Part 610 – Updating Soil Surveys

Subpart B – Exhibits

610.10 Agency Resources Concerns

Project Concern Type Name	Project Concern Description
Air Quality	Particulate matter less than 2.5 and/or 10 micrometers in diameter is suspended in the air, causing potential health hazards to humans and animals.
Fish and/or Wildlife	Habitat has insufficient structure, extent, and connectivity to provide ecological functions and/or achieve management objectives.
Land Use	Implementing the conservation practices may cause an increased change from one land use to another.
Plant Condition	Plants do not produce the yields, quality, and soil cover to meet client objectives or do not have adequate nutritive value or palatability for the intended use.
Soil Condition	The capacity to limit redistribution and loss of soil resources (including nutrients and organic matter) by wind and water.
Water Erosion	Detachment and transport of soil particles caused by rainfall splash and runoff degrade soil quality.
Water Quality	Excessive nutrients and organics in surface water pollution from natural or human-induced nutrients such as N, P, and S (including animal and other wastes) degrades surface water quality.
Water Quantity	The capacity to capture, store, and safely release water from rainfall, run-on, and snowmelt (where relevant).
Wind Erosion	Detachment and transport of soil particles caused by wind degrade soil quality and/or damage plants.

610.11 Information Items for the Inventory and Assessment

The following outline presents the major information items to be considered in updating soil surveys for an MLRA SSO area.

(1) A general review of existing soil surveys and an identification of deficiencies (needed as part of the long-range plan)
- a. Review of legends
- b. Examination of the geographic distribution of soils using GIS tools
- c. Examination of spatial data for join problems
- d. Collection of known information about the quality of existing soil surveys from resource soil scientists, conservationists, other discipline specialists, and other knowledgeable sources

(2) Inventory and review of benchmark soils
- a. Benchmark soil status and documentation
- b. Current status and need for revision
- c. Inventory of existing data
- d. Identification of data gaps

(3) Review and update of Official Soil Series Descriptions (OSD)
- a. Georeferences
- b. Metric units of measure
- c. Use of current taxonomy and horizon designations
- d. Competing series
- e. Distribution and extent
- f. Diagnostic horizons and features
- g. Other items needing attention

(4) Taxonomic classification of soil components
- a. Application of latest edition of *Keys to Soil Taxonomy*
- b. Series with obsolete classification
- c. Typical pedon selection

(5) Attribute data review
- a. Integrity and management of the NASIS site, pedon, map unit, data mapunit, and legend objects
- b. Names and acres of unique map units within the MLRA SSO area
- c. Traditional map unit concepts from published map unit and taxonomic unit descriptions, mapping concepts, and existing database population.
- d. Number of data mapunits by unique component name
- e. Data populated in non-MLRA data map units compared to soil information in published manuscripts
- f. Map units meeting current naming convention standards
- g. Inactive series or components out-of-place for a particular MLRA
- h. Consistent use of map unit phase criteria for the MLRA, including but not limited to standardized slope phases; consistent use of erosion, surface stoniness, rockiness, flooding, local phases, or other appropriate map unit phases.
- i. Consistency of surface horizon textures populated in the database in relation to the correlated map unit phase
- j. Map unit composition, including major and important minor components

k. Consistency of map unit correlations across the MLRA for a particular landform or map unit setting
l. Current soil temperature regime and possible adjustment to assist with map unit correlation on a MLRA basis
m. Map units with incomplete or inconsistent data population
n. Map units of obsolete or unofficial miscellaneous areas
o. Component or map unit concepts compared to OSD concepts, particularly for soils where the OSD concept has evolved
p. Soil morphology or other properties of series versus taxadjuncts
q. Soil morphology of typical and representative pedons
r. Component interpretation inconsistencies or errors
s. Areas impacted by land use changes
t. Consistent use of data population guides and calculations
u. Other items needing attention

(6) Spatial database review

a. Spatial extent of map units—
    i. Do map units extend to appropriate parts of the MLRA?
    ii. Do map units need to be extended and correlated into new areas, or removed and recorrelated out of certain areas?
    iii. Is mapping density consistent across the MLRA?
b. Consistency in level of mapping detail within and among individual survey areas for particular groups of landforms, parent materials, or map units (For example, are flood plains and adjacent stream terraces combined in mapping or separated; are soils formed in residual and colluvial materials combined in mapping or separated; are key landforms delineated, such as aspect differences in mountainous areas?)
c. Consistency of mapping concepts within and between individual survey areas
d. Consistency between how the map units are delineated and the concept described in the manuscripts
e. Consistency in map unit design (kind) in mapping same or similar landforms (For example, did some non-MLRA soil surveys use complexes while others used consociations to map the same or similar landforms?)
f. Identification of areas were the existing mapping is too broad or inadequate for current needs
g. Consistency in mapping scale or mapping order
h. Correction of symbol errors due to recompilation
i. Adjustment of line placement errors, i.e., map unit delineations adhering to correct landforms or fitting the base image correctly
j. Series or map units mapped over too broad an extent
k. Joins issues at soil survey area boundaries
l. Areas impacted by land use changes
m. Geographic areas with spatial problems
n. Other items needing attention

(7) Review and update of ecological site descriptions (ESD)

a. Correlation of ESDs across MLRA/LRU and State lines
b. Creation and addition of needed ESDs to cover minor components and unique habitats
c. Completeness of existing ESDs (including S&T models)
d. Comparisons to check for redundant sites

610.12 Resources for the Inventory and Assessment

(1) Items to compile

a. All available historical documentation
b. Personal interviews with retired soil scientists
c. Published soil survey manuscripts
d. Laboratory investigations by the Kellogg Soil Survey Laboratory (KSSL) and university labs (lab data will be used in the review of a component's properties)
e. University research findings (experiment station bulletins, theses, dissertations, etc.) and other published materials
f. Official soil survey records (correlation documents, progress field reports, etc.) and trip reports of field assistance visits
g. Official SSDs and accompanying or historical notes
h. Pedon descriptions, transects, and field notes
i. Electronic, i.e. database and paper file notes
j. Expert knowledge from soil scientists familiar with the area

(2) Map unit descriptions

a. Review previously completed soil surveys
b. Review soil surveys for conservation planning
c. Review soil survey quality control data, including field notes and documentation
d. Review soil survey photographs, block diagrams, and other figures
e. Review soil survey quality assurance documents
f. Review soil correlation memoranda and amendments.
g. Review the map unit names and phase criteria within the MLRA based on guidance in Part 627 of this handbook and the *Soil Survey Manual* (SSM). Reconcile the map unit name phase criteria for similarly named map units to a standard developed for the MLRA.
h. Compare the map unit concept for the similarly named map units within the MLRA. Identify and reconcile the map unit compositions (major and minor components) from the various soil surveys.
i. Identify minor components worthy of populating within the MLRA map unit. Verify those minor components contrasting to the named major components. Development of a MLRA similar/dissimilar model provides consistency.
j. Evaluate the validity and regional consistency of map unit concepts.
k. Ensure that standard landform and miscellaneous surface features and ad hoc features have been reviewed to identify additional minor components not written into the map unit description.
l. Review the manuscript reports and compare the soil properties and interpretations assigned to the map unit components.
m. Gather all characterization data on the major components for the given project. Analyze the data to verify proper correlated name and correlated classification. Manuscript information and lab data will be used as the foundation for populating the estimated soil properties for the components in the MLRA map unit.

