BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
PROPOSED AMENDMENTS TO	)	
CLEAN CONSTRUCTION OR DEMOLITION	)	R12-9
DEBRIS FILL OPERATIONS (CCDD):	)	(Rulemaking – Land)
PROPOSED AMENDMENTS TO 35 Ill.	)	
Adm. Code 1100)	)	

NOTICE OF FILING

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Attached Service List

PLEASE TAKE NOTICE that I have today filed with the Office of the Clerk of the Illinois Pollution Control Board the Illinois Environmental Protection Agency's First Notice Comments copies of which are herewith served upon you.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

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DATE: April 18, 2012

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY'S FIRST-NOTICE COMMENTS

The Illinois Environmental Protection Agency ("Agency") respectfully submits its comments in the above-titled matter to the Illinois Pollution Control Board ("Board") in accordance with 35 Ill. Adm. Code 102.604 and the Hearing Officer Order of March 14, 2012.

I. OVERVIEW

Three hearings have been held on the Agency's proposal for amendments to rules for clean construction or demolition debris ("CCDD") fill operations at 35 Ill. Adm. Code 1100. The amendments are required by Sections 3.160, 22.51 and 22.51a of the Environmental Protection Act ("Act"). 415 ILCS 5/3.160, 22.51, 22.51a (2010) (as amended by P.A. 97-0137 (eff. July 14, 2011)). The hearings were held in Springfield on September 26, 2011, and in Chicago on October 25 - 26, 2011, and March 13 - 14, 2012. During the course of the hearings, approximately 622 pages of testimony, questions and responses have been gathered and fifty-one exhibits admitted to the record. As a result of its continuing evaluation of its proposal and in response to questions and comments raised during the hearings, the Agency has filed three errata sheets suggesting additions and corrections to the original proposal. Additional information has been presented in written comments. The Board issued its First Notice Opinion and Order on February 2, 2012.

The Agency respectfully requests that the Board revise its First Notice proposal by restoring the groundwater monitoring requirements in Subpart G of the Agency's proposal (as amended by Agency errata sheets one through three) and by returning the enhanced certification procedures in Section 1100.205 to the more flexible requirements proposed by the Agency. Modifications to reflect the use of ASTM due diligence and environmental site assessment procedures as guidance rather than as mandatory components of the certification process would be acceptable to the Agency. The Agency's comments below will elaborate on these and other matters raised during the proceedings. The absence of comment in this document on any other matters contained in the record should not be construed as acquiescence or agreement by the Agency for positions or revisions not otherwise expressly endorsed.[1]

II. COMMENTS ON SPECIFIC ISSUES

A. Groundwater Monitoring Issues

1. The Importance of Groundwater Monitoring

As set forth in the testimony of Mr. Cobb and others in the March hearings and in comments, the Agency strongly supports the inclusion of groundwater monitoring requirements in the CCDD amendments and recommends that the Board restore the Agency's proposed Subpart G in its Second Notice Opinion and Order. Pre-Filed Testimony of Richard P. Cobb, P.G., Exh. 26. Certification and screening procedures cannot be expected to bear the entire weight of protecting groundwater from the potential for contamination from fill operations, and increasing the stringency of the certification procedures shifts the regulatory burdens of costs and

[1] In this document, the Board's First Notice Opinion and Order is cited as "First Notice Opinion [Order] at___." Exhibits are cited as "Exh. ___ at___." The transcript of the September 26, 2011, hearing is cited as "TR 1 at ___"; the transcript of the October 25, 2011, hearing is cited as Tr. 2 at ___"; the transcript of the October 26, 2011, hearing is cited as Tr. 3 at ___"; the transcript of the March 13, 2012, hearing is cited as Tr. 4 at ___; and the transcript of the March 14, 2012, hearing is cited as Tr. 5 at ___. The Agency's Statement of Reasons is cited as "SOR at ___." The Agency's Pre-First Notice Comments are sited as "PC#9 at ___."

delays from fill site operators directly to source site owner/operators. In these circumstances, groundwater monitoring provides the single most reliable tool for protection of groundwater. It will act as a check on the effectiveness of the certification and screening procedures, provide incentive for fill site owner/operators to maintain and improve their screening and load checking practices, serve as a sentinel for groundwater contamination, and trigger corrective action measures if groundwater contamination is identified. *Id*. at 3 – 4. If groundwater contamination does occur and is not identified at the earliest stages, the Agency's testimony demonstrates that potential costs of corrective action would undoubtedly and significantly exceed the costs of groundwater monitoring not to mention the costs of decreases in property values and the loss of a safe potable water supply for current or future use. *Id*. at 14 – 19; Exhs. 27 – 32 (showing northeastern Illinois fill sites in relation to valuable aquifers and potable water supply wells). The Agency presents estimated cost data below for a basic groundwater monitoring system installation.

In response to the Board's decision to strike the proposed groundwater monitoring requirements in its First Notice proposal, the Agency testified that proof of actual groundwater contamination from fill operations is not necessary for the inclusion in Part 1100 of a groundwater monitoring requirement for fill operations. Because the State's long-standing policy has been to prevent groundwater contamination and preserve groundwater resources for their highest current and future uses, it is sufficient to include a groundwater monitoring requirement based on the <u>potential</u> for such facilities to cause groundwater contamination. The Agency provided several examples of the legal origins of this policy from statements of legislative purpose and intent, to examples of the policy in regulatory programs, to statutory enforcement authorities, and to court cases. Pre-Filed Testimony of Mr. Cobb, Exh. 26 at 9 – 14.

The Agency was supported on this key point by the testimony of Mr. Sylvester on behalf of the Illinois Attorney General's Office ("AGO"). Pre-Filed Testimony of the Attorney General's Office by Stephen J. Sylvester, Exh. 35 at 2 – 9 (citing also Article XI, Section 1 of the Illinois Constitution). The Agency noted that evidence either way of groundwater contamination from fill operations is "virtually nonexistent" since fill site owner/operators are not required to monitor for or report it. Pre-Filed Testimony of Mr. Cobb, Exh. 26 at 12 – 13 (citing Testimony of Mr. Purseglove and Mr. Nightingale, Tr. 1 at 27, 41, 52, 54). In the absence of groundwater monitoring, the ability to limit off-site damage to the groundwater resource will have been lost if the first indication of contamination from a fill site operation comes from off-site wells. *Id*. at 14. As Mr. Sylvester pointed out, "If there was ever an instance where the adage 'an ounce of prevention is worth a pound of cure,' it is in the area of groundwater contamination." Pre-Filed Testimony of Mr. Sylvester, Exh. 35 at 4.

In further support of its position that groundwater monitoring may be required by the Board based on the potential of a facility to cause groundwater contamination, the Agency testified that fill operations have the potential to cause groundwater contamination. It stated as a starting point that the legislature has concluded that fill operations have this potential because it directed the Agency and the Board to propose and adopt standards and procedures for fill operations necessary to protect groundwater. Pre-Filed Testimony of Mr. Cobb, Exh. 26 at 4. The Agency further testified that, in the collective experience and judgment of the Agency's workgroup, several factors support the legislature's conclusion. Soil that does not comply with the maximum allowable concentrations ("MAC") and therefore must be managed as waste is likely to be accepted at fill operations because of imperfect certification procedures, imperfect implementation of the certification procedures, and the limitations of the screening tools available to fill site owner/operators. Pre-Filed Testimony of Mr. Cobb at 5 – 6 (noting limitations of the available screening tools -- visual/olfactory methods, photo ionization detectors, x-ray fluorescence); Pre-Filed Testimony of Douglas W. Clay, P.E., Exh. 33 at 6 – 8 (discussing limitations of x-ray fluorescence as a screening device for metals in this scenario). These factors, along with the volumes of soil accepted at such facilities, the frequent placement of the soils in the saturated zone, the nearly complete absence of design controls such as liners to prevent contaminant migration, the impracticality of installing or retrofitting design controls such as liners in former quarry operations, and the locations of many facilities in areas (1) geologically susceptible to groundwater contamination; (2) with significant and increasing current and future demand for fresh water, and (3) within 2500 feet or less of hundreds of existing community water supply ("CWS") wells, non-community water supply wells, and private water wells, demonstrate the potential for groundwater contamination from fill operations and support the inclusion of a groundwater monitoring requirement for fill operations. Pre-Filed Testimony of Mr. Cobb, Exh. 26 at 20; Exhs. 27 – 32 (showing potential for aquifer recharge relative to CCDD and uncontaminated soil fill operations in six northeastern Illinois counties).

Mr. Sylvester further developed the record concerning the potential for groundwater contamination from fill operations in his testimony about enforcement actions initiated by the AGO. In particular, he noted the *Einoder* case, cases in which the Board's solid waste disposal regulations, despite their load checking requirements, did not prevent "highly regulated landfills [from] accepting materials for which they were not permitted," and cases initiated against CCDD fill operations since the adoption of the Board's Part 1100 regulations "that call into question the ability to determine the nature of materials accepted by the facility." Pre-Filed Testimony of Mr. Sylvester, Exh. 35 at 22 – 28 (citing eleven such actions initiated against CCDD fill operations).

For these reasons and others set forth below, the Agency urges the Board to restore the groundwater monitoring requirements in the Agency's proposed Subpart G.

2. Additional Reasons to Adopt Groundwater Monitoring Requirements

Several issues were raised at the March hearings that prompted additional investigation and consideration by the Agency. The Agency takes this opportunity to provide additional information on a few of these topics. In the Agency's opinion, these factors further support the adoption of the Agency's proposed groundwater monitoring requirement at Subpart G.

a. Minimum Setback Zone Requirements

At the March 13th hearing, the Board asked the Agency if the CCDD or soil fill sites would be considered potential primary or potential secondary sources under Section 14.1 of the Environmental Protection Act ("Act"). 415 ILCS 5/14.1 (2010). Tr. 4 at 23 – 25. Mr. Cobb answered the immediate questions, but the Agency would like to expand on Mr. Cobb's response. CCDD fill operations are not considered potential primary or potential secondary sources under Section 14.1 of the Act. This is because construction and demolition debris is excluded from the definition of "potential primary source" at Section 3.345(2) of the Act and from the definition of "potential secondary source" at Section 3.355(1) of the Act and is not otherwise included within the definitions. 415 ILCS 5/3.345(2), 3.355(1) (2010). However, any excavation for the discovery, development or production of stone, sand or gravel, including those where CCDD fill is being placed, does meet the definition of a "potential route." *Id*. § 3.350. Thus, CCDD fill operations at former stone, sand or gravel excavations are potential routes but are not potential primary or potential secondary sources as those terms are defined for purposes of Sections 14.1 through 14.3 and related sections and regulations.

Uncontaminated soil fill operations ("USFO") are not potential primary or potential secondary sources because soil generated during construction or demolition activities that is not commingled with general or clean construction or demolition debris or other waste (including contaminants above the applicable MACs) is not general or clean construction or demolition debris or waste and is not otherwise included within the definitions. *Id*. §§ 3.160(a), (b); 3.345, 3.355. However, USFOs at excavations made for the discovery, development or production of stone, sand or gravel would be potential routes. *Id*. § 3.350. USFOs at excavations made for the discovery, development or production of materials other than stone, sand or gravel (*e.g*., clay) would not be potential routes.

To summarize the effect of these provisions, Section 14.2 of the Act prohibits <u>new</u> CWS wells from locating within either 200 or 400 feet of an <u>existing</u> potential route of groundwater contamination after January 1, 1988. *Id*. §§ 14.2(a), (d). Section 14.2 further prohibits <u>new</u> private, semi-private, and/or non-community wells from locating within 200 feet of an <u>existing</u> potential route after January 1, 1988. *Id*. § 14.2(a). In addition, <u>new</u> potential routes are prohibited from locating within the setback zones of existing potable wells after January 1, 1988. *Id*. However, potential routes that existed prior to January 1, 1988, within the applicable setback zone of a potable water supply well were grandfathered into indefinite existence.

In addition to considering the status of CCDD fill operations and USFOs as potential routes under Sections 14.1 through 14.3 and the applicable minimum setback requirements, the definition of "clean construction or demolition debris" also imposes a setback requirement on the use of CCDD as fill material as follows:

> To the extent allowed by federal law, clean construction or demolition debris <u>shall not be considered "waste" if it is (i) used as fill material outside of a setback zone</u> if the fill is placed no higher than the highest point of elevation existing prior to the filling immediately adjacent to the fill area, and if covered by sufficient uncontaminated soil to support vegetation within 30 days of the completion of filling or if covered by a road or structure, and, if used as fill

> material in a current or former quarry, mine, or other excavation, is used in accordance with the requirements of Section 22.51 of this Act and the rules adopted thereunder or…

Id. § 3.160(b) (emphasis added). However, even though there is a minimum setback for new CCDD fill operations relative to existing potable water supply wells (under Section 3.160(b) or as potential routes), the Agency still has significant concerns about not requiring groundwater monitoring at CCDD sites. The listed potential sources are far from a complete list of actual potential sources of contamination. Moreover, <u>USFOs are not included in the setback provision under Section 3.160(b)</u> because soil generated during construction or demolition activities that is not commingled with construction or demolition debris or other waste (including contaminants above the applicable MACs) is not clean construction or demolition debris. Thus, USFOs only are subject to a setback for new wells if they fall within the narrow definition of potential route (*i.e.*, located at former stone, sand or gravel excavations).

The term "minimum" setback zone was used for a reason. It is a small area providing protection only as a surrogate for a well's actual zone of influence and the zone of capture. It is only one of the tools in the tool box used to implement wellhead protection. It was never intended as the sole element for providing wellhead protection, and wellhead protection is only a portion of the larger policy of protecting groundwater resources for the highest current and future uses. In the mid-1980's, Public Act 83-1268 required the Department of Natural Resources to prepare a study of Illinois groundwater quality. The Agency then was required to develop a groundwater protection plan that resulted in a report, "A Plan for Protecting Illinois Groundwater" ("Plan") and to submit the Plan to the Governor, General Assembly, and the Board in January 1985. The Board was mandated to conduct public hearings on the results and recommendations in the Plan. Upon conclusion of the hearings, the Board was required to publish a report on the areas covered by the study, the Plan, and the testimony received in the hearings. The Board conducted seven days of hearings across the State, and published a final report (In the Matter of Protecting Illinois Groundwater, PCB R86-8, August 28, 1986 (Report of the Board (by R. C. Flemal)) ("Flemal Report"). This report provided what should be included in the foundation of a groundwater protection program. It also can be said to be an early expression of the State's long-standing policy to protect groundwater resources for current and future uses. Although many of the steps recommended in the plan have come to pass since 1986, many of the general findings in the Flemal Report are still relevant to this proceeding, among them:

► [G]roundwater protection is predicated on maintaining quality of a resource; hence, <u>demonstration of contamination should not be a condition necessary to justify institution of programs to prevent groundwater contamination</u>; . . .

► [R]emediation of groundwater contamination is likely to be difficult and expensive; accordingly, <u>the primary long-term measures for protecting groundwater resources are those that prevent contamination</u>; . . .

► <u>[G]roundwater monitoring needs to be expanded</u> . . .

► [G]roundwaters may not be amenable to a standard of protection at other than that of the highest potential use without risk of long-term or permanent loss of the highest use . . .

Flemal Report at ii – iv (emphasis added).

