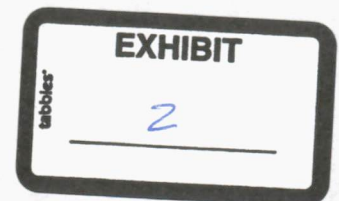
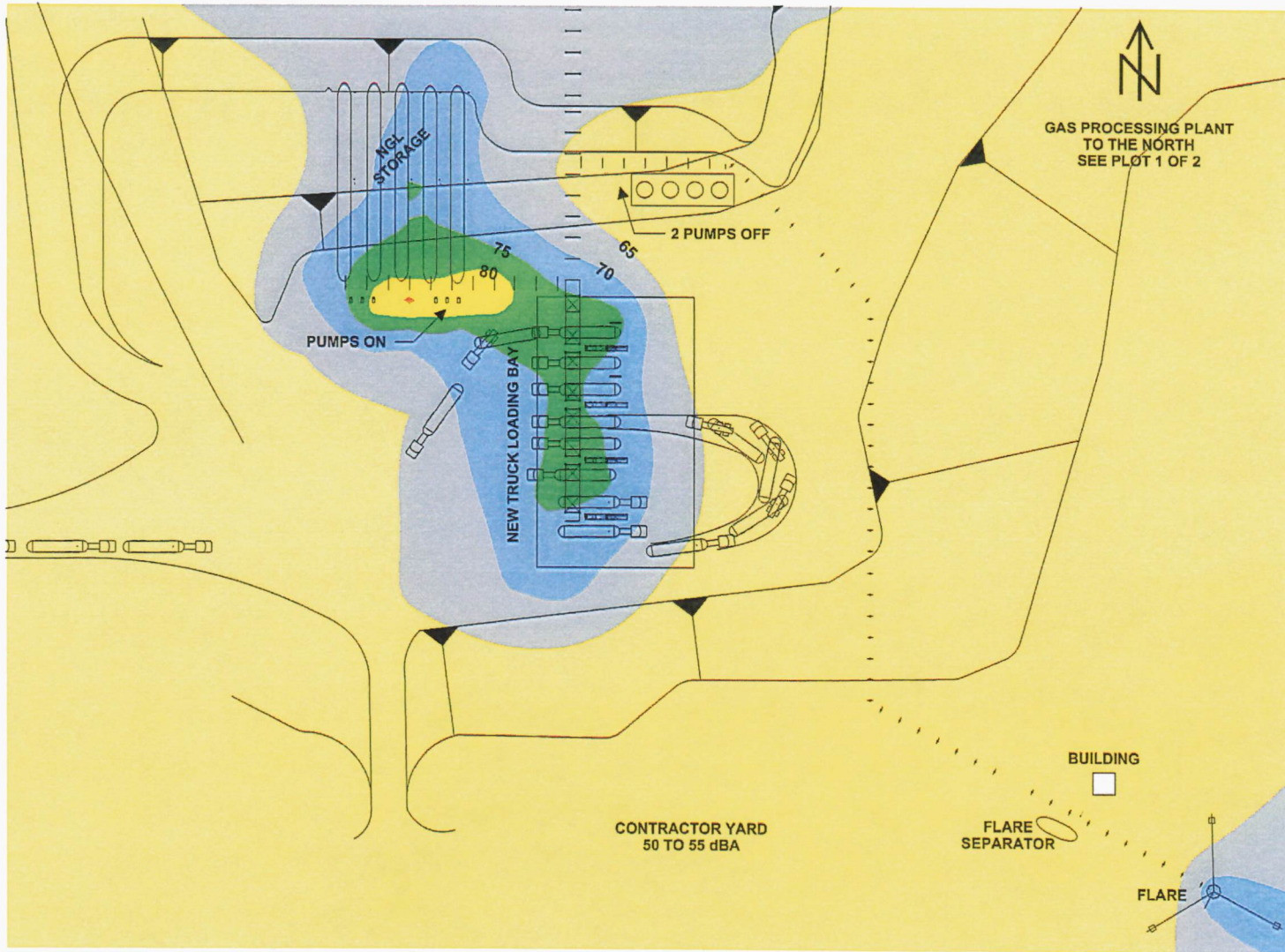


Noise level measurements are of gas process operations and do not include impulsive noises due to alarms, intercoms, disc grinding, abrasive blasting, vehicles, cranes, etc.

Noise measurements taken on February 26th and 27th, 2013. Robinson Lake Plant is processing at full capacity of 68 MMCF.





Noise level measurements are of truck loading operations and not of idling of diesel engines or passing of trucks either in yard or on Hwy 8 to the west.

Noise measurements were taken on February 27th, 2013. Trucks were loading in bays during noise measurements.