(3) Other items

a. Review correlation records for all surveys to identify final correlation issues.
b. Review ESD and other plant community information for completeness and appropriateness for development of ESDs and state-and-transition models.

c. Review any special investigation and laboratory data collected for the map units.
d. Review available historical transect and pedon descriptions, including the manuscript taxonomic unit descriptions.
e. Review and evaluate the accuracy and consistency of that data in NASIS.
f. Create a map unit geographic distribution map to identify soil delineations and landform positions.
g. Determine if map units are mapped too extensively.
h. Determine if map unit spatial extent is artificially interrupted within the MLRA.
i. Look for variability of soil delineations that may result from individual mapping styles, inconsistent quality control, or differences in detail within and among soil survey areas and for the consistent use of standard landform and miscellaneous surface features and ad hoc features (i.e., spot symbols).
j. Analyze the soil-landscape model, ensuring that the same map units occur in areas with the same or similar geology, landforms, and parent materials.
k. Evaluate map unit delineations that fall outside of the predicted landform(s).
l. Examine line placement for conformance to landforms and crisp landscape boundaries, such as for escarpments, upland and flood plain interfaces, and the edges of water features. The analysis is made at publication scale.
m. Examine line work for join issues between adjacent soil survey areas.
n. Examine line placement and spot symbol placement for conformance to the official base map. The analysis is made at publication scale.
o. Determine the extent and impacts of change in land use within the survey area.
p. Investigate catastrophic natural events or human activities that have altered the land and, consequently, interpretive ratings.
q. Review the kind and accuracy of the soil interpretations and consider interpretive results and the relation of data entries to criteria.
r. Evaluate needs for new or additional interpretations not included in the survey.
s. Evaluate needs for new interpretations, such as dynamic soil properties or soil quality.
t. Review State soil survey conference reports and recommendations.

(4) Reference maps (use in digital format if available)
a. Original field sheets
b. Major land resource area maps
c. General soil map
d. All available aerial photography and other remote-sensing coverage
e. USGS topographic and slope maps
f. Public lands survey
g. Maps and text on geology, geomorphology, geography, and water resources
h. Maps and text on vegetation and land use
i. Climatic maps and data
j. Flood plain maps
k. Maps and text on air resources
l. U.S. Fish and Wildlife Service wetland maps

(5) Reports and Inventories
a. Census reports
b. Crop-reporting service reports
c. Multi-spectral data
d. River basin reports
e. State, regional, or county land use plans and regulations

f. Resource Conservation and Development work plans
g. Public lands management reports and inventories
h. Bulletins and reports of State Agricultural Experiment Stations
i. National Food Security Act Manual and similar manuals
j. National resource inventory data
k. Field office technical guides
l. Soil laboratory data

(6) Scientific and research reports and data
a. Theses and dissertations of college or university students
b. International committee (ICOM) reports, such as those for wet soils, Vertisols, Aridisols, and Andisols
c. Articles in scientific and technical journals
d. Well logs from local or State agencies
e. NRCS drainage, irrigation, and erosion-control guides and maps
f. Percolation test results from local agencies
g. Highway soil test data
h. Climate data
i. Geomorphology studies

(7) Ecological site descriptions (ESD)
a. Existing ESDs
b. ESDs developed in other States and adjoining MLRAs
c. Ecoregion descriptions
d. Life zone descriptions
e. Other plant community inventories

(8) Forestry, range, and wildlife inventories and studies
a. Forest inventories
b. Range inventories
c. Studies and reports on wildlife habitat recreational sites

(9) Official Soil Series
a. Current version of Official Soil Series Descriptions (OSD)
b. Archived copies of previous versions of OSDs (if available)

(10) Databases
a. National Soil Information System (NASIS) database
b. Ecological Site Inventory System (ESIS) database
c. U.S. General Soil Map (STATSGO2) database
d. Soil Survey Geographic (SSURGO) database
e. Soil characterization databases (NRCS and universities)

(11) Digital data
a. Digital orthophotography LiDAR
b. Digital raster graphic
c. Digital elevation model
d. Common land units
e. Common resource areas
f. Digital hydrography, transportation, etc.

610.13 Sample Project Evaluation Worksheet

This worksheet should be tailored for the MLRA soil survey area. An effective worksheet identifies key items for evaluation and assists with an organized and consistent review of map units. The information gathered on this worksheet should be used for the evaluation of each map unit, the evaluation of the taxa used in the map unit name, and the evaluation of individual delineations of the map unit. This information should be collected and analyzed and a summarized paragraph entered into the NASIS database (see part 638 of this handbook) in the Mapunit Text table under the appropriate map unit(s).

All notes entered into the Mapunit Text table should be populated with Kind set to "miscellaneous notes," Category set to "evaluation notes," and Subcategory set to "spatial," "attribute," or "interpretation." A variety of national NASIS reports named "MLRA – mgmt – XXX" can be used to create the evaluation report.

Part A. Evaluation of the survey area

Summarize the information from the non-MLRA survey areas occurring within the update project:

- How were the soil maps digitized?
- What is the new base map for the update?
- What is the new map scale?
- What additional soil data have users requested?
- What additional interpretations have users requested?

Briefly describe the investigative and laboratory support needed to provide the new data and interpretations.

Briefly describe how this survey will be improved by the update.

Briefly describe any publication plans in addition to the Web Soil Survey.

Part B. Evaluation of the map unit (subcategory "attribute")

- Give the probable map unit name if re-correlated.
- Do map unit names correspond with current NCSS and editorial standards?
- Is the unit adequately described? If not, what is inadequate?
- Does the map unit design meet current user needs within the MLRA?
- Are limiting dissimilar soils named as minor map unit components in NASIS?
- Is the amount and type of minor components consistent with NSSH guidelines?
- What were the major interpretive uses of the map unit at the time it was correlated?
- What is the major interpretive use of the map unit at the time of evaluation?
- Are soil properties consistent with the needs of the current land use?
- Are soil property entries in the NASIS database complete?

