

Alison Barry
Assistant General Counsel
DCP Midstream
370 17th Street, Suite 2500
Denver, CO 80202
303-595-3331
303-605-1753 DIRECT
303-605-2226 FAX

February 20, 2007

VIA OVERNIGHT MAIL

Mr. David Dillon
Colorado Oil and Gas Commission
1120 Lincoln Street, Suite 801
Denver, CO 80203

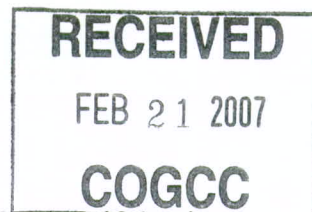
Dear Mr. Dillon

As we discussed several weeks ago, I am sending you a copy of the recent noise study of the Marilyn Compressor Station conducted for DCP Midstream by D.L. Adams & Associates, as well as copies of site maps. I apologize for the delay in sending this material, but I wanted to send a final copy of the noise study rather than the draft version I had at the time of our conversation. After you have had an opportunity to review the study and the site plans, I propose that we meet to discuss the appropriate resolution of the complaint received by the COGCC regarding noise from the Marilyn facility.

I am also enclosing a copy of the development standards recently adopted by the Weld County Commissioners for another DCP facility, the Marla Compressor Station, which includes the County's noise standard determination for these facilities. The same language has been proposed by the Planning Commission as part of the Marilyn development standards. As you are aware, the COGCC's noise control regulations, at section 802.b, allow the COGCC to take into account the local government's land use designations in determining the appropriate noise standards for a particular location. Weld County has designated the Industrial Zone District noise standards at CRS 25-12-103 as appropriate for the Marla and Marilyn compressor stations, among other similar natural gas facilities operated by DCP and other gas processors. The noise levels associated with the Marilyn Compressor Station are well below the Industrial Zone District noise standards, as shown by the results of the D.L. Adams study.

Please note that DCP is reviewing the feasibility of additional noise mitigation at the Marilyn facility, despite the facility's compliance with the industrial standards, in order to accommodate local residents' concerns. Although no specific plan has yet been developed, DCP is considering several options, and will be happy to discuss the status of this evaluation when we meet.

Mr. Dillon
February 20, 2007
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I suggest we schedule a meeting for early in the week of March 5, if that is convenient for you. Please let me know if you would be available then, or if you have any questions regarding this matter.

Sincerely yours,

A handwritten signature in blue ink, appearing to read "Alison E. Barry".

Alison E. Barry

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Enclosures

RESOLUTION

RE: APPROVE SITE SPECIFIC DEVELOPMENT PLAN AND AMENDED USE BY SPECIAL REVIEW PERMIT #991 FOR A MINERAL RESOURCE DEVELOPMENT FACILITY INCLUDING AN OIL AND GAS PROCESSING FACILITY IN THE A (AGRICULTURAL) ZONE DISTRICT - DUKE ENERGY FIELD SERVICES

WHEREAS, the Board of County Commissioners of Weld County, Colorado, pursuant to Colorado statute and the Weld County Home Rule Charter, is vested with the authority of administering the affairs of Weld County, Colorado, and

WHEREAS, the Board of County Commissioners held a public hearing on the 27th day of October, 2004, at the hour of 10:00 a.m. in the Chambers of the Board for the purpose of hearing the application of Duke Energy Field Services, 1324 North 7th Avenue, Greeley, Colorado 80631, for a Site Specific Development Plan and Amended Use by Special Review Permit #991 for a Mineral Resource Development Facility including an Oil and Gas Processing Facility in the A (Agricultural) Zone District on the following described real estate, to-wit:

SE1/4 SE1/4 of Section 28, Township 4 North, Range
64 West of the 6th P.M., Weld County, Colorado

WHEREAS, at said hearing, at the request of the applicant, the Board deemed it advisable to continue the matter to November 17, 2004, to allow the applicants time to evaluate methods to mitigate operational noise to surrounding property owners, and

WHEREAS, at said hearing on November 17, 2004, said applicant was represented by Tim Clancy, Witwer, Oldenburg, Barry and Johnson, LLP, 822 7th Street, Suite 760, Greeley, Colorado 80631, and

WHEREAS, Section 23-2-230 of the Weld County Code provides standards for review of said Use by Special Review Permit, and

WHEREAS, the Board of County Commissioners heard all of the testimony and statements of those present, studied the request of the applicant and the recommendations of the Weld County Planning Commission and all of the exhibits and evidence presented in this matter and, having been fully informed, finds that this request shall be approved for the following reasons:

1. The submitted materials are in compliance with the application requirements of Section 23-2-260 of the Weld County Code.
2. It is the opinion of the Board of County Commissioners that the applicant has shown compliance with Section 23-2-230.B of the Weld County Code as follows:
 - a. Section 23-2-230.B.1 -- The proposed use is consistent with Chapter 22 and any other applicable Code provisions or ordinance in effect. Section 22-5-100.A (OG.Goal 1) states, "Oil and gas exploration and production should occur in a manner which minimizes the impact to agricultural uses and the environment, and reduces the conflicts between

2004-2976
PL0890

10: PL, PW, HLC(EP) APPL, REP

10-09-04

AMENDED SPECIAL REVIEW PERMIT #991 - DUKE ENERGY FIELD SERVICES
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mineral development and current and future surface uses." Further, Section 22-5-100.B (OG.Goal.2) states, "The extraction of oil and gas resources should conserve the land and minimize the impact on surrounding land." The request for a Site Specific Development Plan and Use by Special Review Permit for a Mineral Resource Development Facility, including an Oil and Gas Processing Facility, in the A (Agricultural) Zone District is an amendment to an existing permitted facility. The original Use by Special Review Permit was applied for by Associated Natural Gas, Inc., in 1992. The application was for three compressors with no expansion delineated. This application addresses the current on-site conditions, and serves as a baseline for future improvements to the site. Further, the amendment was required by the Department of Planning Services due to a change in ownership of the facility.

- b. Section 23-2-230.B.2 -- The proposed use is consistent with the intent of the A (Agricultural) Zone District. Section 23-3-40.A.2 of the Weld County Code provides for an Oil and Gas Support and Service as a Use by Special Review in the A (Agricultural) Zone District.
- c. Section 23-2-230.B.3 -- The uses which will be permitted will be compatible with the existing surrounding land uses. The property is surrounded by agricultural lands in crop production and related uses. There is a single family dwelling approximately 1/4 mile to the west, with prairie grassland in all other directions.
- d. Section 23-2-230.B.4 -- The uses which will be permitted will be compatible with future development of the surrounding area as permitted by the existing zoning and with the future development as projected by Chapter 22 of the Weld County Code and any other applicable code provisions or ordinances in effect, or the adopted Master Plans of affected municipalities. The site does not lie within the three-mile referral area of any municipality.
- e. Section 23-2-230.B.5 -- The application complies with Section 23-5 of the Weld County Code. The existing site is not within a recognized overlay district, including the Geologic Hazard, Flood Hazard, or Airport Overlay District. The existing site is within the County-Wide Road Impact Fee Area. Effective January 1, 2003, Building Permits issued on the lot will be required to adhere to the fee structure of Area 4.
- f. Section 23-2-230.B.6 -- The applicant has demonstrated a diligent effort to conserve agricultural land in the locational decision for the proposed use. This facility was acquired by the Duke Energy Field Services Division in 1995. Previous to this acquisition the facility was permitted and operated by Amoco Oil Corporation.

AMENDED SPECIAL REVIEW PERMIT #991 - DUKE ENERGY FIELD SERVICES
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- g. Section 23-2-230.B.7 -- The Design Standards (Section 23-2-240, Weld County Code), Operation Standards (Section 23-2-250, Weld County Code), Conditions of Approval, and Development Standards ensure that there are adequate provisions for the protection of the health, safety, and welfare of the inhabitants of the neighborhood and County.

NOW, THEREFORE, BE IT RESOLVED by the Board of County Commissioners of Weld County, Colorado, that the application of Duke Energy Field Services for a Site Specific Development Plan and Amended Use by Special Review Permit #991 for a Mineral Resource Development Facility including an Oil and Gas Processing Facility in the A (Agricultural) Zone District on the parcel of land described above be, and hereby is, granted subject to the following conditions:

1. Prior to recording the plat:
 - A. The plat shall be prepared in accordance with Section 23-2-260.D of the Weld County Code.
 - B. The plat shall be labeled AmUSR-991.
 - C. The plat shall be amended to delineate the following:
 - 1) The attached Development Standards.
 - 2) The approved Screening Plan, to address the outdoor storage of materials, including the fifty-five (55) gallon barrels associated with this facility, shall be screened from adjacent properties, including the public rights-of-way.
 - 3) The existing points of ingress and egress. All other accesses shall be labeled as emergency accesses.
 - D. The applicant shall submit an Air Pollution Emission Notice (A.P.E.N.) and Emissions Permit application to the Air Pollution Control Division, Colorado Department of Health and Environment for emissions of criteria, hazardous or odorous air pollutants. Evidence of such shall be submitted in writing to the Weld County Department of Planning Services.
 - E. The applicant shall submit a Dust Abatement Plan to the Environmental Health Services Division of the Weld County Department of Public Health and Environment, for approval prior to operation. Evidence of such shall be submitted in writing to the Weld County Department of Planning Services.
 - F. The applicant shall submit a Waste Handling Plan, for approval, to the Environmental Health Services Division of the Weld County Department of Public Health and Environment. The plan shall include at a minimum, the following:

AMENDED SPECIAL REVIEW PERMIT #991 - DUKE ENERGY FIELD SERVICES
PAGE 4

- 1) A list of wastes which are expected to be generated on site (this should include expected volumes and types of waste generated).
 - 2) A list of the type and volume of chemicals expected to be stored on site.
 - 3) The waste handler and facility where the waste will be disposed (including the facility name, address, and phone number). Evidence of such shall be submitted in writing to the Weld County Department of Planning Services.
- G. A portable, adequate sewage disposal system and hand washing system shall be provided for sanitary purposes. Written evidence of compliance shall be submitted to the Department of Planning Services from the Environmental Health Services Division.
- H. An adequate water supply shall be provided for drinking and sanitary purposes. Written evidence of compliance shall be submitted to the Department of Planning Services from the Environmental Health Services Division.
- I. The applicant shall provide evidence of approval by the Department of Public Works concerning the on-site access, circulation, and stormwater drainage as addressed in the memorandum dated January 27, 2003. Evidence of approval by the Department of Public Works shall be submitted in writing to the Weld County Department of Planning Services.
- J. Permits will be required for the installation of all new equipment and all electrical work, but not for the replacement of equipment on existing foundations, including the piping and electrical connections to that equipment, nor for the addition of minor equipment such as filters and coolers; however electrical permits are required for any new electrical circuits provided to added equipment. Permits are not required for process piping for liquids or gas. Evidence of compliance with all of the requirements of the Department of Building Inspection shall be submitted in writing to the Weld County Department of Planning Services.
- K. The applicant shall provide evidence of compliance with the Department of Code Compliance, Zoning Division and Building Inspection Division. Evidence of such shall be submitted in writing to the Weld County Department of Planning Services.
- L. The applicant shall provide evidence of compliance with the setbacks of all structures specific to the future rights-of-way for Weld County Roads 40 and 55. Evidence of such shall be submitted in writing to the Weld County Departments of Public Works and Planning Services.

AMENDED SPECIAL REVIEW PERMIT #991 - DUKE ENERGY FIELD SERVICES
PAGE 5

- M. The applicant shall enter into an Improvements Agreement for all On-site Improvements to the AmUSR-991 Marla Site.
 - N. The applicant shall submit two (2) paper copies of the plat for preliminary approval to the Weld County Department of Planning Services.
- 2. Upon completion of Condition of Approval #1 above, the applicant shall submit a Mylar plat, along with all other documentation required as Conditions of Approval. The Mylar plat shall be recorded in the office of the Weld County Clerk and Recorder by the Department of Planning Services. The plat shall be prepared in accordance with the requirements of Section 23-2-260.D of the Weld County Code. The Mylar plat and additional requirements shall be submitted within thirty (30) days from the date of the Board of County Commissioners Resolution. The applicant shall be responsible for paying the recording fee.
 - 3. The Department of Planning Services respectfully requests the surveyor provide a digital copy of this Use by Special Review. Acceptable CAD formats are .dwg, .dxf, and .dgn (Microstation); acceptable GIS formats are ArcView shapefiles, ArcInfo Coverages and ArcInfo Export files format type is .e00. The preferred format for Images is .tif (Group 4). (Group 6 is not acceptable). This digital file may be sent to maps@co.weld.co.us.
 - 4. Prior to Operation:
 - A. The applicant shall contact the office of the Weld County Sheriff to schedule a walk-through of the site for the purposes of implementing the Crime Prevention through Environmental Design Program. This program reduces the likelihood of criminal activity at a specific location by "hardening" it to crime. Evidence of such shall be submitted in writing to the Weld County Department of Planning Services.
 - 5. The Amended Use by Special Review activity shall not occur, nor shall any Building or Electrical Permits be issued on the property, until the Amended Use by Special Review plat is ready to be recorded in the office of the Weld County Clerk and Recorder.

AMENDED SPECIAL REVIEW PERMIT #991 - DUKE ENERGY FIELD SERVICES
PAGE 6

The above and foregoing Resolution was, on motion duly made and seconded, adopted by the following vote on the 17th day of November, A.D., 2004.

BOARD OF COUNTY COMMISSIONERS
WELD COUNTY, COLORADO

Robert D. Masden
Robert D. Masden, Chair

William H. Jerke
William H. Jerke, Pro-Tem

M. J. Geile
M. J. Geile


David E. Long
David E. Long

Glenn Vaad
Glenn Vaad

ATTEST: Ronald D. Masden
Weld County Clerk to the Board
BY: Deputy Clerk
Deputy Clerk to the Board
APPROVED AS TO FORM: [Signature]
County Attorney

Date of signature: 12-9-04

**SITE SPECIFIC DEVELOPMENT PLAN
AMENDED USE BY SPECIAL REVIEW PERMIT
DEVELOPMENT STANDARDS
DUKE ENERGY FIELD SERVICES
AMUSR #991**

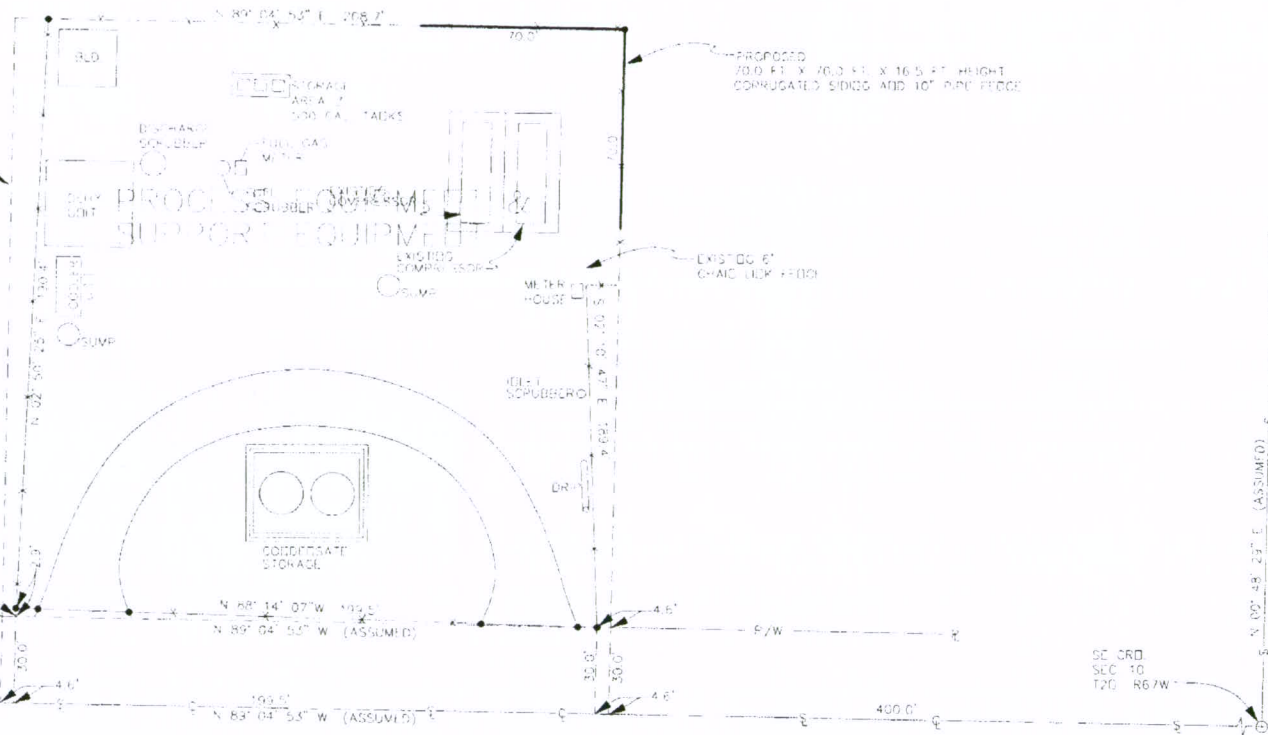
1. The Site Specific Development Plan and Amended Use by Special Review Permit #991 is for a Mineral Resource Development Facility, including an Oil and Gas Processing Facility, in the A (Agricultural) Zone District, as indicated in the application materials on file and subject to the Development Standards stated hereon.
2. Approval of this plan may create a vested property right pursuant to Section 23-8-10 of the Weld County Code.
3. All liquid and solid wastes, as defined in the Solid Wastes Disposal Sites and Facilities Act, Section 30-20-100.5, C.R.S., shall be stored and removed for final disposal in a manner that protects against surface and groundwater contamination.
4. No permanent disposal of wastes shall be permitted at this site. This is not meant to include those wastes specifically excluded from the definition of a "solid waste" in the Solid Wastes Disposal Sites and Facilities Act, Section 30-20-100.5, C.R.S.
5. Waste materials shall be handled, stored, and disposed in a manner that controls fugitive dust, blowing debris, and other potential nuisance conditions.
6. Fugitive dust shall be controlled on this site. The facility shall be operated in accordance with the approved Dust Abatement Plan at all times.
-  7. The facility shall adhere to the maximum permissible noise levels allowed in the Industrial Zone District as delineated in Section 25-12-103, C.R.S.
8. All potentially hazardous chemicals must be stored and handled in a safe manner in accordance with product labeling.
9. The applicant shall operate in accordance with the approved Waste Handling Plan.
10. Adequate hand washing and toilet facilities shall be provided for employees of the facility.
11. Effective January 1, 2003, Building Permits issued on the lot will be required to adhere to the fee structure of the County-Wide Road Impact Fee Program, Area 4.
12. The property owner or operator shall be responsible for complying with the Design Standards of Section 23-2-240, Weld County Code.
13. The property owner or operator shall be responsible for complying with the Operation Standards of Section 23-2-250, Weld County Code.
14. Personnel from Weld County Government shall be granted access onto the property at any reasonable time in order to ensure the activities carried out on the property comply with the Development Standards stated herein and all applicable Weld County regulations.

DEVELOPMENT STANDARDS - DUKE ENERGY FIELD SERVICES (AMUSR #991)
PAGE 2

15. The Amended Use by Special Review area shall be limited to the plans shown hereon and governed by the foregoing standards and all applicable Weld County regulations. Substantial changes from the plans or Development Standards as shown or stated shall require the approval of an amendment of the Permit by the Weld County Board of County Commissioners before such changes from the plans or Development Standards are permitted. Any other changes shall be filed in the office of the Department of Planning Services.
16. The property owner or operator shall be responsible for complying with all of the foregoing Development Standards. Noncompliance with any of the foregoing Development Standards may be reason for revocation of the Permit by the Board of County Commissioners.



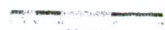
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208.17' X 208.17'



A New Kind of Energy™

SCALE: 1"=40'	REVISED BY: <u>BERNIE</u>	DRAWN BY: <u>BERNIE</u>
DATE: 4/7/92	DATE REVISED: 08/05/2002	BOOK: <u>De.</u>
MARILYN COMPRESSOR SITE		
MARILYN	DISK #85, MARILYN	
WELD COUNTY PROJECT		

EXHIBIT A
SEE R/W SEC. 10



Adaptive Frequency Control
Control System Co.

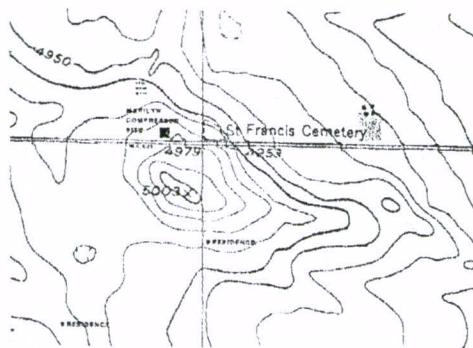
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- **DRUGS: CONTRA**
- **SERIAL CONTRA**
- **ARTIST CONTRA**

DEPT. OF ENV. & NAT. RES.



PLASIN MAD



Tim Claneey
SE1/4SE1/4 10-2-87



-  Highways
-  Major Roads
-  Local Roads
-  Railroads
-  Hydrography
-  Soil Survey Types
- Lakes
-  Mountains & Ranges
-  Place Names

[illegible]

NOTES

- [illegible]

Adverse Property Owners
Singer Farms Co.

LEGAL DESCRIPTION

Tomlinson, J. David, Manager, 87 West, Oak Park
Section 10, 58/4 8/14
Wild Canyon, Colorado

PLANNING COMMISSION CERTIFICATION

This is to certify that the Weld County Planning Commission has certified and does hereby recommend to the board of Commissioners, Weld County, Colorado, for the application approval and adoption of this plan to Special Use Development. File and give to Special Review as shown and described therein.
This _____ day of _____, 20____

BOARD OF COUNTY COMMISSIONERS CERTIFICATION

This is to certify that the Board of County Commissioners, Weld County, Colorado, does hereby confirm and adopt the Site Specific Development Plan and use by Special Review and Development Standards as shown and described herein this 22nd day of November 2000.

Chair, House of County Commissioners

ATTEST:
Weld County Clerk to the Board
By _____
Deputy Clerk to the Board

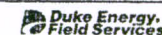
Coldest _____

PROPERTY OWNERS CERTIFICATE

The undersigned major property owner(s), do hereby agree to the Site Specific Development Plan and Use by Special Review and Development Standards as shown and described herein this ____ day of _____, 20__.

