E=	$1.5\ (.833)^{.9}$ x	$(40.5/3)^{.45}$	205	365	
		$(13.5)^{.45}$	0.56		
E=	1.5 0.848361 x	3.225895		**2.31 lbs/vmt**	(plant road)
VMT=		14,000 trips full	28,000 total trips	28,000,000 ft	
		14,000 trips empty	=	5,303 miles	

12,227 lbs PM-10 generated on plant road per year
6.11 tons PM-10 generated on plant road per year
3056.66 lbs PM-10 with 75% control applied

FRONTIER STONE, LLC
DEC ID #8-3436-00033
AP42 Section 13.2.2-4- Equation for estimating emissions on industrial unpaved roads
PM-2.5 Calculation (Alternate Plant Road to Fletcher Chapel Road)

E=k (s/12)a (w/3)b (365-P/365)

E = emission factor (lb/VMT)
k =.15 (for PM-2.5) k=1.5 (for PM-10)
a =.9 (for both PM-2.5 and PM-10)
b =.45
s = silt content % Mean=8.3 for haul road to pit Mean=**10** for plant road
W = mean vehicle weight (in tons) Operating weight empty+Operating weight full /2
P= number of days in a year with at least .01 inches precipitation
Distance of entrance road to stockpiles = 2000 ft
Customer Truck ≈ 28 tons GVW
53 tons with 25 ton payload

E=	0.15 $(10/12)^{.9}$ x $(28+53/2/3)^{.45}$	x	(365-160) /365			
E=	0.15 $(.833)^{.9}$ x	$(40.5)^{.45}$	205	365		
		$(13.5)^{.45}$	0.56			
E=	0.15 0.848361 x	3.225895		**0.231** lbs/vmt	(haul roads)	
VMT=		14,000 trips full		28,000 total trips	56,000,000 ft	
		14,000 trips empty			=	10,606 miles

2445.328 lbs PM-2.5 generated on alternate plant road per year
1.22 tons PM-2.5 generated on alternate plant road per year
611.33 lbs PM-2.5 generated on alternate plant road per year with 75% control applied

FRONTIER STONE, LLC
DEC ID #8-3436-00033
AP42 Section 13.2.2-4- Equation for estimating emissions on industrial unpaved roads
PM 10 Calculation (Alternate Plant Road from Fletcher Chapel Road)

E=k (s/12)a (w/3)b (365-P/365)

E = emission factor (lb/VMT)
k =.15 (for PM-2.5) **k=1.5 (for PM-10)**
a =.9 (for both PM-2.5 and PM-10)
b =.45
s = silt content % Mean=8.3 for haul road to pit Mean=**10** for plant road
W = mean vehicle weight (in tons) Operating weight empty+Operating weight full /2
P= number of days in a year with at least .01 inches precipitation

Distance of entrance road to stockpiles =			2000 ft		
Customer Truck	≈		28 tons	GVW	
			53 tons		25 ton payload
Production	350,000	tpy	14,000 trips		

E=	$1.5\ (10/12)^{.9}$ x $(28+53/2/3)^{.45}$	x	(365-160) /365			
E=	1.5 $(.833)^{.9}$ x	$(40.5/3)^{.45}$	205	365		
		$(13.5)^{.45}$	0.56			
E=	1.5 0.848361 x	3.225895		**2.31 lbs/vmt**	(plant road)	
VMT=		14,000 trips full		28,000 total trips	56,000,000 ft	
		14,000 trips empty			=	10,606 miles

24,453 lbs PM-10 generated on alternate plant road per year
12.23 tons PM-10 generated on alternate plant road per year
6,113 lbs PM-10 generated on alternate plant road per year with applied 75% control

$PM_{2.5}$ PM_{10} and TSP FORMATION, COMPOSITION, AND DEPOSITION at a STONE CRUSHING PLANT

VOLUME 1 REPORT

Prepared for:

Jennifer Joy Wilson, President
National Stone Association
1415 Elliot Place, N.W.
Washington, DC 20007-2599

Prepared by:

John Richards, Ph.D., P.E., and Todd Brozell, P.E.
Air Control Techniques, P.C.
301 East Durham Road
Cary, North Carolina 27513
(919) 460-7811

February 2000
ACTPC Job Number 545

Air
Control Techniques, P.C.
AIR POLLUTION CONTROL SYSTEMS ENGINEERING

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ACRONYMS

CFR	Code of Federal Regulations
E	East
EDS	Energy Dispersive Spectroscopy
ENE	East-Northeast
ESE	East-Southeast
EPA	U.S. Environmental Protection Agency
FRM	Federal Reference Method
GMW	General Metal Works
IC	Ion Chromatography
ISC	Industrial Source Complex
NAAQS	National Ambient Air Quality Standards
NE	Northeast
NIST	National Institute of Standards and Technology
NNE	North-Northeast
NNW	North-Northwest
NW	Northwest
NSA	National Stone Association
PM	Particulate Matter

ACRONYMS (Continued)

PLM	Polarizing Light Microscopy
PTFE	Polytetrafluoroethylene
R&P	Rupprecht & Patashnick Co, Inc.
SE	Southeast
SEM	Scanning Electron Microsopy
SSE	South-Southeast
SSW	South-Southwest
SW	Southwest
W	West
WNW	West-Northwest
WSW	West-Southwest
WINS	Wells Impactor Ninety Six
XRD	X-Ray Diffraction

APPENDICES

VOLUME 2

$PM_{2.5}$ PM_{10} and TSP FORMATION, COMPOSITION, AND DEPOSITION at a STONE CRUSHING PLANT

1. SUMMARY

1.1 Purpose and Scope of the Test Program

The National Stone Association (NSA) sponsored this ambient air test program to compile data concerning the formation, composition, and deposition of particulate matter at a typical stone crushing plant. The primary purpose of this program was to provide technical data useful for supporting and expanding NSA's position taken in legal action with EPA regarding the fine particulate matter National Ambient Air Quality Standard (NAAQS). NSA studies have previously demonstrated that stone crushing plants have a negligible impact on fine particulate matter ambient levels. Additional data were needed concerning the penetration of crustal material into the intermodal size range of 1 to 2.5 micrometers and into the fine particulate matter distribution of less than 1 micrometer. This information was needed to confirm NSA's position that mineral particulate matter should be exempted from future fine particulate ($PM_{2.5}$) NAAQS.

A second purpose of this study was to further evaluate the deposition of PM_{10} and TSP (Particulate Matter larger than approximately 30 micrometers). In various meetings between EPA and NSA and in various EPA documents, EPA has stated that there is a significant difference between the emission inventory quantities of PM_{10} and TSP emissions and the observed mineral particulate matter levels on ambient air filters. NSA has previously contended that this very large inconsistency in the EPA data sets is due, in part, to emission factors biased to higher-than-true levels. NSA has also had reason to believe that coarse (2.5 to 10 micrometers) and supercoasre (>10 micrometer) particles are rapidly removed from the ambient air due to gravity settling and dry deposition processes. This study evaluated the PM_{10} and TSP concentrations as a function of distance from stone crushing plants. These data will be used to challenge EPA's assumptions regarding the importance of mineral particulate sources with respect to $PM_{2.5}$ ambient levels and to challenge dispersion models that fail to take into account gravity settling and dry deposition.

The test program was conducted by Air Control Techniques, P.C. in cooperation with personnel from Martin Marietta Aggregate's Greensboro, North Carolina Buchanan plant and Raleigh office. $PM_{2.5}$ monitoring was conducted using Rupprecht & Patashnick Co, Inc. FRM-2000 monitors that fully met the design specifications of 40 CFR Part 58, Appendix L. One $PM_{2.5}$ monitor was located upwind and away from the plant processing equipment on the Buchanan plant grounds. A second $PM_{2.5}$ monitor was located in the plant immediately downwind of the processing area. The monitoring locations met all applicable EPA requirements concerning ambient air monitoring.

PM_{10} monitoring was conducted using Andersen Samplers, Inc. and General Metal Works, Inc. high volume PM_{10} monitors that fully met the design specifications of the Federal Reference Method for PM_{10}

promulgated on July 1, 1987. One PM_{10} monitor was located upwind and away from the plant processing equipment on the Buchanan plant grounds. Three additional monitors were located in the plant along a line downwind of the processing areas.

TSP monitoring was conducted using General Metal Works, Inc high volume TSP monitors. The TSP monitors were located on the same four platforms as the PM_{10} monitors.

The ambient air monitoring network was operated for 14 days when the ambient winds were forecasted to be from the southwest to northwest. During these periods, the winds passed over the plant quarry and processing area and toward the three downwind monitoring locations. Filter samples were recovered each sampling day by Air Control Techniques, P.C. personnel.

The 47 mm filter media used in the $PM_{2.5}$ monitors were polycarbonate filters rather than the standard PTFE filters. The purpose of the $PM_{2.5}$ monitoring was to evaluate particle chemical composition in the intermodal size range of 1 to 2.5 micrometers, and the polycarbonate filters are considerably more appropriate for the chemical analyses needed. The $PM_{2.5}$ filters were sent to Research Triangle Institute (RTI) for weight gain determination using a state-of-the-art microbalance located in a temperature and humidity controlled room. RTI was selected for these filter analyses due, in part, to the fact that one of their divisions worked with EPA in the development of Appendix L and the general procedures used to prepare and weigh the filters. This same laboratory has also been awarded a multi-million dollar contract to serve as the lead laboratory providing $PM_{2.5}$ filter analytical services for the U.S. EPA and the States.

Following gravimetric analysis, a set of ten $PM_{2.5}$ filters was selected by Air Control Techniques, P.C. and prepared by RTI for analysis by scanning electron microscopy (SEM). The filters were analyzed using SEM with magnifications ranging from 20X to 20,000X. Air Control Techniques, P.C. requested that each sample be analyzed by means of energy-dispersive spectroscopy (EDS) to evaluate particle composition in the 0.3 to 4 micrometer (aerodynamic) size range. Twenty individual particles in each filter sample were chemically analyzed.

The differences between the upwind and downwind $PM_{2.5}$ ambient concentrations were evaluated to confirm, as previous NSA sponsored studies strongly indicated, that stone crushing plants have negligible $PM_{2.5}$ emissions.

The deposition of PM_{10} and TSP was evaluated using data from the set of four monitoring locations along a line upwind and downwind of the plant quarry and processing area. The ambient concentration data from this set of four monitoring stations provided a measurement of the rapid decrease in the concentrations of mass in these size ranges. These data can be used in conjunction with standard dispersion models to estimate the gravity settling and dry deposition rates for coarse and supercoarse particulate matter.

1.2 Conclusions

The following conclusions are based on the results of the $PM_{2.5}$ PM_{10} and TSP ambient air monitoring study conducted at the Greensboro, North Carolina Buchanan plant.

- Crustal material emitted from the stone crushing plant and adjacent natural and anthropogenic sources is limited to the greater than 1 micrometer size range. Crustal materials are not part of the ambient fine particle mode.

- The adoption of a PM_1 NAAQS instead of a $PM_{2.5}$ NAAQS would effectively exempt mineral particulate matter.

- There was no detectable impact of the plant operations on ambient $PM_{2.5}$ concentrations. These results are entirely consistent with previous NSA sponsored studies.
- PM_{10} and TSP particulate matter have different spatial and temporal trends than $PM_{2.5}$. It is apparent that $PM_{2.5}$ is part of a different mode of particulate matter than PM_{10} and TSP.
- The observed decrease in the concentrations of TSP and PM_{10} as a function of downwind distance confirmed that there is rapid loss of particulate matter in the coarse and supercoarse size ranges. The information concerning PM_{10} and TSP emissions now present in EPA's emission inventories is significantly biased high due to the failure to account for the rapid removal of large particles from the atmosphere.
- EPA and state agencies should not attempt to estimate the emissions of $PM_{2.5}$ or an alternative fine particulate matter size category by using PM_{10} and/or TSP emission factor data as a basis.

The results of this study support the technical arguments made by NSA with respect to the $PM_{2.5}$ NAAQS promulgated in July 1997, remanded in 1999, and presently subject to future litigation between EPA, NSA, and other industrial trade associations. The results of this study indicate that crustal material is part of the ambient air particulate matter coarse mode and should not be regulated as part of EPA's fine particulate control program. The results also indicate that the choice of PM_1 rather than $PM_{2.5}$ to define the fine mode will effectively eliminate the inappropriate control of crustal materials.

The study results shed further light on the significant discontinuity between EPA emission inventory data for PM_{10} and TSP and the observed low concentrations of crustal material on ambient filters. It is clear that the atmospheric removal rates for large particles is extremely rapid and must be taken into account when evaluating the contributions of various sources to observed ambient particulate matter concentrations.

2. TEST PROCEDURES AND PLANT OPERATING CONDITIONS

2.1 Selection of the Test Site

One of the purposes of this study was to evaluate the deposition patterns of different particle size ranges at a stone crushing plant. The National Stone Association and Air Control Techniques, P.C. applied the following criteria in selecting a plant site in this region.

- The plant must be sufficiently large and have processing equipment typical of stone crushing plants throughout the U.S.
- The prevailing wind patterns in the geographical area must allow for representative monitoring of emissions from the plant processing equipment, storage piles, and quarry operations.
- The plant must have sufficient land area to allow for monitoring of in-plant ambient particulate matter concentrations at least one-half mile downwind.
- With the inherent limitations of surrounding roads, there must be no major stationary sources of particulate matter emissions in the immediate area that could complicate the interpretation of the ambient concentrations being measured.
- The plant must be willing to cooperate in the study and to allow daily visits to the monitoring locations for servicing the ambient air monitors and the meteorological stations.

Preliminary discussions were conducted with representatives of a number of NSA member companies operating stone crushing plants. NSA and Air Control Techniques, P.C. selected the Martin Marietta Aggregates Buchanan plant in Greensboro North Carolina based on (1) aerial photographs, (2) site plans, (3) production rate data, (4) production characteristic data, and (5) a limited number of site visits. The Buchanan plant has a capacity of approximately 700,000 tons of stone per year. It operates four days per week for approximately 10 hours per day.

2.2 Selection of the Upwind and Downwind Deposition Pattern Monitoring Locations

The Buchanan plant entrance is a road on the southwestern edge of the facility. The scale office and truck scales are located on the entrance road that is oriented south-to-north from the plant entrance. The crushing and screening operations are located in the approximate center of the facility. There are also a number of product storage piles in this area. The quarry pit is located in the western portion of the facility.

