

Major Land Resource Area 052X

Brown Glaciated Plains

Accessed: 04/25/2024

Ecological site keys

Key Determination Key

I. LRU level climatic group ESDs

- A. Site occurs in a Typic moisture regime (13-17"MAP) ... Key 4 – MLRA 52X Moist Grassland LRU Key - Version 8.2
- B. Site occurs in an Aridic Ustic moisture regime (10-14" MAP)
 - 1 Sagebrush component is predominantly silver sagebrush ... Key 2 – MLRA 52X Dry Grassland LRU Key - Version 8.2
 - 2 Sagebrush component is predominantly Wyoming big sagebrush ... Key 3 – MLRA 52X Dry Shrubland LRU Key - Version 8.2

II. 2005 era RRU Legacy ESDs with plant tables and reference worksheets

- A. MLRA 52X Hill County and west, Central RRU ... Key 5 – MLRA 52X Legacy RRU Central Key
- B. MLRA 52X Blaine County and east, North RRU ... Key 6 – MLRA 52X Legacy RRU North Key

MLRA 52X Dry Grassland LRU Key - Version 8.2

A. Site Receives additional moisture either from groundwater (endosaturation) or from surface water (episaturation)

- 1a. Soil Saline ($EC \geq 4$) and/or Sodic ($SAR \geq 13$) within surface 4" (10 cm)
 - 2a. Water table < 24" (60 cm) soil poorly drained with long duration ponding, seasonal lake beds, depressions, & flats, vegetation sparse ... FX052X99X003 – Alkali Flat (Af)
 - 2b. Water table > 24" (60 cm); soil somewhat well drained to well drained
 - 3a. Seasonal high water table 24-40" (60-102 cm) from surface, soil somewhat well drained, usually endosaturation ... FX052X99X092 – Saline Subirrigated (Ssb)
 - 3b. Seasonal high water table > 40" (102 cm), soil well drained, usually episaturation ... FX052X99X091 – Saline Overflow (Sov)
- 1b. Soil neither saline nor sodic [$EC < 4$ and $SAR < 13$ within surface 4" (10 cm)]
 - 4a. Site is a closed depression with run in
 - 5a. Site receives water from groundwater discharge - accumulated salts moderate to high ... FX052X99X705 – Discharge Closed Depression (Cdr)
 - 5b. Site does not receive water from groundwater discharge - accumulated salts low ... FX052X99X071 – Recharge Closed Depression (Cdr)
 - 4b. Site is a swale, coulee, or riparian area
 - 6a. Site is located outside of the floodplain
 - 7a. Upland swales and coulees; herbaceous species and/or sagebrush dominate site ... FX052X01X062 – Swale (Se) Dry Grassland
 - 7b. Upland swales & coulees; woody species (chokecherry, serviceberry, green ash) dominate site ... FX052X02X756 – Woody Draw (Wd) Moist Grassland

6b. Site is located inside the floodplain

8a. Site Dominated by woody vegetation ... FX052X99X061 – Riparian Woodland (RW)

8b. Site dominated by herbaceous vegetation

9a. Receives additional moisture from surface water (episaturation) ... FX052X99X060 – Overflow (Ov)

9b. Receives additional moisture from groundwater (endosaturation), water table ≤ 40 " (102 cm)

10a. Seasonal high water table 24" to 40" (60-102 cm) ... FX052X99X150 – Subirrigated (Sb)

10b. Seasonal high water table < 24 " (60 cm) ... FX052X99X084 – Slough (SI)

B. Site does not receive additional effective moisture

1a. Soil saline and/or sodic within surface 20" (50 cm) or soils with natric or relic natric horizons.

