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June 7, 2012

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

**BELL BEND NUCLEAR POWER PLANT
ENVIRONMENTAL AUDIT NEED FOR
INFORMATION RESPONSES:
SECOND SUBMITTAL
BNP-2012-139 Docket No. 52-039**

The purpose of this letter is to formally document PPL Bell Bend, LLC's responses to NRC Need for Information (NFI) requests that were discussed with the NRC at the Bell Bend Supplemental Environmental Audit held the week of May 14, 2012. Additional letters providing the remainder of the NFI responses requested by the NRC at the audit will be provided in coming weeks.

Responses to the following NFIs are included in this letter as Enclosure 1:

- | | | | | |
|-----------|----------|-----------|----------|-----------|
| • LU-07 | • MET-01 | • MET-02 | • MET-03 | • NRHH-01 |
| • NRHH-03 | • RHH-07 | • S/EJ-06 | • STO-01 | |

Additional supporting enclosures are as follows:

- Enclosure 2 – MET-01, -02, -03 – AEOLUS3 and SACTI Input/Output Files, AREVA, 2012, and Affidavit Attesting to Confidential/Proprietary Nature of Model Input/Output Files
- Enclosure 3 - NRHH-03 - Legionella Sampling at the PPL SSES Facility, Indoor Air Solutions, Inc., 2011 and Pennsylvania EPI Notes, Volume 2, Issue 1, Pennsylvania Department of Health, Winter 2012.

As discussed at the audit, the information presented in RHH-07 requires an update to language in the Bell Bend Nuclear Power Plant (BBNPP) Combined License Application (COLA) Part 3, "Environmental Report," Rev. 3 to be consistent with information provided in this NFI. The revised COLA content will be included in a future revision of the BBNPP COLA. The future revision of the COLA is the only new regulatory commitment in this letter.

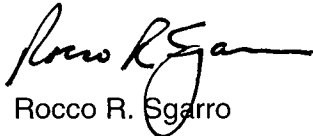
D102
NRO

Should you have questions or need additional information, please contact the undersigned at 610.774.7552.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on June 7, 2012.

Respectfully,



Rocco R. Sgarro

RRS/kw

- Enclosures:
- 1) Need For Information Responses
 - 2) Proprietary AEOLUS3 and SACTI Computer Model Input/Output Files, AREVA, 2012 and Affidavit Attesting to Confidential/Proprietary Nature of Model Input/Output Files
 - 3) NRHH-03 - Legionella Sampling at the PPL SSES Facility, Indoor Air Solutions, Inc., 2011 and Pennsylvania EPI Notes, Volume 2, Issue 1, Pennsylvania Department of Health, Winter 2012.

cc: (w/ Enclosures)

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(w/o Enclosures)

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Enclosure 1

Need for Information Responses

LAND USE (LU)

LU-07: Provide a knowledgeable expert to discuss local and regional land use plans of state, regional, and local agencies, particularly those administered by Luzerne County, Columbia County, and Salem Township.

Audit Disposition: Upon review of this NFI response the NRC requested to be provided links to the Bloomsburg, Berwick Borough, and Lackawanna-Luzerne land use plans. These links were sent via email on 16 May 2012, were subsequently included with the response to LU-05 (ref BNP-2012-130, May 31 2012), and are reproduced below.

Response:

2010 State Land Use and Growth Management Report

<http://newpa.com/get-local-gov-support/community-planning/land-use-reports/2010-state-land-use-and-growth-management-report>

Lackawanna/Luzerne Regional Plan, 2011

http://www.luzernecounty.org/county/departments_agencies/planning_commission/lackawanna-luzerne-metropolitan-planning-organization/mpo-plansdocuments

Columbia County Comprehensive Recreation, Parks, Greenways and Open Space Plan, 2007

http://www.dcnr.state.pa.us/ucmprd1/groups/public/documents/document/d_001222.pdf

Town of Bloomsburg 2009 Comprehensive Plan

<http://www.bloomsburgpa.org/compplan.htm>

Borough of Berwick, Columbia County, Comprehensive Plan, November 2000

<http://www.berwickborough.org/documents/File/Berwick%20Borough%20Comprehensive%20Plan%20FY%202000.PDF>

Open Space, Greenways & Outdoor Recreation Master Plan, Lackawanna and Luzerne Counties, Pennsylvania

http://www.dcnr.state.pa.us/ucmprd1/groups/public/documents/document/d_001197.pdf

METEOROLOGY (MET)

MET-01: Discuss updates to the AEOLUS3 model run for the long term routine releases including any changes to receptor location, terrain heights, and recirculation correction factors.

MET-02: Discuss updates to the same model runs for short term releases and apparent disagreements in distance to the EAB and associated 50th percentile chi/Q as presented in ER 2.7.6.2 and 7.1.

MET-03: Discuss updates made to the SACTI model run and associated model outputs summarized in ER 5.3.3.

Audit Disposition: Upon review of this NFI response, the NRC requested to have model input/output files for AEOLUS3 normal (long-term) releases, short-term (accident) releases, and SACTI models provided as a docketed response.

Response: AEOLUS3 and SACTI model input and output files are provided as Enclosure 2 to this letter.

NON-RADIOLOGICAL HUMAN HEALTH (NRHH)

NRHH-01: Provide an SME to discuss the proximity of recreational activities to the thermal discharge in the receiving waters and what the likelihood of interaction by members of the public with the thermal influence. (The topic of proximity of recreational activity is discussed in Chapter 2, but, not in the context of nonradiological human health (NRHH) issues).

Audit Disposition: Upon review of this NFI response the NRC requested to be provided a docketed copy of the response, included below. In addition, the NRC requested to be provided with the information on the warning sign at the SSES intake and the distance from the wetland cottage boat ramp to the intake, and this information is also provided below.

Response: Based on the results of CORMIX modeling, the extent of the thermal plume is minimal, reducing the likelihood of interaction with the plume by the public.

There is very little angling and usually only pass-through boating in the vicinity of both the Susquehanna SES intake-discharge complex and the proposed location for these facilities for BBNPP. Occasionally, boat and bank angling is done directly in this section of the river, but not very often as this is not a preferred fishing destination compared to the mouths of Little Wapwallopen and Wapwallopen Creeks, up and downriver, respectively. There is no public swimming in the location of the SSES and proposed BBNPP discharge structures, and there is signage indicating that swimming is prohibited.

The warning sign on the SSES intake structure reads: "DANGER – WATER INTAKE – DO NOT APPROACH WITHIN 200 FT." The distance from the SSES intake structure to the kayak/canoe launch area at the location of the former wetland cottage is approximately 2,000 linear feet downstream.

NRHH-03: Provide an SME to discuss consultation with the state or local public health department to adequately characterize the state's level of concern for etiological agents in the receiving waters. (Section 5.3.4.1). There is information on Centers for Disease Control data; however, it is from 2004 and 2006 and there is no information from the Susquehanna River.

Audit Disposition: Upon review of this NFI response the NRC requested to be provided a docketed copy of the response, included below. In addition, the NRC requested information on the SSES Legionella monitoring and risk management plan. The overall program is under development by PPL, however this response provides the data collected as part of that program as Enclosure 3 to this letter.

Response: Consultation with the regulatory agencies regarding thermophilic microorganisms in the receiving waters was part of the license renewal application for SSES Units 1 and 2. PPL consulted the Pennsylvania Department of Environmental Protection (PaDEP), Bureau of Water Supply and Wastewater Management, Division of Water Quality Assessment and Standards, to determine whether there was any concern about the potential occurrence of thermophilic microorganisms in the Susquehanna River at the SSES location (PPL, 2006). The PaDEP indicated that it does not collect any microorganism data in the vicinity of the SSES site on the North Branch Susquehanna River (PPL, 2006). PPL Bell Bend is not aware of any sampling in the river in the vicinity of the proposed plant at this time for etiological agents. There is, however, sampling of *E. coli* at Pennsylvania State Parks where swimming occurs, (PaDH, 2012). It is conducted by the Bureau of Epidemiology (EPI), Pa Dept. of Health. Pa EPI Notes, Winter 2012 notes are also included in Enclosure 3. A review of a recent Centers for Disease Control report "Morbidity and Mortality Weekly Report, September 23, 2011, Surveillance for Water Borne Disease Outbreaks..." provides data for waterborne diseases back to 2007 and 2008. Waterborne diseases in Pennsylvania dealt mainly with swimming pools and also with a drinking water system etiological agents. (CDC, 2011)

PPL Services Corp., Department of Health and Safety has developed a procedure "Environmentally Based Pathogenic Organisms" General Safety Policy, 2.015 to reduce or eliminate the potential for employee exposure to environmentally based pathogenic organisms at PPL facilities. It addresses pathogenic organisms such as Legionella, Hanta Virus or Molds. This procedure (PPL, 2006) references Centers for Disease Control guidelines.

Note also that NUREG 1437, Supplement 35, NRC's EIS for SSES license renewal application, evaluates the effects of microbiological organisms on human health from the closed-cycle cooling system and the magnitude of the potential public health impacts associated with thermal enhancement of enteric pathogens (NRC, 2009, Section 4.1.2).

