MWH

BUILDING A BETTER WORLD

May 20, 2011

Ms. Diana Engeman
Remedial Project Manager
Superfund Division
U.S. Environmental Protection Agency, Region VII
901 North 5th Street
Kansas City, KS 66101

MWH #1011180.0106

RE: Work Plan – Additional Delineation and Preliminary Remedial Design
Former Peoples Natural Gas Site
Dubuque, Iowa

Dear Ms. Engeman:

On behalf of MidAmerican Energy Company (MidAmerican), MWH has prepared this Work Plan for the former Peoples Natural Gas (PNG) site located at 925 Kerper Boulevard in Dubuque, Iowa (site). Pending United States Environmental Protection Agency (USEPA) approval, it is anticipated this work will be initiated during the summer of 2011 in accordance with the schedule presented in this Work Plan.

As requested by USEPA, MidAmerican has evaluated a number of remedial options to address groundwater impact in the vicinity of monitoring well P-112. As discussed during an April 7, 2011 teleconference between USEPA, MidAmerican, and MWH; evaluation of a groundwater control remedy to address migration of impacted groundwater toward the Mississippi River is required. MidAmerican will evaluate a remedial option of groundwater extraction with treatment using a Venturi stripper and subsequent discharge of water to the City of Dubuque (City) sanitary sewer system. The possible use of a cutoff wall between the site and the Mississippi River will also be evaluated for its effect on the system and its possible reduction in the long-term operating costs of the remedy. A conceptual layout of the cutoff wall and extraction well location are shown in Figure 1.

Also, this Work Plan identifies plans for the inspection, rehabilitation, and abandonment of select monitoring wells as described in the July 2010 Five-Year Review Report for the site.

DESCRIPTION OF WORK

The work will be conducted in accordance with the March 2004 site-specific Site Safety Plan (SSP) Addendum; the September 2004 Quality Assurance Project Plan (QAPP); and applicable portions of the November 8, 2004, Additional Site Characterization Work Plan (November 2004

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Work Plan) for the site. The SSP Addendum defines the safety procedures to be followed to ensure the protection of site personnel during field operations. The QAPP describes the project objectives and data goals, functional activities, and quality assurance/quality control (QA/QC) activities to be performed during site work. The November 2004 Work Plan describes procedures for installation and development of monitoring wells.

P-112 Specific Capacity Testing

During the April 2011 semiannual monitoring event, MWH conducted a specific capacity test on P-112 to evaluate whether or not it can successfully be used as the pumping well during a pilot test. P-112 is a 2-inch inner diameter (ID) well with a screen length of 2.2 feet, which may limit its suitability for use in pilot testing. The capacity test (approximately 4 hours in duration) was used to evaluate the sustained yield of P-112. This data will in turn be used to design an aquifer test and select the spacing for the 1-inch ID observation piezometers to be installed during the delineation activities. Based on the 4-hour capacity test, it appears P-112 is capable of yielding 4 to 5 gallons per minute on a sustained basis. Higher flow rates are not likely to be obtained from P-112 due to the limitations of the pumps that can be installed in a 2-inch ID well.

To select the position of observation wells for proposed pilot testing, aquifer parameters were entered into the Theis Equation for estimation of drawdown at a given distance from P-112 after a given duration of pumping. For the purposes of the drawdown estimation, the following parameters were used:

- Discharge = 5 gallons per minute from monitoring well P-112.
- Hydraulic Conductivity = 0.0096 centimeters per second.
- Storativity = 0.0004 (unitless).
- Silty Sand Aquifer thickness = 6 feet.

Drawdown values were then calculated for radial distances ranging from 1 to 100 feet away from the discharge well for pumping durations ranging from 1 to 365 days. Based on this evaluation, temporary piezometers for water level monitoring are proposed at radial distances of 10 and 20 feet from P-112 for use during future treatability study testing.

It should be noted that if this remedial option were to be selected for implementation, a new larger diameter extraction well would be required.

Proposed P-112 Area Delineation and Preliminary Remedial Design Field Activities

A direct-push assessment will be conducted to delineate the width of the impacted groundwater plume in the vicinity of P-112 and gather preliminary remedial design data. The proposed direct-push assessment locations are shown in Figure 2 and summarized in Table 1.