2a. Massive, subangular blocky, or prismatic structure; effective rooting depth > 10 " (25 cm)

3a. Clay content $< 35\%$ in surface mineral 4" (10 cm) [able to make a ribbon < 2 " long] ... FX052X01X094 – Loamy Sodic (Losd) Dry Grassland

3b. Clay content $> 35\%$ in surface mineral 4" (10 cm) [able to make a ribbon > 2 " long] ... FX052X01X012 – Dense Clay Sodic (Dcsd) Dry Grassland

2b. Columnar structure, abrupt root or water restrictive clay layer present within 10" (25 cm) of soil surface

4a. 0"- 4" (0-10 cm) of surface over clay layer (evidenced by columnar structure)

5a. 1" (2.5 cm) or less of surface over clay layer (evidenced by columnar structure) ... FX052X01X145 – Panspot (Pn) Dry Grassland

5b. Greater than 1" (2.5 cm) of surface over clay layer (evidenced by columnar structure) ... FX052X01X165 – Thin Claypan (Tcp) Dry Grassland

4b. Greater than 4" (10 cm) of surface over clay layer (evidenced by columnar structure) ... FX052X01X006 – Claypan (Cp) Dry Grassland

1b. Soil neither saline nor sodic [EC < 4 and SAR < 13 within surface 20" (50 cm)]

6a. Coarse granular clay, site dominated by sandy vegetation (e.g. Prairie sandreed) ... FX052X01X007 – Coarse Clay (Coc) Dry Grassland

6b. Site not as above

7a. Soil pH < 5.6 in all parts below surface horizon, derived from acid shale parent material

8a. Soil moderately deep [20"-40" (50-102 cm)] $> 35\%$ clay - Future site concept Acid Clay (AcC) - go to 18

18aa. Slope $\geq 15\%$... FX052X01X005 – Clayey-Steep (Cystp) Dry Grassland

18bb. Slope $< 15\%$

19aa. Clay content $> 35\%$ to 45% in surface mineral 4" (10 cm) ... FX052X01X001 – Clayey (Cy) Dry Grassland

19bb. Clay content $> 45\%$ in surface mineral 4" (10 cm) ... FX052X01X010 – Dense Clay (DC) Dry Grassland

8b. Soil shallow or very shallow [less than 20" (50 cm)] $> 35\%$ clay - Future site concept Shallow Acid Clay (SwAcC) - see 11a Shallow Clay ... FX052X01X131 – Shallow Clay (Swc) Dry Grassland

7b. Soil pH ≥ 5.6 in all parts below surface horizon, derived from non-acid parent material

9a. Soils moderately deep or shallower [< 40 " (100 cm) deep to bedrock, lithic, or paralithic root restrictive layer]

10a. Clay content is $> 35\%$ in surface mineral 4" (10 cm) [ribbon > 2 " long]

11a. Soils shallow or very shallow [< 20 " (50 cm) deep to bedrock, lithic, or paralithic root restrictive layer] ... FX052X01X131 – Shallow Clay (Swc) Dry Grassland

11b. Soils moderately deep [≥ 20 " (50cm) to < 40 " (100cm) deep to bedrock, lithic, or paralithic root restrictive layer] - go to 18