The Flemal Report became the basis for Public Act 85-863, which created the Illinois Groundwater Protection Act ("IGPA") [415 ILCS 55] and amended the Environmental Protection Act accordingly. The framework for groundwater protection under PA 85-863 includes the following elements in addition to setback zones that are supposed to provide wellhead protection and groundwater resource protection:

► Identification, classification and protection of resource groundwaters, including waters of both present and potential use, and comprehensive groundwater quality standards (Section 8 of the IGPA, 35 Ill. Adm. Code 620);

► Priority Groundwater Protection Planning Regions based on Illinois Potential for Aquifer Recharge Map (Section 17.2 of the Act);

► Regulated recharge areas (Sections 17.3 and 17.4 of the Act);

► Technology control regulations (<u>including groundwater monitoring requirements</u>) for certain activities located within setback zones and regulated recharge areas (Section 14.4 of the Act and 35 Ill. Adm. Code 615 and 616); and

► Maximum setback zones for CWS wells based on the actual cone of depression and exceeding the distance for the minimum setback zones of Section 14.2 (Section 14.3 of the Act).

These elements, working together and combined with specific program requirements and the enforcement authority to prevent groundwater contamination, are the basic elements of the policy intended to provide groundwater protection. *See* 415 ILCS 5/12(a), (d); 35 Ill. Adm. Code 620.301, 620.405. Groundwater monitoring has always been a component of evaluating the effectiveness of legal and technological controls as part of a <u>multi-barrier approach</u> to prevention of groundwater contamination. In the case of fill operations, the certification and screening requirements constitute only a single barrier to groundwater contamination. There are no technological controls (*e.g.*, liners, leachate collection, impermeable cover) to prevent groundwater contamination if certification and screening requirements do not achieve a very high level of effectiveness. Therefore, groundwater monitoring assumes even greater importance in the groundwater protection plan for fill operations by providing early identification of groundwater contamination, if any, and by triggering corrective action before contaminants threaten off-site groundwater and wellheads.

b. Class III Special Resource Groundwater

Class III Special Resource Groundwater is groundwater that is determined by the Board to be: (1) demonstrably unique and suitable for application of a water quality standard more stringent than the otherwise applicable groundwater quality standard, or (2) vital for a particularly sensitive ecological system. 35 Ill. Adm. Code 620.230. At the hearings on March 13th and 14th, there were some exchanges concerning bogs, fens, variable pH and possible effects related to fill operations located in or near recharge zones for Class III groundwater areas. Mr. Cobb indicated the Agency would provide more information in comments. Tr. 5 at 39 – 40. In addition, Mr. Huff previously had commented in the context of the pH issue:

> Looking at the record on the pH and now that was established, you heard some testimony today. . . . <u>When we run across these low pHs, they tend to be associated with a bog. Volo Bog is a good example up here and then down in southern Illinois you've got some swamps down there, and typically they are attributed to where you've had the nutrient leaching and the production of the volatile organic acids that happen. And we don't necessarily see that in the wetlands up here. It's more truly in the bog type areas where you see these pHs.</u> And all these bogs, much like the swamps, they are highly protected deemed irreplaceable resources to the State and to the federal government. . . . So to base – a MAC on a soil that basically is deemed irreplaceable is technically, I believe, an over simplistic and flawed approach.

Tr. 4 at 101 – 102 (emphasis added).

In response to these exchanges, the Agency evaluated the location of existing CCDD fill operations and proposed CCDD expansions in or near Class III groundwater. There are several examples. Attachment 1 provides a map of the existing Peterson Sand and Gravel CCDD (McHenry County) within and adjacent to the Volo Bog State Nature Preserve[2] in relation to: 1) the United States Department of Agriculture ("USDA"), Natural Resource Conservation Service ("NRCS") county-specific soil chemistry data base; and 2) the United States Fish and Wildlife Service's ("USFWS") map of wetlands. Attachment 1 includes the Peterson site, proposed

[2] Volo Bog itself is 47.5 acres (0.2 km²) in size. It was originally a steep-sided lake created by the melting of a large chunk of glacial ice at the end of the Wisconsonian glaciation. About 6,000 years before the present, a mat of sphagnum moss began to grow out into the water, playing a major role in the evolution of this geological feature from a lake into a bog. As the sphagnum mat aged and thickened, the developing bog (already poorly-drained) <u>became acidic</u>. The bog's changing pH levels encouraged the growth of other acid-loving plant species, such as leatherleaf, certain specialized orchids, and coniferous tamarack trees. The development of a tamarack grove on the edge of the bog signaled further change in the wetland. Illinois Department of Conservation (IDC) [now Illinois Department of Natural Resources], 1991, *A Directory of Illinois Nature Preserves*, p. 355 (emphasis added).

CCDD expansion areas, wetland types, adjacent soil types, and the cross-referenced NRCS pH data presented in depth ranges. The USDA NRCS county-specific soil chemistry data base shows pH lows of 4.5. This attachment also illustrates additional adjacent quarries with a potential for additional CCDD and/or soil fill sites to locate. This map and a second map referenced below provide examples and reasons to believe these fill sites and potential fill sites are subject to water table fluctuation and are hydraulically linked to adjacent wetland complexes in many cases.[3] The potential for interaction with saturated materials in fill operations of acidic or alkaline pH within these hydrogeologic settings is another reason to restore the Agency's proposed groundwater monitoring requirements in Subpart G.

A key factor in this consideration is that a wetland can be a point of groundwater discharge or recharge. A United States Geological Survey report[4] states:

> <u>Wetlands most commonly are ground-water discharge areas; however, ground-water recharge also occurs.</u> Ground-water recharge or discharge in wetlands is affected by topographic position, hydrogeology, sediment and soil characteristics, season, ET, and climate and might not occur uniformly throughout a wetland. Recharge rates in wetlands can be much slower than those in adjacent uplands if the upland soils are more permeable than the slightly permeable clays or peat that usually underlie wetlands. . . .
>
> <u>The accumulation and composition of peat in wetlands are important factors influencing hydrology and vegetation. It was long assumed that the discharge of ground water through thick layers of well-decomposed peat was negligible because of its low permeability, but recent studies have shown that these layers</u>

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[3] "Wetlands" are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is covered by shallow water . . . Wetlands must have one or more of the following three attributes: 1) at least periodically, the land supports predominantly hydrophytes; 2) the substrate is predominantly undrained hydric soil; and 3) the substrate is saturated with water or covered by shallow water at some time during the growing season of each year. (Cowardin, L.M., V. Carter, F. C. Golet, E.T. LaRoe, <u>Classification of Wetlands and Deepwater Habitats of the United States</u>. U. S. Dept. of Interior, Fish and Wildlife Service, Washington D.C. (1979)).

[4] Carter, Virginia, *Technical Aspects of Wetlands, Wetland Hydrology, Water Quality, and Associated Functions,* USGS National Water Summary on Wetland Resources, United States Geological Survey Water Supply Paper 2425.

> can transmit ground water more rapidly than previously thought. [citation omitted] Peatland type (fen or bog) and plant communities are affected by the chemistry of water in the surface layers of the wetland; the source of water (precipitation, surface water, or ground water) controls the water chemistry and determines what nutrients are available for plant growth.

Id. note 4 (emphasis added). Groundwater can flow either from or to these wetlands. Since the CCDD and soil fill sites are located within the geologic materials comprising aquifers adjacent to these wetland areas, it is expected that fluctuation of the water table within the wetland aquifer complex and saturated CCDD and soil fill materials may at times create a more acidic or alkaline groundwater geochemistry with a corresponding impact on the release of pH-sensitive contaminants in fill material in contact with groundwater. We know that many of the Class III areas designated by the Board are hydraulically linked to dedicated nature preserves comprised of wetlands. These areas can produce acidic conditions (low pH) or alkaline conditions for fens. In addition, given their proximity to the wetlands and fluctuation of the water table, CCDD and soil-only sites could affect Class III groundwater and dedicated nature preserves.

A second example of the proximity of fill operations and wetlands and the potential for pH and groundwater interaction between fill operations and Class III groundwater is the Bluff Spring Fen vicinity, designated by the Board to be Special Resource Groundwater. The county-specific NRCS data in Attachment 2 show that the Bluff Spring Fen - Class III groundwater area is adjacent to wetland areas and soils that are acidic (5.1) to moderately alkaline (8.4). Attachment 2 also shows the existing Gifford East, Blue Heron Business Park, and 47 Acres/South Wind Business Park CCDD sites that are located in the Class III groundwater area.

Other existing CCDD sites are located in areas where there also are existing and proposed Class III groundwater areas, existing nature preserves, and existing wetlands, as follows: (1) the Beverly Materials CCDD site (Bartlett, Kane Co.); (2) Reliable Sand & Gravel Co. CCDD site

(Holiday Hills, McHenry Co.); (3) Lake in the Hills CCDD site (Lake in the Hills, McHenry Co.); and (4) Hanson Material Service Yard 588 (Romeoville, Will Co.). Beverly Materials is located in the Class III groundwater area designated by the Board to recharge Trout Park Nature Preserve. Reliable Sand & Gravel Co. CCDD site is located in a complex wetland setting. Lake in the Hills CCDD site is located in a principal sand and gravel aquifer with open water wetlands**.** Hanson Material Service Yard 588 appears to be located in the same hydrogeologic setting as nearby Class III areas recharging the groundwater of the Romeoville Prairie Nature Preserve and Lockport Prairie Nature Preserve. In addition to existing facilities, there appear to be many other potential locations for fill operations within this northeastern Illinois principal sand and gravel aquifer. The potential for two-way interaction between fill operations and wetland areas in general and Class III Special Resource Groundwater areas in particular constitutes an additional reason why the Board should restore the proposed Subpart G monitoring requirements.

c. Use of Institutional Controls and Site-Specific MACs

As part of the discussion regarding CCDD and USFO facilities located in or near Class III groundwaters, Ms. Manning acknowledged that fill operations may be located in Class III areas and responded:

> [B]ut there are also some in areas that a site owner could make a groundwater [class] two demonstration adequately whereas there [are] no drinking water sources near because they're all subject to an ordinance under the TACO – under the TACO parameters and/or they may have already-impacted wells as a result.
>
> I know one of these CCDD facilities has about 50 former underground storage tanks near them and I'm not suggesting that's what – I'm just suggesting you have to look at the whole gamut, not the most pristine of the CCDD facilities and then create a rule that requires all soil to be based on that most pristine of standards. I don't think that's what the legislature did, and I don't think that that's where the Board ought to be going with this rule.

Tr. 5 at 40 – 42. On Ms. Manning's first point, groundwater use restriction ordinances address only wellhead protection and drinking water concerns at remediation sites. They are not instruments for the protection of groundwater resources for the highest current and future uses. As Class III groundwater demonstrates, pollution of drinking water is not the only concern of the Board's groundwater protection rules. In addition, the Agency has consistently stated its opposition to the use of TACO tools such as institutional controls to increase the concentrations of contaminants in so-called "uncontaminated soil" that may be accepted at fill operations. SOR at 18 – 20; Agency's Pre-First Notice comments at 5 – 8. In the instance suggested here, groundwater use restriction ordinances approved for use as environmental institutional controls at remediation sites [35 Ill. Adm. Code 742.1015] are not required to prohibit existing potable uses of groundwater. Instead, they must prohibit only future potable uses that might be constructed after the Agency issues a no further remediation letter allowing groundwater contamination to remain in place in reliance on the ordinance. Therefore, existing potable wells may remain in significant numbers within areas with ordinance-based groundwater use restrictions. Existing potable uses in the vicinity of remediation sites are addressed in other provisions of the program rules and TACO rules and must be protected as described below. The one thing that is certain and that is addressed by the ordinance or other institutional control is that the State cannot allow new potable water supply wells to be constructed in contamination plumes it has authorized to remain in place in accordance with applicable law.

The remediation program rules and the TACO rules recognize the property rights of existing well owners. Remediation site owner/operators are not allowed to use institutional controls for site closure until existing wells have been identified and addressed taking into account the interests of the well owners.[5] 35 Ill. Adm. Code 742.320(c) and (e), 742.805(a)(4) and (a)(6). The remediation site owner/operator may not close the site as long as the groundwater ingestion exposure route has been or may be completed. The owner/operator must instead conduct corrective action and/or negotiate an acceptable resolution with the well owner to sever the exposure route (*e.g.*, closure of the well, provision of alternate water supplies). Therefore, the existence of such an ordinance would not automatically allow additional or unlimited contamination of the resource but instead would require substantial oversight of the process described here.

Further, local ordinances should not be a basis for allowing new groundwater contamination to occur. While the use of restrictive ordinances may allow elevated groundwater contamination levels to remain in place at remediation sites as a means of returning degraded sites to productive uses, using restrictive ordinances to allow groundwater contamination from materials intentionally deposited at a site would be contrary to prohibitions in the Act and rules and tantamount to allowing local ordinances to trump the Board's groundwater protection regulations and the State's policy of prevention of groundwater contamination and protection of groundwater resources for the highest current and future uses. 415 ILCS 5/12(a). 12(d); 35 Ill. Adm. Code 620.301, 620.405. In addition to the fact that it would be impractical to administer such a site-specific approach to fill site regulation, this approach is conceptually unacceptable to the Agency.

On Ms. Manning's second point concerning basing standards on the most pristine

[5] The use of institutional controls at remediation sites for groundwater contamination also assumes that the source material will have been addressed so that no more contaminants are entering the groundwater. The model projections for the contaminant plume are useless if contaminant loading continues. Any fill operations that may cause groundwater contamination will likely be <u>continuing sources of contamination</u> to groundwater unless the source material is removed from the site – a prospect that could be highly unlikely in many scenarios.

conditions, the Agency's proposal is intended to achieve not some ideal type of protection, but the groundwater standards already adopted by the Board. However, the State's groundwater protection policy must achieve a high level of success through the Act and Board regulations if it is hoped to preserve the highest current and future uses into the indefinite future – a very long time indeed. Prevention of any contamination would be the ideal, and, in the long run, the future of development in areas of Illinois dependent upon groundwater resources will be determined to a significant extent on how close to this ideal the State's protection mechanisms are able to come.

<u>*d. Potential for Aquifer Recharge, Acidic Precipitation and Fill Operations*</u>

Attachment 3 shows the "Illinois Potential for Aquifer Recharge Map," which overlays and includes the principle aquifers in Illinois. The potential for aquifer recharge is defined as the probability of precipitation reaching the uppermost aquifer. The map is based on a simplified function of depth to the aquifer, occurrence of principal aquifers, and the potential infiltration rate of the soil. Approximately fifteen percent of the land area in Illinois has a high potential for aquifer recharge. Mr. Cobb provided pre-filed and supplemental testimony explaining details on the process of groundwater recharge by precipitation, the accompanying exhibits, and the fact that many northeastern Illinois fill operations are located in principal aquifers with a very high potential for aquifer recharge. Pre-Filed Testimony of Mr. Cobb, Exh. 26 at 17 – 18; Testimony of Mr. Cobb, Tr. 4 at 15 – 23; Exhs. 27 – 32.

As the fill sites are filled in over time and become saturated, precipitation will migrate down through the unsaturated material to the water table. During the hearings several witnesses have testified about pH and the neutralizing capacity of the soil and/or the limestone, dolomite, or sand and gravel environments.[6] No testimony was provided regarding the pH of precipitation recharging aquifers through CCDD and soil fill areas and especially those located in areas such as wetlands with dynamic hydrologic conditions (*i.e*., potential for varying water table elevations and reversed gradients) and a very high potential for aquifer recharge.

