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May 3, 2007

Mr. Christopher C. Carey, Post-Remediation Unit
Bureau of Environmental Remediation
Kansas Department of Health and Environment
1000 SW Jackson, Suite 410
Topeka, KS 66612-1367

Subject: *Recommendations for New Monitoring Wells at Everest, Kansas*, ANL/EVS/AGEM/CHRON-1041

Dear Mr. Carey:

Attached, at the request of Caroline Roe of the Commodity Credit Corporation of the U.S. Department of Agriculture, is the document *Recommendations for New Monitoring Wells at Everest, Kansas*.

Please address your comments on these recommendations to Ms. Roe. Let us know if we can do anything to assist in your review.

Sincerely,

Lorraine M. LaFreniere

LML:rs

Attachment: *Recommendations for New Monitoring Wells at Everest, Kansas*

cc: C. Roe (CCC/USDA)
√ Chron 1041

bcc: L. LaFreniere
R. Sedivy
E. Yan
C. Dennis
J. Hansen
D. Surgnier
K. Haugen
L. Culbert

Recommendations for New Monitoring Wells at Everest, Kansas

On February 15, 2007, the Commodity Credit Corporation of the U.S. Department of Agriculture (CCC/USDA) submitted *Recommendations for Remedial Action at Everest, Kansas*.[1] Those *Recommendations* were accepted by the Kansas Department of Health and Environment (KDHE) in a letter to the CCC/USDA dated March 5, 2007.[2] The approved *Recommendations* document outlines a plan for systematic groundwater sampling and monitoring at Everest to provide data necessary for the critical evaluation of remedial options — including a phytoremediation alternative — for restoration of the groundwater and protection of the surface waters of the intermittent creek at this site. Phase I of the KDHE-approved monitoring plan includes the following activities:

- Groundwater sampling at existing monitoring wells, with analyses for volatile organic compounds (VOCs) and selected biodegradation parameters.
- Sampling of surface waters along the intermittent creek for VOCs analyses.
- Periodic manual measurement and automated recording of groundwater and surface water levels in the vicinity of the intermittent creek.

The locations selected for groundwater and surface water sampling and analyses under the approved monitoring program[1] were determined in consultation with the KDHE.

As a result of subsequent discussions among representatives of the KDHE, the CCC/USDA, and Argonne regarding the technical program at Everest, the CCC/USDA seeks KDHE approval for the installation of up to four new permanent monitoring wells along the upper reach of the intermittent creek west of the Nigh property, as shown in Figure 1.

The proposed new well locations lie progressively downgradient in the anticipated direction of future groundwater and contaminant movement; *all of the recommended points lie at least 2,000 ft upgradient, however, of the confirmed area of groundwater discharge to the creek identified near Highway 73* (Figure 2).

The proposed new wells will supplement the existing network of groundwater and surface water monitoring points identified in the KDHE-approved monitoring plan. The new wells will be sampled in accord with the schedules outlined in the approved plan.[1]

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[1] Argonne National Laboratory, 2007, *Recommendations for Remedial Action at Everest, Kansas*, ANL/EVS/AGEM/CHRON-1025, prepared for the Commodity Credit Corporation, U.S. Department of Agriculture, by Argonne National Laboratory, Argonne, Illinois, February 15.

[2] Carey, C., 2007, letter from Carey (Bureau of Environmental Remediation, Kansas Department of Health and Environment, Topeka, Kansas), to C. Roe (Commodity Credit Corporation, U.S. Department of Agriculture, Washington, D.C.), March 5.

The new wells are recommended to address specific investigation needs, as follows:

- The proposed borings will provide data on the lithologic and hydrogeologic characteristics — and the relative continuity — of the Everest aquifer unit along the upgradient reach of the intermittent creek, where possible implementation of a phytoremediation remedy is under consideration.

- Installation of the borings will permit the collection of sediments from the aquifer unit for possible physical or hydraulic property analyses. The completed monitoring wells will also facilitate possible future *in situ* estimation of the aquifer unit's hydraulic properties in this area, as part of the remedy evaluation and development process.