Part C. Evaluation of the map unit components used to name the map unit (subcategory "attribute")

- Is the proper component kind value entered for the component?
- Does the component name and/or taxonomic classification need to be updated? If so, what is the proposed new name or taxonomic classification?
- Do miscellaneous area names correspond to the approved list of miscellaneous areas?
- Are component names properly entered with only the component name and in title case (e.g., Jonus)?
- Are phase criteria properly entered in the local phase column?
- Can the soil component be classified as presently described? If no, why not?
- Does the depth of the typifying pedon meet current needs?
- Does the series (taxa), as described, overlap with other series (taxa)? If yes, how?

Does the typical pedon represent the map unit component?
Is there lab data for the series (taxa)? If yes, how many locations were tested and is the data adequate?
Do the component properties concur with characterization data?
Is the representative pedon within the RIC of the OSD? If not, why?
Is the series consistent with parent material?
Is the series consistent with geomorphic landform?
Is the series consistent with geographic setting and the MLRA?

Part D. Evaluation of the map unit delineations (subcategory "spatial")

Do soil lines fit major landform breaks?
Do lines correctly separate map units in the soil landform?
Is there a need to create new map units to delineate dissimilar soils?
Are dissimilar soils consistent with the map unit description?
Is the intensity of mapping suitable for the land use?
Does the series concept, as correlated, fit the map unit concept?
How was the mapping evaluated?
Are there user comments?
What are the number of:

transects _____
field notes _____
descriptions _____
areas that need remapping _____
areas that need road checking for line placement _____

Is there an exact join with surrounding surveys?
Is soil mapping consistently applied to landscapes across the major land resource area?
Does the use of features and symbols reflect current definitions and follow standards on the Feature and Symbol Legend for Soil Survey, NRCS-SOI-37A?
Will this map unit require extensive revision (remapping)?

Part E. Evaluation of map unit interpretations (subcategory "interpretation")

Address the interpretation issues within the survey manuscript.
Identify interpretation join issues of similar map units across survey boundaries.

Example report:

Area Symbol	Area Name	Mapunit Symbol	Mapunit Name	Kind	Category	Subcategory	Text Entry
AL007	Bibb County, Alabama	FuD	Fullerton gravelly silt loam, 6 to 15 percent slopes	Miscellaneous notes	evaluation notes	attribute	The manuscript identifies several dissimilar soils and states that they occupy 20 total percent; howeve,r no information is provided in the database. The population of soil properties are not complete to NI305 Exhibit A population standards. The component name and taxonomic

Area Symbol	Area Name	Mapunit Symbol	Mapunit Name	Kind	Category	Subcategory	Text Entry
							classification need to be updated to current standards. Five KSSL sites exist but none from this survey area. One (Madison Co, AL) fits the Fullerton OSD very well. Three others deviate from the OSD slightly in fragment and/or clay content, but are within acceptable margins of error to use as reference data. One is a Kandiudult. Fullerton is a benchmark soil and additional characterization sampling is needed. The component properties do concur with characterization data.
AL007	Bibb County, Alabama	FuD	Fullerton gravelly silt loam, 6 to 15 percent slopes	Miscellaneous notes	evaluation notes	interpretation	The interpretive focus on this map unit is agriculture, woodland, and residential and low-density urban development. In review of the interpretations during SDJR with similar named map units, the major interpretation discrepancy is slope phases that must be reconciled for the MLRA. Once a decision on slope phase is made, the interpretations should be more uniform.
AL007	Bibb County, Alabama	FuD	Fullerton gravelly silt loam, 6 to 15 percent slopes	Miscellaneous notes	evaluation notes	spatial	During the SDJR review, no spatial issues were noted. The lines all fit the landform boundaries and seem to fit the map unit concept. There were polygons outside the major areas that will require field visits to verify map unit concept.

610.14 Project Plan Checklist

The Project Plan is a NASIS report that presents the data entered into the NASIS Project object. For proposed projects, the following data fields in the Project table data are populated:

User Project Identification
Project Name
Project Description
MLRA Soil Survey Office
Project Map units
Project Land Category Breakdown
Project Concern Need
Milestone "Future Project"

Once approved, the remaining fields are then populated.

This exhibit provides a checklist of NASIS populated fields to be managed by the SSO.

User Project Identification: This column identifies the priority of the project and is populated based on region guidance. An example is "2018-1," which identifies the top priority for fiscal year (FY) 2018.

Project Name: The project name begins with the MLRA followed by a space, a dash, and another space, map unit or landform indicator (e.g., MLRA 133B – Cahaba fine sandy loam, 1 to 3 percent slopes; MLRA 128 – Great Limestone Valley Summits).

Project Description
The project description discusses the key issues of project map units identified during the inventory and assessment and describes specific work activities necessary to address those key issues. Time needed to complete the project, where work will occur, expected outcome, and benefits gained from completing the project are described. The project description provides mangers with appropriate information to review and approve the project while providing project staff with information sufficient to carry out the project. Section 610.16 shows examples of project descriptions. Including items in the project description that are also populated elsewhere in project object may produce redundancy in the Project Plan. For example, the Project Plan may extract project map units from the Project Map Unit table; therefore, consideration should be given to how the map units, or components are described in the project description.

The project description is subdivided into two required sections. The first section is a single paragraph summary while the second section expounds specific project details. Each section describes the what, how, where, when, why, and who of the project.

First Section - Summary Paragraph
The first paragraph is an executive summary, or abstract, of the project. The primary audience are managers, e.g., State Conservationists, State soil scientists, and soil survey regional directors. The summary provides the managers with an overview to assist them in reviewing the project. The paragraph is limited to 1,000 characters. The paragraph is written without headers, bulleted items, or lists. See section 610.16 for examples. The summary paragraph discusses the following six items:

1. *What* map units (or components) are being investigated AND what are the key issues.

2. *Where* will the project be focused or the areas impacted by the project. Identify individual survey areas, specific landforms, geographic areas, States or sections of States, or MLRAs or sections of MLRAs.
3. *How* will the issues be addressed or resolved, AND what is the expected outcome:
    a. List field and/or office work necessary to address the issues listed in item 1,
    b. Summarize how the current soil survey information will change.
4. *When* is the project timeframe and how many staff years to complete the project?
5. *Who* requested the project and/or is the main beneficiary?
6. *Why* is the project important by identifying the major resource concern to benefit from project completion?