The specific off-site and in-plant $PM_{2.5}$ ambient air monitoring locations at the Buchanan plant were selected based on the following criteria.

- The first downwind monitoring locations must be close to the center of the plant processing equipment.
- The second and third downwind deposition pattern in-plant monitoring locations must in-line with one another and be separated by a sufficient distance to show the particle deposition pattern.
- The third downwind monitoring location must be at least one-half mile from the edge of the plant quarry and/or plant processing equipment.

- The upwind monitoring location must be at a reasonable distance from local sources of ambient particulate matter that could bias the results, and the monitoring location must meet all applicable EPA requirements concerning ambient air monitoring.
- All three of the downwind deposition pattern monitoring locations must meet all applicable EPA requirements concerning ambient air monitoring.
- All four of the monitoring locations must be in areas that were not significantly influenced by adjacent stationary sources.
- There must be safe access to the monitoring location.

Color photographs located in the report appendix illustrate both the off-site and in-plant test locations in reference to the plant and surrounding areas.

During the pretest site visit to the Buchanan Plant, several possible upwind and downwind monitoring locations were identified based on information concerning (1) the prevailing wind directions, (2) the availability of electrical power, and (3) the adequacy of safe access.

The upwind monitoring location was selected to provide (1) the maximum distance from off-site particulate matter sources and (2) accessibility. The in-plant deposition pattern monitoring location sites were selected primarily to provide (1) representative measurement of emissions from the stone crushing plant at three different distances from the center of the plant processing equipment and (2) accessibility.

The upwind monitoring location is shown in Figure 1. The in-plant deposition pattern monitoring locations shown in Figure 1 are designated as locations "Downwind 1, 2, and 3". All of the monitoring locations were well within the property boundary of the Martin Marietta Aggregates, Buchanan plant.

The upwind monitoring location was approximately 1700 feet upwind from the center of the plant processing equipment. It was west of the plant processing equipment in an open, grass-covered pasture and separated from the plant by a two lane paved road that runs through the plant property. State Highway 421 was to the west approximately 800 feet from the upwind monitoring location. This position was also sufficiently far from a tree line. The ambient air monitors were located in the open field to avoid any localized effects of the prevailing off-site particulate matter concentrations. The three upwind monitors were positioned on scaffolding 6 feet above the ground. A small portable generator located approximately 100 feet downwind of the upwind monitoring station supplied power.

The downwind deposition pattern monitoring locations identified as Downwind 1, 2, and 3 were approximately 1150, 2200, and 3200 feet downwind and east of the center of the plant processing equipment respectively as seen in Figure 1. The downwind deposition pattern monitors were located in areas of grass and scrub brush. Each of the monitoring locations was sufficiently far from any tree lines. The monitors at each monitoring location were positioned on scaffolding 6 feet above the ground in order to avoid any localized effects of particulate matter from vegetation. Each of the in-plant deposition pattern monitoring locations was also on scaffolding 6 feet above the ground. Three small portable generators located approximately 100 feet downwind of each monitoring station supplied power.

Both the upwind and downwind monitoring locations were approximately three miles west of the ongoing construction of the outer interstate loop around Greensboro, North Carolina. Accordingly, there were a number of potential sources of particulate matter due to vehicle traffic and construction. The monitoring locations were selected to minimize differences in the vulnerability to these off-site particulate matter sources. When the winds were from the southwest to northwest, there were no apparent effects from this

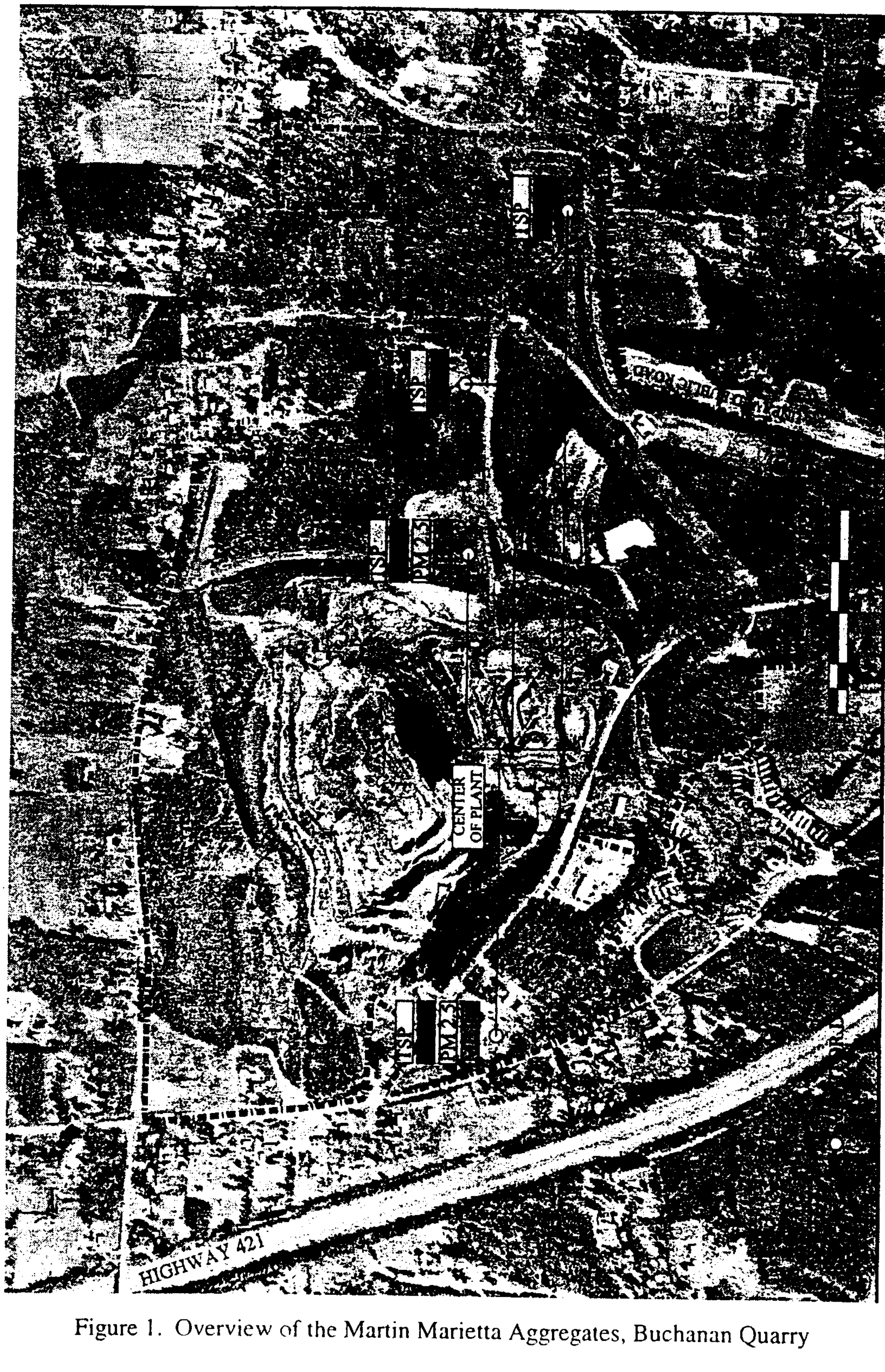

Figure 1. Overview of the Martin Marietta Aggregates, Buchanan Quarry

construction. With respect to the proximity to off-site sources, Air Control Techniques, P.C. believes that the Buchanan plant site is typical of a moderately populated eastern city.

Meteorological monitoring stations were mounted at both the Upwind 1 and Downwind 1 monitoring locations. These stations were used to monitor rainfall, wind speed, wind direction, and ambient temperature. A meteorological station was located at both monitoring sites in order to document differences in wind speed and direction due to land contours. A consistent difference in wind direction was observed as expected due to the localized effects of a tree line approximately 150 feet from the upwind monitoring location. Therefore, the Downwind 1 meteorological data were used in to determine the predominant wind direction on a daily basis. There were no trees or buildings within a four hundred-foot radius of the Downwind 1 monitoring location.

2.3 Ambient Monitoring Procedures

Ambient PM$_{2.5}$ Monitoring Procedures

Ambient concentrations of PM$_{2.5}$ particulate matter were measured following the guidelines of Appendix L proposed on December 13, 1996 and promulgated on July 18, 1997. The ambient PM$_{2.5}$ concentrations were determined based on actual conditions as required by Appendix L. The monitors used for this study were Model FRM-2000 PM$_{2.5}$ monitors manufactured by Rupprecht & Patashnick Co, Inc. (R&P). These instruments use an electrically powered pump to draw ambient air into a non-directional inlet and into a specially shaped inlet consistent with the requirements of Section 7.0 and the dimensions of Section 14.0 of Appendix L. The sample flow rate is maintained at 1.0 cubic meter per hour (16.67 liters/min. ±5%) as required by Appendix L, Section 7.4.1.

Rain and fog droplets are removed in an inertial preseparator near the top of the inlet tube. The sample gas stream then passes through a bug screen (fine wire mesh) and enters a WINS impactor. This portion of the PM$_{2.5}$ sampling instrument is shown in Figure 2.

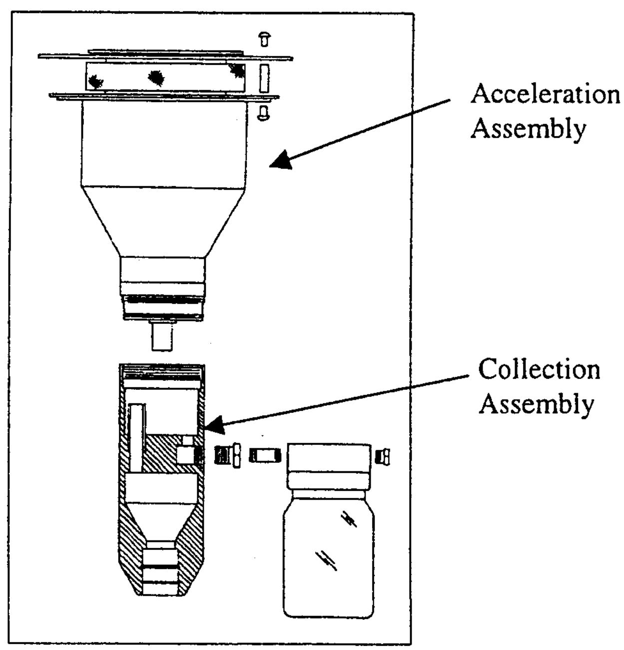

Figure 2. PM$_{2.5}$ Monitor Ambient Air Intake and Water Knockout

Particulate matter larger than 2.5 micrometers (aerodynamic diameter) is collected in the WINS impactor. A glass-fiber filter coated with exactly 43 drops of non-volatile oil is used to capture the particles larger than 2.5 micrometers.

The sample gas stream containing only the $PM_{2.5}$ particulate matter then passes downward to the filter cartridge. Air Control Techniques, P.C. used polycarbonate 47 mm filters to collect the $PM_{2.5}$ particulate matter rather than the conventional polytetrafluoroethylene (PTFE) filters specified in Section 6.0 of Appendix L. Air Control Techniques, P.C. made this modification to the method so that the filters could be analyzed using scanning electron microscopy (SEM) and energy-dispersive spectroscopy (EDS). The EDS was used to develop a particle by particle composition in various particle size ranges.

The polycarbonate filters have a smooth glass-like surface that is ideal for SEM and EDS analysis. The polycarbonate filters had the same pore size as the recommended PTFE filters, which have a rated removal efficiency of 99.7 percent as measured using monodisperse Dioctyl Pthalate (DOP) droplets having a physical diameter of 0.3 micrometers. The 0.3 micrometer size is at the generally accepted minimum efficiency point for filters.

The 47 mm filters were each mounted in a filter cassette that was sealed in a horizontal orientation underneath the down-tube of the sampling system. All of the filters used in this project were conditioned before the pre-sampling weighing in accordance with Section 8.2 of Appendix L. The filters were conditioned in a temperature and relative humidity controlled room having a temperature of 21 - 21.9°C and a relative humidity of 38 - 40%. The preconditioning equilibration times were at least 48 hours, significantly exceeding the 24-hours specified by Appendix L, Section 8.2.5. The filter conditioning times were extended based on RTI's initial experience in obtaining stable filter weights.

Using standard weights immediately before the beginning of the pre-sampling filter weight measurements, the analyst checked the calibration of the analytical microbalance used by RTI for this study. Appendix L, Section 8.1 requires that the balance be calibrated at least once per year. The balance used by RTI was a Mettler Toledo Model UMT2 with a readability of 0.1µg and a repeatability of 0.25µg. The microbalance was located in the same temperature and relative humidity controlled room used for the conditioning of the 47 mm polycarbonate filters.

An orifice located directly below the filter cartridge measures the flow rate of the sample gas stream. Leak checks were performed according to R&P's performance audits in the field prior to sampling and immediately following the final day of sampling. R&P completed a multi-point calibration of the sample flow rate. This calibration was conducted using an NIST traceable flow rate standard that is accurate to ± 2%. A single point verification of the sample flow rate was conducted by Air Control Techniques, P.C. upon arrival of the monitors prior to the test and prior to shipping the monitors at the conclusion of the tests. The single point flow verification is required by Section 9.1.

The field procedures for operating the $PM_{2.5}$ monitors, changing the filters, and transporting the filters conformed to the requirements of Section 10.0. Upon arrival at the monitoring location at the end of a sample period, the filter (cassette mounted) used for that 6-8-hour sample period was removed from the instrument and stored in a sample transport case. The data acquisition system of the FRM-2000 was interrogated to determine if all of the operating conditions monitored continuously and recorded every five minutes were within the required performance specifications. The monitor was then turned off and secured for the night. The test times were only 6-8 hours rather than the standard 24 hour sampling time period. This was done for three reasons (1) the sample times were during hours that the Buchanan plant was operating only, (2) Air Control Techniques, P.C. did not want to overload the filter samples thereby reducing the effectiveness of the energy-dispersive spectroscopy analysis, and (3) due to the remote sample locations small portable generators with approximately a 9 hour fuel supply were used to power the monitors. On each sample day, the generators were started and the monitors were energized and set to run approximately 8 hours. Numbered, conditioned, and pre-weighed filters (cassette mounted) were placed into the instruments and sealed in the proper position. Each filter was recovered well before the 96 hour maximum allowed period of Section 10.10.