The National Atmospheric Deposition Program ("NADP"), which began in 1977, analyzes precipitation samples for acidity and chemical composition. The results of this monitoring are summarized in the "Climate Atlas of Illinois."[7] This document states:

> Clean water exposed to the atmosphere has a pH of approximately 5.6. Due to the effect of other natural chemicals in the atmosphere, precipitation with a pH below 5.0 is generally considered very acidic. . . .
>
> The profile of annual average pH (Figure 6-14) indicates the precipitation with the highest acidity (lowest pH) generally fell in eastern portions of Illinois. In 1985, the lowest average pH was 4.3, measured at Bondville (IL11) and Salem (IL47). The pH values generally increased towards the northwestern corner of the state, indicating a lowering of precipitation acidity. In 2000, pH values were 4.7 in eastern Illinois, increasing to 5.0 at Monmouth (IL78). Improved precipitation quality was likely due to reductions in certain air pollutant emissions, especially sulfur dioxide. . . .
>
> Nitrate in precipitation is another significant contributor to precipitation acidity in Illinois.

Changnon, S. A., et al, p. 165. The NADP produces maps each year, and they are currently finalizing the data for 2011. The last completed data set from the NADP is for 2010. Attachment 4 shows the locations of the five NADP monitors in Illinois and that precipitation acidity in eastern and northeastern Illinois ranged from 4.9 to 5.1 in 2010, which is considered to be very acidic.[8]

Acidic precipitation infiltrating through CCDD and soil fill materials could potentially

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[6] Additional discussion of the pH issue is included below.
[7] Changnon, S. A., *et al*., March 2004, *Climate Atlas of Illinois*, Illinois State Water Survey, 309 pp.
[8] National Atmospheric Deposition Program web page: http://nadp.isws.illinois.edu/ntn/maps.aspx

mobilize and leach contaminants to the water table. In addition, this acidic precipitation could create concentrations of total dissolved solids ("TDS"). TDS cannot be removed by ordinary drinking water treatment techniques used by private well owners. Although the Agency has no data to quantify the effects of acid rain at fill operations and in wetland areas, at a minimum, the Agency believes this is a previously unconsidered complicating factor in the discussion of the potential for groundwater contamination based on the effects of pH on the leaching of pH-sensitive contaminants in fill operations. This factor very likely contributes to the potential for contamination from fill operations and is another reason to restore the Agency's groundwater monitoring requirements in proposed Subpart G.

3. Enhanced Assessment and Certification Procedures

The Board proposed enhanced certification procedures for source-site owner/operators based on source property assessment requirements conducted in accordance with ASTM standards for environmental due diligence or environmental site assessment to determine potentially-impacted-property ("PIP") status. Under the Board's revisions, soil taken for placement at fill operations from properties determined to be PIPs must be accompanied by analytical testing data demonstrating compliance of soil from such properties with the MACs. The Board reasoned that requiring assessment of source properties using ASTM procedures and requiring analytical soil testing to demonstrate compliance with the MACs by soil from PIPs would provide a higher level of certainty than the Agency's more flexible proposal of certifications based on the judgment of licensed professionals so that soils with the potential to cause groundwater contamination will be excluded from fill operations. The Board expects these enhanced certification and assessment procedures, combined with the fill operation screening procedures, to provide sufficient protection for groundwater making groundwater monitoring unnecessary.

Concerning this alternative, the Agency responded in Mr. Cobb's testimony that, while the enhanced procedures might produce marginally better results than the Agency's more flexible assessment and certification procedures, the Agency does not share the Board's confidence that the enhanced procedures, even when combined with the fill operation screening procedures, are a sufficient substitute for groundwater monitoring. Pre-Filed Testimony of Mr. Cobb, Exh. 26 at 2 – 9. Reasons for skepticism include (1) the complexity of the ASTM due diligence procedures that may place them beyond the effective use of persons unfamiliar with the investigative procedures and the environmental and legal concepts contained in them, and (2) the additional costs and delays of implementing the ASTM procedures that are disincentives for the diligent performance of the requirements that is essential for their effectiveness. *Id*.; Pre-Filed Testimony of Douglas W. Clay, Exh. 33 at 1 - 6.

Specifically, with regard to Dr. Glosser's question asking if the Agency had concerns about the variability in the quality and accuracy of assessments and certifications in the absence of specific standards of review, Mr. Clay stated the Agency acknowledges there will be variability even among environmental professionals. Tr. 4 at 91 – 92. Mr. Clay noted that variability is understood in all cases where professional certifications are required for demonstrations of compliance, and the Agency accepts the fact. *Id*. The Agency would add, as previously stated, that the adoption of specific standards, if consistently applied at a high level of effectiveness, may reduce the degree of variability but will not eliminate it. Testimony of Mr. Cobb, Tr. 4 at 21 – 22. That is why the Agency acknowledges the Board's proposed procedures may result in marginal improvements in the accuracy of certifications but at the cost of shifting most of the direct burden for groundwater protection to the soil generators and their construction projects in return for a very uncertain result at the fill operations.

Other witnesses at the March hearings also expressed concerns about the enhanced assessment procedures for reasons of compliance, cost and delay. Mr. Gobelman of the Illinois Department of Transportation ("IDOT"), Mr. Metz of the City of Springfield's municipal utility, City Water, Light and Power, and Mr. Huff, representing several governmental road-building organizations referred to as the "Illinois Transportation Coalition," all testified that mandatory use of the ASTM procedures would create certification problems for their own and similar organizations, especially for linear projects (*e.g.*, road construction and repair, utility construction and repair). In the alternative, each proposed an exception to the Board's requirements to address the specific concern. Pre-Filed Testimony of Steven Gobelman, Exh. 34; Pre-Filed Testimony of Pat Metz, Exh. 43; Pre-Filed Testimony of James E. Huff, P.E., Exh. 45, at 8 – 9; (noting that requiring full Phase I assessments would be a hardship on all linear projects resulting in delays and significant expenses); Testimony of Mr. Huff, Tr. 4 at 126 – 127 (stating the cost for a professional firm performing either of the ASTM assessment procedures for individual properties could range from $2000 to $5000). However, these exceptions to the ASTM-based requirements are meant to relieve the problems presented for their proponents and do not address the Agency's larger concern about the overall effectiveness of any such procedures for ensuring that contaminated media are not accepted a fill operations.

The amendments proposed by each of these individuals would abbreviate the Board's proposed ASTM procedures, authorize the use of "equivalent alternatives," or create new certification authority for utilities. Again, the Agency objects to the mandatory ASTM-based assessment procedures proposed by the Board and to all three amendments proposed for specific exceptions to the mandatory requirements proposed by the Board. While the points about hardship and delays for source-site owner/operators are well-taken, in the absence of groundwater monitoring, each of the exceptions would weaken the basis on which the Board excluded the groundwater monitoring requirement by making the ASTM procedures less comprehensive. Moreover, not all projects are linear and the entire range of ASTM procedures might be appropriate for other types of properties, the determinations of "equivalent procedures" should not be left to the source-site owner/operators or allocated to the Agency because of resource and procedural issues, and the exception for utilities proposed by Mr. Metz includes neither a standard for making a PIP determination nor a licensed professional's judgment.

The Agency advocates a return to its more general and flexible proposal allowing source-site PIP assessments and certifications based on personal knowledge of owner/operators and site-specific judgments by licensed professional engineers ("LPE") and geologists ("LPG"). The Agency believes this approach would accommodate the concerns of the three witnesses mentioned. Both Mr. Gobelman and Mr. Metz agreed the Agency's proposed language would accommodate their concerns and would be acceptable to their organizations. Pre-Filed Testimony of Mr. Gobelman, Exh. 34 at 1, 6, Attachment 2; Testimony of Mr. Gobelman, Tr. 4 at 53 - 54; Pre-Filed Testimony of Mr. Metz, Exh. 43 at 4; Testimony of Mr. Metz, Tr. 4 at 89 – 90.

As stated above and in Mr. Cobb's testimony, the Agency's position is that neither the Agency's flexible certification procedures nor the Board's more stringent certification procedures will guarantee all materials accepted at fill operations will comply with the MACs such that there will be no potential for groundwater contamination from such facilities. This remains true even when the procedures are combined with the fill operation screening procedures, which have weaknesses of their own. Pre-Filed Testimony of Mr. Cobb at 5 – 6 (noting limitations of the available screening tools -- visual/olfactory methods, photo ionization detectors, x-ray fluorescence). Therefore, groundwater monitoring must be included along with the source-site assessment and certification procedures and the fill operation screening procedures to ensure protection from potential groundwater contamination. By returning to the Agency's more flexible proposal combined with groundwater monitoring, the additional costs and delays for source-site owner/operators arising from the mandatory use of ASTM procedures will be addressed, the compliance concerns of the witnesses can be accommodated, and potential for groundwater contamination will be addressed directly and more effectively than with reliance on front-end procedures alone.

4. ASTM Procedures as Guidance

At the March 13th hearing, the Board asked Mr. Clay if it would be acceptable to the Agency if the definition of PIP is amended to acknowledge the ASTM due diligence standard as guidance for investigation procedures and techniques rather to include it as the required standard under Section 100.205(a)(1)(A). Tr. 4 at 25 – 27. Mr. Clay agreed that such an amendment would be acceptable to the Agency as long as the language is clear the ASTM procedures are not the only acceptable guidance. *Id*. at 26 – 27. The Agency believes the inclusion of both ASTM procedures (ASTM Standard E1527-05, ASTM Standard E1528-06) as guidance referenced in the PIP definition could be helpful, especially for source-site owner/operators unfamiliar with environmental assessments. However, Mr. Clay also stated the Agency does not support a provision requiring the Agency to review and approve other sources of guidance. *Id*.

5. Costs of Groundwater Monitoring and ASTM-Based Site Assessment Procedures

In the Board's pre-filed questions and at the March 13th hearing, the Agency was asked for a comparison of estimated cumulative costs of the ASTM-based site owner/operator certifications with the expected groundwater monitoring costs "at a typical CCDD fill site on an annual basis". Ms. Liu also asked if that cumulative cost could be converted to a cost per cubic yard or a cost per ton. Tr. 4 at 29 – 30. Mr. Clay stated the cost of an ASTM-based certification could range from several hundred dollars to several thousand dollars but that the Agency has no information on the number of such certifications per year or the amounts of soil generated per certification. *Id*. at 28. As previously noted, Mr. Huff estimated the cost of the ASTM-based certifications as $2000 to $5000 per individual property depending on site complexity and history. Presumably, these figures would be greater for linear projects affecting multiple properties and independent of the amount of excess soil subsequently generated by a project such that the costs would be the same whether five cubic yards or 500 cubic yards were generated. The resulting costs per cubic yard or per ton would vary widely.

Mr. Clay offered to provide in comments estimates for the costs of groundwater monitoring for an example site. *Id*. at 30. Mr. Clay cautioned that the variability from site to site under the proposed Subpart G would be such that the scenario provided by the Agency "in no way should be interpreted as what the Agency believes is appropriate for other sites." *Id*. From the beginning, the Agency's position on its proposed groundwater monitoring systems has been that there is no way to prescribe a one-size-fits-all system and that LPEs and LPGs will have to develop site-specific designs addressing variables such as the size of the fill site, site geology, number of wells, depth and location of wells, and so forth. *Id*.; Pre-Filed Testimony of Stephen F. Nightingale, Exh. 1 at 24 – 31.

An estimate of groundwater monitoring costs at CCDD fill sites is set forth in Attachments 5 and 6. Attachment 5 shows the estimated costs of well installation averaged over all permitted CCDD fill sites based on the total volume of CCDD disposed of at CCDD fill sites in 2011 (3,357,177 cubic yards), the only full year for which reporting data are available to the Agency.[9] These costs are based on several assumptions that will not apply at every fill operation. The assumptions and underlying limitations of the scenario are stated in the attachment. In summary, the estimated cost to install five wells at a site consisting of bedrock geology is $75,000. Twenty-two (35%) of the permitted CCDD fill sites are believed to have bedrock geology. The cost to install five wells at a site with unconsolidated material geology (*e.g.*, sand and gravel) is $6,750. Forty (65%) of the permitted CCDD fill sites are believed to have unconsolidated material geology. Averaging the total volume of cubic yards disposed of in 2011 over all 62 permitted CCDD fill sites, well installation costs average $.06 per cubic yard over the 10-year life of a CCDD permit. If fill volumes increase or if fill sites accept material for more than 10 years, the average cost per cubic yard will be even lower.

Because CCDD is not distributed to each fill site in equal quantities, the statewide cost per yard is of limited use. To provide additional perspective, the Agency has taken the simple five-well scenario a step further and applied it to individual permitted CCDD fill sites. Included in the first page of Attachment 6 is a further breakdown of estimated well installation costs based on the actual volumes of CCDD disposed of at each permitted CCDD fill site in 2011. For fill sites that received more than 100 cubic yards, the attachment also indicates what is believed to be the local geology for each site and the estimated cost per cubic yard to install five wells based on that geology. As in Attachment 5, the estimated cost for each site is spread over the 10-year life of a CCDD permit. Permitted sites that accepted less than 100 cubic yards of CCDD in 2011 are listed on the second page of Attachment 6. The sites accepting very limited amounts of

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[9] Registered uncontaminated soil fill operations do not report the quantity of uncontaminated soil received. Estimated monitoring well installation costs would be similar to those in Attachment 5 for the Agency's simple scenario, but no costs per cubic yard are included in either Attachment 5 or 6.

CCDD obviously would have much higher costs per yard over the 10-year span but the effects on any particular operation of higher costs per yard or a much longer cost recovery period depend on a number of factors that cannot be anticipated or accounted for here.

According to the site-specific disposal figures in Attachment 6, 62% of the 2011 CCDD was disposed of at fill sites with bedrock geology, which have higher estimated well installation costs than sites with unconsolidated material geology. However, <u>50% of the CCDD disposed of at sites with bedrock geology</u> (a total of 1,034,250 cubic yards) was disposed of at the two fill sites accepting the largest volumes of material. As a result, the estimated well installation costs under the Agency's simple scenario for the CCDD disposed of at these sites are only 1.2¢ and 1.9¢ per cubic yard, respectively. Because of their size it is anticipated that these sites will require more wells and incur higher groundwater monitoring costs than is assumed for purposes of these estimates. However, the increase in groundwater monitoring costs at larger sites is expected to be modest compared to landfill disposal costs when spread over the higher volumes of soil they accept.

As a whole, Attachment 6 shows that the estimated well installation costs under the Agency's simple scenario for approximately 96% of the CCDD disposed of at fill sites (a total of 3,217,118 cubic yards) are less than $0.10 per cubic yard. The estimated costs for approximately 98% of the CCDD disposed of at fill sites (a total of 3,275,674 cubic yards) is less than $0.25, and the estimated cost for approximately 99% of the CCDD disposed of at fill sites (a total of 3,315,858 cubic yards) is less than $0.50. As noted above, the cost for sites that accept material for more than 10 years will be even lower.

In addition to well installation costs, groundwater monitoring costs will include engineering design costs, maintenance costs, and the costs of well sampling and sample analysis.

Engineering design costs and maintenance costs are not reflected in these estimates. Estimated costs of well sampling and sample analysis are shown in Attachment 5 and are based on testimony already in the record. Testimony of Mr. Hock, Tr. 2 at 34. Like the well installation costs in Attachment 5, these costs are based on five wells at each of the 62 permitted CCDD fill sites in the state and averaged over the total volume of CCDD disposed of at fill sites in 2011. The result is an estimated statewide cost per cubic yard of $.20 for annual sampling and analysis.