Signature _____

Signature _____



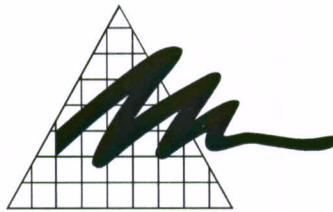
A New Kind of Energy

DATE AS NOTED REMOVED BY	JANUARY	DRAWN BY	BOENKE
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DATE: 1/7/92	TIME: 10:28 AM	ISSN: 112
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MARILYN USR DRAWING

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D. L. ADAMS ASSOCIATES, INC.

▲ Consultants in Acoustics and Performing Arts Technologies ▲

Marilyn Compressor Station

Acoustical Report

DLAA #7699

January 31, 2007

Prepared for:

Ms. Alison E. Barry
Duke Energy Field Services
370 17th Street, Ste. 2500
Denver, CO 80202

Prepared by:

D.L. Adams Associates, Inc.
1701 Boulder St.
Denver, CO 80211

Signed: Jeff Kwoikoski, P.E., INCE Bd. Cert.
Associate Principal

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Appendix A: Acoustical Terminology and Definitions

Appendix B: Weather Data

Appendix C: Sound Level Plots from The Thuener Residence

Appendix D: Product Literature

1. Introduction

At your request, we have completed an assessment of noise from the Marilyn Compressor Station in Weld County, Colorado. The station is located on Weld County Road 22 approximately one mile east of the intersection of Weld County Roads 19 and 22. As part of our assessment, we measured the sound around the compressor station site at distances of 25' and 350', and we measured background sound levels (with the compressor station shut down) at several locations. We also measured sound levels at the Thuener residence over a period of approximately five days to investigate complaints of excessive noise.

At your request, we have identified potential noise mitigation measures that may be considered to reduce the sound levels.

For your reference, a glossary of acoustical terminology is attached as Appendix A.

2. Measurement Procedures & Test Equipment

Sound levels were measured at distances of 25' and 350' from the perimeter fence on Friday, November 3, 2006, with the compressor station operational. Background sound levels were measured with the compressor station shut down.

A sound level meter was set up and left unattended from November 3 to November 8, 2006, in the backyard of the Thuener residence, which is approximately 0.6 miles southeast of Marilyn Compressor Station. A short-term measurement was also made at the Thueners' on November 3, 2006.

a. Short-Term Measurements

These measurements were taken with a handheld Larson-Davis Model 2900 (S/N 0518) Type 1 sound level meter, using a Brüel & Kjær Type 4165 (S/N 875052) microphone. They included one-third octave-band sound levels, and were for durations of approximately 30 seconds to 5 minutes, as was deemed necessary to acquire a representative sample. Measurements close to the compressor station may be shorter since the noise is steady. Measurements further from the station, or with the station off, must be longer since the sound levels vary more due to traffic, aircraft, and other sound sources in the area.

Calibration was checked before and after each series of measurements with a Larson-Davis CA250 (S/N 0118) Precision Acoustic Calibrator.

Marilyn Compressor Station

DLAA #7699
January 31, 2007

During the short-term measurements, the meter was either handheld or placed on a tripod with the microphone approximately 4' above the ground. Subjective observations of ambient sound sources and weather conditions were also recorded at the time of the measurements.

b. Long-term Unattended Measurements at the Thueners' Residence

Fifteen-minute duration A-weighted sound levels were continuously measured (unattended) using the following equipment:

Larson Davis Model 820 (S/N 0768) sound level meter
Larson Davis Model 2560 (S/N 2298) microphone
Larson Davis Model 828 (S/N 1863) pre-amplifier

The Larson Davis Model 820 sound level meter meets the American National Standard Institute (ANSI) requirements for Type 1 sound level meters. Calibration of the meter was checked before and after the measurements with a Larson-Davis CAL200 Acoustic Calibrator (S/N 2436). During the measurements, the meter was secured in a weatherproof case with the microphone mounted on a tripod.

Data was recorded from approximately 11:00 a.m. on Friday, November 3, 2006 until 2:30 p.m. on Wednesday, November 8, 2006. The meter was placed in the backyard of the Thuener residence. A Lowrance iFINDER Go WAAS GPS receiver was used to record the latitude and longitude of the measurement location. It is accurate to ± 21 feet. The coordinates of the measurement location are:

N 40° 08.164'
W104° 51.883'

c. Additional Information

All sound level meters were set for "slow" response, and a windscreen covered the microphones during all measurements. The calibration of all sound level meters and calibrators has been checked by the manufacturer within the manufacturer's recommended time period.

3. Weather Conditions

Observations of weather conditions were manually recorded during each visit to the site. In addition, a weather station was set up at the Thueners' and ran simultaneously with the sound level meter. The weather station is a Davis Weather Wizard III Model 7425 weather station that measured and logged temperature, wind speed, and wind direction in 15 minute intervals. That is, for each 15 minute interval, it recorded the average, high, and low parameters for that time period. The weather station time was synchronized with the Larson Davis 820 sound level meter.

The weather station data is attached in Appendix B.

On November 3 at 10:40 a.m., there was no wind, it was overcast, and the temperature was 48°F. At 11:20 a.m., it was partly cloudy and there was a slight wind from the east. During the measurements around the Marilyn site fence, the wind varied from 0 to 5 mph, and from the northeast to the northwest. On November 8, it was sunny with clear skies and winds from the west and northwest.

During periods of high winds (≥ 8 mph), the sound level measurements are suspect because the wind can generate noise across the microphone. Ambient sound levels are also higher due to the rustling of leaves, grass, etc.

There were periods of high winds on the afternoon of Tuesday, November 7, and Wednesday, November 8. Periods where the average wind speed exceeded 8 mph are highlighted in the report of weather data in Appendix B.

Data at the beginning and end of Appendix B that are stricken in red are invalid as the weather station collected data before and after the meter was properly set up and operating.

4. Sound Levels around the Perimeter of the Marilyn Site

Refer to Figure 1 for the background sound levels measured when the compressor station was shut down for a short period. Four locations were selected as representative of the area. Figure 1 shows the L_{eq} and L_{90} sound levels.

The L_{eq} is essentially the average sound level. The L_{90} is the 90% Exceedence Level, or the sound pressure level that was exceeded 90% of the time during the measurement period. For example, the hourly L_{90} is the sound level that is exceeded 90% (54 minutes) of each measured hour. The L_{90} is an industry standard parameter commonly used to represent the level of ambient sound without the effect of occasional short duration events such as cars passing nearby,

Marilyn Compressor Station

DLAA #7699
January 31, 2007

aircraft flyovers, dogs barking, etc. Please refer to Appendix A for additional definitions of terminology.

When the L_{eq} and L_{90} sound levels are steady, that shows that there is not much fluctuation in the sound level. If the sound levels fluctuate, there is more difference between the two values.

Refer to Figure 2 for the sound levels measured 350' from the perimeter fence with the compressor station operating. The measured sound levels ranged from 48 dBA to 59 dBA.

Refer to Figure 3 for the sound levels measured 25' from the perimeter fence. The measured sound levels ranged from 58 dBA to 77 dBA.

5. Ambient Sound Levels at the Thuener Residence - Observations

Ambient sound levels were measured at the Thuener residence. Please refer to Figure 4 for the location of the Thuener residence to the Marilyn site. Ambient sound is sound from all sources that affect the area. The significance of these sources may vary from day to night, and from summer to winter. We have summarized our observations of the predominant sources of ambient sound as follows:

Primary Sound Sources

- Vehicular traffic on Weld County Road 19
- Nearby aircraft flyovers
- Grass and leaves rustling in the wind

Secondary Sound Sources

- Distant train whistle
- Distant aircraft flyover
- Vehicular traffic on secondary roads
- Dogs barking
- Normal activity around the property (including tractors, horses, etc.)
- Condensing unit or heat pump behind the Thueners' house (I measured 40 dBA at the meter when on, 36 dBA when off)

Mr. Thuener has complained of excessive noise from the compressor station. On Friday, November 3, I was not able to hear noise from the compressor station. The compressor was shut down while I was at the Thueners, and I was not able to hear the difference when it went off.

On Wednesday, November 8, the compressor station was running and I was initially not able to

Marilyn Compressor Station

DLAA #7699
January 31, 2007

hear it. While I was in the Thueners backyard, the sound of the compressor station became audible for short periods at a time. This was at approximately 2:15 p.m. The wind was from the west at this time. The sound lasted from as little as several seconds to as much as 10 to 15 seconds, and was most audible during lulls in the wind and traffic on Weld County Road 19. I describe the sound as a mid to high frequency "whine". While clearly audible, the compressor sound was still relatively faint compared to the ambient sounds. It was not loud enough to significantly change the A-weighted sound level. I attempted to measure the compressor sound in one-third octave bands. The sound appeared to be at a frequency of approximately 1,200 Hertz and/or 2,000 Hertz, but I was unable to determine this conclusively. Mr. Thuener was present during my observations and indicated that the sound we heard was typical of what he hears often. He stated that the sound appears to be the worst from 7 a.m. to 8 a.m. and from 6 p.m. to 7 p.m. on most days.

I have plotted the sound levels measured at the Thueners' residence on a series of charts that are attached in Appendix C. There is no clear increase of sound levels during the 7 a.m. to 8 a.m. and 6 p.m. to 7 p.m. time periods. From my observations on two separate days, the fluctuation of sound levels is much more likely to be from the wind and traffic on Weld County Road 19.

6. Sound Levels near the Gardner Residence - Observations

Short-term sound levels were measured near the Gardner residence, approximately 0.3 miles northeast of the Marilyn site. Please refer to Figure 4 to see the measurement location. I understand that the Gardners have also complained of noise from the site.

With the compressor station shut down, the L_{eq} and L_{90} sound levels were 42 dBA and 38 dBA, respectively. With the compressor station operating, the L_{eq} and L_{90} sound levels were 39 dBA and 36 dBA, respectively.

The compressor station was faintly audible as it started up and ran normally, but sound from the station did not significantly affect the overall sound levels that were measured. In fact, the sound levels dropped slightly with the station running which is due to normal fluctuations in noise from traffic on Weld County Road 19 and heavy equipment operating to the west.

7. Sound Levels near the Jones Residence - Observations

Short-term sound levels were measured between the nearest homes to the site, on the southeast side. Please refer to Figures 2 and 4 for the measurement location. I understand that the Jones residence is the southernmost of these two homes, and that they have complained of noise from the site.

With the compressor station operating, the L_{eq} sound level was 53 dBA.

For your reference, Figure 8 shows decibel levels of common sound sources.

8. Potential Mitigation Measures

We have evaluated potential ways to mitigate noise from the compressor station. In particular, to the south where the higher sound levels were measured.

This report is not intended to provide detailed recommendations, drawings, specifications, etc., for noise mitigation. The intent is to provide concepts for noise reduction that must be evaluated further for cost and feasibility before they are implemented.

There is an existing barrier wall on the north and east sides of the compressor. From the southeast end of the wall, it could be extended to the west, through the site, to block the line of sight between the compressor/engine and the properties to the south. Please refer to Figures 5 and 6 for conceptual sketches of where this wall could be located. The wall should have a sound absorbing face on the inside (similar to the existing wall). If the wall is the same height as the existing wall, it should reduce sound levels below 50 dBA at locations 350' south of the fence. Making the wall higher would improve the wall's performance slightly, but the biggest improvement is gained by blocking the line of sight between the sound source (engine/compressor) and the receiver. If the wall is moved further away from the source (south on the site), then it may be necessary to make the wall higher to maintain the same performance. A wall in this location would also reduce sound levels transmitted to the east. Hangar doors in the wall could be used for maintenance access, or the wall could be constructed so that some panels could be removed when necessary.

In conjunction with the new wall, we recommend wrapping the separator tank and inlet and discharge piping with an acoustical barrier material (unless the separator and piping is inside the new barrier wall. The wrapping material consists of fiberglass batt insulation on the inside, a 1 psf or 2 psf vinyl or sheet metal barrier, and a weather resistant covering, such as Shannon Enterprises Insultech.

Marilyn Compressor Station

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As an alternative to the new barrier wall, you could consider enclosing the compressor and engine. The extent of a possible enclosure is shown in Figure 7. While a smaller enclosure would work acoustically, we understand that the enclosure would most likely have to be a building that houses the equipment in order to be feasible.

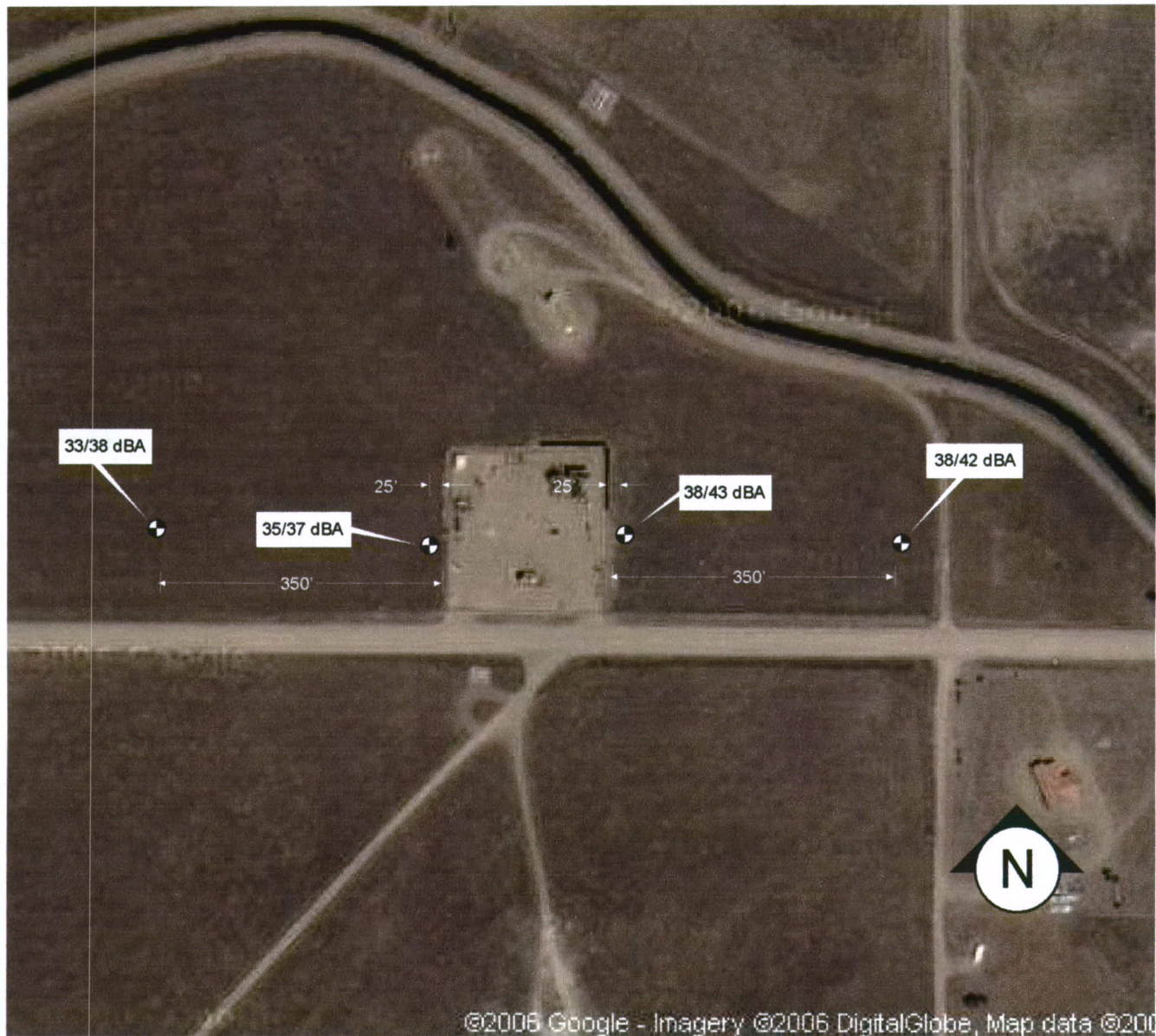
9. Conclusions

Sound levels around the perimeter of the Marilyn Compressor Station site were measured and evaluated. The sound levels to the south were the highest measured at a distance of 350' from the site fence. The sound level on the east side of the site was the highest measured 25' from the site fence.

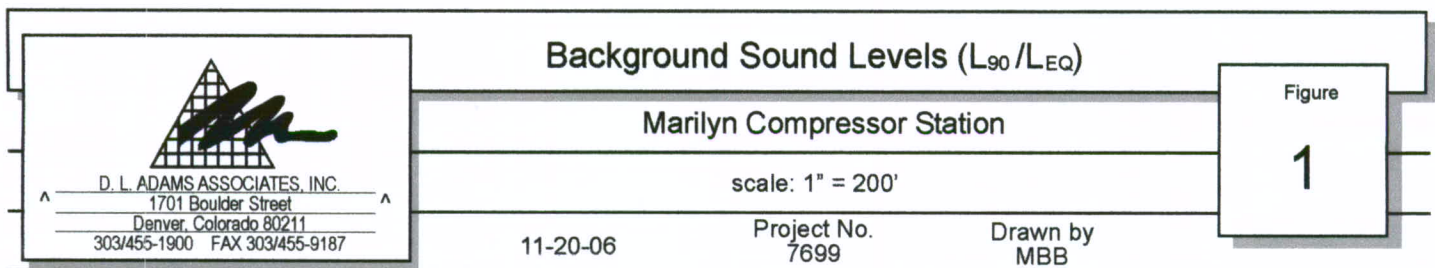
Sound levels from the compressor station were also measured and evaluated near the homes of two residents who have complained about noise. In both cases, sound from the compressor station was audible at the homes, but was not loud enough, in comparison to traffic noise and other ambient sources, to change the overall A-weighted sound level. The homes are approximately 0.3 and 0.6 miles from the Marilyn site. It should be noted that at these distances, sound levels can vary widely due to wind and other atmospheric conditions. In particular, temperature inversions and lapses can have a very significant effect on sound transmission.

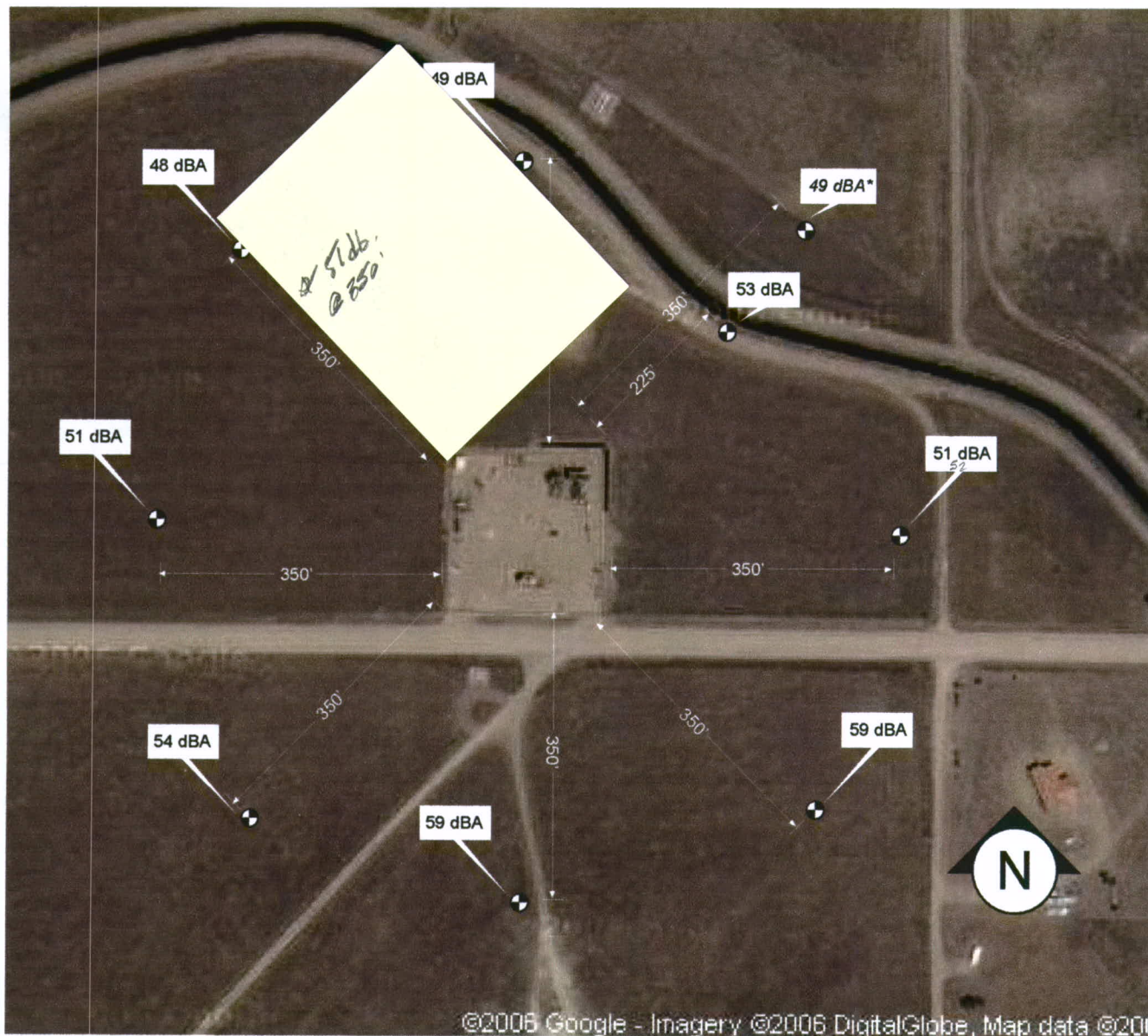
Mr. Thuener stated that he believes that the compressor station is shut down for days at a time when it is quiet, but Duke Energy has indicated that the station runs 24/7. The perception that the station is shut down could be explained by the variation in sound levels due to the atmospheric conditions. It is quite possible that the compressor sound is faint or not audible for days, and then it becomes clearly audible for a period of time. In any case, from my observations and measurements, it is clear the sound levels at the Thuener residence are well below the sound levels found in the immediate vicinity of the site (within 350'). However, even sounds at relatively low levels can be disturbing.

As requested, we have provided options to reduce sound radiated by the compressor station. We can work with you to develop these concepts in more detail if you wish, and we can evaluate any other ideas for mitigation that you may have.

