Appendix G

DNT Storage Bunkers Memorandum

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Technical Memorandum

To: Project Files
From: Kristen Betz
Subject: SOC 5 – Dintrotoluene (DNT) Storage Bunkers
Date: October 2009
Project: 23/19-0B05.07 SIRI 300

As part of the Supplemental Site Inspection/Remedial Investigation (SSI/RI) conducted at the UMore Mining Area (UMA), the former DNT storage bunkers located in Site of Concern (SOC) 5 were investigated as potential release point for hazardous substances or petroleum products. This technical memorandum summarizes the observations made during the investigation of the former DNT storage bunkers. Attachments to this technical memorandum include a figure showing the locations of the DNT storage bunkers, photographs taken during the investigation of the bunkerss, an as-built drawing documenting observations during the SSI/RI, a table summarizing results of limited testing conducted on bunker construction materials, a DNT storage bunker construction and useage summary prepared by Dakota County (2006), and a copy of a GOW-era plan sheet showing DNT storage bunker construction details.

Background

Eight DNT storage bunkers (referred to occasionally as "DNT Igloos") were constructed in 1943 to store DNT during the operation of the GOW (Dakota County, 2006). Prior to the University's acquisition of property, some or all of the DNT storage bunkers were leased by the U.S. Government to Raymond Laboratories for storage of explosives including DNT and diphenylamine (DPA) (Army, 2009). Sometime after SOC 5 was deeded to the University (in 1947), the DNT storage bunkers were used for storage by the as Agricultural Experimentation Station (AES) and to support agricultural operations at UMore Park. The locations of the DNT storage bunkers, identified as buildings 260-A through H, are shown on Figure G-1.

Each DNT storage bunker was constructed with a peaked floor slab to direct drainage to gutters located along the north and south interior building walls. Reportedly, vertical 6-inch diameter, gravel-filled, tiles

set three feet into the ground were constructed near the entrances of the bunkers and may have served as dry wells for the gutters (Dakota County, 2006). Drains in the floor slabs may have also been present near the center of storage bunkers (Army, 2009).

Field Observations

Test trenching, soil borings, and surface soil sampling were used to investigate the DNT storage bunkers during the SSI/RI. The observations below were made during the investigation. The referenced photos are included in the attached photolog.

- Gutter connections were observed in the northwest and southwest corners of the DNT storage bunkers (Photo 1). Each gutter was connected to a pipe at the terminus of the gutter (Photo 2). A 4 inch diameter pipe extends at least 12 inches past the connection. A flap gate is located in each connection (Photo 2). The operation/use of the flap valves is unknown but it may have been intended to limit flow into the gutter (and the bunker) from the pipe. Attempts to determine if the pipe extends beyond 12 inches past the flap gate were made with underground utility locating equipment and test trenching in and adjacent to the entrances of DNT storage bunkers 260-F, G, and H (Photo 3). Test trenching indicated that the pipe did not extend more than 12-inches from the connections. No dry well structures were found.

- Soils were excavated below the gutter connections and the floor slab of DNT storage bunker 260-H (Photos 4 and 5). No dry wells, sumps, or piping were observed.

- Where exposed, the weatherproofing (tar) material on the exterior walls of the DNT storage bunkers is weathered and flaking off (Photo 5).

- Drain tile consisting of clay pipe bedded in gravel was encountered around the perimeter of the DNT storage bunkers. The drain tile at bunker 260-H contained a white powder. The drain tile around DNT storage bunker 260-H was removed and it was determined that the drain tile was not plumbed to the interior of the bunker. The drain tile terminates in subsurface soils near the western edge of the DNT storage bunkers. At numerous locations the end of the drain tile was covered with a buried wooden board.

- The north, east, and south walls of DNT storage bunkers 260-A, B, and C are covered with soil berms. The north and south walls of DNT storage bunker 260-D are partially covered with

bermed soil. With the exception of a loading/unloading ramp on the south side of bunker 260-E, soil berms do not cover the walls of DNT storage bunkers 260-E through H.

- No floor drains in the DNT bunker floor slabs were observed. However, equipment and supply storage did obstruct a complete view of all of the floor slabs.

The following activities were conducted to determine the outlet (if any) of the pipe leaving the gutter connections within the storage bunkers:

- The north, south and east sides of two bunkers (buildings 603 & 604) were completely excavated and no piping or external connections to the bunker were observed (Photo 3).

- An area directly below the gutter connection was over-excavated to expose the area directly below the drain. No vertical outlet or dry well was observed below the floor drains (Photos 4 & 5).

- Electrical tracing equipment was used in an attempt to determine if metal pipe extends more than 12-inches from the gutter connection. Test trenching confirmed that drainage pipe did not extend below the bunker slab at building 603) (Photo 6).

- Historical building plan sheets were reviewed (attached). A note in the wing wall detail indicates that a notch was to be constructed in the wing wall footings for drainage. An additional test trench was placed in the area where the notch was indicated on the plans, but no evidence of the notch or drains was observed.

Limited Materials Testing Results

Samples of weatherproofing material from the bunker walls and a sample of residue in the drain tile were collected for laboratory analysis as described below. A pre-demolition building inspection was not conducted. The sample locations are shown on Figure G-1 and analytical results are in Table G-1 and are summarized below.

- Bunker 260-E North Exterior Wall – a sample of the weatherproofing material from an exterior DNT storage bunker wall was collected to determine if the weatherproofing material contained asbestos (so additional analyses could be conducted without unknowingly exposing laboratory personnel to asbestos containing material). Asbestos fibers were not detected.

- Tar Coating - a sample or the weatherproofing material from an exterior DNT storage bunker wall was collected to investigate if the weatherproofing material is a potential source of the semivolatile organic compounds detected in surface soils near the exposed DNT storage bunker walls. Results indicate the presence of elevated SVOC concentrations.

- SOC5-Bld604-NPipe – a sample of the white powder found inside the drain tile was analyzed for SVOCs and nitrocellulose. No analytes were detected.

References

Barr Engineering, 2009. Work Plan for Supplemental Site Inspection (SOC 4) and Remedial Investigation (SOC 5), UMore Mining Area, Dakota County, Minnesota.

Dakota County (MN), 2006. DNT Igloos – Site 5705, Former Gopher Ordnance Works, UMore Park, Rosemount.

Army, 2009. Final Focused Site Inspection Report, Former Gopher Ordnance Works, Rosemount, Minnesota.