**Noise Levels--Grade Level
Robinson Lake Gas Plant
Plot 2 of 2
Whiting Petroleum Corp.
Mountrail County, North Dakota**



HAGEMEYER®

NORTH AMERICA

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OFFICE 713.896.0193 FAX 713.896.6006 WWW.HAGEMEYERNA.COM

April 2nd, 2013

Mr. Justin Clock
Health & Safety Coordinator
Whiting Petroleum Corporation
4499 Hwy 8
New Town, ND 58763

via email: justin.clock@whiting.com

RE: Project Survey Report—Plotting of Noise Isopleth Maps of Robinson Lake Natural Gas Plant

Dear Mr. Clock:

Hagemeyer North America has developed noise isopleth (contour) maps of the Robinson Lake Natural Gas Plant of Whiting Petroleum Corporation at 4499 Hwy 8, New Town, North Dakota 58763. The maps illustrate noise levels using colored contours or isopleths. Noise levels are representative of plant process operations at full capacity of 68 million cubic feet of natural gas per day (MMCFPD). Also, at the new truck loading bay, noise levels represent loading of trucks with truck diesel engines off. The noise isopleths are based on noise measurements taken on February 26th and 27th, 2013.

Plotting of Noise Isopleth Maps

Noise levels were measured on the decibel A-weighted scale (dBA); the measurements were recorded directly onto plan view drawings of the Robinson Lake Natural Gas Plant. After obtaining all noise level measurements, the data was inputted into a contour plotting software, and noise isopleths were developed.

The project involved taking a total of 562 noise level measurements at grade level within the Robinson Lake Plant. All noise level measurements were taken five feet above ground level or near to ear level height. All measurements were made during routine gas processing and truck loading operations.

Noise level measurements were obtained using a Quest sound level meter, model number 2100 and serial number DAE100019. The meter conformed to the instrument design and performance standards of ANSI S1.4-1983, Type 2 and IEC 651-1979. Before and after each field survey session (approximately 3 to 4 hours in duration), the sound level meter was pre and post calibrated using a Quest QC-10 field acoustical calibrator; the calibrator conformed to the instrument design and performance specifications of ANSI S1.40-1984 and IEC 942-1988. A log of pre and post survey instrument calibrations during the survey sessions is attached on [page 3](#). Also attached are [calibration certificates](#) for the Quest sound level meter and its field acoustical calibrator.

The following are criteria for making the noise level measurements and plotting the noise isopleth maps.

- Noise measurements were taken during normal and routine gas processing and truck loading operations; measurements were not made during non-routine events such as maintenance service activities.
- Noise level measurements were not recorded during noise interference events, such as sounding of sirens, alarms or the facility's intercom system, personnel talking, passing or idling of vehicles, man-lifts or mobile cranes.

- Noise levels were recorded of normal process operations including gas compressors, pumps, heat exchanger fans, compressed air or steam process venting, etc. However, noise measurements were not recorded of impulsive or peak noise events which were infrequent, short in duration and/or non-routine.
- Noise measurements are area measurements and are not necessarily specific to a machine, motor, compressor, etc. Measurements are for a given area.
- For all noise measurements, a windscreen (Quest part # WS-7) was installed over the microphone to the Quest #2100 sound level meter. The windscreen prevents measurement error caused by air currents or wind passing over the microphone.
- Dates of noise measurements are recorded on the noise isopleth maps.
- Noise isopleths (contours) were generated using an engineering contour and 2D surface mapping software program. Interpolations between measurement points were made using the Kriging grid method (point type). Noise contours were overlain onto plan view drawings of the Robinson Lake Gas Plant by aligning the x,y coordinate system.

Thank you for your support and coordination of this noise survey mapping project. It was completed on schedule and without delays. If you should have any questions, please feel free to call me at 281-923-7437 or email me at tkrill@hagemeyerna.us.

Sincerely,



Digitally signed by Timothy J Krill
DN: cn=Timothy J Krill, o=Hagemeyer
North America, ou=Technical Services
Group—EH&S Consulting and Training,
email=tkrill@hagemeyerna.us, c=US
Date: 2013.04.02 19:49:32 -05'00'



Tim Krill, CIH, CSP
Safety Specialist and Industrial Hygienist
Hagemeyer North America
Technical Services Group—EH&S Consulting and Training
6825 West Sam Houston Pkwy North
Houston, TX 77041

Attachments: Log of noise survey sessions with register of pre and post survey calibrations of Quest #2100 sound level meter. Also included is a log of weather conditions during noise survey sessions. 1 page.

Certificates of Calibration for Quest sound level meter, model # 2100, serial # DAE100019 and Quest field acoustical calibrator, model QC-10, serial # QE6050070, 2 pages.