Each of the direct-push points in the P-112 area (Figure 2) will be advanced using soil electrical conductivity (EC) or cone penetration test (CPT) equipment to determine the thickness of the silty sand aquifer and elevation of the lower confining unit (LCU) in the P-112 area. The EC/CPT will provide real time data on the lithologies encountered during the work and will allow identification of the LCU. Because the silty sand aquifer and LCU are of variable depth and thickness, an understanding of the geometry of the units is an important design element.

Additional groundwater delineation in the silty sand aquifer at the northeast and southwest margins of the Technical Impracticability (TI) Zone near the Mississippi River will be assessed with six direct-push borings (DP-1 through DP-3 and DP-6 through DP-8) for groundwater sampling (three locations on each the northeast and southwest margins of the P-112 area) as shown in Figure 2. Groundwater will be collected through the direct-push rods using a Geoprobe® SP-15 screen, or similar. The groundwater samples will be analyzed for the site contaminants of concern (COCs) consisting of benzene, toluene, ethylbenzene, xylenes (BTEX) and polycyclic aromatic hydrocarbons (PAHs) using the same methods (Method 8260 and Method 8310, respectively) and laboratory (TestAmerica, Inc.) as are used for semiannual monitoring at the site. Permanent sampling points will not be left in place at these direct-push locations. Borings not completed as temporary piezometers will be backfilled with bentonite grout to approximately 1 foot below grade. The remainder of the borehole will be backfilled with soil, gravel, or cement as appropriate to restore the surface to surrounding conditions.

Soil will continuously be sampled at two direct-push locations (DP-4 and DP-5), to correlate the observed soil types with EC/CPT borings advanced immediately adjacent to these borings. DP-4 and DP-5 will also be used to gather geotechnical data along the possible alignment of the containment wall. The soil samples will be logged in accordance with the Unified Soil Classification System (USCS). The following laboratory testing is planned for representative soil samples collected from DP-4 and DP-5:

- Water Content
- Atterberg Limits
- Grain Size
- Specific Gravity
- Unit Weight
- Corrosion Resistance (resistivity, chloride, sulfate, pH)

Soil samples will not be submitted for the analysis of site COCs.

Two 1-inch ID piezometers (TP-101 and TP-102) will be installed near P-112 to serve as water level gauging points during future pilot testing. The temporary piezometers will be constructed of polyvinyl chloride (PVC) well materials with the screen length cut to match the observed thickness of the silty sand aquifer based on the EC/CPT data. The work will be conducted by a driller licensed in the state of Iowa. The completed temporary piezometers will be developed

using Waterra pumps approximately 24 hours following installation in accordance with the procedures outlined in the November 2004 Work Plan.

Equipment Decontamination. The purpose of decontamination and cleaning procedures during drilling, well installation, and water sampling is to prevent contamination of the samples and cross-contamination between wells and sampling locations. Before use, the nondedicated boring and sampling equipment will be decontaminated. Dedicated sampling equipment will be new and will not require decontamination. Large equipment will be cleaned with a high-pressure washer. Small equipment will be cleaned using a detergent solution and a distilled water rinse.

Surveying. The locations of each of the newly installed monitoring wells will be determined relative to other site features. The elevations of the tops of the well casings and the ground surface at each borehole will be surveyed to the nearest 0.01 foot, National Geodetic Vertical Datum (NGVD), using established benchmarks.

Investigation-Derived Waste. Investigation-derived waste (IDW) including soil cuttings, groundwater, used personal protective equipment (PPE), disposable sampling equipment, and decontamination fluids will be generated during the site activities. To ensure IDW is handled and documented appropriately, the waste will be segregated into the categories discussed below and disposed of according to the specified protocols.

Soil cuttings generated from soil boring and monitoring well construction activities will be placed in Department of Transportation-approved 55-gallon drums on site. The drums will be labeled and stored on site until the appropriate final disposal option is selected. Following completion of the field activities, samples will be collected from the containers for laboratory analysis, as required, for disposal.

Water generated during the site activities will be collected, and containerized to the extent practicable. Sources will include water generated during equipment decontamination, well development, and well purging. The water will initially be contained at the site in labeled 55-gallon drums or truck-mounted tanks. The water will then be transported to the former treatment building on site and discharged to the City sanitary sewer.