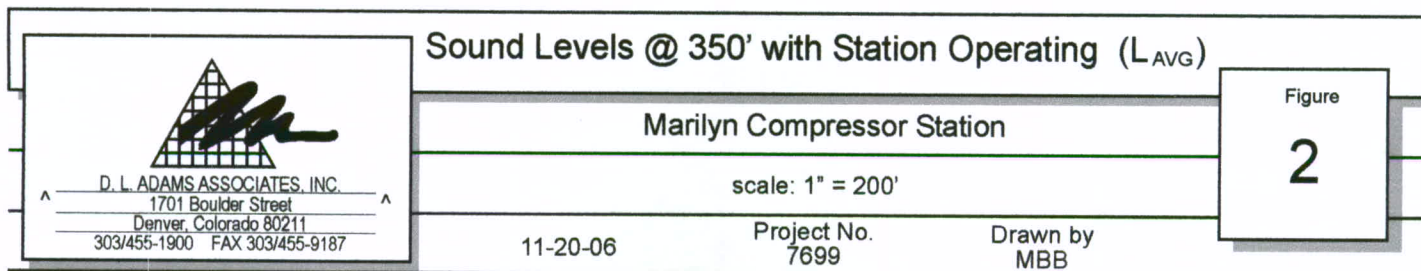


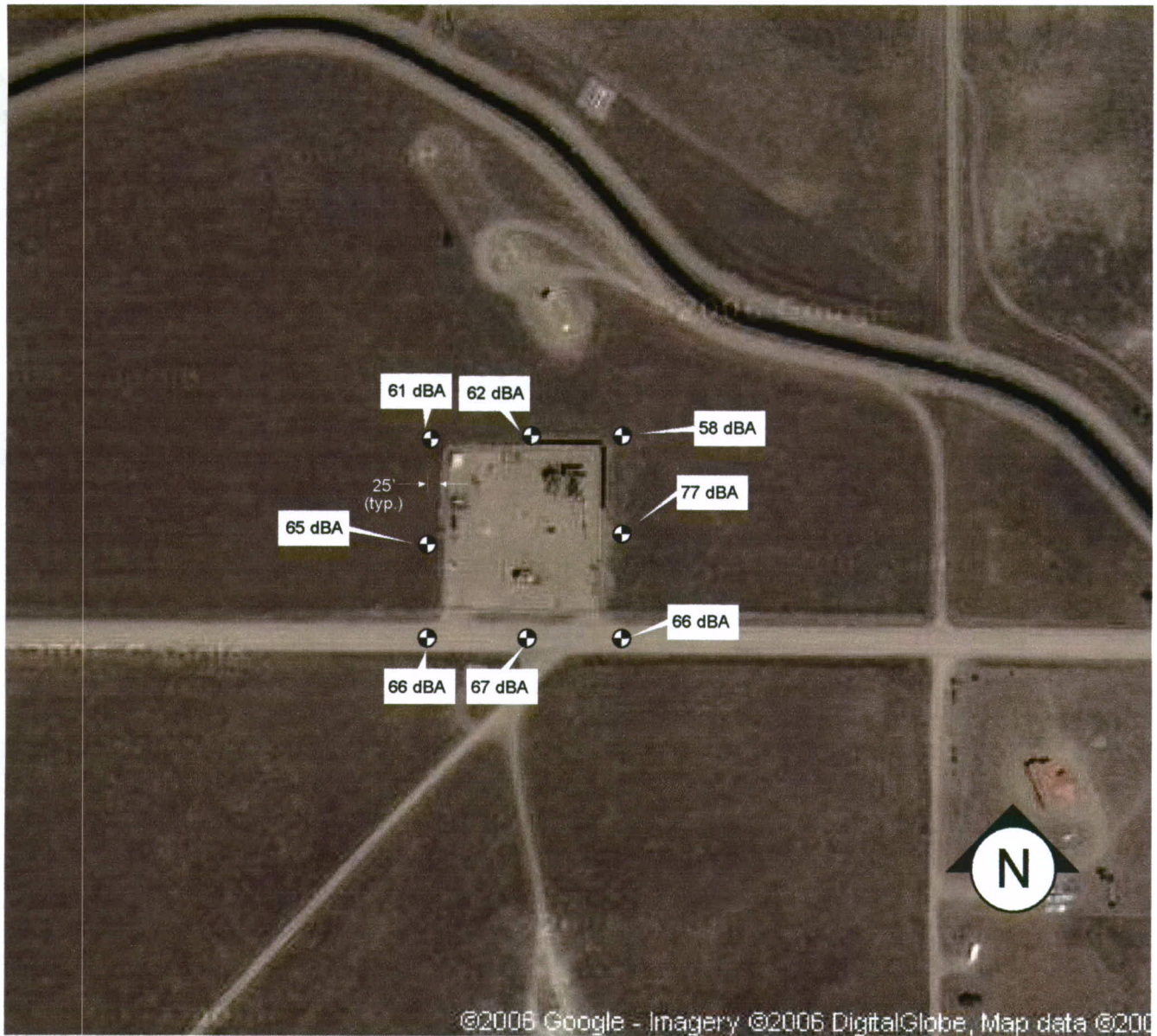
Note: All dimensions are from perimeter fence to measurement location





* Extrapolated from 225' measurement





Sound Levels @ 25' with Station Operating (L_{AVG})

Marilyn Compressor Station

scale: 1" = 200'

11-20-06

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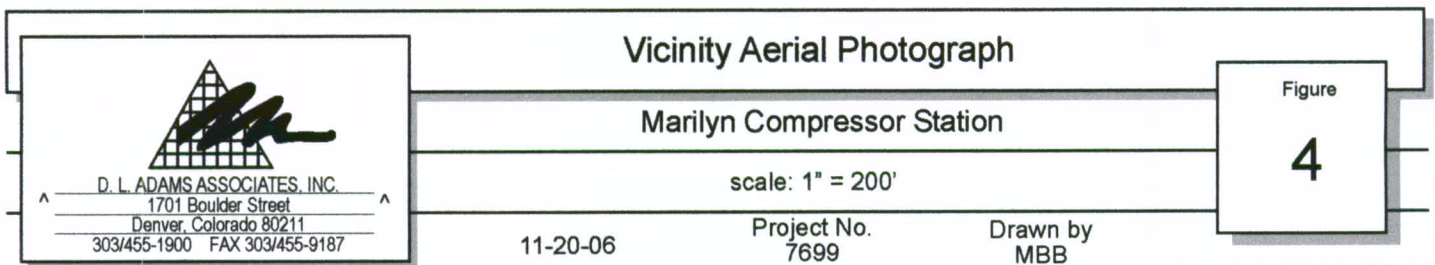
Drawn by
MBB

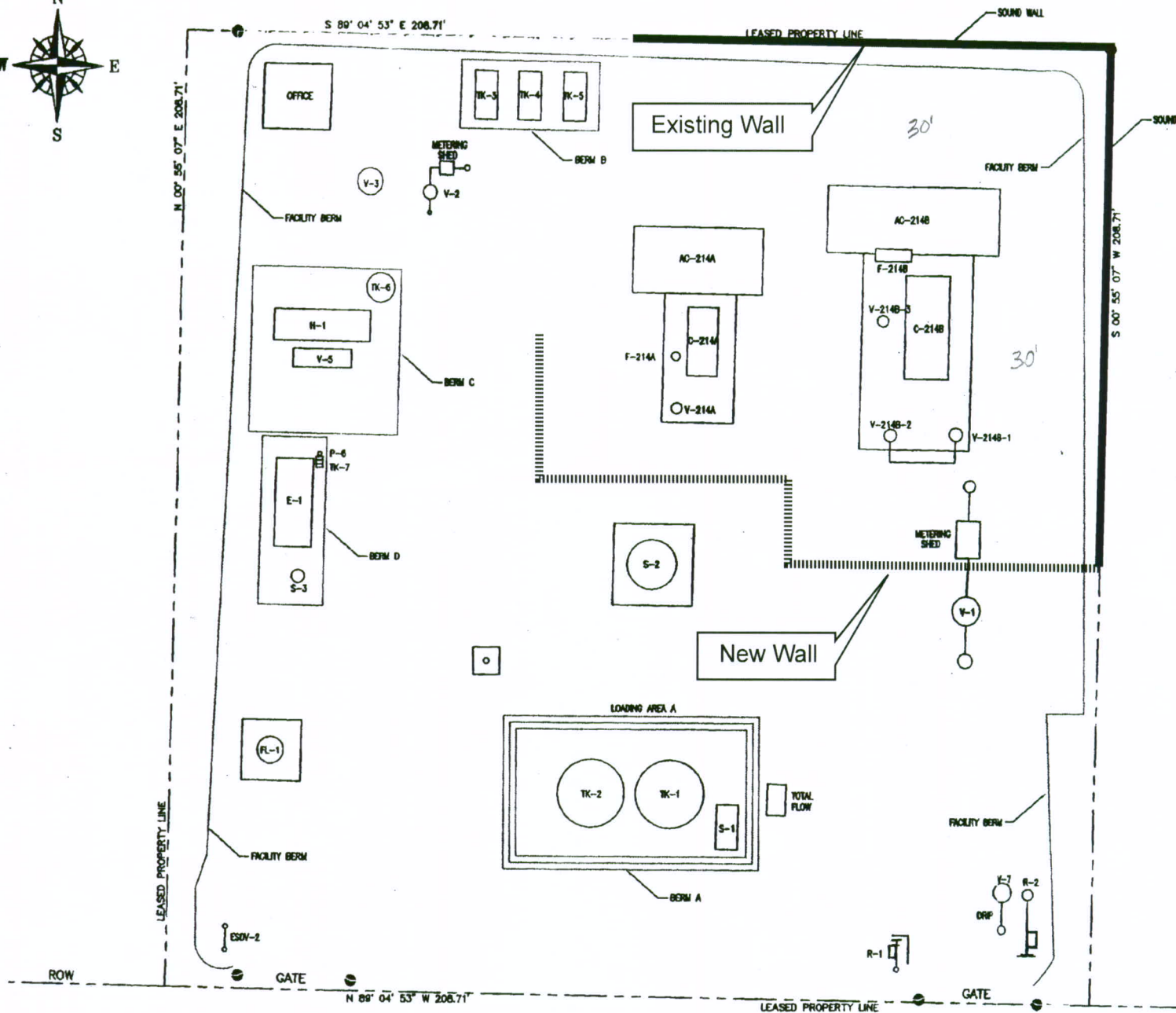
Figure

3



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Option 1

Marilyn Compressor Station

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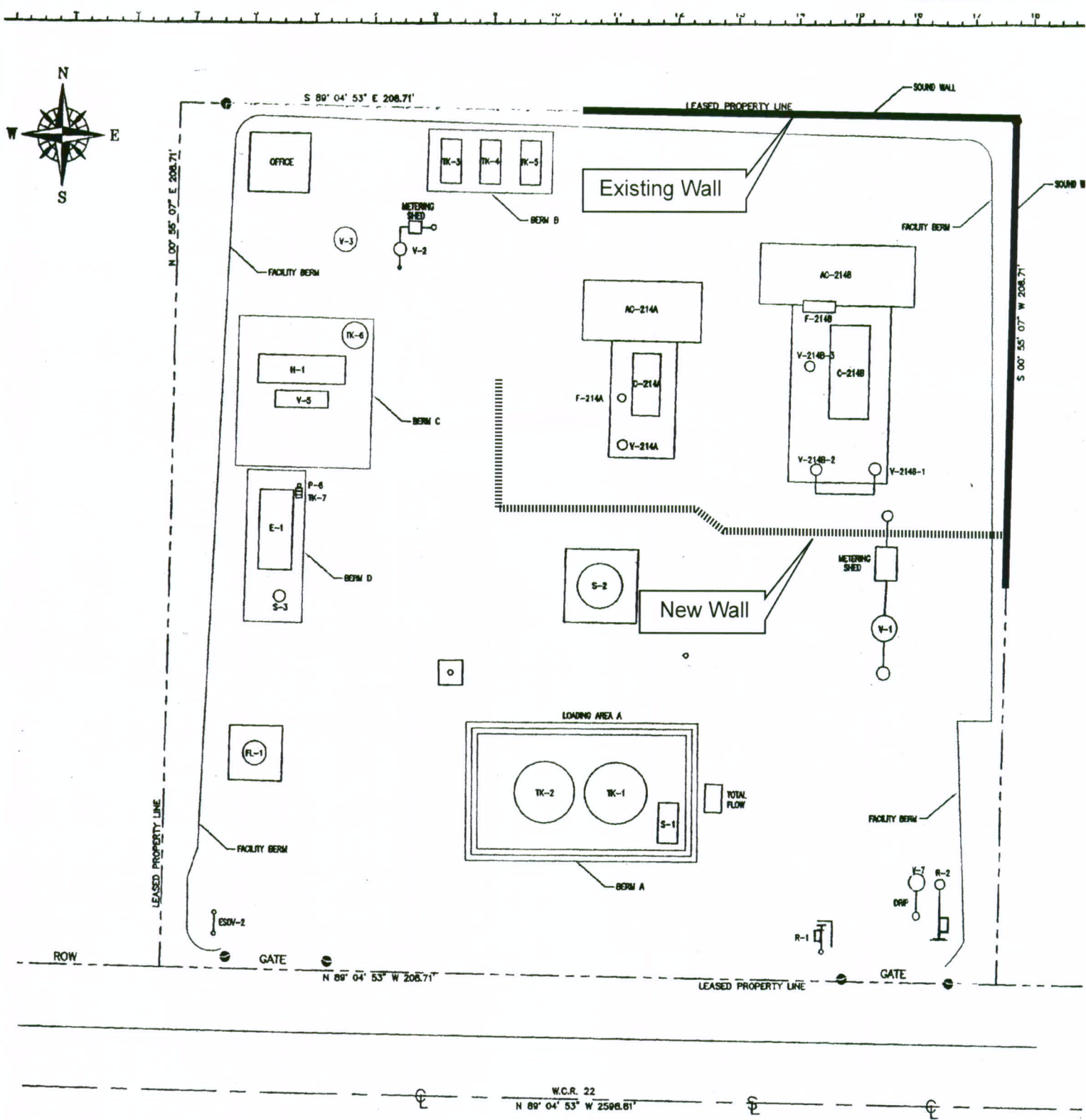
Figure

5



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Option 2

Marilyn Compressor Station

NTS

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Drawn by
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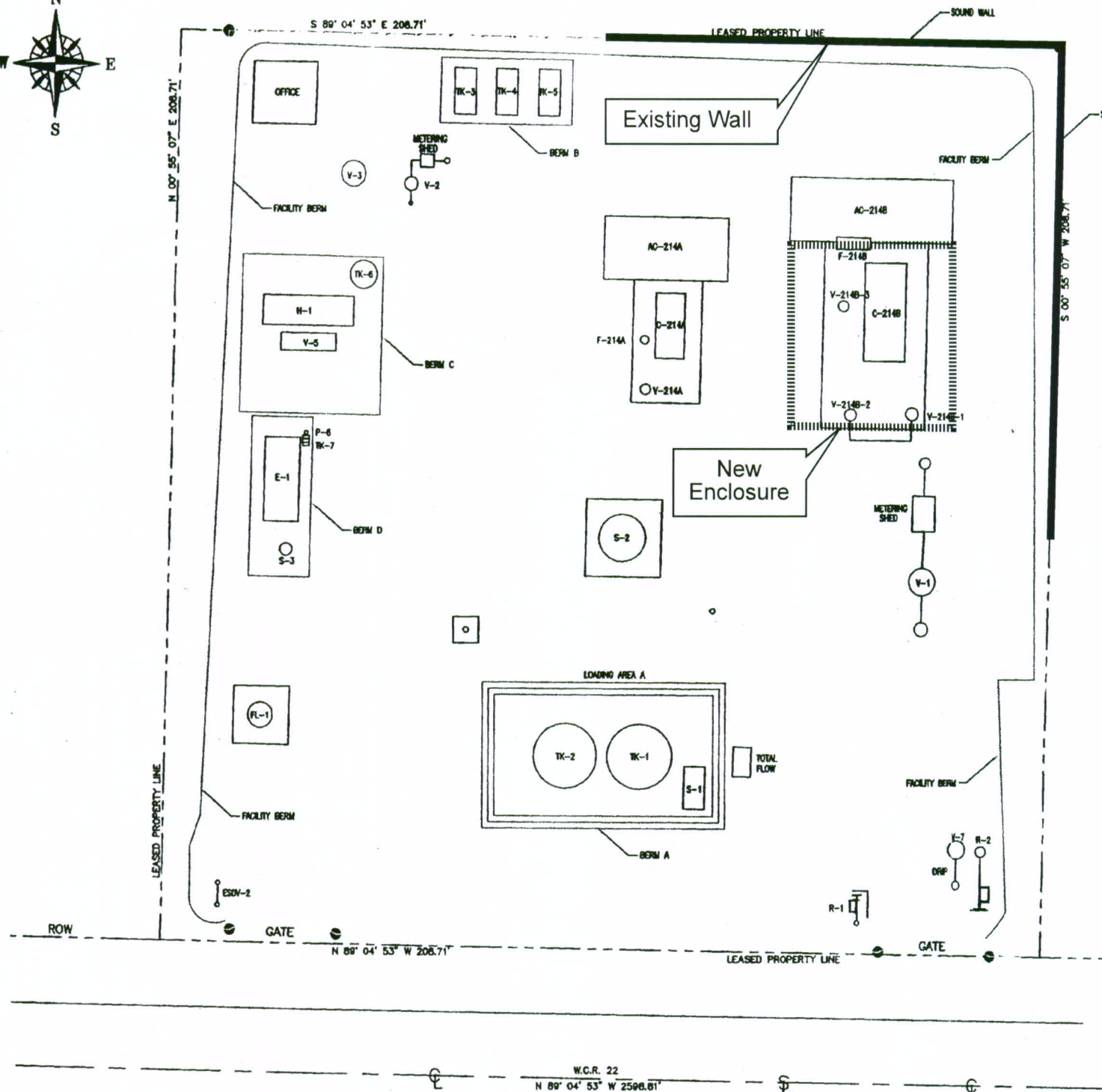
Figure

6



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Option 3

Marilyn Compressor Station

NTS

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MBB

Figure

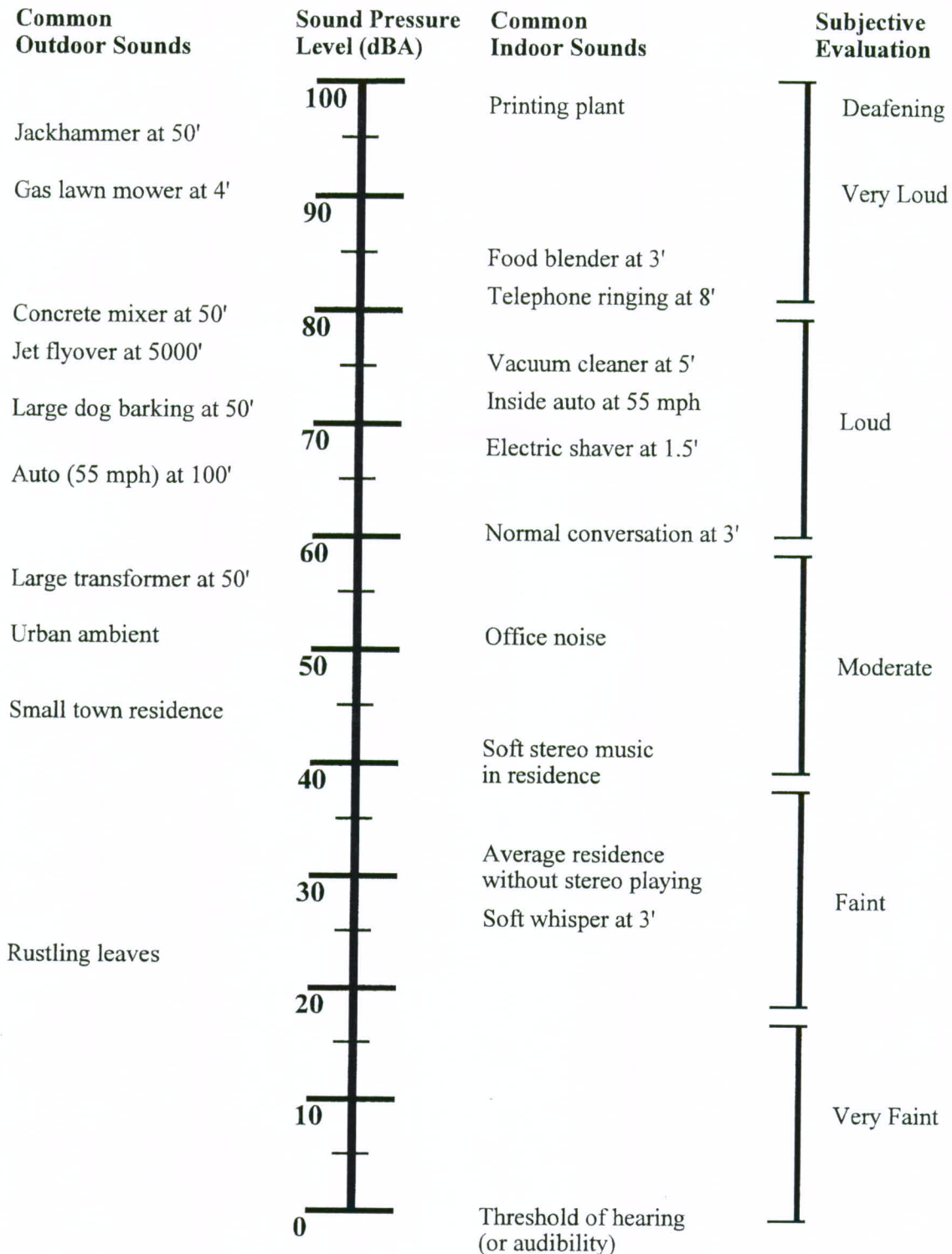
7



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11-28-06

Common Sounds in Decibels



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Common Sounds in Decibels

Marilyn Compressor Station

Figure No.

8

Date
December 1, 2006

Drawn By
JPK

Appendix A

Acoustical Terminology and Definitions

Ambient sound: the composite of airborne sound from many sources near and far associated with a given environment. No particular sound is singled out for interest.