The filter in the WINS impactor was replaced every fourth sample day. This is three times as often as recommended by Appendix L. The frequent changing of the WINS impactor filter was considered prudent due to literature indicating that a bias to higher-than-true $PM_{2.5}$ concentrations is possible due to the entrainment of particulate matter from the surface of the impactor into the sample gas stream going toward the $PM_{2.5}$ filter.

The extensive quality assurance data recorded by each FRM-2000 instrument were downloaded into a field computer on a once-per-week basis. These data were scanned for any monitoring problems that could potentially affect the adequacy of the observed $PM_{2.5}$ concentrations. Air Control Techniques, P.C. believes that the R&P $PM_{2.5}$ monitors performed well.

Ambient PM_{10} Monitoring Procedures

Ambient concentrations of PM_{10} particulate matter were measured following the guidelines of Appendix J promulgated on July 1, 1987 by the U.S. EPA. The ambient PM_{10} concentrations were determined based on standard conditions as required by the PM_{10} standard. The PM_{10} samplers used for this study were Model 1200 units with mass flow controllers manufactured by Andersen Samplers, Inc. and General Metal Works. As shown in Figure 3, these instruments use an electrically powered fan to draw ambient air into a size selective inlet that is specially shaped to be consistent with the requirements of EPA Appendix J.

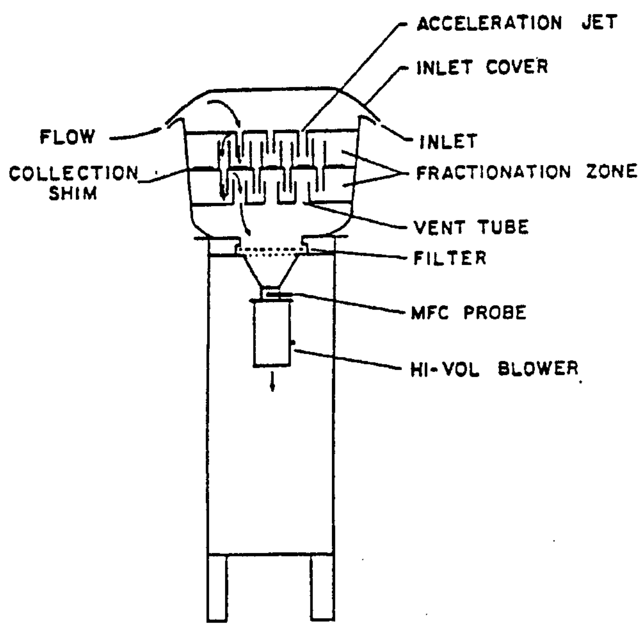

Figure 3. Model 1200 PM_{10} Monitor with Mass Flow Controller

The particle size discrimination characteristics of the Model 1200 (Figure 3) size selective inlet are dependent on the air velocity through the acceleration jets. A change in the entrance velocity will result in a change in the nominal particle size collected. For this reason, it is imperative that the flow rate through the inlet be maintained at a constant actual flow rate of 1.13 actual cubic meters per minute (±10%). The sample flow rate is controlled by the use of a mass flow controller.

The inlet cover removes rain droplets. The sample gas stream then passes through a grid of acceleration nozzles. The larger than ten micrometer particles are then collected on a greased (Dow Silicon Grease #316) collection shim. The equal to and smaller than ten micrometer particles then pass through a bug screen (fine wire mesh) and are collected on a micro-quartz fiber filter.

Ambient TSP Monitoring Procedures

Ambient concentrations of total suspended particulate matter (30 micrometers and less) particulate matter were measured following the U.S. EPA guidelines Federal Register Volume 36, No 84 dated April 30, 1971. The ambient total suspended particulate matter (TSP) concentrations were determined based on standard conditions as required by the PM_{10} standard. The TSP monitors used for this study were Model GMWL-2310 outfitted with venturi flow controllers manufactured by General Metal Works. As shown in Figure 4, These instruments use an electrically powered fan to draw ambient air into the monitor inlet. The flow rate through the monitor is controlled by the flow across the critical venturi. The sample flow rate is determined by the pressure drop across the critical venturi.

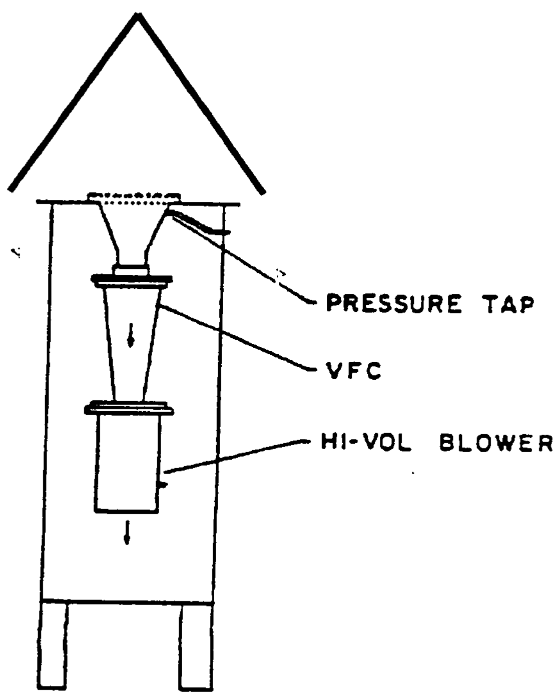

Figure 4. Model GMWL-2310 TSP Monitor with Venturi Flow Controller

The inlet cover removes rain droplets. The sample gas stream then passes through a micro-quartz fiber filter. The Model GMWL-2310 outfitted with a venturi flow controller is shown in Figure 4.

2.4 Meteorological Monitoring Procedures

Meteorological data were monitored on a continuous basis at the Buchanan plant. Air Control Techniques, P.C. installed a Davis Weather Wizard III monitoring station at the Upwind #1 and Downwind #1 monitoring stations. These instrument systems monitored the rainfall, wind speed, wind direction, and temperature. Barometric pressure data were monitored by the R&P FRM-2000 $PM_{2.5}$ instruments.

The meteorological data were recorded continuously and reduced to 15-minute average values in a data acquisition system. These data were retrieved by Air Control Techniques, P.C. on a daily basis and are presented in the appendix to this report.

2.5 Plant Production Rates

The Buchanan Plant operated at normal levels throughout the period of the ambient air monitoring study. The production and material loadout rates for the sampling days are summarized in Table 1.

Table 1. Plant Production and Loadout Rates

Date	Production, Tons/Day	Loadout, Tons/Day
10/6/99	4572	2597
10/7/99	4364	4318
10/11/99	3942	2542
10/12/99	4541	3630
10/13/99	3231	1451
10/14/99	4173	2639
10/18/99	3617	1622
10/19/99	2869	4392
10/21/99	3430	3085
11/9/99	4010	3172
11/10/99	4000	4231
11/11/99	4348	1975
11/15/99	4322	3505
11/16/99	4025	4784

The plant conducted blasting at a frequency of one to three times per week during the study period. Blasts occurred on the following four sampling days: October 13th, October 21st, November 9th, and November 11th. All of the monitoring instruments operated throughout the blast period.

3. TEST RESULTS

3.1 Wind Directions

The wind directions during the 14 sampling days are summarized in Figure 5 for the downwind monitoring locations (each tic mark on the charts is equivalent to one day.). It is apparent from these data that the winds were predominantly from the west-northwest during the study period. However, there were a number of days in which the actual wind direction observed at the dominant downwind monitoring location were actually from the east, north, or south southeast despite the one-day advance weather forecasts.

The dominant downwind site (in-plant) wind direction was from the west-southwest to north-northwest on eight of the fourteen days. The in-plant winds were from the south-southeast to east-northeast on 5 days. The frequency of the winds from the south and east are not typical of this area during the fall. The dominant upwind site wind direction was from westerly directions on twelve days

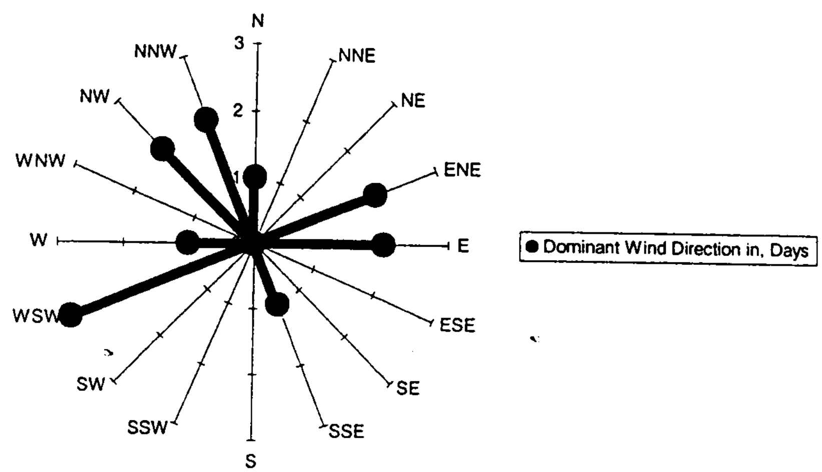

Figure 5. Wind Rose Showing the Downwind (In-plant) Dominant Wind Direction
(Note: Long lines for western winds indicate that the prevailing winds were primarily from the west.)

During the eight days that the wind was from the west, the air approaching the in-plant monitoring site passed over the stone crushing plant quarry, haul roads, and processing equipment. These wind direction data demonstrated that the in-plant monitoring site was properly selected. Accordingly, it was possible to evaluate the differences between the upwind monitoring location and the downwind monitoring locations to determine the extent to which the stone crushing plant contributed and the deposition patterns of the different particle size ranges.

3.2 $PM_{2.5}$ Data and Characteristics

The upwind $PM_{2.5}$ concentration averaged 10.3 $\mu g/M^3$ and varied from approximately 3.4 to 25.1 $\mu g/M^3$. The downwind concentration averaged 9.3 $\mu g/M^3$ for and varied from approximately 3.5 to 23.8 $\mu g/M^3$. The average $PM_{2.5}$ value of 10.3 $\mu g/M^3$ for the Upwind 1 location is similar to data presented by EPA[1] for the Eastern U.S. during the fall season. The use of EPA's fall $PM_{2.5}$ data is appropriate for comparison purposes due to the prevailing temperatures during most of the test period. The peak ambient temperatures were consistently in the range of 40 to 80°F during this period.

The concentration rose for the upwind monitoring location (Figure 6) shows the $PM_{2.5}$ maximum concentrations that occurred when the dominant wind direction for the monitoring day was from the west or west-southwest, the direction from U.S. Highway 421 (Figure 1). The upwind monitoring station concentrations were consistently low when the wind came from the east and passed over the stone crushing plant prior to approaching the monitoring instrument.

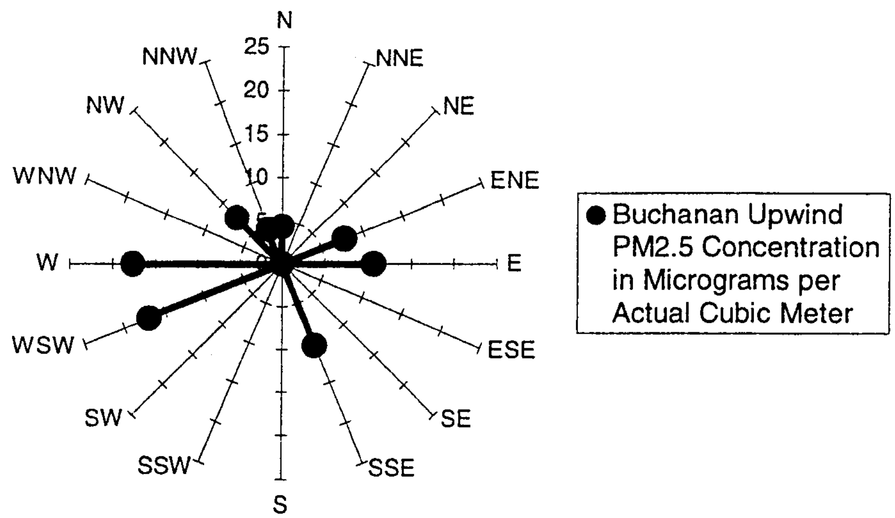

Figure 6. Upwind $PM_{2.5}$ Particulate Matter Concentration Rose (Note: Wind direction normalized to downwind conditions for comparison)

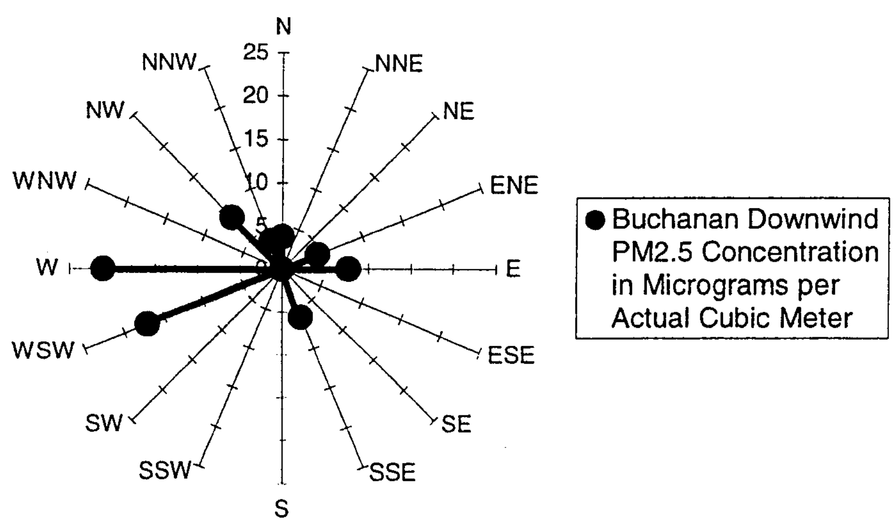

Figure 7. Downwind $PM_{2.5}$ Particulate Matter Concentration Rose
(Note: Highest concentrations were observed when winds were from the west.)