Disposable PPE generated during the site field activities will be containerized on site in garbage bags and disposed of with other general solid waste at the site. Other waste (paper, cardboard boxes, shipping materials, etc.) generated on site that is not exposed to site contaminants will be disposed of as general solid waste.

Preliminary Remedial Design Activities and Treatability Study Work Plan Development

As part of the preliminary remedial design, MWH will compare advantages and disadvantages of conventional slurry wall and sheet pile to this application. The evaluation will include a

comparison of available installation methods, estimated ease of implementation, effectiveness, liquefaction risk, and cost. Due to the proximity of the Mississippi River levee, MWH will discuss the possible construction of a cutoff wall with representatives of the City and US Corps of Engineers during the preliminary design activities.

Preliminary groundwater modeling of the P-112 area was completed to estimate the required well spacing and flow rates with and without a cutoff wall. The preliminary groundwater model indicates a flow rate as low as 3 gallons per minute may achieve control of the groundwater plume migrating toward the Mississippi River when coupled with a cutoff wall. Based on findings of the additional delineation and preliminary design activities, a preliminary design report and proposed treatability study plan will be submitted for USEPA review. The treatability study work plan will identify the layout and design of a treatability study to assess the ability of a Venturi stripper to treat impacted groundwater with subsequent discharge to the City sanitary sewer system.

Monitoring Well Inspection, Rehabilitation, and Abandonment Activities

In the July 2010 Five-Year Review Report for the site, USEPA specified MidAmerican is to inspect site monitoring wells with a probability for failure. Twenty of the existing site monitoring wells are constructed of black steel riser pipe (Table 2); two of the similarly constructed monitoring wells were previously abandoned and shown to have holes corroded through the black steel casing, creating a conduit for shallow contamination to migrate to deeper zones. As a result, inspection of the remaining black steel wells is warranted. As verbally approved by USEPA during the April 7, 2011 teleconference, MidAmerican proposes to abandon six of the black steel wells prior to inspection; these six deep wells are not in the current monitoring program and it is not anticipated the wells will be used in the future. Additionally, five of the black steel monitoring wells are of a new construction and visual inspection from the surface indicates these wells are not experiencing significant corrosion at this time. MWH will retain Cahoy Well and Pump Service (Cahoy) to prepare nine wells for video inspection (by brushing the well casing to remove scale and flushing the wells with clean water) and plug the six deep wells, as identified in Table 2. Downhole Well Services, LLC will be retained to video inspect the nine wells (Table 2). The video inspection will be limited to the upper 50 feet of each well; because below that depth corrosion is not anticipated, and below 50 feet the wells are below the LCU, minimizing the potential for contaminant entry into the well.

Additionally, Cahoy will repair surface completions at twelve of the site monitoring wells with rusted hinges on the protective casings. MWH personnel will be on site to oversee the inspection, abandonment, and repair work. Upon completion of the video inspections, MWH will prepare a brief letter report for submittal to USEPA, providing recommendations for future use or abandonment of the wells based on the observed conditions. MWH will also prepare and submit well abandonment forms to USEPA, the Iowa Department of Natural Resources, and the local well permitting agency for the six deep wells. The need for abandonment and/or

replacement of the nine wells to be inspected will be determined based on findings of the downhole video inspection.

PROJECT SCHEDULE

The work is anticipated to be completed in accordance with the following schedule:

Milestone	Approximate Time After USEPA Approval of Work Plan
Well Inspections and Abandonment	2 Weeks
Direct-Push Field Activities	4 Weeks
Monitoring Well Inspection Summary Report to USEPA	6 Weeks
Treatability Study Work Plan/Preliminary Design Report to USEPA	10 Weeks

If you have any questions regarding the site, please contact Kevin Dodson of MidAmerican at (515) 281-2692 or me at (515) 253-0830.