References:

1. PPL, 2006. PPL Susquehanna, LLC (PPL), Susquehanna Steam Electric Station Units 1 and 2 License Renewal Application, Appendix E: Applicant's Environmental Report – Operating License Renewal Stage. Allentown, Pennsylvania. ADAMS No. ML062630235.
2. PaDH, 2012. Pennsylvania EPI Notes, Volume 2, Issue 1, Pennsylvania Department of Health, Winter 2012.
3. CDC, 2011. Surveillance for Waterborne Disease Outbreaks and Other Health Events Associated with Recreational Water – United States, 2007-2008 and Surveillance for Waterborne

Disease Outbreaks Associated with Drinking Water – United States, 2007 -2008, Centers for Disease Control, September 23, 2011, Website: <http://www.cdc.gov/mmwr/pdf/ss/ss6012.pdf>. Accessed: April 18, 2012.

4. NRC, 2009. NUREG 1437, Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 35, Regarding Susquehanna Steam Electric Station, Units 1 and 2, Final Report, U.S. Nuclear Regulatory Commission, March 2009. ADAMS No. ML090700454.

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RADIOLOGICAL HUMAN HEALTH (RHH)

RHH-07: Discuss any changes to the design, technical basis, and/or planned implementation of the BBNPP REMP since 2009.

Audit Disposition: Upon review of this NFI response the NRC requested to be provided a docketed copy of the response, included in its entirety below. In addition, ER Section 5.4, fourth paragraph will be separated into two paragraphs to clarify that this section of the ER regards non-human biota dose only.

Response: The following changes have been made to the BBNPP REMP in ER Section 6.2 since ER Rev. 1 (2009):

1. Minor editorial changes in several locations.
2. A sentence was added to the second paragraph of Sect. 6.2 to clarify that BBNPP will prepare its own Annual Radiological Environmental Operating Report.
3. "Site Boundary" was replaced with "Owner Controlled Area Boundary" (OCA Boundary) throughout Sect. 6.2, i.e., relative to REMP sampling locations.
4. In Sect. 6.2.3.2 (Airborne Activity Monitoring), for the location of air sampling stations, the words "highest ranked D/Q" were replaced with "high ranked D/Q". This was done to allow flexibility in location selection to accommodate availability of power and road access for servicing the equipment, and also to preclude the change of sample locations, with the resulting disruption of long-term data continuity, due to typical annual meteorological variations.
5. In Sect. 6.2.7 (REMP Modifications for BBNPP) three air sampling stations near the Site Boundary were replaced with four stations near the Owner Controlled Area Boundary. The fourth station (AP4) is "not required", as shown in Table 6.2-5.
6. Two of the air sampling stations to be shared with SSES had their sector and distance identifications changed in Table 6.2-5 due to the relocation of the BBNPP Power Block.
7. Sect. 6.2.8 (Ground Water Protection Program) has been added to address the NEI "Industry Ground Water Protection Initiative," and a new reference to the NEI Initiative has been added to Sect. 6.2.10 (References).
8. Sect. 6.2.9 (Preoperational (Units 1 & 2) Site Area Background Radiation) has been added. This section summarizes the pre-operational REMP data for SSES Units 1 and 2.
9. In Table 6.2-4 (BBNPP Radiological Environmental Monitoring Program), under "Direct Radiation," a sentence was added to the second column for clarification. The sentence is: "The remaining stations to be placed in special interest areas such as population centers, nearby residences, schools, and in one area to serve as a control station."
10. In Table 6.2-5 (Operational BBNPP Radiological Environmental Monitoring Program Locations), many sectors and distances have changed slightly due to the relocation of the Power Block. With the exception of the air sampling stations and inner ring TLD locations, described elsewhere, the actual locations remain unchanged; only the distance and sector designations relative to the relocated power block have been modified slightly.
11. The inner ring TLD monitoring locations in Table 6.2-5 and Figure 6.2-7 have changed due to their relocation from the "Site Boundary" to the "Owner Controlled Area Boundary" and due to the relocation of the Power Block.

12. In Table 6.2-5, of the 74 listed TLD monitoring locations (40 are required by Table 6.2-4), 50 are currently specified in the second column as "required for a minimum REMP," as changed from 57 in ER Rev. 1. Also, due to the relocation of the Power Block, the categorization of some locations as required ("yes") has been changed to not required ("no"), and vice versa.

13. Figures 6.2-7 and 6.2-10 have been modified to replace the Site Boundary with the Owner Controlled Area Boundary.

14. The base map for Figure 6.2-13 (BBNPP Ground Water Sampling Locations that are within the Protected Area Boundary) has been updated, but the indicated sampling locations were not changed.

ER Section 6.3.3 in Rev. 1 (2009) included a statement that NRC regulations do not explicitly require routine onsite groundwater monitoring during plant operation, and that such regulations might change in response to the Nuclear Energy Institute (NEI) groundwater protection initiative. In Revision 3 of ER Section 6.3.3, the above statements were replaced with a discussion of the new regulations 10 CFR 20.1406(c) and 10 CFR 20.1501(a) and their applicability to the REMP program. The references in Section 6.3.4 were modified accordingly.

COLA Impact:

ER Section 5.4 will be revised as shown below, in a future COLA revision:

5.4 RADIOLOGICAL IMPACTS OF NORMAL OPERATIONS

Finally, consideration of the dose impact to biota other than man that appear along the exposure pathways or that are on endangered species lists is presented. Other than the endangered species identified, there are no unusual animals, plants, agricultural practices, game harvest or food operations in the vicinity of BBNPP that need to be considered for radiological impacts.

Regulatory guidance is for use of the site boundary for gaseous dose calculations. Site design changes resulted in minor changes to the site boundary during the period dose calculations were performed. Rather than adjust gaseous effluents dose calculations with each change of site boundary, gaseous effluent doses for the site boundary were instead conservatively calculated at the Owner Controlled Area boundary ~~which remained constant~~.

SOCIOECONOMICS/ENVIRONMENTAL JUSTICE (S/EJ)

S/EJ-06: Make available data supporting calculations of estimated annual expenditures in the regions for materials and services during plant construction and operation.

Audit Disposition: Upon review of this NFI response the NRC requested to be provided a copy, included in its entirety below.

Response: ER Sections 5.8.2.4.1 and 5.8.3.2.3 note that about \$9 million will be spent on materials, equipment, and outside services during operations. The \$9 million is exclusive of planned outage costs and is an estimate of the expenditures associated entirely with future plant operations that could be made in the 50 Mile (80 km) Comparative Geographic Area (CGA). See the response to Request for Additional Information RAI SE 4.4-9 for additional clarification on the estimated operational expenditures. RAI SE 4.4-9 was provided to NRC by PPL in February 2010 (Adams No. ML100640163, Enclosure 2, page 7).

RAI SE 4.4-9 also addresses information on annual expenditures on materials, equipment, and outside services during construction. As noted in RAI SE 4.4-9, the quantities of commodity type construction materials (concrete, steel, piping and mechanical material, and electrical equipment) are included in ER Table 10.2-2. The local purchase of these materials is expected to have the greatest economic impact on the region. Quantities from ER Table 10.2-2 have been used as the principal basis for estimating the expenditures that could be made in the region. A U.S. Department of Energy analysis (DOE, 2005) provided bulk material pricing that was applied to the quantities taken from ER Table 10.2-2 to develop the total cost estimate. Notwithstanding the fact that materials, equipment, and outside services will be purchased by several tiers of contractors and subcontractors that are not currently identified, it is estimated that more than \$250 million could be spent in the region during the 68 month period of construction.

The attached spreadsheet (Construction Commodities Cost Estimate) was used to develop ER Table 10.2-2.

COLA Impact:

ER Table 10.2-2 will be revised as shown below, in a future COLA revision:

**Table 10.2-2— U.S. EPR Estimated Construction Materials
(Tons)**

Electrical Equipment

Power and Control Wire	4,496 <u>4,406</u>
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Reference:

DOE, 2005. Cost Estimating Guidelines for Generation IV Nuclear Energy Systems, Rev. 2.02, U.S. Department of Energy, September 2005.

