

Agreement No. 03C4NENE0302301  
Customer No. NE030  
Cost Center 8626  
TIN 47-6006256

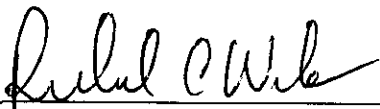
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
SUPPLEMENTAL JOINT FUNDING AGREEMENT  
FOR  
WATER RESOURCES INVESTIGATIONS

THE GEOLOGICAL SURVEY, UNITED STATES DEPARTMENT OF THE INTERIOR, party of the first part, and the CITY OF LINCOLN, party of the second part, hereby agree to amend (Amendment #1) the Joint Funding Agreement No. 03C4NENE0302300 dated October 1, 2001, as follows:

Paragraph 2(a) is hereby increased from \$132,100 to \$145,100 and paragraph 2(b) is hereby increased from \$132,100 to \$161,200. The change in scope of the project (C. Microorganism transport into drinking-water project; City Resolution #A-81832) included extending the sampling period from 18 months to 24 months, which allows for more reliable analysis of trends.

Geological Survey  
UNITED STATES  
DEPARTMENT OF THE INTERIOR

CITY OF LINCOLN

by   
Richard C. Wilson, Acting District Chief

by \_\_\_\_\_

Date 3/26/04

Date \_\_\_\_\_

Agreement No. NE0200402  
Customer No. NE030  
Cost Center 8626  
TIN 47-6006256

DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
SUPPLEMENTAL JOINT FUNDING AGREEMENT  
FOR  
WATER RESOURCES INVESTIGATIONS

THE GEOLOGICAL SURVEY, UNITED STATES DEPARTMENT OF THE INTERIOR, party of the first part, and the CITY OF LINCOLN, party of the second part, hereby agree to amend (Amendment #2) the Joint Funding Agreement No. NE 0200400 dated October 1, 2001, as follows:

Paragraph 2(a) is hereby increased from \$237,500 to \$257,500 and extended from October 31, 2001 to October 31, 2005 and paragraph 2(b) is hereby increased from \$237,500 to \$267,100 and extending from October 31, 2001 to October 31, 2005. The change in scope of the project (A. Endocrine disrupter transport into drinking-water and injection project; City Resolution #A-81832) is to determine if there is a specific, repeating source for the large number of low concentration pharmaceuticals in the ground water at the site in November, 2002.

Geological Survey  
UNITED STATES  
DEPARTMENT OF THE INTERIOR

by Richard C. Wilson  
Richard C. Wilson, Acting District Chief

Date 3/26/04

CITY OF LINCOLN

by \_\_\_\_\_

Date \_\_\_\_\_

## City of Lincoln, Nebraska – US Geological Survey Bank Filtration Project Budget Amendment

Jason R. Vogel, Ph.D.  
Hydrologist  
US Geological Survey – Nebraska District

### Summary

An amendment to the current bank filtration research project that is being conducted jointly by the City of Lincoln Water System, the US Environmental Protection Agency (EPA), and the US Geological Survey (USGS) at the City of Lincoln Well Field near Ashland, Nebraska is being requested. The proposed budget for the research extension is \$43,700 in FY2004 (present-Sep 2004) and \$45,000 in FY2005 (Oct 2004 – Sep 2005). Of this amount, we are requesting that the City of Lincoln fund \$33,700 in FY2004 and \$25,000 in FY2005. The remaining amount, totaling \$33,000 over two years, will be funded by the USGS. This additional funding will be used for further pharmaceutical and microbial sampling and analysis to supplement the data collected during the aforementioned joint City of Lincoln-US EPA-USGS research project.

### Objectives

The collection of additional microbial and pharmaceutical samples is proposed. Microbial schedule samples will be collected from the Platte River and from a horizontal collector well monthly for an additional six months. These extra microbial samples were suggested in the original project proposal if deemed necessary. The objective of collecting these additional microbial samples is to complete the data set to include two full years of data, which allows for more reliable analysis of trends. Additional pharmaceutical samples will also be collected four times between April 2004 and January 2005 from three vertical wells, a monitoring well on the east side of the Platte River, a horizontal collector well, and the Platte River. The objective of collecting the pharmaceutical samples is to determine if there is a specific, repeating source for the large number of pharmaceuticals detected in the ground water in November 2002.

