City of Lincoln, Nebraska
Cooperating Technical Partner
Mapping Activity Statement

Statement 1 – Digital Flood Insurance Rate Map (DFIRM) Production and Development of Updated Flood Data

In accordance with the Cooperating Technical Partners (CTP) Memorandum of Agreement dated January 15, 2003, between the City of Lincoln, Nebraska and the Federal Emergency Management Agency (FEMA), Mapping Activity Statement 1 is as follows:

1. **Statement Objective and Scope:** The objective of this Mapping Activity for the City of Lincoln, Nebraska – Beal Slough, Southeast Upper Salt Creek, Stevens Creek, Cardwell Brach, and Salt Creek Study Areas are to develop a new or updated Digital Flood Insurance Rate Map(s) (DFIRM) and Flood Insurance Study (FIS) report(s) for the City of Lincoln, Lancaster County, Nebraska. The FIS and DFIRM will be produced in countywide DFIRM format.

Additionally, this project will include developing new and/or updated flood hazard data, as summarized in the following table:

Flooding Source	Reach Limits	Reach Length	Detailed Riverine		Detailed Coastal				Redelineation of SFHAs Using Effective Profiles	Refine/ Establish Zone A
			Hydrology	Hydraulics	Stillwater	Wave Height	Wave Runup	Erosion		
Beal Slough	Confluence with Salt Creek to S. 84th Street	17 miles, 9.7 miles of main stem and 7.3 miles of tribs	X	X						
Southeast Upper Salt Creek Main Tributary	Confluence with Salt Creek to 70th Street	7.3 miles, 4.4 miles main stem and 2.9 miles of tribs	X	X						
Southeast Upper Salt Creek South Tributary	Confluence with Salt Creek to S. 40th Street	2.1 miles, 1.4 miles of main stem and 0.7 miles of tribs	X	X						

Stevens Creek Main Stem	Confluence with Salt Creek to Nebraska Hwy	11.0 miles	X	X						
Stevens Creek Tribs	Main stem to 150 acre drainage	26.0 miles	X	X						
Cardwell Branch	Confluence with Salt Creek to Yankee Hill Dam	9.3 miles	X	X						
Salt Creek (south)	Saltillo Road to Superior Street	17.0 miles	X	X						
Salt Creek (north)	Superior Street to Stevens Creek Confluence	4.6 miles	X	X						

This project will be completed by the Mapping Partners listed below:

City of Lincoln, Nebraska
Black & Veatch
The Mapping Coordination Contractor

The activities, and who will complete them, are summarized in the table below.

The following sections describe the specific mapping activities associated with this mapping project. Each activity description identifies the responsible Mapping Partners, the Standards that must be met, and resultant map component.

Summary of Project Tasks and Assignments

Tasks	Black & Veatch	The City of Lincoln, NE	FEMA (MCC)
Task 1 – Field Surveys and Reconnaissance		X	
Task 2 – Topographic Data Development		X	
Task 3 – Independent QA/QC Review of Topographic Data			X
Task 4 –Hydrologic Analyses		X	
Task 5–Independent QA/QC Review of			X

Hydrologic Analyses			
Task 6 – Hydraulic Analyses		X	
Task 7 – Independent QA/QC Review of Hydraulic Analyses			X
Task 8 – Floodplain Mapping (Detailed Riverine)		X	
Task 8A – Floodplain Mapping (Redelineation Using Effective Flood Profiles and Updated Topographic Data)			
Task 8B – Floodplain Mapping (Refinement or Creation of Zone A)			
Task 9 – Independent QA/QC Review of Floodplain Mapping (Revised Areas)			X
Task 10 – Base Map Acquisition	X	X	
Task 11 – DFIRM Production (Non-Revised Areas)	X		
Task 11A – Independent QA/QC Review of DFIRM Production (Non-Revised Areas)			X
Task 12 – DFIRM Production (Merge Revised and Non-Revised Information)	X		
Task 12A – Application of DFIRM Graphic and Database Specifications	X		
Task 12B – Independent QA/QC Review of DFIRM Product Meeting FEMA Graphic and Database Specifications			X
Task 13 – Preliminary DFIRM and FIS Report Distribution			X
Task 14 – Post-Preliminary Processing			X

Activity 1 - Field Surveys and Reconnaissance

Responsible Mapping Partner: City of Lincoln, Nebraska

Scope: To supplement any field reconnaissance conducted during the Project Scoping phase of this project, the City of Lincoln shall conduct a detailed field reconnaissance of the specific study area to determine conditions along the floodplain(s), types and numbers of hydraulic and/or flood-control structures, apparent maintenance or lack thereof of existing hydraulic structures, locations of cross sections to be surveyed, and other parameters needed for the hydrologic and hydraulic analyses.

In addition to the initial field reconnaissance, the City of Lincoln shall conduct field surveys, including obtaining channel and floodplain cross sections, identifying or establishing Temporary Bench Marks, and obtaining the physical dimensions of hydraulic and flood-control structures. The City of Lincoln also shall coordinate with other Mapping Partners that are collecting topographic data under Activity 2.

The vertical datum for all field surveys will be NAVD 1988.

Standards: All work under Activity 1 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: In accordance with the Technical Support Data Notebook (TSDN) format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, the City of Lincoln shall make the following products available to FEMA:

- A report summarizing the findings of the field reconnaissance;
- Maps and drawings that provide the detailed survey results; and
- Survey notebook containing cross sections and structural data.
- All products may be provided in a digital format.

Appendix M may be downloaded from the FEMA Flood Hazard Mapping Web site at www.fema.gov/mit/tsd/frm_gsam.pdf.

