

## AK Tech Note 7 - Food Security Act Compliance Highly Erodible Land Determination Procedures

**Subject:** Procedures for completing HEL determinations in Alaska

**Purpose:** To acquire and maintain certified Wetland Determination training in Alaska for Wetland Conservation Compliance (WCC) Provisions of the Food Security Act (FSA).

**Reference:** Title 7 Code of Federal Regulations (CFR) Part 12; M\_180\_NFSAM\_511.0, 511.1

**When used:** When conducting Food Security Act (FSA) HEL determinations on any lands in Alaska.

### Introduction

Over seventy percent of Alaska land does not have existing soil surveys for making Highly Erodible Lands (HEL) determinations as required by the Food Security Act (1985). The following guidance sets forth the standard operating procedure (SOP) for making HEL determinations in Alaska for crop land fields when a soil survey is available and outlines how to document deferral for small acreage (2 acres or less) fields when a soil survey is not available.

### Background

Soil map units and an erodibility index (EI) are used as the basis for identifying Highly Erodible Land (HEL) for Food Security Act compliance. Erodiability calculations are based on the “frozen” soil map units, soil loss tolerance (T), and factors for water and wind erosion as they existed in the Field Office Technical Guide on January 1, 1990. HEL determinations are completed using offsite methods by regulation and policy. See Title 7 Code of Federal Regulations (CFR) Part 12, Subpart B, and National Food Security Act Manual (NFSAM) Parts 511.0 and 511.1.

Erosion Equation	Calculation	Variables
Sheet and Rill Erosion (USLE)	$R \times K \times LS$ $\text{-----} = EI$ $T$	R - rainfall and runoff K - susceptibility of the soil to water erosion LS - the combined effects of slope length and steepness
Wind Erosion (WEQ)	$C \times I$ $\text{-----} = EI$ $T$	C – climatic characterization of windspeed and surface soil moisture expressed as a percentage I – the susceptibility of the soil to wind erosion

The EI of a soil map unit is determined by dividing the potential erodibility for each soil map unit by the T value established for the soil. A soil map unit with an EI of 8 or more is designated as HEL. A soil map unit with an EI less than 8 is not HEL (NHEL). A soil map unit is potentially HEL (PHEL) if the Universal Soil Loss Equation (USLE) EI value using the minimum length of slope (LS) factor for the soil map unit is less than 8 and the EI value using the maximum LS factor for the soil map unit is equal to or greater than 8.

Lists of frozen HEL soil map units by soil survey area are maintained in Section II of the electronic Field Office Technical Guide (eFOTG). When completing HEL determinations, do not make a field visit to complete field slope gradient or slope length measurements for HEL or NHEL map units. Only PHEL map units will be examined in the field, or using LiDAR data, to measure the percent slope and slope length to determine if they are HEL or NHEL. Contact the state GIS Specialist for more information on using LiDAR data for work with PHEL soils

## Procedure for all HEL determinations

1. The NRCS District Conservationist receives form AD-1026 from Farm Service Agency (FSA).
2. The NRCS District Conservationist assigns determination to a qualified Planner.
3. The Planner determines whether or not the determination is for an area with an existing soil survey (refer to Appendix A).
  - a. If a soil survey exists, the Planner proceeds with the procedure for making a determination on fields with an existing soil survey.
  - b. If a soil survey does not exist, the Planner proceeds with the procedure for making a determination on fields without existing soil surveys.

## Procedure for fields with an existing soil survey

1. The offsite HEL determination will be conducted in ArcMap using the “Alaska Frozen Soils List” feature class (X:\geodata\soils\HEL\FrozenSoils\FrozenSoils).
2. The Planner uses the FrozenSoils feature class and CLU layer to determine the soil map units within the field.
3. The Planner uses the identify tool on the FrozenSoils feature class and the List\_Link attribute hyperlink in order to navigate to the correct frozen soils list in Section II of the eFOTG for the HEL values for the soil map units. Using the List\_Link hyperlink ensures the Planner is using the correct survey for the determination.
4. For fields that have multiple soil map units, the Planner uses the Alaska HEL toolbox (directions in Appendix C), to determine the percentages of the field for each map unit. This will allow them to determine how much of the field has HEL, NHEL and PHEL soils,
  - a. If either 33 1/3% or 50 acres of the field has HEL soils, the field is HEL.
  - b. If either 33 1/3% or 50 acres of the field is made up of PHEL and HEL soils, an onsite is necessary; move onto step 5.
  - c. If less than 33 1/3% or 50 acres of the field is made up of PHEL and HEL soils, then the field is NHEL, you can document your determination, and the review is complete.