Second Section – Project Details
This section follows the executive summary (above) and begins with the major heading "Project Details." It should be as concise as possible while remaining informative enough to provide current or future soil scientists with the information necessary to continue the project. The primary target audience is the field soil scientist. Include background history only to the extent necessary to guide the project leader. The following outline will be followed; however, the list is not all inclusive and other issues can be included. A comment on the implemented update strategy is interwoven into this section (see section 610.3(C)). The project details are organized by: Objectives and Procedures, 'Areas Included in the Project, Timeframe, Benefits, Outcome and Deliverables, and Travel Budget.

Objectives and Procedures (what and how)
Discuss the map units and/or components to be investigated, the issues needing to be addressed, and the specific work activities necessary to address those issues in relation to map unit correlation, spatial adjustment, and database population.

<u>Map unit correlation</u>
- Discuss correlation issues of project map units and any re-correlation plans.

<u>Spatial adjustment</u>
- Discuss the join condition of project map units along SSA boundaries and how deficiencies will be corrected.
- Discuss adjusting the map unit extent to produce consistent geographical distribution of project map units where map units correctly follow natural landforms.
- Discuss how spatial adjustments will be managed for those map unit delineations that do not conform to the base image or correct landform.
- Discuss adjustments to map unit symbols, spot symbols, or line features.
- Discuss supplement mapping to provide more detail within a higher order survey.

<u>Data</u>
- List specific lab data needs and purpose. Include number of pedons to sample.
- List and discuss other field data needs, such as number of field transects and purpose, or other needs as appropriate.
- Discuss transect and sampling locations to the extent necessary to guide the project leader.

Areas Included in the Project (where)

- Explain the project extent by listing:
  - The SSAs or portions of the SSAs impacted, or
  - Particular landforms, geology, and/or geographic areas.

Timeframe (when)

- List project length (see section 610.3(C)(2)). This should coordinate with project milestone dates.

Benefits (why and who)

Discuss the major benefit(s) gained from the project completion, and who requested the project and/or who benefits. Benefits to the soil survey program include, but are not limited to:

- Scientific: updating and improving attribute and spatial soil survey information, where issues identified in the inventory and assessment have been addressed
- External: better interpretations to meet user needs; support for partners or other disciplines
- Internal: complete population of attribute information used in Farm Bill programs, conservation planning, and other agency needs or concerns or cooperator needs
- Synergy: wider application of data to support other projects or for multiple soil survey areas
- Efficiency: improvement in the ratio of acreage affected to time required to complete project

Outcome and Deliverables

List the expected outcome of the project, i.e., how will the legend, maps, NASIS data, and interpretations be influenced or impacted as a result of this project.

List deliverable products, i.e., data updated to the WSS, reports and maps deliverable to cooperators, etc.

Travel Budget Needs

List the proposed travel nights needed for SSO staff for the duration of the project.

Project Approval: The "Approved?" column is checked if approved and unchecked if not approved.

MLRA Soil Survey Office: This column is used to assign the project to a specific office.

State Responsible: Choose the State where the regional office is located.

Project Mapunit table: Identify the correlated map units that will be investigated within the project. Include the provisional map unit(s) that will be created during the project. All editing is completed on the new map unit(s); original map units remain untouched.

Project Staff table: Identify all personnel whose time and/or resources will be required to complete the project. Include any SSR staff, the NSSC liaison, State soil scientists, vegetation specialists, etc. The individual SSO staff that is responsible for completing the project is assigned as the project leader.

Project Mapping Goal table: Populate the acre mapping goal for the project. Typically, this figure is the sum of all correlated map unit acres. The goal is assigned to appropriate SSO staff with fiscal year identified.

Project Land Category Breakdown table: Populate the acre assignment to the various land categories.

Project Milestone table: Identify the tasks and their scheduled start and completion dates. This table is used to manage the time table for the project. NASIS Pangaea Query "! PROJECT Templates National ES, SDJR, MLRA" retrieves project templates to assist with developing MLRA field projects. The project named "MLRA XXX - enter mapunit name(s) (National Template)" provides the applicable milestones for MLRA field projects.

The projected scheduled completion date for the Milestone Type "Project completed date" includes time needed for SSO work and quality control and regional office quality assurance and correlation activities.

Project Text table: Include any additional project plans or investigation plans.

Project Data Need table: Include assistance from NSSC staff, lab data, equipment, materials and supplies, technology, training, and other staff or administrative support.

Project Mapping Progress table: Report progress once the SSR staff certifies the project as completed.

Project Concern Need: Each MLRA field project identifies the project concern to address the agency resource concerns as listed in section 610.10. The Seq column is populated to identify the priority concern where multiple concerns exist.

610.15 Example of a Project Evaluation Ranking Procedure

Rank each factor from 1 to 3, with 1 being low and 3 being high. Determine the overall priority ranking from the key at the end.

A. Scientific Merit. How important is the project for soil science and the soil resource inventory? Examples: updating or investigating taxonomic classifications, revising series concepts, updating or correcting pedon descriptions, sampling to fill data voids for series.

Score	Criteria
1	Little or no scientific merit
2	Some merit: minor changes to benchmark soils; changes to soils of small extent, etc.
3	High merit: major advances in scientific knowledge about benchmark soils

B. Agency Merit. Does the project address agency resource concerns, or how important is the project for programs of NRCS and their partners? Included are all of the agency concern types (see section 610.10), Farm Bill programs, conservation planning, State cost-share, etc. Examples: K factors (affecting HEL and CRP), hydric soils (wetlands), prime farmland issues, suitability groups.

Score	Criteria
1	Little or no agency merit
2	Minor or incidental effects on some properties or areas of concern; affects one or more programs in a minor way
3	Significant revision to properties of benchmark soils used in programs or areas of significant concern to conservation efforts; affects several programs or has a major impact on one or more programs

C. External Merit. How important is the project for external customers, either government or private?

Score	Criteria
1	Little or no interest from external customers
2	Some effect on soil survey users or agencies; one user group impacted
3	Major impact on land use planning, interpretations, or agency programs or lands; more than one user group impacted

D. Financial/Partnership Inputs. Are there inputs from other sources or partners, such as funding, staffing, equipment, or technical support?

Score	Criteria
1	Little or no partnership involvement
2	Some commitment of staff time, equipment, and/or technical support; one partner involved
3	Major commitment of staff time and equipment and/or financial support; more than one partner involved; strong support or guidance needed from NRCS or partner administration

E. Synergy. Does the project serve or support another project or proposal?

Score	Criteria
1	Not at all
2	Some advantage to another project
3	Closely related to another project; significantly improves the efficiency of both projects

F. Deficiencies in Soil Survey Information. Does the project address deficiencies identified in the inventory and assessment and/or digital flags?