Sincerely,

Kevin G. Armstrong, C.P.G.
Project Manager

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Enclosures
Table 1 – Proposed Direct-Push Sampling Summary
Table 2 – Proposed Video Inspection And Abandonment Summary
Figure 1 – Conceptual Layout of Sheet Piling and Extraction Well
Figure 2 – Proposed Delineation and Preliminary Design Locations

cc: Kevin Dodson, MidAmerican Energy Company
Jess Vilsack, MidAmerican Energy Company
Dan Cook, Iowa Department of Natural Resources
Jim Rost, Iowa Department of Transportation
Barry Lindahl, City of Dubuque
Don Vogt, City of Dubuque

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TABLE 1

PROPOSED DIRECT-PUSH SAMPLING SUMMARY
PEOPLES NATURAL GAS SITE - DUBUQUE, IOWA

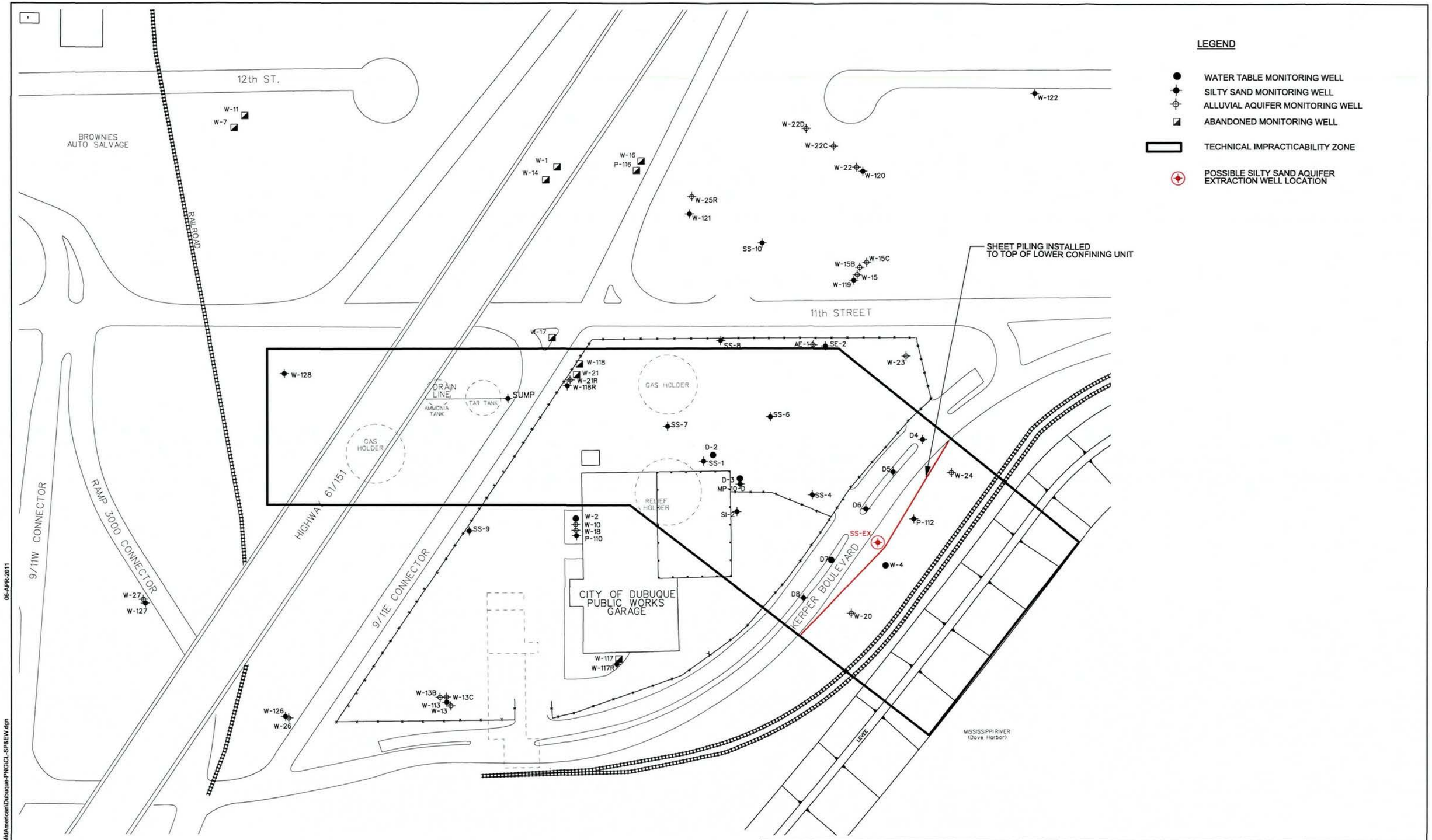
Location	Electrical Conductivity/ Cone Penetration Test	Soil Sampling	Groundwater Sampling	Temporary Piezometer
DP-1	Yes	No	Yes	No
DP-2	Yes	No	Yes	No
DP-3	Yes	No	Yes	No
DP-4	Yes	Yes	No	No
DP-5	Yes	Yes	No	No
DP-6	Yes	No	Yes	No
DP-7	Yes	No	Yes	No
DP-8	Yes	No	Yes	No
TP-101	Yes	No	No	Yes
TP-102	Yes	No	No	Yes