Average sound pressure level (of several related sound pressure levels measured at different positions or times): the logarithmic average of a number of separate measurements; equal to ten times the common logarithm of the arithmetic mean of the squared pressure ratios from which the individual levels were derived. The average sound pressure level is calculated from the expression:

$$\overline{L_p} = 10 \log \left(\frac{1}{n} \sum_{i=1}^n 10^{L_i/10} \right)$$

where:

$\overline{L_p}$ = average sound pressure level (dB or dBA),
 n = number of individual sound pressure levels,
 L_i = an individual sound pressure level (dB or dBA).

A-weighted sound level: the A-weighted sound level is a single number rating which reflects most closely the human perception of sound levels, which is generally less sensitive to sounds at low frequencies than at mid and high frequencies. The A-weighted level is calculated by combining decibels from each octave band, while applying an ANSI specified weighting factor to each band. This system expresses sound levels in units of A-weighted decibels (dBA).

Background sound: sound from all sources unrelated to a particular sound that is the object of interest. Background sound can be short term or long term. A passing vehicle would be considered short term, while the “din” of a distant highway would be considered long term background sound.

Decibel (dB): A common unit used for sound pressure level; equal to ten times the common logarithm of the ratio of two like quantities proportional to power or energy.

Equivalent sound level (L_{eq}): a type of average which represents the steady level that, integrated over a time period, would produce the same energy as the actual signal. The actual *instantaneous* sound levels typically fluctuate above and below the measured L_{eq} during the measurement period. The A-weighted L_{eq} is a common index for measuring environmental sound.

Minimum sound level (L_{min}): The minimum sound pressure level that occurred during the measurement duration.

90-percentile-exceeded sound level (L_{90}): The sound pressure level that was exceeded 90% of the time during the measurement duration.

Octave-band: An internationally accepted frequency band, or range, commonly used to divide the audible frequency range into ten bands. Octave bands are identified by their center frequencies of 31.5, 63, 125, 250, 500, 1,000, 2,000, 4,000, 8,000, and 16,000 hertz.

Sound pressure level: Sound or noise consists of minute fluctuations in atmospheric pressure capable of evoking the sense of hearing. Technically, it is twenty times the common logarithm of the ratio of the sound pressure under consideration to the standard reference pressure of 20 μ Pa. The quantity so obtained is expressed in decibels.

Statistical Sound Levels: The sound levels of long-term sound producing activities such as traffic movement, aircraft operations, etc., can vary considerably with time. In order to obtain a single number rating of such a sound source, a statistically-based method of expressing sound or sound levels has been developed. It is known as the Exceedence Level, L_n . The L_n represents the sound level that is exceeded for n% of the measurement time period. For example, $L_{10} = 60$ dBA indicates that for the duration of the measurement period, the sound level exceeded 60 dBA 10% of the time.

Appendix B

Weather Data

**From the Weather Station
at the Thuener Residence**

Marilyn2 11/03/06

Date	Time	Temp Out	Wind Chill	Hi Temp	Low Temp	Wind Speed	Hi	Dir	Temp In	Arc Per
11/03/06	12:00a	66.7	66.7	66.8	66.6	0.0	0.0	---	66.9	15
11/03/06	12:15a	66.5	66.5	66.6	66.4	0.0	0.0	---	66.7	15
11/03/06	12:30a	66.4	66.4	66.5	66.3	0.0	0.0	---	66.6	15
11/03/06	12:45a	66.2	66.2	66.3	66.1	0.0	0.0	---	66.4	15
11/03/06	1:00a	66.1	66.1	66.2	66.0	0.0	0.0	---	66.2	15
11/03/06	1:15a	65.9	65.9	66.0	65.8	0.0	0.0	---	66.1	15
11/03/06	1:30a	65.8	65.8	65.9	65.7	0.0	0.0	---	65.9	15
11/03/06	1:45a	65.6	65.6	65.7	65.5	0.0	0.0	---	65.8	15
11/03/06	2:00a	65.5	65.5	65.6	65.4	0.0	0.0	---	65.6	15
11/03/06	2:15a	65.4	65.4	65.4	65.3	0.0	0.0	---	65.5	15
11/03/06	2:30a	65.2	65.2	65.3	65.2	0.0	0.0	---	65.4	15
11/03/06	2:45a	65.1	65.1	65.2	65.0	0.0	0.0	---	65.2	15
11/03/06	3:00a	65.0	65.0	65.0	64.9	0.0	0.0	---	65.1	15
11/03/06	3:15a	64.8	64.8	64.9	64.7	0.0	0.0	---	65.0	15
11/03/06	3:30a	64.7	64.7	64.8	64.6	0.0	0.0	---	64.8	15
11/03/06	3:45a	64.6	64.6	64.6	64.5	0.0	0.0	---	64.7	15
11/03/06	4:00a	64.4	64.4	64.5	64.3	0.0	0.0	---	64.6	15
11/03/06	4:15a	64.3	64.3	64.4	64.2	0.0	0.0	---	64.4	15
11/03/06	4:30a	64.2	64.2	64.3	64.1	0.0	0.0	---	64.3	15
11/03/06	4:45a	64.1	64.1	64.1	64.0	0.0	0.0	---	64.2	15
11/03/06	5:00a	63.9	63.9	64.0	63.9	0.0	0.0	---	64.1	15
11/03/06	5:15a	63.8	63.8	63.9	63.7	0.0	0.0	---	64.0	15
11/03/06	5:30a	63.7	63.7	63.7	63.6	0.0	0.0	---	63.9	15
11/03/06	5:45a	63.6	63.6	63.6	63.5	0.0	0.0	---	63.7	15
11/03/06	6:00a	63.5	63.5	63.6	63.4	0.0	0.0	---	63.6	15
11/03/06	6:15a	63.4	63.4	63.5	63.4	0.0	0.0	---	63.5	15
11/03/06	6:30a	63.5	63.5	63.6	63.4	0.0	0.0	---	63.5	15
11/03/06	6:45a	63.8	63.8	64.2	63.6	0.0	0.0	---	63.7	15
11/03/06	7:00a	64.5	64.5	64.9	64.2	0.0	0.0	---	64.2	15
11/03/06	7:15a	65.2	65.2	65.5	64.9	0.0	0.0	---	64.8	15
11/03/06	7:30a	65.8	65.8	66.2	65.5	0.0	0.0	---	65.4	15
11/03/06	7:45a	66.4	66.4	66.7	66.1	0.0	0.0	---	65.9	15
11/03/06	8:00a	67.0	67.0	67.3	66.6	0.0	0.0	---	66.5	15
11/03/06	8:15a	67.5	67.5	67.8	67.3	0.0	0.0	---	67.1	15
11/03/06	8:30a	67.8	67.8	67.8	67.7	0.0	0.0	---	67.6	15
11/03/06	8:45a	67.4	67.4	67.7	67.0	0.0	0.0	---	67.6	15
11/03/06	9:00a	66.7	66.7	67.0	66.4	0.0	0.0	---	67.1	15
11/03/06	9:15a	66.2	66.2	66.4	66.1	0.0	0.0	---	66.6	15
11/03/06	9:30a	66.0	66.0	66.1	65.8	0.0	0.0	---	66.2	15
11/03/06	9:45a	65.7	65.7	65.9	65.6	0.0	0.0	---	65.9	15
11/03/06	10:00a	65.3	65.3	65.6	65.0	0.0	0.0	---	65.5	15
11/03/06	10:15a	64.7	64.7	65.0	64.4	0.0	0.0	---	65.1	15
11/03/06	10:30a	63.4	63.4	64.4	56.2	0.0	0.0	---	64.4	15
11/03/06	10:45a	50.1	50.1	56.2	47.5	0.0	1.0	NNE	58.8	15
11/03/06	11:00a	47.8	47.8	48.4	47.4	0.0	2.0	N	56.3	15
11/03/06	11:15a	50.6	50.6	54.3	48.1	0.0	3.0	NNE	56.1	15
11/03/06	11:30a	58.5	58.5	61.7	53.4	1.0	4.0	E	57.7	15

Marilyn2 11/03/06

Date	Time	Temp Out	Wind Chill	Hi Temp	Low Temp	Wind Speed	Hi	Dir	Temp In	Arc Per
11/03/06	11:45a	58.8	58.8	64.0	55.0	1.0	4.0	E	60.8	15
11/03/06	12:00p	62.2	62.2	64.9	60.3	1.0	4.0	E	63.6	15
11/03/06	12:15p	60.2	60.2	63.2	57.2	1.0	4.0	ENE	66.8	15
11/03/06	12:30p	64.8	64.8	68.3	62.0	1.0	3.0	ESE	69.0	15
11/03/06	12:45p	65.9	65.9	70.8	58.8	0.0	3.0	N	71.8	15
11/03/06	1:00p	59.2	59.2	62.8	57.1	0.0	3.0	ENE	74.5	15
11/03/06	1:15p	62.7	62.7	65.5	60.4	1.0	4.0	ENE	75.7	15
11/03/06	1:30p	65.8	65.8	67.5	63.7	2.0	4.0	ENE	76.3	15
11/03/06	1:45p	66.3	66.3	67.5	65.5	1.0	3.0	ENE	76.2	15
11/03/06	2:00p	66.4	66.4	67.1	65.8	2.0	4.0	E	75.8	15
11/03/06	2:15p	66.0	66.0	68.0	63.9	3.0	9.0	NW	75.4	15
11/03/06	2:30p	66.4	66.4	67.1	66.0	0.0	4.0	NNW	74.4	15
11/03/06	2:45p	66.9	66.9	67.7	66.0	0.0	2.0	NNW	72.8	15
11/03/06	3:00p	65.1	65.1	66.9	62.2	0.0	2.0	NNW	70.8	15
11/03/06	3:15p	65.4	65.4	66.5	64.1	1.0	4.0	NE	69.0	15
11/03/06	3:30p	64.4	64.4	65.5	63.1	1.0	4.0	NE	67.7	15
11/03/06	3:45p	59.6	59.6	63.0	56.4	1.0	4.0	ENE	66.8	15
11/03/06	4:00p	54.7	54.7	56.4	53.9	0.0	1.0	NE	65.6	15
11/03/06	4:15p	53.3	53.3	54.4	52.7	0.0	2.0	NE	64.0	15
11/03/06	4:30p	53.7	53.7	54.8	53.0	0.0	2.0	NE	62.0	15
11/03/06	4:45p	51.8	51.8	53.5	50.7	0.0	1.0	NNE	59.9	15
11/03/06	5:00p	45.8	45.8	51.5	42.0	0.0	2.0	NW	57.8	15
11/03/06	5:15p	46.2	46.2	48.3	42.7	0.0	2.0	ESE	55.7	15
11/03/06	5:30p	45.3	45.3	48.2	40.0	0.0	3.0	NW	53.6	15
11/03/06	5:45p	38.7	38.7	39.8	37.4	1.0	3.0	NW	51.5	15
11/03/06	6:00p	40.9	40.9	44.4	38.2	0.0	3.0	W	49.5	15
11/03/06	6:15p	40.1	40.1	42.0	36.6	1.0	4.0	W	47.6	15
11/03/06	6:30p	42.5	42.5	44.2	40.8	0.0	3.0	WSW	45.9	15
11/03/06	6:45p	44.0	44.0	45.2	42.0	1.0	3.0	SW	44.4	15
11/03/06	7:00p	40.9	40.9	43.2	38.4	0.0	2.0	W	43.2	15
11/03/06	7:15p	39.2	39.2	43.3	36.3	1.0	3.0	W	42.1	15
11/03/06	7:30p	37.1	37.1	39.8	35.5	1.0	2.0	WNW	41.2	15
11/03/06	7:45p	35.8	35.8	37.5	34.8	1.0	4.0	W	40.3	15
11/03/06	8:00p	37.2	37.2	39.7	35.5	1.0	4.0	ESE	39.5	15
11/03/06	8:15p	39.8	39.8	40.9	38.0	0.0	3.0	SSE	38.8	15
11/03/06	8:30p	37.0	37.0	38.5	35.9	0.0	2.0	SW	38.2	15
11/03/06	8:45p	35.5	35.5	36.9	34.3	1.0	5.0	SW	37.6	15
11/03/06	9:00p	37.6	37.6	39.2	35.4	0.0	2.0	SSE	37.0	15
11/03/06	9:15p	40.0	40.0	41.0	39.1	0.0	2.0	S	36.4	15
11/03/06	9:30p	38.6	38.6	40.8	38.0	0.0	3.0	E	36.0	15
11/03/06	9:45p	38.9	38.9	39.7	37.6	0.0	2.0	E	35.6	15
11/03/06	10:00p	38.3	38.3	39.6	37.3	0.0	2.0	S	35.3	15
11/03/06	10:15p	38.1	38.1	39.7	37.0	0.0	3.0	E	35.0	15
11/03/06	10:30p	36.4	36.4	37.2	35.3	0.0	2.0	E	34.8	15
11/03/06	10:45p	36.1	36.1	39.6	34.7	0.0	3.0	E	34.5	15
11/03/06	11:00p	39.8	39.8	40.8	38.1	0.0	3.0	S	34.3	15
11/03/06	11:15p	37.1	37.1	38.1	36.3	0.0	2.0	SSW	34.2	15

Marilyn2 11/03/06

Date	Time	Temp Out	Wind Chill	Hi Temp	Low Temp	Wind Speed	Hi	Dir	Temp In	Arc Per
11/03/06	11:30p	38.0	38.0	40.5	36.4	0.0	5.0	SSW	34.3	15
11/03/06	11:45p	39.3	39.3	40.1	38.3	0.0	2.0	SSE	34.3	15
11/03/06	12:00p	39.9	39.9	40.5	39.5	0.0	2.0	SSE	34.4	15

Marilyn2 11/04/06

Date	Time	Temp Out	Wind Chill	Hi Temp	Low Temp	Wind Speed	Hi	Dir	Temp In	Arc Per
11/04/06	12:00a	39.9	39.9	40.5	39.5	0.0	2.0	SSE	34.4	15
11/04/06	12:15a	40.1	40.1	40.7	39.5	0.0	2.0	SW	34.5	15
11/04/06	12:30a	37.2	37.2	39.4	35.9	1.0	3.0	E	34.7	15
11/04/06	12:45a	37.3	37.3	38.9	35.9	0.0	3.0	E	34.8	15
11/04/06	1:00a	37.8	37.8	39.3	36.6	1.0	3.0	NW	34.8	15
11/04/06	1:15a	38.2	38.2	39.2	37.3	0.0	2.0	ENE	34.9	15
11/04/06	1:30a	36.8	36.8	37.5	36.2	0.0	2.0	ENE	35.0	15
11/04/06	1:45a	36.6	36.6	37.1	36.3	0.0	2.0	NE	35.0	15
11/04/06	2:00a	36.0	36.0	37.0	35.1	0.0	2.0	N	35.1	15
11/04/06	2:15a	36.8	36.8	38.6	35.7	0.0	3.0	NW	35.1	15
11/04/06	2:30a	37.4	37.4	37.7	36.7	0.0	4.0	WNW	35.2	15
11/04/06	2:45a	36.3	36.3	37.9	35.1	0.0	2.0	SSW	35.2	15
11/04/06	3:00a	36.7	36.7	38.1	35.8	0.0	1.0	SSW	35.3	15
11/04/06	3:15a	37.2	37.2	38.9	35.7	0.0	2.0	SSW	35.3	15
11/04/06	3:30a	36.9	36.9	38.3	36.3	0.0	2.0	SSW	35.4	15
11/04/06	3:45a	37.3	37.3	37.6	36.9	0.0	1.0	WNW	35.6	15
11/04/06	4:00a	38.2	38.2	38.9	37.3	0.0	2.0	WNW	35.9	15
11/04/06	4:15a	40.6	40.6	44.3	38.9	2.0	7.0	WNW	36.1	15
11/04/06	4:30a	41.9	41.9	44.3	41.2	1.0	3.0	WSW	36.5	15
11/04/06	4:45a	41.9	41.9	42.5	41.4	0.0	2.0	SW	36.9	15
11/04/06	5:00a	40.2	40.2	41.6	38.7	1.0	5.0	WSW	37.2	15
11/04/06	5:15a	39.6	39.6	40.1	39.0	0.0	2.0	SSW	37.6	15
11/04/06	5:30a	40.0	40.0	40.7	39.3	0.0	4.0	WNW	37.9	15
11/04/06	5:45a	39.8	39.8	40.2	39.5	1.0	3.0	W	38.1	15
11/04/06	6:00a	39.3	39.3	39.8	39.0	0.0	4.0	W	38.4	15
11/04/06	6:15a	38.6	38.6	39.1	38.4	0.0	2.0	W	38.5	15
11/04/06	6:30a	38.3	38.3	38.7	38.0	0.0	2.0	W	38.6	15
11/04/06	6:45a	38.5	38.5	38.9	38.3	1.0	2.0	W	38.7	15
11/04/06	7:00a	39.2	39.2	39.5	38.9	1.0	3.0	W	38.8	15
11/04/06	7:15a	38.9	38.9	39.1	38.6	1.0	2.0	NW	38.9	15
11/04/06	7:30a	39.1	39.1	39.5	38.9	0.0	2.0	NW	39.0	15
11/04/06	7:45a	39.8	39.8	40.4	39.4	0.0	1.0	NW	39.1	15
11/04/06	8:00a	40.9	40.9	41.3	40.4	0.0	1.0	NW	39.4	15
11/04/06	8:15a	42.0	42.0	42.7	41.3	0.0	1.0	---	39.8	15
11/04/06	8:30a	43.2	43.2	43.5	42.6	0.0	0.0	---	40.4	15
11/04/06	8:45a	43.9	43.9	44.2	43.4	0.0	0.0	---	41.0	15
11/04/06	9:00a	44.4	44.4	45.2	44.0	0.0	3.0	NW	41.7	15
11/04/06	9:15a	45.6	45.6	46.1	45.1	1.0	3.0	ENE	42.4	15
11/04/06	9:30a	45.4	45.4	45.7	45.2	1.0	3.0	ENE	43.3	15
11/04/06	9:45a	46.1	46.1	47.8	45.0	1.0	2.0	E	44.1	15
11/04/06	10:00a	49.9	49.9	51.4	47.8	0.0	3.0	E	45.2	15
11/04/06	10:15a	51.3	51.3	52.4	49.8	1.0	4.0	NW	46.5	15
11/04/06	10:30a	55.2	55.2	58.0	52.5	1.0	3.0	NW	48.2	15
11/04/06	10:45a	54.0	54.0	56.6	52.5	3.0	7.0	NW	50.6	15
11/04/06	11:00a	53.4	53.4	55.9	52.2	2.0	5.0	WNW	53.1	15
11/04/06	11:15a	58.7	58.7	62.9	55.5	1.0	6.0	NE	55.3	15
11/04/06	11:30a	56.7	56.7	58.5	55.3	3.0	5.0	ENE	57.8	15

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Date	Time	Temp Out	Wind Chill	Hi Temp	Low Temp	Wind Speed	Hi	Dir	Temp In	Arc Per
11/04/06	11:45a	59.7	59.7	61.6	57.1	2.0	6.0	ENE	60.4	15
11/04/06	12:00p	62.6	62.6	65.8	60.8	3.0	8.0	ENE	63.0	15
11/04/06	12:15p	62.3	62.3	66.0	59.9	2.0	6.0	E	66.4	15
11/04/06	12:30p	64.2	64.2	66.2	62.6	3.0	7.0	ENE	69.6	15
11/04/06	12:45p	65.6	65.6	68.3	63.6	3.0	8.0	ENE	72.8	15
11/04/06	1:00p	65.2	65.2	66.9	64.0	3.0	6.0	ENE	75.7	15
11/04/06	1:15p	62.9	62.9	65.0	61.5	3.0	6.0	E	77.8	15
11/04/06	1:30p	61.0	61.0	63.1	59.1	3.0	7.0	E	78.7	15
11/04/06	1:45p	61.0	61.0	62.3	59.5	2.0	7.0	E	78.0	15
11/04/06	2:00p	61.5	61.5	62.1	60.6	2.0	5.0	E	76.8	15
11/04/06	2:15p	62.0	62.0	63.4	60.7	1.0	4.0	SE	75.5	15
11/04/06	2:30p	60.4	60.4	60.9	59.9	1.0	3.0	ENE	74.4	15
11/04/06	2:45p	62.7	62.7	63.5	60.4	0.0	2.0	ENE	73.1	15
11/04/06	3:00p	63.5	63.5	64.4	62.6	0.0	3.0	N	72.1	15
11/04/06	3:15p	61.0	61.0	63.0	59.2	0.0	2.0	N	71.3	15
11/04/06	3:30p	59.4	59.4	60.7	57.0	0.0	2.0	N	70.4	15
11/04/06	3:45p	56.2	56.2	57.0	55.8	0.0	0.0	---	69.0	15
11/04/06	4:00p	55.6	55.6	56.0	55.1	0.0	0.0	---	67.5	15
11/04/06	4:15p	53.9	53.9	55.0	52.0	1.0	6.0	NNW	65.9	15
11/04/06	4:30p	50.4	50.4	52.0	49.4	0.0	2.0	NNW	64.2	15
11/04/06	4:45p	48.1	48.1	49.5	46.6	1.0	3.0	NNW	62.2	15
11/04/06	5:00p	45.8	45.8	46.9	45.0	1.0	2.0	NNW	60.1	15
11/04/06	5:15p	43.5	43.5	45.1	42.4	0.0	1.0	NNW	58.0	15
11/04/06	5:30p	42.8	42.8	43.8	42.0	0.0	1.0	NNW	55.8	15
11/04/06	5:45p	40.4	40.4	42.1	38.8	0.0	2.0	NNW	53.6	15
11/04/06	6:00p	39.2	39.2	40.1	38.4	0.0	2.0	NW	51.5	15
11/04/06	6:15p	38.4	38.4	39.0	37.9	0.0	2.0	NW	49.5	15
11/04/06	6:30p	37.6	37.6	38.2	37.0	1.0	3.0	NW	47.7	15
11/04/06	6:45p	38.9	38.9	39.8	37.5	1.0	2.0	W	46.1	15
11/04/06	7:00p	36.2	36.2	38.7	34.3	1.0	2.0	W	44.7	15
11/04/06	7:15p	37.7	37.7	38.5	37.3	1.0	4.0	W	43.4	15
11/04/06	7:30p	38.5	38.5	40.0	37.5	1.0	4.0	WSW	42.3	15
11/04/06	7:45p	38.0	38.0	38.5	37.2	1.0	2.0	WSW	41.4	15
11/04/06	8:00p	36.8	36.8	37.3	36.5	1.0	2.0	WSW	40.6	15
11/04/06	8:15p	36.9	36.9	37.6	34.1	1.0	2.0	WSW	39.9	15
11/04/06	8:30p	34.7	34.7	36.1	33.8	0.0	3.0	SE	39.2	15
11/04/06	8:45p	36.1	36.1	37.0	35.1	0.0	2.0	SE	38.6	15
11/04/06	9:00p	35.5	35.5	37.0	34.5	0.0	0.0	---	37.9	15
11/04/06	9:15p	33.6	33.6	35.1	32.4	0.0	1.0	SE	37.2	15
11/04/06	9:30p	33.5	33.5	34.1	32.6	0.0	2.0	E	36.5	15
11/04/06	9:45p	34.7	34.7	35.8	33.8	0.0	2.0	ESE	35.8	15
11/04/06	10:00p	32.3	32.3	34.6	29.9	0.0	1.0	S	35.3	15
11/04/06	10:15p	30.8	30.8	32.0	29.6	0.0	2.0	W	34.8	15
11/04/06	10:30p	28.9	28.9	29.8	27.8	0.0	1.0	W	34.2	15
11/04/06	10:45p	32.0	32.0	35.4	28.8	0.0	1.0	W	33.7	15
11/04/06	11:00p	33.5	33.5	36.3	29.8	0.0	2.0	S	33.3	15
11/04/06	11:15p	32.5	32.5	35.8	29.1	0.0	2.0	WNW	32.9	15