Attachments

Table G-1, DNT Storage Bunker Material Testing Results

Figure G-1, DNT Storage Bunkers

DNT Storage Bunker Photolog

DNT-Bunker as-built diagram

DNT Igloos – Site 5705 (Dakota County, 2006)

Historical construction plan sheet

Table G-1
DNT-Storage Bunker Material Testing Results
SSI/RI Report SOCs 4 and 5
UMore Mining Area
Dakota County, Minnesota

Sys Loc Code Sample Date	SOC5-Bld604-NPi 09/02/2009	Tar Coating 08/31/2009	Bunker 260-E - North Exterior Wall 06/26/2009
Chemical Name			
General Parameters			
Asbestos	--	--	ND
Nitrocellulose	< 5.4 mg/kg	--	--
SVOCs			
1,2,4-Trichlorobenzene	< 0.027 mg/kg	<16 mg/kg	--
1,2-Dichlorobenzene	< 0.025 mg/kg	<15 mg/kg	--
1,3-Dichlorobenzene	< 0.023 mg/kg	<14 mg/kg	--
1,4-Dichlorobenzene	< 0.024 mg/kg	<14 mg/kg	--
2,3,4,6-Tetrachlorophenol	< 0.038 mg/kg	<22 mg/kg	--
2,4,5-Trichlorophenol	< 0.024 mg/kg	<14 mg/kg	--
2,4,6-Trichlorophenol	< 0.035 mg/kg	<21 mg/kg	--
2,4-Dichlorophenol	< 0.035 mg/kg	<21 mg/kg	--
2,4-Dimethylphenol	< 0.090 mg/kg	<53 mg/kg	--
2,4-Dinitrophenol	< 0.058 mg/kg	<34 mg/kg	--
2,4-Dinitrotoluene	< 0.021 mg/kg	<12 mg/kg	--
2,6-Dichlorophenol	< 0.043 mg/kg	<25 mg/kg	--
2,6-Dinitrotoluene	< 0.019 mg/kg	<11 mg/kg	--
2-Chloronaphthalene	< 0.019 mg/kg	<11 mg/kg	--
2-Chlorophenol	< 0.038 mg/kg	<22 mg/kg	--
2-Methyl-4,6-dinitrophenol	< 0.074 mg/kg	<44 mg/kg	--
2-Methylnaphthalene	< 0.028 mg/kg	**170 mg/kg**	--
2-Nitroaniline	< 0.020 mg/kg	<12 mg/kg	--
2-Nitrophenol	< 0.036 mg/kg	<21 mg/kg	--
3,3`-Dichlorobenzidine	< 0.39 mg/kg	<230 mg/kg	--
3-Nitroaniline	< 0.033 mg/kg	<19 mg/kg	--
4-Bromophenyl phenyl ether	< 0.017 mg/kg	<10 mg/kg	--
4-Chloro-3-methylphenol	< 0.040 mg/kg	<24 mg/kg	--
4-Chloroaniline	< 0.11 mg/kg	<65 mg/kg	--
4-Chlorophenyl phenyl ether	< 0.023 mg/kg	<14 mg/kg	--
4-Nitroaniline	< 0.023 mg/kg	<14 mg/kg	--
4-Nitrophenol	< 0.099 mg/kg	<58 mg/kg	--
Acenaphthene	< 0.028 mg/kg	520 mg/kg	--
Acenaphthylene	< 0.023 mg/kg	<14 mg/kg	--
Aniline	< 0.090 mg/kg	<53 mg/kg	--
Anthracene	< 0.025 mg/kg	**1600 mg/kg**	--
Azobenzene	< 0.020 mg/kg	<12 mg/kg	--
Benzidine	< 0.72 mg/kg	<420 mg/kg	--
Benzo(g,h,i)perylene	< 0.030 mg/kg	**640 mg/kg**	--
Benzoic Acid	< 0.058 mg/kg	<34 mg/kg	--
Benzyl alcohol	< 0.12 mg/kg	<71 mg/kg	--
Bis(2-chloroethoxy)methane	< 0.021 mg/kg	<12 mg/kg	--
Bis(2-chloroethyl)ether	< 0.024 mg/kg	<14 mg/kg	--
Bis(2-chloroisopropyl)ether	< 0.022 mg/kg	<13 mg/kg	--
Bis(2-ethylhexyl)phthalate	< 0.020 mg/kg	<12 mg/kg	--
Butyl benzyl phthalate	< 0.021 mg/kg	<12 mg/kg	--
Carbazole	< 0.022 mg/kg	**600 mg/kg**	--
Dibenzofuran	< 0.019 mg/kg	**350 mg/kg**	--
Diethyl phthalate	< 0.015 mg/kg	<8.8 mg/kg	--
Dimethyl phthalate	< 0.018 mg/kg	<11 mg/kg	--
Di-n-butyl phthalate	< 0.037 mg/kg	<22 mg/kg	--
Di-n-octyl phthalate	< 0.025 mg/kg	<15 mg/kg	--
Fluoranthene	< 0.024 mg/kg	**5800 mg/kg**	--
Fluorene	< 0.018 mg/kg	**740 mg/kg**	--
Hexachlorobenzene	< 0.016 mg/kg	<9.4 mg/kg	--
Hexachlorobutadiene	< 0.033 mg/kg	<19 mg/kg	--
Hexachlorocyclopentadiene	< 0.041 mg/kg	<24 mg/kg	--
Hexachloroethane	< 0.028 mg/kg	<16 mg/kg	--
Isophorone	< 0.017 mg/kg	<10 mg/kg	--
Naphthalene	< 0.029 mg/kg	**340 mg/kg**	--
Nitrobenzene	< 0.030 mg/kg	<18 mg/kg	--
N-Nitrosodimethylamine	< 0.032 mg/kg	<19 mg/kg	--
N-Nitrosodi-n-propylamine	< 0.025 mg/kg	<15 mg/kg	--