Score	Criteria
1	No deficiencies previously noted
2	Minor deficiencies are addressed
3	Significant deficiencies in the existing soil survey information are addressed

G. Efficiency. How much "bang for the buck" is in this project? Evaluate, in part, on the ratio of acreage affected to time required to complete.

Score	Criteria
1	Low: lots of work for a few acres (e.g., < 300 acres / person-day, few and minor NASIS changes per person-day)
2	Moderate: reasonable return for the labor (e.g., 300 to 1000 acres / person-day, numerous NASIS changes per person-day, etc.)
3	High: big changes with little effort (e.g., >1000 acres / person-day, major NASIS revisions per person-day, etc.)

Key:
1) If G = 3 and D = 3 and two or more of A or B or C or F = 3 or if score = 3 on three of A, B, C, or F, then Priority = High
2) If D = 1 and G = 1 and none = 3 and composite score < 11, then Priority = Low
3) All other, Priority = Medium

610.16 Project Description Examples

Examples of Summary Opening Paragraphs

Example 1.
The northern portion of the Chehalis River flood plain is experiencing heavy urban development. This development is causing land use concerns about the accuracy and consistency of the current soil lines and water-related soil properties. This area occurs in MLRA 2 and includes portions of WA627, WA667, and WA641. This 2-year project will result in updated order 2 tabular and spatial data for 41,861 acres. Chehalis, Cloquato, and Newberg are the major soils that will be investigated. New map units will be generated and line work will be recompiled to current imagery using LIDAR. Data will be updated, including new field observations and KSSL samples; however, information from existing KSSL data, archived manuscripts, original SSURGO data, and tacit knowledge will be reviewed and incorporated. No ESD work will be included in this project.

Example 2.
The Jaucus series is mapped throughout the Hawaiian Islands of Oahu, Molokai, Lanai, and Maui—on beaches of all islands and on relatively upland soils in the isthmus valley of Maui on sugar cane lands (MLRAs 158, 163, 164, 166, and 167). This series was established in the U.S. Virgin Islands; documentation needs to be obtained to establish a new series to reflect Hawaiian Island characteristics. Preliminary investigation of soil mapping in sugar cane fields indicates that the soil condition has extensive surface anthropogenic modification affecting soil morphology. Basic requirements for establishing series, including transects to determine map unit composition, will be met. New map units will be developed, some map line work will be modified, and all data associated with the data mapunits will be updated. The project will encompass the 2016 and possibly 2017 fiscal years. It will require an estimated 250 staff hours (0.12 staff years) to complete. Travel costs are anticipated.

Example 3.
Hydric ratings, as well as forestland suitability, are very important water quality/quantity issues with Pelham soils. This map unit is correlated in 9 counties along with other Pelham map units mapped along the GA-FL line. Determining and populating the exact water table associated properties for this ponded phase will erase an issue where hydric ratings differ along State lines. As a result, more consistent interpretations will be available for farmers, as well as State and Federal agencies that utilize this data for suitability and compliance determinations. This project will focus on MLRA 153A/B in Florida/Georgia within transition areas between non-ponded Pelham units as well as along drain heads and flat, sluggish drains without well-defined channels. This is a substantial project, requiring transects, sample collection for base saturation, as well as ponding frequency observations. With one staff person, this project will take 1 year.

Example 4.
Huckleberry is a benchmark series in MLRA 43A and has been mapped in a cryic temperature regime in 4 surveys (ID606, ID670, WA065, WA651). Currently, the associated forest canopy is western red cedar, subalpine fir, and mountain hemlock. Current research supports a cryic temperature regime for soils occurring under a subalpine fir or mountain hemlock canopy and a frigid temperature regime for soils under a western red cedar canopy. Huckleberry components will be evaluated against vegetative models and then field verified to refine plant condition mapping. The Huckleberry series concept will be updated and a frigid counterpart developed for areas with a western red cedar canopy. This project encompasses 181,400 acres. It will take two field seasons by one staff person to complete due to short seasons and remote travel locations.

Example 5.
Soil wind erosion of the Ulysses eroded map units has significantly changed the soil condition in 7 counties in MLRA 72 as identified by farmers in the area. Transects will be run on these map units to verify map unit composition and identify soil condition characteristics. Significant KSSL samples are available; however, additional samples will be collected to compare surface soil properties between non-eroded and eroded phases of these map units. Soil classification may change due to erosion. The evaluation of these map units found a potential difference in soil properties impacting the Kf value interpretation. This study is significant with almost 150,000 acres. Fieldwork should be completed in one field season by one staff year.

Example 6.
The map unit "Frederick silt loam, 8 to 15 percent slopes" occurs in the large limestone valley in the mesic part of MLRA 128. The map unit is in four counties, but is absent in two adjacent counties (VA155 and VA121). Past correlation concepts varied, and similar soils, such as Groseclose or Lodi, were preferred in VA155 and VA121 in place of Frederick. New field transect data from the similar map units in VA155 and VA121, combined with existing data, will confirm or disprove that the Frederick map unit can be extended and correlated into these two counties. Spot checks where Frederick is currently mapped will verify those correlations. Soil delineations will be joined between counties, and attribute data will be updated. The result will be consistent map unit correlation on this particular hillslope in the MLRA. The project will benefit land use and conservation decisions by providing consistent and improved data. The fieldwork will be completed in 1/3 of a field season by 2 staff.

Example 7.
Atmore soils occupy water collection positions on the landscape, receiving and filtering both surface runoff and subsurface flow downslope above a restrictive layer. They occur in ecological sites commonly referred to as pitcher plant bogs and host vegetative communities dominated by hydrophytic vegetation of a jurisdictional wetland. These map units include a variety of carnivorous plants and some endangered species, and are well represented in an ecological system known as the longleaf pine savannah. Atmore is mapped in MLRA 133A and 152A in 13 counties, occupying 164,442 acres. Evaluations suggest potential differences in soil properties (such as texture, silt content, and plinthite amount) related to differences in parent material age and depositional environment, topography, hydrology, and landform position across the extent of this map unit. Additional characterization data is needed for these ecologically sensitive areas. This project will be completed by four staff members within 2 years.

Example 8.
Severe dust storms are reducing air quality and visibility along the I-10 corridor where playa systems occur. Several cooperators have requested updated soil and ecological site information for these playa areas. The scope of MLRA 41 – Update of the Animas Valley Playas and Adjoining Map Units is to update all playa areas that exist throughout MLRA 41, LRU 41.2. All geographically associated landforms, such as basin floor, play dune, piedmont, and drainageway, will be assessed and updated accordingly. This effort will develop new map units, modify existing map units, evaluate ecological sites, and update all data associated with the data map units. This effort will be accomplished by gathering all current documentation, collecting additional documentation as needed, and sampling map unit components for characterization data. The project consists of private, BLM, and State lands for a total of 105,027 acres. It will be completed with two personnel in 1 year.