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Date	Time	Temp Out	Wind Chill	Hi Temp	Low Temp	Wind Speed	Hi	Dir	Temp In	Arc Per
11/04/06	11:30p	30.8	30.8	33.5	28.9	0.0	5.0	NW	32.5	15
11/04/06	11:45p	29.4	29.4	30.8	27.9	0.0	1.0	NW	32.2	15
11/04/06	12:00p	29.0	29.0	31.1	27.5	0.0	2.0	SSW	31.8	15

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Date	Time	Temp Out	Wind Chill	Hi Temp	Low Temp	Wind Speed	Hi	Dir	Temp In	Arc Per
11/05/06	12:00a	29.0	29.0	31.1	27.5	0.0	2.0	SSW	31.8	15
11/05/06	12:15a	29.3	29.3	32.7	26.6	0.0	3.0	S	31.4	15
11/05/06	12:30a	32.1	32.1	34.6	28.5	0.0	2.0	S	31.0	15
11/05/06	12:45a	28.3	28.3	29.6	26.8	0.0	2.0	WNW	30.7	15
11/05/06	1:00a	28.5	28.5	29.8	26.7	1.0	3.0	WNW	30.4	15
11/05/06	1:15a	29.7	29.7	31.2	27.6	0.0	2.0	NW	30.2	15
11/05/06	1:30a	30.3	30.3	31.6	28.8	0.0	3.0	ESE	30.0	15
11/05/06	1:45a	29.1	29.1	30.4	28.4	0.0	1.0	SSE	29.9	15
11/05/06	2:00a	28.1	28.1	30.5	26.0	0.0	3.0	NNW	29.8	15
11/05/06	2:15a	27.3	27.3	28.6	26.3	0.0	1.0	W	29.5	15
11/05/06	2:30a	25.7	25.7	27.2	24.2	0.0	1.0	W	29.2	15
11/05/06	2:45a	25.8	25.8	27.9	23.8	0.0	2.0	W	28.9	15
11/05/06	3:00a	26.3	26.3	27.9	24.4	0.0	1.0	W	28.6	15
11/05/06	3:15a	26.2	26.2	27.4	24.8	0.0	1.0	W	28.2	15
11/05/06	3:30a	25.0	25.0	26.6	23.0	0.0	1.0	W	27.9	15
11/05/06	3:45a	25.4	25.4	28.2	23.0	0.0	2.0	W	27.5	15
11/05/06	4:00a	28.5	28.5	29.2	27.4	0.0	2.0	SSW	27.2	15
11/05/06	4:15a	28.7	28.7	29.1	27.9	0.0	2.0	S	26.9	15
11/05/06	4:30a	28.8	28.8	29.7	28.0	0.0	1.0	S	26.8	15
11/05/06	4:45a	30.0	30.0	31.3	28.2	0.0	2.0	S	26.7	15
11/05/06	5:00a	26.8	26.8	29.6	24.9	0.0	2.0	S	26.6	15
11/05/06	5:15a	25.0	25.0	25.9	24.4	0.0	3.0	NNW	26.4	15
11/05/06	5:30a	25.0	25.0	25.6	24.3	0.0	1.0	---	26.1	15
11/05/06	5:45a	25.2	25.2	26.9	23.6	0.0	2.0	NNW	25.8	15
11/05/06	6:00a	24.2	24.2	25.4	23.6	0.0	3.0	WNW	25.6	15
11/05/06	6:15a	24.0	24.0	24.9	22.7	0.0	2.0	WNW	25.4	15
11/05/06	6:30a	23.4	23.4	24.2	22.3	0.0	1.0	WNW	25.1	15
11/05/06	6:45a	25.2	25.2	26.1	23.7	0.0	2.0	WNW	24.9	15
11/05/06	7:00a	27.2	27.2	28.3	25.9	0.0	3.0	E	24.7	15
11/05/06	7:15a	31.6	31.6	36.3	28.6	0.0	3.0	SSE	24.7	15
11/05/06	7:30a	37.2	37.2	39.8	34.7	0.0	3.0	S	24.9	15
11/05/06	7:45a	41.6	41.6	45.9	38.6	0.0	3.0	NNW	25.6	15
11/05/06	8:00a	41.8	41.8	45.3	39.8	0.0	2.0	NE	26.7	15
11/05/06	8:15a	47.1	47.1	50.3	44.6	0.0	3.0	E	28.4	15
11/05/06	8:30a	50.2	50.2	52.6	47.9	1.0	4.0	SE	30.4	15
11/05/06	8:45a	51.9	51.9	53.6	48.9	0.0	4.0	WSW	33.2	15
11/05/06	9:00a	51.3	51.3	53.7	49.2	0.0	3.0	W	36.8	15
11/05/06	9:15a	51.2	51.2	53.3	50.1	1.0	3.0	W	40.5	15
11/05/06	9:30a	55.2	55.2	57.5	53.0	0.0	2.0	SW	44.9	15
11/05/06	9:45a	57.8	57.8	59.3	55.7	1.0	3.0	WSW	50.1	15
11/05/06	10:00a	59.2	59.2	61.2	56.4	1.0	4.0	W	55.4	15
11/05/06	10:15a	61.3	61.3	64.0	59.1	1.0	3.0	ESE	60.7	15
11/05/06	10:30a	63.1	63.1	65.4	61.5	1.0	4.0	WSW	65.7	15
11/05/06	10:45a	64.1	64.1	65.6	61.6	1.0	4.0	SSE	70.3	15
11/05/06	11:00a	64.3	64.3	66.3	62.1	1.0	4.0	E	74.5	15
11/05/06	11:15a	65.9	65.9	69.0	63.9	1.0	5.0	WSW	77.9	15
11/05/06	11:30a	67.3	67.3	68.8	66.1	1.0	4.0	SE	81.0	15

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Date	Time	Temp Out	Wind Chill	Hi Temp	Low Temp	Wind Speed	Hi	Dir	Temp In	Arc Per
11/05/06	11:45a	66.9	66.9	69.8	65.3	2.0	6.0	WSW	83.9	15
11/05/06	12:00p	67.8	67.8	70.7	66.2	2.0	6.0	W	86.4	15
11/05/06	12:15p	69.0	69.0	71.3	67.2	1.0	6.0	WSW	88.6	15
11/05/06	12:30p	67.6	67.6	69.4	66.3	2.0	6.0	WSW	90.5	15
11/05/06	12:45p	67.6	67.6	69.8	66.0	2.0	6.0	W	91.9	15
11/05/06	1:00p	66.8	66.8	68.6	65.5	3.0	6.0	W	93.1	15
11/05/06	1:15p	67.1	67.1	68.4	66.2	2.0	6.0	W	93.5	15
11/05/06	1:30p	65.4	65.4	66.6	64.0	1.0	4.0	E	92.9	15
11/05/06	1:45p	66.0	66.0	67.3	65.0	1.0	4.0	WSW	90.7	15
11/05/06	2:00p	66.9	66.9	68.4	65.6	1.0	6.0	WSW	88.2	15
11/05/06	2:15p	65.7	65.7	66.3	64.7	1.0	12.0	WNW	85.8	15
11/05/06	2:30p	64.1	64.1	66.0	60.9	1.0	6.0	WSW	82.7	15
11/05/06	2:45p	61.0	61.0	63.4	59.2	0.0	4.0	SW	79.3	15
11/05/06	3:00p	61.6	61.6	62.5	61.2	0.0	2.0	NW	76.0	15
11/05/06	3:15p	61.7	61.7	63.9	61.2	0.0	0.0	---	73.2	15
11/05/06	3:30p	64.3	64.3	64.7	63.2	0.0	1.0	NW	70.8	15
11/05/06	3:45p	61.7	61.7	63.3	60.2	1.0	4.0	W	69.0	15
11/05/06	4:00p	58.4	58.4	60.8	55.5	1.0	4.0	W	67.0	15
11/05/06	4:15p	53.4	53.4	55.9	49.9	0.0	2.0	W	64.8	15
11/05/06	4:30p	48.7	48.7	50.4	47.2	0.0	2.0	W	62.5	15
11/05/06	4:45p	50.4	50.4	51.6	49.4	1.0	5.0	W	60.3	15
11/05/06	5:00p	51.1	51.1	52.2	49.3	2.0	5.0	WSW	58.3	15
11/05/06	5:15p	48.8	48.8	49.8	47.6	1.0	3.0	W	56.6	15
11/05/06	5:30p	48.5	48.5	49.6	47.6	1.0	5.0	WSW	55.1	15
11/05/06	5:45p	48.7	48.7	50.1	47.5	1.0	5.0	WNW	53.7	15
11/05/06	6:00p	46.2	46.2	47.4	45.2	1.0	3.0	WNW	52.3	15
11/05/06	6:15p	48.2	48.2	50.3	45.5	3.0	6.0	WNW	51.0	15
11/05/06	6:30p	48.1	48.1	48.7	47.7	3.0	5.0	W	49.8	15
11/05/06	6:45p	45.8	45.8	47.7	45.1	1.0	4.0	WSW	48.8	15
11/05/06	7:00p	45.2	45.2	46.3	41.9	0.0	2.0	WSW	47.9	15
11/05/06	7:15p	43.9	43.9	45.6	42.0	1.0	2.0	WSW	47.0	15
11/05/06	7:30p	44.7	44.7	45.5	44.2	1.0	3.0	WSW	46.1	15
11/05/06	7:45p	45.9	45.9	48.4	43.9	2.0	6.0	WSW	45.4	15
11/05/06	8:00p	47.5	47.5	49.4	46.1	2.0	5.0	W	44.8	15
11/05/06	8:15p	47.6	47.6	49.4	46.4	2.0	6.0	WSW	44.3	15
11/05/06	8:30p	48.4	48.4	49.1	47.3	2.0	5.0	WSW	44.0	15
11/05/06	8:45p	47.4	47.4	49.3	46.3	2.0	4.0	WSW	43.9	15
11/05/06	9:00p	48.5	48.5	49.4	47.1	3.0	5.0	WSW	43.8	15
11/05/06	9:15p	48.9	48.9	49.6	47.5	3.0	5.0	W	43.8	15
11/05/06	9:30p	48.4	48.4	49.2	47.1	2.0	5.0	W	43.9	15
11/05/06	9:45p	48.3	48.3	49.9	47.1	2.0	4.0	WSW	43.9	15
11/05/06	10:00p	49.2	49.2	49.9	47.7	3.0	5.0	W	44.0	15
11/05/06	10:15p	48.8	48.8	49.3	47.5	2.0	4.0	WSW	44.1	15
11/05/06	10:30p	46.3	46.3	47.5	45.8	1.0	2.0	W	44.2	15
11/05/06	10:45p	46.0	46.0	46.7	44.8	0.0	1.0	W	44.2	15
11/05/06	11:00p	44.9	44.9	45.8	43.9	1.0	2.0	W	44.2	15
11/05/06	11:15p	46.1	46.1	46.7	45.2	1.0	2.0	W	44.0	15

Marilyn2 11/05/06

Date	Time	Temp Out	Wind Chill	Hi Temp	Low Temp	Wind Speed	Hi	Dir	Temp In	Arc Per
11/05/06	11:30p	43.7	43.7	45.2	41.9	1.0	2.0	W	43.6	15
11/05/06	11:45p	42.5	42.5	44.2	41.9	1.0	3.0	W	43.1	15
11/05/06	12:00p	44.5	44.5	44.8	44.1	2.0	2.0	W	42.6	15

Marilyn2 11/06/06

Date	Time	Temp Out	Wind Chill	Hi Temp	Low Temp	Wind Speed	Hi	Dir	Temp In	Arc Per
11/06/06	12:00a	44.5	44.5	44.8	44.1	2.0	2.0	W	42.6	15
11/06/06	12:15a	44.6	44.6	45.3	43.7	1.0	3.0	W	42.2	15
11/06/06	12:30a	40.2	40.2	43.9	38.5	0.0	2.0	W	41.7	15
11/06/06	12:45a	39.0	39.0	40.7	36.7	0.0	2.0	W	41.1	15
11/06/06	1:00a	38.4	38.4	40.6	35.7	0.0	2.0	W	40.3	15
11/06/06	1:15a	34.8	34.8	38.0	32.6	0.0	2.0	W	39.4	15
11/06/06	1:30a	32.5	32.5	34.7	31.4	1.0	4.0	W	38.5	15
11/06/06	1:45a	32.0	32.0	34.2	30.5	0.0	4.0	NW	37.5	15
11/06/06	2:00a	30.1	30.1	32.6	28.7	1.0	3.0	NW	36.6	15
11/06/06	2:15a	30.9	30.9	32.8	29.5	0.0	2.0	WNW	35.7	15
11/06/06	2:30a	35.1	35.1	37.4	31.3	0.0	0.0	---	34.9	15
11/06/06	2:45a	36.3	36.3	37.5	35.2	0.0	0.0	---	34.1	15
11/06/06	3:00a	37.3	37.3	38.6	36.3	0.0	0.0	---	33.4	15
11/06/06	3:15a	37.6	37.6	38.6	35.6	0.0	1.0	WNW	32.7	15
11/06/06	3:30a	36.0	36.0	39.0	33.6	1.0	3.0	SW	32.1	15
11/06/06	3:45a	37.8	37.8	39.4	36.4	0.0	2.0	S	31.7	15
11/06/06	4:00a	35.2	35.2	37.3	31.6	0.0	2.0	SW	31.4	15
11/06/06	4:15a	30.7	30.7	33.8	28.3	0.0	3.0	W	31.1	15
11/06/06	4:30a	34.4	34.4	37.8	30.1	1.0	3.0	SSE	30.8	15
11/06/06	4:45a	31.6	31.6	37.3	29.5	0.0	2.0	SSE	30.5	15
11/06/06	5:00a	31.4	31.4	32.7	30.0	0.0	3.0	WNW	30.2	15
11/06/06	5:15a	28.6	28.6	30.6	27.7	1.0	3.0	NW	30.0	15
11/06/06	5:30a	29.2	29.2	34.6	26.8	0.0	2.0	W	29.6	15
11/06/06	5:45a	34.4	34.4	36.9	31.8	0.0	2.0	SSW	29.3	15
11/06/06	6:00a	31.8	31.8	32.4	31.3	0.0	1.0	---	29.1	15
11/06/06	6:15a	31.3	31.3	32.5	30.7	0.0	2.0	SSW	28.8	15
11/06/06	6:30a	31.3	31.3	32.5	30.2	0.0	1.0	SSW	28.5	15
11/06/06	6:45a	32.0	32.0	36.5	28.4	0.0	3.0	SE	28.3	15
11/06/06	7:00a	37.9	37.9	40.0	35.9	0.0	3.0	SSW	28.2	15
11/06/06	7:15a	40.4	40.4	42.2	38.8	0.0	3.0	SSW	28.3	15
11/06/06	7:30a	43.8	43.8	45.7	41.4	1.0	4.0	S	28.8	15
11/06/06	7:45a	44.0	44.0	45.0	42.6	0.0	3.0	SE	29.7	15
11/06/06	8:00a	44.3	44.3	46.6	42.9	0.0	3.0	SE	31.0	15
11/06/06	8:15a	47.7	47.7	49.8	46.0	1.0	5.0	SE	32.5	15
11/06/06	8:30a	50.8	50.8	54.1	47.5	1.0	4.0	SSE	34.3	15
11/06/06	8:45a	53.4	53.4	54.8	52.2	1.0	7.0	SSE	36.5	15
11/06/06	9:00a	52.9	52.9	54.3	52.1	2.0	8.0	SE	39.5	15
11/06/06	9:15a	54.0	54.0	55.8	52.8	2.0	7.0	SSE	42.8	15
11/06/06	9:30a	56.1	56.1	56.9	55.3	2.0	7.0	SE	46.6	15
11/06/06	9:45a	57.4	57.4	60.2	56.2	2.0	7.0	SSE	51.0	15
11/06/06	10:00a	59.1	59.1	60.2	58.0	2.0	5.0	ESE	55.3	15
11/06/06	10:15a	62.0	62.0	64.2	60.2	2.0	6.0	ESE	59.5	15
11/06/06	10:30a	60.3	60.3	62.3	58.8	2.0	6.0	SE	63.7	15
11/06/06	10:45a	63.2	63.2	66.5	60.3	2.0	8.0	ESE	67.1	15
11/06/06	11:00a	65.5	65.5	68.7	61.3	2.0	5.0	SE	70.2	15
11/06/06	11:15a	63.5	63.5	65.5	61.2	1.0	8.0	SE	73.4	15
11/06/06	11:30a	66.2	66.2	68.2	64.1	2.0	7.0	SE	75.8	15

Marilyn2 11/06/06

Date	Time	Temp Out	Wind Chill	Hi Temp	Low Temp	Wind Speed	Hi	Dir	Temp In	Arc Per
11/06/06	11:45a	68.2	68.2	70.1	65.3	1.0	6.0	SSE	78.2	15
11/06/06	12:00p	69.0	69.0	71.4	67.2	2.0	5.0	W	80.8	15
11/06/06	12:15p	69.9	69.9	73.4	66.4	1.0	5.0	SSW	83.6	15
11/06/06	12:30p	68.3	68.3	71.4	65.9	1.0	5.0	WNW	86.0	15
11/06/06	12:45p	68.6	68.6	71.1	66.9	2.0	5.0	E	87.5	15
11/06/06	1:00p	70.0	70.0	71.2	68.3	2.0	5.0	ESE	88.9	15
11/06/06	1:15p	68.2	68.2	69.5	67.4	2.0	6.0	E	89.6	15
11/06/06	1:30p	67.3	67.3	68.5	66.3	2.0	5.0	E	89.4	15
11/06/06	1:45p	67.0	67.0	68.1	66.1	2.0	5.0	E	87.7	15
11/06/06	2:00p	68.2	68.2	69.5	66.9	2.0	8.0	ENE	85.5	15
11/06/06	2:15p	68.0	68.0	69.6	66.7	3.0	6.0	ENE	83.7	15
11/06/06	2:30p	68.2	68.2	69.5	66.7	3.0	6.0	ENE	81.8	15
11/06/06	2:45p	65.9	65.9	66.8	65.5	2.0	4.0	ENE	79.9	15
11/06/06	3:00p	66.3	66.3	69.0	65.0	2.0	5.0	ENE	77.9	15
11/06/06	3:15p	66.3	66.3	67.1	65.7	2.0	5.0	ENE	76.2	15
11/06/06	3:30p	66.0	66.0	67.0	65.5	1.0	3.0	ENE	74.5	15
11/06/06	3:45p	62.0	62.0	65.4	60.6	0.0	4.0	ENE	72.8	15
11/06/06	4:00p	60.1	60.1	60.6	59.9	0.0	0.0	---	70.9	15
11/06/06	4:15p	59.1	59.1	60.4	57.3	0.0	0.0	---	69.0	15
11/06/06	4:30p	56.7	56.7	57.8	55.3	0.0	0.0	---	67.0	15
11/06/06	4:45p	53.6	53.6	55.3	51.5	0.0	0.0	---	64.8	15
11/06/06	5:00p	49.4	49.4	51.5	46.9	0.0	0.0	---	62.5	15
11/06/06	5:15p	48.1	48.1	49.9	46.6	0.0	1.0	---	60.1	15
11/06/06	5:30p	49.6	49.6	50.3	48.2	0.0	1.0	ENE	57.8	15
11/06/06	5:45p	48.5	48.5	49.4	47.8	0.0	2.0	ENE	55.6	15
11/06/06	6:00p	47.5	47.5	49.3	46.4	0.0	2.0	NE	53.6	15
11/06/06	6:15p	46.6	46.6	47.6	45.1	0.0	0.0	---	51.9	15
11/06/06	6:30p	45.8	45.8	48.6	44.5	0.0	2.0	NE	50.2	15
11/06/06	6:45p	45.6	45.6	46.7	44.8	0.0	2.0	NNW	48.7	15
11/06/06	7:00p	46.4	46.4	48.2	44.8	0.0	2.0	W	47.4	15
11/06/06	7:15p	45.6	45.6	47.9	44.3	1.0	3.0	W	46.3	15
11/06/06	7:30p	45.5	45.5	46.1	44.4	1.0	3.0	W	45.4	15
11/06/06	7:45p	45.1	45.1	45.5	44.4	2.0	3.0	W	44.6	15
11/06/06	8:00p	44.5	44.5	45.7	43.0	2.0	2.0	W	43.9	15
11/06/06	8:15p	42.8	42.8	43.2	42.2	1.0	2.0	W	43.3	15
11/06/06	8:30p	42.9	42.9	44.0	42.2	1.0	2.0	W	42.8	15
11/06/06	8:45p	42.9	42.9	44.8	41.8	1.0	3.0	W	42.2	15
11/06/06	9:00p	42.2	42.2	43.1	40.6	1.0	3.0	W	41.7	15
11/06/06	9:15p	42.1	42.1	43.4	41.2	1.0	2.0	W	41.2	15
11/06/06	9:30p	42.5	42.5	45.5	39.6	0.0	2.0	ESE	40.7	15
11/06/06	9:45p	43.1	43.1	43.9	42.0	0.0	2.0	S	40.3	15
11/06/06	10:00p	42.2	42.2	44.6	40.1	0.0	2.0	SW	39.9	15
11/06/06	10:15p	44.5	44.5	45.5	43.4	1.0	3.0	WSW	39.5	15
11/06/06	10:30p	42.4	42.4	43.4	41.6	1.0	2.0	WSW	39.2	15
11/06/06	10:45p	41.4	41.4	42.6	38.7	1.0	2.0	WSW	39.0	15
11/06/06	11:00p	39.9	39.9	40.6	39.0	0.0	2.0	ESE	38.7	15
11/06/06	11:15p	38.1	38.1	40.0	36.6	0.0	1.0	ESE	38.4	15