In testimony provided at hearing the cost of disposing of material at fill sites was stated to be approximately $3.50 per cubic yard by Mr. Huff and $4.66 per cubic yard based on information provided by Mr. Metz. Testimony of Mr. Huff, Tr. 4 at 100; Pre-Filed Testimony of Mr. Metz, Exh. 43 at 5. The cost of disposing of the same material in a landfill based on information provided by Mr. Metz is estimated to be $19.58 a cubic yard. Pre-Filed Testimony of Mr. Metz, Exh. 43 at 5. Groundwater monitoring will increase the cost of disposing of material at fill sites. However, the increase appears to be within a quite reasonable range considering the protection to the State's groundwater resource that monitoring would provide and especially when compared to the considerably higher cost of disposing of material at a landfill.

B. The Role of Soil pH in Determining Maximum Allowable Concentrations

In response to question 6 of the Board's pre-filed questions concerning the pH data submitted by members of the Illinois Association of Aggregate Producers, Mr. Clay stated the Agency wished to take additional time to evaluate the data testimony and would provide additional comments during the comment period. Tr. 4 at 35 – 36. The issue of factoring soil pH into the determination of the MACs has been controversial. The issue is closely related to the discussion of groundwater monitoring and is important because of the effects of pH on the leaching of certain inorganic and ionizing organic constituents and their migration to groundwater. The Agency explained at length the rationale for its proposed approach in its Pre-First Notice Comments. Agency's Pre-First Notice Comments, PC#9 at 10 – 15; *see also* Testimony of Dr. Hornshaw, Tr. 4 at 72 - 75; SOR at 25 – 26. The Agency has acknowledged its approach is conservative, but it also has stated how the development of its approach led to the conservative result. PC#9 at 10 – 13.

1. Additional Explanation of the Agency's Data from the STATSGO2 Database

In pre-filed questions and at the March 13th hearing, the Board asked for clarification of the Agency's data concerning pH values in Illinois from the STATSGO2[10] database as presented in Exhibit 25. Mr. Morrow provided some preliminary explanations, but was unable to answer all of Dr. Glosser's questions. Mr. Rao stated the Board would appreciate any additional information the Agency could add in comments. Tr. 4 at 36 – 43.

Two requests for information were posed by the Board. The first request was in three parts and asked the Agency to provide narrative explanations for three entries in Exhibit 25. The first part asked for explanations of the percentages and the pH ranges presented in the exhibit. For each of the 23 included counties, a series of between two and 13 percentage values are listed. These percentages correspond to the overall areal coverage of the listed county by a major soil type. For each county, STATSGO2 lists many (up to 200) unique soil types. Areal coverage for most soil types in a county is less than 1%. To make the data more manageable, the Agency focused on the fewest number of soil types necessary to represent around one-third of the entire

[10] This soil property database is properly cited as: Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. U.S. General Soil Map (STATSGO2). Available online at http://soildatamart.nrcs .usda. gov. At various times in this proceeding, Agency representatives may have referred to this database simply as "STATSGO." However, an earlier version of the database is known as "STATSGO." At all such times the Agency was referring to STATSGO2, the more recent version.

county surface area. Each percentage entry represents a specific soil type and the percentage value is the corresponding coverage for the county. This effort reduced the number of unique soil types to between two and 13 as mentioned above. Each soil type percentage is followed by a range of pH values. This range corresponds to the lowest and the highest soil pH determined in the specific soil type represented by the percent coverage. The range of pHs includes values from all levels evaluated; from the soil surface through up to 80 inches below ground surface.

The Board also asked how these data are relevant to soil accepted at CCDD or uncontaminated soil fill sites. Exhibit 25 presents data for 23 Illinois counties. These counties were identified as containing a CCDD or USFO site. In planning the investigation, the Agency surmised that the surrounding natural soil pH values in these counties would be representative of the pH of the deposited fill material. From the STATSGO2 information we hoped to determine a single value or a narrow range of soil pH values that would be representative of soil used as fill material. The STATSGO2 data, however, led the Agency to conclude that soil pH is too variable and that no generalizations suitable for a statewide rule of general applicability could be made regarding average or background soil pH.

The Board next asked for the Agency's opinion on how the pH ranges can be so wide within any given soil type. The Agency has no conclusive answer to this comment. However, we can point out a few conditions affecting the NRCS data that might contribute to the wide range in pH results. The STATSGO2 data are by design obtained from agricultural fields that are highly amended and impacted by agricultural activities. Many fields are amended with anhydrous ammonia prior to planting. The natural transformation of nitrogen to nitrate in the soil is acidifying. Additionally, the mineral uptake by growing plants produces acidic conditions in the soil. In agriculture, this is typically managed by the application of lime-based materials to raise the pH for maximum growth potential. Also, precipitation tends to naturally wash out base cations from the soil plus Illinois rainfall trends toward being moderately to highly acidic. The impacts of the above variables are most pronounced on the upper levels of the soil profile. The lower, dolomitic soils are expected to be more alkaline due to the absence of the above-described influences and their geologic relationship to bedrock materials. The influence of bedrock is variable, however, depending on the depth and nature of the unconsolidated materials. Given the above influences and absent the neutralizing effect of agricultural lime, we would expect non-agricultural areas to possess slightly acidic surface soil conditions with more alkaline conditions below. However, pH trends lower as one moves southward across the State, and the extreme southwest and southern areas of the state that were not included in the last glacial activity are recognized areas of low soil pH.

The Board also asked if the STATSGO2 pH results are determined using laboratory procedures and, if not, how results are derived. To answer this comment, the Agency contacted the local USDA Soil Survey Leader, Mr. Robert Tegeler. Mr. Tegeler answered that most of the STATSGO2 pH data is based on field collected results using a LaMotte Chemical pH kit or a Truog field kit. Some data, however, are determined by the National Soil Survey Laboratory. The Agency conducted internet searches for the two identified field kits. They both require small samples of soil to be placed in reaction cups after which a measured amount of reagent is added. The resulting mixture produces a color change in the reagent. The resulting color is compared to a reference chart and the corresponding pH range recorded. Our internet investigation of these field kits also determined that the LaMotte kit produces results in the 3.8 – 8.4 pH range and the Truog kit in the 4.0 – 8.5 range. The constraints of the field kit results on the alkaline data, the high end of the pH range, may help explain some of the differences in the

STATSGO2 pH data when compared to data from other sources.

2. Soil pH Data Sets

In basing the MACs on Tier 1 remediation objectives from 35 Ill. Adm. Code 742, the Agency was required to consider the effects of soil pH on the leaching of certain contaminants. The Agency started in 2010 - 11 by attempting to identify representative soil pH values throughout the State for purposes of a statewide rule of generally applicability. *Id*. Two statewide sources were identified, the STATSGO2 database and a recent unpublished study for the Illinois State Geological Survey ("ISGS") cited in Dr. Roy's testimony and references (*i.e.*, Cahill, 2012, (under review)). Pre-Filed Testimony of Dr. William Roy, Exh. 50 at 6; Testimony of Dr. Roy, Tr. 4 at 15 – 16. Although the Agency is not aware of any significant inconsistencies in the findings of the two sources of data, it chose to rely on the STATSGO2 database because the Cahill study was unpublished and still under review, and the STATSGO2 database is more comprehensive in its coverage and therefore the more representative for purposes of a statewide rule of general applicability. To reduce the data to manageable proportions, the Agency then prepared summaries of the STATSGO2 data for counties with fill operations as described above and by Dr. Hornshaw in testimony. Testimony of Dr. Thomas Hornshaw, Tr. 3 at 72 – 76; Exh. 25.

Dr. Hornshaw summarized the observations and conclusions of the Agency based on the data in the worksheet:

> The summary of soil pH values showed varied pH for each soil type and between the various counties. For most soil types, pH trended higher with depth. This is expected due to the high organic content and the impact of precipitation on the upper levels. The most striking result was the trend to lower pH at all soil depths seen in the southern counties and from this our conclusions are based on this investigation. The workgroup determined that no single default soil pH value could be identified that would provide a level of safety for all soil depths at all locations in the state. Use of the most protective

> pH-dependent TACO objective is the Agency's recommendation in light of the widely varying soil pHs determined in our investigation and expected to be introduced into the soil fill pits. . . .

Testimony of Dr. Hornshaw, Tr. 3 at 74-5; Exh. 25. As summarized by Dr. Hornshaw and seen in Exhibit 25, the data for northern and central counties indicate pH commonly ranging from 5.1 to 8.4 (with occasional data points as low as 4.5) at STATSGO2 sample depths up to 80 inches – well within the construction-demolition excavation zone. As one moves to southern counties, the data more commonly range from 4.5 to 7.3. Because soil generated during construction or demolition could come from almost anywhere, and because Part 1100 is a statewide rule of general applicability, the Agency concluded that conservative use of Table C (35 Ill. Adm. Code 742.Appendix B, Table C), which ranges from pH 4.5 to 9.0, is appropriate.

The Agency discussed pH data presented by other witnesses in the fall 2011 hearings in its Pre-First Notice Comments and why it preferred to rely on the STATSGO2 data. Agency's Pre-First Notice Comments, PC#9 at 13 – 15. Since that time a substantial amount of additional testimony and pH data have been presented in support of relaxing the Agency's conservative proposal and allowing the acceptance at fill operations of uncontaminated soil with higher concentrations of pH-sensitive contaminants. The purpose of the additional testimony generally has been to convince the Board that the Agency's approach is so unrepresentative of soils in Illinois that determinations of the MACs should be based on pH values no lower than 6.25.

It is not easy to reconcile all the pH data in part because all the data sets have their limitations, at least a few of which are described here. The STATSGO2 database is maintained by the Natural Resources Conservation Service of the United State Department of Agriculture. It catalogs physical and chemical properties of soils across the nation for the purposes of promoting conservation and sustaining agricultural productivity. Although very comprehensive in area and depth, the data apply largely to soils used for agricultural purposes, and they may reflect that such soils frequently are amended to create mid-range pH conditions (6 – 7) favorable for crop production and other agricultural purposes.

The data presented by Mr. Hall, Mr. Wilcox and Ms. Maenhout reflect pH readings collected at the fill operations with which they are affiliated. Mr. Hall provided a summary of pH values from Licensed Professional Engineers or Geologists in LPC-663 forms from 53 separate construction projects "throughout the Chicagoland area" from Wheeling to Oak Lawn and Naperville to downtown Chicago. The pH values from the 53 sites averaged 7.6. Pre-Filed Testimony of Bret Hall, Exh. 36 at 1; Testimony of Mr. Hall, Tr. 4 at 67 – 69. Mr. Wilcox provided a summary of 767 pH analyses from LPC-663 forms from 218 separate project sites "throughout the Chicago Metro area" resulting in averages at the two fill operations of 7.8 and 7.77. Pre-Filed Testimony of Gregory Wilcox, P.E., Exh. 38 at 1; Testimony of Mr. Wilcox, Tr. 4 at 72 – 73. Ms. Maenhout provided a summary from LPC-663 forms of pH values from 103 samples taken "in and around the Chicago Metropolitan Area" ranging from McHenry County through Kane County to Kankakee County. The average pH value was 7.97. Pre-Filed Testimony of Annick Maenhout, Exh. 37 at 1; Testimony of Ms. Maenhout, Exh. 37 at 74 – 75. The Agency does not dispute this data but suggests, as it did with data previously submitted from northern and northeastern Illinois, that the data provide a geographically limited foundation on which to base a statewide rule of general applicability for all current and future fill operations.

The data set referenced by Dr. Fernández consists of 567 samples collected from agricultural soil ("corn fields") in 51 different Illinois counties in the top seven inches of soil. The mean was 6.72 and the median value was 6.71. Pre-Filed Testimony of Dr. Fabián Fernández, Exh. 48 at 1; Testimony of Dr. Fernández, Tr. 4 at 106 – 07. However, this data set is substantially less comprehensive as to area and depth than the STATSGO2 data and also may reflect amendment of the soils.

As noted above, Dr. Roy briefly discussed the Cahill study for the ISGS. Dr. Roy noted the study is based on samples from "137 soil cores . . . collected in a State-wide assessment of soil properties." Pre-Filed Testimony of Dr. William Roy, Exh. 50 at 6. Dr. Roy further noted that, of the 820 samples taken from the cores for testing, the pH ranged from "3.6 to 8.7 with a median value of 6.64" and that "79% of the samples yielded a pH in the range of 5 to 8." *Id*. Dr. Roy's Table 2 provides data limited to four counties in northeastern Illinois showing pH values from 6.2 to 8.2 at depths to 7.3 feet. *Id*. Dr. Roy noted that 79% of the state-wide samples (648 samples) produced a range of pH values from 5 to 8. *Id*. The Agency notes this means 21% of the samples (172 samples) were either below 5 or above 8. Specifically, the study states 89 samples (10.9%) had a pH below 5 and 81 samples (9.9%) were above 8.

At the March 13th hearing, Mr. Gobelman of the Illinois Department of Transportation ("IDOT") asked if the Agency would be willing to consider "other pH values that would be provided to you for statewide in your evaluations". Tr. 4 at 44 – 45. Mr. Clay responded that the Agency would consider such information if it were also submitted as part of the record. *Id*. Mr. Gobelman subsequently provided pH data collected by IDOT contractors from various road projects around the state. Mr. Gobelman has indicated to the Agency that the data provided to the Agency will be presented to the Board as part of IDOT's post-hearing comments. To briefly summarize, the data set encompasses 13,616 samples from 48 counties located throughout the state. The number of samples from each listed county varies widely – from 3 to 3,853. For all listed counties, the minimum pH value was 3.58 and the maximum was 12.4. Thirty of the counties have minimum pH values ranging from 3.58 to 5.99, and twenty-five of the counties have maximum pH values ranging from 9.0 to 12.4. The IDOT data summaries indicate arithmetic averages per listed county range from 5.37 to 8.93 with most values in the mid-6's to lower 8's. Average pH per listed county based on average hydrogen ion concentration ranges from 4.68 to 8.76 with most values in the upper 5's to upper 7's.

The IDOT data show wide-ranging soil pH values running to both acidic and alkaline extremes. In addition, soil from roadway projects is the type of soil that might well be sent to fill operations. However, the Agency understands that roadways are not always sources of pristine soils, and unknown conditions may have affected pH values at the extremes. In addition, some of the listed counties are represented by a relatively small number of samples taken from what appears to be a single project. Again, it's difficult to generalize to conclusions with a high degree of confidence.

3. Neutralizing Effects of Sand and Gravel

During the course of the hearings, several witnesses have testified about the pH-neutralizing effects of carbonates and stated that these effects are a reason to take a less conservative approach than that proposed by the Agency for pH-sensitive constituents. Again, this issue is closely related to the discussion of groundwater monitoring and is important because of the effects of pH on the leaching of certain inorganic and ionizing organic constituents and their migration to groundwater. Of course, the Agency agrees with the chemistry underlying the assertion of the neutralizing effects of carbonates, but it is less certain as to the specific effects of carbonates on the pH at particular fill operations. No data have been presented to quantify the neutralizing effects at fill operations.