Activity 2 - Topographic Data Development

Responsible Mapping Partner: City of Lincoln, NE

Scope: To supplement the field surveys conducted under Activity 1, the City of Lincoln shall obtain additional topographic data of the overbank areas of the flooding sources studied to delineate floodplain boundaries. Specifically, the City of Lincoln shall generate new topographic data for flooding sources listed earlier in this MAS using aerial Photogrammetry taken in 1997 with a contour interval of 2'. The City of Lincoln also shall coordinate with other team members conducting field surveys under Activity 1. Contour interval and/or accuracy for the topographic data shall be selected based on the current FEMA requirements as documented in *Guidelines and Specifications for Flood Hazard Mapping Partners.*

The vertical datum for topographic data shall be NAVD 1988.

Standards: All work under Activity 2 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: Upon completion of topographic data collection and processing for flooding sources listed earlier in this MAS, the City of Lincoln shall submit these data to MCC for an independent QA/QC review under Activity 3. The City of Lincoln shall submit data for the remaining flooding sources for a final QA/QC review at the completion of this activity.

In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, the City of Lincoln, NE shall make the following products available to FEMA:

- Completed Form No. 5 of *Revisions to National Flood Insurance Program Maps, Application/Certification Forms and Instructions* (MT-2), which is available from the FEMA Flood Hazard Mapping Web site at http://www.fema.gov/fhm/dl_mt-2.shtm;
- Report summarizing methodology and results;
- Triangular Irregular Network (TIN) data on CD-ROM;
- Digital work maps with contours;
- Checkpoint analyses to assess the accuracy of TIN data including Root Mean Square Error calculations to support vertical accuracy;
- Identification of remote-sensing data voids and methods used to supplement data voids;
- National Geodetic Survey data sheets for Network Control Points used to control remote- sensing and ground surveys; and
- Metadata compliant with Federal Geographic Data Committee standards.

Appendix M may be downloaded from the FEMA Flood Hazard Mapping Web site at www.fema.gov/mit/tsd/frm_gsam.pdf.

Activity 3 - Independent QA/QC Review of Topographic Data

Responsible Mapping Partner: MCC

Scope: MCC shall review the mapping data generated by the City of Lincoln under Activity 2 to ensure that these data are consistent with FEMA standards and standard engineering practice and are sufficient to prepare the DFIRM.

Standards: All work under Activity 3 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, MCC shall make the following products available to FEMA:

- A Summary Report that describes the findings of the independent QA/QC review; and
- Recommendations to resolve any problems that are identified during the independent QA/QC review.

Appendix M may be downloaded from the FEMA Flood Hazard Mapping Web site at www.fema.gov/mit/tsd/frm_gsam.pdf.

Activity 4 - Hydrology

Responsible Entity: City of Lincoln, Nebraska

Scope: Hydrologic analyses will be completed for approximately 85.3 square miles of drainage area for the flooding source(s) listed in Section 1 of this Mapping Activity Statement, except for Salt Creek. The hydrologic methods used for this analysis will be HEC-HMS. Hydrologic analyses will be completed for approximately 588 square miles of drainage area for Salt Creek. The hydrologic methods used for this analysis will be extreme probability – discharge relationships. Peak flood discharges will be calculated for the 10%, 2%, 1% and 0.2% annual chance storm events. These flood discharges will be the basis for subsequent hydraulic analyses of the subject flooding source(s). In addition, City of Lincoln, Nebraska will be responsible for addressing all concerns or questions regarding this Activity raised during the QA/QC review outlined in Activity 2.

Standards: All work conducted under this Activity shall conform to the standards specified for this Activity in Section 5 of this Mapping Activity Statement.

Products: Upon completion of hydrologic modeling for Beal Slough, Southeast Upper Salt Creek, Stevens Creek, Cardwell Branch, and Salt Creek, City of Lincoln, Nebraska will submit the results to Mapping Coordination Contractor for an independent QA/QC review as described in Activity 2.

In accordance with the TSDN format described in Section 2, City of Lincoln, Nebraska shall make the following products available to FEMA.

- Digital copies of all hydrologic modeling (input and output) files for the 10%, 2%, 1% and 0.2% annual chance storm events.
- "Summary of Discharges" table(s) presenting discharge data for each flooding source.
- Draft text for Section 3.1, Hydrologic Analyses, of FIS report.
- Appropriate application/certification form for hydrology from the MT-2 package.
- All backup data used in the analysis, including work maps.
- For GIS-based modeling, products include all input and output data, intermediate data processing products, GIS data layers, and final products.

Activity 5 - Independent QA/QC Review of Hydrologic Analyses

Responsible Entity: Mapping Coordination Contractor

Scope: The Mapping Coordination Contractor shall review the technical, scientific, and other information submitted by City of Lincoln, Nebraska under Activity 1 of this Mapping Activity Statement to ensure that the data and modeling are consistent with FEMA standards and standard engineering practices and are sufficient to revise the FIRM. This work will include, at a minimum, the following activities:

- Review submittal for technical and regulatory adequacy, completeness of required information, application/certification forms, and supporting data and documentation. The technical review will focus on:
  - Use of acceptable models;
  - Use of appropriate methodology(ies);
  - Correctly applied methodology(ies)/model(s), including QC of input parameters;
  - Comparison with gage data and/or regression equations, if appropriate; and
  - Comparison with discharges for contiguous reaches or flooding sources.
- Maintain records of all contacts, reviews, recommendations, and actions and make them readily available to FEMA.
- Maintain an archive of all data submitted for hydrologic modeling review. All supporting data should be retained for 3 years from the date funding recipient submits its final expenditure report to FEMA.

Standards: All work conducted under this Activity shall conform to the standards specified for this Activity in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format described in Section 2, Mapping Coordination Contractor shall make the following products available to FEMA.

- A Summary Report that describes the findings of the independent QA/QC review; and
- Recommendations to resolve any problems that arise as a result of the QA/QC review.