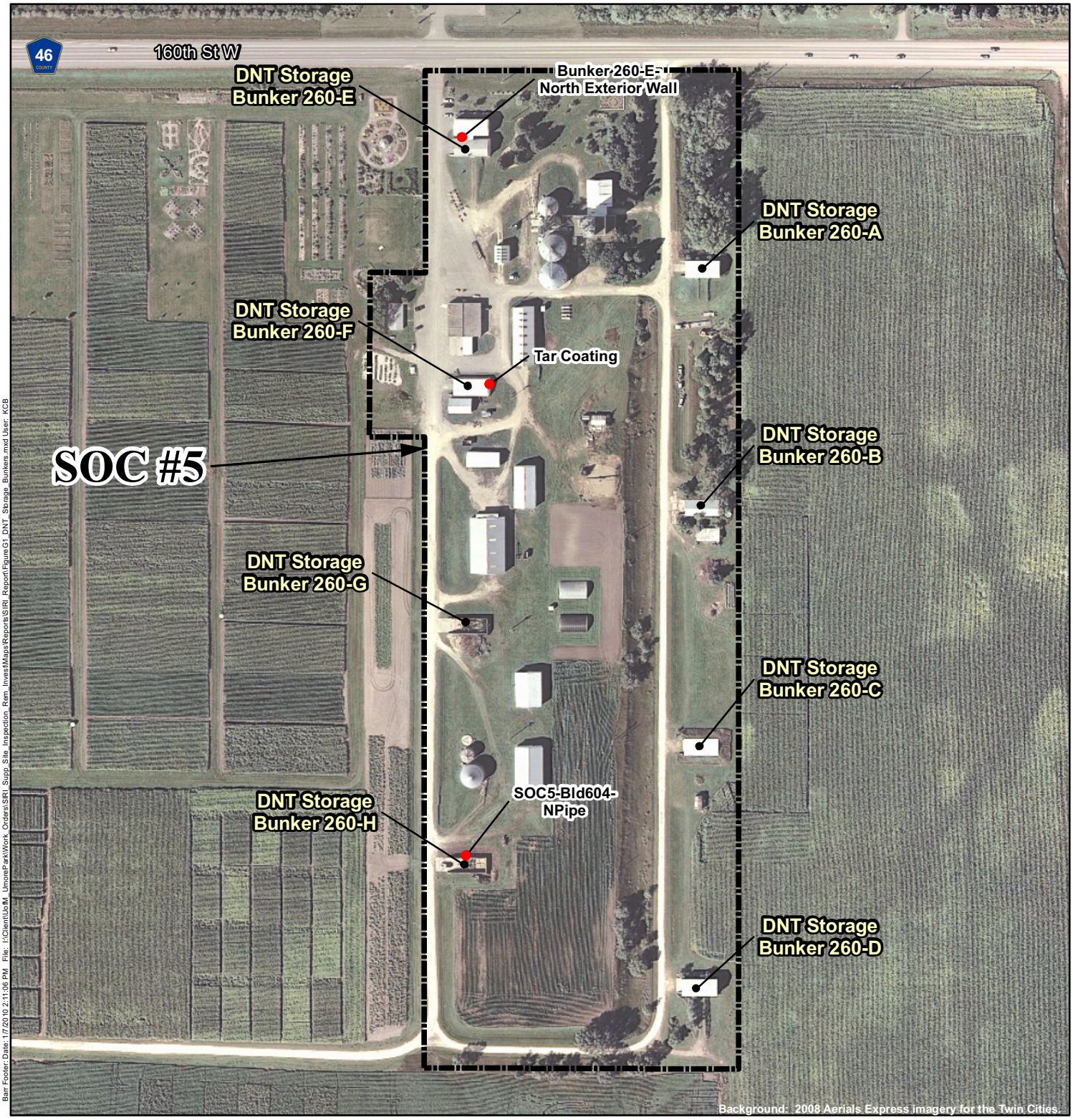
Table G-1
DNT-Storage Bunker Material Testing Results
SSI/RI Report SOCs 4 and 5
UMore Mining Area
Dakota County, Minnesota

Sys Loc Code Sample Date	SOC5-Bld604-NPi 09/02/2009	Tar Coating 08/31/2009	Bunker 260-E - North Exterior Wall 06/26/2009
Chemical Name			
N-Nitrosodiphenylamine	< 0.018 mg/kg	<11 mg/kg	--
o-Cresol	< 0.035 mg/kg	<21 mg/kg	--
p-Cresol	< 0.027 mg/kg	<16 mg/kg	--
Pentachlorophenol	< 0.096 mg/kg	<56 mg/kg	--
Phenanthrene	< 0.019 mg/kg	**5300 mg/kg**	--
Phenol	< 0.057 mg/kg	<34 mg/kg	--
Pyrene	< 0.023 mg/kg	**5100 mg/kg**	--
Benzo(a)anthracene	< 0.027 mg/kg	**2600 mg/kg**	--
Benzo(a)pyrene	< 0.027 mg/kg	**1600 mg/kg**	--
Benzo(b)fluoranthene	< 0.034 mg/kg	**2100 mg/kg**	--
Benzo(k)fluoranthene	< 0.031 mg/kg	**850 mg/kg**	--
Chrysene	< 0.033 mg/kg	**2300 mg/kg**	--
Dibenz(a,h)anthracene	< 0.034 mg/kg	**270 mg/kg**	--
Indeno(1,2,3-cd)pyrene	< 0.032 mg/kg	**840 mg/kg**	--
BaP equivalent, non-detects at zero for the detection limit.[1]	ND	2413.2	--

Data Qualifiers/Footnotes - Soil	
Qualifier	**Definition**
--	Not analyzed/not available.
a	Estimated value, calculated using some or all values that are estimates.
b	Potential false positive value based on blank data validation procedures.
c	Coeluting compound.
e	Estimated value, exceeded the instrument calibration range.
h	EPA recommended sample preservation, extraction or analysis holding time was exceeded.
I	Indeterminate value based on failure of blind duplicate data to meet quality assurance criteria.
j	Reported value is less than the stated laboratory quantitation limit and is considered an estimated value.
p	Relative percent difference is >40% (25% CLP pesticides) between primary and confirmation GC columns.
r	The presence of the compound is suspect based on the ID criteria of the retention time and relative retention time obtained from the examination of the chromatograms.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
ND	Not detected.

Data Qualifiers / Footnotes - Soil

	Qualifier	Definition
MN Tier I SLV	DI	Value represents a criteria for 2,3,7,8-TCDD or 2,3,7,8-TCDD equivalents.
	M	Value represents the criteria for mixed Xylenes.
	MC	Mercury as Mercuric Chloride.
	NA	Not Applicable.
	T	Value represents a criteria for the total carcinogenic PAHs as BaP. Total carcinogenic PAHs are: Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenz(a,h)anthracene, Chrysene and Indeno(1,2.3-cd)pyrene.
MN Tier I SRV	DI	Value represents a criteria for 2,3,7,8-TCDD or 2,3,7,8-TCDD equivalents.
	M	Value represents the criteria for mixed Xylenes.
	T	Value represents a criteria for the total carcinogenic PAHs as BaP. Total carcinogenic PAHs are: Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenz(a,h)anthracene, Chrysene and Indeno(1,2.3-cd)pyrene.



Barr Footer: Date: 1/7/2010 2:11:06 PM File: I:\Client\UofM UmoreParkWork Orders\SIRI Supp Site Inspection Rem Invest\Maps\Reports\SIRI Report\Figure G1 DNT Storage Bunkers.mxd User: KCB

Figure G-1

DNT STORAGE BUNKERS

SSI/RI Work Plan
Sites of Concern 4 and 5
UMore Mining Area
Dakota County, MN

Site of Concern (SOC) Boundary

Sample Location

N

Feet
250 0 250

Source: Dakota County, Barr, SEH, HKGi, Bay West (2008).