18aaa. Slope $\geq 15\%$... FX052X01X005 – Clayey-Steep (Cystp) Dry Grassland

18bbb. Slope $< 15\%$

- 19aaa. Clay content > 35% to 45% in surface mineral 4" (10 cm) ... FX052X01X001 – Clayey (Cy) Dry Grassland
- 19bbb. Clay content > 45% in surface mineral 4" (10 cm) ... FX052X01X010 – Dense Clay (DC) Dry Grassland
- 10b. Clay content ≤ 35% in surface mineral 4" (10 cm) [ribbon < 2" long]
 - 12a. Soils weakly developed, typically lacking a mollic epipedon and argillic horizon ... FX052X01X160 – Thin Breaks (TB) Dry Grassland
 - 12b. Soils well developed, evidenced by features such as argillic horizons and/or a mollic epipedon - go to 20
 - 20aa. Strongly or violently effervescent in surface mineral 5" (12 cm), lime conc. increasing with depth.
 - 21aa. Slope < 15% ... FX052X01X030 – Limy (Ly) Dry Grassland
 - 21bb. Slope ≥ 15% ... FX052X01X029 – Limy-Steep (Lystp) Dry Grassland
 - 20bb. Not strongly or violently effervescent within surface mineral 5" (12 cm)
 - 22aa. Slope < 15% ... FX052X01X032 – Loamy (Lo) Dry Grassland
 - 22bb. Slope ≥ 15% ... FX052X01X040 – Loamy-Steep (Lostp) Dry Grassland
- 9b. Soils deep to very deep [≥ 40" (100 cm) deep to bedrock, lithic, or paralithic root restrictive layer]
 - 13a. Soil skeletal in surface 20" (50 cm) [≥ 35% rock fragments in most of the surface 20"]
 - 14a. Soil sandy-skeletal within 10 inches of the surface ... FX052X01X021 – Sandy Gravel (Sygr) Dry Grassland
 - 14b. Soil loamy-skeletal within 10 inches of the surface ... FX052X01X022 – Loamy Gravel (Logr) Dry Grassland
 - 13b. Soil not skeletal in surface 20" (50 cm) [< 35% rock fragments in most of the surface 20"]
 - 15a. Sandy textural family in surface mineral 4" (10 cm) - Future Site Concept Sands (Sa) - see 16a Sandy ... FX052X01X110 – Sandy (Sy) Dry Grassland
 - 15b. Coarse loamy or finer textural family in surface mineral 4" (10 cm)
 - 16a. Coarse loamy or coarse silty textural family in surface mineral 4" (10 cm) ... FX052X01X110 – Sandy (Sy) Dry Grassland
 - 16b. Fine loamy, fine silty or finer textural family in surface mineral 4" (10 cm)
 - 17a. Clay content is > 35% in surface mineral 4" (10 cm) [ribbon > 2" long]
 - 18a. Slope ≥ 15% ... FX052X01X005 – Clayey-Steep (Cystp) Dry Grassland
 - 18b. Slope < 15%
 - 19a. Clay content > 35% to 45% in surface mineral 4" (10 cm) ... FX052X01X001 – Clayey (Cy) Dry Grassland
 - 19b. Clay content > 45% in surface mineral 4" (10 cm) ... FX052X01X010 – Dense Clay (DC) Dry Grassland
 - 17b. Clay content ≤ 35% in surface mineral 4" (10 cm) [ribbon < 2" long]
 - 20a. Strongly or violently effervescent in surface mineral 5" (12 cm), lime conc. increasing with depth.
 - 21a. Slope < 15% ... FX052X01X030 – Limy (Ly) Dry Grassland
 - 21b. Slope ≥ 15% ... FX052X01X029 – Limy-Steep (Lystp) Dry Grassland
 - 20b. Not strongly or violently effervescent within surface mineral 5" (12 cm)
 - 22a. Slope < 15% ... FX052X01X032 – Loamy (Lo) Dry Grassland
 - 22b. Slope ≥ 15% ... FX052X01X040 – Loamy-Steep (Lostp) Dry Grassland