Activity 6 – Hydraulic Analyses

Responsible Entity: City of Lincoln, Nebraska

Scope: City of Lincoln, Nebraska will perform hydraulic analyses for approximately 94.3 miles of the flooding sources listed in the Section 1 of this Mapping Activity Statement. The modeling will include the 10%, 2%, 1% and 0.2% annual chance storm events based on peak discharges computed under Activity 1. The hydraulic methods used for this analysis will include HEC-RAS. Salt Creek will require hydraulic analysis using unsteady HEC-RAS. The City of Lincoln, Nebraska will use cross-section and field data collected previously to perform the hydraulic analyses. The hydraulic analyses will be used to establish flood elevations and regulatory floodways for the subject flooding sources. The City of Lincoln, Nebraska shall use a FEMA checking program, CHECK-2 (if HEC-2 hydraulic model is used) or CHECK-RAS (if HEC-RAS hydraulic model is used), to check the reasonableness of hydraulic analyses. To facilitate the independent QA/QC review under Activity 4, the City of Lincoln, Nebraska shall provide an explanation for each unresolved message from the CHECK-2 or CHECK-RAS program, as appropriate. In addition, the City of Lincoln, Nebraska will address all concerns or questions regarding this Activity raised during the independent QA/QC review under Activity 4.

Standards: All work conducted under this Activity shall conform to the standards specified for this Activity in Section 5 of this Mapping Activity Statement.

Products: Upon completion of hydraulic modeling for Beal Slough, Southeast Upper Salt Creek, Stevens Creek, Cardwell Branch, and Salt Creek, the City of Lincoln, Nebraska, will submit the results to Mapping Coordination Contractor for an independent QA/QC review as described in Activity 4. The City of Lincoln, Nebraska will submit the results for the remaining flooding sources for an independent QA/QC review at the completion of this Activity.

In accordance with the TSDN format described in Section 2, the City of Lincoln, Nebraska shall make the following products available to FEMA:

- Digital profiles of the 10%, 2%, 1% and 0.2% and annual chance water-surface elevations representing existing conditions using FEMA's RASPLOT program or similar software;
- Floodway Data Table(s) for each subject flooding source. The Floodway Data Table(s) must be compatible with the DFIRM database;
- Digital copies of all hydraulic modeling (input and output) files;
- Table with range of Manning's "n" values
- An explanation for each unresolved message from CHECK-2 or CHECK-RAS program, as appropriate;
- All backup data used in the analyses;
- Draft text for inclusion in Section 3.2, Hydraulic Analyses, of the FIS report; and
- For GIS-based modeling, products include all input and output data, intermediate data processing products, GIS data layers, and final products.

Activity 7 - Independent QA/QC Review of Hydraulic Analyses

Responsible Entity: Mapping Coordination Contractor

Scope: Mapping Coordination Contractor shall review the technical, scientific, and other information submitted by City of Lincoln, Nebraska under Activity 3 of this Mapping Activity Statement to ensure that the data and modeling are consistent with FEMA standards and standard engineering practices and are sufficient to revise the FIRM. This independent QA/QC review of the hydraulic analyses will include, at a minimum, the following activities:

- Review submittal for technical and regulatory adequacy, completeness of required information, application/certification forms, and supporting data and documentation. The technical review will focus on:
  - Use of acceptable models;
  - Starting water-surface elevations;
  - Cross section geometry;
  - Manning's "n" values and expansion/contraction coefficients;
  - Bridge and culvert modeling;
  - Discharges;
  - Regulatory floodway computation methods; and
  - Tie-in to upstream and downstream non-revised profiles.
- Use the CHECK-2 (when HEC-2 model was used) or CHECK-RAS (when HEC-RAS model was used) programs to flag potential problems and focus review efforts.
- Maintain records of all contacts, reviews, recommendations, and actions and make them readily available to FEMA.
- Maintain an archive of all data submitted for hydraulic modeling review. (All supporting data must be retained for 3 years from the date funding recipient submits its final expenditure report to FEMA.)

Standards: All work conducted under this Activity shall conform to the standards specified for this Activity in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format described in Section 2, Mapping Coordination Contractor shall make the following products available to FEMA:

- A Summary Report that describes the findings of the independent QA/QC review and
- Recommendations to resolve any problems that arise as a result of the independent QA/QC review.

Activity 8 – Floodplain Mapping (Detailed Riverine)

Responsible Entity: City of Lincoln, Nebraska

Scope: The City of Lincoln, Nebraska shall delineate digital floodplain and regulatory floodway boundaries for the flooding sources listed in Section 1 of this Mapping Activity Statement. The mapping will incorporate all revised hydraulic modeling and acquired topographic information. The City of Lincoln, Nebraska will delineate the floodplain boundaries for the 1% and 0.2% recurrence intervals and the regulatory floodway on a digital work map based on existing topography or topographic data developed previously, which will be the basis of the revised FIRM. The City of Lincoln, Nebraska will provide an explanation for selecting an existing topographic map if one is used for the floodplain boundary delineation. The City of Lincoln, Nebraska will incorporate the results of all effective Letters of Map Change as appropriate. In addition, City of Lincoln, Nebraska will address all concerns or questions regarding this Activity raised during the independent QA/QC review outlined in Activity 6.

Standards: All work conducted under this Activity shall conform to the standards specified for this Activity in Section 5 of this Mapping Activity Statement.

Products: Upon completion of floodplain mapping for Beal Slough, Southeast Upper Salt Creek, Stevens Creek, Cardwell Branch, and Salt Creek, City of Lincoln, Nebraska will submit the results to Mapping Coordination Contractor for an independent QA/QC review under Activity 6.

In accordance with the TSDN format described in Section 2, City of Lincoln, Nebraska shall make the following products available to FEMA:

- Digital work maps with the 1% and 0.2% annual chance floodplain boundary delineations, regulatory floodway boundary delineations, cross sections, Base Flood Elevations (BFEs), zone designation labels, and all applicable base map features;
- Explanation for the selection of an existing topographic map;
- DFIRM mapping files, in one of the GIS file and database formats specified in FEMA's DFIRM Specifications;
- Metadata files describing the DFIRM data, including the required information shown in the examples shown in FEMA's DFIRM Specifications;
- A QA/QC report that includes a description and the results of all automated or manual QA/QC steps taken during the preparation of the DFIRM; and
- Any backup or supplemental information used in the mapping required for the independent QA/QC review outlined in Activity 6.