## **Background and Description**

### *Microbes*

Current USGS microbe sampling at the City of Lincoln Well Field began in October 2002 and is scheduled to proceed until March 2004. The original proposal called for an evaluation of the data after twelve months to determine if an additional six months of sampling was warranted. After examination of the data, it became apparent that the extra six months of data is needed to give a complete two-year record of bank filtration. As a result, additional samples will be collected once a month from April to September 2004 from the Platte River and from the collector well (W90-1). These samples will be analyzed for *Cryptosporidium*, *Giardia*, and filter plant optimization by the US EPA Region 10 laboratory; *E. coli* and fecal coliforms by the Nebraska Department of Health and Human Services laboratory; *enterococci* and aerobic spores by Dr. Gene Rice of the US EPA in Cincinnati, OH; dissolved organic carbon by NWQL; stable isotopes of hydrogen and oxygen by Dr. Tyler Coplen, USGS; laser particle counting by Analytical Services, Inc.; and coliphage by the USGS-Ohio District Microbiology lab.

### *Pharmaceuticals*

Pharmaceuticals were sampled at the well field quarterly from February 2002 until November 2002 and again during April and May 2003. Ground water samples collected in November 2002 showed detections of ten different pharmaceuticals that were not detected in the surface water or ground water at other times. The pharmaceuticals that were detected at this time included acetaminophen, azithromycin, caffeine, dehydronifedipine, diltiazem, diphenhydramine, erythromycin, fluoxetine, furosemide, and thiabendazole. To determine whether or not these detections were an isolated incident and to attempt to pinpoint geographically the source of the possible contamination, additional pharmaceuticals samples will be collected in April, September, and November, 2003, and in January 2004 from three vertical wells (W49-9, W56-5, and 54-10), a monitoring well on the east side of the Platte River, from a

collector well (W90-1), from the Platte River, and from the finished water. These samples will be analyzed by Dr. Ed Furlong, USGS. In addition to pharmaceuticals, stable isotopes of hydrogen and oxygen will be collected from each of the sample sites for surface water fraction determination and analyzed by Dr. Tyler Coplen, USGS.

**Budget**

*Overview*

An overview of the funding request is shown below.

	City of Lincoln		USGS		Total	
	Labor + Other	USGS Labs	Labor + Other	USGS Labs	Labor + Other	USGS Labs
FY04	\$17,600	\$16,100	\$10,000	0	\$27,600	\$16,100
FY05	15,400	9,600	23,000	0	38,400	9,600
Total	33,000	25,700	33,000	0	66,000	25,700

The total two-year request from the City of Lincoln is \$58,700. Total funds provided by the USGS during the same two-year period is \$33,000. It is the current policy of the USGS Nebraska District to match 40% of the cost of the project excluding analyses conducted by USGS labs. However, since this policy was changed from matching 50% of the entire project cost at the end of FY2003, a compromise of 50% of the cost of the project excluding analyses conducted by USGS labs in other districts is being provided by the USGS Nebraska District for this project. An estimated summary of the "Labor + Other" section of the budget overview follows:

Labor + Other Summary

<i>(all amounts include USGS overhead)</i>	FY2004	FY2005
Paul Bartz salary	\$ 8,000	\$ 2,820
Margaret Pratt salary	2,000	1,000
Jason Vogel salary	5,310	13,730
Supplies, shipping, etc.	7,200	6,450
Reports and Journal Articles	0	14,400
Non-USGS lab analyses	5,090	0

Subtotal	\$27,600	\$38,400
Total	\$66,000	

Finally, the initial and amended cost of the project for all parties involved is shown below:

	Fund Source		
	City of Lincoln	US EPA	USGS
Original Proposal	369,600	187,500	369,600
Amendment	58,700	0	33,000
Total Project	428,300	187,500	402,600