Marilyn2 11/06/06

Date	Time	Temp Out	Wind Chill	Hi Temp	Low Temp	Wind Speed	Hi	Dir	Temp In	Arc Per
11/06/06	11:30p	35.5	35.5	36.6	34.7	1.0	3.0	WSW	38.0	15
11/06/06	11:45p	35.9	35.9	37.0	34.6	1.0	4.0	NNE	37.6	15
11/06/06	12:00p	35.7	35.7	37.0	34.6	1.0	6.0	W	37.2	15

Marilyn2 11/07/06

Date	Time	Temp Out	Wind Chill	Hi Temp	Low Temp	Wind Speed	Hi	Dir	Temp In	Arc Per
11/07/06	12:00a	35.7	35.7	37.0	34.6	1.0	6.0	W	37.2	15
11/07/06	12:15a	36.2	36.2	37.3	34.5	0.0	4.0	W	36.8	15
11/07/06	12:30a	34.1	34.1	35.1	33.2	0.0	3.0	E	36.4	15
11/07/06	12:45a	33.8	33.8	36.1	32.6	1.0	2.0	SSE	36.2	15
11/07/06	1:00a	32.9	32.9	34.9	32.0	1.0	2.0	W	35.8	15
11/07/06	1:15a	34.0	34.0	35.7	32.9	1.0	2.0	W	35.5	15
11/07/06	1:30a	36.2	36.2	37.8	34.6	0.0	2.0	W	35.3	15
11/07/06	1:45a	36.5	36.5	38.8	34.9	1.0	5.0	S	35.0	15
11/07/06	2:00a	36.9	36.9	39.5	35.1	0.0	5.0	W	34.8	15
11/07/06	2:15a	40.3	40.3	41.7	39.6	0.0	2.0	W	34.7	15
11/07/06	2:30a	39.8	39.8	41.5	38.6	1.0	5.0	W	34.6	15
11/07/06	2:45a	39.3	39.3	40.2	38.3	1.0	4.0	W	34.5	15
11/07/06	3:00a	38.3	38.3	39.8	37.2	1.0	5.0	S	34.5	15
11/07/06	3:15a	40.3	40.3	41.3	38.7	1.0	2.0	SE	34.6	15
11/07/06	3:30a	41.3	41.3	42.5	40.4	0.0	2.0	SE	34.7	15
11/07/06	3:45a	41.9	41.9	42.3	40.9	0.0	2.0	SE	34.9	15
11/07/06	4:00a	42.1	42.1	43.1	41.5	0.0	2.0	SSE	35.0	15
11/07/06	4:15a	41.9	41.9	43.1	40.5	0.0	2.0	SE	35.2	15
11/07/06	4:30a	43.0	43.0	44.8	41.4	1.0	2.0	SE	35.3	15
11/07/06	4:45a	40.9	40.9	41.6	40.1	0.0	2.0	ESE	35.3	15
11/07/06	5:00a	39.7	39.7	40.5	39.1	1.0	3.0	ESE	35.4	15
11/07/06	5:15a	38.6	38.6	39.2	38.0	1.0	2.0	ESE	35.5	15
11/07/06	5:30a	38.8	38.8	39.3	38.4	0.0	2.0	ESE	35.5	15
11/07/06	5:45a	38.6	38.6	39.0	37.9	0.0	2.0	SSW	35.5	15
11/07/06	6:00a	38.3	38.3	39.3	37.2	0.0	5.0	WNW	35.5	15
11/07/06	6:15a	37.4	37.4	38.3	36.3	0.0	3.0	ENE	35.4	15
11/07/06	6:30a	36.0	36.0	36.5	35.4	0.0	1.0	ENE	35.4	15
11/07/06	6:45a	36.5	36.5	37.9	35.5	0.0	2.0	ENE	35.2	15
11/07/06	7:00a	39.3	39.3	40.5	37.8	1.0	3.0	SSE	35.0	15
11/07/06	7:15a	41.0	41.0	42.7	39.7	1.0	3.0	SSE	35.0	15
11/07/06	7:30a	43.6	43.6	44.5	42.7	1.0	3.0	S	35.1	15
11/07/06	7:45a	46.0	46.0	47.0	44.5	1.0	4.0	S	35.6	15
11/07/06	8:00a	46.7	46.7	47.4	46.0	2.0	9.0	WNW	36.4	15
11/07/06	8:15a	44.0	44.0	46.2	43.1	4.0	8.0	NW	37.6	15
11/07/06	8:30a	45.3	45.3	45.8	44.1	1.0	6.0	NW	38.9	15
11/07/06	8:45a	44.8	44.8	45.8	43.7	1.0	3.0	NW	40.4	15
11/07/06	9:00a	49.7	49.7	53.8	46.0	1.0	3.0	WNW	41.8	15
11/07/06	9:15a	52.8	52.8	55.2	51.6	1.0	2.0	ESE	43.6	15
11/07/06	9:30a	60.9	60.9	65.1	55.4	0.0	3.0	S	46.4	15
11/07/06	9:45a	67.3	67.3	69.3	62.9	0.0	2.0	SW	50.6	15
11/07/06	10:00a	71.5	71.5	74.0	69.5	1.0	4.0	WSW	55.8	15
11/07/06	10:15a	74.7	74.7	76.9	72.2	1.0	7.0	WSW	61.5	15
11/07/06	10:30a	73.0	73.0	76.8	68.9	2.0	7.0	W	67.2	15
11/07/06	10:45a	75.3	75.3	77.9	73.2	4.0	11.0	WSW	72.5	15
11/07/06	11:00a	76.5	76.5	78.5	74.3	4.0	12.0	WSW	77.4	15
11/07/06	11:15a	76.9	76.1	79.5	74.9	5.0	14.0	WSW	81.8	15
11/07/06	11:30a	76.3	74.4	77.7	75.0	7.0	16.0	WSW	85.7	15

Marilyn2 11/07/06

Date	Time	Temp Out	Wind Chill	Hi Temp	Low Temp	Wind Speed	Hi	Dir	Temp In	Arc Per
11/07/06	11:45a	76.7	75.4	78.4	75.3	6.0	15.0	WSW	89.0	15
11/07/06	12:00p	77.3	76.0	78.7	76.1	6.0	13.0	W	91.7	15
11/07/06	12:15p	77.9	77.2	79.1	76.9	5.0	12.0	W	94.0	15
11/07/06	12:30p	77.9	76.2	79.2	76.6	7.0	15.0	W	96.1	15
11/07/06	12:45p	78.2	77.0	79.4	76.8	6.0	13.0	WNW	97.6	15
11/07/06	1:00p	78.3	76.6	80.0	76.8	7.0	16.0	W	98.5	15
11/07/06	1:15p	76.8	74.9	77.9	75.5	7.0	15.0	W	98.6	15
11/07/06	1:30p	76.7	74.3	78.3	75.7	8.0	15.0	WSW	97.7	15
11/07/06	1:45p	75.8	73.8	77.1	74.4	7.0	15.0	WSW	95.8	15
11/07/06	2:00p	76.8	74.9	78.5	75.3	7.0	15.0	WSW	93.5	15
11/07/06	2:15p	74.1	73.2	76.0	73.0	5.0	14.0	WSW	91.4	15
11/07/06	2:30p	72.3	69.8	73.2	71.4	7.0	15.0	WSW	89.2	15
11/07/06	2:45p	70.9	69.0	71.4	70.6	6.0	14.0	WSW	86.8	15
11/07/06	3:00p	71.4	68.8	71.9	71.0	7.0	14.0	WSW	84.2	15
11/07/06	3:15p	71.0	68.4	71.7	69.8	7.0	15.0	WSW	81.9	15
11/07/06	3:30p	69.2	67.2	69.9	68.7	6.0	11.0	WSW	79.8	15
11/07/06	3:45p	67.8	65.6	69.3	66.5	6.0	14.0	WSW	77.7	15
11/07/06	4:00p	66.0	64.6	66.8	65.0	5.0	12.0	WSW	75.7	15
11/07/06	4:15p	65.9	61.7	66.3	65.7	8.0	14.0	WSW	73.7	15
11/07/06	4:30p	66.4	63.2	67.0	65.8	7.0	14.0	WSW	71.8	15
11/07/06	4:45p	63.9	63.9	65.9	61.9	3.0	7.0	WSW	70.1	15
11/07/06	5:00p	61.0	61.0	62.0	59.9	2.0	3.0	WSW	68.4	15
11/07/06	5:15p	60.3	60.3	60.8	59.8	3.0	6.0	WSW	66.7	15
11/07/06	5:30p	60.8	60.8	62.0	59.3	3.0	7.0	WSW	64.9	15
11/07/06	5:45p	58.9	58.9	59.4	58.1	1.0	5.0	WSW	63.2	15
11/07/06	6:00p	56.7	56.7	58.0	55.4	1.0	3.0	W	61.6	15
11/07/06	6:15p	57.7	57.7	59.9	55.8	3.0	8.0	WSW	60.0	15
11/07/06	6:30p	61.0	58.2	61.8	59.6	6.0	11.0	WSW	58.5	15
11/07/06	6:45p	59.7	58.0	60.2	59.2	5.0	10.0	W	57.3	15
11/07/06	7:00p	59.1	59.1	59.8	57.7	4.0	8.0	WSW	56.3	15
11/07/06	7:15p	58.2	58.2	59.4	56.9	4.0	8.0	WSW	55.5	15
11/07/06	7:30p	55.7	55.7	57.3	53.4	1.0	4.0	WSW	54.7	15
11/07/06	7:45p	53.9	53.9	54.8	53.4	0.0	2.0	E	53.9	15
11/07/06	8:00p	52.7	52.7	54.6	50.8	1.0	2.0	E	53.0	15
11/07/06	8:15p	56.4	56.4	58.1	53.7	1.0	3.0	SW	52.1	15
11/07/06	8:30p	57.4	57.4	58.0	56.9	2.0	3.0	SW	51.3	15
11/07/06	8:45p	56.3	56.3	57.8	55.6	1.0	4.0	WSW	50.7	15
11/07/06	9:00p	55.7	55.7	57.6	54.3	1.0	6.0	NW	50.2	15
11/07/06	9:15p	52.6	52.6	54.2	51.8	0.0	1.0	WNW	49.7	15
11/07/06	9:30p	53.4	53.4	54.5	51.6	0.0	2.0	WNW	49.1	15
11/07/06	9:45p	51.7	51.7	53.6	50.3	0.0	2.0	WNW	48.4	15
11/07/06	10:00p	54.3	54.3	56.3	50.4	0.0	3.0	SW	47.8	15
11/07/06	10:15p	55.7	55.7	56.7	54.8	0.0	3.0	SW	47.2	15
11/07/06	10:30p	55.8	55.8	56.5	54.5	1.0	4.0	WSW	46.8	15
11/07/06	10:45p	56.7	56.7	57.2	55.8	2.0	3.0	WSW	46.7	15
11/07/06	11:00p	56.1	56.1	57.4	54.9	0.0	3.0	SSW	46.6	15
11/07/06	11:15p	57.7	57.7	60.2	54.7	1.0	6.0	W	46.6	15

Marilyn2 11/08/06

Date	Time	Temp Out	Wind Chill	Hi Temp	Low Temp	Wind Speed	Hi	Dir	Temp In	Arc Per
11/08/06	12:00a	51.5	51.5	52.8	49.7	0.0	2.0	W	45.7	15
11/08/06	12:15a	50.1	50.1	51.8	49.0	1.0	3.0	WSW	45.1	15
11/08/06	12:30a	54.5	54.5	57.1	51.3	1.0	3.0	WSW	44.6	15
11/08/06	12:45a	55.2	55.2	57.2	52.2	1.0	3.0	WSW	44.5	15
11/08/06	1:00a	53.4	53.4	55.9	50.6	1.0	3.0	W	44.6	15
11/08/06	1:15a	55.0	55.0	56.4	54.1	0.0	2.0	WSW	44.7	15
11/08/06	1:30a	55.3	55.3	57.9	54.3	0.0	2.0	WSW	44.9	15
11/08/06	1:45a	57.4	57.4	58.5	56.8	1.0	2.0	WSW	45.1	15
11/08/06	2:00a	55.6	55.6	57.3	54.2	0.0	2.0	WSW	45.4	15
11/08/06	2:15a	52.4	52.4	54.8	49.4	0.0	1.0	WSW	45.6	15
11/08/06	2:30a	50.7	50.7	52.7	49.5	0.0	2.0	WSW	45.7	15
11/08/06	2:45a	51.6	51.6	52.8	50.2	0.0	2.0	SSW	45.6	15
11/08/06	3:00a	47.1	47.1	51.3	43.4	1.0	3.0	ESE	45.5	15
11/08/06	3:15a	42.9	42.9	43.9	42.1	0.0	2.0	ESE	45.1	15
11/08/06	3:30a	42.8	42.8	44.1	41.6	0.0	0.0	---	44.5	15
11/08/06	3:45a	41.7	41.7	43.0	41.0	0.0	0.0	---	43.9	15
11/08/06	4:00a	44.3	44.3	46.4	42.7	0.0	0.0	---	43.1	15
11/08/06	4:15a	51.2	51.2	53.5	46.5	0.0	3.0	SSW	42.4	15
11/08/06	4:30a	51.6	51.6	53.0	49.6	1.0	4.0	WSW	41.8	15
11/08/06	4:45a	48.7	48.7	50.7	46.1	2.0	6.0	WSW	41.5	15
11/08/06	5:00a	44.0	44.0	46.4	42.2	2.0	7.0	WSW	41.3	15
11/08/06	5:15a	43.4	43.4	45.1	42.0	3.0	7.0	WSW	41.1	15
11/08/06	5:30a	47.2	47.2	56.7	42.8	3.0	8.0	WSW	40.8	15
11/08/06	5:45a	55.0	55.0	58.3	52.1	2.0	8.0	WSW	40.7	15
11/08/06	6:00a	41.2	41.2	52.3	38.6	1.0	4.0	ENE	40.7	15
11/08/06	6:15a	39.3	39.3	40.4	38.4	0.0	1.0	ENE	40.6	15
11/08/06	6:30a	38.4	38.4	39.8	36.9	0.0	2.0	SE	40.2	15
11/08/06	6:45a	37.2	37.2	38.4	36.0	0.0	1.0	SE	39.6	15
11/08/06	7:00a	37.4	37.4	40.7	35.9	0.0	2.0	SSE	39.0	15
11/08/06	7:15a	42.1	42.1	43.3	39.8	2.0	9.0	W	38.5	15
11/08/06	7:30a	46.3	46.3	47.4	43.3	2.0	6.0	WNW	38.3	15
11/08/06	7:45a	48.4	48.4	50.0	47.2	0.0	2.0	SW	38.6	15
11/08/06	8:00a	51.2	51.2	53.9	49.4	0.0	2.0	WSW	39.4	15
11/08/06	8:15a	54.3	54.3	55.9	53.1	1.0	4.0	E	40.6	15
11/08/06	8:30a	57.6	57.6	60.7	55.1	1.0	4.0	SSE	42.3	15
11/08/06	8:45a	62.7	62.7	65.2	58.6	0.0	3.0	S	44.6	15
11/08/06	9:00a	63.4	63.4	64.9	62.0	1.0	4.0	SW	47.8	15
11/08/06	9:15a	63.7	63.7	65.2	61.8	1.0	4.0	NW	51.2	15
11/08/06	9:30a	64.9	64.9	66.9	63.2	1.0	4.0	ENE	55.1	15
11/08/06	9:45a	68.0	68.0	69.8	66.5	2.0	4.0	ENE	59.6	15
11/08/06	10:00a	72.3	72.3	73.9	69.5	1.0	4.0	ESE	64.4	15
11/08/06	10:15a	74.6	74.6	77.6	72.3	1.0	4.0	E	69.4	15
11/08/06	10:30a	76.5	76.5	79.0	75.3	1.0	4.0	ENE	74.1	15
11/08/06	10:45a	78.1	78.1	81.6	74.7	1.0	5.0	ENE	78.6	15
11/08/06	11:00a	79.8	79.8	82.8	77.1	2.0	9.0	NE	82.7	15
11/08/06	11:15a	79.4	79.4	81.2	77.1	4.0	10.0	W	86.6	15
11/08/06	11:30a	78.9	78.9	80.7	77.5	4.0	12.0	WNW	90.1	15

Marilyn2 11/08/06

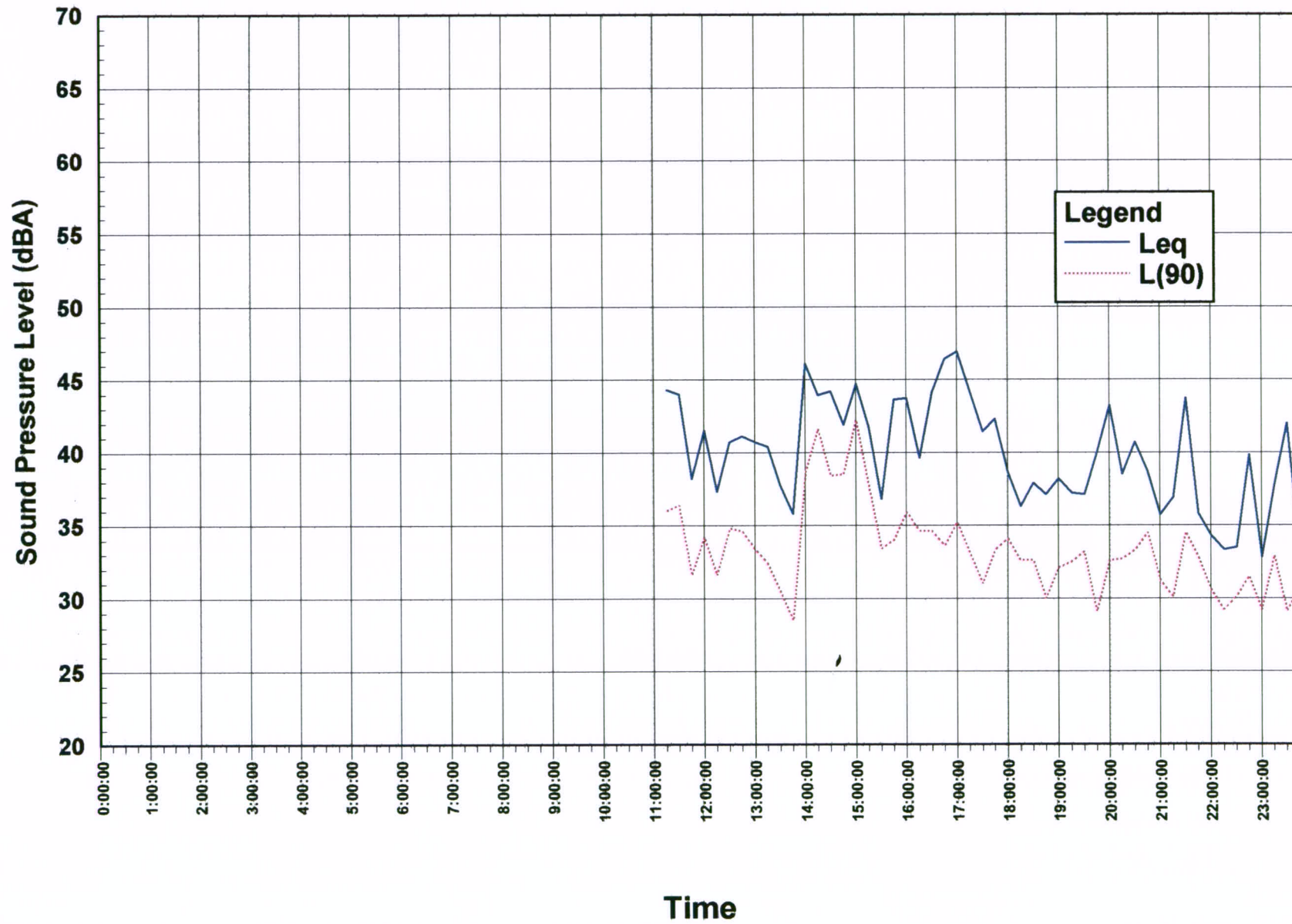
Date	Time	Temp Out	Wind Chill	Hi Temp	Low Temp	Wind Speed	Hi	Dir	Temp In	Arc Per
11/08/06	11:45a	80.5	80.5	82.0	79.0	2.0	7.0	NW	93.2	15
11/08/06	12:00p	81.3	81.3	84.1	79.4	1.0	5.0	N	96.0	15
11/08/06	12:15p	81.6	81.6	83.5	79.7	2.0	10.0	NW	98.3	15
11/08/06	12:30p	81.1	80.5	82.1	80.0	5.0	11.0	WNW	100.1	15
11/08/06	12:45p	81.6	80.3	82.8	80.7	7.0	17.0	W	101.4	15
11/08/06	1:00p	81.8	79.9	82.8	80.7	9.0	20.0	W	102.1	15
11/08/06	1:15p	82.2	81.4	83.1	80.4	6.0	17.0	WSW	101.8	15
11/08/06	1:30p	80.0	77.1	80.8	79.4	11.0	21.0	W	100.7	15
11/08/06	1:45p	80.5	78.7	81.4	79.7	8.0	17.0	W	98.1	15
11/08/06	2:00p	80.8	78.6	81.6	80.1	9.0	17.0	W	95.3	15
11/08/06	2:15p	80.4	78.6	81.1	79.8	8.0	14.0	W	92.6	15
11/08/06	2:30p	80.3	79.7	81.7	77.7	5.0	14.0	WNW	88.6	15
11/08/06	2:45p	<u>76.8</u>	<u>76.8</u>	<u>77.7</u>	<u>76.6</u>	<u>0.0</u>	<u>0.0</u>	---	<u>84.0</u>	<u>15</u>
11/08/06	3:00p	<u>76.7</u>	<u>76.7</u>	<u>76.8</u>	<u>76.6</u>	<u>0.0</u>	<u>0.0</u>	---	<u>82.6</u>	<u>15</u>
11/08/06	3:15p	<u>77.0</u>	<u>77.0</u>	<u>77.2</u>	<u>76.8</u>	<u>0.0</u>	<u>0.0</u>	---	<u>81.9</u>	<u>15</u>
11/08/06	3:30p	<u>77.3</u>	<u>77.3</u>	<u>77.5</u>	<u>77.2</u>	<u>0.0</u>	<u>0.0</u>	---	<u>81.6</u>	<u>15</u>
11/08/06	3:45p	<u>77.5</u>	<u>77.5</u>	<u>77.6</u>	<u>77.5</u>	<u>0.0</u>	<u>0.0</u>	---	<u>81.4</u>	<u>15</u>
11/08/06	4:00p	<u>77.5</u>	<u>77.5</u>	<u>77.6</u>	<u>77.5</u>	<u>0.0</u>	<u>0.0</u>	---	<u>81.1</u>	<u>15</u>