Activity 9 - Independent QA/QC Review of Floodplain Mapping

Responsible Entity: Mapping Coordination Contractor

Scope: Mapping Coordination Contractor shall review the floodplain work maps submitted by City of Lincoln, Nebraska under Activity 5 of this Mapping Activity Statement to ensure that the results of the hydraulic analyses are accurately represented on the work maps. This work will include, at a minimum, the following activities:

- Review the cross sections for proper location and orientation on the work map and agreement with the Floodway Data Table.
- Review the BFEs shown on the work map for proper location and agreement with the results of the hydraulic modeling.
- Review the regulatory floodway widths for agreement with the widths shown in the Floodway Data Table and the results of the hydraulic modeling.
- Review the floodplain boundaries for agreement with the flood elevations shown in the Floodway Data Table and the contour lines and other topographic information shown on the work maps.
- Floodplain widths at cross section must match floodway data table. Floodplain boundaries as shown on work maps match profiles
- Ensure zone designations are indicated properly.
- Ensure DFIRM mapping files are in one of the GIS file and database formats specified in FEMA's DFIRM Specifications and conform to those specifications for content and attribution.
- Ensure metadata files describing the DFIRM data include the required information and follow the examples shown in FEMA's DFIRM Specifications.

Standards: All work conducted under this Activity shall conform to the standards specified for this Activity in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format described in Section 2, Mapping Coordination Contractor shall make the following products available to FEMA:

- A Summary Report that describes the findings of the independent QA/QC review noting any deficiencies and providing recommendations to resolve them or agreeing with the mapping results; and
- An annotated work map with all questions and/or concerns indicated if necessary.

Activity 10 - Base Map Acquisition and Preparation

Responsible Entity: City of Lincoln, Nebraska

Scope: This is a required activity when Activity 8 is performed. This activity consists of obtaining the digital base map for the project. The City of Lincoln, Nebraska shall:

- Obtain digital files (vector) of the base map;
- Secure necessary permissions from the map source to allow FEMA's use and distribution of hardcopy and digital map products using the digital base map, free of charge;
- Certify that the digital data meet the minimum standards and specifications that FEMA requires for DFIRM production; and
- Populate the DFIRM database for base map features and applicable data.

Standards: All work conducted under this Activity shall conform to the standards specified for this Activity in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format described in Section 2, the City of Lincoln, Nebraska shall make the following products available to FEMA.

- Written certification that the digital data meet the minimum FEMA standards and specifications; and
- Documentation that FEMA can use the digital base map.

Activity 11- DFIRM Production (Non-Revised Areas)

Responsible Entity: Black & Veatch

Scope: For all flooding sources except those specified in Section 1 of this Mapping Activity Statement (that will have updated flood data developed under Activities 1 through 6), Black & Veatch will convert the effective FIRM/FBFM panels to digital format in conformance with FEMA's DFIRM specifications. Black & Veatch will use the base map acquired under Activity 10 of this Mapping Activity Statement for the conversion. The scope of this Activity covers the digitization of 83 FIRM panels and no FBFM panels. Black & Veatch also will incorporate LOMCs issued by FEMA since the current effective FIRM for each affected community. The digital flood theme for the flooding sources specified in Section 1 will not be digitized as part of this Activity; rather, Black & Veatch will leave these as "holes" in the digital flood theme that will be filled in as part of Activity 9 using digital flood data from Activity 5.

This activity will be assigned to Black & Veatch as a task order for EMK-2001-CO-2019.

Standards: All work conducted under this Activity shall conform to the standards specified for this Activity in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format described in Section 2, Black & Veatch shall make the following products available to FEMA.

- DFIRM mapping files, in one of the GIS file and database formats specified in FEMA's DFIRM Specifications;
- The vertical datum for all non-revised flood sources will be converted to NAGV 1988. This conversion is necessary to match the revised data produced by the City of Lincoln.
- Metadata files describing the DFIRM data, including the required information shown in the examples shown in FEMA's DFIRM Specifications;
- Complete set of plots of the DFIRM panels showing all unrevised flood hazard information taken from the effective FIRMs and FBFMs at a suitable scale; and
- A QA/QC report that includes a description and the results of all automated or manual quality assurance steps taken during the preparation of the DFIRMs, including a check that the road and floodplain relationship is maintained for all unrevised areas.

Activity 11A - Independent QA/QC Review of DFIRM Production (Non-Revised Areas)

Responsible Entity: Mapping Coordination Contractor

Scope: : Mapping Coordination Contractor shall review the DFIRM panels submitted by Black & Veatch under Activity 8 of this Mapping Activity Statement to ensure that the unrevised flood hazard information taken from the effective FIRM and FBFM panels is accurately represented on the DFIRM panels. This work will include, at a minimum, ensuring the following:

- Unrevised flood hazard information shown on the effective FIRM and FBFM panels is completely and accurately captured in the digital files.
- The floodway widths agree with the widths shown in the Floodway Data Table(s) and the results of the hydraulic modeling within a tolerance of 5 percent.
- The distances between cross sections agree with the distances shown in the Floodway Data Table(s) and the results of the hydraulic modeling within a tolerance of 5 percent.
- Road and floodplain relationships are maintained for all unrevised areas.
- DFIRM mapping files are in one of the GIS file and database formats specified in FEMA's DFIRM Specifications and conform to those specifications for content and attribution.
- Metadata files describing the DFIRM data include the required information and follow the examples shown in FEMA's DFIRM Specifications.

Standards: All work conducted under this Activity shall conform to the standards specified for this Activity in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format described in Section 2,: Mapping Coordination Contractor shall make the following products available to FEMA.

- A Summary Report that describes the findings of the independent QA/QC review, noting any deficiencies and providing recommendations to resolve them or agreeing with the mapping results; and
- Annotated DFIRM panels with all questions and/or concerns indicated, if necessary.