As shown in the Figure 7, the $PM_{2.5}$ concentration rose for the downwind monitoring site was very similar to that for the upwind site. The $PM_{2.5}$ maximum concentrations occurred when the dominant wind direction for the monitoring day was also from the west. When the wind was from this direction, the air passed over the entire stone crushing plant and quarry prior to arriving at the monitoring instrument. Nevertheless, the ambient $PM_{2.5}$ concentrations were essentially identical to those observed in the upwind location. The very limited differences between the upwind and downwind $PM_{2.5}$ concentrations are illustrated in Figure 8.

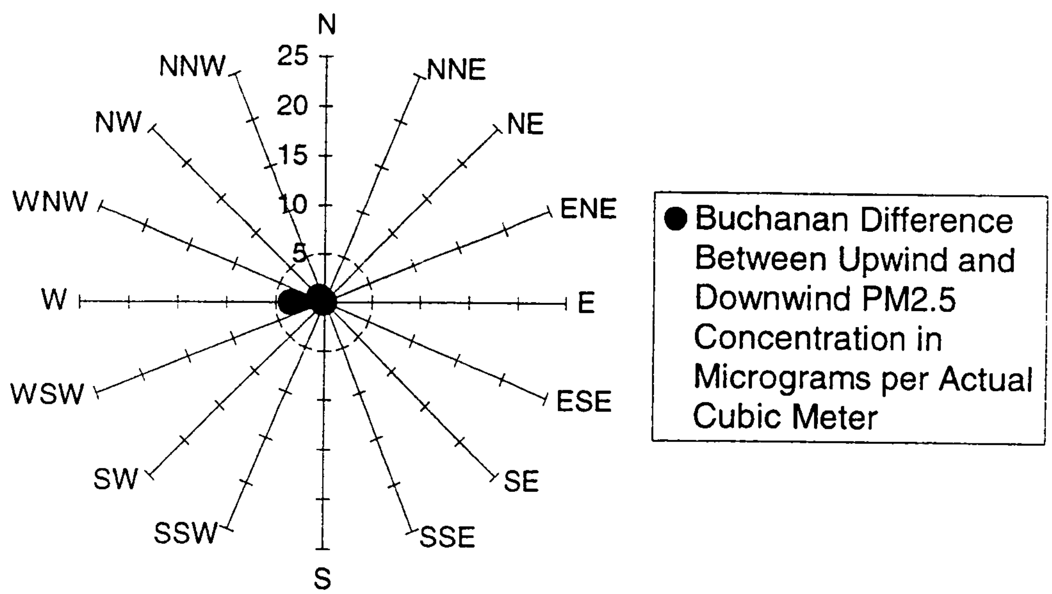

Figure 8. $PM_{2.5}$ Concentrations in the Upwind and Downwind Monitoring Locations

These data provide a clear indication that this very small difference observed between the Upwind 1 and Downwind 1 monitoring locations was due primarily to the precision of the $PM_{2.5}$ ambient concentration measurement method. A repeated measures t-test of the upwind and downwind $PM_{2.5}$ data confirms that there is no statistically significant difference in the two data sets. $PM_{2.5}$ ambient concentrations are unaffected by the presence of the stone crushing plant. This conclusion is identical to the results of NSA sponsored studies in Benson, North Carolina, Leesburg, Virginia, and Denver, Colorado.

The trends in the sampling day-by-sampling day $PM_{2.5}$ concentrations in the upwind and downwind locations are illustrated in Figure 9. The general relationship shown in this trend is consistent with EPA's conclusions that fine particulate matter is formed primarily from gaseous precursors during multi-day transport of air masses across the U.S. The upwind and downwind $PM_{2.5}$ concentrations are essentially identical regardless of the wind direction. This trend relationship could not exist if the stone crushing plant were a significant source of $PM_{2.5}$ emissions.

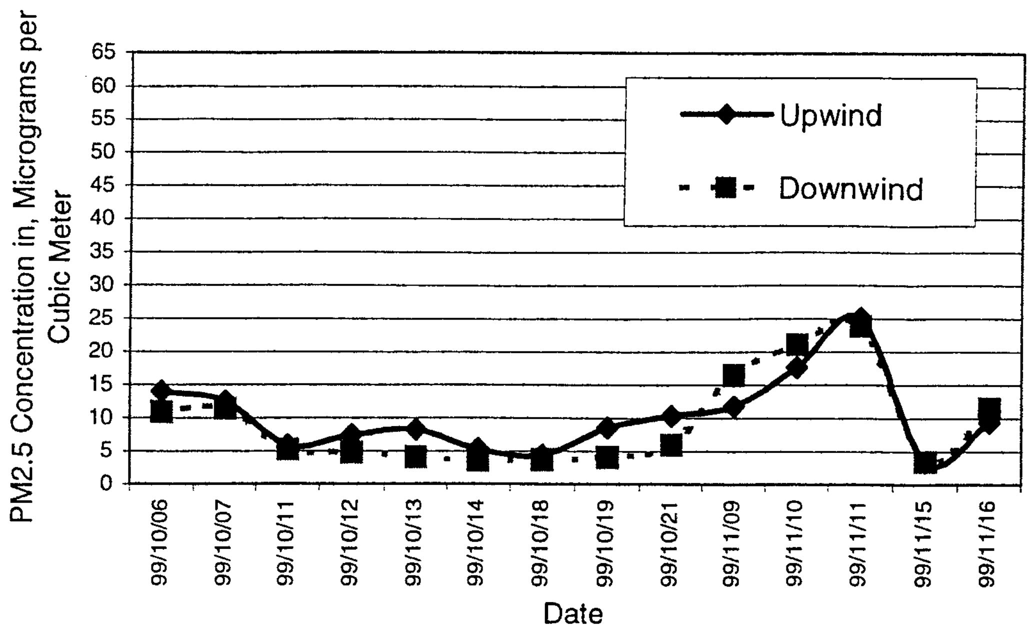

Figure 9. $PM_{2.5}$ Concentration Trend Data for the Buchanan Plant

The $PM_{2.5}$ concentration trends are entirely unrelated to plant operating conditions. For example, there is no relationship between the day-by-day $PM_{2.5}$ concentrations and the plant production and loadout rates presented in Table 1. For example, the correlation between the $PM_{2.5}$ concentration at downwind location 1 and the plant production and loadout rates are shown in Figures 10 and 11. The R^2 correlation for both of the data sets shown in these figures are less than 0.2 confirming that there is no relationship between plant operating rates and the ambient $PM_{2.5}$ levels even at the edge of the plant processing area. The plots for other monitoring locations have similar scatter.

There is also no relationship between the observed $PM_{2.5}$ ambient levels at any of the four monitoring locations and the occurrence of blasts in the quarry. Blasts were conducted on October 13th, October 21st, November 9th, and November 11th.

Wind Speed Analyses

An evaluation of the $PM_{2.5}$ concentration data as a function of the wind speed indicates that the concentrations at both locations (Figures 12 and 13) decrease slightly as the wind speed increases. This strongly indicates that wind blown fugitive emissions from the stone crushing plant are <u>not</u> a significant contributor to the ambient $PM_{2.5}$ emissions. EPA emission factors indicate that emissions from certain operations, such as storage pile stacking and reclaiming, increase as the wind speed increases. It is also logical to assume that emissions from quarry haul roads and other plant operations increase with wind speed. However, the opposite pattern was observed in this study. This is possible only if off-site $PM_{2.5}$ sources are exclusively responsible for observed ambient $PM_{2.5}$ concentrations. If the stone crushing plant were a detectable contributor to ambient $PM_{2.5}$ concentrations, the observed levels at high average wind speeds of 7 to 10 mph would have been significantly higher than those in the 1 to 3 mph range.

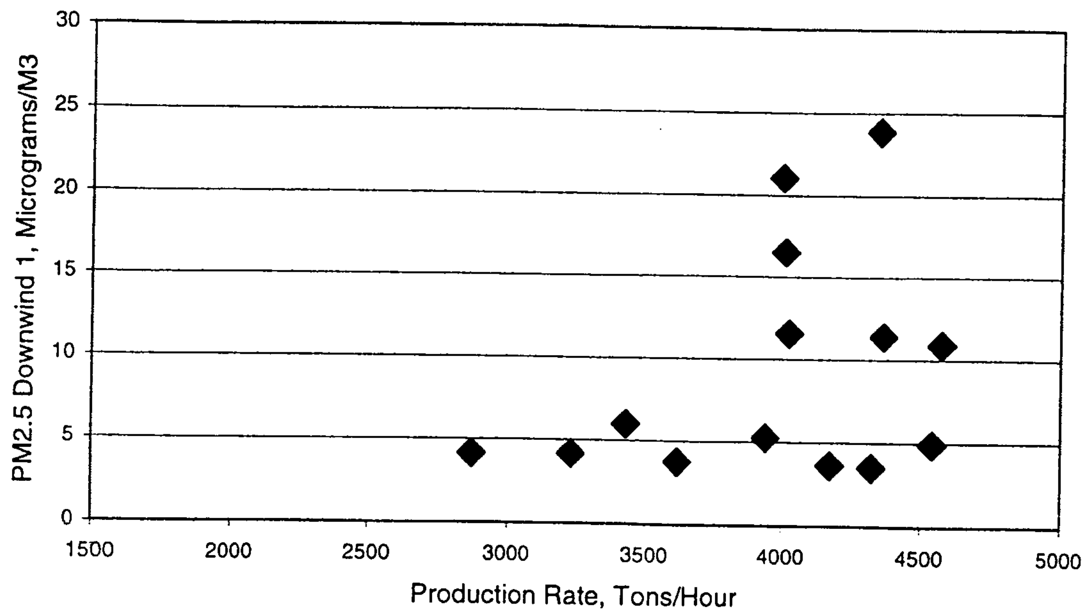

Figure 10. Lack of a Relationship Between $PM_{2.5}$ Concentrations at Downwind Location 1 and the Plant Production Rates

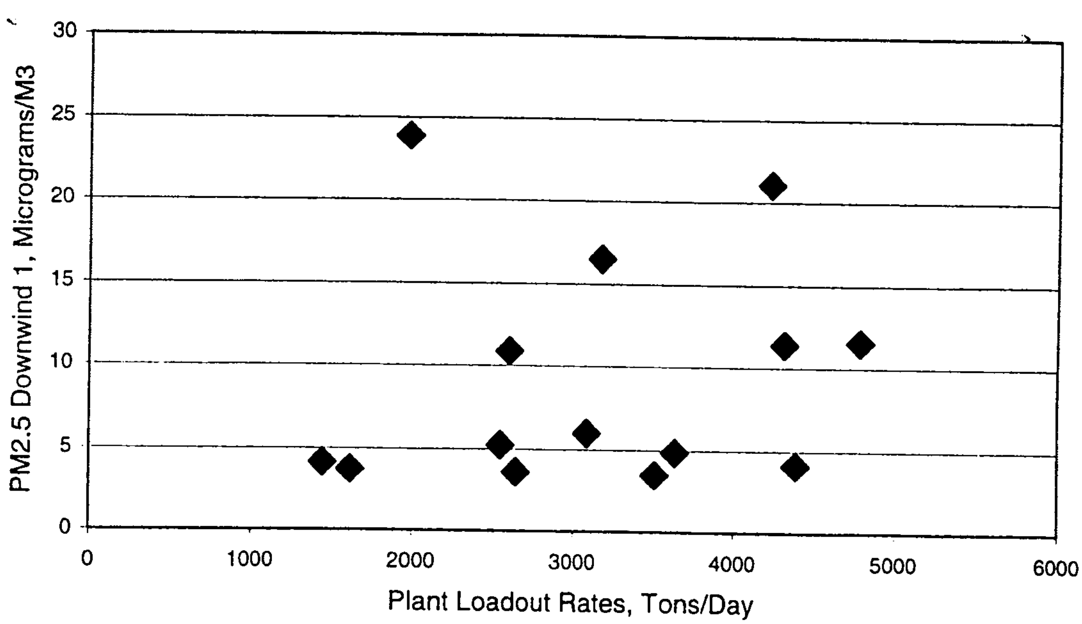

Figure 10. Lack of a Relationship Between $PM_{2.5}$ Concentrations at Downwind Location 1 and the Plant Loadout Rates

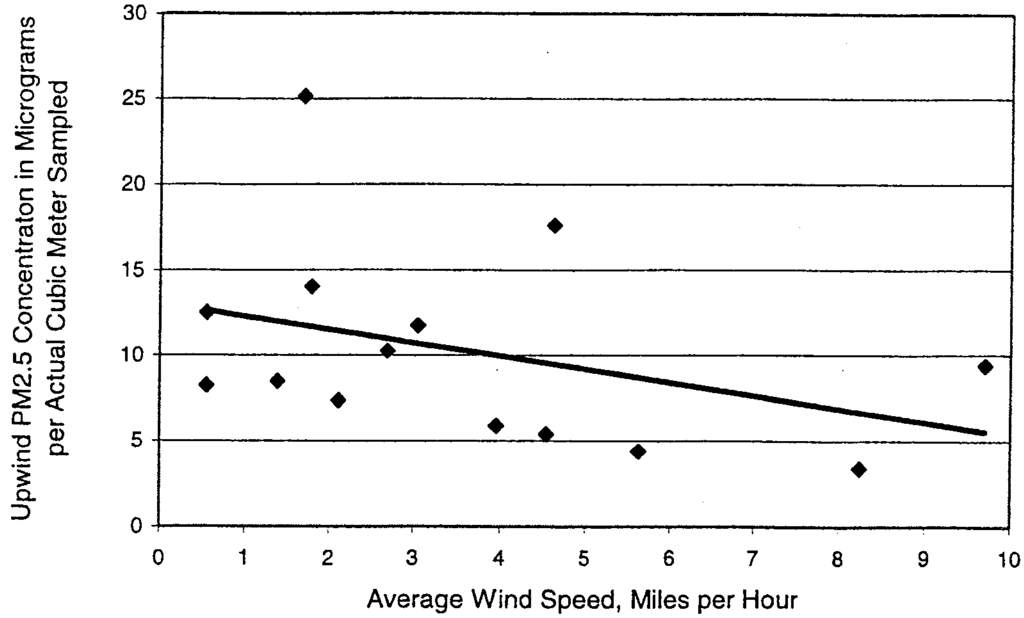

Figure 12. Upwind $PM_{2.5}$ Particulate Matter Concentrations as a Function of Wind Speed