BARR

UMP019925

BARR
MINNEAPOLIS, MINNESOTA - HIBBING, MINNESOTA
DULUTH, MINNESOTA
ANN ARBOR, MICHIGAN - JEFFERSON CITY, MISSOURI

COMPUTED	CHECKED	SUBMITTED
BY KCB	BY	TO
DATE 9/9/09	DATE	DATE

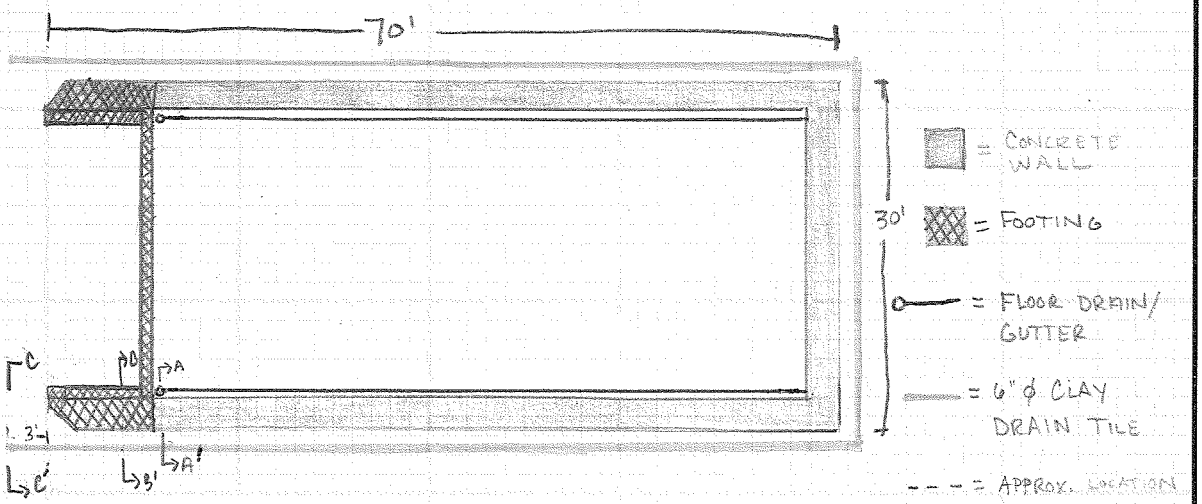
DATE 9/9/09 | SHEET NO.

PROJECT NAME UMA - SSI / RI

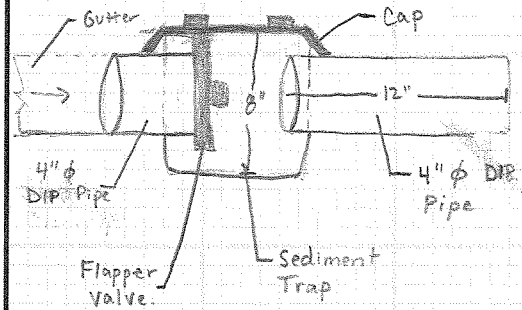
PROJECT NUMBER 23/19-0805.07 SIRI 300

SUBJECT
DNT Bunker "As-Built"

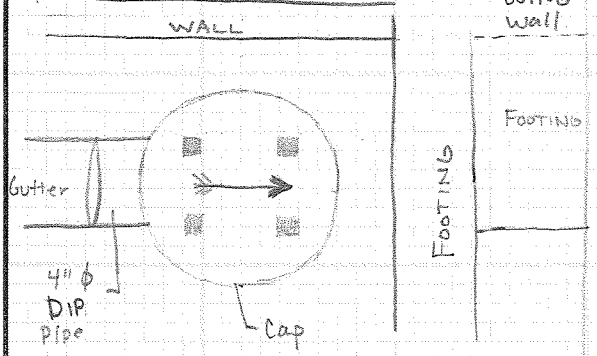
PLAN VIEW



FLOOR DRAIN DETAIL



FLOOR DRAIN PLAN VIEW



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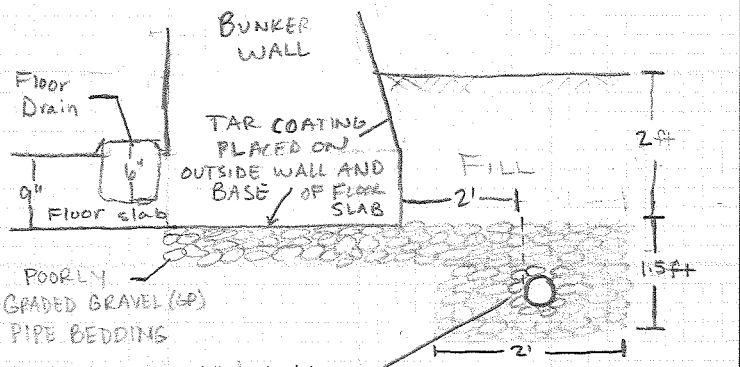

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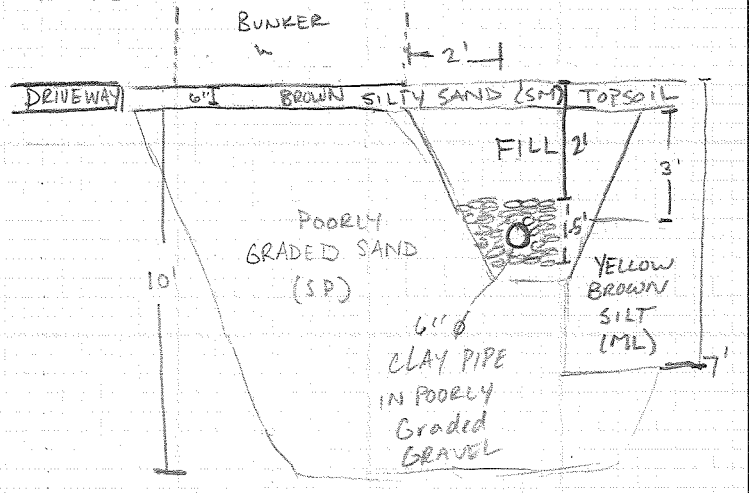

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10 Squares per Inch

BARR

MINNEAPOLIS, MINNESOTA - HIBBING, MINNESOTA
DULUTH, MINNESOTA
ANN ARBOR, MICHIGAN - JEFFERSON CITY, MISSOURI

DATE	SHEET NO.
PROJECT NAME	
PROJECT NUMBER	
SUBJECT	

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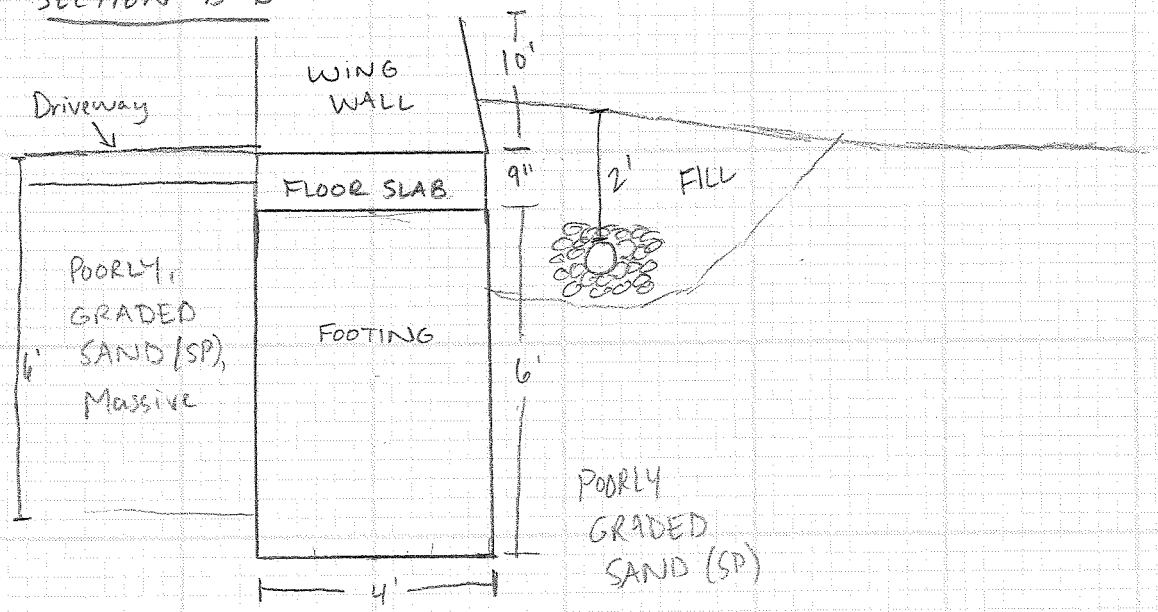
DATE	DATE	DATE