5. If part of the field being determined was previously determined HEL, that area remains HEL.
6. For all of the field that was not previously determined HEL, if PHEL and HEL soils make up 33 1/3% or 50 acres of the undetermined portion, the Planner must visit the field (or use LiDAR data) to estimate slope gradient and slope length of PHEL soils.
  - a. The Planner selects representative areas of the PHEL soils in the field.
  - b. The Planner measures slope gradient and slope length at in the representative areas and records the location of these measurements with GPS.
  - c. The Planner references the eFOTG frozen soils list for the field to determine the Rainfall Erosion Index (R) value.
  - d. The Planner uses the FrozenSoils feature class to verify which survey area their field is in and then uses the list for that survey to determine the T and soil erodibility (K) factors for the PHEL soils in their field. The lists are available at eFOTG->Section II->HEL Frozen Soil Legends and Interpretations->HEL Soil Legends, K and T Factors for Frozen Soil Lists->K and T Factors and LS Table for Frozen Soil Surveys.
  - e. The Planner use the slope gradient and slope length measurements collected from the field to determine LS for each of the representative areas of PHEL soil using Table 3 from Agricultural Handbook 537 or the spreadsheet on eFOTG at eFOTG->Section II->HEL Frozen Soil Legends and Interpretations->HEL Soil Legends, K and T Factors for Frozen Soil Lists->K and T Factors and LS Table for Frozen Soil Surveys->LS Table to Calculate EI.xls.
  - f. The Planner determines EI by using the formula  $EI = RKLS/T$ .
    - i. If EI is equal to or greater than 8, the soil is HEL.
    - ii. If the result of the onsite reveals HEL soils makes up 33 1/3% or 50 acres of the field then the field is HEL.
7. The Planner and District Conservationist complete NRCS-CPA-026e and send it to FSA.
8. If field is HEL, the Planner develops a HEL compliance plan.
9. If field is not HEL, the Planner does not need to develop a compliance plan.

## Procedure for fields without an existing soil survey

It is imperative that all conservation Planners are familiar with the status of soil surveys within the state (Appendix A). When traveling to visit with potential clients where there is no existing NRCS soil survey, the Planner should discuss soil information related to planning and compliance while onsite in order to prevent additional trips for the sole purpose of collecting soils data.

1. The Planner should discuss basic operation with the producer prior to going to the field.  
**If the cropland area is greater than two acres, contact the State Resource Conservationist, as this procedure will not apply.**
2. The Planner should identify whether a soil survey is in progress prior to going to the field.
3. If a soil survey is in progress, work with the State Soil Scientist to determine if there is adequate information for an HEL determination.

4. If there is no soil survey in progress, or if the SSS determines there is not adequate information to use for an HEL determination, the Planner should proceed to step 5.
5. The Planner performs in-office pre-visit work to delineate possible field boundaries, land classifications and land uses.
6. The Planner travels to the field to collect planning, inventory and soils information.
7. The Planner collects field boundaries (most notably cropland) using GPS.
8. The Planner should fill out, at a minimum, all shaded areas of Appendix B.
  - a. The Planner should reference the Field Book for Describing and Sampling Soils for proper procedures.
  - b. The Planner must dig and describe a pit to for each area within the field that may be a different soil type.
  - c. The Planner should describe soil within the top 150 cm or to a root restricting layer, whichever is shallower.
9. When the Planner returns from the field they download the GPS information to verify applicant qualifies for this protocol (cropland is less than 2 acres).
10. The Planner sends the soils information to the State Soil Scientist (SSS), or designee, for review.
11. The SSS, or designee, determines whether or not it would be appropriate to make an HEL determination based on soil characteristics and nearby soil survey data.
12. The SSS, or designee, notifies the Planner whether or not a determination can be made, or the field should be included in the HEL deferred database.
  - a. If the SSS, or designee, makes a HEL determination, the Planner and DC completes the O26e, send it to FSA and proceed with planning.
  - b. If the SSS, or designee, defers the HEL determination, the Planner proceeds to step 13.
13. The Planner and DC complete the O26e, noting that there is no soil survey data available and making pertinent remarks related to the size of the operation, soil type, etc., and send it to FSA.
14. The Planner sends the field delineation GPS data and the following attributes to the GIS Specialist for inclusion in HEL backlog database.
  - a. Customer name
  - b. Planner name
  - c. Date of field visit
  - d. Field number
  - e. Acres
15. The Planner develops an interim HEL compliance plan based on general soil characteristics and site-specific management.
  - a. Best practices may include keeping ground cover when soil is not covered by plastic or frozen, planting perennial crops, cover crops, field width, field slope, etc.

## Planner/DC Responsibilities

1. The Planners must use the FrozenSoils GIS data to ensure they are using the correct soil survey for making HEL determinations.
2. The Planner must be comfortable evaluating basic soil characteristics to complete Appendix B in the field.
3. Once a deferral decision has been made by the SSS, the Planner will ensure fields have been sent to the State GIS Specialist for inclusion in the deferral database prior to proceeding with contract eligibility.