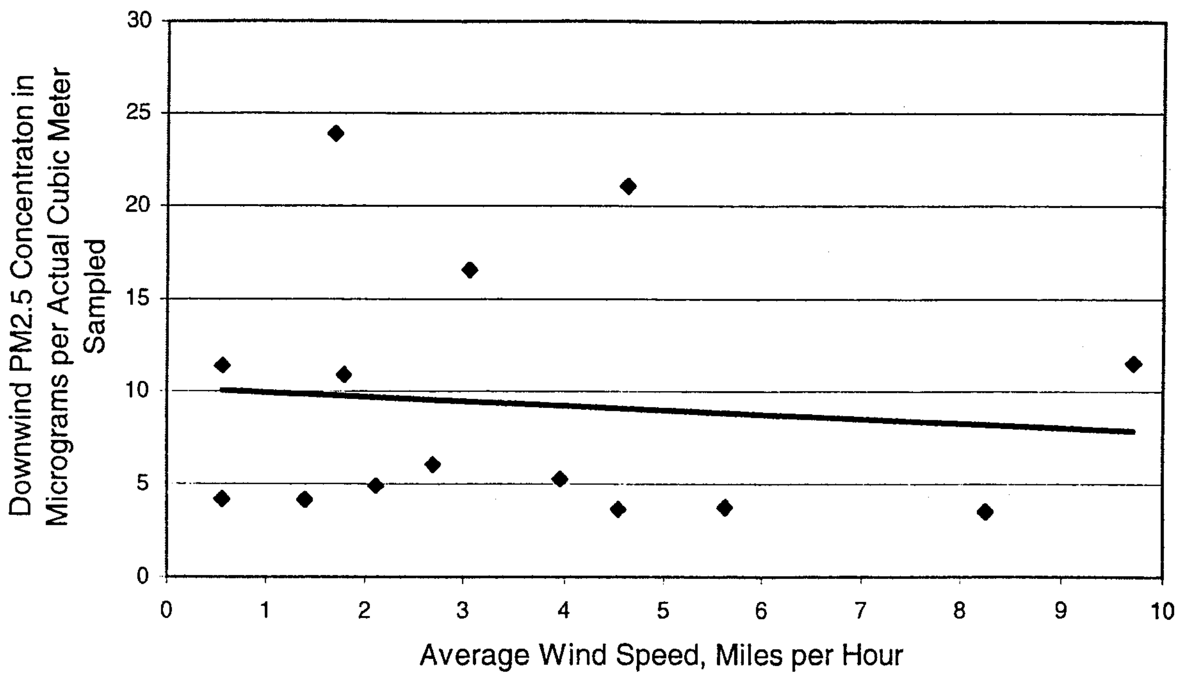

Figure 13. Downwind $PM_{2.5}$ Particulate Concentrations as a Function of Wind Speed

Intermodal Particulate Matter Chemical Analyses

Air Control Techniques, P.C. selected 10 sets of $PM_{2.5}$ filters for SEM and EDS analyses. A summary of these filters is provided in Table 2. This set of filters appeared to have slightly higher $PM_{2.5}$ concentrations downwind of the plant equipment. Accordingly, it would be possible that some $PM_{2.5}$ particles emitted from the equipment would be available on the filters and could be analyzed.

Table 2. Analyzed Filters

Date	Location	Filter Number	$PM_{2.5}$ Concentration, ug/M^3	Dominant Wind Direction
Oct. 13, 1999	Upwind	9	8.2	ENE
	Downwind	10	4.2	ENE
Nov. 9, 1999	Upwind	19	11.8	WSW
	Downwind	20	16.5	WSW
Nov. 10, 1999	Upwind	22	17.6	W
	Downwind	23	21.1	W
Nov. 11, 1999	Upwind	24	25.1	WSW
	Downwind	25	23.8	WSW
Nov. 16, 1999	Upwind	28	9.4	NW
	Downwind	29	11.5	NW
Oct. 24, 1999	Mt. Taylor, NM	N/A	N/A	N/A
	El Calderon, NM	N/A	N/A	N/A

Two of the samples were obtained in wilderness areas of New Mexico, using a battery powered pump and polycarbonate filters in a standard filter holder. The New Mexico samples were obtained to provide examples of PM_1 and intermodal crustal particulate matter far removed from any anthropogenic sources. Single particle EDS analyses were conducted to determine if crustal materials emitted from the stone crushing plant or other sources in the general vicinity were present as particles less than 1 micrometer aerodynamic diameter. EDS tests are conducted using an electron beam focused on individual particles by an electron microscope. Figure 14 illustrates individual particles resting on the surface of a polycarbonate filter.

The emitted X-rays from the particle probed by the electron beam are analyzed to determine the elements present in the particle. The X-ray spectra from 1 to 5 kev were scanned as part of the EDS analyses.

In addition to obtaining particle spectra, RTI also obtained background spectra of the polycarbonate filters used in the $PM_{2.5}$ ambient monitoring instruments. The background spectra are important because the electron beam partially passes through small particles, and the emitted X-rays are from the particle itself and the filter media underneath the particle.

Air Control Techniques, P.C. asked RTI to analyze particles in the size categories outlined in Table 3. The physical diameters are specified along with the aerodynamic diameters due to the differences in the size measurement techniques of the $PM_{2.5}$ ambient monitor and the scanning electron microscopy. The $PM_{2.5}$ instruments separate particles according to their aerodynamic diameter while the SEM inherently is limited to the projected area of the physical diameter.

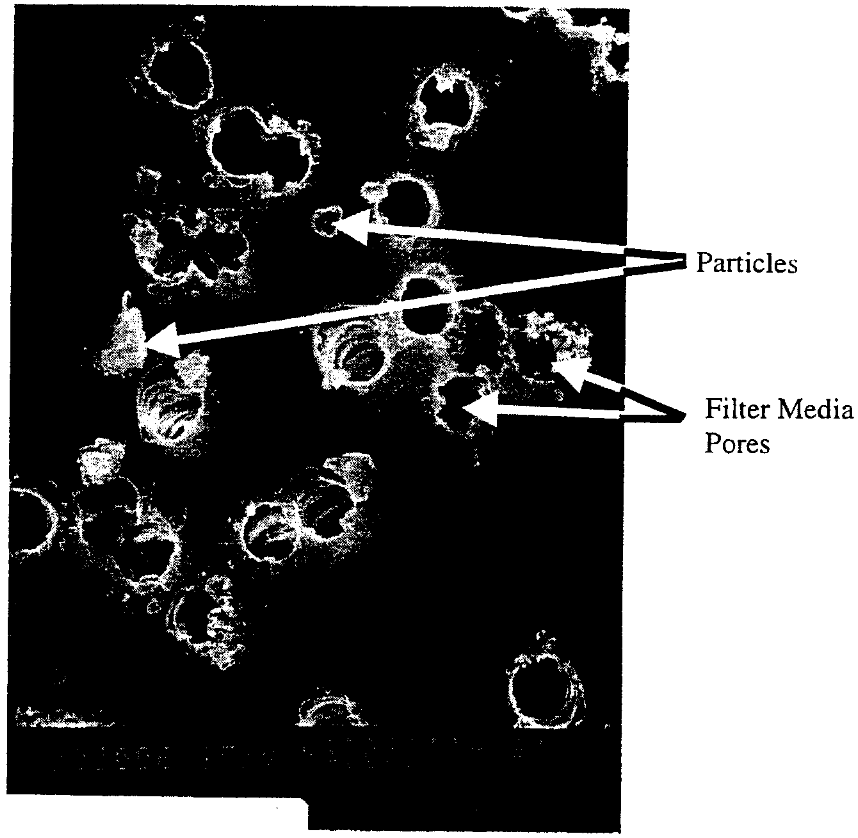

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Figure 14. Particles Resting on the Surface of a Polycarbonate Filter
(Filter holes have not yet bridged over due to light particulate matter loadings.)

Table 3. EDS Analysis Size Categories

Category	Physical Diameter Micrometers	Aerodynamic Diameter, Micrometers
1	≤ 0.33	≤ 0.54
2	> 0.33 to ≤ 0.67	> 0.54 to ≤ 1.0
3	> 0.67 to ≤1.0	> 1.0 to ≤1.6
4	> 1.0 to ≤1.5	> 1.6 to ≤2.5

The physical sizes were chosen based on an assumed particle density of 2.7 grams per cubic centimeter. The aerodynamic diameters were calculated based on Equation 1.

$$d_p = d_{pg}\sqrt{\rho_p} \qquad \text{Equation 1}$$

Where

d_p = Particle aerodynamic diameter, micrometers
d_{pg} = Particle physical diameter, micrometers
ρ_p = Particle density, grams per cm3

Based on this approach, the first two categories include particles that are in the PM_1 size range, and the second two categories include particles that are in the intermodal size range of 1 to 2.5 micrometers.

In evaluating the chemical composition of the particles, Air Control Techniques, P.C. asked RTI to use the following elements as indicators of crustal material.

- Aluminum
- Silicon
- Iron
- Calcium
- Magnesium
- Sodium
- Potassium
- Chromium

This list of elements is consistent with information concerning crustal materials provided in the October 1999 External Review Draft of the Particulate Matter Criteria Document published by EPA.

A variety of other elements were also included in the analyses to check for types of $PM_{2.5}$ and PM_1 particles not associated with stone crushing plants and sources of mineral particulate matter in general. These elements included the following.

- Sulfur (indicator of sulfates)
- Nitrogen (indicator of ammonia and nitrates)
- Carbon (indicator of carbonaceous particulate matter)
- Oxygen (indicator of carbonaceous particulate matter)

Carbon and oxygen are also present in the polycarbonate filter media. Accordingly, the presence of carbonaceous particulate matter could only be determined by observing shifts in the C to O levels from the filter media background tests.

The results of the EDS analyses are summarized in the appendix of this report. These results indicate that the crustal elements are only present in particles having an aerodynamic particle diameter larger than 1 micrometer. The distribution of aluminum and silicon, the two most commonly observed crustal elements, is summarized in Figure 15. It is apparent that aluminum and silicon increase above filter media background levels when the particle aerodynamic diameter increases above approximately 1.0 micrometers (PM_1 upper size limit). The presence of crustal elements only in the greater than 1.0 micrometer aerodynamic diameter size range is illustrated by the comparison of the X-ray spectra obtained from filter #10. For a 0.5 micrometer physical diameter (0.8 micrometer aerodynamic diameter) particle (Figure 16), and a 0.9 micrometer physical diameter (1.5 micrometer aerodynamic diameter) particle (Figure 17), and the filter media background (Figure 18). The aluminum and silicon peaks shown in Figure 17 are considerably above the background levels shown in Figure 18. This indicates that this 1.5 micrometer aerodynamic diameter particle has a crustal origin.

The three spectra shown in Figures 16-18 are typical of the spectra of all of the filter samples analyzed by EDS. The particles less than 1.0 micrometer aerodynamic diameter that were probed had negligible levels of crustal elements and relatively high carbon, nitrogen, oxygen, and sulfur levels. Particles dominated by these elements were present in all four size categories analyzed. However, the crustal elements were only present in particles having aerodynamic diameters larger than 1.0 micrometers.

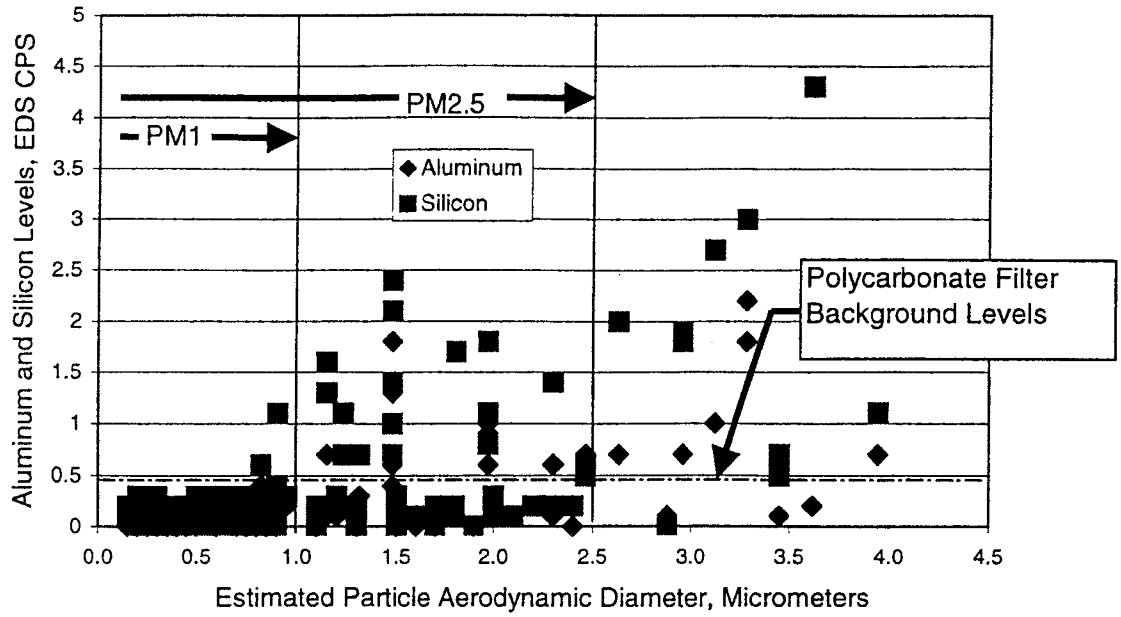

Figure 15. Distribution of Aluminum and Silicon in PM_1, Intermodal $PM_{2.5}$, and PM_{10} Particles

The EDS results for the samples obtained at the stone crushing plant are identical for the two samples obtained in wilderness areas of central New Mexico. For example, Figures 19 and 20 show the X-ray spectra for particles having aerodynamic diameters of 0.8 and 1.8 micrometers physical diameter (1.3 and 2.9 micrometers aerodynamic diameter) respectively. The filter media background spectra for the filter is shown in Figure 21. As with the stone crushing plant samples, the crustal elements were restricted to particle sizes larger than 1.0 aerodynamic diameter.

These results strongly indicate that EPA could use PM_1 as an effective means to define the fine particulate matter mode and avoid the confusion inherently involved with a $PM_{2.5}$ size definition that inadvertently overlaps with the lower portion of the coarse particulate matter definition. The use of $PM_{2.5}$ as the size definition will substantially complicate the development of fine particulate matter control strategies.

