June 21, 2017

United States Nuclear Regulatory Commission
Attn: Mr. Dominick Orlando, Senior Project Manager
Materials Decommissioning Branch
Division of Decommissioning, Uranium Recovery,
and Waste Programs
Office of Nuclear Material Safety and Safeguards
11545 Rockville Pike
Rockville, MD

RE: License Amendment Request for Western Nuclear Inc., Split Rock Mill Site, Source Material License SUA-56.

Dear Mr. Orlando:

On October 25, 2016, Western Nuclear, Inc. ("WNI"), holder of United States Nuclear Regulatory Commission ("NRC") License No. SUA-56 for the former Split Rock conventional uranium milling site ("Site"), submitted a request for license amendment to revise its current alternate concentration limit ("ACL") for nitrate and to amend its proposed long-term surveillance boundary ("LTSB") extending it to include additional properties controlled by WNI.

During a conference call on May 24, 2017 with NRC staff and personnel from the U.S. Department of Energy Office of Legacy Management ("LDOE/LM"), two items were raised and additional information requested. The items raised and information requested are summarized in the following items.

1. DOE staff wanted to confirm the relationship between the predicted nitrate plume extent and the proposed LTSB given the Site specific hydrologic conditions. Therefore, it was requested that WNI plot the predicted nitrate plume with Site groundwater potentiometric contours and proposed LTSB to clearly indicate the relationship between the predicted plume dimensions, the Site hydrologic conditions, and the proposed LTSB.
2. Resolve differences between current measured heads in SWAB-2 (6,293.50 feet [ft.] above mean sea level [amsl] for 2nd half 2016) and the head assumed in the modeling (6,292.0 ft. amsl).

WNI herein submits to NRC the materials and analysis requested to address these items. This submittal includes a revision to the proposed LTSB that supersedes all previous submittals and which should be regarded as replacing the LTSB requested in the October 25, 2016 license amendment request.

Item 1:

The attached Figure 1 illustrates the current (second half 2016) groundwater elevations in the remaining Site monitoring wells. However, the original monitoring wells east of SWAB-31 toward the Sweetwater River, which covers a linear groundwater flow distance of approximately 2.5 miles were abandoned. In order to provide a higher degree of confidence in the estimate of current groundwater elevations in this area east of SWAB-31, and to better relate the predicted nitrate

plume dimensions to the current hydrologic conditions, historical (1996) groundwater elevations in this eastern area were used to estimate current groundwater elevations, using the method described below.

Figure 1 presents the locations of several wells east of SWAB-31 that were monitored in 1996 as part of the original groundwater characterization presented to the NRC in 1999. These wells are no longer monitored and many are abandoned. Representative groundwater monitoring wells for the eastern-most Southwest Valley (SWAB-29, SWAB-31, and SWAB-32) and the 1996 measured groundwater elevations for all these wells are presented in the attached Table 1. In addition, Table 1 presents the 2nd half 2016 measured groundwater elevations for SWAB-29, SWAB-31, and SWAB-32. These data indicate that the groundwater elevations in SWAB-29 and SWAB-31 have declined by approximately 4.88 feet since 1996 due to sustained below annual average regional precipitation. Based on this difference, 4.88 feet was subtracted from the each of the 1996/1997 measured groundwater elevations in the eastern wells identified in Table 1. The estimated 2016 groundwater elevations for these eastern wells were used to estimate the current groundwater elevations in the area between SWAB-31 and the Sweetwater River, as illustrated in Figure 1.

As presented in the October 2016 submittal, Table 2 presents the predicted nitrate plume width at different distances from the model origin (SWAB-2) based on the model results included as Figure 2. These data have been used to plot the southern and eastern margin of the predicted plume with respect to the current groundwater potentiometric elevations on Figure 1.

Based on the information presented in Tables 1 and 2 and Figures 1 and 2, WNI herein proposes the LTSB and the associated groundwater monitoring points identified in Figure 1. This proposed LTSB encompasses the maximum extent of the highly conservative perpetual and constant source of nitrate at a concentration of 500 mg/L for 1,000 years.

Item 2:

The calculated uniform gradient used in the analytical nitrate transport model presented in October 2016 used a head at the source (SWAB-2) of 6,292.0 ft. amsl and a head of 6240.0 ft. at the Sweetwater River at the eastern margin of Section 5 and a flow distance for 21,310 ft., resulting in a uniform and constant gradient of approximately 0.00244 ft./ft. A rounded value of 6,292.0 was used as groundwater elevations in SWAB-2 have varied to as low as 6,292.7 as recently as 4 years ago (2014). If a source head of 6,293.5 had been used instead, the calculated gradient would have been 0.00251 ft./ft., a difference of 0.00007 ft./ft. or less than 3% relative percent difference in gradient. This difference is inconsequential given highly conservative constant source concentration used and the fact that groundwater elevations over the flow domain are expected to rise and fall by at least this amount during the next 200 to 1,000 years. This difference does not materially impact the highly conservative predicted extent of the nitrate plume or its relationship to the proposed LTSB.