- The completed new wells will be used to determine the depths to groundwater and the pattern(s) of groundwater flow near the intermittent creek, and hence to predict more accurately the locations of possible groundwater (and contaminant) discharge and the extent of the area amenable to possible phytoremediation.

- The use of automated groundwater level recorders at the new locations will provide data on the potential range and variability of groundwater levels to be expected in the area near the intermittent creek.

- Periodic sampling of the recommended wells for VOCs analyses will help to constrain (1) the rate(s) and pathway(s) of contaminant approach toward the intermittent creek (and the area amenable to possible phytoremediation) and (2) the areal extent of the plume as it continues to evolve. The resulting "early warning" data obtained from this sampling will therefore help to ensure that remedial action can be taken, if necessary, in sufficient time to prevent unacceptable levels of carbon tetrachloride contamination from threatening the identified surface waters of the creek.

The well locations shown in Figure 1 were chosen to satisfy the technical objectives above, as well as to minimize disruption (to the extent possible) of the normal agricultural activities in the required investigation area. To accommodate these somewhat conflicting goals, the recommended monitoring points include one new well (PZ1) along the existing waterways west of the Nigh property, one new well (PZ3) along the margin of the farm field southwest of existing well SB63 and northeast of well SB64, and two new wells (PZ2, PZ4) in the fields east of the intermittent creek. The CCC/USDA has contacted the potentially affected landowner and is attempting to negotiate access to the desired well locations. If the necessary access cannot be obtained, a modified distribution of three new monitoring wells, to be located entirely along the existing waterways west and southwest of the Nigh property (Figure 3), is proposed as a possible alternate configuration.

The Argonne 22-ton, track-mounted crawler cone penetrometer (CPT) vehicle will be used to advance the investigative borings and install the monitoring wells, in accord with

procedures outlined in the *Master Work Plan*.[3] At each location, CPT logs of tip pressure, sleeve friction, conductivity (if possible), borehole inclination, and tip:sleeve ratio will be obtained to aid in characterization of the aquifer unit's geology and hydrogeology. On the basis of these logs, one or more depth intervals (to be determined as needed) in each boring may be selectively cored to confirm the lithologies present, as well as to obtain sediment samples for possible analyses for physical or hydraulic properties.

The monitoring wells will be installed with the CPT as 1-in.-diameter piezometers, in accord with KDHE requirements. The specific depth interval to be screened in each well will be selected, with CCC/USDA and KDHE approval, on the basis of the electronic log and sediment core data obtained at each location. Previous Argonne findings for this site suggest possible well depths ranging from 30 ft to 40 ft below ground level (BGL) for the topographically more upslope locations PZ1, PZ2, and PZ4 (Figure 1) and 20 ft to 30 ft BGL for well PZ3, nearer the creek (Figure 1). Each well will be constructed by using either a flush-mount or stick-up surface completion at the request of the property owner. The wells will be developed in accord with KDHE requirements. Groundwater will be sampled from each well upon completion of the well installation and development.

[3] Argonne National Laboratory, 2002, *Final Master Work Plan: Environmental Investigations at Former CCC/USDA Facilities in Kansas, 2002 Revision*, ANL/ER/TR-02/004, prepared for the Commodity Credit Corporation, U.S. Department of Agriculture, by Argonne National Laboratory, Argonne, Illinois, December.