3.3 PM_{10} and TSP Ambient Air Concentrations

Concentration - Distance Profile Analyses

One of the purposes of this study was to evaluate the deposition patterns of different size ranges of particulate matter at a stone crushing plant. The average ambient air concentrations measured at the upwind monitoring location (Upwind 1 - 1700 feet from the center of plant processing) and the three downwind deposition monitoring locations (Downwind 1, 2, 3 - 1150, 2200, and 3200 feet respectively from the center of plant processing) of the Buchanan plant are illustrated in Figures 22 through 25. These figures concern only the test days when the wind was from a westerly direction in order to indicate the rate of change in the particulate matter levels for winds passing directly over the plant to the line of downwind monitoring stations.

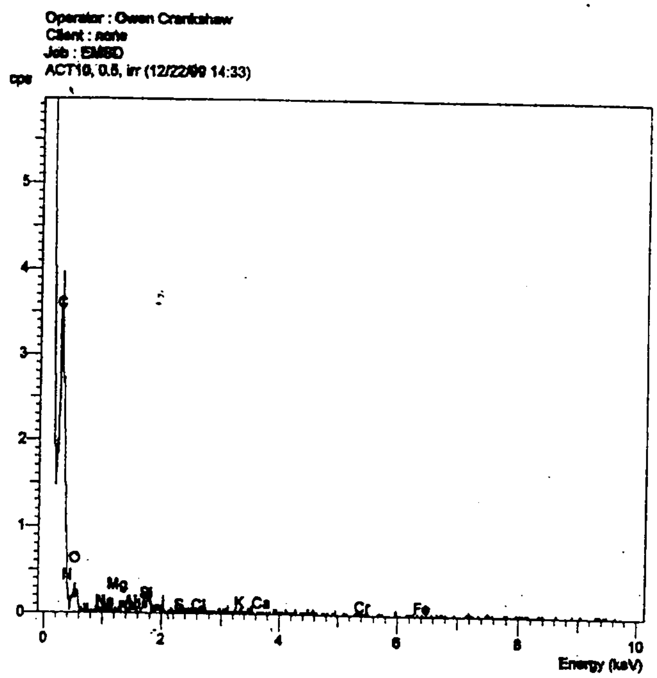

Figure 16. EDS Spectra for a 0.5 micrometer physical diameter
(0.8 micrometer aerodynamic diameter) particle,
Filter 10 Downwind Location, October 13, 1999

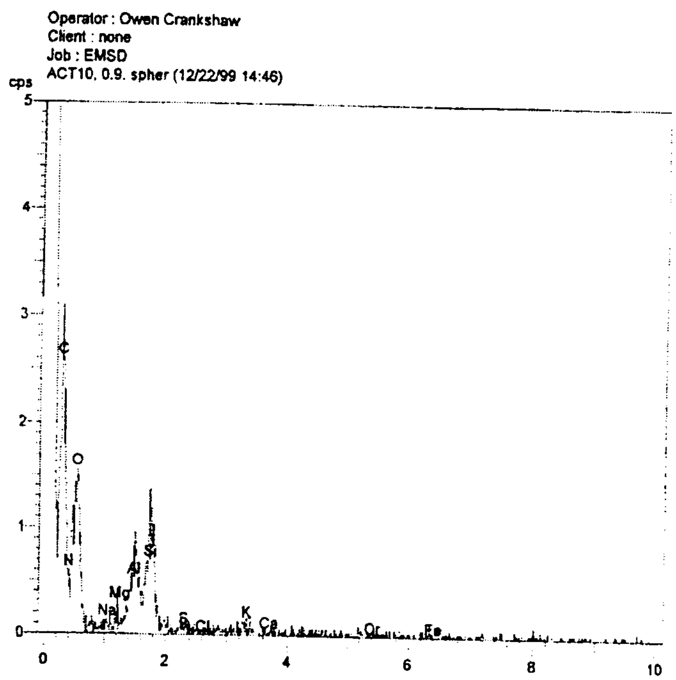

Figure 17. EDS Spectra for a a 0.9 micrometer physical diameter
(1.5 micrometer aerodynamic diameter) particle,
Filter 10 Downwind Location, October 13, 1999

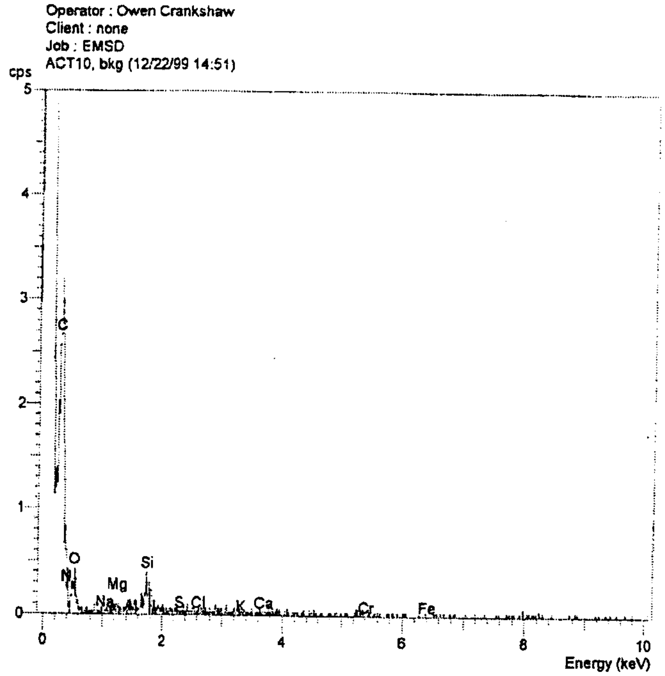

Figure 18. EDS Spectra for the Polycarbonate Filter Media, Filter 10 Background

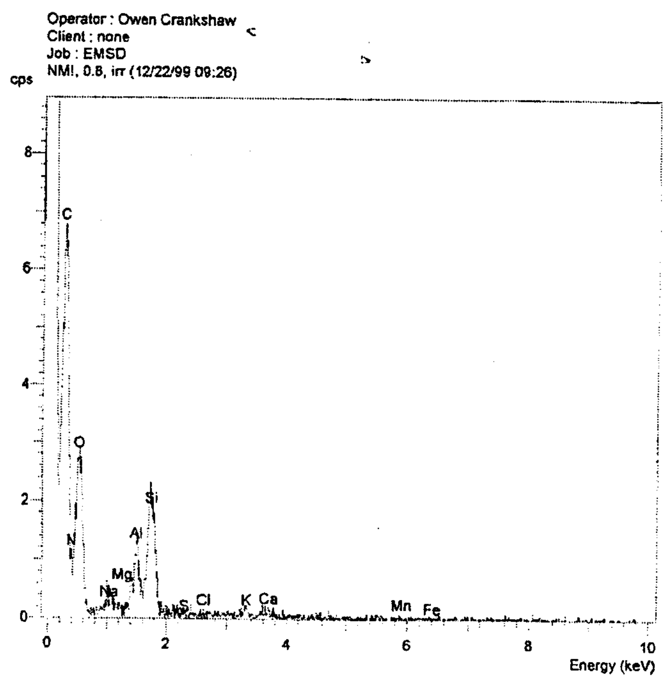

Figure 19. EDS Spectra for a 0.8 micrometer physical diameter
(1.3 micrometer aerodynamic diameter) particle,
Mt. Taylor, New Mexico October 24, 1999

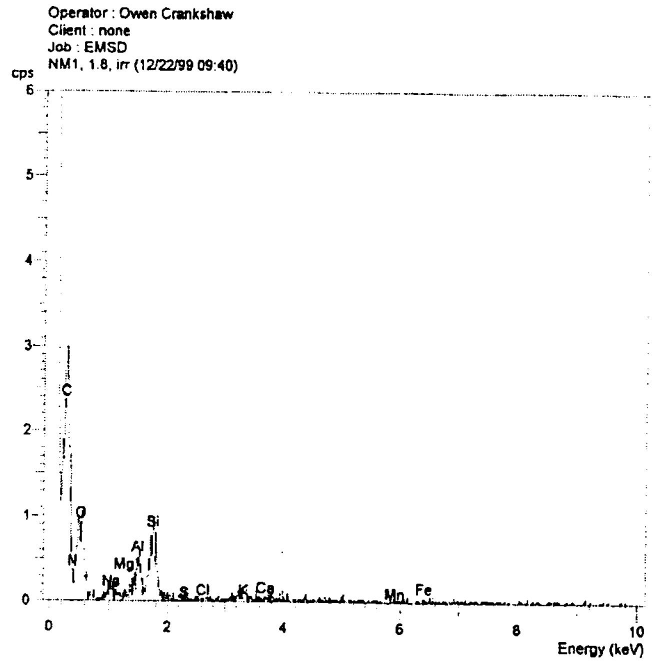

Figure 20. EDS Spectra for a 1.8 micrometer physical diameter (2.9 micrometer aerodynamic diameter) particle, Mt. Taylor, New Mexico October 24, 1999

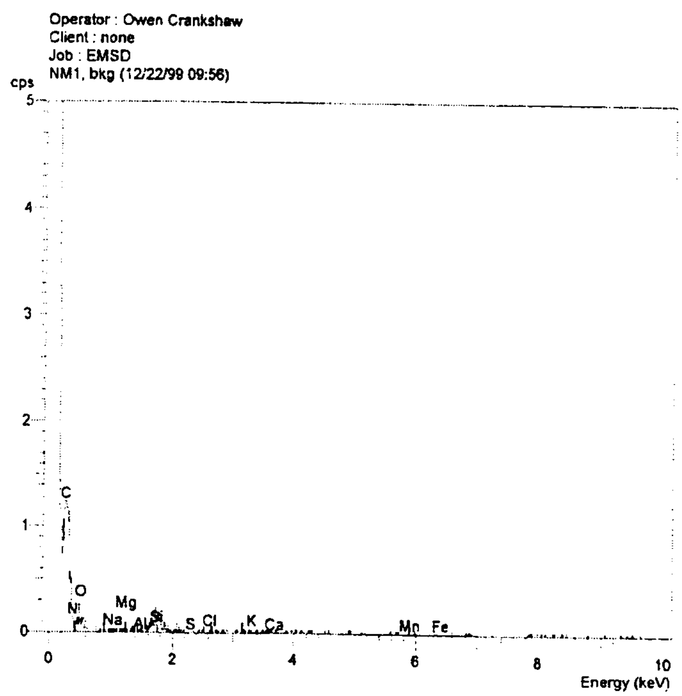

Figure 21. EDS Spectra for the Polycarbonate Filter Media, Mt. Taylor filter background

The particulate matter concentrations illustrated in Figure 22 were measured on November 9, 1999 when the winds were from the west at an average speed of 4.6 mph. The maximum wind gust during the sampling period was 9.9 mph. There is a slightly elevated PM_{10} level at the first downwind monitoring location near the edge of the plant processing area. The second and third monitoring locations had PM_{10} levels essentially identical to the upwind level. Overall, the PM_{10} data indicate that the emissions of PM_{10} from the plant are small, and there is rapid decreases in PM_{10} levels in the air moving downwind of the plant. The TSP concentration at the first downwind location was substantially above the upwind concentration. However, the TSP levels rapidly dropped as the ambient air moved to the second downwind location 1050 feet away. This indicates very rapid deposition of TSP.

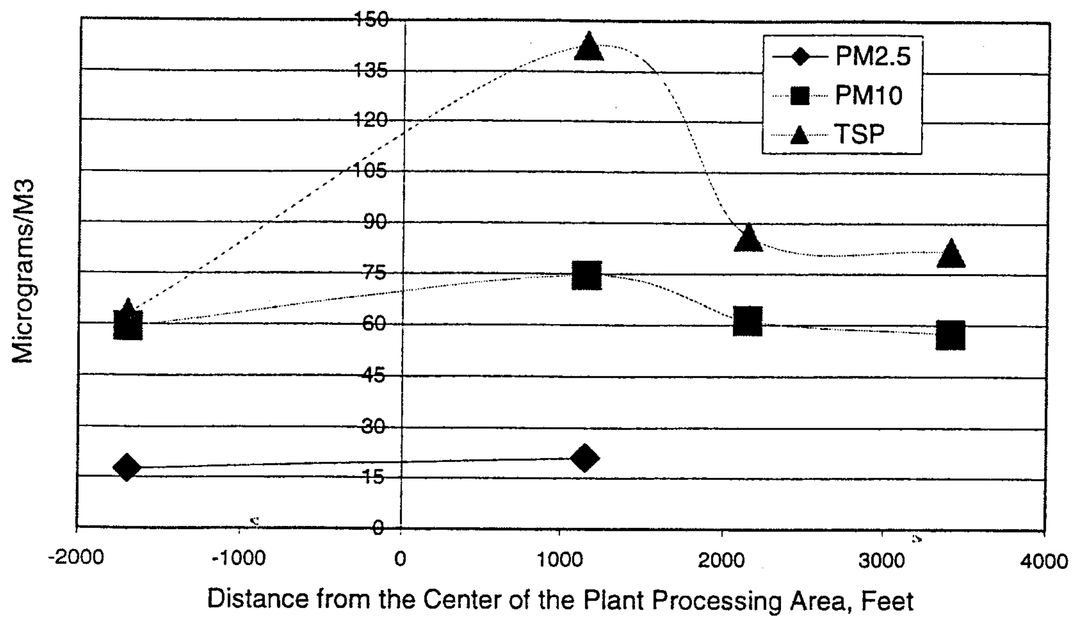

Figure 22. Concentration-Distance Profile for November 10, 1999, Winds from the West

Data from November 11, 1999 is illustrated in Figure 23. During this sampling period, the winds were from the west-southwest at an average speed of 1.7 mph. The peak wind speed during the sampling period was only 4.3 mph. There is no detectable increase in the $PM_{2.5}$ concentrations and only a slight increase in the PM_{10} concentrations. However, there is a moderate increase in the TSP levels from upwind to downwind locations. These TSP levels return to the upwind baseline levels in the time necessary for the air to move approximately 1050 feet from the first to the second downwind monitoring locations. This data set also indicates very rapid gravity settling and dry deposition of the large TSP sized particles and the moderately sized PM_{10} particles.

A moderate increase in TSP concentrations along the line of monitoring stations was observed on November 15, 1999 (Figure 24) when the winds averaged 8.3 mph and gusted to 17.1 mph. It is again apparent from these data that the TSP levels decreased very rapidly between the first and second downwind monitoring sites. This is similar to the rapid TSP removal rates illustrated in previous two figures.