Comparison of the groundwater potentiometric elevation contours from 1996/1997 (see attached Figure E-4-16) and the groundwater potentiometric elevation contours in the attached Figure 1 indicates that decreased precipitation and recharge has the net effect of moving the groundwater contours in the southeastern plains area (area between SWAB-31 and the Sweetwater River to the east) westward, without significant change to their general orientation. This indicates

that periodic fluctuations to groundwater elevations in response to increasing or decreasing precipitation and recharge over the next 200 to 1,000 years would not have a substantial effect on the plume flow path.

It is emphasized that the lateral limits of the predicted nitrate plume are grossly conservative due to the assumption of perpetual and constant source at a concentration higher than measured anywhere at or beyond the point of compliance (WN-21) in the Southwest Valley. The 2006 modeling upon which ACLs for all other hazardous constituents are based is still believed to bound the likely ultimate limits of long-term hazardous constituent migration. The conservative 2016 modeling was presented to facilitate more prompt termination of the license through bounding analysis. The proposed LTSB presented in Figure 1 represents a boundary that incorporates an abundance or prudence and caution in modeling and reasonably bounds variations in local and regional hydrologic conditions for the period of compliance.

WNI believes that the amendment of the nitrate ACL, previously approved in 2006, and extension of the proposed LTSB boundary as presented herein is fully compliant with Section 83 of the Atomic Energy Act of 1954's, as amended by the Uranium Mill Tailings Radiation Control Act of 1978 ("UMTRCA") (hereinafter the "AEA") requirements for long-term surveillance and monitoring ("LTSM") of two hundred (200) years and, to the maximum extent practicable, one thousand (1,000) years. As a result, WNI believes that approval of this license amendment should result in the completion of all licensing actions necessary to proceed to final site closure and license termination with eventual transfer of all properties, including the newly proposed properties, as well as all property interests acquired by WNI for lands within the newly proposed LTSB, to the United States Department of Energy ("DOE") for LTSM.

WNI believes that it is appropriate for NRC to request DOE to initiate completion of the Site LTSP at this time given the status of all other licensing actions necessary for license termination and property transfer to DOE for LTSM. WNI appreciates NRC Staff's efforts in this matter and is looking forward to completing this license amendment so that final site closure and license termination may be achieved as soon as practicable, as well as commencing discussions with DOE and ACOE. Please feel free to contact me if you have any questions regarding this submittal.

Sincerely,

for

Lawrence J. Corte, President
Western Nuclear Inc.

Cc: Christopher Pugsley (Thompson & Pugsley)
Harley S. Shaver, Esq.
Lou Miller (Worthington-Miller Environmental Inc.)
File

Table 1 Summary of Historical, Current Measured, and Estimate Groundwater Elevations

Wells	1996/1997 [1]Measured GW Elevations (ft. amsl)	H2 2016 Measured GW Elevations (ft. amsl)	GW Elevations Change Since 1996 (ft.)	2016 Estimated GW Elevations (ft. amsl)
Northwest Valley Wells				
WN-4R	na	6285.95	na	na
WN-5	na	6280.95	na	na
WN-42A	na	6275.95	na	na
WN-39B	na	6273.1	na	na
WN-41B	na	6271.45	na	na
Southwest Valley Wells				
WN-1 (Well-1)	na	6295.75	na	na
WN-21	na	6295.75	na	na
SWAB-4	na	6291.8	na	na
SWAB-22	na	6288.15	na	na
SWAB-12/12R	na	6298.8	na	na
SWAB-2	na	6293.5	na	na
SWAB-1/1R	na	6295.65	na	na
SWAB-29	6282.41	6277.55	-4.86	na
SWAB-31	6275.06	6270.25	-4.81	na
SWAB-32	6276.97	6272.00	-4.97	na
		Avg Change:	**-4.88**	
Historical Wells				
SWAB-7	6289.82	NM	*assumed -4.88*	6284.94
SWAB-14	6283.17	NM	*assumed -4.88*	6278.29
SWAB-15	6291.23	NM	*assumed -4.88*	6286.35
SWAB-16	6288.15	NM	*assumed -4.88*	6283.27
SWAB-28	6285.09	NM	*assumed -4.88*	6280.21
SWAB-33	6266.30	NM	*assumed -4.88*	6261.42
SWAB-34	6269.98	NM	*assumed -4.88*	6265.10
WM-1	6270.10	NM	*assumed -4.88*	6265.22
RM-1	6271.77	NM	*assumed -4.88*	6266.89
COX-1	6266.05	NM	*assumed -4.88*	6261.17
FOX-1	6264.26	NM	*assumed -4.88*	6259.38
JOHNSON	6273.60	NM	*assumed -4.88*	6268.72
KK-1	6268.92	NM	*assumed -4.88*	6264.04
Crandell-1	6255.27	NM	*assumed -4.88*	6250.39
Knight	6273.07	NM	*assumed -4.88*	6268.19
Durban-1	6275.25	NM	*assumed -4.88*	6270.37