USEPR Estimated "Local" Commodities, in Tons, of Construction Materials, Single Unit								
Estimated Minimum Requirements	Estimated Tons (a)	Estimated Metric Tons (a)	Conversion Factor (b)	New Quantity	Unit of Measurement (c)	\$/Unit in 2001\$ (b)	2001\$	Conversion to 2007\$ (d)
								1.17
Civil Material								
Concrete:	848,362	769,621	0.4162	320,302	cubic meter	\$157.00	\$50,287,372	\$58,836,225
Cement	188,525	171,027	see above	see above	see above	see above	see above	see above
Sand	282,787	256,540	see above	see above	see above	see above	see above	see above
Aggregate	377,050	342,054	see above	see above	see above	see above	see above	see above
Steel:								
Rebar	55,331	50,195	n/a	n/a	metric ton	\$825.50	\$41,435,973	\$48,480,088
Structural Steel	6,261	5,680	n/a	n/a	metric ton	\$3,656.00	\$20,766,080	\$24,296,314
Miscellaneous Steel	1,016	922	n/a	n/a	metric ton	\$7,800.00	\$7,191,600	\$8,414,172
Mod Steel	225	204						
Steel Liner	1,412	1,281						
Embedded Steel	1,903	1,726	1,000	1,726,000	kilogram	\$7.30	\$12,599,800	\$14,741,766
Siding & Roofing	2,056	1,865						
Construction Debris:	12,000	10,886	n/a	n/a	n/a	n/a	n/a	n/a
Piping and Mechanical Material								
Large and Small Bore Pipe	7,500	6,804	6.8494	51,371	linear meter	\$1,529.91	\$78,592,633	\$91,953,381
Large Bore Hangers	2,788	2,529						
Nuclear Island EM Package	15,377	13,950	n/a	n/a	n/a	n/a	n/a	n/a
Turbine Island and BOP	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Consumables	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Electrical Equipment								
Conduit (assume 2 x 0.095 inches)	1,356	1,230	315.3647	427,635	linear meter	\$25.25	\$10,797,773	\$12,633,394
Cable Tray	73	66			linear meter	\$73.50		
Power & Control Wire (assume 8 gauge wire)	4,406	3,997	30.4800	134,295	linear meter	\$9.50	\$1,275,801	\$1,492,688
Nuclear Island Electrical	5,000	4,536						
Turbine Island Electrical	5,000	4,536						
Totals	970,066	880,029					\$222,947,032	\$260,848,027
Notes:								
a = Commodities and estimated tons were provided by AREVA.								
b = Glover, Thomas J. 1998. Pocket Reference, Second Edition, Sequoia Publishing, Inc., Littleton, Colorado. November.								
c = from U.S. Department of Energy (USDOE), Cost Estimating Guidelines for Generation IV Nuclear Energy Systems, September 30, 2005, Table 4.4, page 53.								
d = U.S. Bureau of Labor Statistics (USBLS), Consumer Price Index (CPI) Inflation Calculator, website accessed February 23, 2010.								
Conversions (per note b):								
1 metric ton = 1,000 kilograms					Heavy concrete: 5,400 pounds/cubic yard; 3,204 kilograms/cubic meter			
1 ton = 2,000 pounds					Steel pipe: 100mm sch 40 (0.237 inches) = 11 pounds/foot			
50 millimeters = 1.9685 inches					Steel pipe: 300mm sch 80 (0.687 inches) = 89 pounds/foot			
100 millimeters = 3.937 inches					Steel pipe: 500mm sch 120 (1.500 inches) = 296 pounds/foot			
300 millimeters = 11.811 inches					Steel tubing (for conduit): 2 inches by 0.095 inches = 1.933 pounds/foot			
500 millimeters = 19.6850 inches					Copper wire: 6 gauge = 79.5 pounds per 1,000 feet			
1 foot = 0.3048 linear meters					Copper wire: 8 gauge = 50 pounds per 1,000 feet			
Concrete, w/gravel: 4,050 pounds/cubic yard; 2,402.8 kilograms/cubic meter					Copper wire: 10 gauge = 31.4 pounds per 1,000 feet			

SITE AND TECHNICAL OVERVIEW (STO)

STO-01: Discuss other nearby industrial facilities, other nuclear facilities in the region, or other federal projects in the region which could involve resource conflicts and concurrent demands for area labor force that might be needed for the applicant to construct and operate the proposed facility.

Audit Disposition: Upon review of this NFI response the NRC requested to be provided a docketed copy of the response, included in its entirety below. In addition, the NRC asked for clarification of a list of projects obtained from the NEPA-assist database. This information is also provided below.

Response: A geographic area of interest within a 50-mile (80-km) radius of BBNPP site was reviewed for other nearby industrial and nuclear facilities and other federal projects that may have potential cumulative socioeconomic impacts, including resource conflicts and concurrent demands for area labor force that might be needed for the applicant to construct and operate the proposed facility. Such projects are described in ER Rev. 3.0 Section 2.8.6 (Non Federal Potential Impacts), and Section 10.5.2, Cumulative Impacts.

As stated in Section 2.8.6, there are two known, planned non-Federal projects or activities in the region around the BBNPP that may contribute to cumulative impacts in certain resource areas. These two projects are the Susquehanna-Roseland transmission line and Transco's Leidy gas pipeline. Both projects are currently under construction. Additional discussion of recently completed or planned projects in the area of BBNPP is provided in the response to NFI LU-10. In addition, SSES is in the geographic area of interest, and Three Mile Island Unit 1 (TMI), and the Peach Bottom and Limerick nuclear units are within the larger Region of Interest. These facilities are in operation and not under construction, reducing conflicts with demands on the general construction and non-specialized labor pools. However, during operation, BBNPP would draw from the same pool of specialized labor required during outages and major plant upgrades. Based upon prior project experience, adequate labor resources will be available and capable of meeting market demand due to the size and scope of the proposed project.

Information on Additional Projects of Interest Identified by NRC:

Project: Good Spring/Tracy Slope Mine (EmberClear Corp.), Schuylkill County, PA

Originally an Integrated Gasification Combined Cycle (IGCC) project being developed by EmberClear Corp., an advanced coal energy development company, with partner Huaneng Clean Energy Research Institute (HCERI) (EmberClear, 2012a), on May 17, 2012, the company announced that the plant is being changed to a 300 MW Natural Gas Combined Cycle (NGCC) plant scheduled for construction in 2013 (EmberClear, 2012c). As stated by EmberClear, "Good Spring IGCC strives to be a commercially relevant electricity power source and not just an R&D project" (EmberClear, 2012b). EmberClear embarked on a drilling program in May 2011 and filed a new National Instrument 43-101, Standards for Disclosure for Mineral Projects ("NI 43-101") compliant technical report on its coal deposits at the property in March 2012 (EmberClear, 2012d).

Status: Although all permits have been received for a 270MW facility, construction of the plant is on hold pending clarification of federal regulations and programs (Alternate Energy eMagazine, 2012).

Permits: Approval to upgrade the permit (which one was not specified) for the Good Spring project to 270 MW was received in December 2010 (EmberClear, 2012b).

Comments: Per the EmberClear website, Future Fuels power, which is in the ER, is now part of EmberClear.

Project: Shamokin Dam Project (Sunbury Generation LP), 3.8 miles SW of BBNPP, Shamokin Dam, Snyder County, PA

This project involves a preliminary permit application to study of the feasibility of hydropower at the USACE Shamokin Dam on the Susquehanna River. The proposed project would consist of the following: (1) Two prefabricated concrete walls attached to the downstream side of the Corps' dam which would support one frame module; (2) the frame module would be 40 feet wide and weigh 0.65 million pounds and contain 6 generating units with a total combined capacity of 4.5 megawatts (MW); (3) a tailrace approximately 175 feet long, lined with riprap; (4) a new switchyard containing a transformer; and (5) a proposed 1.3-mile-long, 34.5-kilovolt (kV) transmission line connecting to an existing line. The proposed project would have an average annual generation of 25.64 gigawatt-hours, which would be sold to a local utility or the Regional Independent System Operator. (Federal Register, 2011) Sunbury Generation LP owns and operates a 436 MW generation facility located in Shamokin Dam, Snyder County, PA within the market administered by PJM (FERC, 2012).

Permits: Preliminary permit application pursuant to section 4(f) of the Federal Power Act (FPA) filed on 8/4/11; accepted for filing, etc. on 8/23/11 (FERC Project No. 14243-000) (Federal Register, 2011); Intent to Renew Title V Operating Permit 55-00001 (PA Bulletin, 2012a); Existing plant has Industrial Waste NPDES Permit No. PA0008451 for discharge into Susquehanna River and Rolling Green Run (PA Bulletin, 2001).

Project: Spike Island Coal, ~40 miles north of BBNPP, Moosic PA, Lackawanna County

Planned natural gas fired units to replace existing coal fired units (The Daily Item, 2011). No additional information identified.

Permits: Application pending (not sure which); water permit pending with SRBC.

Project: White Deer Project (National Gypsum Company [NGC]), 38 miles west of BBNPP, White Deer Township, Union County

Tire-derived fuel; located adjacent to the West Milton Plant, this project will supply steam and electricity to the Milton Plant. The Project's steam and electricity production will increase NGC energy efficiencies by more than eighty percent. En-Tire Logistics of Milton, PA, LLC (En-Tire) in partnership with Emanuel Tire of Pennsylvania Inc., and NGC have entered into a 15-year agreement for the steam supply. This agreement solidifies NGC's allegiance to its Milton (a recycled-paper factory that supplies paper for NGC's wallboard) employees as well as its ongoing commitment to remain in Union County and the State of Pennsylvania. (White Deer Energy Project, 2011)

Status: Existing natural gas/oil-fired boilers and planned tire-derived fuel operation.

Permits: Operating Permit No. 60-00002 was issued 7/31/98 for operation of two natural gas/#6 fuel oil-fired boilers (PA Bulletin, 1998); A Notice of Intent to Remediate soil and groundwater contaminated with petroleum hydrocarbon contamination was filed in 2002 and a summary of the Notice of Intent to Remediate was reported to have been published in the Milton Daily Standard on February 1, 2002. (PA Bulletin, 2002).

Project: MOXIE Patriot (Moxie Energy), 36 miles west of BBNPP, Clinton Township, Lycoming County

Moxie Energy, through its wholly-owned subsidiary Moxie Liberty LLC, is proposing to build a natural gas power plant in Asylum Township, Bradford County, Pennsylvania to take advantage of the abundant natural gas resources in the area and the skilled workforce that has developed around the domestic natural gas production industry. The power plant will be fueled only by natural gas (no diesel oil back-up), and will not require river water or any other large source of water typically used for cooling needs. It will consist of two combustion turbine generators that will each produce between 225 and 350 megawatts of electricity. The combustion turbines will be connected to two heat recovery steam generators where the hot exhaust gases from the combustion turbines will produce steam that will be directed to two steam turbines. The steam turbines will produce an additional 250 MW to 300 MW of electricity. (Moxie Energy, 2012)

Construction of the project will take approximately 30 months and employ an average of 200 skilled and non-skilled workers and a peak workforce of about 500. The direct construction payroll is expected to be about \$40 million; the indirect and induced payroll (an estimate of the money spent on outside goods and services such as hotels and apartments, food, clothing, gasoline, and other things) is expected to be about \$80 million using a conservative multiplier of two. (Moxie Energy, 2012)

Status: Completion planned for early 2015 (Moxie Energy, 2012)

Permits: General Permit for Discharges of Stormwater Associated with Construction Activities (PAR) Permit No. PAG0200081200 into the Susquehanna River (PA Bulletin, 2012c); General Permit Type—PAG-03 Permit No. PAR704819 for discharge into Susquehanna River (PA Bulletin, 2012b)

Project: PurGen One (SCS Energy LLC), Linden, NJ

Planned 400 MW IGCC project will combine electrical generating capacity with a nearly one trillion ton carbon dioxide collection and storage (CCS) capacity. The manufacturing facility will alternate between production of electricity from hydrogen and other hydrogen commodities. (SCS Energy LLC, 2011)

Status: Planned IGCC project; may begin construction in (2012 SCS Energy LLC, 2012).