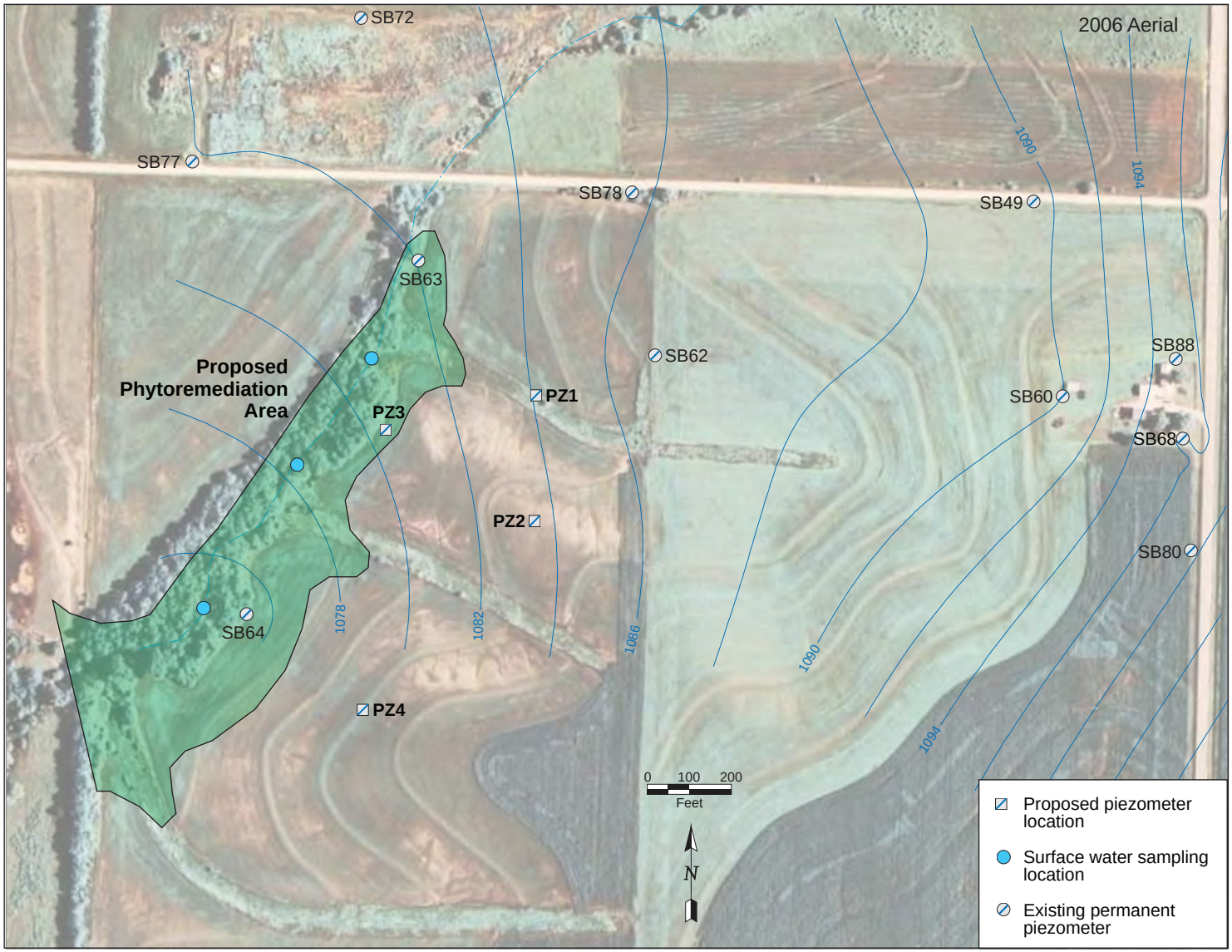

FIGURE 1 Locations of existing permanent monitoring wells, KDHE-approved locations for periodic sampling of surface waters (if present), and proposed locations for four additional permanent monitoring points (piezometers) near the intermittent creek at Everest. Proposed new locations in the fields east of the creek are provisional and subject to CCC/USDA negotiation of property access. The shading indicates the presently estimated upstream (upgradient) margin of the area along the intermittent creek that may be amenable to phytoremediation (with depths to groundwater of 15 ft BGL or less).