SECTION B-B'



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10 Squares per Inch

UMP019927

REV. 12/1/98

Appendix G
DNT storage bunker Photolog

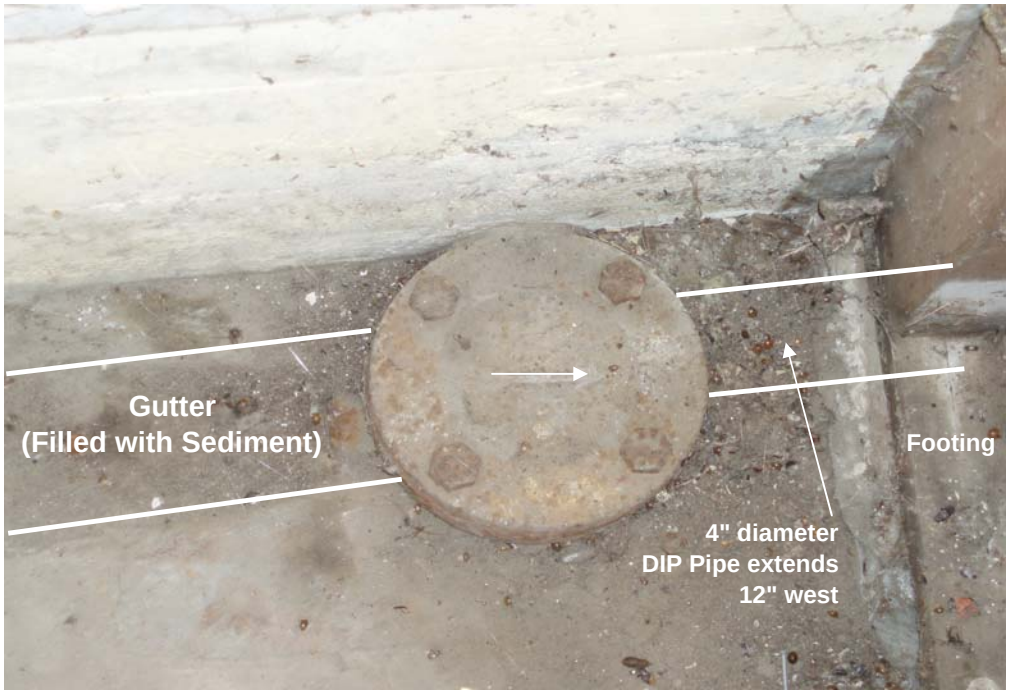


Photo 1 Gutter connection located in the south west corner of DNT storage bunker 260-E. Arrow on cap indicates direction of flow.

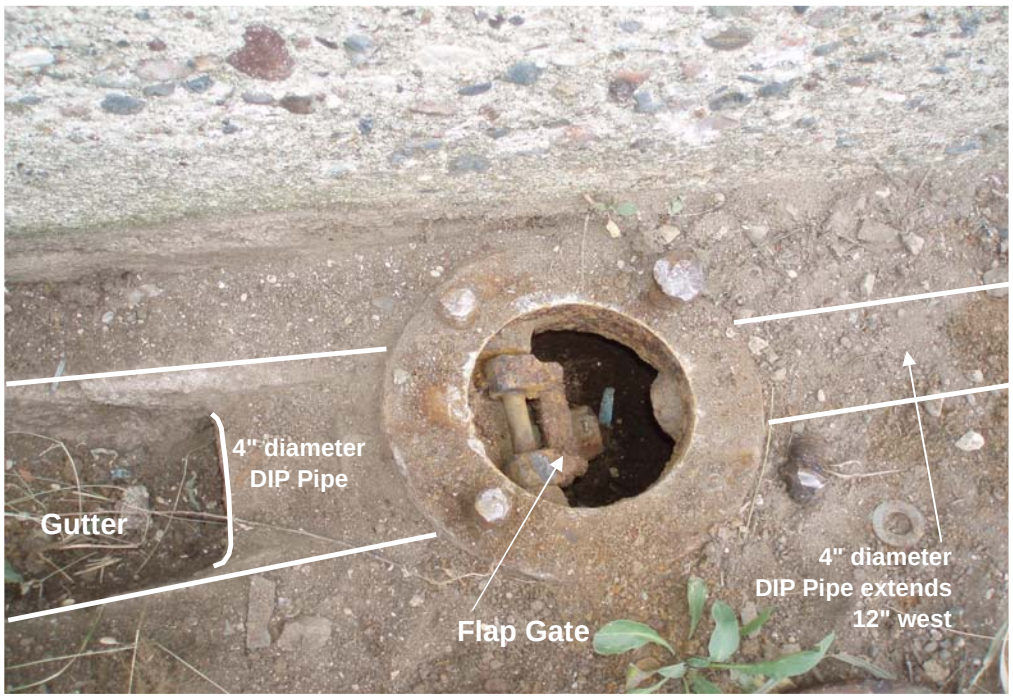


Photo 2 Gutter Connection located in the south west corner of DNT storage bunker 260-H. Cap removed to expose flap gate.

Photo 3 During the investigation, an additional utility locate was conducted to further investigate the possible location of the pipe extending from the gutter connection discharge. The orange flags denote where the survey showed the pipes should have converged, however, no evidence of the pipes was observed. The test trench was completed to 12 feet below the ground surface (bgs) and native soil was observed at 7 feet bgs.

Photo 4 Gutter connection located approximately four feet north of the southern edge of the DNT storage bunker wall.