Permits: NJDEP Bureau of Air Permits received an application on December 28, 2010 but the application was deemed incomplete in Jan 2011 (NJDEP, 2011). A Draft Environmental Impact Statement (DEIS) was filed with the Federal Government in 2011 (Global CCS Institute, 2012).

References:

Alternative Energy eMagazine, 2012. *Doing Business in China & Creating American Jobs*; Albert Lin, EmberClear Corp., Apr/May 11, Web site: <http://altenergymag.com/emagazine/2011/04/doing-business-with-china--creating-american-jobs/1693>; Date accessed: May 15, 2012.

EmberClear, 2012a. EmberClear™, Solutions; Website: <http://www.emberclear.com/Products.html>; Date accessed: May 15, 2012.

EmberClear, 2012b. EmberClear™, Good Spring IGCC, FAQs; Website: <http://www.emberclear.com/FAQs.html>; Date accessed: May 15, 2012.

EmberClear, 2012c. EmberClear® Press Release, Good Spring Power Project Increases to 300 MW, *Electricity Facility Expects to Begin Construction in 2013*, May 17, 2012; Website: <http://www.emberclear.com/PressReleases.html>; Date accessed: June 1, 2012.

EmberClear, 2012d. EmberClear® Press Release, EmberClear's New 43-101 Technical Report Adds Coal Resources at the Good Spring Property, March 14, 2012; Website: <http://www.emberclear.com/PressReleases.html>; Date accessed: June 1, 2012.

Federal Register, 2011. "Lock+Hydro Friends Fund VII; Notice of Preliminary Permit Application Accepted for Filing and Soliciting Comments, Motions To Intervene, and Competing Applications," Federal Register 76:163 (August 23, 2011), p. 52656; Available from the U.S. Government Printing Office, Data accessed: May 16, 2012.

FERC, 2012. Federal Energy Regulatory Commission, Office of Energy Market Regulation, In Reply Refer To: Sunbury Generation LP, Docket Nos. ER10-2923-002, ER10-2923-003, and ER10-2923-004, April 23, 2012.

Global CCS Institute, 2012. Global Carbon Capture and Storage Institute, Projects: PurGen One, Website: <http://www.globalccsinstitute.com/projects/12621>; Date accessed: June 1, 2012.

Moxie Energy, 2012. Current Projects, Website: http://02c14a9.netsolhost.com/Company_Current_Projects.htm; Date accessed: June 1, 2012.

NJDEP, 2011. NJ Clean Air Council Meeting Record, January 19, 2011, 1:00 p.m., Draft Approved: February 9, 2011, Website: http://www.state.nj.us/dep/cleanair/minutes/min_1101.pdf, date accessed: May 15, 2012.

PA Bulletin, 1998. Volume 28, No. 35, Doc. No. 98-1397, August 29, 1998; Website: <http://www.pabulletin.com/secure/data/vol28/28-35/1397.html>; Date accessed: May 17, 2012.

PA Bulletin, 2001. Volume 31, No. 34, Doc. No. 01-1568, August 25, 2001; Website: <http://www.pabulletin.com/secure/data/vol31/31-34/1568.html>; Date accessed: June 1, 2012.

PA Bulletin, 2002. Volume 32, No. 13, Doc. No. 02-502a, March 30, 2002; Website: <http://www.pabulletin.com/secure/data/vol32/32-13/502a.html>; Date accessed: May 17, 2012.

PA Bulletin, 2012a. Volume 42, No. 21, Doc. No. 12-978a, May 26, 2012; Website: <http://www.pabulletin.com/secure/data/vol42/42-21/978a.html>, Date accessed: June 1, 2012.

PA Bulletin, 2012b. Volume 42, No. 16, Doc. No. 12-737b, April 21, 2012; Website: <http://www.pabulletin.com/secure/data/vol42/42-16/737b.html>; Date accessed: June 1, 2012.

PA Bulletin, 2012c. Volume 42, No. 5, Doc. No. 12-193b, February 4, 2012; Website: <http://www.pabulletin.com/secure/data/vol42/42-5/193b.html>; Date accessed: June 1, 2012.

SCS Energy LLC, 2011. PURGen One: At a Glance, Website: <http://www.purgenone.com/purgen-one-at-a-glance.php>, date accessed: May 15, 2012.

The Daily Item, 2011. "Natural gas could replace coal at Shamokin Dam power plant," By Tricia Pursell and John Finnerty, December 23, 2011; Website: http://dailyitem.com/0100_news/x1750827212/Natural-gas-could-replace-coal-at-Shamokin-Dam-power-plant; Date accessed: May 17, 2012.

White Deer Energy Project, 2011. White Deer Energy Project Hosted by National Gypsum Company, What We Do, What is the White Deer Project?, Website: <http://www.whitedeerproject.com/whatwedo.html>; Date accessed: June 1, 2012.

Enclosure 2

Proprietary AEOLUS3 and SACTI Computer Model Input/Output Files, AREVA, 2012
and
Affidavit Attesting to Confidential/Proprietary Nature of Model Input/Output Files

AFFIDAVIT

COMMONWEALTH OF VIRGINIA)
) ss.
COUNTY OF CAMPBELL)

1. My name is Russell D. Wells. I am U.S. EPR COLA Licensing Manager for AREVA NP Inc. and as such I am authorized to execute this Affidavit.

2. I am familiar with the criteria applied by AREVA NP to determine whether certain AREVA NP information is proprietary. I am familiar with the policies established by AREVA NP to ensure the proper application of these criteria.

3. I am familiar with the AREVA NP information contained in "BBNPP NFI MET-01, MET-02, MET-03 Post-Audit Request for Computer Code Input/Output Files," and referred to herein as "Document." Information contained in this Document has been classified by AREVA NP as proprietary in accordance with the policies established by AREVA NP for the control and protection of proprietary and confidential information.

4. This Document contains information of a proprietary and confidential nature and is of the type customarily held in confidence by AREVA NP and not made available to the public. Based on my experience, I am aware that other companies regard information of the kind contained in this Document as proprietary and confidential.

5. This Document has been made available to the U.S. Nuclear Regulatory Commission in confidence with the request that the information contained in this Document be withheld from public disclosure. The request for withholding of proprietary information is made in accordance with 10 CFR 2.390. The information for which withholding from disclosure is

requested qualifies under 10 CFR 2.390(a)(4) "Trade secrets and commercial or financial information".

6. The following criteria are customarily applied by AREVA NP to determine whether information should be classified as proprietary:

- (a) The information reveals details of AREVA NP's research and development plans and programs or their results.
- (b) Use of the information by a competitor would permit the competitor to significantly reduce its expenditures, in time or resources, to design, produce, or market a similar product or service.
- (c) The information includes test data or analytical techniques concerning a process, methodology, or component, the application of which results in a competitive advantage for AREVA NP.
- (d) The information reveals certain distinguishing aspects of a process, methodology, or component, the exclusive use of which provides a competitive advantage for AREVA NP in product optimization or marketability.
- (e) The information is vital to a competitive advantage held by AREVA NP, would be helpful to competitors to AREVA NP, and would likely cause substantial harm to the competitive position of AREVA NP.

The information in the Document is considered proprietary for the reasons set forth in paragraphs 6(b) and 6(c) above.

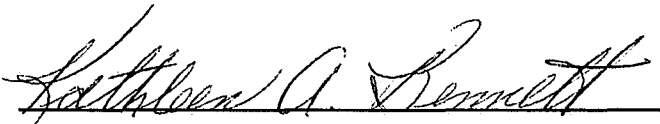
7. In accordance with AREVA NP's policies governing the protection and control of information, proprietary information contained in this Document has been made available, on a limited basis, to others outside AREVA NP only as required and under suitable agreement providing for nondisclosure and limited use of the information.

8. AREVA NP policy requires that proprietary information be kept in a secured file or area and distributed on a need-to-know basis.

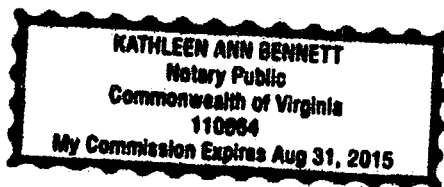
9. The foregoing statements are true and correct to the best of my knowledge, information, and belief.



SUBSCRIBED before me this *31st*
day of May, 2012.