## GIS Specialist Responsibilities

1. The GIS Specialist will add deferred areas to the HEL backlog/Deferred database.
  - a. The database will be stored on the state office X drive at:  
X:\geodata\soils\HEL\HEL\_Deferred.gdb
  - b. Each feature will include
    - i. Customer name
    - ii. Planner name
    - iii. Date of field visit
    - iv. Field number
    - v. Acres

## State Soil Scientist Responsibilities

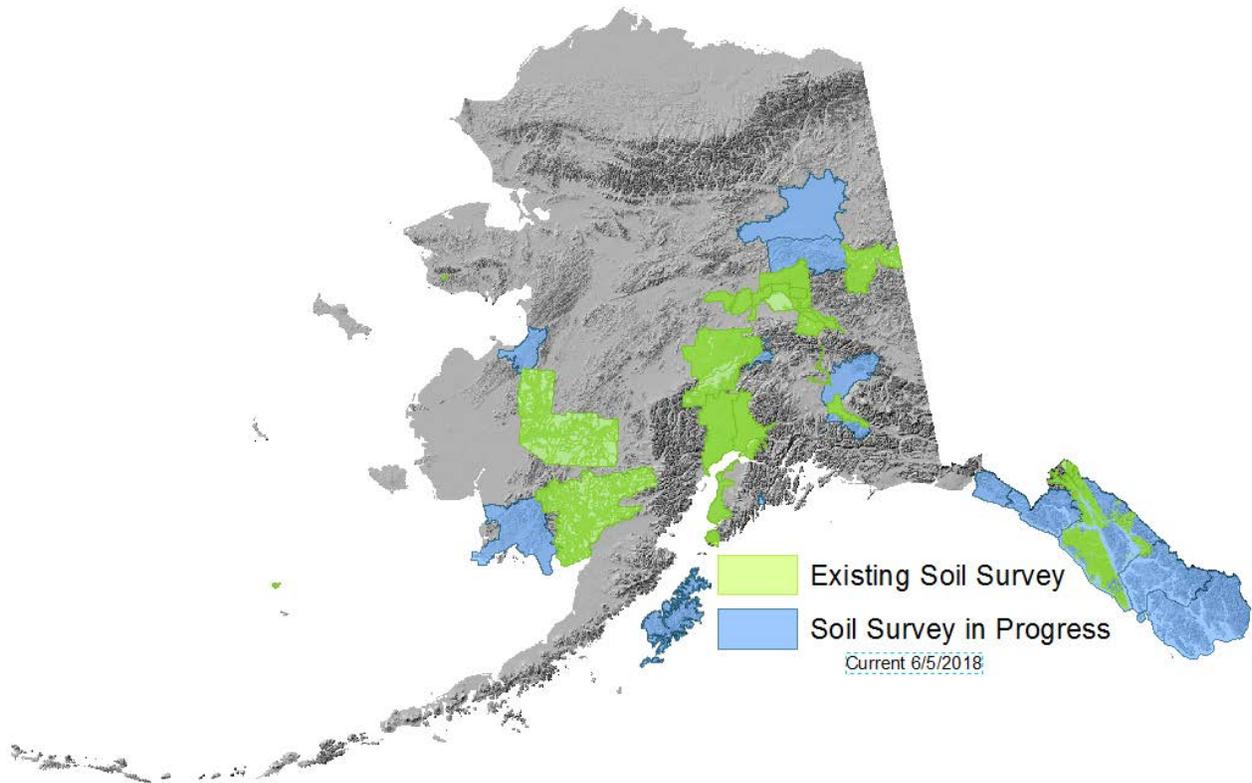
1. The SSS will coordinate with Soil Survey/MO staff regarding interim soil survey status and whether or not interim data is appropriate to use for HEL determinations.
2. The SSS will work with Planners to evaluate field data and determine if a representative soil can be used for a determination or if the field determination should be deferred until soil survey is complete.
3. The SSS will review the HEL\_Defferal database annually to determine whether or not there are overlaps between deferred HEL determinations and newly published soil surveys.
4. The SSS will complete HEL determinations for the deferred areas when a soil survey is available.

## State Resource Conservationist Responsibilities

1. The SRC will be responsible for developing procedures on a case-by-case basis for operations with greater than two acres of annually tilled crops that do not have an existing soil survey
2. The SRC will work with FSA to determine whether or not variances can be given for fields without HEL determinations if they meet the small acreage exemption (<2 acres cropland).

# Appendix A

## Soil Survey Status





## Appendix C - Clipping and calculating Procedures

1. Ensure the soils layer and CLU layer are in your table of contents
2. In the table of contents, right click on the CLU->Selection->Make this the only selectable layer
3. Use the select tool, and select the field within the CLU you want to evaluate
4. Right click the CLU layer in the Table of Contents->Selection->Create layer from selected features
5. On the ArcMap Toolbar, click on the ArcCatalog button
6. Navigate to, and open, the HEL toolbox from X:\geodata\soils\HEL\HEL.tbx
7. Double Click on the HEL\_percent model
8. Use the dropdown arrow to add your selection layer to the dialog box
9. Use the browse button to select an output location and name for the field soils data
10. Click OK

Open the output file from the table of contents and use the Percent field to continue with the

### Contact:

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Or

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