Example 9
Wind erosion impacts the Optima loamy sand, 10 to 25 percent slopes found in the Dust Bowl area of Oklahoma and Kansas. The evaluation identified soil composition and spatial join deficiencies.

Documented deficiencies include pedons that are npt spatially representative of the map unit extent and a lack of transects to estimate map unit composition. KSSL data is available for the OSD type location and supports soil properties and classification. Local laboratory data will be collected to improve identification of physical and chemical properties and refine soil interpretations. Soil polygon boundaries, through field investigation, will be edited to create exact county line joins. This project covers 49,850 acres. It will involve one staff person and be completed within 1 year.

Example 10.
Review of Barnes series, an extensive benchmark soil in MLRA 55A and 55B that is mapped across Souris, Leeds, and Red River till lobes, produced concerns that physical and chemical properties and hydrology within each lobe were not adequately reflected by MLRA map units. Representative pedons will be identified, documented, and sampled. Selected locations will be instrumented with monitoring wells and rain gauges to justify or refute consolidation, separation, and classification and assist in modeling hydrology, all of which will benefit State interpretations and planning. Analyzed MLRA field project data and KSSL samples (salt analysis group) collected on all lobes by two staff in two field seasons (KSSL results to follow) will augment NASIS and document areas with high probability of being affected by salinity/sodicity. Cumulative hydrologic monitoring over multiple MLRA field projects, completed by two staff in five field seasons, initiated with this project will provide a measure of seasonal wetness variability.

Example 11.
Condit soils are very poorly drained soils that occur in depressions and drainageways where water table features significantly influence plant condition. A single ponding frequency, duration, and depth is currently assigned to all Condit map units. Landform features that influence hydrologic properties were not considered in the existing database. Using digital soil mapping tools and LIDAR analysis, a hydrologic model will be used to identify landform features known to influence water tables. Those features will then be used to differentiate condit map units into phases that assign ponding frequency, depth, and duration, which will help farmers to better evaluate their potential for crop production. Landowner evaluations of the phased maps will be used to test their usefulness for predicting water features. This project covers the portion of LRU 111E behind the Broadway end moraine, but the hydrologic model can be adapted for other ponded soils. Required SSO staff time: 0.5 staff year.

Example 12
Bangor, Dixmont, and other acidic tills mapped on the calcareous Waterville Formation may not best represent soil conditions as they exist across portions of a 10-county area in MLRA 144B and 143 in central Maine. Recently sampled lab data supports correlation to high lime soils of the recently established Sebasticook catena. Interpretations and program applications would be improved by this revised data. Selective field investigation, review of lab and other published data, and geospatial analysis of bedrock geology will be used to determine the best correlation. This project covers about 250,000 acres. SSO staff time is estimated at 1.75 staff years for production and quality control; regional office staff time is estimated at .10 staff years for support, quality assurance, correlation, and certification. Publication of the data to the Web Soil Survey is done by the State soil scientist. The project is proposed to begin in FY 2018 and last 1 year.

Example of a Complete Project Description

Soil erosion of the MLRA 72 - Ulysses silt loam, 3 to 6 percent slopes map units has significantly changed the soil condition in 27 counties in MLRA 72. Transects will be run on these map units to verify map unit composition and identify phase characteristics. Significant KSSL samples are available;

however, additional samples will be collected to compare surface soil properties between non-eroded and eroded phases of these map units. Soil classification may change due to erosion. The evaluation of these map units found a potential difference in soil properties impacting the Kf value interpretation. This study is significant with almost 150,000 acres, and may take 2 staff years to complete with extensive travel throughout western Kansas and eastern Colorado.

Project Details:

Project: MLRA 72 - Ulysses sil, 3-6, maintenance continued (58549)

Objectives and Procedures
This project will complete the maintenance for the Ulysses silt loam, 3 to 6 percent slopes map units. The maintenance was started in 1999 as part of the Kansas initiative to investigate the degree of erosion in the Ulysses map units that have slope greater than 3 percent. The maintenance was suspended in 2012 so staff could focus on the SDJR initiative.

The Garden City SSO collected pedons in FY 2011 and FY 2012 and entered the pedons that were collected in 1999, 2003, 2011, and 2012 into NASIS. For the 1859 map units in Kansas, 512 pedons have been entered in NASIS and analyzed. Pedons remain to be collected in the following counties:
Rawlins Co., Kansas (ks153)
Sherman Co., Kansas (ks181)
Thomas Co., Kansas (ks193)
Wallace Co., Kansas (ks199)
Wichita Co., Kansas (ks203)
Hayes Co., Nebraska (ne085)

This project will include:

- Field investigation of Ulysses silt loam, 3 to 6 percent slopes (1859) in the counties listed above
- Field investigation of Ulysses silt loam, 3 to 6 percent slopes, eroded (1860) in Chase (ne029) and Hitchcock (ne087) Counties of Nebraska
- Joins along the Kansas-Nebraska State line where 1859 polygons in Kansas join Nebraska
- Joins along the Kansas-Nebraska State line where 1860 polygons in Nebraska join Kansas

The project extent is 538,584 acres with 6,203 polygons. The extent is 90 percent in MLRA 72 and 10 percent in MLRA 73. The extent is listed by county in a table at the end of this document. All of the Kansas and Colorado extent was combined during the first phase of this maintenance in 2013, and that extent is represented by national mapunit symbol 2mb5b, which is supported by DMUID 626924. We did not submit the Nebraska extent to the SDJR process.

The originally mapped Ulysses silt loam, 3 to 6 percent slopes map units were assigned to the Loamy Upland ESD and were not HEL, with WEI/WEG values of 48/6. The maintenance of 1999 was started because of complaints that the Ulysses silt loam map units, with slopes greater than 3 percent, should be HEL and in the Limy Upland ecological site because they have free carbonates in the surface layer. The resource soil scientists thought the difference was caused by erosion that occurred after the original mapping. In the past 3 years, the ecological site specialists have indicated that this map unit has some areas that support the Loamy Upland plant community and some that support the Limy Upland community. The ecologists focused on this map unit because part of it is in prime Lesser Prairie Chicken habitat.

Areas Included in the Project

We will begin by describing the Ulysses TUDs in the counties listed below. We will try to incorporate these TUDs in the traverses we plan to complete.