Kathleen A. Bennett
NOTARY PUBLIC, COMMONWEALTH OF VIRGINIA
MY COMMISSION EXPIRES: 8/31/2015
Registration No. 110864



Enclosure 3

NRHH-03 - Legionella Sampling at the PPL SSES Facility, Indoor Air Solutions, Inc., 2011
and
Pennsylvania EPI Notes, Volume 2, Issue 1, Pennsylvania Department of Health, Winter 2012.



August 31, 2011

Mr. Frank Bastian, CIH, CSP
Senior Safety & IH Specialist
PPL Corporation
769 Salem Boulevard
Mail Stop: NUCSA3
Berwick, PA 18603

RE: Legionella Sampling at the PPL SSES Facility

Dear Mr. Bastian,

At your request, Indoor Air Solutions, Inc. (IAS) visited the PPL SSES facility located at 769 Salem Boulevard, Berwick, PA on several dates for the purpose of performing Legionella sampling.

Introduction

Reportedly, PPL has performed testing on source water for their generating facility cooling towers served by multiple water sources. On occasion, some of those water sources and cooling towers have tested positive for Legionella pneumophila. Consequently, PPL treats their cooling tower with a biocide and subsequently neutralizes and cooling tower water blow-down back to the point of origin. The data summarized in this report represents the Legionella concentrations measured at SSES through the date of this report. The status of each tower/circulating water system is indicated in the tables below.

Methods

Mr. David Nugent of IAS visited the SSES facility on the dates indicated to perform sampling for Legionella. IAS utilized the sampling methods specific by the analyzing laboratory for collecting and handling water samples. In addition, these laboratory sampling methods conform to OSHA's water sampling protocol. A reach pole is extended with a sterile collection bottle and rinsed at least 3 times in cooling tower water at each location. The 1 liter collection bottle is then used to fill irradiated and sealed 250ml sample bottles containing 50mg tablet of Sodium Thiosulfate preservative. Collection bottles are changed at each cooling tower/circulating water system.

Results

Test results and sample documentation for the sampling performed are attached in Appendix A.

Date/	Sample #	Tower	Location (Azimuth/Column)	Oper. Status	Sample Type	Results (cfu/ml)
June 6, 2011	N/A	Unit 1	N/A	Drained	N/A	N/A
June 6, 2011	1157010	Unit 2	Az. 0; Col. 37	100% Pwr.	Cultured	<4
June 6, 2011	1157011	Unit 2	Az 180; Col. 17	100% Pwr.	Cultured	<4
July 25, 2011	1206001	Unit 2	Az 0; Col. 37	100% Pwr.	Cultured	580
July 25, 2011	1206002	Unit 2	Az 270; Col. 27	100% Pwr.	Cultured	580
July 25, 2011	1206003	Unit 2	Az 180; Col. 17	100% Pwr.	Cultured	500
July 25, 2011	1206004	Unit 1	Az 0; Col. 17	100% Pwr.	Cultured	16
July 25, 2011	1206005	Unit 1	Az 270; Col. 27	100% Pwr.	Cultured	8
July 25, 2011	1206006	Unit 1	Az 180; Col. 37	100% Pwr.	Cultured	24
August 5, 2011	SSES001	Unit 1	Az 0; Col. 17	100% Pwr.	Cultured	ND
August 5, 2011	SSES002	Unit 1	Az 270; Col.27	100% Pwr.	Cultured	ND
August 5, 2011	SSES003	Unit 1	Az 180; Col. 37	100% Pwr.	Cultured	ND
August 5, 2011	SSES004	Unit 2	Az 0; Col. 37	100% Pwr.	Cultured	72
August 5, 2011	SSES004	Unit 2	Az 0; Col. 37	100% Pwr.	PCR	<100*
August 5, 2011	SSES005	Unit 2	Az 270; Col. 27	100% Pwr.	Cultured	64
August 5, 2011	SSES005	Unit 2	Az 270; Col. 27	100% Pwr.	PCR	<100*
August 5, 2011	SSES006	Unit 2	Az 180; Col. 17	100% Pwr.	Cultured	60
August 5, 2011	SSES006	Unit 2	Az 180; Col. 17	100% Pwr.	PCR	<100*
August 25, 2011	1237001	Unit 1	Az 0; Col. 17	100% Pwr.	Cultured	Pending
August 25, 2011	1237002	Unit 1	Az 270; Col.27	100% Pwr.	Cultured	Pending
August 25, 2011	1237003	Unit 1	Az 180; Col. 37	100% Pwr.	Cultured	Pending
August 25, 2011	1237004	Unit 2	Az 0; Col. 37	100% Pwr.	Cultured	Pending
August 25, 2011	1237005	Unit 2	Az 270; Col. 27	100% Pwr.	Cultured	Pending
August 25, 2011	1237006	Unit 2	Az 180; Col. 17	100% Pwr.	Cultured	Pending

*Organisms/ml (both viable and non-viable organisms).

Mr. Frank Bastian, CIH, CSP
August 31, 2011
Page 3

Discussion

JUNE 6, 2011

Unit 1 was shutdown, and Unit 2 was operating at 100% on this date. Although test results for samples collected on June 6, 2011 were negative for Legionella, IAS does not suggest altering water treatment or PPE safety protocols already in place. Additionally, IAS suggests that this testing be repeated when the SSES facility is in operation and waste heat is being circulated to the subject cooling towers.

JULY 25, 2011

Both Units were operating at 100% power on this date. Unit 2 cooling tower concentrations measured on this date indicate the need for investigation and urgent response. The concentrations represent a high risk, but not very high risk (>1000 cfu/ml). Reportedly, Hypochlorite levels were not carefully monitored during a shutdown period, and as a result, after startup U/2 circulating water went untreated for a period of time. This has since been corrected. Unit 1 concentrations measured <100 cfu/ml putting this system in the low risk category.

AUGUST 5, 2011

Both Units were operating at 100% power on this date. Both Unit 1 and Unit 2 concentrations measured <100 cfu/ml putting these systems in the low risk category.

Should you have any questions or comments about the information contained in this report, please do not hesitate to contact me.

Sincerely,

Indoor Air Solutions, Inc.

David E. Nugent
Operations Manager

DEN:hrp

cc: Cherylanne Kiedaisch

APPENDIX A LABORATORY RESULTS AND CHAIN OF CUSTODY FORM

Client: Indoor Air Solutions, Inc.
C/O: Dave Nugent
Re: SSESDate of Sampling: 06-06-2011
Date of Receipt: 06-07-2011
Date of Report: 06-15-2011**QUANTITATIVE *LEGIONELLA* REPORT**

Location:	(1157)010: Cooling Tower #2	(1157)011: Cooling Tower #2
Comments (see below)	None	None
Lab ID-Version‡:	3505924-1	3505925-1
Sample type*	Water sample	Water sample
	cfu/1 ml	cfu/1 ml
<i>L. pneumophila</i>	< 4	< 4
Other <i>Legionella</i> species***	< 4	< 4
TOTAL CFU/UNIT	< 4	< 4

Comments:

* The sample type affects the interpretation of the results. For example, swab samples provide only qualitative results but are not recommended for comparison to the OSHA guidelines for permissible levels of *Legionella* in water samples.

** *Legionella* isolate identification using serological testing. The *Legionella pneumophila* organism is responsible for approximately 90% of the reported Legionellosis cases. Of the reported Legionellosis cases caused by *Legionella pneumophila* species, *Legionella pneumophila* serotype 1 organisms are implicated as the causative agent over 80% of the time, with serotypes 2-14 being implicated in the majority of the remaining cases.

*** "Other *Legionella* species" include, but are not limited to, the following organisms: *Legionella anisa*, *Legionella bozemanii*, *Legionella dumoffii*, *Legionella gormanii*, *Legionella jordanis*, *Legionella longbeachae* 1 and 2, and *Legionella micdadei*.

Information on *Legionella* control may be found in the OSHA Technical Manual Sec. III, Ch. 7 (ISBN: 0-86587-674-6 or online at www.osha.gov).

The limit of detection is a raw count of 1 at the lowest dilution plated. The analytical sensitivity is equal to 1 raw count/reporting unit x the dilution factor.

Interpretation is left to the company and/or persons who conducted the field work.

Based on samples delivered. Sampling techniques, contaminants infecting samples, unrepresentative samples and other similar or dissimilar factors may affect results. EMLab P&K hereby disclaims any liability for indirect, punitive, incidental, special or consequential damages arising out of the use or interpretation of the data contained in, or any actions taken in reliance upon, this report; and its actual direct damages arising out of the use or interpretation of the data contained in, or any actions or omitted taken in reliance upon, this report shall be limited to the cost of this report.

‡ A "Version" indicated by "-x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".