Appendix C

Sound Level Plots from The Thuener Residence

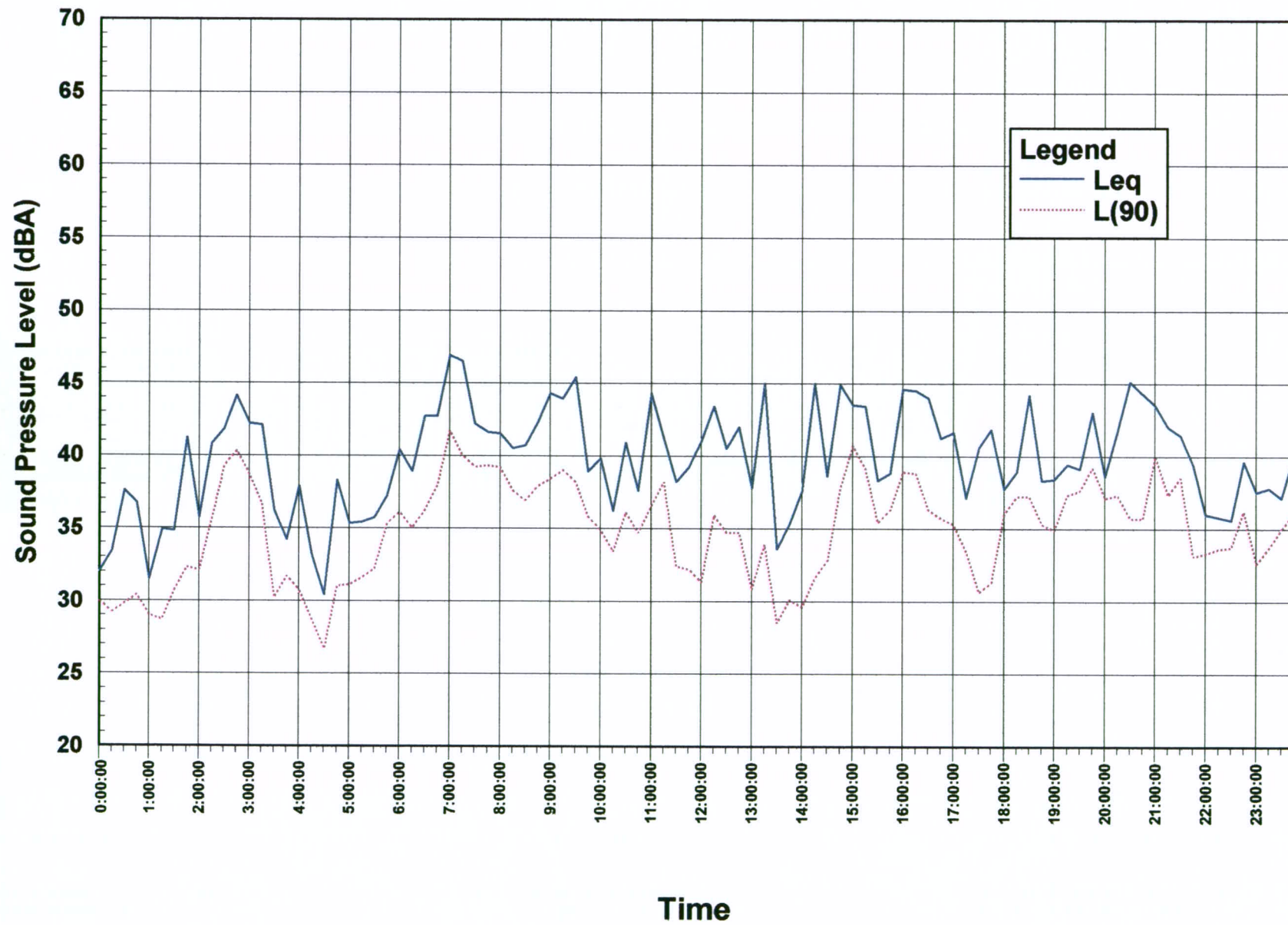
Thuener Residence: Friday, November 3, 2006

Ambient Sound Levels



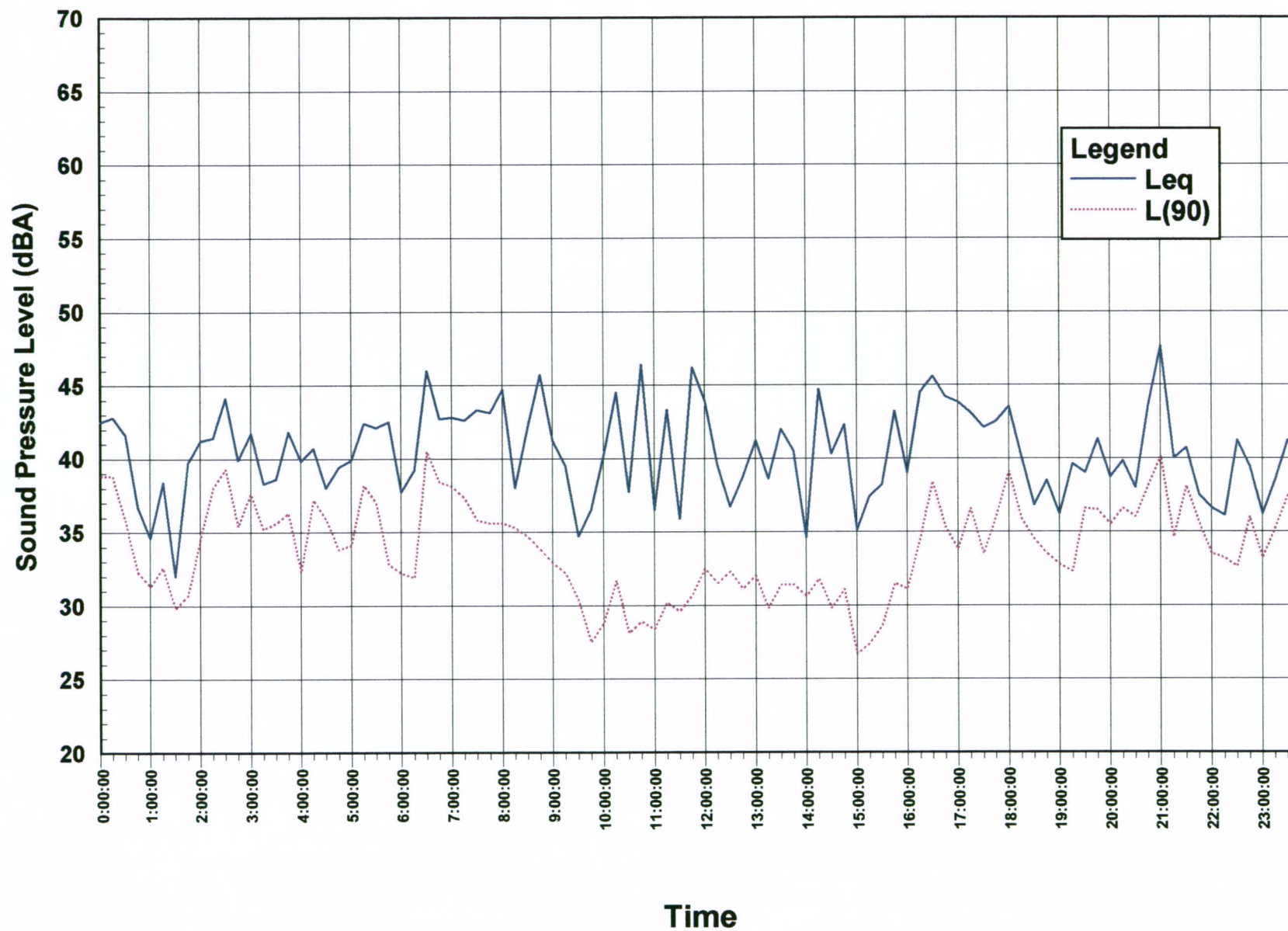
Thuener Residence: Saturday, November 4, 2006

Ambient Sound Levels



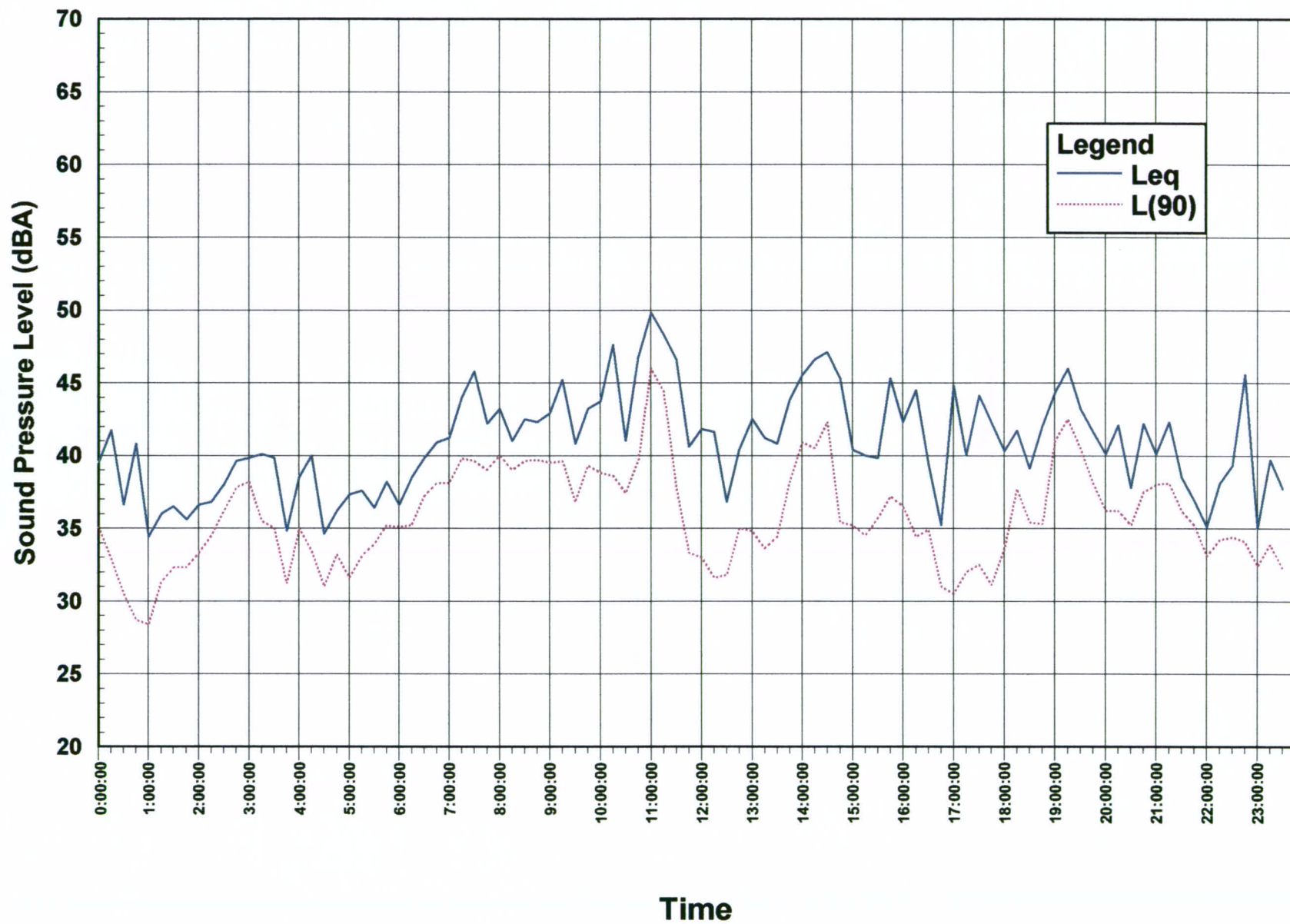
Thuener Residence: Sunday, November 5, 2006

Ambient Sound Levels



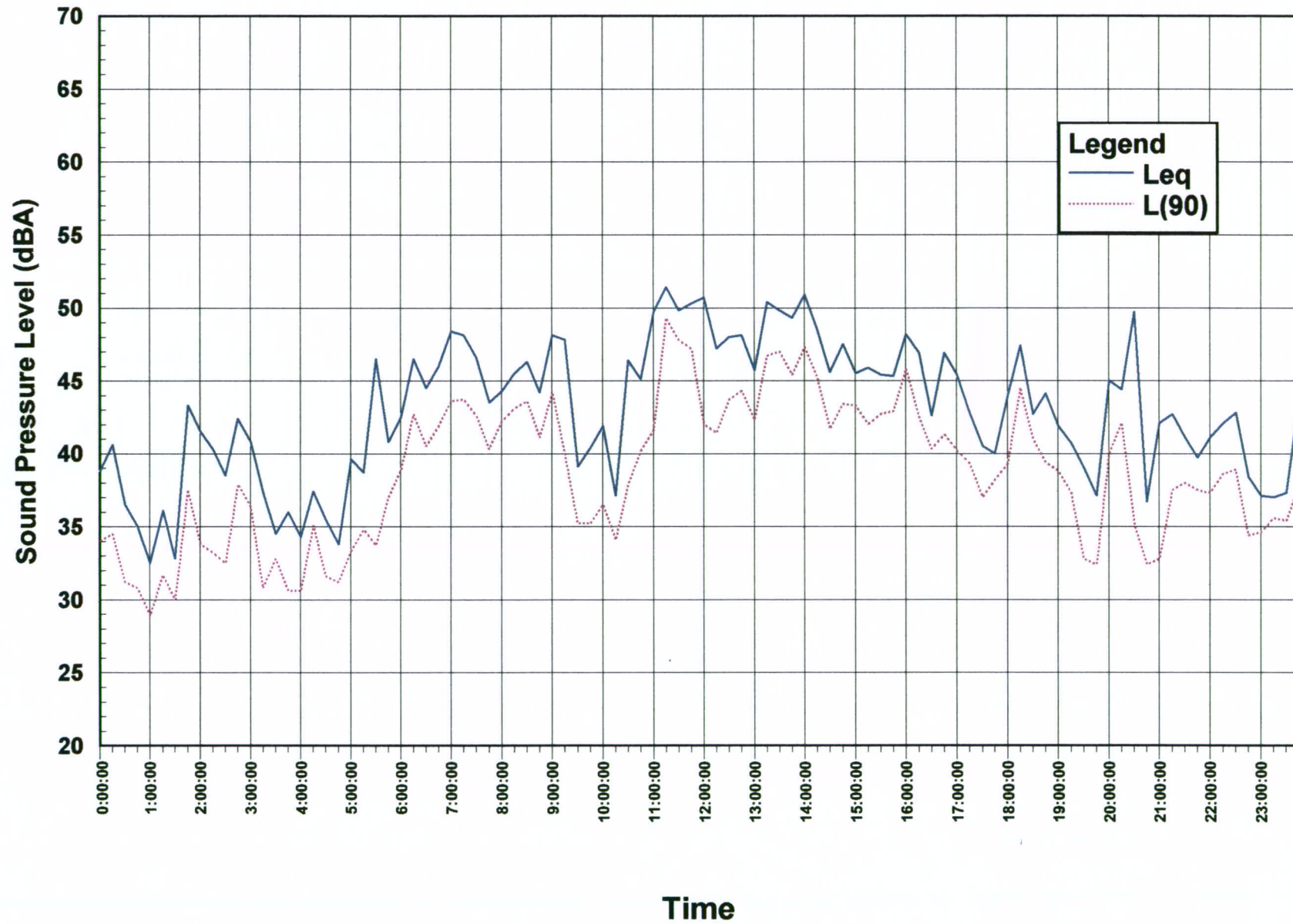
Thuener Residence: Monday, November 6, 2006

Ambient Sound Levels



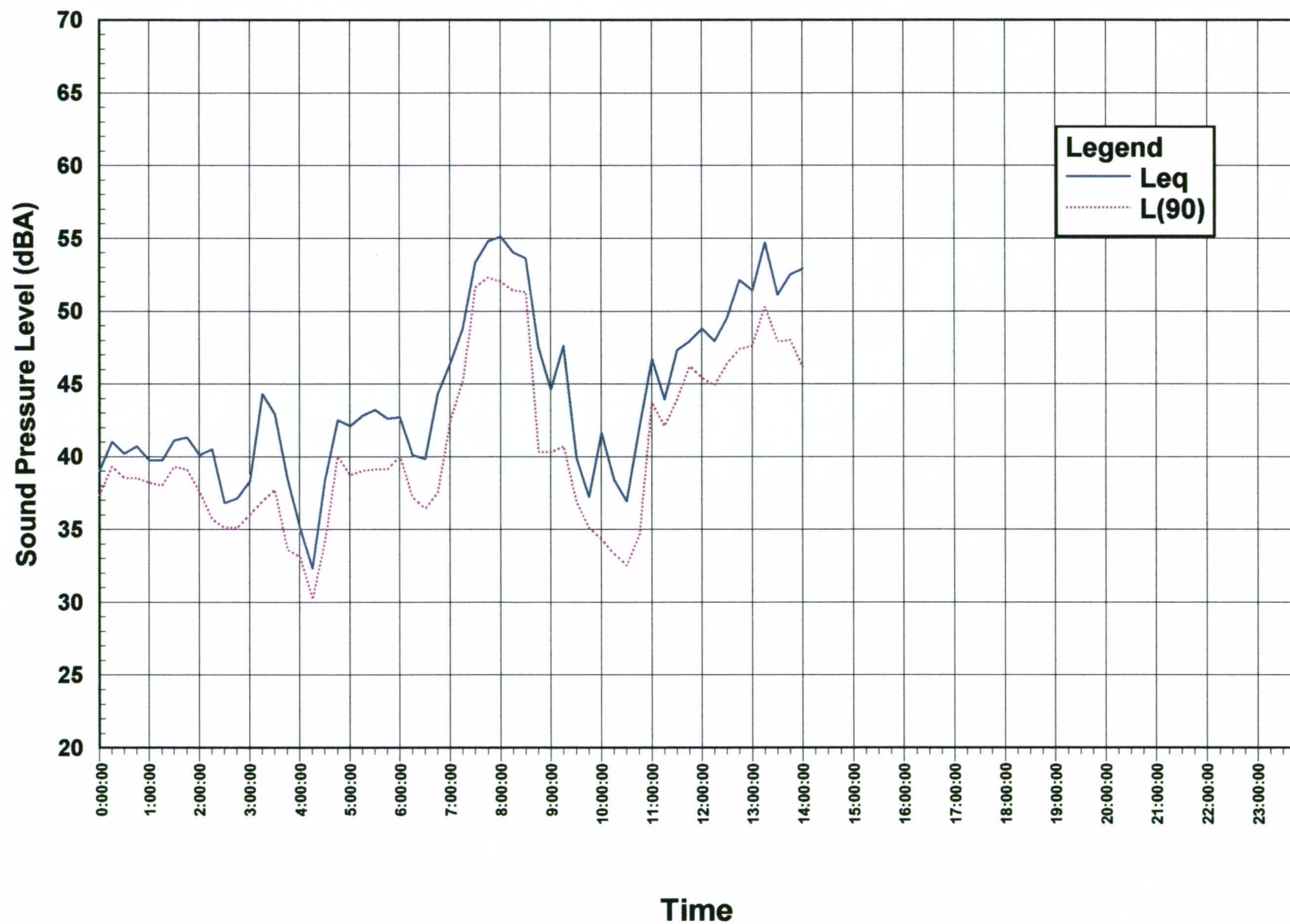
Thuener Residence: Tuesday, November 7, 2006

Ambient Sound Levels



Thuener Residence: Wednesday, November 8, 2006

Ambient Sound Levels



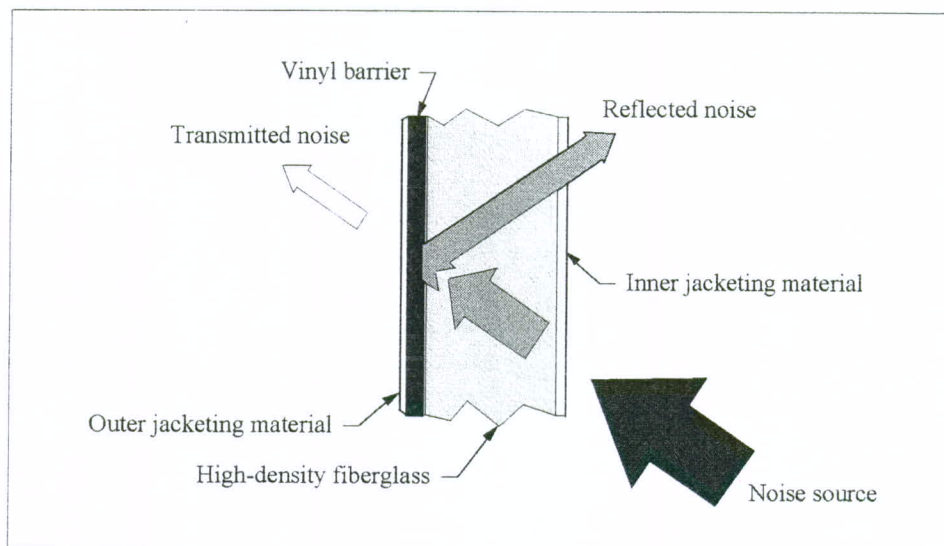
Appendix D

Product Literature

INSULTECH

About Acoustic Blanket Insulation

Insultech Acoustic Blanket Insulation is an extremely versatile and efficient solution to common industrial noise problems. It combines high density fiberglass mat with a mass-loaded Vinyl sandwiched between a weatherproof jacketing. The purpose of the fiberglass is to reduce reflected noise and to absorb noise energy, while the mass-loaded vinyl blocks transmitted noise. The fiberglass also has excellent thermal insulation qualities. While combining both an absorbing material and a well matched barrier material, the acoustic blanketing yields a highly efficient and cost effective means for solving industrial noise control problems.