na = not applicable
NM = Not Measured
ft. = feet
amsl = above mean sea level
[1]From Figure E-4-16, Appendix E to Ground Water Protection Plan

Table 2 Nitrate Tran sport Model 1,000 Year Predicted Plume Dimensions

Total Plume Width (ft.)	Plume Width From Axis (ft.)	Plume Length (ft.)
2,000	1,000	0
3,600	1,800	2,000
4,000	2,000	5,625
4,200	2,100	7,500
4,300	2,150	8,000
4,500	2,250	9,000
4,600	2,300	10,000
4,700	2,350	12,000
4,680	2,340	14,000
4,200	2,100	16,000
3,760	1,880	18,000
-	-	20,000

Width is measured to outside of
10 mg/L isoconcentration contour,
See Figure 2

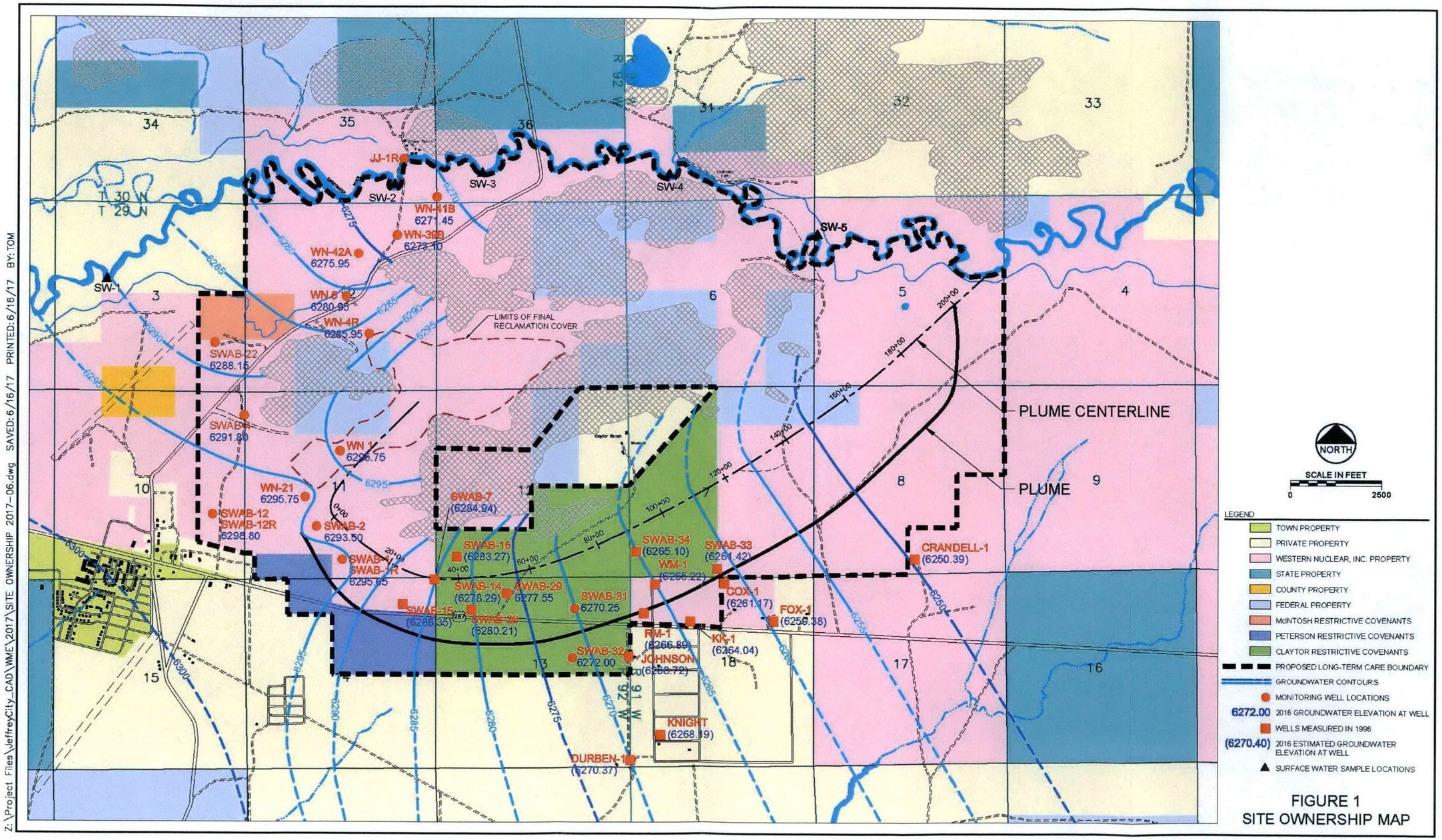
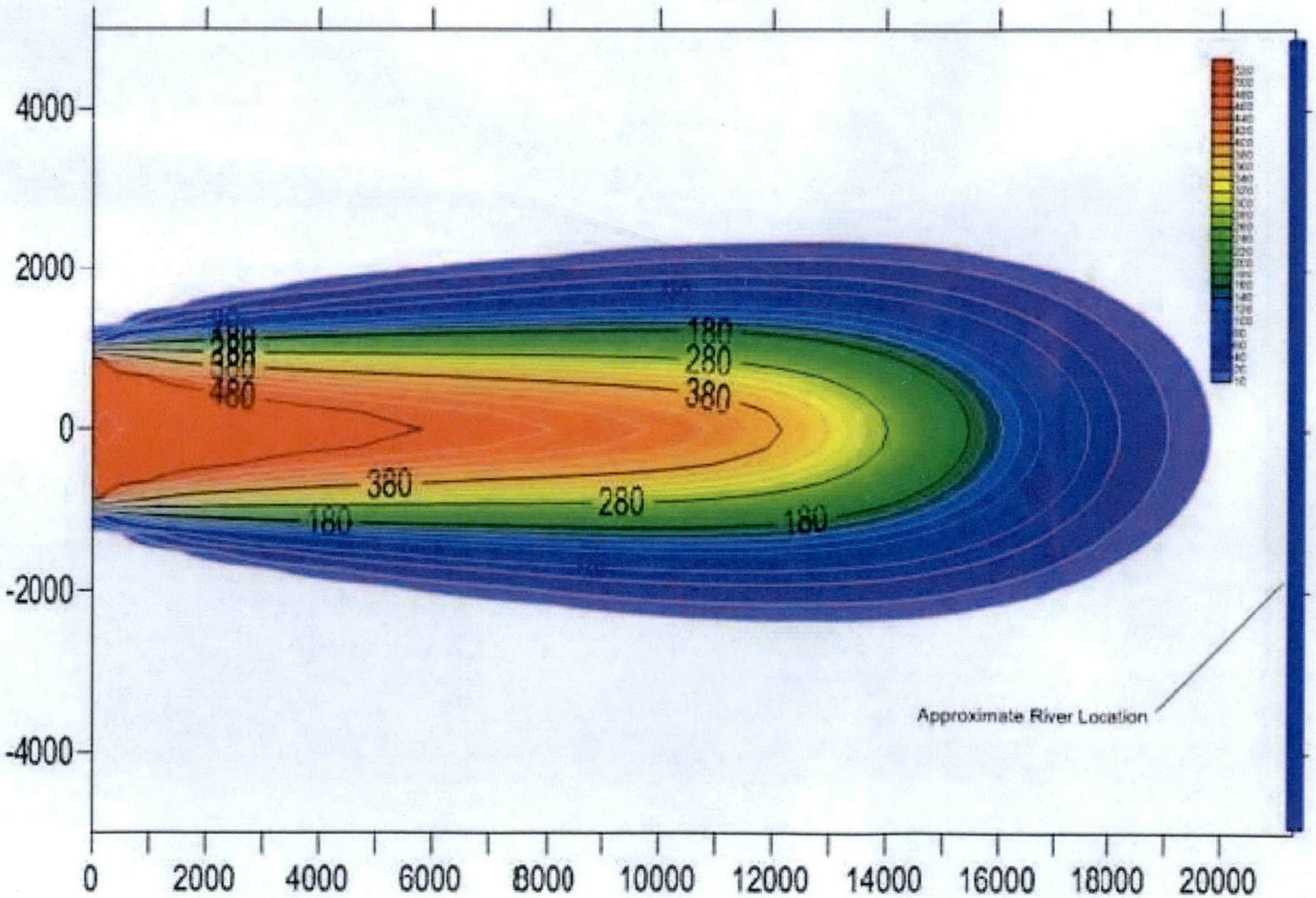