Cherry Hill, NJ: 1936 Olney Avenue, Cherry Hill, NJ 08003 * (866) 871-1984
Phoenix, AZ: 1501 West Knudsen Drive, Phoenix, AZ 85027 * (800) 651-4802
San Bruno, CA: 1150 Bayhill Drive, #100, San Bruno, CA 94066 * (866) 888-6653

Weather		Fog	Rain	Snow	Wind	Clear
Intensity	None					
	Light					
	Moderate					
	Heavy					




000791570

Requests

CONTACT INFORMATION	
Company: <u>Indemhi Solutions, Inc.</u>	Address: <u>1250 E High St - Ste 301 Pottstown, PA 19464</u>
Contact: <u>David Nugent</u>	Special Instructions: <u>J</u>
Phone: <u>(603) 373-8818</u>	

PROJECT INFORMATION		SCHEDULING TIME CODES	
Project ID:	SS03	STD - Standard (DEFAULT)	(A) Standard (Default) - 8:00 AM to 5:00 PM (B) Next Business Day - 8:00 AM to 5:00 PM (C) Same Business Day Rush - 8:00 AM to 5:00 PM (D) Weekend/Holiday - 8:00 AM to 5:00 PM
Project Desc.:	_____	ND - Next Business Day	
Project	Sampling	SD - Same Business Day Rush	
Zip Code:	Date & Time: 6-6-11 @ 10:30	WH - Weekend/Holiday	
PQ Number:	_____		

[illegible]

Sample Type Codes				Prepared by	Date Time
BC - BioCassette	ST - Spore Trap: Zefon,	T - Tape	D - Dust		6-6-11 @ 1400
AIS - Andersen	Allergenco, Burkard...	SW - Swab	SO - Soil		
SAS - Surface Air Sampler	P - Potable Water	B - Bulk			
CP - Contact Plate	NP - Non-Potable Water	O - Other:			

Non-Culturable		Request	
Spore Trap	Tape Swab Bulk		
Fungi - Spore Trap Analysis			
Spore Trap Analysis - Other particles			
Direct Microscopic Exam (Qualitative)			
Quantitative Spore Count Direct Exam			
1-Media Surface Fungi (Genus ID + Asp. spp.)			
2-Media Surface Fungi (Genus ID + Asp. spp.)			
3-Media Surface Fungi (Genus ID + Asp. spp.)			
Culturable Air Fungi (Genus ID + Asp. spp.)			
Gram Stain and Counts (Culturable Air and Surface Bacteria)			
Legionella culture			
Total Coliform, E. coli (Presence/Absence)			
Membrane Filtration (Please specify organism)			
MEN Bacteria (Please specify organism)			
Quantitray - Sewage Screen			
Asbestos Analysis - PCM Airborne Fiber Count (NIOSH 7400)			
Asbestos Analysis - PLM (EPA method 600/R-93-116)			
PCR (Please specify test)			

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Red 210

Client: Indoor Air Solutions, Inc.
C/O: Dave Nugent
Re: SSES - CoolingTwrs.; Legionella Sampling

Date of Sampling: 07-25-2011
Date of Receipt: 07-26-2011
Date of Report: 08-04-2011

QUANTITATIVE *LEGIONELLA* REPORT

Location:	(1206) 003: Cooling Twr # 2	(1206) 002: Cooling Twr # 2	(1206) 001: Cooling Twr # 2
Comments (see below)	None	None	None
Lab ID-Version‡:	3586679-1	3586680-1	3586681-1
Sample type*	Water sample	Water sample	Water sample
	cfu/1 ml	cfu/1 ml	cfu/1 ml
<i>L. pneumophila</i> serotype 5	500	580	580
Other <i>Legionella</i> species***	< 4	< 4	< 4
TOTAL CFU/UNIT	500	580	580

Comments:

* The sample type affects the interpretation of the results. For example, swab samples provide only qualitative results but are not recommended for comparison to the OSHA guidelines for permissible levels of *Legionella* in water samples.

** *Legionella* isolate identification using serological testing. The *Legionella pneumophila* organism is responsible for approximately 90% of the reported Legionellosis cases. Of the reported Legionellosis cases caused by *Legionella pneumophila* species, *Legionella pneumophila* serotype 1 organisms are implicated as the causative agent over 80% of the time, with serotypes 2-14 being implicated in the majority of the remaining cases.

*** "Other *Legionella* species" include, but are not limited to, the following organisms: *Legionella anisa*, *Legionella bozemanii*, *Legionella dumoffii*, *Legionella gormanii*, *Legionella jordanis*, *Legionella longbeachae* 1 and 2, and *Legionella micdadei*.

Information on *Legionella* control may be found in the OSHA Technical Manual Sec. III, Ch. 7 (ISBN: 0-86587-674-6 or online at www.osha.gov).

The limit of detection is a raw count of 1 at the lowest dilution plated. The analytical sensitivity is equal to 1 raw count/reporting unit x the dilution factor.

Interpretation is left to the company and/or persons who conducted the field work.

Based on samples delivered. Sampling techniques, contaminants infecting samples, unrepresentative samples and other similar or dissimilar factors may affect results. EMLab P&K hereby disclaims any liability for indirect, punitive, incidental, special or consequential damages arising out of the use or interpretation of the data contained in, or any actions taken in reliance upon, this report; and its actual direct damages arising out of the use or interpretation of the data contained in, or any actions or omitted taken in reliance upon, this report shall be limited to the cost of this report.

‡ A "Version" indicated by "-x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

Client: Indoor Air Solutions, Inc.
C/O: Dave Nugent
Re: SSES - CoolingTwrs.; Legionella Sampling

Date of Sampling: 07-25-2011
Date of Receipt: 07-26-2011
Date of Report: 08-04-2011

QUANTITATIVE LEGIONELLA REPORT

Location:	(1206) 006: Cooling Twr # 1	(1206) 005: Cooling Twr # 1	(1206) 004: Cooling Twr # 1
Comments (see below)	None	None	None
Lab ID-Version‡:	3586676-1	3586677-1	3586678-1
Sample type*	Water sample	Water sample	Water sample
	cfu/1 ml	cfu/1 ml	cfu/1 ml
<i>L. pneumophila</i> serotype 5	24	8	16
Other <i>Legionella</i> species***	< 4	< 4	< 4
TOTAL CFU/UNIT	24	8	16

Comments:

* The sample type affects the interpretation of the results. For example, swab samples provide only qualitative results but are not recommended for comparison to the OSHA guidelines for permissible levels of *Legionella* in water samples.

** *Legionella* isolate identification using serological testing. The *Legionella pneumophila* organism is responsible for approximately 90% of the reported Legionellosis cases. Of the reported Legionellosis cases caused by *Legionella pneumophila* species, *Legionella pneumophila* serotype 1 organisms are implicated as the causative agent over 80% of the time, with serotypes 2-14 being implicated in the majority of the remaining cases.

*** "Other *Legionella* species" include, but are not limited to, the following organisms: *Legionella anisa*, *Legionella bozemanii*, *Legionella dumoffii*, *Legionella gormanii*, *Legionella jordanis*, *Legionella longbeachae* 1 and 2, and *Legionella micdadei*.

Information on *Legionella* control may be found in the OSHA Technical Manual Sec. III, Ch. 7 (ISBN: 0-86587-674-6 or online at www.osha.gov).

The limit of detection is a raw count of 1 at the lowest dilution plated. The analytical sensitivity is equal to 1 raw count/reporting unit x the dilution factor.

Interpretation is left to the company and/or persons who conducted the field work.

Based on samples delivered. Sampling techniques, contaminants infecting samples, unrepresentative samples and other similar or dissimilar factors may affect results. EMLab P&K hereby disclaims any liability for indirect, punitive, incidental, special or consequential damages arising out of the use or interpretation of the data contained in, or any actions taken in reliance upon, this report; and its actual direct damages arising out of the use or interpretation of the data contained in, or any actions or omitted taken in reliance upon, this report shall be limited to the cost of this report.

‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K

	Fog	Rain	Snow	Wind	Clear
None					
Light					
Moderate					
Heavy					

Abstract

000809468

Non-Culturable		000809468	
Spore	Tape	BioC	
Trap	Swab	Water, Bulk, Urine, Stool, Vaginal	
	Bulk		

Fungi - Spore Trap Analysis Spore Trap Analysis - Other particles Direct Microscopic Exam (Qualitative) Quantitative Spore Count Direct Exam Media Surface Fungi (Genus ID + Asp. spp.) Media Surface Fungi (Genus ID + Asp. spp.) Media Surface Fungi (Genus ID + Asp. spp.) Culturable Air Fungi (Genus ID + Asp. spp.) Gram Stain and Counts (Culturable Air and Surface Bacteria) <i>Legionella</i> culture Total Coliform, <i>E. coli</i> (Presence/Absence) Membrane Filtration (Please specify organism) AMPN Bacteria (Please specify organism) QuantiTray • Sowaigo Screen Asbestos Analysis • PCM Airborne Fiber Count (NIOSH 7400) Asbestos Analysis • PLM (EPA method 600/R-93-116) PCR (please specify test)

PT-109

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Client: Indoor Air Solutions, Inc.
C/O: Dave Nugent
Re: SSES 8-5-11; Legionella Sampling

Date of Sampling: 08-05-2011
Date of Receipt: 08-08-2011
Date of Report: 08-29-2011

QUANTITATIVE *LEGIONELLA* REPORT

Location:	(SSES) 001: U/1 Cooling Tower	(SSES) 002: U/1 Cooling Tower	(SSES) 003: U/1 Cooling Tower
Comments (see below)	None	None	None
Lab ID-Version‡:	3610274-1	3610276-1	3610278-1
Sample type*	Water sample	Water sample	Water sample
	cfu/1 ml	cfu/1 ml	cfu/1 ml
<i>L. pneumophila</i>	ND	ND	ND
Other <i>Legionella</i> species***	ND	ND	ND
TOTAL CFU/UNIT	< 4	< 4	< 4

Comments:

* The sample type affects the interpretation of the results. For example, swab samples provide only qualitative results but are not recommended for comparison to the OSHA guidelines for permissible levels of *Legionella* in water samples.

** *Legionella* isolate identification using serological testing. The *Legionella pneumophila* organism is responsible for approximately 90% of the reported Legionellosis cases. Of the reported Legionellosis cases caused by *Legionella pneumophila* species, *Legionella pneumophila* serotype 1 organisms are implicated as the causative agent over 80% of the time, with serotypes 2-14 being implicated in the majority of the remaining cases.