Finney Co., Kansas (ks055)
Gove Co., Kansas (ks063)
Gray Co., Kansas (ks069)
Greeley Co., Kansas (ks071) (Ulysses type location)
Lane Co., Kansas (ks101)
Logan Co., Kansas (ks109)
Rawlins Co., Kansas (ks153)
Scott Co., Kansas (ks171)
Sheridan Co., Kansas (ks179)
Sherman Co., Kansas (ks181)
Stanton Co., Kansas (ks187)
Thomas Co., Kansas (ks193)
Wallace Co., Kansas (ks199)
Wichita Co., Kansas (ks203)
Chase Co., Nebraska (ne029)
Hayes Co., Nebraska (ne085)
Hitchcock Co., Nebraska (ne087)

The following counties only have a few polygons because 1859 was added to facilitate SSURGO joins, so the TUDs will not be described.

Cheyenne Co., Colorado (co017)
Cheyenne Co., Kansas (ks023)
Decatur Co., Kansas (ks039)
Ford Co., Kansas (ks057)
Graham Co., Kansas (ks065)
Greeley Co., Kansas (ks071)
Ness Co., Kansas (ks135)
Trego Co., Kansas (ks195)
Lincoln Co., Nebraska (ne111)

We will then collect three 5-hole traverses in each of the counties listed below, focusing on the various surface morphometries that are expressed within the polygons. This approach was chosen instead of the 10-hole equidistant transect method because we want to be able to analyze the pedons by surface morphometry. We may need to collect more traverses to define the 1860 map unit, but I think the 1859 map unit will be well served with twenty-four more 5-hole traverses.

Rawlins Co., Kansas (ks153)
Sherman Co., Kansas (ks181)
Thomas Co., Kansas (ks193)
Wallace Co., Kansas (ks199)
Wichita Co., Kansas (ks203)
Chase Co., Nebraska (ne029)
Hayes Co., Nebraska (ne085)
Hitchcock Co., Nebraska (ne087)

For each county listed above, we also will collect a full pedon description in a location we feel is representative of the major component. We will do this in five polygons in each county. The chosen polygons will not be those that received a traverse.

In addition to the 512 pedons already collected, this plan will result in a new full description at seventeen Ulysses TUD sites, twenty-four 5-hole traverses, and 40 full pedon descriptions for the 1859 map unit. The 1860 map unit will have six 5-hole traverses and 10 full pedon descriptions collected. This collection will provide 690 full pedon descriptions by the end of the project.

Project Extent by County

Ulysses silt loam, 3 to 6 percent slopes (1859)

Survey	NMUsym	DMUID	acres	polygons
Cheyenne (co017)	2mb5b	626924	16	1
Cheyenne (ks023)	2mb5b	626924	560	17
Decatur (ks039)	2mb5b	626924	3,934	29
Finney (ks055)	2mb5b	626924	22,961	485
Ford (ks057)	2mb5b	626924	27	2
Gove (ks063)	2mb5b	626924	34,996	916
Graham (ks065)	2mb5b	626924	340	3
Gray (ks069)	2mb5b	626924	6,387	110
Greeley (ks071)	2mb5b	626924	98	1
Kearny (ks093)	2mb5b	626924	820	19
Lane (ks101)	2mb5b	626924	11,274	363
Logan (ks109)	2mb5b	626924	48,255	520
Ness (ks135)	2mb5b	626924	474	19
Rawlins (ks153)	2mb5b	626924	76,874	782
Scott (ks171)	2mb5b	626924	8,095	127
Sheridan (ks179)	2mb5b	626924	101,982	555
Sherman (ks181	2mb5b	626924	58,048	782
Stanton (ks187)	2mb5b	626924	2,499	36
Thomas (ks193)	2mb5b	626924	72,674	358
Trego (ks195)	2mb5b	626924	70	2
Wallace (ks199)	2mb5b	626924	57,405	446
Wichita (ks203)	2mb5b	626924	18,314	181
Hayes (ne085)	1v170	69718	918	41
Lincoln (ne111)	2dhv5	69718	14	1

Ulysses silt loam, 3 to 6 percent slopes, eroded (1860)

Chase (ne029)	1v10l	69639	2,399	30
Hitchcock (ne087)	1v18m	69765	9,624	396
	Project total		539,058	6,222

Joins

Map unit 1859 in Cheyenne Co., Colorado (co017) has a join with Wallace Co., Kansas (ks199) that needs attention. The Wallace Co. map unit that 1859 joins is:
(1580) Colby silt loam, 5 to 15 percent slopes (2w5d4)

- (1859) in section 30-12s-41w joins (1580) in section 25-12n-43w

Map unit 1859 in Rawlins Co., Kansas (ks153) has a join with Red Willow Co., Nebraska (ne145) that needs attention. The Red Willow Co. map unit that 1859 joins is:
(4121) Holdrege and Keith silt loams, 3 to 7 percent slopes, eroded (2s7w5)

- Two polygons of (1859) in section 1-1s-31w join two polygons of (4121) in section 31-1n-30w

Map unit 1859 in Rawlins Co., Kansas (ks153) has joins with Hitchcock Co., Nebraska (ne087) that need attention. The list of joins below is from east to west along the Rawlins-Hitchcock County line. The Hitchcock Co. map units that 1859 joins are:
(1620) Keith silt loam, 1 to 3 percent slopes (2r2fs)
(1630) Keith silt loam, 3 to 6 percent slopes, eroded (2s7vx)
(1632) Keith silt loam, 1 to 3 percent slopes, eroded (2s7vw)
(1860) Ulysses silt loam, 3 to 6 percent slopes, eroded (1v18m)
(1869) Ulysses-Sulco silt loams, 6 to 9 percent slopes, eroded (2r9kt)

- (1859) in section 3-1s-31w joins (1630) in section 35-1n-31w
- (1859) in section 4-1s-31w joins (1630) in section 34-1n-31w
- (1859) in section 1-1s-32w joins (1630) in section 31-1n-31w
- (1859) in section 3-1s-32w joins (1869) in section 35-1n-32w
- (1859) in section 3-1s-32w joins (1860) in section 35-1n-32w
- (1859) in section 1-1s-33w joins (1630) in section 31-1n-32w
- (1859) in section 2-1s-33w joins (1630) in section 36-1n-33w
- (1859) in section 4-1s-33w joins (1630) in section 35-1n-33w
- (1859) in section 2-1s-34w joins (1630 & 1620) in section 36-1n-34w
- (1859) in section 3-1s-34w joins (1632 & 1860) in section 35-1n-34w
- (1859) in section 3-1s-34w joins (1869) in section 35-1n-34w
- (1859) in section 4-1s-34w joins (1630) in section 35-1n-34w
- (1859) in section 3-1s-35w joins (1860) in section 36-1n-35w
- (1859) in section 4-1s-35w joins (1620 & 1860) in section 36-1n-35w

Map unit 1859 in Rawlins Co., Kansas (ks153) has a join with Dundy Co., Nebraska (ne057) that needs attention. The Dundy Co. map unit is (1855) Ulysses loam, 3 to 6 percent slopes (2sbwd).

