DOCUMENTATION REQUIREMENTS
Waste Storage Facility - 313

I. Reference Materials

The following is a list of reference materials useful in planning, design, and construction of a waste storage facility.

a. Engineering Field Manual, Chapters 2 (Estimating Runoff), 3 (Hydraulics), 6 (Structures), 9 (Diversions)
b. Supplement to Engineering Field Manual, Chapters 2 (Estimating Runoff), 3 (Hydraulics), Chapter 16 (Waterspreading)
c. Section IV Technical Guide, Practice Standard 313, Waste Storage Facility
d. North Dakota Construction & Material Specifications for Conservation Practices
e. North Dakota Hydrology Manual
f. NRCS – Ag Waste Handbook
g. Midwest Plan Service (MWPS) #18 – other MWPS Publications
h. Suitable Computer Software:

Watershed Hydrology (e.g. EFM2, EFH2, TR55)
Excel Spreadsheet Hydrology (e.g. ND-ENG-12e)
Excel Spreadsheet Yardage (e.g. ND-ENG-1e)
Structure Hydraulics (e.g. OHIO Program)
Pipe Hydraulics (e.g. ND PipeDesign)

II. Site Investigation/Data Collection

Use Forms ND-ENG-25, ND-ENG-17 or field notebooks for survey, layout, design, and checking as applicable.

The following is a list of items to be checked in the field:

a. Does proposed waste storage facility have a potential storage detention site? What is the downstream condition?
b. Determine the uncontrolled drainage area, average watershed slope, and weighted cover complex number.
c. Is there a spring or base flow condition through the area that will need to be controlled?
d. Determine if some or all of the watershed can be controlled by diversions.
e. Log soils in feedlot, storage area, anywhere manure will be in contact. Log soils in areas of structures (e.g. diversion, pond). Log borrow area(s) if needed.
f. Inventory animals, type of operation, additional water, bedding, time(s) of use, and similar questions. Use the ND State Health Department list titled “Information that needs to be included in Livestock Design Plans” as a guide.
g. Check for buried utilities, North Dakota ONE-CALL.
h. Determine engineering job class.

III. Design Surveys

a. Survey notes shall be kept in loose-leaf or bound field notebooks. The notes will be kept in a format similar to that shown in Technical Release 62 and Chapter I,

Engineering Field Manual. Electronic survey notes will be documented in a format that allows complete checking by others.

b. The surveyor will use sound professional judgement in gathering information for the design and construction of the waste facility. Information will be used to determine structure(s) locations, grades and estimated quantities. Survey detail will depend on complexity of the proposed system.

IV. Design Plans and Specifications

The design of a waste facility will be in accordance with Standard 313 Waste Facility, Section IV, Technical Guide. Individual structures and components will be designed in accordance with the appropriate standard for that feature (e.g. Diversion Standard 362).

a. Conduct hydrologic investigations for the required events (25 year - 24 hour minimum), if applicable. Determine storage feasibility and watershed/feedlot runoff, as applicable. Determine storage size using FORM ND-ENG 25, or equivalent. Document all decisions.

b. During this period the appropriate permit applications need to completed. Other Federal, State, and Local laws - rules - regulations will apply depending on specific features (e.g. Cultural, Historical, Endangered Species, Wetlands).

c. Determine type of waste facility to use based on topography, existing features, and landowner wishes. Complete design plans for dikes, diversions, storage structure(s), ditches, pipe and outlets, emergency spillways, etc.

d. At this point, it is recommended that the ND State Health Department be made aware of the proposed facility, on-site if possible, to ensure any questions or concerns are satisfied before final design proceeds. Such items as in-situ or compacted earth pond seepage rates, ground and surface waters, capacities, and waste management are a few of the more common pollution concerns.

e. Use applicable forms (e.g. ND-ENG-31, Peak Flow Data Sheet or ND-ENG-16, Dam Data Sheet), or equivalent, along with drawings. Electronic survey and computer design of features, computer output, and hand or CADD drawings will include adequate information for checking by others (design, quantities, etc.)

V. Material and Construction Requirements

Construction specifications are to be provided with each set of plans. The North Dakota Construction and Material Specification for Conservation Practices shall be used for each item of work and material, as applicable or available. Additional specifications may need to be written to provide full material and installation instructions. A cover sheet and list of specifications is to be provided with the specifications.

The cooperator, contractor, and the NRCS cooperator's file will be provided a set of construction plans and specifications. The plans can be shown on appropriately sized grid or plan/profile sheets.

The plans will contain, as a minimum, the following:

a. Overall Plan View. This may be superimposed on the location map. Show stationing, identify reaches, locate all structures.

b. Profile ditches, dikes, waste storage areas. Show original ground superimposed on design grade, stationing, reaches, etc. Centerline profiles are required.

c. Cross Sections - Show typical cross sections. Cross sections are required at all significant changes in original cross section shapes and grades to calculate quantities.

d. Construction Notes - Add notes to clarify or furnish direction for construction.

e. Quantities - Estimates based on earthwork cross sections and structural quantities.

f. Develop a waste management plan that meets the applicable ND Practice Standards (e.g. Waste Utilization 633, Nutrient Management 590) and ND State Health Department requirements.

g. Job Approval.

VI. Layout and Installation Procedures

Layout surveys will be recorded in loose-leaf or bound survey books. Set necessary stakes for at alignment, depth, width, and side slopes. Set grade stakes as needed. Survey notes will be kept in the format as shown in Chapter I - Engineering Field Manual and/or Technical Release 62. Electronic survey notes will be documented in a format to allow complete checking by others.

VII. Checkout

a. Compliance Checking - record in field notes. Take standard survey notes of dikes, ditches, and structures. If electronic equipment is used, the output must be readable by others and contain the information needed to verify quantities.

   (1) Record sufficient elevations and cross sections of each dike, diversion, storage, or other structures to verify adherence to design and specifications for final yardage computations. Check profiles, top and bottom elevations, sideslopes. Verify widths and depths.

   (2) Record elevations and dimensions of all practice components. Measure lengths and areas seeded.

   (3) Check all quantities, wall thicknesses, dimensions - all computations, using appropriate ND-ENG forms or alternate acceptable methods (e.g. computer generated double end-area earthwork quantities).

   (4) Qualified signature and date checked.

b. Statement of compliance on "as-built" plans - that construction is complete according to plans and specifications, and adequacy or status of vegetation and topsoil placement. Date and sign by individual making determination.