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Information on *Legionella* control may be found in the OSHA Technical Manual Sec. III, Ch. 7 (ISBN: 0-86587-674-6 or online at www.osha.gov).

ND means not detected.

The limit of detection is a raw count of 1 at the lowest dilution plated. The analytical sensitivity is equal to 1 raw count/reporting unit x the dilution factor.

Interpretation is left to the company and/or persons who conducted the field work.

Based on samples delivered. Sampling techniques, contaminants infecting samples, unrepresentative samples and other similar or dissimilar factors may affect results. EMLab P&K hereby disclaims any liability for indirect, punitive, incidental, special or consequential damages arising out of the use or interpretation of the data contained in, or any actions taken in reliance upon, this report; and its actual direct damages arising out of the use or interpretation of the data contained in, or any actions or omitted taken in reliance upon, this report shall be limited to the cost of this report.

‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

Client: Indoor Air Solutions, Inc.
C/O: Dave Nugent
Re: SSES 8-5-11; Legionella Sampling

Date of Sampling: 08-05-2011
Date of Receipt: 08-08-2011
Date of Report: 08-29-2011

QUANTITATIVE *LEGIONELLA* REPORT

Location:	(SSES) 004: U/2 CoolingTower	(SSES) 005: U/2 CoolingTower	(SSES) 006: U/2 CoolingTower
Comments (see below)	None	None	None
Lab ID-Version‡:	3610280-1	3610282-1	3610284-1
Sample type*	Water sample	Water sample	Water sample
	cfu/1 ml	cfu/1 ml	cfu/1 ml
<i>L. pneumophila</i>	72	64	60
Other <i>Legionella</i> species***	ND	ND	ND
TOTAL CFU/UNIT	72	64	60

Comments:

* The sample type affects the interpretation of the results. For example, swab samples provide only qualitative results but are not recommended for comparison to the OSHA guidelines for permissible levels of *Legionella* in water samples.

** *Legionella* isolate identification using serological testing. The *Legionella pneumophila* organism is responsible for approximately 90% of the reported Legionellosis cases. Of the reported Legionellosis cases caused by *Legionella pneumophila* species, *Legionella pneumophila* serotype 1 organisms are implicated as the causative agent over 80% of the time, with serotypes 2-14 being implicated in the majority of the remaining cases.

*** "Other *Legionella* species" include, but are not limited to, the following organisms: *Legionella anisa*, *Legionella bozemanii*, *Legionella dumoffii*, *Legionella gormanii*, *Legionella jordanis*, *Legionella longbeachae* 1 and 2, and *Legionella micdadei*.

Information on *Legionella* control may be found in the OSHA Technical Manual Sec. III, Ch. 7 (ISBN: 0-86587-674-6 or online at www.osha.gov).

ND means not detected.

The limit of detection is a raw count of 1 at the lowest dilution plated. The analytical sensitivity is equal to 1 raw count/reporting unit x the dilution factor.

Interpretation is left to the company and/or persons who conducted the field work.

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(623) 780-4800 Fax (623) 780-7695 www.emlabpk.com

Client: Indoor Air Solutions, Inc
C/O: David Nugent
Re: SSES 8-5-11

Date of Sampling: 8/5/2011
Date of Receipt: 8/8/2011
Date of Report: 8/9/2011

PCR LEGIONELLA PNEUMOPHILA - WATER

Lab ID Number:	4	5	6
Sample Identification:	SSES 004 U/2 Cooling Twr	SSES 005 U/2 Cooling Twr	SSES 006 U/2 Cooling Twr
Date Analyzed:			
	Organisms/mL	Organisms/mL	Organisms/mL
<i>Legionella pneumophila</i> group	Present	Present	Present
Comments:	A, B	A,B	A,B

A: Sample contained PCR inhibitors - Dilutions were required. Minimum detection limit is > 100.

B: Target organism indicated as " Present" is detected, but below quantifiable limits.

Method Summary:

The results represent analysis by polymerase chain reaction (PCR). The PCR method is a proprietary adaptation of the method of Cloud et al., 2000. "Detection of *Legionella* Species in Respiratory Specimens Using PCR with Sequencing Confirmation." Journal of Clinical Microbiology, p.1709-1712. The PCR method is a rapid screen for *Legionella pneumophila* group. This group includes *L. pneumophila*, *L. feeleeii*, *F. dumoffii*, *L. longbeachae*, *F. bozemanii*, and *L. micdadei*. Quantification is calculated from instrument response to *L. pneumophila*. PCR will detect both viable and non-viable *Legionella*.

CHAIN OF CUSTODY EMLab P&K

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Weather	Fog	Rain	Snow	Wind	Clear
None					
Light					
Moderate					
Heavy					



000814333

Other Requests

Company: <u>Indoor Air Solutions, Inc.</u>	Address: <u>1700 E. 17th St - Ste 301 Pittsburgh, PA 15204</u>
Contact: <u>Dino Nigent</u>	Special Instructions: <u></u>
Phone: <u>610 328 8818</u>	

Project ID: <u>SES 85-11</u>	STD - Standard (DEFAULT)
Project Desc.: <u>Legionella sampling</u>	ND - Next Business Day
Project: <u>Sampling</u>	SD - Same Business Day Rush
Zip Code: <u></u>	WH - Weekend/Holiday
PO Number: <u></u>	

Sample ID	Location	Volume	Notes
445001	u/l cooling tower	NP	* 250ml (Legionella culture method std TAT)
002			
003			
004	u/l cooling tower		
005			
006			

Fungi - Spore Trap Analysis	Spore Trap Analysis - Other particles	Direct Microscopic Exam (Qualitative)	Quantitative Spore Count Direct Exam	1-Media Surface Fungi (Genus ID + App. spp.)	2-Media Surface Fungi (Genus ID + App. spp.)	3-Media Surface Fungi (Genus ID + App. spp.)	Culturable Air Fungi (Genus ID + App. spp.)	Gram Stain and Counts (Culturable Air and Surface Bacteria)	Legionella culture	Total Coliform, Ecof. (Presence/Absence)	Membrane Filtration (Please specify organism)	MPN Bacteria (Please specify organism)	QuantiTray - Sewage Screen	Asbestos Analysis - PCM Airborne Fiber Count (NIOSH 7400)	Asbestos Analysis - PLM (EPA method 600/R-93-116)	PCR (please specify test)	<u>Legionella (next day)</u>

BC - BioCassette™	ST - Spore Trap: Zefon, Allergenco, Burkard...	T - Tape	D - Dust	<u>05/10/1030</u>	<u>05/10/1030</u>	<u>05/10/1030</u>
A15 - Andersen		SW - Swab	SO - Soil			
SAS - Surface Air Sampler	P - Potable Water	B - Bulk				
CP - Contact Plate	NP - Non-Potable Water	O - Other:				

By submitting this Chain of Custody, you agree to be bound by the terms and conditions set forth at www.emlabpk.com/terms.html

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PENNSYLVANIA EPI NOTES



pennsylvania
DEPARTMENT OF HEALTH

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BUREAU OF EPIDEMIOLOGY
PENNSYLVANIA DEPARTMENT OF HEALTH

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Outbreak of *E. coli* Associated with Lake Swimming at a Pennsylvania State Park

BACKGROUND

Escherichia coli (*E. coli*) is a diverse group of bacteria that consists of hundreds of strains, most of which are harmless to people and live in the intestines of healthy humans and animals. This broad group of bacteria is often used as a marker for water testing and can be an indication that the water has been contaminated by human or animal waste. Certain strains of the bacteria produce powerful Shiga-like toxins that can cause severe human illness. These are referred to as Shiga toxin-producing *E. coli* or STEC.

The best known Shiga toxin-producing strain is *E. coli* O157:H7, which causes an estimated 96,000 infections in the US each year. Infection often occurs from eating contaminated food, especially undercooked meat, unpasteurized dairy products or, more recently, fresh produce. Animal contact is an important source of infection, and person-to-person transmission can be a problem in settings such as day care centers. Recreational water can cause illness when accidentally swallowed during activities such as swimming.

Infection with *E. coli* O157:H7 often causes severe, bloody diarrhea and abdominal cramps, although sometimes non-bloody diarrhea or asymptomatic infection can occur. Half of those infected experience vomiting, and less than one-third develop low-grade fevers. Typical treatment of *E. coli* O157:H7 includes hydration and supportive therapy. Antibiotics are not recommended, as there is no evidence that they improve the course of disease and may even lead to complications. *E. coli* O157:H7 can infect people of any age, though the very old and very young are at highest risk of severe complications, such as hemolytic uremic syndrome (HUS).

HUS occurs when Shiga toxins cause damage to small blood vessels leading to anemia, low platelet counts and kidney damage. Dialysis or kidney transplant may be necessary, and about 8 percent of people with HUS have lifelong complications. The majority of HUS is caused by infection with *E. coli* O157:H7; in Pennsylvania, even a small cluster of two cases of HUS is considered an outbreak.