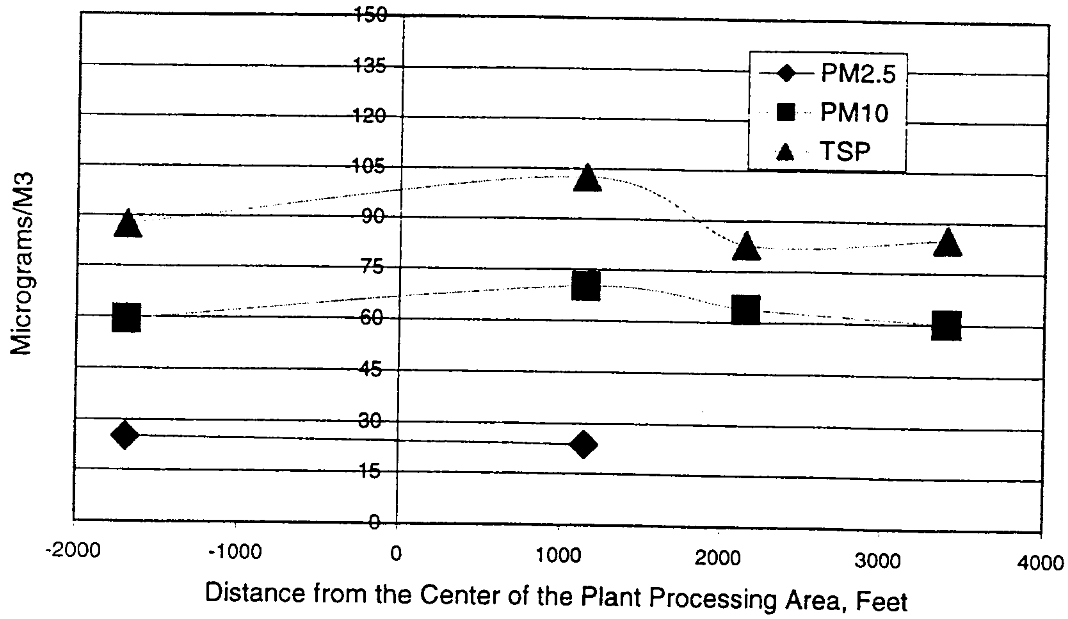

Figure 23. Concentration-Distance Profile for November 11, 1999, Winds from the West-Southwest

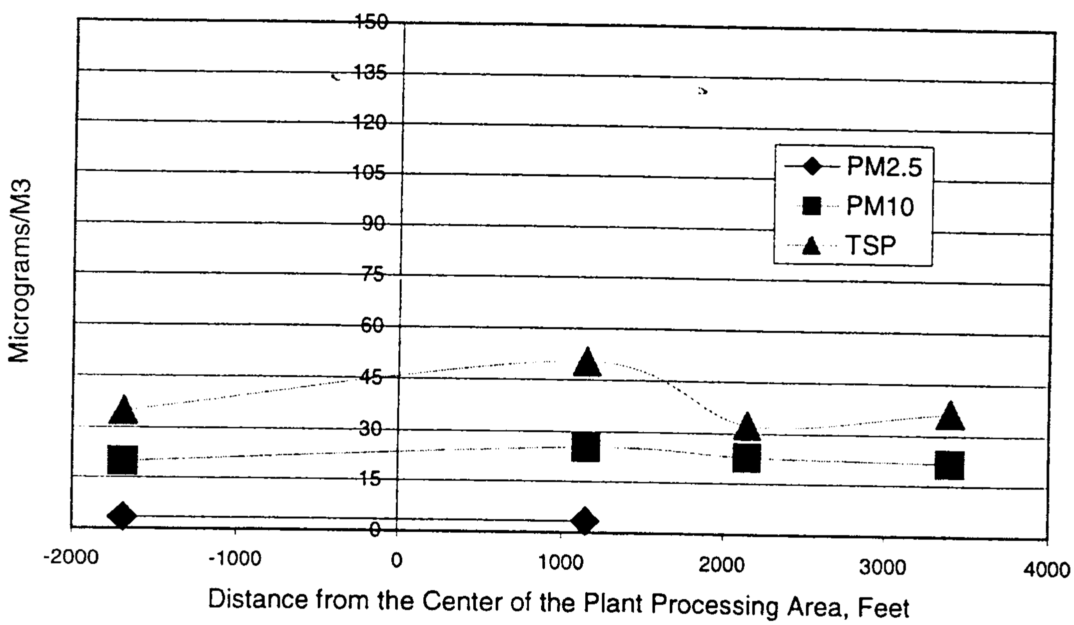

Figure 24. Concentration-Distance Profile for November 15, 1999, Winds from the North-Northwest

The PM_{10} concentrations on November 15, 1999 had a very slight increase from the upwind location to the first downwind location. However, the PM_{10} levels returned to the upwind baseline levels by the time the ambient winds reached the second downwind monitoring location. The observed PM_{10} levels along the downwind line of monitors is considerably lower than that indicated by standard dispersion models that do not take into account settling and deposition. The $PM_{2.5}$ levels on November 15, 1999 had essentially no increase across the plant processing area. The slight difference in the observed levels is within the measurement precision level of the $PM_{2.5}$ ambient monitoring technique.

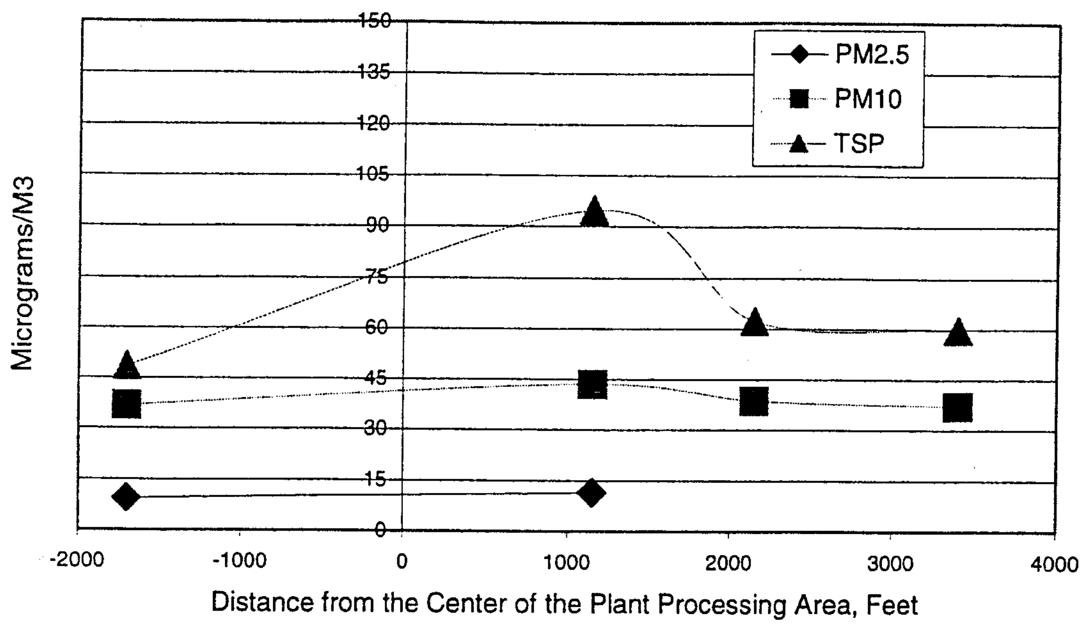

Figure 25. Concentration-Distance Profile for November 16, 1999, Winds from the Northwest

The particulate matter concentration profiles observed on November 16, 1999 (Figure 25) are similar to the other days analyzed. The dominant wind direction during this sampling day was from the northwest and average 9.7 mph. The peak wind speed during the sampling period was 19.7 mph. These average and peak wind speeds are above the normal levels for Greensboro, North Carolina in the fall. The PM_{10} concentrations increased slightly as the ambient air reached the first downwind monitoring location. The PM_{10} levels then quickly decreased to the upwind baseline levels. The TSP levels at the first downwind station were elevated as would be expected during a period of sustained moderate winds and gusty conditions. However, the downwind TSP concentrations rapidly decreased in the short time necessary for the air to reach the second downwind location. The TSP concentrations at the third downwind monitoring location increased slightly due to dust entrained by the nearby unpaved access road to this monitoring location.

The TSP monitoring data obtained during the test program at the Buchanan Plant indicate that TSP levels become slightly elevated after the winds pass over the processing area and then rapidly decrease to levels at or near the upwind levels. TSP size particles generated by the plant appear to be almost completely removed from the atmosphere in less than 1000 feet. These TSP concentration data could be further analyzed by conventional dispersion models to separate the concentration decreases due to normal atmospheric dispersion and due to gravity settling/dry deposition.

Future studies of TSP gravity settling/dry deposition should to focus on areas quite close to the plant processing equipment. There is little point in evaluating TSP gravity settling/dry deposition at distances exceeding 1000 feet from the edge of the processing area because essentially all of the TSP particles generated at the plant are already removed from the ambient air.

Wind Direction - Concentration

PM_{10} and TSP emissions from the stone crushing plant have an impact on the particulate matter concentrations at the first downwind monitoring location at the edge of the plant processing area. The two concentration roses for the Downwind 1 monitoring location (Figures 26 and 27) indicate that the PM_{10} and TSP maximum concentrations occurred when the dominant wind direction for the sampling period was from the west. During these conditions, the ambient air passes directly over the plant processing area and quarry.

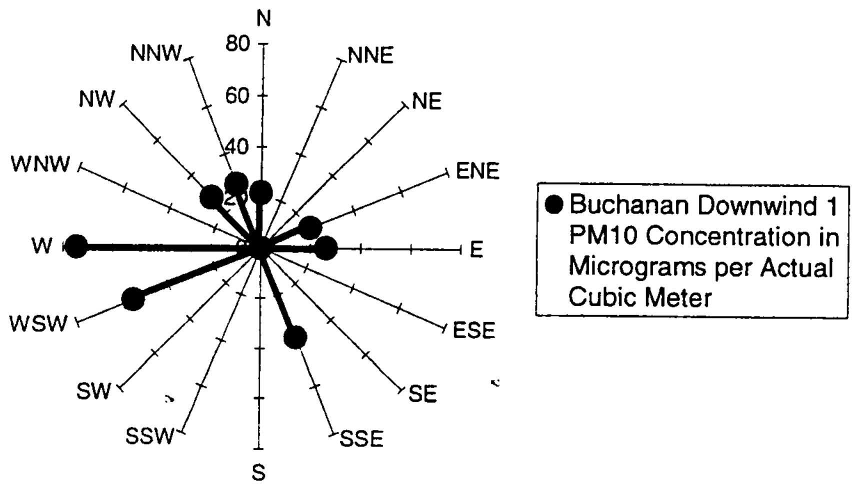

Figure 26. Downwind 1 Monitoring Location PM_{10} Particulate Concentration Rose

The lowest PM_{10} and TSP concentrations were observed at the Downwind 1 monitoring location when the wind direction was from the north and east-northeast. The winds coming from these directions hit the Downwind 1 monitors in a crosswind style; therefore, the effects of the plant cannot be determined.

The presence of a wind-dependent pattern in the TSP and PM_{10} concentrations is in direct contrast to the pattern observed for $PM_{2.5}$ particulate matter. For $PM_{2.5}$, there was no discernable difference in the upwind and downwind ambient air concentrations even though the downwind monitoring was conducted at the very edge of the plant processing area well within plant boundaries. These patterns clearly indicate that stone crushing plants are a slight source of PM_{10} and TSP emissions and a negligible source of $PM_{2.5}$ emissions. It also indicates that $PM_{2.5}$ is present as an entirely different ambient air particulate matter distribution than the mass present as PM_{10} and TSP.

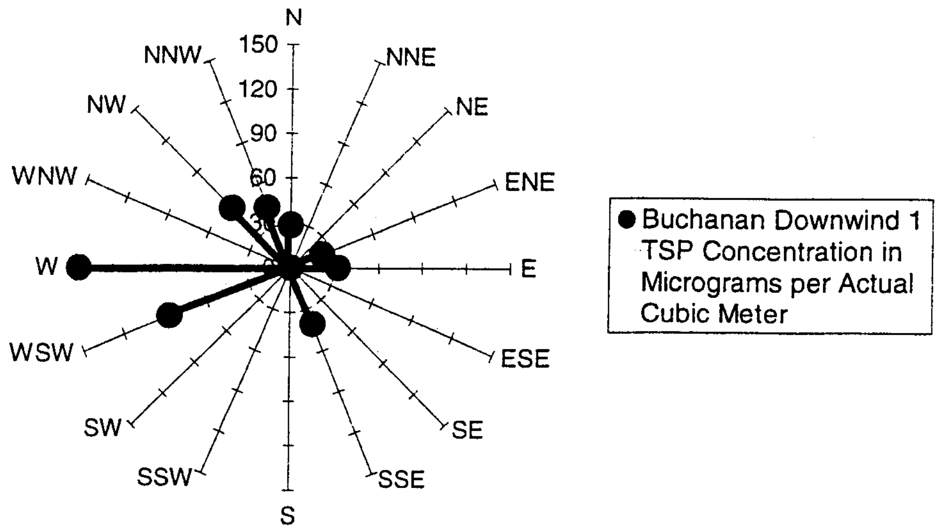

Figure 27. Downwind 1 Monitoring Location TSP Particulate Concentration Rose

It is also important to note that the PM_{10} concentrations observed, even in the first downwind location immediately adjacent to the plant processing equipment, were consistently below the prevailing National Ambient Air Quality Standards for 24-hour periods, despite sampling times of only 6 to 8 hours while the plant was active. This provides further evidence that the PM_{10} emissions from stone crushing plants are low. This conclusion is consistent with low PM_{10} emission factors measured in a series of NSA and EPA sponsored studies over the 1991 through 1996 period.

4. QUALITY ASSURANCE PROCEDURES

The data acquisition system of the FRM-2000 was interrogated to determine if all of the operating conditions monitored continuously and recorded every five minutes were within the required performance specifications. Quality assurance problems occurred with the Downwind 1 $PM_{2.5}$ sampler on a few occasions generally due to power fluctuations.