One specific question concerns the neutralizing effects of sand and gravel. Mr. Cobb asked Dr. Fernández for his opinion on this question. Tr. 4 at 113 – 115. Dr. Fernández noted that sand and gravel deposits are not very common in Illinois, but the gravel would "have quite a bit of buffering capacity" while sand "doesn't have very much buffering capacity." *Id*. at 114 – 115. While sand and gravel deposits may not be common in Illinois, they are quite common in relation to fill operations located in northeastern Illinois. The Illinois State Water Survey ("ISWS") has mapped the three principal aquifer[11] types in Illinois: 1) sand and gravel, 2) shallow bedrock, and 3) deep bedrock aquifers. Attachment 7 is a map showing fill operations from the 2011 inventory relative to the principal aquifer types. Based on information provided from Agency field operations and other data, sixty-five percent of the CCDD fill operations are located in unconsolidated material (e.g., sand and gravel) and thirty-five percent are in bedrock quarries. Seventy-two percent of the USFO sites are located in unconsolidated material and twenty-eight percent are located in bedrock quarries. Showing the connection between the locations of the facilities and the vulnerability of the aquifers, Attachment 7 further demonstrates these aquifers are overlain by unconsolidated materials that have a high potential for aquifer recharge. *See* Pre-Filed Testimony of Mr. Cobb, Exh. 26 at 17 – 19; Testimony of Mr. Cobb, Tr. 4 at 15 – 23; Exhs. 27 – 32 (showing the potential for groundwater recharge in relation to fill operations in six northeastern Illinois counties). Overlying soils generally are developed from the underlying geologic materials.

The Agency believes there may be more uncertainty than what has been indicated by other witnesses relative to the neutralizing capacity of sand and gravel deposits, soils overlying sand and gravel, and the groundwater in a sand and gravel quarry that could interact with fill material. The neutralizing capacity of sand and gravel may be less than that of dolomite, which

[11] "Principal aquifer" means an aquifer that has a potential yield of at least 100,000 gallons per day per square foot over at least a 50 square mile area. (Shafer, J. M. et al, 1985, "An Assessment of Ground-Water Quality and Hazardous Substance Activities in Illinois with Recommendations for a Statewide Monitoring Strategy" (P.A. 83-1268), Contract Report 367, Illinois State Water Survey, 119 pp.)

is in turn less reactive than limestone. Based on the testimony of Dr. Fernández, one suspects the proportions of sand to gravel also would be an important variable in the neutralizing capacity of sand and gravel. However, as with the other witnesses, the Agency does not have definitive data quantifying the neutralizing effects of the sand and gravel environments at fill operations or relative to limestone or dolomite environments.

4. Establishing a Minimum Soil pH of 6.25

The Agency's review of the pH data presented in this proceeding leads to the following limited conclusions:

► The STATSGO2 database is still the single most comprehensive source of statewide Illinois soil pH data presented in this proceeding;

► STATSGO2 and some of the other more geographically diverse data sets indicate that pH values generally are higher in northern Illinois and trend lower as one moves southward across the State;

► STATSGO2 and some of the other data sets indicate that pH values generally increase with the depth of the soil;

► The arithmetic average and median soil pH values in Illinois generally are above 6.25;

► STATSGO2 and the other more geographically diverse data sets show that pH values below 6.25 are found throughout the State and in increasing numbers as one moves southward across the State.

The Agency cannot say with any certainty the extent to which soils with pH values below 6.25 are being accepted at fill operations nor can it rule out the possibility that such soils will be accepted at fill operations in quantities large enough to leach higher concentrations of pH-sensitive contaminants to groundwater. Therefore, the Agency does not agree that its proposal is unreasonable. The proposal accommodates the inherent uncertainty in a way that is protective of groundwater and the groundwater ingestion exposure route. It does so by adjusting the MACs to eliminate pH considerations except at the extremes where high and low pH values create soils that are corrosive solids and that may create leachate that must be managed as hazardous waste (*i.e.*, pH 2.0 and below, pH 12.5 and above). The drawback of the approach (and the basis for the objections) is that it excludes soils with certain pH-sensitive contaminant concentrations higher than the proposed MACs even though there may be no portion of the fill operation with a pH environment acidic enough to create leaching that would be of concern.

Mr. Hock and others have proposed an alternative to the Agency's proposal that would base the MACs on a soil pH of 6.25 and above as set forth in 35 Ill. Adm. Code 742.Appendix B, Table C. Pre-Filed Testimony of John Hock, P.E., Exh. 12 at 7; Testimony of Mr. Hock, Tr. 4 at 78 - 80. As the Agency understands the proposal, instead of basing MACs for pH-sensitive chemicals on the lowest pH-dependent value from Table C (whether that lowest value is at the acidic or alkaline end of the table), the MACs for chemicals with pH sensitivity would be based on the lowest pH-dependent values between Table C column range 6.25 to 6.64 and column range 8.75 to 9.0. The pH of all soils would have to be determined prior to acceptance at fill operations regardless of whether the soils were from potentially impacted properties, and fill operations would be prohibited from accepting soils with a pH below 6.25 regardless of applicable MACs.

If the Board is inclined to revise the Agency's proposal along the lines proposed by Mr. Hock and others, the following factors should be considered:

► Assuming highly effective implementation of certification/screening measures for excluding soils below pH 6.25, the approach should be protective of groundwater and the groundwater ingestion exposure route. However, as discussed elsewhere in this document and Mr. Cobb's testimony, the Agency considers most certification and screening procedures to be less than highly effective. Pre-Filed Testimony of Mr. Cobb, Exh. 26 at 4 – 9. The adoption of a minimum soil pH of 6.25 creates an additional certification/screening point that (1) also raises questions of applicable certification/screening protocols, and (2) introduces potential contamination issues for pH-sensitive constituents not raised by the Agency's more conservative approach (*e.g.*, acceptance of larger amounts of soil with pH-sensitive constituents, soils with higher concentrations of pH-sensitive constituents). Therefore, a revision to a minimum pH of

6.25 would constitute an additional reason why the Agency's proposed Subpart G groundwater monitoring requirements should be restored.

► Ten chemicals would be affected and eleven of the proposed MACs (mercury has two entries) would be revised upward but not necessarily to other Table C values. The MAC for arsenic would not change at all because it is a carcinogen and is restricted by the Act to a value no greater than its background concentration as set forth in 35 Ill. Adm. Code 742 (13/11.3 mg/kg). 415 ILCS 5/3.160(c) (2010) (as amended by P.A. 97-137, eff. July 14, 2011). Values for copper and elemental mercury would increase but only to interceding Part 742 values for ingestion or inhalation exposure routes. Attachment 8 shows changes, if any, to the proposed MACs for pH-sensitive constituents that are currently based on the most stringent Table C values for the soil component of the groundwater ingestion exposure route.

► Contrary to an earlier statement, the Agency, upon further reflection, does not think soils rejected solely because of pH below 6.25 automatically would be considered waste. *See* Agency's Pre-First Notice Comments, PC#9 at 15. Except at extreme pH values where soil becomes a corrosive solid or may produce hazardous leachates, whether soil should be managed as waste would depend on contaminant concentrations and not on its acid or alkaline properties. (It must be noted here that the proposed MACs do not apply outside the fill operation context.) However, as set forth by the Board, Section 1100.205(b)(4) would require loads rejected solely on the basis of pH to be disposed of at a permitted landfill unless retesting demonstrated the earlier pH values were in error. Board's First Notice Order at 95; Board's First Notice Opinion at 70 – 72.

► The Agency's approach to the pH issue excludes from fill operations some soils with contaminant concentrations that would not constitute a threat to groundwater or the groundwater ingestion exposure route in fill operations with mid-range and higher pH environments. The minimum 6.25 pH proposal will exclude from fill operations some soils that would not otherwise exceed the applicable MACs. Given the declining pH values as one moves southward across the State, one would expect greater amounts of soil to be excluded from fill operations in central and southern Illinois than in northern Illinois.

C. <u>Request for Data Related to Enforcement Actions</u>

At the hearing on March 14th, Mr. Huff referred to page 13 of Mr. Cobb's pre-filed testimony referencing previous testimony by Mr. Purseglove concerning an enforcement action that resulted in an order requiring groundwater monitoring. Mr. Huff requested any data the Agency might have from the court-ordered groundwater monitoring at the facility in Lynwood, and the Agency offered to respond in comments. Tr. 4 at 43 – 44.[12] To date, the defendant has not complied with the court order for groundwater monitoring and removal of CCDD that is above grade. The first groundwater monitoring proposal was determined to be inadequate, and the matter still is in negotiations. No monitoring wells have been installed, and no additional groundwater monitoring data are available at this time.

D. Village of Lyons Park Project

At the hearing on March 14th, The Honorable Christopher Getty, Mayor of the Village of Lyons, testified concerning a park project undertaken by the Village and enrolled in the Agency's Site Remediation Program ("SRP") (*i.e.*, "voluntary cleanup program") to obtain a no further remediation ("NFR") letter in furtherance of the project. Testimony of Mayor Getty, Tr. 5 at 59 – 64; *see* Comment of Michael F. McClain, Esq., PC#26. The SRP provides oversight of remediation projects in accordance with regulations at 35 Ill. Adm. Code 740 and 742 and issues NFR letters upon successful completion of remediation projects. As part of the site investigation, significant quantities of contaminated soil were identified requiring a remedial action plan. The Mayor expressed his frustration with the Agency's refusal to approve the placement of soils exceeding the Tier 1 ingestion remediation objectives at an adjacent CCDD fill operation and with the additional costs to the Village of sampling and analysis and alternative management of the contaminated soils. The Mayor asked why the Village should be allowed to place the contaminated soil beneath a three-foot cap in a park site while the same material could not be deposited at the adjacent fill operation. Testimony of Mayor Getty, Tr. 5 at 62 – 63.

[12] This facility also was discussed as the Einoder facility in the testimony of Mr. Sylvester, who presented limited groundwater data from the enforcement action. Pre-Filed Testimony of the Attorney General's Office by Stephen J. Sylvester, Exh. 35 at 22 – 25; Testimony of Mr. Sylvester, Tr. 4 at 60 – 63.

To summarize briefly, Agency files indicate the Village acquired the land for the park from the adjacent Reliable Materials Lyons Quarry and CCDD fill operation. This apparently was an older area of the quarry that previously had been backfilled with concrete and asphalt. The Village enrolled in the SRP in August 2003, and performed a site investigation that identified PNAs and metals (arsenic and lead) as contaminants of concern in the planned "green-space" areas with exceedences of the applicable TACO Tier 1 residential and construction worker ingestion exposure route values. To obtain the NFR Letter and to maintain the local topographic relief of the remediation site for two baseball fields, the Village elected to grade the upper four feet of the property and to place three feet of clean soil over the contaminated soils. The grading of the upper four feet created a 75,000 cubic yard stockpile of soil. This soil was systematically gridded and sampled. Approximately 60% of the soil met the Tier 1 ingestion exposure route values and was taken off-site for placement in the adjacent quarry fill operation.

The remaining 40% of soil exceeded Tier 1 residential or construction worker ingestion values and was considered a contaminated medium required to be managed as waste. When disposal at a permitted landfill proved too costly for the Village, an alternate plan of constructing a berm with the contaminated soil covered by an engineered barrier was devised pursuant to the soil management zone provisions of Part 740. 35 Ill. Adm. Code 740.535. Section 740.535(a)(1) states the purpose of soil management zones as allowing "consideration and approval of on-site solutions to on-site soil contamination without violating the solid waste disposal regulations at 35 Ill. Adm. Code 807 or 811 – 815." Uses of soil management zones are set forth in Section 740.535(a)(2) and include "consolidation of contaminated soils within a remediation site." Since the soils contaminated above Tier 1 values must be managed as waste if taken off-site, these "on-site solutions" are restricted to certain areas of remediation sites and are strictly regulated as provided in the remainder of Section 740.535 to ensure that all exposure routes are addressed.

The project was handled in accordance with applicable law and not in an arbitrary manner. If the soil management zone provision had not been available under the SRP regulations, the soil would have been required to be managed as waste. The soil management zone provisions are acceptable to the Agency only as remediation site solutions for previously contaminated properties as implemented under Part 740 and with site-specific Agency oversight. They are not a model for redistributing contaminated soils from remediation sites or other contaminated sites to off-site locations that have not been permitted for waste management. The Agency does not support relaxing the proposed MACs or allowing the use of engineered barriers and institutional controls so fill operations may accept soil with contamination exceeding values protective of residential or construction worker exposure routes. Agency's Pre-First Notice Comments, PC#9 at 5 – 8. These soils are not "uncontaminated" within the literal or the statutory meanings of the word. *Id*. at 6 – 7. Materials that are not "waste" do not need such controls. *Id*. at 7 – 8.

III. CONCLUSION

The Agency once again urges the Board to restore the Agency's groundwater monitoring requirements at Subpart G of the Agency's proposal. The Agency bases its request on several factors. First and foremost is the State's long-standing policy of protecting valuable groundwater resources for current and future uses. This policy has been imbedded in state law for at least three decades and is found in the Environmental Protection Act, the Illinois Groundwater Protection Act and numerous regulatory measures promulgated by the Board. For purposes of this proceeding, the policy is expressed as a mandate in Sections 22.51 and 22.51a of the Act.

Testimony from the Attorney General's Office has confirmed that prevention of contamination and protection of groundwater resources are fundamental principles and goals of State environmental enforcement actions.

The Agency and the AGO also have argued that proof of contamination from fill operations is not prerequisite for requiring groundwater monitoring at fill operations, and the Flemal Report confirms the Board's concurrence with this principle as far back as 1986. It is sufficient for adoption of groundwater monitoring requirements that the circumstances surrounding the regulated material and its management create the potential for groundwater contamination. The potential does not have to be demonstrated by actual contamination before it can be considered as a basis for requiring groundwater monitoring. The legislature already has concluded that the potential for groundwater contamination from fill operations exists, and the Agency and the AGO have offered numerous reasons in support of the legislature's conclusion.

The cost estimates for groundwater monitoring system construction for CCDD fill operations provided by the Agency in this document, while based on a simple scenario and somewhat limited data, certainly indicate that the additional costs per cubic yard of groundwater monitoring still would allow tipping fees significantly lower than tipping fees for landfills. The additional costs of a few cents to a few dollars per cubic yard are entirely reasonable for systems that would provide a significant improvement in groundwater protection value when compared to uncertain certification procedures and marginally effective screening procedures. This is not to deny the importance of certification and screening procedures, but only to recognize their limitations and to avoid placing on them the entire weight of groundwater protection.

The consequences of groundwater contamination can be severe and expensive, especially in areas of the State that depend on groundwater resources for potable water and development. Given the difficulties and expense of corrective action, there is little margin for error. Given the potential for groundwater contamination and its consequences, any uncertainties must be resolved in favor of groundwater monitoring. It is the single most effective tool for early detection and mitigation of groundwater contamination.