TABLE 2

PROPOSED VIDEO INSPECTION AND ABANDONMENT SUMMARY
PEOPLES NATURAL GAS SITE - DUBUQUE, IOWA

Location	Well Diameter (inches)	Screen Length (feet)	Total Well Depth (feet)[a]	Screen Material	Riser Material	Date Installed	Comments	Proposed Video Footage (feet)[a]
Water Table Wells								
D-7	4	10	22	Stainless Steel	Black Steel	03/02/2001	Video inspection not proposed.	0
Silty Sand Aquifer Wells								
SE-2	8	9	33	Stainless Steel	Black Steel	04/07/1993		33
W-119	2	10	35	Stainless Steel	Black Steel	01/28/1993		35
W-120	2	10	38	Stainless Steel	Black Steel	01/29/1993		38
W-121	2	5	33	Stainless Steel	Black Steel	01/27/1993		33
D-4	4	10	37	Stainless Steel	Black Steel	03/01/2001	Video inspection not proposed.	0
D-5	4	10	38	Stainless Steel	Black Steel	02/27/2001	Video inspection not proposed.	0
D-6	4	10	37	Stainless Steel	Black Steel	02/28/2001	Video inspection not proposed.	0
D-8	4	10	38	Stainless Steel	Black Steel	03/08/2001	Video inspection not proposed.	0
Alluvial Aquifer Wells								
AE-1	8	21	88	Stainless Steel	Black Steel	01/27/1993		50
W-13B	4	10	103	Stainless Steel	Black Steel	02/25/1993	Request abandonment prior to inspection.	0
W-13C	4	10	187	Stainless Steel	Black Steel	01/30/1993	Request abandonment prior to inspection.	0
W-15B	4	10	142	Stainless Steel	Black Steel	02/24/1993	Request abandonment prior to inspection.	0
W-15C	4	10	263	Stainless Steel	Black Steel	02/09/1993	Request abandonment prior to inspection.	0
W-20	2	10	51	Stainless Steel	Black Steel	02/11/1993		50
W-22	2	10	69	Stainless Steel	Black Steel	02/11/1993		50
W-22C	4	10	219	Stainless Steel	Black Steel	01/11/1993	Request abandonment prior to inspection.	0
W-22D	4	10	276	Stainless Steel	Black Steel	01/16/1993	Request abandonment prior to inspection.	0
W-23	2	10	73	Stainless Steel	Black Steel	03/22/1993		50
W-24	2	10	76	Stainless Steel	Black Steel	02/01/1993		50

[a] Below Top of Casing.