Activity 12 – Merge Effective and Revised Information

Responsible Entity: Black & Veatch

Scope: Upon completion of the Floodplain Mapping activity (Activity 8) for the revised flooding sources and the Digital FIRM Production activity (Activity 11) for Non-Revised flooding sources, the digital floodplain data will be merged into a single, updated Digital FIRM. This work will include tie-in of flood hazard information with contiguous communities that were not studied as part of this project. Also, the revised Flood Profiles, floodplain boundaries, and regulatory floodway boundaries will be tied-in. Black & Veatch and the City of Lincoln, Nebraska will coordinate to resolve any potential tie-in issues.

This activity will be assigned to Black & Veatch as a task order for EMK-2001-CO-2019.

Standards: All work conducted under this Activity shall conform to the standards specified for this Activity in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format described in Section 2, Black & Veatch shall make the following products available to FEMA.

- Digital work maps, with 1% and 0.2% annual chance floodplain boundary delineations, cross sections, BFEs, zone designation labels, and all applicable base map features shown;
- DFIRM mapping files, in one of the GIS file and database formats specified in FEMA's DFIRM Specifications, provided on CD-ROM;
- Metadata files describing the DFIRM data, including the required information shown in the examples shown in FEMA's DFIRM Specifications, provided on CD-ROM;
- Complete set of plots of DFIRM panels showing all detailed flood hazard information at a suitable scale;
- A QA/QC report that includes a description and the results of all automated or manual QA/QC steps taken during the preparation of the DFIRM.

Activity 12A – Application of DFIRM Graphic Specifications

Responsible Entity: Black & Veatch

Scope: Upon completion of merging of effective and revised floodplain mapping into a single, updated DFIRM (Activity 12), Black & Veatch shall apply the final FEMA DFIRM graphic specifications to the DFIRM mapping files. This work will include adding all required annotation, line patterns, area shading, and map collar information (e.g., map borders, title blocks, legends, notes to user).

This activity will be assigned to Black & Veatch as a task order for EMK-2001-CO-2019.

Standards: All work conducted under this Activity shall conform to the standards specified for this Activity in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format described in Section 2, Black & Veatch shall make the following products available to FEMA.

- DFIRM mapping files in one of the GIS file and database formats specified in FEMA's DFIRM Specifications, provided on CD-ROM;
- DFIRM database files in one of the database formats specified in FEMA's DFIRM Specifications, provided on CD-ROM;
- Metadata files describing the DFIRM data including the required information based on the examples shown in FEMA's DFIRM Specifications;
- Complete set of plots of the DFIRM panels showing all the details at the scale(s) agreed upon in the "Scope of Project;" and
- A QA/QC report that includes a description and the results of all automated or manual quality assurance steps taken during the preparation of the DFIRM.

Activity 12B - Independent QA/QC Review of DFIRM Graphics

Responsible Entity: Mapping Coordination Contractor

Scope: Mapping Coordination Contractor shall review the DFIRM panels submitted by City under Activity 9A of this Mapping Activity Statement to ensure that the DIRM panels conform to FEMA's DFIRM graphic standards. This work will include, at a minimum, the following:

- All required DFIRM features are accurately and legibly labeled and follow the examples shown in FEMA's DFIRM Specifications. This includes all flood hazard zones, BFEs, cross sections, coastal transects, studied streams, mapped political entities, and all roads within and adjacent to the 1% annual chance flood hazard areas.
- All DFIRM features are correctly symbolized with the appropriate symbol, line pattern, or area shading and follow the examples shown in FEMA's DFIRM Specifications.
- All map collar information is complete, correct, and follows the examples shown in FEMA's DFIRM Specifications.
- DFIRM mapping files are in one of the GIS file and database formats specified in FEMA's DFIRM Specifications and conform to those specifications for content and attribution.
- DFIRM database files are in one of the database formats specified in FEMA's DFIRM Specifications and conform to those specifications for content and attribution.
- Metadata files describing the DFIRM data include the required information and follow the examples shown in FEMA's DFIRM Specifications.

Standards: All work conducted under this Activity shall conform to the standards specified for this Activity in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format described in Section 2, Mapping Coordination Contractor shall make the following products available to FEMA.

- A Summary Report that describes the findings of the independent QA/QC review, noting any deficiencies and providing recommendations to resolve them or agreeing with the mapping results; and
- Annotated DFIRM panels with all questions and/or concerns indicated, if necessary.

Activity 13 – Preparation and Issuance of Preliminary FIS and DFIRM

Responsible Entity: Mapping Coordination Contractor

Scope: This Activity consists of the final preparation, review, and distribution of the Preliminary copies of the FIRM and FIS report for community and public review and comment. The activities to be performed are summarized below.

- *FIS Report Preparation:* Unless instructed otherwise by FEMA, Mapping Coordination Contractor will prepare the revised FIS report in the format of the existing FIS report, revising the report only to reflect current conditions and include updated data tables and flood profiles. At a minimum, the FIS report will include the following: text; cover; vicinity map; data tables; photographs (if available); flood profiles; floodway schematic; and, when necessary, transect schematic and transect location map.
- *Quality Assurance/Quality Control:* Final QA/QC review of the FIS report, including all data tables, profiles, and other components of the FIS, as appropriate, and the news release will be conducted. The QA/QC procedures will be consistent with FEMA standards outlined below for this activity.
- *Discrepancy Resolution:* Mapping Coordination Contractor will be responsible for working with City of Lincoln, Nebraska who is responsible for performing the activities of this project to resolve discrepancies identified during QA/QC.
- *Distribution of Preliminary DFIRM and FIS Report:* Mapping Coordination Contractor will distribute the preliminary copies of the FIS report and DFIRM to the affected communities, State agencies, and others as identified by FEMA.
- *News Release and Federal Register Notice Preparation:* Mapping Coordination Contractor will prepare the news release notifications of BFE changes. The news release will summarize newly proposed BFEs, modifications to existing BFEs, and any changes to the community's floodplain management ordinances to be NFIP compliant. Upon completion of a 30-day community comment period and/or final meeting with the community, and upon initiation of the 90-day appeal period, the Mapping Coordination Contractor will arrange for and verify that the news release is published in the prominent newspaper(s) with local circulation within each affected community identified by the community and FEMA. Mapping Coordination Contractor also will arrange for and verify that a similar notice is published in the *Federal Register*.