- (1859) in section 3-1s-36w joins (1855) in section 35-1n-36w

Map unit 1860 in Hitchcock Co., Nebraska (ne087) has joins with Rawlins Co., Kansas (ks153) that need attention. The list of joins below is from east to west along the Rawlins/Hitchcock county line. The Rawlins Co. map units are:

(1581) Colby silt loam, 10 to 25 percent slopes (2v9g1)
(1619) Keith silt loam, 0 to 1 percent slopes (2s7vs)
(1859) Ulysses silt loam, 3 to 6 percent slopes (2mb5b)

- (1860) in section 35-1n-32w joins (1859) in section 3-1s-32w
- (1860) in section 35-1n-34w joins (1581 & 1859) in section 3-1s-34w
- (1860) in section 36-1n-35w joins (1619 & 1859) in section 3-1s-35w
- (1860) in section 34-1n-35w joins (1581) in section 4-1s-35w

Summary of work completed to date.—The Garden City SSO has reviewed the 512 pedons that were collected and find the following. Additional data collected in this project will be reviewed to determine if the trends, summarized below, are representative of the entire extent.

Classification

- 41 percent of the pedons classify as fine-silty, mixed, superactive, mesic Torriorthentic Haplustolls (Quinter [tentative])
- 23 percent classify as fine-silty, mixed, superactive, mesic Aridic Haplustepts (Buffalo Park)
- 11 percent classify as fine-silty, mixed, superactive, mesic Aridic Haplustolls (Ulysses)

The 512 pedons suggest this map unit is more complicated than its consociation designation indicates. The map unit is a patchwork of plant communities that cannot be modeled by landform. I think the map unit may become a Quinter consociation with a Ulysses, Buffalo Park, and swale minor component.

There is evidence that the Torriorthentic Haplustolls should be separated from the Aridic Haplustolls. This would require a new soil series (Quinter), for which I have selected a type location, acquired KSSL data, and developed a tentative OSD. The separation will be especially helpful for the Ulysses map units that have slope greater than 6 percent because we have not found Ulysses soils in these polygons.

Timeframe

This extensive project covers many counties and will begin in April 2016 with major fieldwork completed by November 2016. Field lab analysis, database population, and spatial editing will be completed by April 2017. Field travel to each county will be from 30 minutes to 2 hours. While at each site, a 10-hole transect will be obtained on designated polygons. Polygons outside the heart of the map units will be field checked and pedon descriptions obtained. The project will include fieldwork for transecting, field descriptions, and sample selection collecting the needed analyses as explained above. This project is planned to be submitted to the regional office for quality assurance and correlation in July 2017.

Benefits

The major benefit is to develop a consistent map unit across the southern reaches of MLRA 72 recognizing the erosion of the Ulysses map unit.

Outcome and Deliverables

Improving the population of soil properties associated with eroded Ulysses will help planners better determine conservation practices needed on these eroded soils.

Ecological Site Descriptions (ESD).—Recent interdisciplinary work on the Loamy Tableland ESD established a depth to free carbonates of greater than 15 cm (6 inches) for the Loamy Tableland soils and less than 15 cm (6 inches) for the Limy Tableland soils. The statistics below are developed from that depth to free carbonate break and landform.

- 48 percent of the pedons would be assigned to the Loamy Upland ESD
- 43 percent of the pedons would be assigned to the Limy Upland ESD
- 8 percent of the pedons would be assigned to the Swales ESD

Surface effervescence class (Highly Erodible Land, or HEL).—Twenty percent of the 512 pedons would be HEL. The Buffalo Park component (Aridic Haplustepts) would represent these soils. The effervescent strength (tested with 1M HCL) is described below.

- Noneffervescent 70 percent
- Very slightly effervescent 2 percent
- Slightly effervescent 8 percent
- Strongly effervescent 12 percent

- Violently effervescent 8 percent

Maximum effervescence (0-25cm)
- 36 percent of the pedons have strong effervescence
- 33 percent are noneffervescent
- 21 percent have violent effervescence
- 57 percent of the pedons have strong or violent effervescence in the root zone
- Average depth to the top of the strong or violent effervescence is 12 cm, for pedons with strong or violent effervescence as maximum strength in the root zone

Surface layers with strong to violent effervescence are considered to be HEL. More than half of the 512 pedons have strong or violent effervescence in the root zone and this affects the plant communities. This map unit (1859) will not be HEL, but it needs an HEL component for the planners to use where needed. Based on work already completed, the Ulysses map units with slope greater than 6 percent are probably going to be considered HEL map units and will no longer be considered Ulysses.

The pedon data suggests this map unit should be a consociation of Quinter that is not HEL (48/6) and in the Loamy Upland ESD. Quinter could represent the Aridic Haplustolls (Ulysses) if a Ulysses minor component needs to be avoided.

There should be a Buffalo Park minor component (10 percent component composition) that is HEL (86/4L) because 20 percent of the pedons have strong to violent effervescence in the surface and more than 50 percent have this effervescent strength in the root zone. The Buffalo Park component will provide an HEL component and a Limy Upland component for the users to allow for the patchy areas of HEL.

With 20 percent of the map unit eligible for HEL designation, we may want to create a Quinter-Buffalo Park undifferentiated group, but that is not often desirable. Statistics cannot define the landform position of the HEL component. The HEL (Buffalo Park) and non-HEL (Quinter) components are predominantly on backslopes of side slopes.

Of the 512 pedons collected to date for the 1859 maintenance in Kansas, 60 pedons (12 percent) fit the current Ulysses classification. A Ulysses minor component could be added to provide the users with a component that is non-HEL and in the Loamy Upland ESD, and this minor component would have interpretive rankings that are very similar to the Torriorthentic Haplustolls component.

With 8 percent of the pedons in swales, there is a case for another minor component, probably Duroc.

Field review of plant communities within previously collected transects is advised. The ecological site specialist and Garden City SSO have found that broom snakeweed can be used as an indicator species for the Limy Upland sites. This indicator was not documented when transects were collected, and verification may be helpful in the future.

Travel Budget
Considering an average 90-mile round trip, 4 days per week, for 10 months, is 14,400 miles with an average 15 mpg, and $2.50 gasoline cost per gallon, there is a potential $2,400 cost associated with this project. No overnight travel is associated with this project.