DESIGNED BY	KEVIN ARMSTRONG	
DRAWN BY	NORA DAY	
CHECKED BY	-	
APPROVED BY	-	
PROJECT MANAGER	KEVIN ARMSTRONG	

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SCALE IN FEET

MANAGING OFFICE: DES MOINES, IOWA

PROJECT: MIDAMERICAN ENERGY COMPANY
PEOPLES NATURAL GAS SITE
DUBUQUE, IOWA

TITLE: **CONCEPTUAL LAYOUT OF SHEET PILING AND EXTRACTION WELL**

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FIGURE 1

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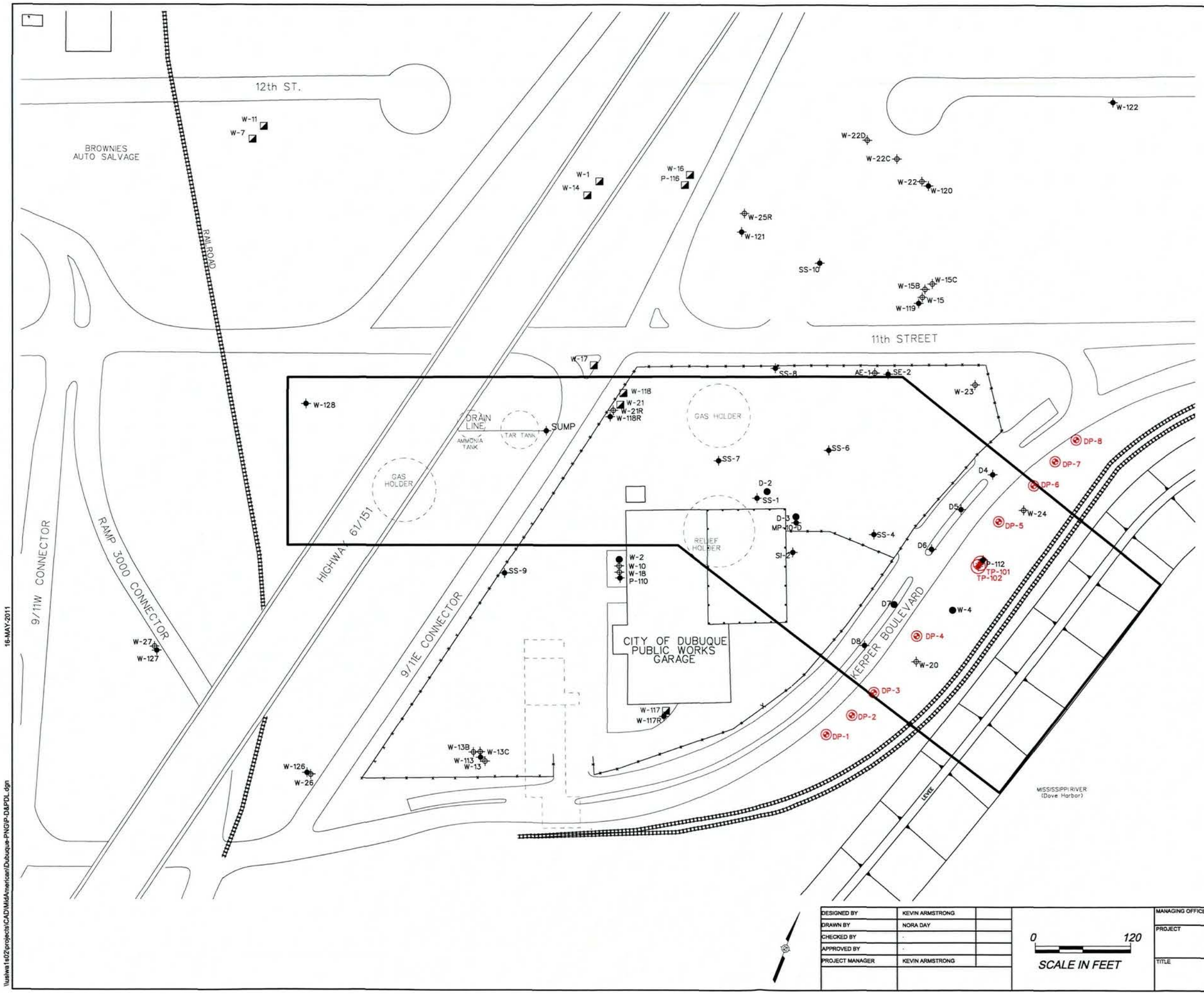

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DESIGNED BY	KEVIN ARMSTRONG	
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PROJECT MANAGER	KEVIN ARMSTRONG	

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SCALE IN FEET

MANAGING OFFICE: DES MOINES, IOWA

PROJECT: MIDAMERICAN ENERGY COMPANY
PEOPLES NATURAL GAS SITE
DUBUQUE, IOWA

TITLE: **PROPOSED DELINEATION AND PRELIMINARY DESIGN LOCATIONS**

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FIGURE 2