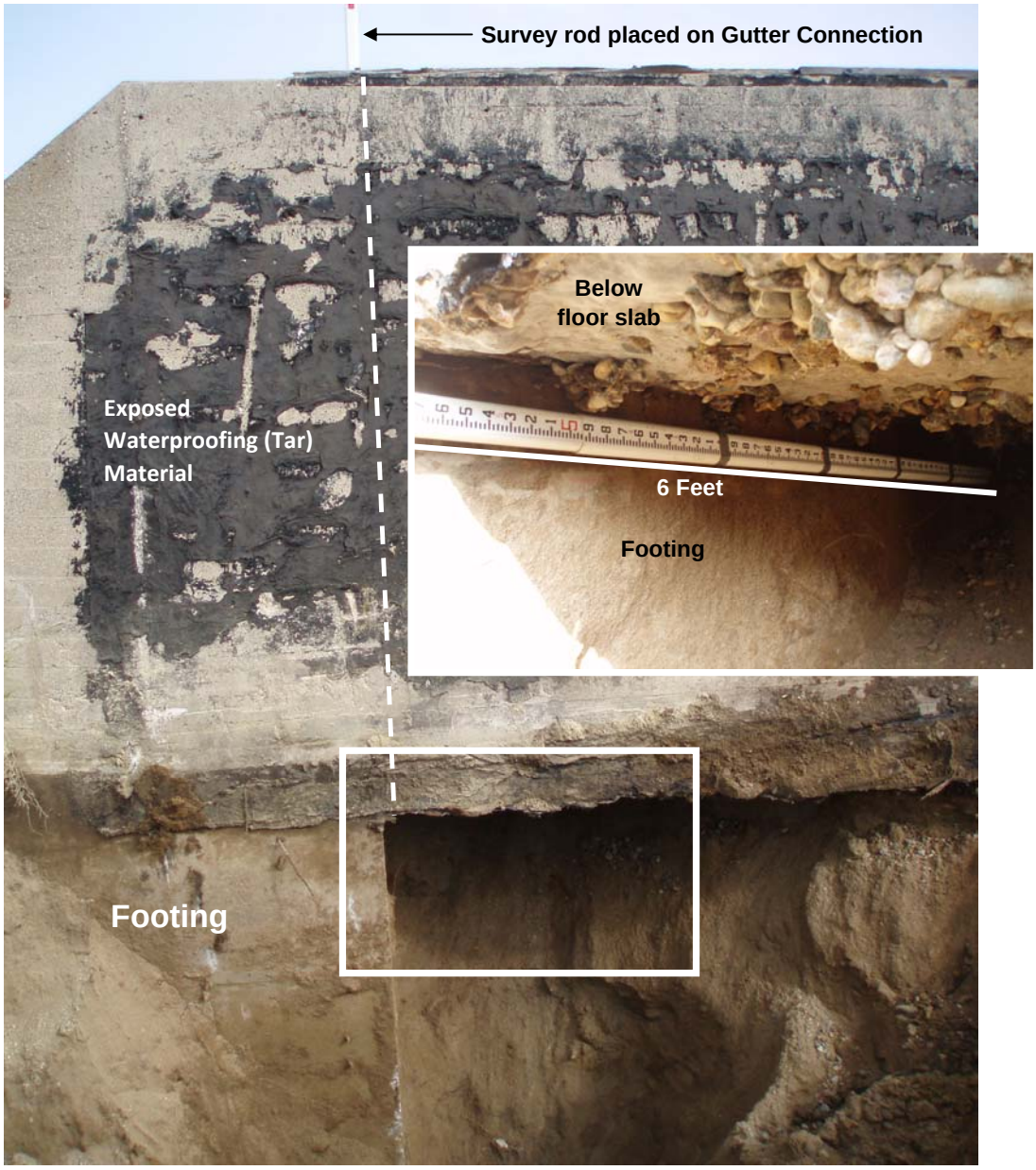


Photo 5 A survey rod was placed on the gutter connection on the southwest corner of the DNT storage bunker 260-H. An area below the gutter connection was excavated to approximately 6 feet north of the southern edge of the DNT storage bunker wall and no penetration of the slab was observed. Tar, with gravel adhered, was observed below the DNT storage bunker floor slab.

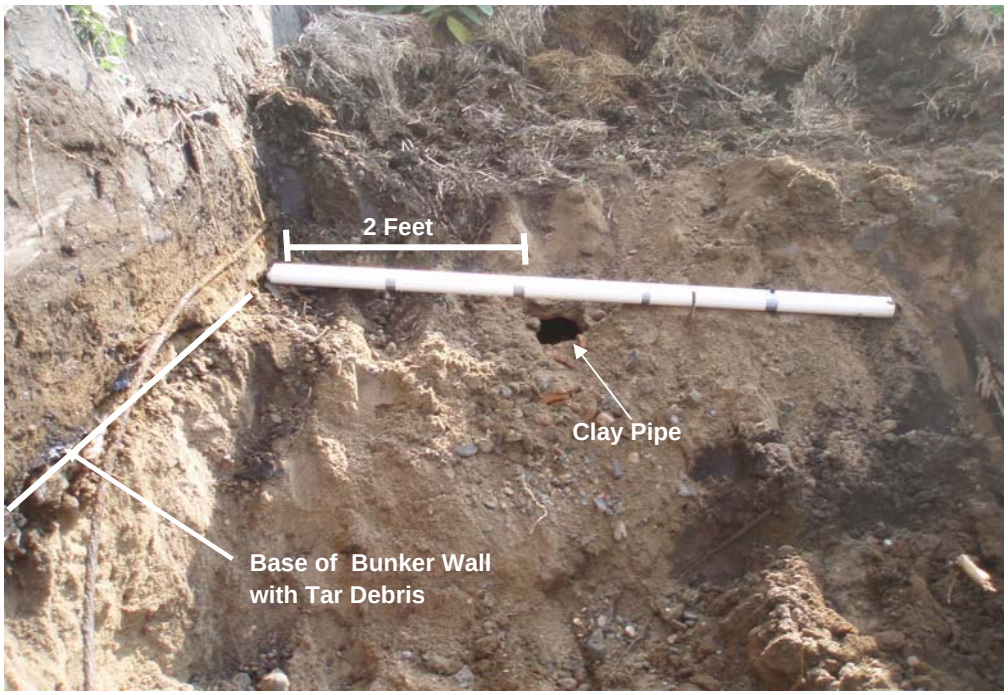
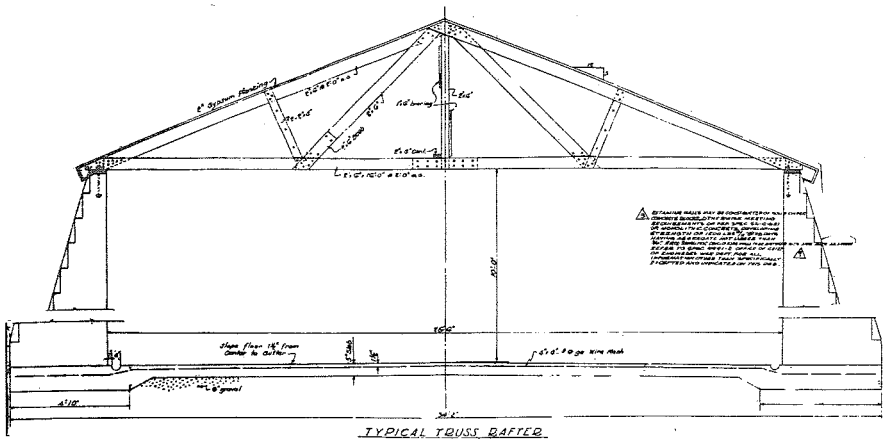
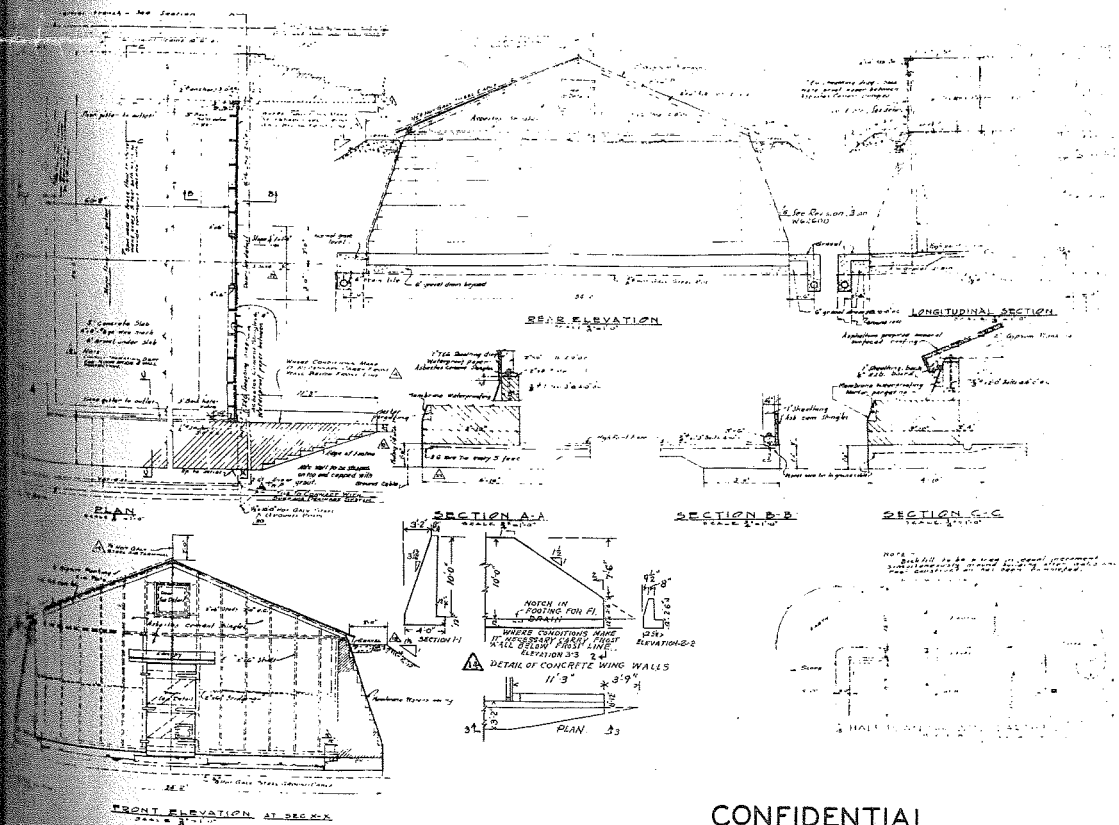