The power fluctuations were due to the use of a small portable generator. The power fluctuations affected the sensitive electronics of the $PM_{2.5}$ monitor that would shorten the test run. The power fluctuations did not affect the $PM_{2.5}$ samples because the monitor recorded the sample times. Therefore, the total flow rate was decreased as well as the total filter catch, so the concentration data were not affected. The power fluctuations were minimal and did not affect the PM_{10} or TSP monitors or samples.

According to the manufacturer and EPA Part 58 Appendix L, the temperature differential between the filter and the ambient air should not exceed 5°C for more than 10 consecutive minutes. This was never a problem during the study.

There were no quality assurance problems with the post sampling of the $PM_{2.5}$ filters. It should be noted that all the duplicate samples and certified weights were within the acceptance ranges as set forth in the EPA guidance document concerning $PM_{2.5}$ monitoring.

The Appendix of this report contains the daily $PM_{2.5}$ monitor filter data and the corresponding field data sheets for the entire study. Due to the voluminous quantity of 5-minute interval quality assurance data it has been made available on a set of computer disks. During all sample runs, with the exception of two all of the following sampling criteria were met (Table 4.)

- Sample time was greater than 6 hours.
- Sample volumes were greater than 6 liters.
- Average flow rate was 16.7 liters per minute ± 5%.
- The flow coefficient of variation was less than 4%.
- The filter temperature was never more than 5°C above the ambient temperature for more than 10 consecutive minutes.
- No power interruptions were recorded.

Table 4. Quality Assurance, Sample Volumes and Times

Test Location	Filter Number	Test Date	Sample Volume, Liters	Required Sample Volume, Liters	Sample Time, Hours : Minutes	Required Sample Time, Hours	Notes
Upwind 1	5	10/11/99	6.3	≥6	6:10	≥6	Power Interruption
Downwind 1	25	11/11/99	5.2	≥6	5:09	≥6	Power Fluctuation

6. REFERENCES

1. U.S. Environmental Protection Agency. "Review of the National Ambient Air Quality Standards for Particulate Matter: Policy Assessment of the Scientific and Technical Information." 1996.
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3. Brozell, T., J. Richards, J., and. B. Palm. " $PM_{2.5}$ Monitoring Study, Leesburg Virginia. Report to the National Stone Association. July 1998.
4. Richards, J., T. Brozell, and B. Palm. " $PM_{2.5}$ Monitoring Study, Denver Colorado. Report to the National Stone Association 1999.
5. Richards, J., T. Brozell, and J. Hayden. "Upwind-Downwind Ambient $PM_{2.5}$ Monitoring at Stone Crushing Plants." Environmental Manager, August 1999, Pages 17-26.

APPENDIX 13

- **Aimone-Martin Blast Summary**

EXECUTIVE SUMMARY

Blasting Attenuation Study
Structure Response Study

Crystal Ridge, MacDonald Ranch and MacDonald Highlands

For the

City of Henderson
240 Water St.
Henderson, Nevada

Prepared by

Dr. Catherine T. Aimone-Martin
President

May 27, 2005

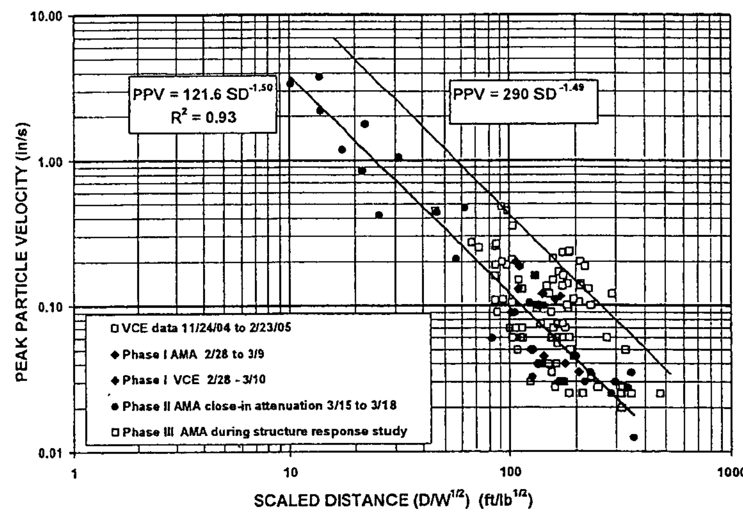
AIMONE-MARTIN ASSOCIATES LLC
1005 BULLOCK AVE.
SOCORRO, NM 87801

(505) 838-2229

BLASTING ATTENUATION STUDY

A blasting attenuation study was initiated by Aimone-Martin Associates, LLC (AMA) on 2/25/05 to record and evaluate vibration and airblast measurements at locations near current blasting south of West Horizon Ridge Parkway within the neighborhoods of Crystal Ridge, MacDonald Ranch, and MacDonald Highlands. The purpose of this study was to

- evaluate seismograph measurements and data from blasting operators and vibration consultants, VCE, of Las Vegas, Nevada,
- validate measurements recorded by VCE,
- evaluate geological influences that may be contributing to unusual ground vibrations in various directions from blasting operations, and
- evaluate blasting methodology as it may be influencing unpredictable or unusual ground vibrations or airblast.



The best-fit equation (50-percentile) for data recorded during this study was

$$PPV = 121.6SD^{-1.50}$$

with a correlation, R^2, of 0.93. This fit is very close to the fit obtained by Siskind, et al. (1980) during U.S. Bureau of Mines structure response research at coal mines. The 100% confidence line for all data, including data recorded during the Structure Response Study, was

$$PPV = 290SD^{-1.49}$$

Conclusions drawn from this study are as follows:

- Blasting and vibration monitoring and control methods currently employed are state-of-art and represent best practices available in the rock blasting industry.

- Historical vibration records from VCE (prior to 2/25/05, or the commencement of these studies) showed vibration levels slightly higher than those recorded by both VCE and AMA from 2/25/05 to 4/14/05, given a constant distance and explosive charge weight. However all historical data for ground motions were within regulatory limits. This may indicate that <u>more control</u> on blasting was exercised since that inceptions of scientific studies and elevated oversight by the City.

- Post-blast record keeping of blasting and vibration information was lacking in key information upon the commencement of this study and greatly improved over the following 3 months. As a result, blasters were more aware of off-site impacts and responded with improved control measures.

- There are measurable yet minor influences of geology and terrain conditions that appear to enhance ground vibrations in directions that align with the surface ridge lines from the blast sites. The attenuation or decrease in vibration amplitudes with distance in different directions is not statistically significant and does not warrant special regulatory consideration.

STRUTCURE RESPONSE STUDY

The response of two residential structures, one in Sun City MacDonald Ranch and one in MacDonald Highlands, to blasting vibrations was conducted from 3/15/05 to 4/15/05. Structures were instrumented with single-axis velocity geophones to measure whole structure and mid-wall vibratory motions during blasting events. Displacement-type gages were used to measure movement of a pre-existing stucco exterior wall crack during blasting, construction, and wind events. A single tri-axial geophone and air pressure sensor were employed exterior to the dwellings to record ground motions and airblast. Data analyses for blast-induced and other motions were conducted to:

- compare vibration time histories in terms of velocity and calculated displacements within structures relative to ground excitations and air overpressures,
- evaluate response frequencies to determine natural frequencies and damping characteristics,
- determine structure response amplification of ground motions,
- compute differential displacements at corner motions to estimate global shear and in-plane tension wall strains,
- compute bending strains in walls, and
- compare crack movements subjected to blasting, variations in temperature and humidity and wind gusts.

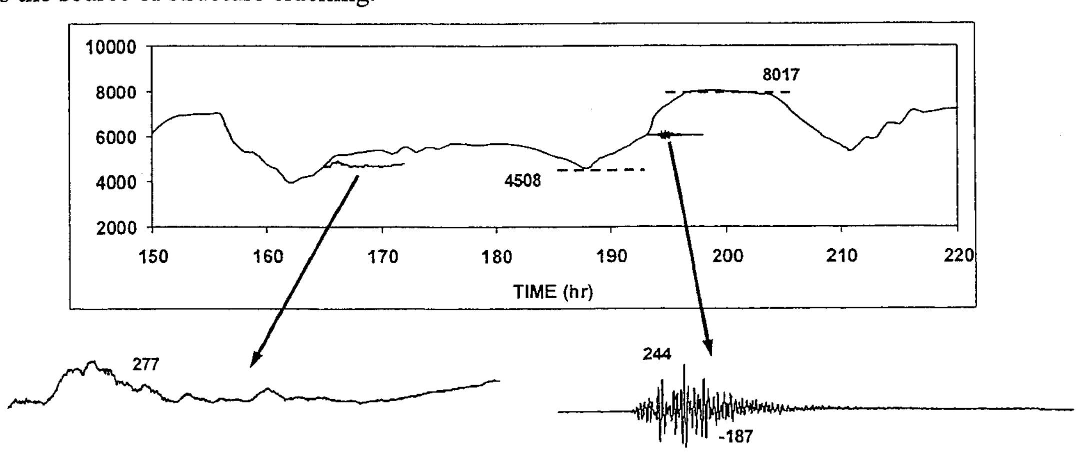
Blasting over the time period of this study did not provide sufficient energy in the ground and into the structures to compute structure damping, natural frequency, and amplification except in the case of the blast on 3/23/05 at 2:47 pm for the structure on Bighorn. The computed 9 Hz natural frequency and damping of 5.4% are within the typical range for residential structures. Structure amplifications of blast excitations were 1.23 and 1.2 for southwest and southeast wall motions and below the average of 2 for typical residential structures.

The blast on 3/23/05 generated maximum in-plane tensile and mid-wall bending strains of 27.8 and 9.4 micro-strains, respectively, in the southwest wall at the dwelling on Bighorn. For the dwelling on High Mesa, the maximum calculated in-plane tensile and mid-wall bending strains were 5.78 and 4.33 micro-strains, respectively, in the northeast wall during the blast on 4/13/05. These computed strains were far below the range of tensile failure strains in gypsum core of interior drywall (300 to 500 micro-strains) and modern stuccos, reinforced with polymeric fiber (exceeding 1,000 micro-strains). At low levels of blasting recorded throughout this study, the induced strains never exceeded the elastic limit of the wall materials and no permanent deformation could have occurred. Hence, cracking both in interior drywalls and exterior stucco is not caused by blasting activities at the excitation levels recorded during this project.

Peak blast-induced dynamic crack displacements ranged from 45.6 to 243.5 micro-inch and 42.6 to 113.6 micro-inch for the structures on Bighorn and High Mesa, respectively. The largest overall weather-induced changes in crack width over the project duration were 8212 and 5403 micro-inch for the structures at High Mesa and Bighorn, respectively.

Daily weather-induced changes in crack width over a 4-day period are compared below with dynamic crack motions for the most significant blast on 3/23/05 (right, for 0.45 in/sec peak ground motion) and high wind gusts (left, for 34 mph winds) for the structure on Bighorn. The maximum daily change of 3509 micro-inch exceeds the largest change in zero-to-peak crack width during blasting (244 micro-inch) while the wind gust zero-to-peak opening (277 micro-inch) was greater than that for the largest blast.

It is therefore concluded that large weather-induced changes in crack width is the greatest contributing factor to crack extension and widening over time. The influence of wind pressures against walls during a typical storm produced crack width changes greater than those produced by blasting when ground vibrations were near the 0.5 in/sec regulatory limit. Hence, the influence of blasting vibrations on crack width changes is negligible compared with the influence of climate and less than the influence of wind gusts. It is highly unlikely that blasting is the source of structure cracking.



Crack displacement during wind gust 3/23/05 at 2:15 am

Crack displacement during blast 3/23/05 at 2:47 pm

Conclusions drawn from this study are as follows:

- There is a 100% probability that blasting at the current regulatory limit does _not_ contribute to cracking in structures.
- Structure response data clearly demonstrated that large variations in ambient temperature and humidity produce wall strains up to 72 times greater than those created by blasting at the current regulatory limit of 0.5 in/sec peak ground velocity.
- Structures motions and wall strains produced by wind gusts on the order of 31 to 34 miles per hour were 10% greater than those produced from blasting at the current regulatory limit.
- Ground vibrations from construction activities near structures, ranging from 0.03 to 0.07 in/sec., and resulting wall strains were on the same order as those produced by blasting.
- Airblast or air-born pressures from blasting were negligible and the effects were not detected in structure response motions.

AUTHOR BIOGRAPHY

Dr. Aimone-Martin is President of Aimone-Martin Associates, LLC and a Professor Mining and Civil Engineering at New Mexico Institute of Mining and Technology. She has degrees in geological engineering (with emphasis in geophysics and mining), civil engineering, and mining engineering. Since 1971, she has worked in the mining and construction industries and with geotechnical consulting firms in both the U.S. and Canada, and with Sandia and Los Alamos National Laboratories as a research affiliate. Special projects with national laboratories have included research on electrohydraulic fracture, design of underground nuclear repositories, and solar-powered solution mining concepts for potash extraction. Dr. Aimone-Martin helped to fund for the development of the Center of Explosives Technology and Research at New Mexico Tech with a $5M grant and was Chair of the Mining, Geological, and Environmental Engineering Department for 9 years.

She currently serves as an advisor to Homeland Security and on several national committees and boards including the National Institute of Occupational Health under NIH and the New Mexico Mining Association Board of Directors. She has recently held important U.S. Presidential appointments to the Academy of Sciences of the National Research Council. Dr. Aimone-Martin served 13 years as a Director on the International Society of Explosives Engineering Board (ISEE) and continues to participate on Committees including Seismograph Standards Committee, Public Relations, and Education.

Dr. Aimone-Martin is an international invited speaker, author of over 90 publications, and has received over $ 500,000 in research grants while at New Mexico Tech.

Dr. Aimone-Martin's expertise is in the areas of explosives engineering, rock blasting, structure response to blasting, instrumentation for vibration control and structure response, geotechnical engineering, soil and rock mechanics, foundation design and analysis, risk assessments, regulatory compliance, and public relations. She serves as a consultant to construction, coal, quarrying, and hard rock mining companies in the areas of blast design, vibration monitoring and control, structure response, fragmentation, backbreak control, instrumentation, blasting impact plans, and public relations. Dr. Aimone-Martin has further worked for municipalities in the development of blasting standards and regulations to protect off-site structures and for federal agencies to validate federal safe blasting standards limiting vibration and airblast for general blasting applications throughout the U.S.