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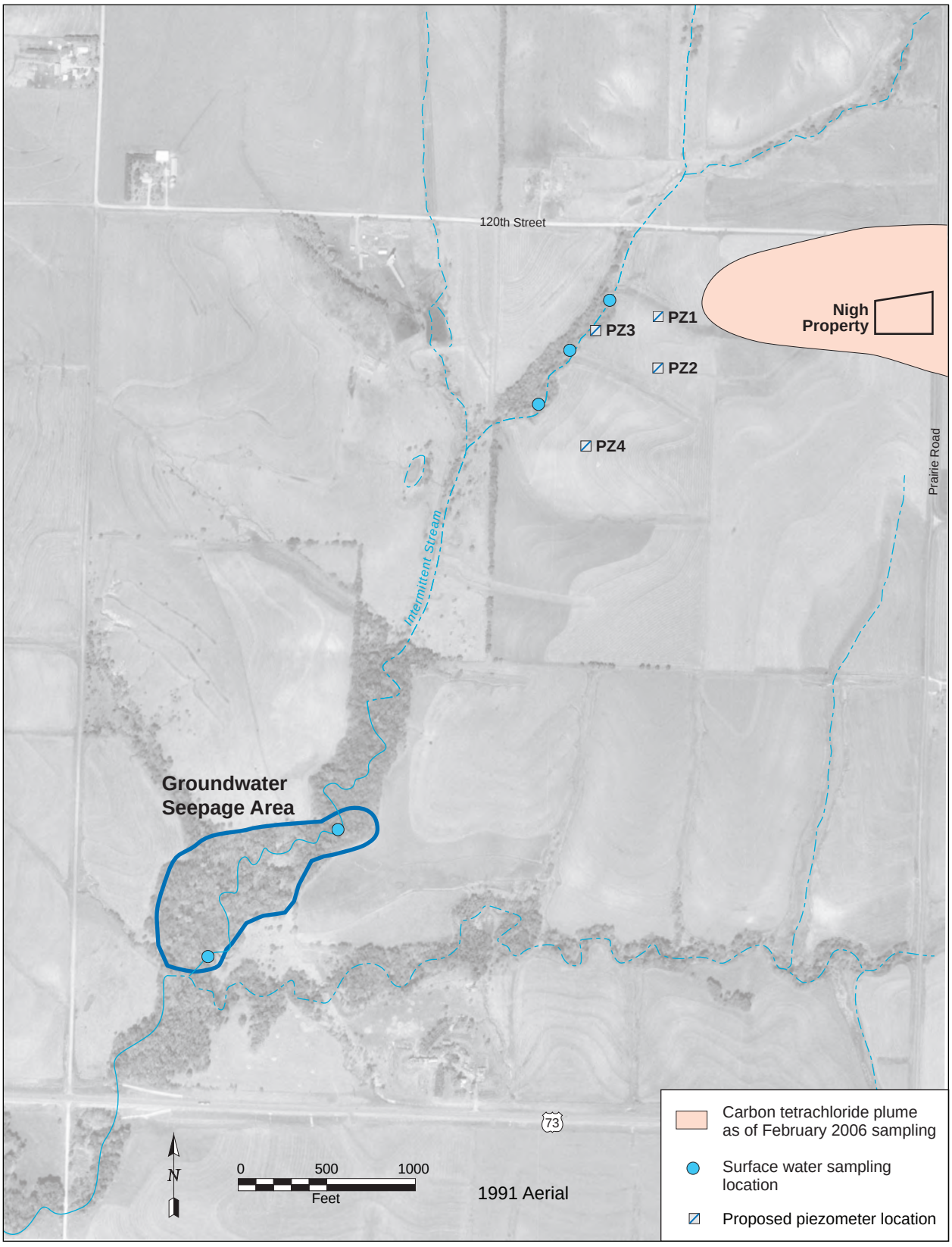

FIGURE 2 Proposed locations for new permanent monitoring points (piezometers) near the intermittent creek at Everest. The proposed locations are, at minimum, 2,000 ft upstream/upgradient from the identified area of groundwater discharge to the creek near Highway 73.