Photo 6 Excavation exposed 6" diameter clay pipe (drain tile), located approximately 2 feet from the DNT storage bunker 260-H, in a poorly graded gravel bed.



TYPICAL TRUSS RAFTER



CONFIDENTIAL

GOPHER ORDNANCE WORKS
ROSEMOUNT MINNESOTA

BUILDING PLANS
PART I SECTION 8
BLDG NO 260

DNT IGLOOS – Site 5705
Former Gopher Ordnance Works
UMore Park, Empire Township

Location. The DNT (2,4- and 2,6-dinitrotoluene) Igloos (Site 5705) are located south of the former Gopher Ordnance Works' (GOW) "K' Street (now known as West 160th Street and County Road 46) and west of GOW Ninth Street (now known as Akron Avenue West) in UMore Park in Empire Township (Figures 1. – 2.) . The Public Land Survey (PLS) coordinates are the northeast quarter of the northeast quarter of section 4, Township 114 North, Range 19 West.

Owner. The parcel (Dakota County PIN 12-00400-010-01, 640 acres) is owned by the Regents of the University of Minnesota, 335 Morrill Hall, 100 Church Street Southeast, Minneapolis, Minnesota 55455-0110. Since the 1850s, the property was farmed until seized by the federal government in May 1942 for the purpose of constructing and operating a smokeless gunpowder facility for the military during World War II. In October 1947, this and adjacent parcels were quitclaim-deeded to the University of Minnesota.