- A. Site Receives additional moisture either from groundwater (endosaturation) or from surface water (episaturation)
 - 1a. Soil Saline ($EC \geq 4$) and/or Sodic ($SAR \geq 13$) within surface 4" (10 cm)
 - 2a. Water table < 24" (60 cm) soil poorly drained with long duration ponding, seasonal lake beds, depressions, & flats, vegetation sparse ... FX052X99X003 – Alkali Flat (Af)
 - 2b. Water table > 24" (60 cm); soil somewhat well drained to well drained
 - 3a. Seasonal high water table 24-40" (60-102 cm) from surface, soil somewhat well drained, usually endosaturation ... FX052X99X092 – Saline Subirrigated (Ssb)
 - 3b. Seasonal high water table > 40" (102 cm), soil well drained, usually episaturation ... FX052X99X091 – Saline Overflow (Sov)
 - 1b. Soil neither saline nor sodic [$EC < 4$ and $SAR < 13$ within surface 4" (10 cm)]
 - 4a. Site is a closed depression with run in
 - 5a. Site receives water from groundwater discharge - accumulated salts moderate to high ... FX052X99X705 – Discharge Closed Depression (Cdr)
 - 5b. Site does not receive water from groundwater discharge - accumulated salts low ... FX052X99X071 – Recharge Closed Depression (Cdr)
 - 4b. Site is a swale, coulee, or riparian area
 - 6a. Site is located outside of the floodplain
 - 7a. Upland swales and coulees; herbaceous species and/or sagebrush dominate site ... FX052X03X062 – Swale (Se) Dry Shrubland
 - 7b. Upland swales & coulees; woody species (chokecherry, serviceberry, green ash) dominate site ... FX052X02X756 – Woody Draw (Wd) Moist Grassland
 - 6b. Site is located inside the floodplain
 - 8a. Site Dominated by woody vegetation ... FX052X99X061 – Riparian Woodland (RW)
 - 8b. Site dominated by herbaceous vegetation
 - 9a. Receives additional moisture from surface water (episaturation) ... FX052X99X060 – Overflow (Ov)
 - 9b. Receives additional moisture from groundwater (endosaturation), water table < 40" (102 cm)
 - 10a. Seasonal high water table 24" to 40" (60-102 cm) ... FX052X99X150 – Subirrigated (Sb)
 - 10b. Seasonal high water table < 24" (60 cm) ... FX052X99X084 – Slough (SI)
- B. Site does not receive additional effective moisture
 - 1a. Soil saline and/or sodic within surface 20" (50 cm) or soils with natric or relic natric horizons.
 - 2a. Massive, subangular blocky, or prismatic structure; effective rooting depth > 10" (25 cm)
 - 3a. Clay content < 35% in surface mineral 4" (10 cm) [able to make a ribbon < 2" long] ... FX052X03X094 – Loamy Sodic (Losd) Dry Shrubland
 - 3b. Clay content > 35% in surface mineral 4" (10 cm) [able to make a ribbon > 2" long] ... FX052X03X012 – Dense Clay Sodic (Dcsd) Dry Shrubland
 - 2b. Columnar structure, abrupt root or water restrictive clay layer present within 10" (25 cm) of soil surface
 - 4a. 0"- 4" (0-10 cm) of surface over clay layer (evidenced by columnar structure)
 - 5a. 1" (2.5 cm) or less of surface over clay layer (evidenced by columnar structure) ... FX052X03X145 – Panspot (Pn) Dry Shrubland
 - 5b. Greater than 1" (2.5 cm) of surface over clay layer (evidenced by columnar structure) ... FX052X03X165 – Thin Claypan (Tcp) Dry Shrubland
 - 4b. Greater than 4" (10 cm) of surface over clay layer (evidenced by columnar structure) ... FX052X03X006 – Claypan (Cp) Dry Shrubland
 - 1b. Soil neither saline nor sodic [$EC < 4$ and $SAR < 13$ within surface 20" (50 cm)]
 - 6a. Coarse granular clay, site dominated by sandy vegetation (e.g. Prairie sandreed) ... FX052X03X007 – Coarse Clay (Coc) Dry Shrubland

6b. Site not as above

7a. Soil pH < 5.6 in all parts below surface horizon, derived from acid shale parent material

8a. Soil moderately deep [20"-40" (50-102 cm)] > 35% clay - Future site concept Acid Clay (AcC) - go to 18

18aa. Slope ≥ 15% ... FX052X03X005 – Clayey-Steep (Cystp) Dry Shrubland

18bb. Slope < 15%

19aa. Clay content > 35% to 45% in surface mineral 4" (10 cm) ... FX052X03X001 – Clayey (Cy) Dry Shrubland

19bb. Clay content > 45% in surface mineral 4" (10 cm) ... FX052X03X010 – Dense Clay (DC) Dry Shrubland

8b. Soil shallow or very shallow [less than 20" (50 cm)] > 35% clay - Future site concept Shallow Acid Clay (SwAcC) - see 11a Shallow Clay ... FX052X03X131 – Shallow Clay (Swc) Dry Shrubland