Respectfully submitted,

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY

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DATE: April 18, 2012

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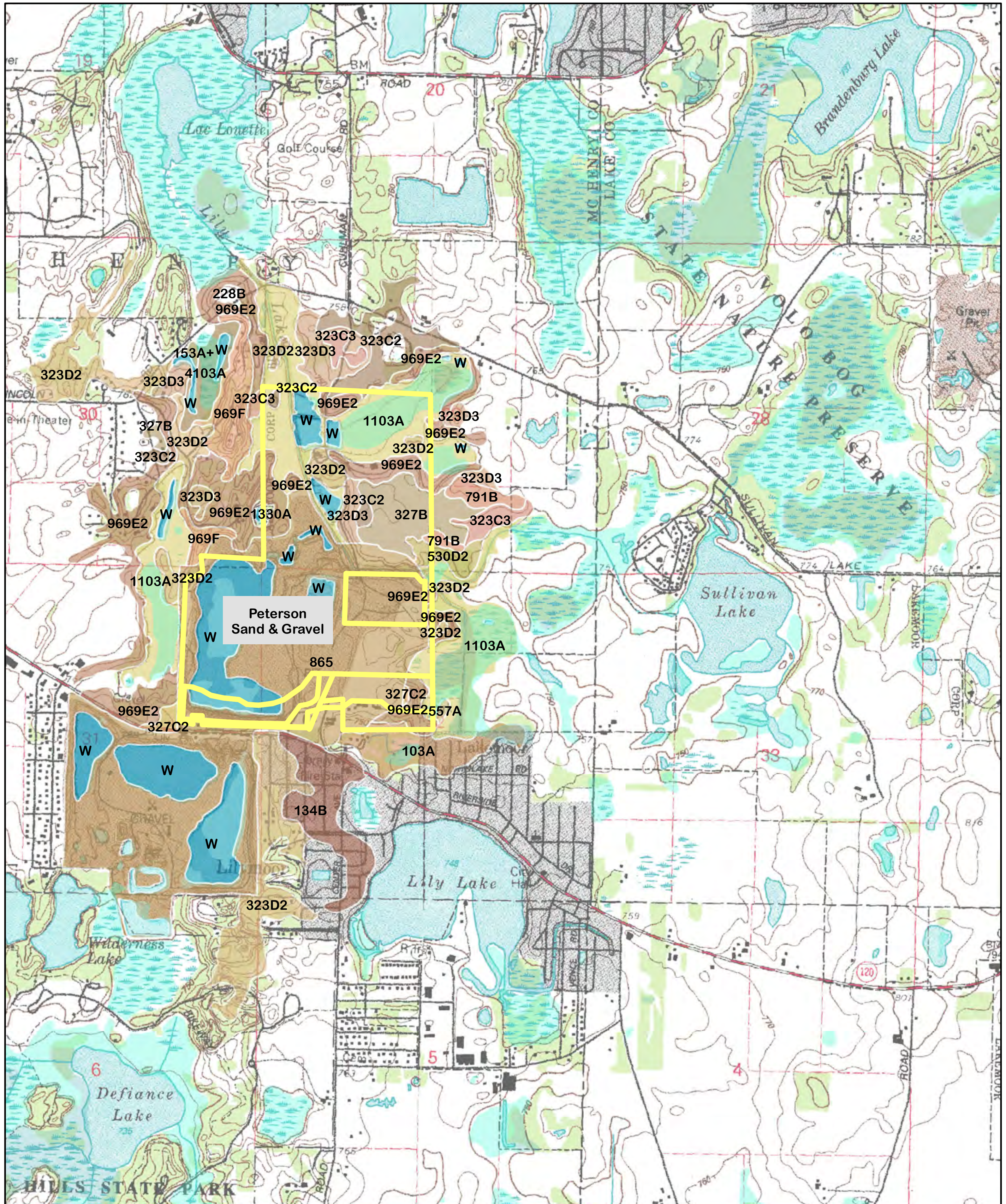
ATTACHMENT 1

Soil Types Around Peterson Sand & Gravel & Volo Bog State Nature Preserve



Map Unit Symbol	Component Name		Horizion Depth Range	Soil pH Range
103A:				
	Houghton			
			Horizion Depth Range	Soil pH Range
			0-7	4.5 - 7.8
			7-60	4.5 - 7.8
134B:				
	Camden			
			Horizion Depth Range	Soil pH Range
			0-7	5.1 - 7.3
			7-10	5.1 - 7.3
			10-33	5.1 - 7.3
			33-52	5.1 - 7.3
			52-60	5.6 - 8.4
153A+:				
	Pella, overwash			
			Horizion Depth Range	Soil pH Range
			0-16	5.6 - 7.3
			16-30	6.1 - 7.8
			30-53	6.6 - 7.8
			53-62	7.4 - 8.4
			62-80	7.8 - 8.4
323C2:				
	Casco			
			Horizion Depth Range	Soil pH Range
			0-8	5.6 - 7.3
			8-17	5.6 - 7.8
			17-60	7.4 - 8.4
323C3:				
	Casco			
			Horizion Depth Range	Soil pH Range
			0-7	5.6 - 7.3
			7-19	5.6 - 7.8
			19-60	7.4 - 8.4
323D2:				
	Casco			
			Horizion Depth Range	Soil pH Range
			0-8	5.6 - 7.3
			8-17	5.6 - 7.8
			17-60	7.4 - 8.4
323D3:				
	Casco			
			Horizion Depth Range	Soil pH Range
			0-6	5.6 - 7.3
			6-12	5.6 - 7.8
			12-60	7.4 - 8.4
327B:				
	Fox			
			Horizion Depth Range	Soil pH Range
			0-10	5.1 - 7.3
			10-21	5.1 - 6.5
			21-33	5.6 - 7.8
			33-60	7.4 - 8.4
327C2:				
	Fox			
			Horizion Depth Range	Soil pH Range
			0-10	5.1 - 7.3
			10-21	5.1 - 6.5
			21-33	5.6 - 7.8
			33-60	7.4 - 8.4

Map Unit Symbol	Component Name		Horizion Depth Range	Soil pH Range
530D2:				
	Ozaukee			
			Horizion Depth Range	Soil pH Range
			0-7	6.1 - 7.8
			7-11	6.1 - 7.8
			11-31	6.1 - 8.4
			31-60	7.9 - 8.4
557A:				
	Millstream			
			Horizion Depth Range	Soil pH Range
			0-8	5.1 - 7.3
			8-14	5.1 - 7.3
			14-27	5.1 - 7.3
			27-47	5.1 - 7.8
			47-60	7.4 - 8.4
791B:				
	Rush			
			Horizion Depth Range	Soil pH Range
			0-11	5.1 - 7.3
			11-38	4.5 - 6.5
			38-45	4.5 - 6.5
			45-60	7.4 - 8.4
865:				
	Pits, gravel			
			Horizion Depth Range	Soil pH Range
			---	---
969E2:				
	Casco			
			Horizion Depth Range	Soil pH Range
			0-8	5.6 - 7.3
			8-17	5.6 - 7.8
			17-60	7.4 - 8.4
	Rodman			
			Horizion Depth Range	Soil pH Range
			0-11	6.6 - 7.8
			11-14	6.6 - 7.8
			14-60	7.4 - 8.4
969F:				
	Casco			
			Horizion Depth Range	Soil pH Range
			0-8	5.6 - 7.3
			8-17	5.6 - 7.8
			17-60	7.4 - 8.4
	Rodman			
			Horizion Depth Range	Soil pH Range
			0-11	6.6 - 7.8
			11-14	6.6 - 7.8
			14-60	7.4 - 8.4
1103A:				
	Houghton			
			Horizion Depth Range	Soil pH Range
			0-7	4.5 - 7.8
			7-60	4.5 - 7.8
4103A:				
	Houghton			
			Horizion Depth Range	Soil pH Range
			0-9	5.6 - 7.8
			9-60	5.6 - 7.8
W:				
	Water			
			Horizion Depth Range	Soil pH Range
			---	---

CCDD BOUNDARY

WETLAND TYPE

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Other

SOIL TYPE

103A, 1103A, 134B, 153A+, 323C2, 323C3, 323D2, 323D3, 327B, 327C2, 4103A, 530D2, 557A, 791B, 865, 969E2, 969F, W

0 — 1,000 — 2,000 — 4,000 — 6,000 Feet

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

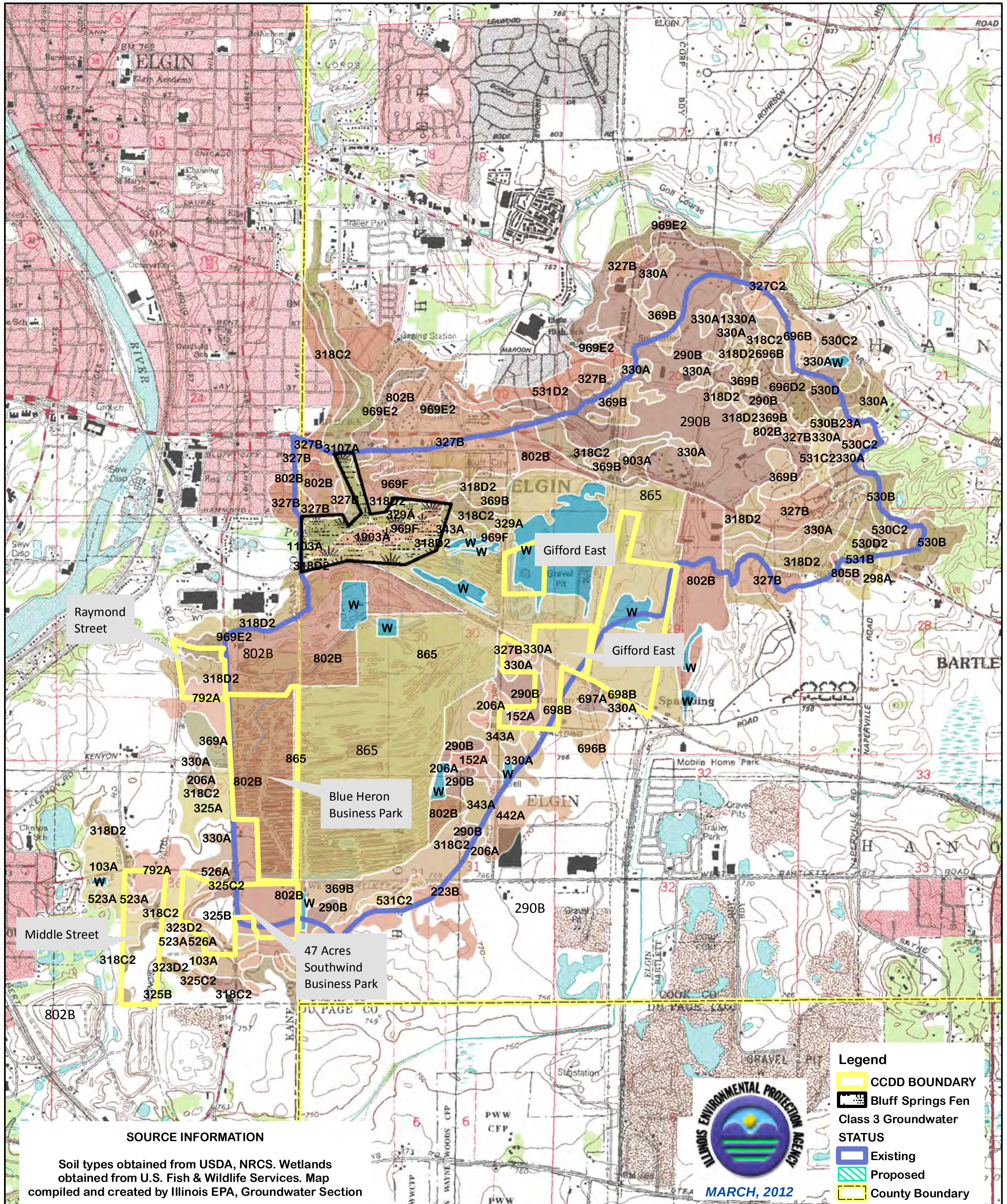
MARCH, 2012

SOURCE INFORMATION

Soil types obtained from USDA, NRCS. Wetlands obtained from U.S. Fish & Wildlife Services. Map compiled and created by Illinois EPA, Groundwater Section

ATTACHMENT 2

Soil Types Around Bluff Spring Fen & Class III Groundwater Area



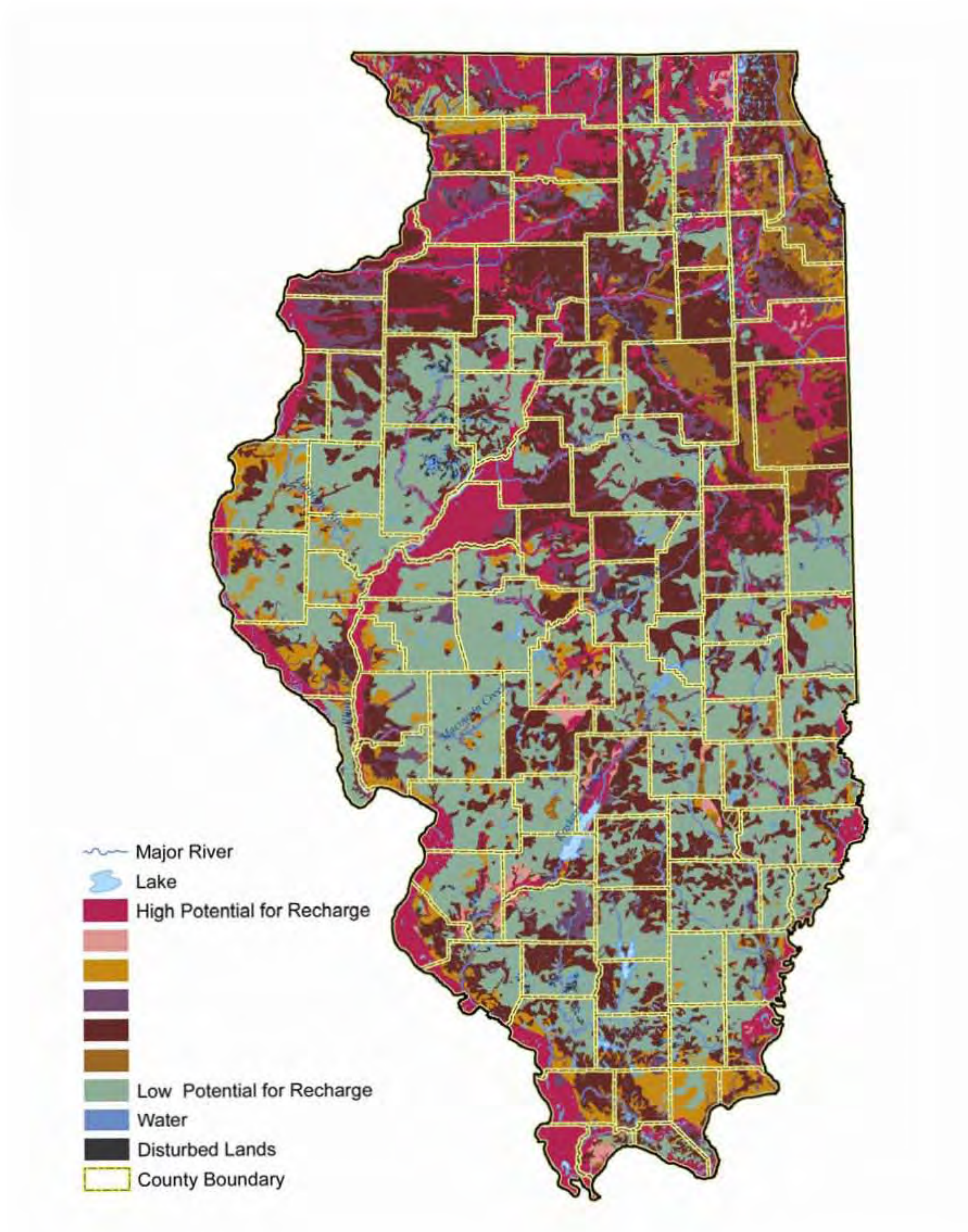
Map Unit	Component Name		
23A:			
	Blount	Horizion Depth Range	Soil pH Range
		0-7	5.1 - 7.3
		7-13	5.1 - 7.3
		13-26	4.5 - 6.5
		26-32	6.1 - 7.8
		32-60	7.4 - 8.4
103A:			
	Houghton	Horizion Depth Range	Soil pH Range
		0-11	5.1 - 7.8
		11-60	5.1 - 7.8
152A:			
	Drummer		
		Horizion Depth Range	Soil pH Range
		0-14	5.6 - 7.8
		14-42	5.6 - 7.8
		42-50	6.1 - 8.4
		43-60	6.6 - 8.4
206A:			
	Thorp	Horizion Depth Range	Soil pH Range
		0-11	5.1 - 7.3
		11-15	5.1 - 7.3
		15-41	5.1 - 7.3
		41-49	5.6 - 7.8
		49-60	6.1 - 8.4
223B:			
	Varna	Horizion Depth Range	Soil pH Range
		0-12	5.6 - 7.3
		12-30	5.6 - 7.3
		30-48	7.4 - 8.4
		48-60	7.9 - 8.4
290B:			
	Warsaw	Horizion Depth Range	Soil pH Range
		0-10	5.6 - 7.3
		10-24	5.1 - 6.5
		24-34	6.1 - 8.4
		34-60	7.9 - 8.4
298A:			
	Beecher	Horizion Depth Range	Soil pH Range
		0-9	5.1 - 7.3
		9-21	4.5 - 7.3
		21-37	6.1 - 7.8
		37-60	7.4 - 8.4
318C2:			
	Lorenzo, eroded	Horizion Depth Range	Soil pH Range
		0-7	5.6 - 7.3
		7-16	5.6 - 7.8
		16-60	7.4 - 8.4
318D2:			
	Lorenzo, eroded	Horizion Depth Range	Soil pH Range
		0-8	5.6 - 7.3
		8-18	5.6 - 7.8
		18-60	7.4 - 8.4
323C2:			
	Casco		
		Horizion Depth Range	Soil pH Range
		0-6	5.6 - 7.3
		6-18	5.6 - 7.8
		18-60	7.4 - 8.4
323D2:			
	Casco		
		Horizion Depth Range	Soil pH Range
		0-5	5.6 - 7.3
		5-16	5.6 - 7.8
		16-60	7.4 - 8.4
325A:			
	Dresden		
		Horizion Depth Range	Soil pH Range
		0-9	5.6 - 7.3
		9-29	5.6 - 7.3
		29-33	5.6 - 7.8
		33-60	7.4 - 8.4
325B:			
	Dresden		
		Horizion Depth Range	Soil pH Range
		0-7	5.6 - 7.3
		7-27	5.6 - 7.3
		27-32	5.6 - 7.8
		32-60	7.4 - 8.4
325C2:			
	Dresden		
		Horizion Depth Range	Soil pH Range
		0-7	5.6 - 7.3
		7-26	5.6 - 7.3
		26-30	5.6 - 7.8
		30-60	7.4 - 8.4
327B:			
	Fox	Horizion Depth Range	Soil pH Range
		0-4	5.1 - 7.3
		4-7	5.1 - 7.3
		7-13	5.1 - 7.3
		13-28	5.6 - 7.8
		28-60	7.4 - 8.4
327C2:			
	Fox, eroded	Horizion Depth Range	Soil pH Range
		0-4	5.1 - 7.3
		4-12	5.1 - 7.3
		12-24	5.6 - 7.8
		24-60	7.4 - 8.4