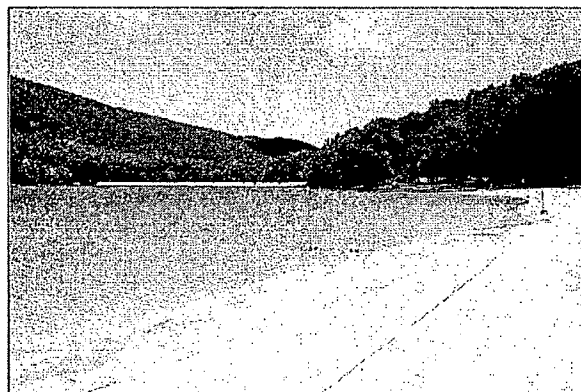
NOTIFICATION

On Wednesday, Aug. 3, the Pennsylvania Department of Health (DOH) was notified by an infection preventionist at a local hospital of two children with HUS who had both reported recent visits to the same Pennsylvania State Park. One of these patients also tested positive for *E. coli* O157:H7. By Friday, Aug. 5, there were additional reports of *E. coli* in persons with exposure to the state park and its beach area.

INVESTIGATION

After initial notification, the Department of Health contacted the Bureau of State Parks in the Department of Conservation and Natural Resources (DCNR). Several hypotheses were initially posed as explanations for this *E. coli* cluster: coincidence (this is a large lake with many swimmers each year), consumption of contaminated food or water at a nearby establishment, consumption of contaminated food or water from the park, or swimming in the park lake.

Figure 1. Photo of Beach Area



(Continued)

(E. coli Outbreak continued)

Information was gathered about previous inspections of the concession stand, water testing results from the beach area, and other significant events at the lake. Previously reported enteric infections in PA-NEDSS, Pennsylvania's electronic disease surveillance system, were reviewed for connections to the state park camping or swimming areas. Local hospitals, doctors' offices and health centers were contacted and asked to notify DOH of additional, unreported cases of *E. coli* O157:H7 or bloody diarrhea. By Monday, Aug. 8, efforts were underway to re-interview the initial five cases with extensive questionnaires to examine exposure histories and narrow the hypothesized exposures.

On the recommendation of DOH, at 5:30 p.m. on Tuesday, Aug. 9, DCNR closed the lake to all water activities, including swimming, boating and fishing. On Aug. 10, DOH conducted a site visit to the park along with DCNR and DEP (Department of Environmental Protection) to view the beach, camping sites, dumping stations and other potential opportunities for contamination of water. Small samples were collected from the beach water and sediment and sent to the DOH Bureau of Laboratories for testing. DEP also sent red dye through the sewer system to check for leaks into the lake. On Aug. 11, 100 liters of water were passed through a large-volume filtration system and sent to CDC as an additional attempt to detect organisms.

Outbreak Case Definitions

Confirmed: Person with HUS or culture-confirmed *E. coli* O157:H7, plus swam at lake July 1-Aug. 9 or was epi-linked to confirmed case

Probable: Person with bloody diarrhea after swimming at lake, or diarrhea and epi-linked to confirmed case in the absence of another diagnosis

Suspect: Person with diarrhea or abdominal cramps after swimming at lake in the absence of another diagnosis

RESULTS

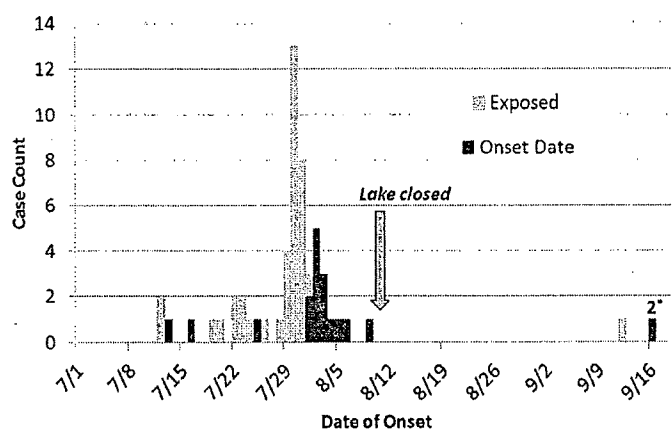
Eighteen confirmed and probable cases were identified throughout the course of the investigation (Table 1). Thirteen of these cases were confirmed through a diagnosis of HUS (7) and/or lab-identification of *E. coli* O157:H7 (11). Ten of the 13 confirmed cases were hospitalized, and one was known to be a secondary case, exposed to another confirmed case but not the lake itself. The majority of the cases (61 percent) were 10 years old or younger (Table 1). Many of the cases were exposed between July 30 and Aug. 1, although many went to the park and swam on multiple days (Figure 2). Additionally, 24 persons were classified as suspect cases because they had reported GI symptoms and exposure to the lake; no additional data was available to classify these cases further. All 11 culture-positive cases had matching PFGE patterns with an uncommon two-enzyme combination that had not been seen nationally since December 2010.

Table 1. Case Characteristics, Confirmed and Probable Cases* (n=18)

	n	%
Case Status		
Confirmed	13	72
Probable	5	28
Age Group (years)		
≤5	7	39
6-10	4	22
11-18	5	28
>18	0	0
Unknown	2	11
Residence		
Franklin County	9	50
Huntingdon County	1	6
Lancaster County	4	22
State of Maryland	4	22

* Excludes 24 suspect cases

Figure 2. Confirmed and Probable Cases by Exposure and Onset Dates

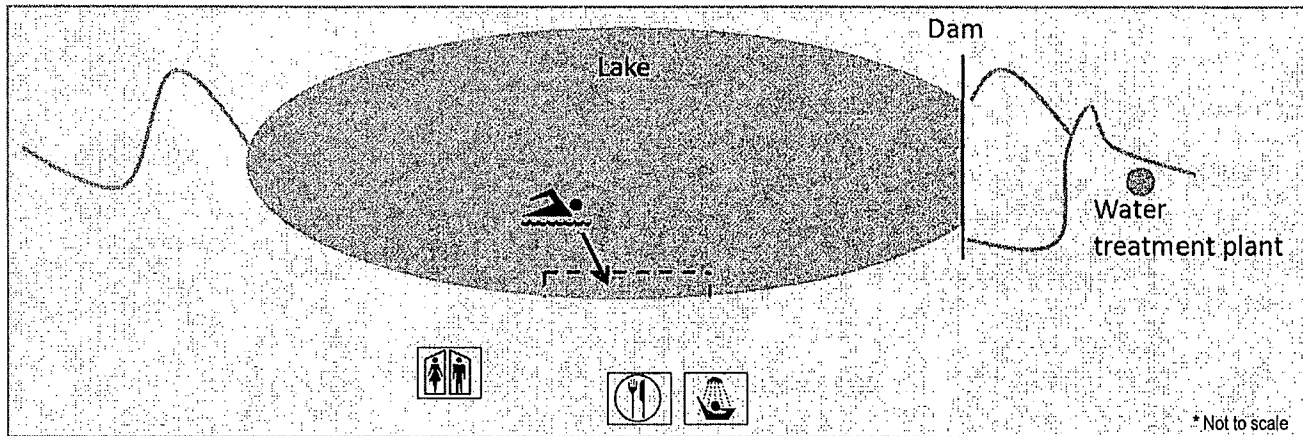


The lake had a shallow swimming area along the beach, delineated by buoys. There were recently built, functioning shower and restroom facilities adjacent to the concession stand, both easily accessible to beach users. There was an on-site water treatment plant downstream from the lake and no critical deficiencies were found. The red dye which was placed in the sewer system was not subsequently observed in the lake, indicating there were no leaks from the sewer system into the lake water. All water and sediment samples tested failed to grow *E. coli* O157:H7.

(Continued)

(*E. coli* Outbreak continued)

Figure 3. Layout of Lake and Park Facilities*



CONCLUSIONS

While the lake water did not test positive for *E. coli* O157:H7, the epidemiology clearly indicates the lake as the source of transmission. The lake was the only common factor among all of the cases, and 100 percent of the primary cases reported swimming in the lake. The vast majority of the cases in this outbreak were children. The original source of contamination of the lake was unable to be determined, though it is likely from a person who was swimming while ill.

DISCUSSION

The predominance of children is typical for outbreaks of *E. coli* O157:H7. The shallow, warm water of this beach makes it a popular site for children; children interact with recreational water very differently than adults and are more likely to accidentally swallow water. Children are also more likely to shed the bacteria after symptoms have resolved, putting other children at risk while playing together in the water or while interacting in other settings. This is particularly a problem with diapered children.

Public health messages about healthy swimming need to continue to be communicated, particularly at places with lots of children. The public needs to be reminded not to swim, or allow their children to swim, when they are experiencing diarrhea. Parents should try to keep their children from swallowing swimming water as much as possible. Finally, practicing good hygiene before and after swimming will help prevent contamination of water.

Q. What does the Pennsylvania Department of Health do to ensure the safety of swimmers at public beaches?

A. Public beaches are inspected and permitted by the Pennsylvania Department of Health. The Department of Health visits each public beach at least once per year to inspect the general sanitation and safety of the facilities. The operators of public bathing places are required to submit water samples to an approved laboratory for bacteriological analysis at least once per week. The Department of Health receives and reviews the lab results and has the authority to close a beach if the lab results indicate bacterial contamination of the water.

For more information, see the [Pennsylvania Code, Chapter 18. Public Swimming and Bathing Places](#).

Q. What can swimmers do to stay healthy when visiting a public beach?

A. Follow [CDC's Six Steps for Healthy Swimming](#): (1) don't swim when you have diarrhea, (2) avoid getting water in your mouth, (3) practice good hygiene before swimming, (4) take children to the bathroom and/or check diapers often, (5) change diapers in a bathroom or diaper-changing area, and (6) wash children with soap and water before swimming.

For more information, see EPA's brochure [Before You Go to the Beach](#) and CDC's website on [Healthy Swimming](#).