7b. Soil pH ≥ 5.6 in all parts below surface horizon, derived from non-acid parent material

9a. Soils moderately deep or shallower [< 40" (100 cm) deep to bedrock, lithic, or paralithic root restrictive layer]

10a. Clay content is > 35% in surface mineral 4" (10 cm) [ribbon > 2" long]

11a. Soils shallow or very shallow [< 20" (50 cm) deep to bedrock, lithic, or paralithic root restrictive layer] ... FX052X03X131 – Shallow Clay (Swc) Dry Shrubland

11b. Soils moderately deep [≥ 20" (50cm) to < 40" (100cm) deep to bedrock, lithic, or paralithic root restrictive layer] - go to 18

18aaa. Slope ≥ 15% ... FX052X03X005 – Clayey-Steep (Cystp) Dry Shrubland

18bbb. Slope < 15%

19aaa. Clay content > 35% to 45% in surface mineral 4" (10 cm) ... FX052X03X001 – Clayey (Cy) Dry Shrubland

19bbb. Clay content > 45% in surface mineral 4" (10 cm) ... FX052X03X010 – Dense Clay (DC) Dry Shrubland

10b. Clay content ≤ 35% in surface mineral 4" (10 cm) [ribbon < 2" long]

12a. Soils weakly developed, typically lacking a mollic epipedon and argillic horizon ... FX052X03X160 – Thin Breaks (TB) Dry Shrubland

12b. Soils well developed, evidenced by features such as argillic horizons and/or a mollic epipedon - go to 20

20aa. Strongly or violently effervescent in surface mineral 5" (12 cm), lime conc. increasing with depth.

21aa. Slope < 15% ... FX052X03X030 – Limy (Ly) Dry Shrubland

21bb. Slope ≥ 15% ... FX052X03X029 – Limy-Steep (Lystp) Dry Shrubland

20bb. Not strongly or violently effervescent within surface mineral 5" (12 cm)

22aa. Slope < 15% ... FX052X03X032 – Loamy (Lo) Dry Shrubland

22bb. Slope ≥ 15% ... FX052X03X040 – Loamy-Steep (Lostp) Dry Shrubland

9b. Soils deep to very deep [≥ 40" (100 cm) deep to bedrock, lithic, or paralithic root restrictive layer]

13a. Soil skeletal in surface 20" (50 cm) [≥ 35% rock fragments in most of the surface 20"]

14a. Soil sandy-skeletal within 10 inches of the surface ... FX052X03X021 – Sandy Gravel (Sygr) Dry Shrubland

14b. Soil loamy-skeletal within 10 inches of the surface ... FX052X03X022 – Loamy Gravel (Logr) Dry Shrubland

13b. Soil not skeletal in surface 20" (50 cm) [< 35% rock fragments in most of the surface 20"]

15a. Sandy textural family in surface mineral 4" (10 cm) - Future Site Concept Sands (Sa) - see 16a Sandy ... FX052X03X110 – Sandy (Sy) Dry Shrubland

15b. Coarse loamy or finer textural family in surface mineral 4" (10 cm)

- 16a. Coarse loamy or coarse silty textural family in surface mineral 4" (10 cm) ...
FX052X03X110 – Sandy (Sy) Dry Shrubland
- 16b. Fine loamy, fine silty or finer textural family in surface mineral 4" (10 cm)
 - 17a. Clay content is > 35% in surface mineral 4" (10 cm) [ribbon > 2" long]
 - 18a. Slope ≥ 15% ... FX052X03X005 – Clayey-Steep (Cystp) Dry Shrubland
 - 18b. Slope < 15%
 - 19a. Clay content > 35% to 45% in surface mineral 4" (10 cm) ...
FX052X03X001 – Clayey (Cy) Dry Shrubland
 - 19b. Clay content > 45% in surface mineral 4" (10 cm) ... FX052X03X010 –
Dense Clay (DC) Dry Shrubland
 - 17b. Clay content ≤ 35% in surface mineral 4" (10 cm) [ribbon < 2" long]
 - 20a. Strongly or violently effervescent in surface mineral 5" (12 cm), lime conc.
increasing with depth.
 - 21a. Slope < 15% ... FX052X03X030 – Limy (Ly) Dry Shrubland
 - 21b. Slope ≥ 15% ... FX052X03X029 – Limy-Steep (Lystp) Dry Shrubland
 - 20b. Not strongly or violently effervescent within surface mineral 5" (12 cm)
 - 22a. Slope < 15% ... FX052X03X032 – Loamy (Lo) Dry Shrubland
 - 22b. Slope ≥ 15% ... FX052X03X040 – Loamy-Steep (Lostp) Dry Shrubland