Map Unit	Component Name		
329A:			
	Will	Horizion Depth Range	Soil pH Range
		0-16	5.6 - 7.3
		16-24	6.1 - 8.4
		24-60	7.4 - 8.4
330A:			
	Peotone	Horizion Depth Range	Soil pH Range
		0-13	5.6 - 7.8
		13-50	6.1 - 7.8
		50-60	6.6 - 8.4
343A:			
	Kane	Horizion Depth Range	Soil pH Range
		0-11	5.6 - 7.3
		11-26	5.6 - 7.3
		26-34	6.1 - 7.8
		34-60	7.9 - 8.4
369A:			
	Waupecan		
		Horizion Depth Range	Soil pH Range
		0-13	6.1 - 7.8
		13-38	5.6 - 7.3
		38-55	5.6 - 7.3
		55-70	6.6 - 8.4
369B:			
	Waupecan		
		Horizion Depth Range	Soil pH Range
		0-11	6.1 - 7.8
		11-38	5.6 - 7.3
		38-55	5.6 - 7.3
		55-60	6.6 - 8.4
442A:			
	Mundelein	Horizion Depth Range	Soil pH Range
		0-17	5.6 - 7.3
		17-31	5.6 - 7.8
		31-42	6.1 - 8.4
		42-60	7.4 - 8.4
523A:			
	Dunham	Horizion Depth Range	Soil pH Range
		0-11	5.6 - 7.3
		11-31	5.6 - 7.3
		31-42	6.1 - 7.8
		42-60	7.4 - 8.4
526A:			
	Grundelein	Horizion Depth Range	Soil pH Range
		0-13	5.6 - 7.3
		13-29	5.6 - 7.3
		29-43	6.1 - 7.8
		43-60	7.4 - 8.4
530B:			
	Ozaukee	Horizion Depth Range	Soil pH Range
		0-4	6.1 - 7.3
		4-10	6.1 - 7.3
		10-21	6.1 - 7.3
		21-39	7.4 - 8.4
		39-60	7.9 - 8.4
530C2:			
	Ozaukee	Horizion Depth Range	Soil pH Range
		0-6	6.1 - 7.3
		6-21	6.1 - 7.3
		21-28	7.4 - 8.4
		28-60	7.9 - 8.4
530D:			
	Ozaukee	Horizion Depth Range	Soil pH Range
		0-4	6.1 - 7.3
		4-9	6.1 - 7.3
		9-34	6.1 - 7.3
		34-39	7.4 - 8.4
		39-60	7.9 - 8.4
530D2:			
	Ozaukee	Horizion Depth Range	Soil pH Range
		0-6	6.1 - 7.3
		6-20	6.1 - 7.3
		20-28	7.4 - 8.4
		28-60	7.9 - 8.4
530F:			
	Ozaukee	Horizion Depth Range	Soil pH Range
		0-5	6.1 - 7.3
		5-29	6.1 - 7.3
		29-36	7.4 - 8.4
		36-60	7.9 - 8.4
531B:			
	Markham	Horizion Depth Range	Soil pH Range
		0-8	5.6 - 7.3
		8-21	5.1 - 7.3
		21-32	7.4 - 8.4
		32-60	7.9 - 8.4
531C2:			
	Markham, eroded	Horizion Depth Range	Soil pH Range
		0-8	5.6 - 7.3
		8-20	5.1 - 7.3
		20-29	7.4 - 8.4
		29-60	7.9 - 8.4
531D2:			
	Markham, eroded	Horizion Depth Range	Soil pH Range
		0-7	5.6 - 7.3
		7-20	5.1 - 7.3
		20-30	7.4 - 8.4
		30-60	7.9 - 8.4

Map Unit	Component Name		
696B:			
	Zurich	Horizion Depth Range	Soil pH Range
		0-5	5.6 - 7.3
		5-9	5.6 - 7.3
		9-28	5.1 - 7.8
		28-38	6.6 - 8.4
		38-64	7.4 - 8.4
696D2:			
	Zurich, eroded	Horizion Depth Range	Soil pH Range
		0-6	5.6 - 7.3
		6-25	5.1 - 7.8
		25-35	6.6 - 8.4
		35-60	7.4 - 8.4
697A:			
	Wauconda	Horizion Depth Range	Soil pH Range
		0-9	5.6 - 7.3
		9-14	5.6 - 7.3
		14-30	5.6 - 7.8
		30-38	6.6 - 8.4
		38-60	7.4 - 8.4
698B:			
	Grays	Horizion Depth Range	Soil pH Range
		0-8	5.6 - 7.3
		8-11	5.6 - 7.3
		11-34	5.6 - 7.8
		34-42	6.6 - 8.4
		42-60	7.4 - 8.4
792A:			
	Bowes		
		Horizion Depth Range	Soil pH Range
		0-9	5.1 - 7.3
		9-13	5.1 - 7.3
		13-43	5.1 - 6.5
		43-51	5.6 - 7.8
		51-61	7.4 - 8.4
802B:			
	Orthents, loamy, undulating	Horizion Depth Range	Soil pH Range
		0-7	5.6 - 7.8
		7-60	5.6 - 8.4
805B:			
	Orthents, clayey, undulating	Horizion Depth Range	Soil pH Range
		0-7	5.6 - 7.8
		7-60	5.6 - 8.4
865:			
	Pits, gravel	Horizion Depth Range	Soil pH Range
		---	---
903A:			
	Muskego	Horizion Depth Range	Soil pH Range
		0-5	5.6 - 7.3
		5-36	5.6 - 7.8
		36-80	6.6 - 8.4
903A:			
	Houghton	Horizion Depth Range	Soil pH Range
		0-19	5.1 - 7.8
		19-60	5.1 - 7.8
969E2:			
	Casco, eroded	Horizion Depth Range	Soil pH Range
		0-5	5.6 - 7.3
		5-19	5.6 - 7.8
		19-60	7.4 - 8.4
	Rodman, eroded	Horizion Depth Range	Soil pH Range
		0-6	6.6 - 7.8
		6-10	6.6 - 7.8
		10-60	7.4 - 8.4
969F:			
	Casco	Horizion Depth Range	Soil pH Range
		0-4	5.6 - 7.3
		4-15	5.6 - 7.8
		15-60	7.4 - 8.4
	Rodman	Horizion Depth Range	Soil pH Range
		0-11	6.6 - 7.8
		11-14	6.6 - 7.8
		14-60	7.4 - 8.4
1103A:			
	Houghton, undrained	Horizion Depth Range	Soil pH Range
		0-7	5.1 - 7.8
		7-60	5.1 - 7.8
1330A:			
	Peotone, undrained	Horizion Depth Range	Soil pH Range
		0-25	5.6 - 7.8
		25-53	6.1 - 7.8
		53-60	6.6 - 8.4
1903A:			
	Muskego	Horizion Depth Range	Soil pH Range
		0-5	5.6 - 7.3
		5-27	5.6 - 7.8
		27-60	6.6 - 8.4
	Houghton	Horizion Depth Range	Soil pH Range
		0-19	5.1 - 7.8
		19-60	5.1 - 7.8
3107A:			
	Sawmill, frequently flooded	Horizion Depth Range	Soil pH Range
		0-29	6.1 - 7.3
		29-48	6.6 - 7.8
		48-60	6.6 - 8.4
W:			
	Water	Horizion Depth Range	Soil pH Range
		---	---

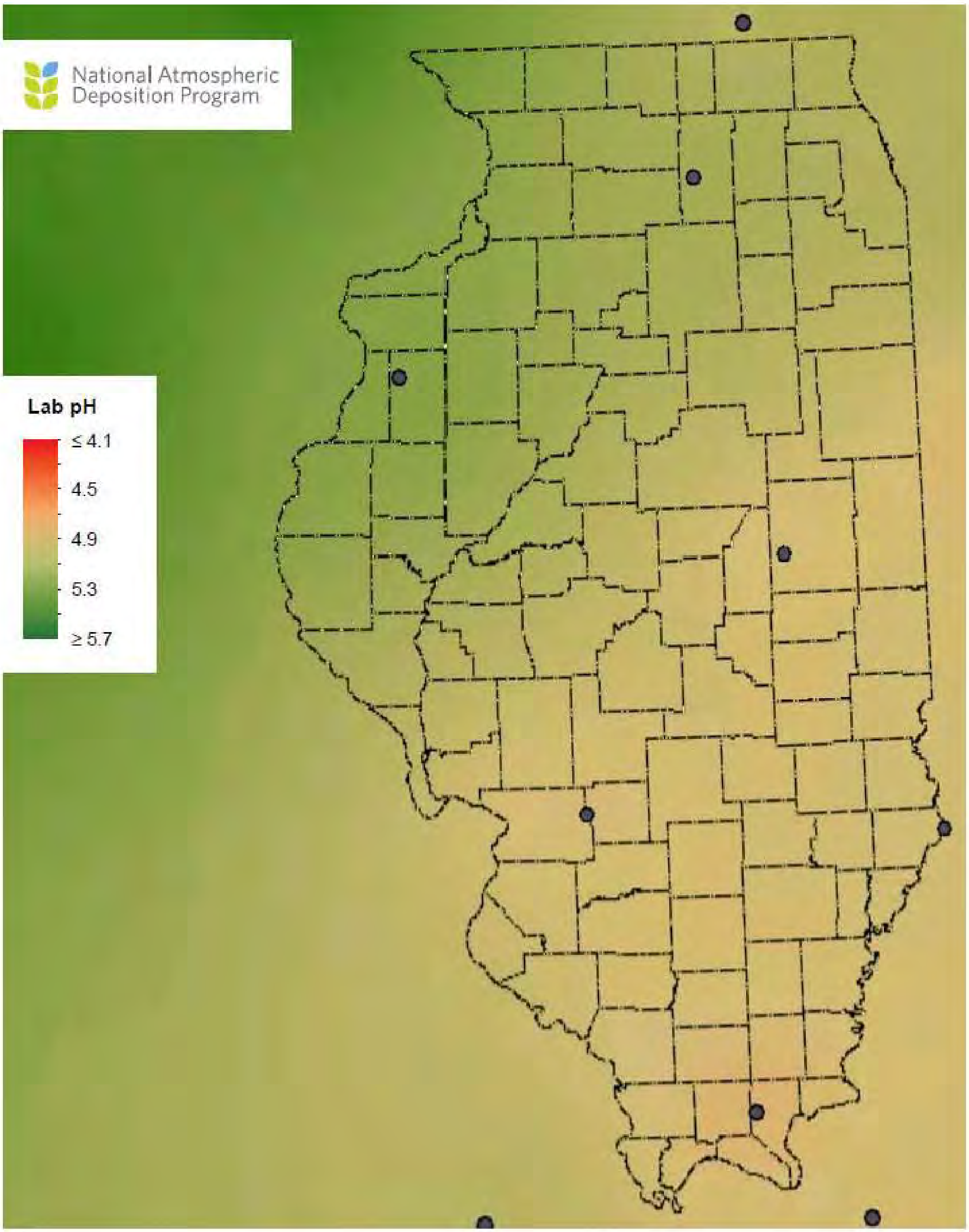
ATTACHMENT 3

Attachment 3: Potential for Aquifer Recharge in Illinois



ATTACHMENT 4

Attachment 4. Precipitation Acidity in Illinois (2010)



ATTACHMENT 5

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* * * * * *PC# 39* * * * * *

Attachment 5

Estimated Statewide Cost per Cubic Yard of Monitoring Groundwater

Qualifications:

1. Five (5) monitoring wells are used as the "Estimated Number of Wells Needed per Fill Site." This should not be construed to mean that five wells are the maximum number of wells needed, or the average number needed, or the minimum. The number of wells needed must be determined by a professional engineer based on site-specific hydrogeologic information.
2. Certain economies of scale are anticipated. Attachment 6 shows the range of size variability and its affect on estimated costs.
3. The cost calculations are based on actual data from calendar year 2011 as reported to the Agency:
    a. The total number of permitted CCDD fill operations is 62.
    b. The annual volume of CCDD used as fill is 3,357,177 cubic yards.
    c. The Agency did not include the number of registered uncontaminated soil fill operations in its calculations because USFOs are exempt from the fee requirement and do not report the quantity of uncontaminated soil received.
4. These estimates do not include costs associated with professional engineer design services or professional engineer report and certification preparation and submittal to the Agency.

The notes on the next page explain how the numbers below were derived and calculated.