Standards: All work conducted under this Activity shall conform to the standards specified for this Activity in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format described in Section 2, Mapping Coordination Contractor shall make the following products available to FEMA:

- Printed preliminary DFIRMs and FIS reports, including all updated data tables and flood profiles for mailing to the CEO of each community, the State NFIP Coordinator, the FEMA Regional Office, and others as directed by FEMA;
- Preliminary transmittal letter(s);
- DFIRM mapping files in one of the database formats specified in FEMA's DFIRM Specifications;
- DFIRM database files in one of the database formats specified in FEMA's DFIRM Specifications;
- Metadata files describing the DFIRM data, including the required information as presented in the examples shown in FEMA's DFIRM Specifications;
- A QA/QC report that includes a description and the results of all automated or manual QA/QC steps taken during the preparation of the preliminary copies of the DFIRM and FIS report;

- Documentation showing that the news release(s) was published correctly in accordance with FEMA requirements and that a similar notice was published correctly in the *Federal Register* in accordance with FEMA requirements

Activity 14 - Post-Preliminary Processing

Responsible Entity: Mapping Coordination Contractor

Scope: This Activity consists of finalizing the DFIRM and FIS report after the preliminary FIS and DFIRM have been issued for public review and comment. The activities to be performed include:

- *Participating in Public Meetings:* When FEMA holds public meetings to present and discuss the results of this Flood Map Project, City of Lincoln, Nebraska and Mapping Coordination Contractor will attend the meetings and assist FEMA in the presentation as required.
- *Resolving Appeals and Protests:* Appeals and protests received during the 90-day appeal period will be reviewed and resolved prior to finalizing the FIRMs and FIS report. City of Lincoln, Nebraska and Mapping Coordination Contractor will provide support to FEMA in resolving appeals and protests. Activities may include, but not limited to, attending community meetings and assisting FEMA and the Mapping Coordination Contractor in addressing any issues that may arise in resolving appeals and protests from affected communities. For a typical appeal and protest, the following activities will be conducted: initial processing of the appeal/protest, performing a technical review of the appeal/protest, preparing letters to request additional data, performing revised analyses, and preparing a proposed resolution for FEMA's review. Mapping Coordination Contractor will mail all associated correspondence upon authorization by FEMA.
- *Special Correspondence:* Comments received within the 90-day appeal period (referred to as "special correspondence") will be reviewed, and responses will be drafted by Mapping Coordination Contractor for FEMA's review. Mapping Coordination Contractor will also mail the final correspondence upon authorization by FEMA.
- *Revise DFIRMs and FIS Report:* If necessary, Mapping Coordination Contractor will work with those parties responsible for preparing the DFIRM under Activities 5, 8, and 9 to prepare revised preliminary copies of the DFIRMs and FIS report, including all data tables and flood profiles. Mapping Coordination Contractor will mail all revised preliminary copies of DFIRMs and associated correspondence upon authorization by FEMA.
- *Letter of Final Determination:* Mapping Coordination Contractor will work with FEMA to establish an effective date for the DFIRM and FIS report, prepare a Letter of Final Determination (LFD) for FEMA review and signature, prepare a final notice for publication in the *Federal Register,* mail the LFD with appropriate enclosures, and coordinate publication of the final notice in the *Federal Register.*
- *GPO Processing:* Mapping Coordination Contractor will prepare final copies of the DFIRM and FIS report, and provide them to FEMA . This will include preparing camera-ready film negatives of the DFIRM and paper copies of the FIS report, including flood profiles; preparing appropriate paperwork to be included with DFIRM and FIS report materials, including the transmittal letter to the community CEO, the print processing worksheet, the Printing Requisition Form, and the Community Map Action Form; and delivering the final materials and paperwork to FEMA in the format prescribed by FEMA.
- *Archiving Data:* Mapping Coordination Contractor will package the backup data and correspondence for this Flood Map Project and transmit it to the Engineering Study Data Package Facility.

Standards: All work conducted under this Activity shall conform to the standards specified for this Activity in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format described in Section 2, Mapping Coordination Contractor shall make the following products available to FEMA as required:

- Draft LFD and associated backup data and information for FEMA review;

- Draft Special Correspondence and backup data and information for FEMA review;
- Appeal and Protest resolution letters, and all backup data and information for FEMA review;
- Printed sets of DFIRM negatives and paper FIS reports, including all updated data tables and flood profiles;
- Paperwork required for printing of DFIRM panels and FIS report;
- Complete DFIRM spatial database; and
- Completed and organized Engineering Study Data Packages.

2. Technical and Administrative Support Data Submittal

The Project Team members for this Flood Map Project that have responsibilities for activities included in this MAS shall comply with the data submittal requirements summarized below.

All supporting documentation for the activities in this Mapping Activity Statement shall be submitted in the TSDN format in accordance with Appendix M of the FEMA *Guidelines and Specifications for Flood Hazard Mapping Partners*, dated April 2003. Appendix M is available for viewing or download on the FEMA Web site at http://www.fema.gov./mit/tsd/frm_gsam.pdf. Table 2-1 indicates the sections of the TSDN that apply to each mapping activity.

If any issues arise that could affect the completion of an activity within the proposed scope or budget, the responsible Mapping Partner shall complete a Special Problem Report (SPR) as soon as possible after the issue is identified and submitted to FEMA. The SPR is to describe the issue and propose possible resolutions. (For additional information on SPRs, refer to Appendix M, Subsection M.2.1.1 of *Guidelines and Specifications for Flood Hazard Mapping Partners*.)

Additionally, the MCC shall collect and maintain a set of products for all Activities and shall compile a comprehensive TSDN for the entire project.