MLRA 52X Moist Grassland LRU Key - Version 8.2

- A. Site Receives additional moisture either from groundwater (endosaturation) or from surface water (episaturation)
 - 1a. Soil Saline ($EC \geq 4$) and/or Sodic ($SAR \geq 13$) within surface 4" (10 cm)
 - 2a. Water table < 24" (60 cm) soil poorly drained with long duration ponding, seasonal lake beds,
depressions, & flats, vegetation sparse ... FX052X99X003 – Alkali Flat (Af)
 - 2b. Water table > 24" (60 cm); soil somewhat well drained to well drained
 - 3a. Seasonal high water table 24-40" (60-102 cm) from surface, soil somewhat well drained, usually
endosaturation ... FX052X99X092 – Saline Subirrigated (Ssb)
 - 3b. Seasonal high water table > 40" (102 cm), soil well drained, usually episaturation ... FX052X99X091
– Saline Overflow (Sov)
 - 1b. Soil neither saline nor sodic [$EC < 4$ and $SAR < 13$ within surface 4" (10 cm)]
 - 4a. Site is a closed depression with run in
 - 5a. Site receives water from groundwater discharge - accumulated salts moderate to high ...
FX052X99X705 – Discharge Closed Depression (Cdr)
 - 5b. Site does not receive water from groundwater discharge - accumulated salts low ... FX052X99X071
– Recharge Closed Depression (Cdr)
 - 4b. Site is a swale, coulee, or riparian area
 - 6a. Site is located outside of the floodplain
 - 7a. Upland swales and coulees; herbaceous species and/or sagebrush dominate site ...
FX052X02X062 – Swale (Se) Moist Grassland
 - 7b. Upland swales & coulees; woody species (chokecherry, serviceberry, green ash) dominate site ...
FX052X02X756 – Woody Draw (Wd) Moist Grassland
 - 6b. Site is located inside the floodplain
 - 8a. Site Dominated by woody vegetation ... FX052X99X061 – Riparian Woodland (RW)
 - 8b. Site dominated by herbaceous vegetation
 - 9a. Receives additional moisture from surface water (episaturation) ... FX052X99X060 –

Overflow (Ov)

9b. Receives additional moisture from groundwater (endosaturation), water table ≤ 40 " (102 cm)

10a. Seasonal high water table 24" to 40" (60-102 cm) ... FX052X99X150 – Subirrigated (Sb)

10b. Seasonal high water table < 24 " (60 cm) ... FX052X99X084 – Slough (SI)

B. Site does not receive additional effective moisture

1a. Soil saline and/or sodic within surface 20" (50 cm) or soils with natric or relic natric horizons.

2a. Abrupt root or water restrictive clay layer (evidenced by columnar structure), present within 4" (10 cm) of soil surface

3a. 1" (2.5 cm) or less of surface over clay layer (evidenced by columnar structure) ... FX052X02X145 – Panspot (Pn) Moist Grassland

3b. Greater than 1" (2.5 cm) of surface over clay layer (evidenced by columnar structure) ... FX052X02X165 – Thin Claypan (Tcp) Moist Grassland

2b. Abrupt root or water restrictive clay layer (evidenced by columnar structure), present between 4" and 10" (10-25 cm) of soil surface ... FX052X02X006 – Claypan (Cp) Moist Grassland