Log of Noise Survey Sessions at Robinson Lake Natural Gas Plant, New Town, ND Register of Pre and Post Survey Calibrations of Quest Sound Level Meter, Model #2100 Log of Weather Conditions February 26th and 27th, 2013		
Date	Surveyed Areas	Pre and Post Survey Calibrations
02-26-13	AM noise survey session from 1056 hour to 1156 hour CST. Noise level measurements of the north side and northwest quadrant of gas processing plant including gas compressor building.	Pre-survey calibration @ 1012 hr. CST @ 114.0 dBA, 114.1 dBC @ 1000 Hz. Post survey calibration check @ 1158 hr. CST @ 114.1 dBA, 114.2 dBC @ 1000 Hz.
02-26-13	PM noise survey session from 1244 hour to 1621 hour CST. Noise level measurements of refrigeration bldg., gas process bldg., NGL facilities and east and south sides of gas processing plant.	Pre-survey calibration @ 1238 hr. CST @ 114.0 dBA, 114.1 dBC @ 1000 Hz. Post survey calibration check @ 1634 hr. CST @ 114.2 dBA, 114.3 dBC @ 1000 Hz.
02-27-13	AM noise survey session from 0927 hour to 1016 hour CST. Noise level measurements of the NGL and natural gasoline storage tank areas, i.e. north side of new truck loading bay.	Pre-survey calibration @ 0902 hr. CST @ 114.0 dBA, 114.1 dBC @ 1000 Hz. Post survey calibration check @ 1022 hr. CST @ 114.3 dBA, 114.4 dBC @ 1000 Hz.
02-27-13	AM noise survey session from 1108 hour to 1242 hour CST. Noise level measurements of new truck loading bay, truck yard, contractor yard and flare facilities.	Pre-survey calibration @ 1048 hr. CST @ 114.0 dBA, 114.1 dBC @ 1000 Hz. Post survey calibration check @ 1250 hr. CST @ 114.1 dBA, 114.2 dBC @ 1000 Hz.
02-27-13	PM noise survey session from 1444 hour to 1603 hour CST. Noise level measurements of instrument air compressor building. Re-checked measurements in refrigeration bldg., gas compressor bldg., and gas process bldg.	Pre-survey calibration @ 1432 hr. CST @ 114.0 dBA, 114.1 dBC @ 1000 Hz. Post survey calibration check @ 1628 hr. CST @ 114.3 dBA, 114.4 dBC @ 1000 Hz.
Quest sound level meter, model 2100, serial number DAE100019. Quest QC-10 acoustical calibrator, serial number QE6050070. Instrument certificates of calibration and compliance are attached.		
Log of weather conditions during noise survey sessions: On 02/26/13 @ 1455 hour CST, 32.0° F, winds 13 mph from WNW with no major gusting, B.P. 29.94" Hg ↑, clear. On 02/27/13 @ 1029 hour CST, 23.0° F, winds 9 mph from NE, B.P. 30.23" Hg ↑, overcast with light snow precipitation.		



Certificate of Calibration

Certificate No: 1101019DAE100019

Submitted By: RISK MANAGEMENT AND SAFETY SE
9203 HWY SIX SOUTH SUITE 124
HOUSTON, TX 77083

Serial Number: DAE100019 Date Received: 1/22/2013
Customer ID: Date Issued: 1/28/2013
Model: 2100 SLM Valid Until: 7/28/2014

Test Conditions:

Temperature: 18°C to 29°C
Humidity: 20% to 80%
Barometric Pressure: 890 mbar to 1050 mbar

Model Conditions:

As Found: IN TOLERANCE
As Left: IN TOLERANCE

SubAssemblies:

Description: MICROPHONE QE 7052 1/2 IN. ELECTRET
TYPE 2 PREAMP
Serial Number: 16113
N/A

Calibrated per Procedure: 53V903

Reference Standard(s):

I.D. Number	Device	Last Calibration Date	Calibration Due
ET0000370	FLUKE 45 MULTIMETER	9/22/2011	9/22/2013
ET0000556	B&K ENSEMBLE	4/10/2012	4/10/2013

Measurement Uncertainty:

+/- 2.2% ACOUSTIC (0.19DB) +/- 1.4% VAC +/- 0.1% VDC
Estimated at 95% Confidence Level (k=2)

Calibrated By: James Neuman 1/28/2013
JAMES NEUMAN Service Technician

This report certifies that all calibration equipment used in the test is traceable to NIST, and applies only to the unit identified under equipment above. This report must not be reproduced except in its entirety without the written approval of Quest Technologies.



Certificate of Calibration

Certificate No: 1101019QE6050070

Submitted By: RISK MANAGEMENT AND SAFETY SE
9203 HWY SIX SOUTH SUITE 124
HOUSTON, TX 77083

Serial Number: QE6050070

Date Received: 1/22/2013

Customer ID:

Date Issued: 1/28/2013

Model: QC-10 CALIBRATOR

Valid Until: 7/28/2014

Test Conditions:

Temperature: 18°C to 29°C
Humidity: 20% to 80%
Barometric Pressure: 890 mbar to 1050 mbar

Model Conditions:

As Found: IN TOLERANCE
As Left: IN TOLERANCE

SubAssemblies:

Description:

Serial Number:

Calibrated per Procedure: 56V981

Reference Standard(s):

I.D. Number	Device	Last Calibration	Date Calibration Due
ET0000556	B&K ENSEMBLE	4/10/2012	4/10/2013
T00230	FLUKE 45 MULTIMETER	2/2/2012	2/2/2014

Measurement Uncertainty:

+/- 1.1% ACOUSTIC (0.1DB) +/- 1.4% VAC +/- 0.012% HZ
Estimated at 95% Confidence Level (k=2)

Calibrated By:


JAMES NEUMAN Service Technician

1/28/2013

This report certifies that all calibration equipment used in the test is traceable to NIST, and applies only to the unit identified under equipment above. This report must not be reproduced except in its entirety without the written approval of Quest Technologies.