Figure 1. View North of DNT Igloos 260-A and 260-B, UMore Park; Photo 2005

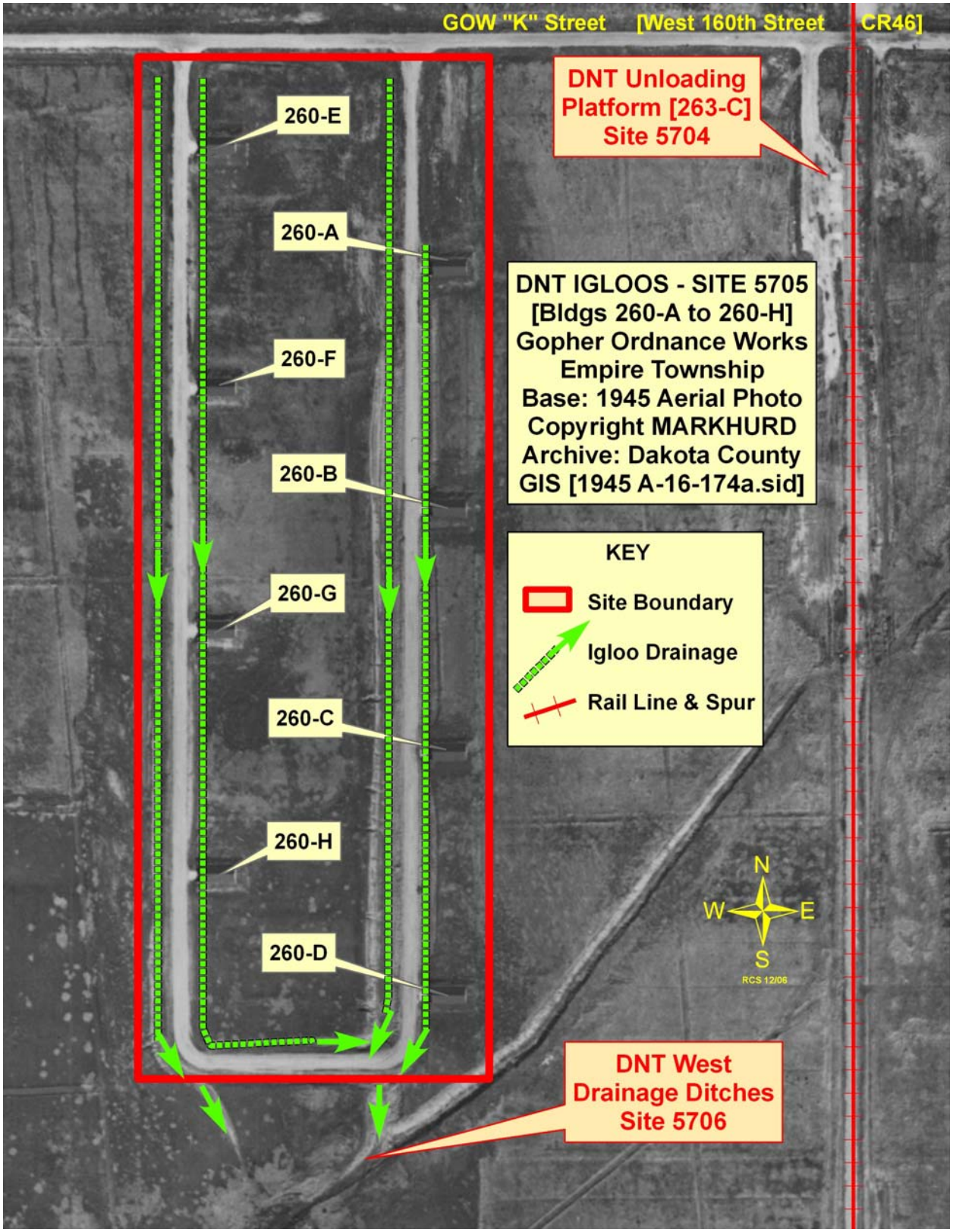


Figure 2. DNT [Dinitrotoluene] Igloos (Site 5705), May 1945 Aerial Photo

Description. The eight DNT Igloos [GOW Bldgs. 260-A to 260-H (Site 5705)] were completed in 1943 being specifically constructed for the safe storage of potentially combustible and explosive chemicals and gunpowder. In particular, each igloo was designed to hold 200,000 pounds of technical grade DNT [i.e., tDNT, a chemically prepared mixture which contains about 80% 2,4-dinitrotoluene (2,4-DNT) and 20% 2,6-dinitrotoluene (2,6-DNT) by weight]. The DNT arrived by rail at the nearby DNT Unloading Platform [GOW Bldg. 263-C (Site 5704)] and was then trucked to the igloos.

Each fiberboard drum of DNT contained about 55 pounds (25 kilograms) of the pale yellow crystalline powder. Caches of those similar drums, albeit burned and buried at the Burning Grounds [GOW Bldg. 616-A (Sites 5073 and 5062)], bore metal lids embossed with "Keystone Drum Co." and labeled either "Pittsburgh PA" or "Radford VA", both cities of which had ordnance works nearby that were similar to GOW, as they manufactured munitions and other chemicals for the war effort.

DNT was an essential additive in the manufacture of single base, multi-perforated cannon powder at GOW. One percent DNT was mixed with nitrocellulose and other chemicals, where it served as a waterproofing agent, gelatinizing agent and a burn deterrent for the cannon powder. Originally, 10% DNT by weight was also to be added as a booster to rifle powder at GOW, but the rifle powder line A2 was converted in 1945 to the manufacture of cannon powder. Rifle powder line A1 was never completed or utilized.

The isolated and heavily bunkered igloos provided the needed protection should one of the storehouses ignite or detonate. The igloos also provided the dark, cool environment conducive to the stability of DNT. Each one-story igloo was constructed on a concrete slab that gradually sloped to the north and south from the centerline to open six-inch half-diameter gutters that ran lengthwise from east to west, the latter of which is where the building entrance was located.

Near the west-building exterior, a vertical 6-inch diameter tile was set three feet into the ground and filled with gravel. It is likely that the vertical tile served as a dry well. There was also a floor drain near the center of each igloo's interior [1]. The gutters and/or the floor drain may have been connected to the dry well or to the surface water drainage ditches. No on-site sewage systems (i.e., septic tank and tile drains), holding tanks or other wastewater treatment utilities were noted on the building plans.

Because of the very level topography, north-to-south drainage ditches with culverts under roadways were constructed on the east and west sides of the igloos. The drainageways eventually merged south of the DNT Igloo area with the drainage ditches constructed along the railroad and the DNT Unloading Platform farther east. From there the collected surface water runoff continued its flow to the southwest and entered a semi-closed depression, which served as an infiltration basin [DNT Drainage Ditches West (Site 5706)].

Thus far, little information has been found in the National Archives concerning the day-to-day use of the DNT Igloos and what was stored in them. In September 1946 correspondence to the University of Minnesota, which was interested in obtaining some of the GOW property, the War Assets Administration (WAA) warned the University not to store or handle food products in the igloos because they had been used to store "…DNT, DPA (diphenylamine) and other smokeless

[1] US Army Ordnance Dept., 1944, "DNT Igloos, 260, Building Plans", Part I, Section 8, p.296, IN: *Industrial Facilities Inventory – Gopher Ordnance Works*, Vol. II.

powder additives…". It further stated that such food storage and handling would be unsafe and "…would quite probably lead to considerable food poisoning." [2] In April 1947, a decontamination inspection of the DNT Igloos discovered DNT in the floor drains of buildings 260-E and 260-F and smokeless powder in the floor drain of building 260-A [3].

In its Preliminary Assessment of the 1947 Quitclaim-deeded property, the US Army Corps of Engineers (USACE) acknowledged DNT was stored in the igloos but suggested that its source was one or more potentially responsible parties, including DuPont, Raymond Laboratories and the University of Minnesota, rather than the federal government (i.e., US Army Ordnance Department) [4].

Sometime after the property was deeded to the University, the Agricultural Experiment Station incorporated the igloos into their agricultural research and development programs. Seven of the eight igloos remain, albeit leaking roofs or other maintenance problems have necessitated replacement or repairs. Two buildings have been removed, and their now open bunkers and concrete pads are used for storing wood, equipment, farm machinery and scrap metal. Second stories have been added to several buildings as well.

Recommendations. The DNT Igloos and related areas have never been investigated. The fact that DNT was observed in the floor drains of two igloos and that approximately 300,000 pounds of DNT were utilized in the production of cannon powder suggests that at least during 1945 a substantial amount of DNT was being transferred into some of the igloos, temporarily stored there, and then trucked to the DNT Screening House [GOW Bldg. 205 (Site 5657)] for processing before being added to nitrocellulose with other chemicals in the Mixer Houses [GOW Bldg. 208-B to 208-F] on powder lines A2, B3, B4, C5 and C6.

Considering the protracted period of time required for the biological degradation of DNT in soils, its potential migration to groundwater and its known human health impacts, an investigation, appropriate remedial actions and closure of the DNT Igloos (Site 5705), DNT Unloading Platform (Site 5704) and the DNT West Drainage Ditches (Site 5706) by the responsible parties, namely the University of Minnesota and the federal government, are warranted. Compliance with Dakota County Ordinance No. 110 (Solid Waste Management) and Minnesota Agency Rules is required. [i]

[2] Correspondence from Robert Whittet, WAA Office of Real Property Disposal, to W.T. Middlebrook, Vice President, Business Administration, University of Minnesota, 13 September 1946, 2 pp.

[3] Memorandum from J.S. Jefferds to the War Assets Administration, 28 April 1947, with attached "Travel Report" by C.J. Belger, 23 April 1947, 9 pp., regarding GOW decontamination inspection of 17 April 1947.

[4] USACE – Omaha District, March 2006, *Preliminary Assessment Report – Final – 1947 Quitclaim Property, Former Gopher Ordnance Works, Rosemount MN*, Project E05MN0019, 99 pp. plus appendices.

[i] ***Disclaimer***

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