**Table 4. Overall Bank Filtration Project Costs--FY2001 through FY2005**

Project entity	FY2001	FY2002	FY2003	FY2004	FY2005	Total
<b>A. Endocrine disrupter transport into drinking-water and injection project: Multi-year agreement</b>						
USEPA contribution	\$13,000	\$164,500	\$10,000	\$0	\$0	\$187,500
USGS Coop contribution	\$0	\$125,000	\$72,500	\$40,000	\$0	\$237,500
Lincoln Water System (LWS) contribution	\$0	\$125,000	\$72,500	\$40,000	\$0	\$237,500
<b>Subtotal</b>	\$13,000	\$414,500	\$155,000	\$80,000	\$0	\$662,500
<b>B. Microorganisms injection project: Executive Order</b>						
Others (UNL, Cornell, and USDA in-kind contributions (estimated))	\$0	\$0	\$15,000	\$29,000	\$0	\$44,000
LWS contribution	\$0	\$0	\$15,000	\$29,550	\$0	\$44,550
<b>Subtotal</b>	\$0	\$0	\$30,000	\$58,550	\$0	\$88,550
<b>C. Microorganism transport into drinking-water project: Multi-year agreement</b>						
USEPA in-kind contribution, Gene Rice (estimated)	\$0	\$0	\$10,000	\$5,000	\$5,000	\$20,000
USGS Coop contribution	\$0	\$0	\$60,000	\$47,600	\$24,500	\$132,100
LWS contribution	\$0	\$0	\$60,000	\$47,600	\$24,500	\$132,100
<b>Subtotal</b>	\$0	\$0	\$130,000	\$100,200	\$54,000	\$284,200
USEPA contribution	\$13,000	\$164,500	\$20,000	\$5,000	\$5,000	\$207,500
USGS Coop contribution	\$0	\$125,000	\$132,500	\$87,600	\$24,500	\$369,600
LWS contribution	\$0	\$125,000	\$147,500	\$117,150	\$24,500	\$414,150
Others (UNL, Cornell, USDA in-kind)	\$0	\$0	\$15,000	\$29,000	\$0	\$44,000
<b>Total</b>	\$13,000	\$414,500	\$315,000	\$238,750	\$54,000	\$1,035,250

**Table 5. Overall Bank Filtration Project Costs—FY2001 through FY2005 (revised 3/25/04)  
(yellow shaded numbers are changed from Table 4)**

Project entity	FY2001	FY2002	FY2003	FY2004	FY2005	Total
<b>A. Endocrine disrupter transport into drinking-water and injection project: Multi-year agreement</b>						
USEPA contribution	\$13,000	\$164,500	\$10,000	\$0	\$0	\$187,500
USGS Coop contribution	\$0	\$125,000	\$72,500	\$45,000	\$15,000	\$257,500
Lincoln Water System (LWS) contribution	\$0	\$125,000	\$72,500	\$52,800	\$16,800	\$267,100
<b>Subtotal</b>	<b>\$13,000</b>	<b>\$414,500</b>	<b>\$155,000</b>	<b>\$97,800</b>	<b>\$31,800</b>	<b>\$712,100</b>
<b>B. Microorganisms injection project: Executive Order</b>						
Others (UNL, Cornell, and USDA in-kind contributions (estimated))	\$0	\$0	\$15,000	\$29,000	\$0	\$44,000
LWS contribution	\$0	\$0	\$15,000	\$29,550	\$0	\$44,550
<b>Subtotal</b>	<b>\$0</b>	<b>\$0</b>	<b>\$30,000</b>	<b>\$58,550</b>	<b>\$0</b>	<b>\$88,550</b>
<b>C. Microorganism transport into drinking-water project: Multi-year agreement</b>						
USEPA in-kind contribution, Gene Rice, Stephanie Harris (estimated)	\$0	\$0	\$27,100	\$13,600	\$5,000	\$45,700
USGS Coop contribution	\$0	\$0	\$60,000	\$52,600	\$32,500	\$145,100
LWS contribution	\$0	\$0	\$60,000	\$68,500	\$32,700	\$161,200
<b>Subtotal</b>	<b>\$0</b>	<b>\$0</b>	<b>\$147,100</b>	<b>\$134,700</b>	<b>\$70,200</b>	<b>\$352,000</b>
USEPA contribution	\$13,000	\$164,500	\$37,100	\$13,600	\$5,000	\$233,200
USGS Coop contribution	\$0	\$125,000	\$132,500	\$97,600	\$47,500	\$402,600
LWS contribution	\$0	\$125,000	\$147,500	\$150,850	\$49,500	\$472,850
Others (UNL, Cornell, USDA in-kind)	\$0	\$0	\$15,000	\$29,000	\$0	\$44,000
<b>Total</b>	<b>\$13,000</b>	<b>\$414,500</b>	<b>\$332,100</b>	<b>\$291,050</b>	<b>\$102,000</b>	<b>\$1,152,650</b>