WELL INSTALLATION COSTS		
	CCDD fill operations penetrating into **bedrock**	CCDD fill operations in **unconsolidated material** (UM)
Estimated percentage of CCDD fill operations statewide	35%	65%
Number of sites	22	40
Estimated average depth of well (ft)	150	30
Estimated cost installation per foot	$100	$45
Installation cost of groundwater monitoring networks per fill site	$75,000	$6,750
Installation cost statewide	$1,650,000	$270,000
Combined installation costs for Bedrock and UM operations statewide		$1,920,000
Well installation cost per cubic yard over 10 years		**$0.06**
WELL SAMPLING AND ANALYTICAL COSTS		
Estimated sampling cost per site		$1,000
Sampling cost statewide		$62,000
Estimated analytical cost per sample		$2,000
Analytical cost per site		$10,000
Analytical cost statewide		$620,000
Combined sampling and analytical costs statewide		$682,000
Sampling and analytical costs per cubic yard for 1 year		**$0.20**
Total cost of well installation, sampling and analysis per cubic yard		**$0.26**

Notes:

1. The estimated number of wells needed per fill site is based on the assumption that in a simple hydrogeologic setting with a single aquifer of concern having a planar piezometric surface, three borings would be needed to define groundwater flow direction and two more borings may be needed for placement of a directly upgradient well and a directly downgradient well. Further, it was assumed that all five borings would be completed as wells.
2. The estimated percentage of operations in bedrock was determined from information that the Agency has on the CCDD fill operations. Twenty-two (22) of these sites are limestone or dolomite quarries.
3. Number of Sites in Bedrock = Total Number of Permitted CCDD Fill Operations (62) x Estimated Percentage of Operations in Bedrock
4. The estimated average depth of well for fill operations penetrating into bedrock is an approximation by the Agency's technical staff based on limited knowledge of the typical depth of quarries in Illinois and the assumption that in many cases at depths greater than 150 feet the permeability of the rock would be too low to produce a groundwater sample. The estimated depth of well for unconsolidated material (UM) is based on the experience of the Agency's technical staff.
5. The estimated cost installation per foot for bedrock sites is based on two (2) projects for which the Agency paid contractors to install monitoring wells into bedrock.
6. Installation Cost of Groundwater Monitoring Networks per Site = Estimated Cost Installation per Foot x Estimated Average Depth of Well x Estimated Number of Wells Needed per Fill Site
7. Installation Cost Statewide for Bedrock = Installation Cost of Groundwater Monitoring Networks per Site x Number of [Bedrock] Sites
8. The estimated percentage of operations in UM was determined from information that the Agency has on the CCDD fill operations. Forty (40) of these sites are sand or sand and gravel pits.
9. Number of Sites in UM = Total Number of Permitted CCDD Fill Operations x Estimated Percentage of Operations in UM.
10. The Estimated Cost Installation per Foot for UM sites is based on the reimbursement rate allowed by the Agency's LUST program.
11. Installation Cost of Groundwater Monitoring Networks per Site = Estimated Cost Installation per Foot x Estimated Average Depth of Well x Estimated Number of Wells Needed per Fill Site
12. Installation Cost Statewide for UM = Installation Cost of Groundwater Monitoring Networks per Site x Number of [UM] Sites
13. Installation Costs for Bedrock & UM operations across the State = Installation Cost across the State for bedrock sites + Installation Cost across the State for UM sites
14. Installation Cost per Cubic Yard over 10 years = [Installation Costs for Bedrock + UM operations Statewide] ÷[Estimated Annual Volume of CCDD Used as Fill in 2011 (3,357,177) x 10]. The Agency selected a 10 year period because CCDD permits, once issued, are valid for 10 years.
15. The estimated sampling cost per site assumes the cost of two (2) workers for one (1) day at $500/day/worker and is based on reimbursement rates allowed by the Agency's LUST program.
16. Sampling Cost Statewide = Estimated Sampling Cost per Site x Total Number of Permitted CCDD Fill Operations in 2011
17. The estimated analytical cost per sample is based on John Hock's testimony as well as research done by the Agency. It assumes that groundwater samples will not be tested for radionuclides.
18. Analytical Cost per Site = Estimated Analytical Cost per Sample x Estimated Number of Wells Needed per Fill Site
19. Analytical Cost Statewide = Analytical Cost per Site x Total Number of Permitted CCDD Fill Operations in 2011
20. Combined Sampling and Analytical Costs = Sampling Cost Statewide + Analytical Cost Statewide
21. Cost of Sampling and Analysis per Cubic Yard = Combined Sampling and Analytical Costs ÷ Estimated Annual Volume of CCDD Used as Fill in 2011

ATTACHMENT 6

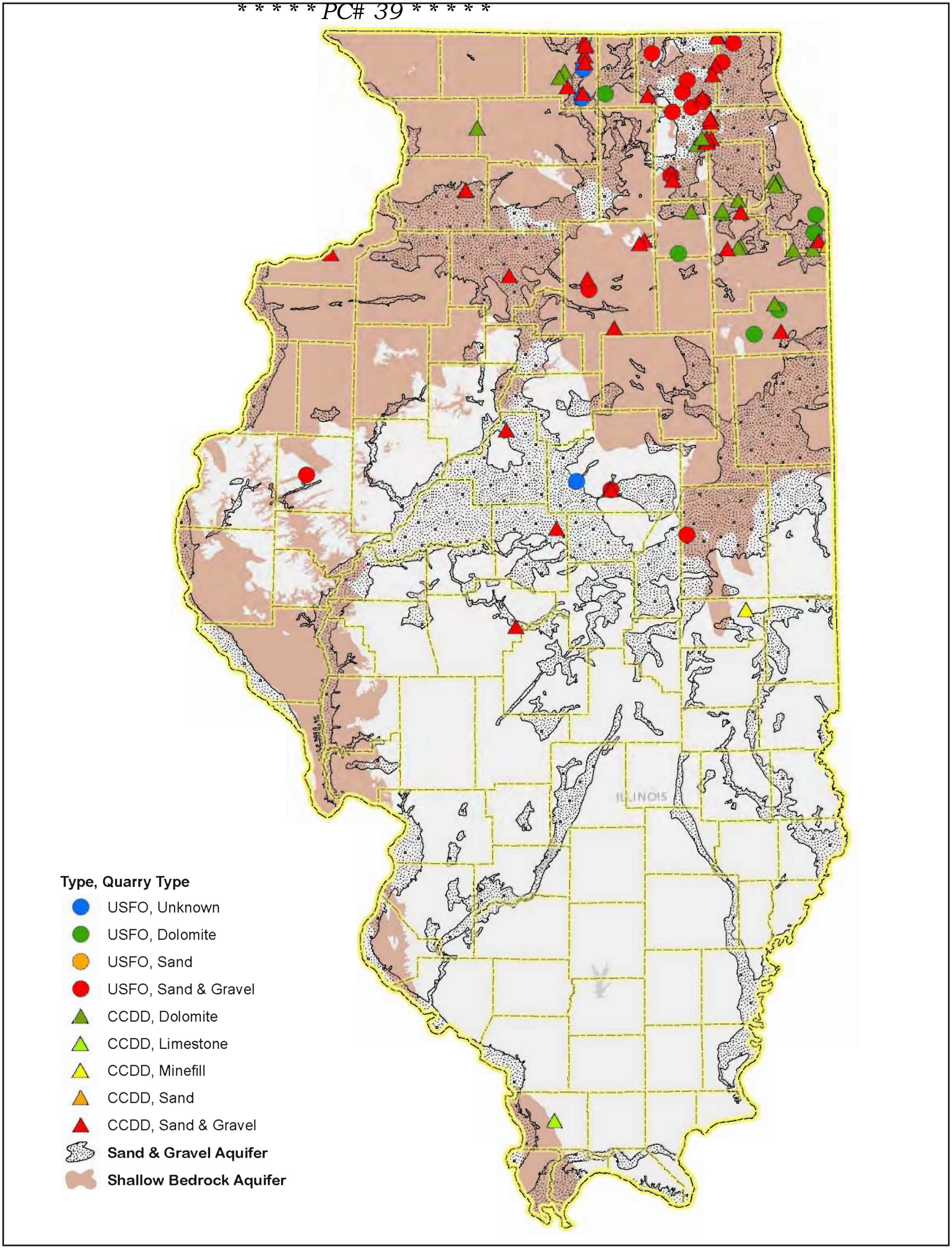
PERMITTED CCDD FILL SITES - VOLUMES RECEIVED 2011

	Cubic Yards Accepted	Bedrock (B)	Unconsolidated Materials (UM)	Local Geology (B/UM)
		Cost per cubic yard over 10 yrs	Cost per cubic yard over 10 yrs	
Reliable Lyons	631,150.00	1.2¢		B
Fox River Stone Co.	403,100.00	1.9¢		B
Gifford East	359,993.00		0.2¢	UM
Prairie Material Sales Yd 92	335,044.00		0.2¢	UM
Richton Park CCDD	197,100.04	3.8¢		B
Hanson Material Serv. Yd 585	177,305.00	4.2¢		B
Vulcan Const. Mat McCook Qry	172,053.00	4.4¢		B
E.F. Heil Site 1	144,599.00	5.2¢		B
Land & Lakes Clean Fill	128,196.00	5.9¢		B
Palumbo Management	125,853.90		0.5¢	UM
Elmhurst Chicago Stone	95,934.00	7.8¢		B
Thelen Sand & Gravel	70,254.00		1¢	UM
Sheridan Sand & Gravel-N-4201Rd	68,663.00		1¢	UM
North Shore	66,467.00		1¢	UM
Chicago Street CCDD	45,569.00	16.5¢		B
Prairie Material Sales Yd 91	33,444.00		2¢	UM
Lambrecht Property	31,328.00		2.2¢	UM
Northern Illinois Svc	27,462.00		2.5¢	UM
Peterson Sand & Gravel	25,157.00		2.7¢	UM
Orange Crush LLC	23,588.00	31.8¢	2.7¢	B
Sandy Hollow Quarry	22,125.00		3.1¢	UM
Reliable Sand and Gravel	21,588.50		3.1¢	UM
Havana Materials Service Yard #588	16,596.00	45.2¢		B
Galt Road CCDD	14,052.61		4.8¢	UM
Richards St. CCDD	13,230.00		5.1¢	UM
Hedrick Property	11,120.00	67.4¢		B,UM
Cannon Pit	10,827.96	69.3¢		B
Midwest Aggregates	10,414.00		6.5¢	UM
Fox Ridge Stone LLC	10,186.00	73.6¢		B
Roscoe Rock & Sand	9,890.00		6.8¢	UM
McAdam & Associates	8,991.84		7.5¢	UM
Speedway Quarry	8,675.00		7.8¢	UM
Sheridan Sand & Gravel-Wiensland	7,684.00		8.8¢	UM
Langman CCDD	7,364.50		9.2¢	UM
Farmdale Pit	6,102.00		11.1¢	UM
E.F. Heil Site 2	3,787.00		17.8¢	UM
Downs CCDD	3,097.38		21.8¢	UM
Vulcan Bolingbrook Quarry	2,532.00	$2.96		B
Quality Ready Mix Concrete	1,711.44	$4.38		B
Prairie Material Sales Yd 95	1,344.00	$5.58		B
Prairie Material Sales YD 90	1,176.00		57.4¢	UM
Anna Quarries	651.21	$11.52		B
Buckhart Sand & Gravel	636.35		$1.06	UM
Beverly Materials CCDD	460.00		$1.47	UM
Stenstrom Sand & Gravel	414.00		$1.63	UM
Total Cubic Yards (>100cy)	**3,356,916.73**			

PERMITTED CCDD FILL SITES - VOLUMES RECEIVED 2011

	Cubic Yards Accepted
Raymond Street	90.00
47 Acres/Southwind Buisness Park	50.00
Central Blacktop	40.00
Lakeview Eststes	40.00
Blue Heron Business Park	30.00
Little Willis CCDD	10.00
Brookville Quarry	0.00
City of Princeton	0.00
Cooling CCDD	0.00
Fitzmar Landfill	0.00
FJV Development	0.00
Lake in the Hills	0.00
Middle St CCDD	0.00
Pierpont Quarry	0.00
Rowe Construction Co.-Downs	0.00
Twoomey Pit	0.00
Village of Lynwood	0.00

ATTACHMENT 7


ILLINOIS
Type, Quarry Type
USFO, Unknown
USFO, Dolomite
USFO, Sand
USFO, Sand & Gravel
CCDD, Dolomite
CCDD, Limestone
CCDD, Minefill
CCDD, Sand
CCDD, Sand & Gravel
Sand & Gravel Aquifer
Shallow Bedrock Aquifer

ATTACHMENT 8

Revised MAC Values If pH 6.25 - 9.0 Range Is Used

Chemical Name	Lowest TACO Remediation Objective in pH Range 6.25 to 9.0	Other Intervening Limit for MAC
Barium	**1,500 *mg/kg***	
Beryllium	**22 *mg/kg***	
Cadmium	**5.2 *mg/kg***	
Copper	59,000 *mg/kg*	**2,900 *mg/kg*** (Residential Ingestion)
Lead	**107 *mg/kg***	
Mercury[a]:		
elemental	---	**0.1 *mg/kg*** (Construction Worker Inhalation)
ionic	**0.89 *mg/kg***	
Nickel	**100 *mg/kg***	
Silver	**4.4 *mg/kg***	
Thallium	**2.6 *mg/kg***	
Zinc	**5,100 *mg/kg***	

Bold = Revised MAC Value.

[a] = Elemental mercury is an inhalation hazard and is evaluated based upon the IRIS inhalation reference concentration for elemental mercury (CAS No. 7439-97-6). All other forms of mercury are evaluated using the IRIS oral reference dose for mercuric chloride (CAS No. 7487-94-7). The inhalation MAC only applies where elemental mercury is a contaminant of concern; the MAC for ionic mercury applies everywhere.

LDM\P:\CCDD-TACOCalc\MAC_pH6.25TenChems0412.docx

STATE OF ILLINOIS)
)
COUNTY OF SANGAMON)

PROOF OF SERVICE

I, the undersigned, on oath state that I have served the attached Illinois Environmental Protection Agency's First Notice Comments, upon the persons to whom they are directed by placing copies of each in an envelope addressed to:

John T. Therriault, Clerk
Illinois Pollution Control Board
James R. Thompson Center
Suite 11-500
100 West Randolph
Chicago, Illinois 60601
(Electronic Filing)

Mitchell Cohen
Chief Legal Counsel
Illinois Dept. of Natural Resources
One Natural Resources Way
Springfield, Illinois 62702-1271
(First Class Mail)

Matthew J. Dunn, Chief
Environmental Enforcement/Asbestos
Litigation Division
Illinois Attorney General's Office
69 West Washington St., 18th Floor
Chicago, Illinois 60602
(First Class Mail)

Marie E. Tipsord
Hearing Officer
Illinois Pollution Control Board
James R. Thompson Center
100 West Randolph, Suite 11-500
Chicago, Illinois 60601
(Electronic Filing)

(Attached Service List – **First Class Mail**)

and sending or mailing them, as applicable, from Springfield, Illinois on April 18, 2012, with sufficient postage affixed as indicated above.

Mark Wight

SUBSCRIBED AND SWORN TO BEFORE ME

This 18th day of April, 2012.

Cynthia L. Wolfe
Notary Public

OFFICIAL SEAL
CYNTHIA L. WOLFE
NOTARY PUBLIC STATE OF ILLINOIS
MY COMMISSION EXPIRES [illegible]-2015

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