TSDN Section	Mapping Activities												
	1	2	3	4	5	6	7	8	9	10	12 12A	13	14
General Documentation													
Special Problem Reports	X	X	X	X	X	X	X	X	X	X	X	X	X
Telephone Conversation Reports	X	X	X	X	X	X	X	X	X	X	X	X	X
Meeting Minutes/Reports	X	X	X	X	X	X	X	X	X	X	X	X	X
General Correspondence	X	X	X	X	X	X	X	X	X	X	X	X	X
Engineering Analyses													
Hydrologic Analyses	X			X	X	X	X	X	X				
Hydraulic Analyses	X			X	X	X	X	X	X				
Key to Cross-Section Labeling	X			X	X	X	X	X	X				
Key to Transect Labeling	X			X	X	X	X	X	X				
Draft FIS Report				X	X	X	X						
Mapping Information								X	X	X	X	X	X
Miscellaneous Reference Information	X	X	X	X	X	X	X	X	X	X	X	X	X

3. **Period of Performance:** The mapping activities assigned to the City of Lincoln in this MAS will be completed as specified in the Agreement Articles of the Cooperative Agreement.

4. **Funding/Cost-Sharing:** Funds will be provided by FEMA through a cooperative agreement EMK-2003-CA-3044) for the completion for this Flood Map Project. The cooperative agreement budget identifies the amount to be provided by each party. The City of Lincoln shall provide any additional resources required to complete the assigned activities for this Flood Map Project.

5. **Standards:** The standards relevant to this Mapping Activity Statement are provided in Tables 5-1 and 5-2. Information on the correct volume, appendix, section, or subsection of the FEMA *Guidelines and Specifications for Flood Hazard Mapping Partners (April 2003)* to be referenced for each mapping activity are summarized in Table 5-2.

   These Guidelines are available for viewing or download from the FEMA Flood Hazard Mapping Web site at http://www.fema.gov./mit/tsd/dl_cgs.htm.

Table 5-1. Applicable Standards for Project Activities

Applicable Standards	Activities												
	1	2	3	4	5	6	7	8	9	10	12, 12A	13	14
Guidelines and Specifications for Flood Hazard Mapping Partners, April 2003	X	X	X	X	X	X	X	X	X	X	X	X	X
American Congress on Surveying and Mapping (ACSM) procedures	X												
Global Positioning System (GPS) Surveys: National Geodetic Survey (NGS-58), "Guidelines for Establishing GPS-Derived Ellipsoid Heights," November 1997	X	X	X										
EM 1000-1-1000, *Photogrammetric Mapping*, March 31, 1993	X	X	X										
EM 1110-2-1003, *Hydrographic Surveys*, October 31, 1994	X		X										
Numerical Models Accepted by FEMA for NFIP Usage, January 11, 2002				X	X	X	X						
Content Standards for Digital Geospatial Metadata (Federal Geographic Data Committee, 1998)								X	X	X	X	X	X
Document Control Procedures Manual, December 2000											X	X	X

Table 5-2. Project Activities and Applicable Portions of FEMA Guidelines and Specifications

Activity Number	Activity Description	Applicable Volume, Section/Subsection, and Appendix
1	Field Surveys and Reconnaissance	Volume 1, Sections 1.2, 1.3, 1.4 (specifically Subsection 1.4.2.1)
		Appendix A, Sections A.5, A.6, A.7, and A.8
		Appendices B, C, and M
2	Topographic Data Development	Volume 1, Section 1.4 (specifically Subsection 1.4.2.1)
		Appendix A, Sections A.2 and A.3
		Appendix M
3	Independent QA/QC Review of Topographic Data	Volume 1, Section 1.4 (specifically Subsections 1.4.1 and 1.4.2.1)
		Appendix A, Sections A.2, A.3, A.7 (specifically Subsection A.7.5), and A.8 (specifically Subsection A.8.6)
		Appendix M
4	Hydrologic Analyses	Volume 1, Section 1.4 (specifically Subsections 1.4.2.2 and 1.4.2.4)
		Appendix C, Sections C.1 and C.7
		Appendices E, F, G, H, and M
5	Independent QA/QC Review of Hydrologic Analyses	Volume 1, Section 1.4 (specifically Subsection 1.4.1)
		Appendix C, Section C.2
		Appendices E, F, G, H, and M

Table 5-2. Project Activities and Applicable Portions of FEMA Guidelines and Specifications (Cont'd)

Activity Number	Activity Description	Applicable Volume, Section/Subsection, and Appendix
6	Hydraulic Analyses	Volume 1, Section 1.4 (specifically Subsections 1.4.2.2 and 1.4.2.4)
		Appendix C, Sections C.3 and C.7
		Appendices B, E, F, G, H, and M
7	Independent QA/QC Review of Hydraulic Analyses	Volume 1, Section 1.4 (specifically Subsection 1.4.1)
		Appendix A, Section A.4 (specifically Subsection A.4.7)
		Appendix C, Section C.5
		Appendices B, E, F, G, H, and M
8	Floodplain Mapping (Detailed Riverine or Coastal Analysis)	Volume 1, Section 1.4 (specifically Subsection 1.4.2.3)
		Appendix C, Sections C. 4 and C.6
		Appendices K, L, and M
9	Independent QA/QC Review of Floodplain Mapping (Revised Areas)	Volume 1, Section 1.4 (specifically Subsection 1.4.2.3)
		Appendix C, Sections C.4 and C.6
		Appendices K, L, and M

Table 5-2. Project Activities and Applicable Portions of FEMA Guidelines and Specifications (Cont'd)