FIGURE 1
SITE OWNERSHIP MAP

Figure 2 Conservative Predicted Groundwater Nitrate Plume at 1,000 Years



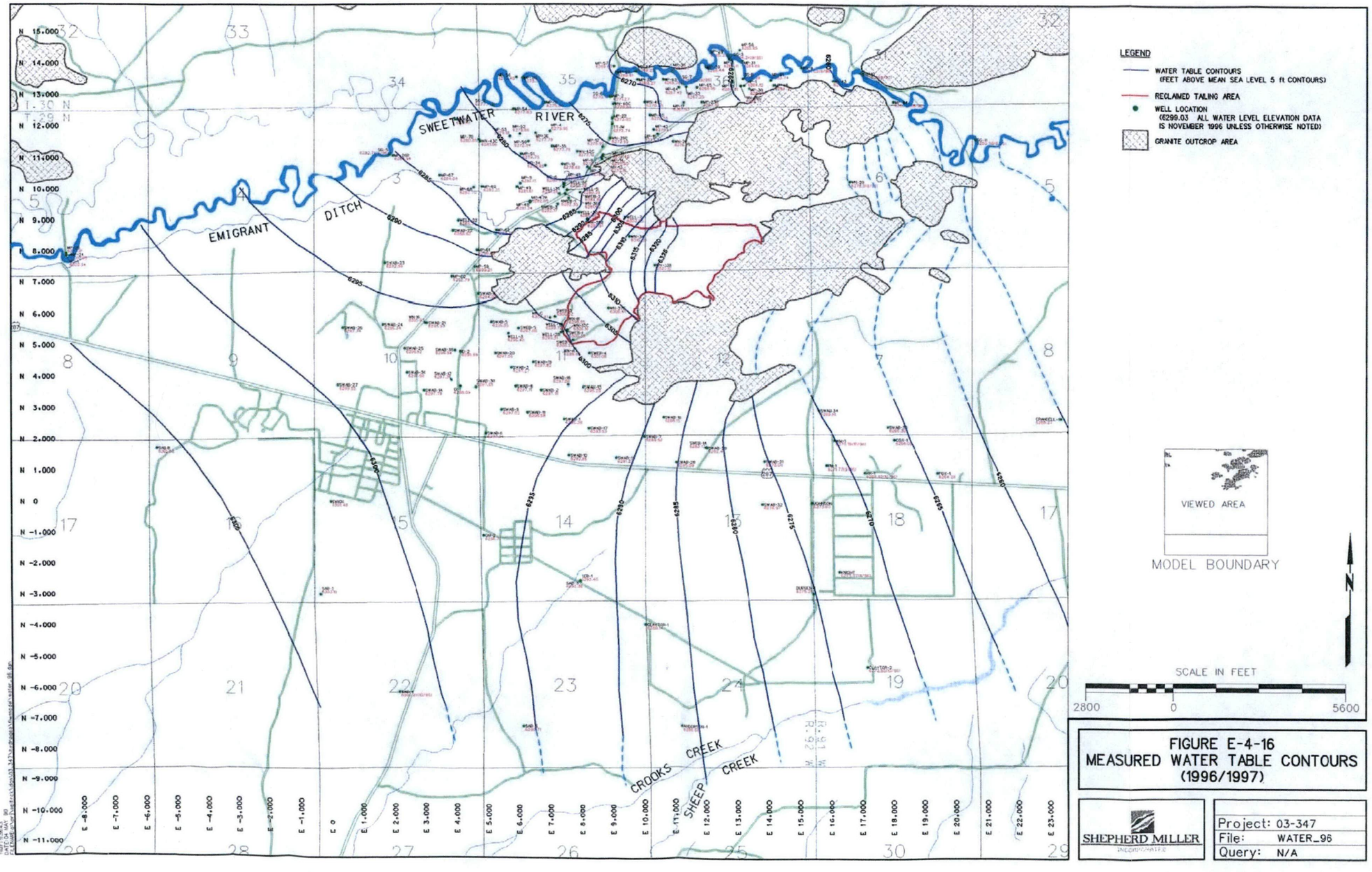


FIGURE E-4-16
MEASURED WATER TABLE CONTOURS
(1996/1997)

SHEPHERD MILLER INCORPORATED

Project: 03-347
File: WATER_96
Query: N/A