Insultech Acoustic Blanket Insulation is completely custom fit to meet your application's needs. Its flexibility and strength add to the versatility of this type of system, while the chemical resistance and high-temperature capabilities of the outer jacketing material allow **Insultech** Acoustic Insulation to perform extremely well in nearly every industrial environment.

INSULTECH2-1 **Index**

2-2

Design Specification:							LT250A-VP	
Service	Temperature		Permeability Pervious / Impervious		Outdoor Use	Chemical Resist	Abrasion Resist	Fire Rating
Equipment Piping	250			✓	Good	Good	Good	Non-Flammable

2-3

Design Specification:						LT450A-TT		
Service	Temperature		Permeability Pervious / Impervious		Outdoor Use	Chemical Resist	Abrasion Resist	Fire Rating
Equipment Piping	450	232		✓	Excellent	Excellent	Good	Non-Flammable

2-4

Design Specification:					MT800A-TGM			
Service	Temperature		Permeability Pervious / Impervious		Outdoor Use	Chemical Resist	Abrasion Resist	Fire Rating
Equipment Piping	800	427	✓		Good	Good	Good	Self-Extinguishing

2-5

Design Specification:						HT 1000A-MTFM		
Service	Temperature		Permeability Pervious / Impervious		Outdoor Use	Chemical Resist	Abrasion Resist	Fire Rating
Equipment Piping	1000	538		✓	Excellent	Excellent	Excellent	Non-Flammable

2-6

Design Specification:					HT1100A-MSGM			
Service	Temperature		Permeability Pervious / Impervious		Outdoor Use	Chemical Resist	Abrasion Resist	Fire Rating
Equipment Piping	1100	593	✓		Excellent	Good	Excellent	Self-Extinguishing

INSULTECH

Specification LT250A-VP

Design Specification:

LT250A-VP

Service	Temperature	Permeability Pervious / Impervious	Outdoor Use	Chemical Resist	Abrasion Resist	Fire Rating
Equipment	250	✓	Good	Good	Good	Nonflammable

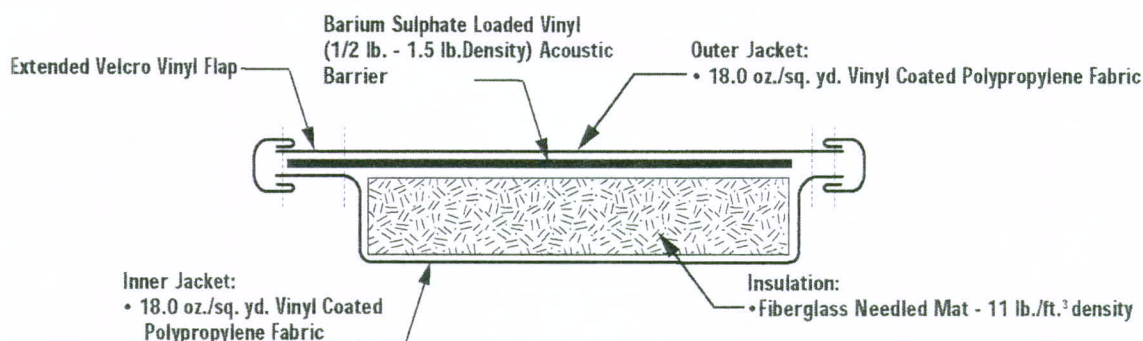
Application

- Process Piping • Pump Housings • Valves • Chiller Heads • Back Flow Preventers • Fittings • Compressor Housings • Fan Housings
- Piping/Ducting • Regulator Valves • Blower Housings • Curtains • Motor Housings • Flow Meters • Enclosure

Market

Commercial HVAC • Equipment Operating Above OSHA Required Sound Limits

Design Components:



Blanket Thickness Surface Temperature Reference:

Operating Temperature	Thickness / Surface Temperature	Thickness / Surface Temperature	Thickness / Surface Temperature
250°F (121°C)	1" 100.2°F	1.5" 92.0°F	2" 87.4°F

- * The above reference cold face surface temperatures should be used as guidelines for blanket thickness design.
- * The cold face surface temperature of the blanket should achieve ambient temperature conditions.
- * The economic thickness of the blanket should consider blanket cost to thermal performance.
- * Heat loss calculations are based on a 70°F ambient using a flat surface condition.

Blanket Thickness to Acoustic Performance:

DBA Reduction Range	Thickness	Surface Mass
2 - 5 DBA	1"	1.38 - 2.38 lb/SF
6 - 10 DBA	1.5"	1.82 - 3.10 lb/SF
11 - 15 DBA	2"	2.5 - 3.51 lb/SF

- * The above DBA reductions are approximations. These figures are only guidelines of performance.
- * True estimates should include field verification of DBA levels and frequency concentrations.

INSULTECH

Specification
LT250A-VP

Fabrication Requirements

Design Requirements

The INSULTECH Thermal Blanket System will be custom fitted to the treated surface. This will ensure maximum thermal performance and will allow quick and easy installation and removal. Blanket pieces will match and account for all surface protrusions (Ex. Tubing, Brackets). All blanket pieces will include necessary fastening hardware of both Stainless Steel Wiretwists and extended Hook & Loop Velcro™ Flaps. There will be no open gaps on any closing seams.

Blanket Construction

Blanket construction shall be a double sewn lock stitch with a minimum of 7 stitches per inch. All raw jacket edges will have a tri fold Teflon cloth binding. No raw cut jacket edge will be exposed. Stitching will be done with Teflon coated fiberglass thread.

Blanket Overlap

To avoid penetrating cold at closing seams, blanket pieces will include an extended 2" wide fabric flap. This flap will cover the exposed seam and will minimize any potential air movement.

ID Plates

For easy identification and location, a stainless steel or aluminum name plate tag is riveted to each blanket piece. 1/8" Embossed lettering shows location, description, size, pressure rating and tag number sequence.

Quality Pins

To enhance blanket quality and to maintain uniform thickness, stainless steel quilting pins will be placed at random locations no greater than 18" apart. This will prevent shifting of the insulation filler.

Minimized Air Void

Blanket design will conform to the equipment surface with minimized air void. The total number of pieces will be minimized. Any one piece will not exceed 50 lbs. in weight. Designs will minimize installation time as well as removal time.

Assembly Drawing Requirements

For multi-piece designs, an installation assembly drawing is required. The assembly drawing will reference tag number sequence for installation. Each blanket piece will have an I.D. tag corresponding to the assembly drawing. Instructions for install and a Material List will also be included. Copies will be submitted for future reference and files.

Design Requirements

All blanket designs will accommodate vibration probes, gauges, tubing, piping, brackets, etc. All blanket pieces will be guaranteed to fit.

Standard Fastener

A 20 gauge stainless steel wire is doubled up and twisted in a spiral fashion with a minimum of 4 twists per inch. Wiretwist length will be 16" or longer. The Wiretwist will be secured to the lacing pin at the pin stem. Lacing pin stems will be 14 gauge.

Fastening Options

1) Velcro

Velcro hook & loop fastener sewn to an outer jacketing flap. 1" wide "D" Ring fastener sewn onto the belt. A minimum 3" of belting will be secured to the outer jacket fabric. Belting will be spaced apart a maximum of 6" at centerline between belts or blanket edge.

Design Guidelines

To access the true limitations of this recommended design, refer to the technical data sheets on each product component. Following these guidelines will produce the highest achievable service life. Blanket design quality can be reduced or enhanced by changing any one component. If a question arises regarding deviations from those stated guidelines, please contact your regional representative or call Shannon direct.

Project Qualifications

All items to be insulated will require a field takeoff prior to bid submittal, and must be reviewed for proper cost estimation. Upon receipt of project contract, each and every item must be accurately measured for retrofitting to existing field conditions and tagged with an aluminum or stainless steel identification tag showing an item number for installation reference. At the time of installation, blankets must have a corresponding item number shown on the blanket tag and must match to existing tagging on fitting. No standard blanket designs will be accepted. This will assure good thermal performance.

Warranties

All blankets will carry an 18 month warranty covering the replacement cost of the blanket. This warranty will cover blanket failure due to premature degradation from either blanket components used in the blanket, the blanket design construction or workmanship.



HANNON

ENTERPRISES OF W.N.Y., INC.

75 Main St., P.O. Box 199 / North Tonawanda, New York 14120
[716] 693-7954 / www.blanket-insulation.com

INSULTECH

Specification LT450A-TT

Design Specification:

LT450A-TT

Service	Temperature		Permeability		Outdoor Use	Chemical Resist	Abrasion Resist	Fire Rating
			Pervious	Impervious				
Process	450	232		✓	Excellent	Excellent	Good	Non-Flammable

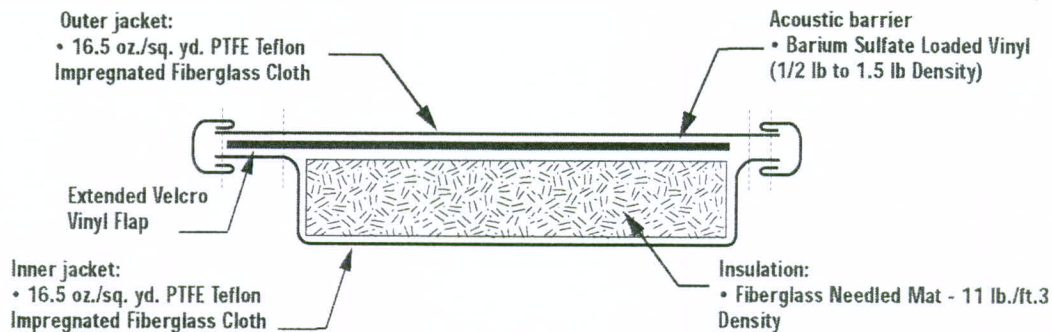
Application

• Motor Housing • Blowers • Rotary Chillers • Compressors • Gear Boxes • Compressor Housings • Piping & Fittings • Pump Housings • Fan Housings

Market

• Equipment operating above OSHA required sound limits • Commercial Industrial OEM

Design Components:



Blanket Thickness Surface Temperature Reference:

Operating Temperature	Thickness / Surface Temperature		Thickness / Surface Temperature		Thickness / Surface Temperature	
250°F (121°C)	1"	100.2°F	1.5"	92.0°F	2"	87.4°F
300°F (149°C)	1"	108.6°F	1.5"	98.2°F	2"	92.3°F
350°F (177°C)	1"	117.2°F	1.5"	104.6°F	2"	97.4°F
400°F (204°C)	1"	126.0°F	1.5"	111.2°F	2"	102.7°F
450°F (232°C)	1"	135.1°F	1.5"	118.0°F	2"	108.2°F

* The above reference cold face surface temperatures should be used as guidelines for blanket thickness design.

* The cold face surface temperature of the blanket should achieve ambient temperature conditions.

* The economic thickness of the blanket should consider blanket cost to thermal performance.

* Heat loss calculations are based on a 70°F ambient using a flat surface condition.

Blanket Thickness to Acoustic Performance:

DBA Reduction Range	Thickness	Surface Mass
2 - 5 DBA	1"	1.38 - 2.38 lb/SF
6 - 10 DBA	1.5"	1.82 - 3.10 lb/SF
11 - 15 DBA	2"	2.5 - 3.51 lb/SF

* The above DBA reductions are approximations. These figures are only guidelines of performance.

* True estimates should include field verification of DBA levels and frequency concentrations.

INSULTECH

Specification
LT450A-TT

Fabrication Requirements

Blanket Construction

Blanket construction is a double sewn lock stitch with a 7 stitches per inch minimum. All raw jacket edges have a tri-fold Teflon cloth binding stitched with Teflon coated fiberglass thread. No raw cut jacket edge will be exposed.

Resistant Flap

To avoid penetrating noise at mating seams, blanket pieces will include an extended 2" wide fabric vinyl flap. This flap will cover the exposed seam and will minimize any potential noise leaks.

ID Plates

For easy identification and location, a stainless steel or aluminum name plate tag is riveted to each blanket piece. 1/8" Embossed lettering shows location, description, size, pressure rating and tag number sequence.

Quality Pins

To enhance blanket quality and to maintain uniform thickness, stainless steel quilting pins will be placed at random locations no greater than 18" apart. This will prevent shifting of the insulation filler.

Blanket Insulation Weight

When designing blanket insulation for large equipment where a multi-piece construction is necessary, the total number of pieces will be minimized. Any one piece will not exceed 50 lbs. in weight.

Assembly Drawing Requirements

Each blanket insulation project will include an instruction package shipped with the blanket material. This package will include Assembly Drawings identifying piece location, a Material List of all pieces and Instructions for Installation on how blanket insulation will be installed. The latest and most accurate records must be kept *by the supplier* on a CAD file for a minimum of ten years to assure re-orders and replacement.

Guaranteed Fit

All blanket designs will accommodate vibration probes, gauges, tubing, piping, brackets, etc. All blanket pieces are guaranteed to fit for optimum acoustic performance.

Standard Fastener

A 20 gauge stainless steel wire is doubled up and twisted in a spiral fashion with a minimum of 4 twists per inch. Wiretwist length will be 16" or longer. The Wiretwist will be secured to the lacing pin at the pin stem. Lacing pin stems will be 14 gauge.

Fastening Options

1) Velcro Flaps

A 2" wide hook will be stitched to the blanket and a 2" wide loop will be stitched to an extended outer jacketing flap. Velcro is rated for temperatures up to 350°F.

2) Stainless Steel "D" Ring Strap with Velcro Tab

A three layer fabric strap is double sewn. One strap is a 16" long pulldown strap, the other is a 6" long stationary strap. Both straps are stitched to the outer jacketing of the blanket. The stationary strap includes a 304 stainless steel "D" Ring measuring 1.125" to 1.25" in width. This is placed 1/2" from the closing seam edge. The pulldown strap is placed 3" in from the closing seam edge. Both matching straps are spaced along the closing seam edge no greater than 8" apart. The pulldown strap includes hook-and-loop velcro, measuring at least 1" wide by 6" long, and is perimeter stitched to the strap surface. All closing seams have a 1.5" extended fabric flap, which is placed along the stationary strap side of the closing seam.

Design Guidelines

To access the true limitations of this recommended design, refer to the technical data sheets on each product component. Following these guidelines will produce the highest achievable service life. Blanket design quality can be reduced or enhanced by changing any one component. If a question arises regarding deviations from those stated guidelines, please contact your regional representative or call Shannon direct.

Project Qualifications

All items to be insulated will require a field takeoff prior to bid submittal, and must be reviewed for proper cost estimation. Upon receipt of project contract, each and every item must be accurately measured for retrofitting to existing field conditions and tagged with an aluminum or stainless steel identification tag showing an item number for installation reference. At the time of installation, blankets must have a corresponding item number shown on the blanket tag and must match to existing tagging on fitting. No standard blanket designs will be accepted. This will assure good thermal performance.

Warranties

All blankets will carry an 18 month warranty covering the replacement cost of the blanket. This warranty will cover blanket failure due to premature degradation from either blanket components used in the blanket, the blanket design construction or workmanship.



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INSULTECH

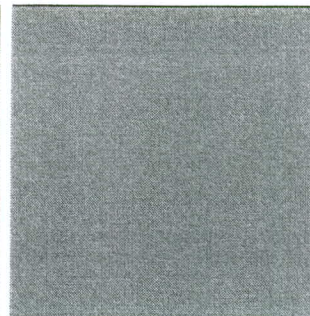
Material Components Acoustic Blankets

Vinyl Coated Polypropylene

18.0 oz. /sq. yd.

This jacket material is Vinyl Coated Polypropylene cloth. Used for many applications in the tarpaulin industry, as well as for commercial and military purposes. "Coverlight" has excellent tear and adhesive strength. It has the ability to maintain this adhesion after being immersed in water. It is abrasion, puncture, and tear resistant, along with resistance to fungicidal growth. These combined properties make this an excellent all purpose jacketing material.

Thickness	Max Fab. Width	Color	Temperature Rating Continuous / Intermittent	Tensile Strength Warp / Fill	Trapezoidal Tear Strength
0.017" typ.	60" typ.	gray	300°F	N/A	N/A

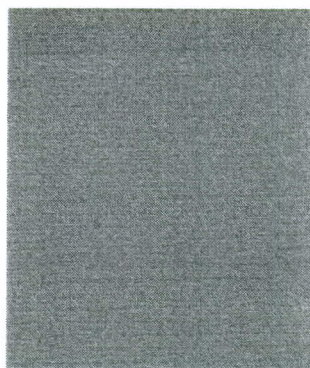


Teflon Impregnated Fiberglass

16.5 oz. /sq. yd.

This jacket material is PTFE Teflon impregnated fiberglass cloth. It is extremely well suited for both caustic and acidic environments, which are common in chemical and petrochemical industries. In addition to excellent chemical resistance properties, this material is also waterproof, oil resistant, abrasion resistant, and can withstand temperatures up to 500°F. These combined properties make this an excellent all purpose jacketing material. Flammability Rating: V-O Rating - UL94 vertical burn test.

Thickness	Max Fab. Width	Color	Temperature Rating Continuous / Intermittent	Tensile Strength Warp / Fill	Trapezoidal Tear Strength
0.016" typ.	60" typ.	gray	500°F	410 lbs./in. avg. Warp 375 lbs./in. avg. Fill	20 lbs. avg. Warp 20 lbs. avg. Fill



Plain Fiberglass Cloth

17.7 oz. / sq. yd.

This fabric is an untreated fiberglass jacketing used for high temperature applications. It is pervious to liquids and should be used where permeability is not a consideration. Because of its flexible nature, it works well as an economical, high-temperature fabric barrier for removable acoustic insulation blankets.

Material	Thickness	Width	Color	Temperature Rating Continuous / Intermittent	Breaking Strength Warp / Fill
de fiberglass fiber ends per inch warp 20 picks per inch fill 14	0.03" typ.	60" typ.	off white	800°F (371°C) Continuous 1000°F (538°C) Intermittent	200 lbs./in. avg. Warp 150 lbs./in. avg. Fill

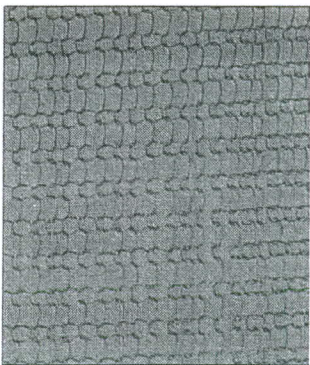


Stainless Steel Knitted Wire Mesh

11.0 oz. / sq. yd.

This jacketing material is type 304 stainless steel knitted wire mesh. The primary purpose of this jacketing is to protect the jacketing material and insulation from abrasion. This material is also used as the main jacketing for very high temperature applications where dual-layer designs are required.

Thickness	Width	Color	Temperature Rating	Approximate Yield
0.011" dia.	60" typ.	steel gray	2300°F (649°C)	16 sf./lb.



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Material Components Acoustic Blankets

Barium Loaded Non-reinforced Vinyl	1.0 lb./sq.ft.					
This filler material is barium loaded non-reinforced PVC sound deadening material. When used in conjunction with fiberglass mat, this material creates a decoupled barrier within the acoustic blanket, giving it excellent sound attenuation properties. Elongation properties are 200%. Burn test properties: MVX-302: Pass (self ext.), MIL STD 6411:9 Pass.						
Die "C" Tear	Thickness	Max Fab. Width		Color	Temperature Rating	
114 lbs./in. strength	0.108" typ.	54" typ.		black	Max. 250°F	
Frequency (Hz)	125	250	500	1K	2K	4K
Transmission Loss (dB)	15	18	22	26	32	37

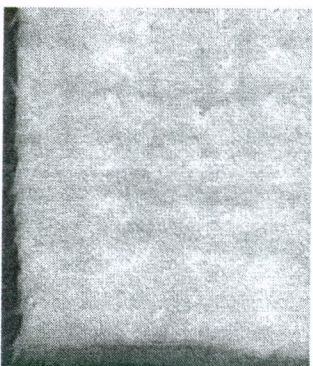


Barium Loaded Non-reinforced Vinyl				1.5 lb./sq.ft.		
This filler material is barium loaded non-reinforced PVC sound deadening material. When used in conjunction with fiberglass mat, this material creates a decoupled barrier within the acoustic blanket, giving it excellent sound attenuation properties. Elongation properties are 200%. Burn test properties:						
Die "C" Tear	Thickness	Max Fab. Width	Color		Temperature Rating	
114 lbs./in. strength	0.149" typ.	54" typ.	black		Max. 250°F	
Frequency (Hz)	125	250	500	1K	2K	4K
Transmission Loss (dB)	17	23	27	33	36	40



Fiberglass Needled Mat				15 oz./sq.ft. (1" thick)	
This material is a high-temperature fiberglass composed of type E fibers and manufactured in mat form. It is asbestos free and does not contain any organic or resinous binders. The material is noncombustible, provides excellent vibration resistance and complies with the following Military Standards: MIL-I-24244A and MIL-I-16411All.					
Fiber Diameter	Density	Temp. Rating	Alkalinity	Tensile Strength	R-Value
.00035" ave.	11.0 lb. cu. ft.	Max. 1200°F	.12%	Parallel to roll: 7 PSI Across roll: 12 PSI	3.85 per 1" thick

Frequency (Hz)	1" Thick	2" Thick	3" Thick
250	.29 +/- .04	.07 +/- .02	.04 +/- .04
500	.86 +/- .03	.30 +/- .03	.17 +/- .02
1000	.95 +/- .04	.72 +/- .08	.40 +/- .04
2000	.92 +/- .03	.94 +/- .05	.68 +/- .03
4000	.95 +/- .05	.97 +/- .05	.94 +/- .05
NRC	.75	.50	.30



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