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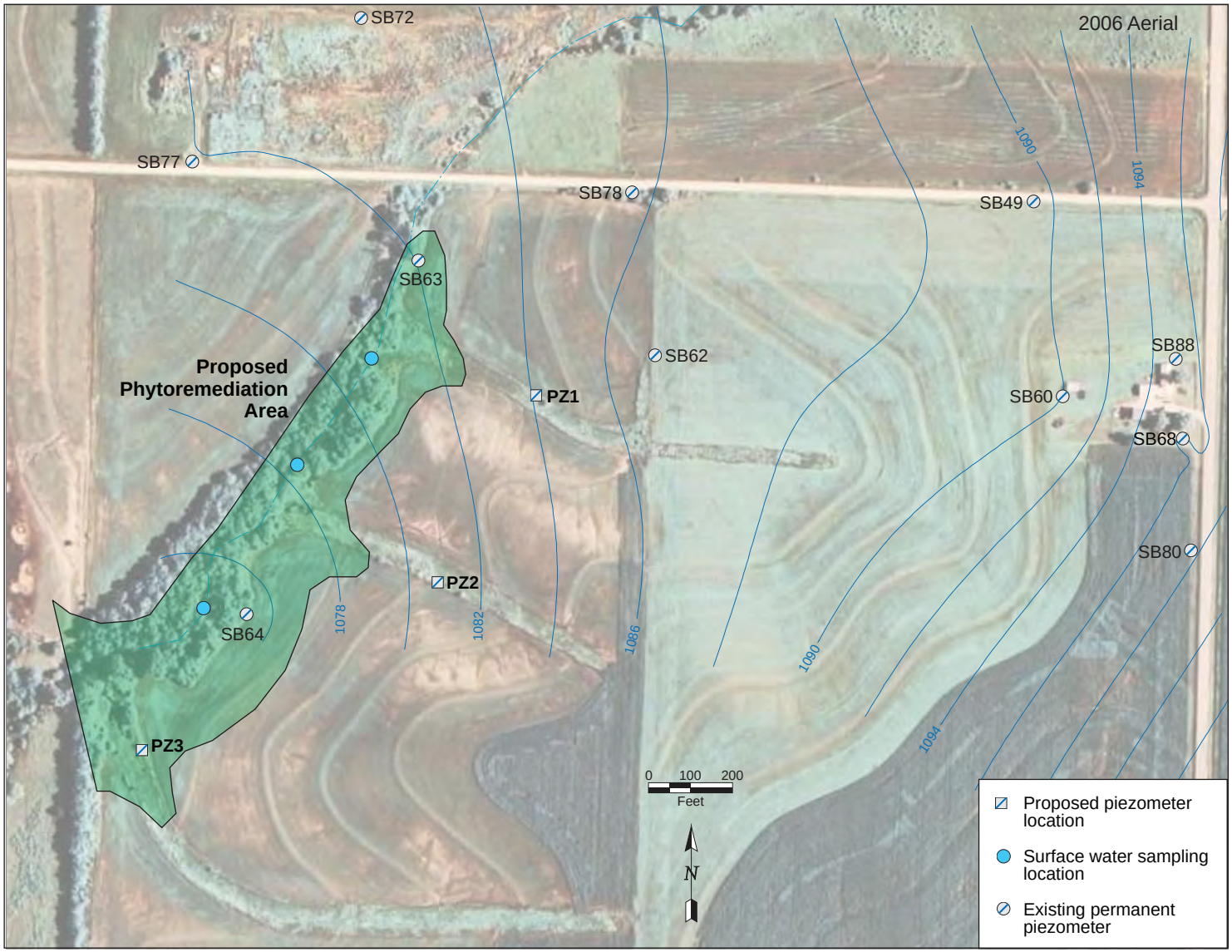

FIGURE 3 Locations of existing permanent monitoring wells, KDHE-approved locations for periodic sampling of surface waters (if present), and proposed alternate locations for three new permanent monitoring points (piezometers) along the existing waterways near the intermittent creek at Everest, if property access to the locations shown in Figure 1 cannot be obtained by the CCC/USDA. The shading indicates the presently estimated upstream (upgradient) margin of the area along the intermittent creek that may be amenable to phytoremediation (with depths to groundwater of 15 ft BGL or less).

EV03.ai 05/02/2007