Activity Number	Activity Description	Applicable Volume, Section/Subsection, and Appendix
10	Base Map Acquisition and Preparation	Volume 1, Section 1.3 (specifically Subsection 1.3.1.8) and 1.4 (specifically Subsection 1.4.3) Appendices A and B
12	DFIRM Production (Merging Revised and Non-Revised Areas)	Volume 1, Section 1.4 (specifically Subsections 1.4.2.3 and 1.4.3.3) Appendices K, L, and M
12A	DFIRM Production (Application of DFIRM Graphic and Database Specifications)	Volume 1, Section 1.4 (specifically Subsection 1.4.3) Appendices K, L, and M
12B	Independent QA/QC Review of DFIRM Product Meeting FEMA Graphic and Database Specifications	Volume 1, Section 1.4 (specifically Subsections 1.4.2.3 and 1.4.3.3) Appendices K, L, and M
13	Preliminary DFIRM and FIS Report Distribution	Volume 1, Section 1.4 (specifically Subsections 1.4.2 and 1.4.3) Appendix C, Sections C.4 and C.6 Appendices J, K, L, and M
14	Post-Preliminary Processing	Volume 1, Section 1.4 (specifically Subsection 1.4.2 and 1.4.3) Appendices J, K, L, and M

6. Schedule and Milestones:

Monitoring Information for Contracted Studies (MICS) will be used to report progress for this Mapping Activity Statement. The initial schedule will be established within two weeks of funds award, and the schedule progress will be updated no later than 30 days after the end of each quarter.
If changes to the schedule are required, the responsible Mapping Partner shall coordinate with FEMA and the other Mapping Partners in a timely manner.

7. Certification: The following certifications apply to this Mapping Activity Statement (as appropriate):

The following certifications apply to this MAS:

Activity 1 (Field Surveys and Reconnaissance)

A Registered Professional Engineer or Licensed Land Surveyor will certify topographic data, in accordance with 44 CFR 65.5(c). Certification of topographic data by the American Society for Photogrammetry and Remote Sensing is also acceptable.

Task 4 (Hydrologic Analyses), Task 6 (Hydraulic Analyses), Task 8 (Floodplain Mapping– Detailed Riverine or Coastal Analysis), Task 8A (Floodplain Mapping {Redelineation Using Effective Flood Profiles and Updated Topographic Data}), and Task 8B (Floodplain Mapping {Refinement or Creation of Zone A})

- A Registered Professional Engineer or Licensed Land Surveyor will certify hydrologic and hydraulic analyses and data in accordance with 44 CFR 65.6(f).
- A Registered Professional Engineer or Licensed Land Surveyor will certify topographic information in accordance with 44 CFR 65.5(c).
- Any levee systems to be accredited will be certified in accordance with 44 CFR 65.10(e).

Task 8 (Floodplain Mapping– Detailed Riverine), Task 8A (Floodplain Mapping {Redelineation Using Effective Flood Profiles and Updated Topographic Data}), and Task 8B (Floodplain Mapping {Refinement or Creation of Zone A}), Task 9 (Independent QA/QC Review of Floodplain Mapping {Revised Areas}), Task 11 (DFIRM Production {Non-Revised Areas}), Task 12 (DFIRM Production {Merging Revised and Non-Revised Information}), and Task 12A (Application of DFIRM Graphic and Database Specifications)

- The DFIRM metadata files will include a description of the horizontal and vertical accuracy of the DFIRM base map and floodplain information.

Activity 10 (Base Map Acquisition and Preparation)

- A community official or responsible party will provide written certification that the digital data meet FEMA minimum standards and specifications.
- The responsible Mapping Partner will provide documentation that the digital base map can be used by FEMA.

8. Technical Assistance and Resources: City of Lincoln, Nebraska may obtain copies of FEMA-issued LOMCs, archived engineering backup data, and data collected as part of the Mapping Needs Assessment Process from the MCC. The MCC may be contacted at 1-877 FEMA MAP (1-877-336-2627). General technical and programmatic information, such as FEMA 265, the Quick-2 computer program, and the MT-2 forms, can be downloaded from FEMA's Flood Hazard Mapping website (www.fema.gov./mit/tsd/). Specific technical and programmatic support may be provided through

FEMA's MCC; such assistance should be requested through the FEMA MCC Project Officer specified in Section 11 of this Mapping Activity Statement.

City of Lincoln, Nebraska may also consult with the FEMA Regional Project Officer to request support in the areas of selection of data sources, digital data accuracy standards, assessment of vertical data accuracy, data collection methods or sub-contractors, and GIS-based engineering and modeling training.

9. **Contractors:** City of Lincoln will ensure that procurement of subcontractors as part of this Mapping Activity Statement complies with the requirements of 44 CFR 13.36.

   Part 13 may be downloaded in PDF or text format from the U.S. Government Printing Office Web site at http://www.access.gpo.gov/nara/cfr/waisidx_02/44cfr13_02.html.

10. **Financial Reporting:** Financial reporting requirements will be in accordance with Cooperative Agreement Articles V & VI.

11. **Points of Contact:** The FEMA Regional Project Officer is Bob Franke, and the CTP Project Manager is Ben Higgins or subsequent personnel of comparable experience who are appointed to fulfill these responsibilities. When necessary, the assistance of FEMA's MCC should be requested through the FEMA MCC Project Officer, Bob Franke.

12. **Project Coordination:** Throughout the project, all members of the Project Team will coordinate, as necessary, to ensure the products meet the technical and format specifications required and contain accurate, up-to-date information. Coordination activities shall include:
    - Meetings, teleconferences, and video conferences with FEMA and other Project Team members;
    - Telephone conversations with FEMA and other Project Team members on an ad hoc basis, as required;
    - Updates to the MICS system, Mapping Needs Update Support System database, and other FEMA status information systems in accordance with requirements in Volumes 1 and 3 of *Guidelines and Specifications for Flood Hazard Mapping Partners*; and
    - E-mail, facsimile transmissions, and letters, as required.

Each party has caused this Mapping Activity Statement to be executed by its duly authorized representative.

Ben Higgins, Senior Engineer
City of Lincoln, Nebraska

9/5/03
Date

Robert G. Bissell, Director
Federal Insurance and Mitigation Division
Federal Emergency Management Agency

9/10/03
Date

William R. Blanton Jr., Project Officer
Federal Emergency Management Agency

12/2/03
Date