1b. Soil neither saline nor sodic [$EC < 4$ and $SAR < 13$ within surface 20" (50 cm)]

4a. Soil skeletal in surface 20" (50 cm) [$\geq 35\%$ rock fragments in most of the surface 20"]

5a. Soil sandy-skeletal within 10 inches of the surface ... FX052X02X021 – Sandy Gravel (Sygr) Moist Grassland

5b. Soil loamy-skeletal within 10 inches of the surface ... FX052X02X022 – Loamy Gravel (Logr) Moist Grassland

4b. Soil not skeletal in surface 20" (50 cm) [$< 35\%$ rock fragments in most of the surface 20"]

6a. Sandy textural family in surface mineral 4" (10 cm) - Future Site Concept Sands (Sa)* - use 16a Sandy ... FX052X02X110 – Sandy (Sy) Moist Grassland

6b. Coarse loamy or finer textural family in surface mineral 4" (10 cm)

7a Coarse loamy or coarse silty textural family in surface mineral 4" (10 cm) ... FX052X02X110 – Sandy (Sy) Moist Grassland

7b. Fine loamy, fine silty or finer textural family in surface mineral 4" (10 cm)

8a. Clay content is $> 35\%$ in surface mineral 4" (10 cm) [ribbon > 2 " long]

9a. Slope $> 15\%$... FX052X02X005 – Clayey-Steep (Cystp) Moist Grassland

9b. Slope $\leq 15\%$... FX052X02X001 – Clayey (Cy) Moist Grassland

8b. Clay content $\leq 35\%$ in surface mineral 4" (10 cm) [ribbon < 2 " long]

10a. Strongly or violently effervescent in surface mineral 5" (12 cm), lime conc. increasing with depth.

11a. Slope $< 15\%$... FX052X02X030 – Limy (Ly) Moist Grassland

11b. Slope $\geq 15\%$... FX052X02X029 – Limy-Steep (Lystp) Moist Grassland

10b. Not strongly or violently effervescent within surface mineral 5" (12 cm)

12a. 22a. Slope $< 15\%$... FX052X02X032 – Loamy (Lo) Moist Grassland

12b. 22b. Slope $\geq 15\%$... FX052X02X040 – Loamy-Steep (Lostp) Moist Grassland

MLRA 52X Legacy RRU Central Key

I. Site receives additional effective moisture¹

A. Soil saline ($EC > 4$ within surface 4")

1 Seasonal high water table ≥ 40 " from ground surface; salt tolerant plants dominate site; site regularly receives more than normal soil moisture because of run-in or stream overflow ... R052XC209MT – Saline Overflow (SOv) 10-14" p.z.

B. Site not as above

1 Seasonal high water table ≥ 40 " from ground surface; site regularly receives more than normal soil moisture because of run-in or stream overflow ... R052XC207MT – Overflow (Ov) 10-14" p.z.

2 Seasonal high water table < 40 " from ground surface ... R052XC218MT – Subirrigated (Sb) 10-14" p.z.

II. Site does not receive additional effective moisture¹

A. Soil saline or saline-sodic within surface 20" or soils with natric or relic natric horizons.

1 No columnar structure; site dominated by salt tolerant plants – Saline Upland (SU) ... R052XC210MT – Saline Upland (SU) 10-14" p.z.

2 Columnar structure present, abrupt root or water restrictive clay layer present within 8" of soil surface ... R052XC204MT – Claypan (Cp) 10-14" p.z.

B. Site not as above

2 Soils moderately deep, deep, or very deep (≥ 20 " deep to bedrock, lithic, or paralithic root restrictive layer)

i. Soil not skeletal within 20" of soil surface (averages $< 35\%$ rock fragments in the 10"-20" layer)

a. Slope $< 15\%$

2) Clay content is $< 32\%$ in surface mineral 4"

a) Coarse sandy loam to fine sandy loam texture within surface mineral 4" ... R052XC212MT – Sandy (Sy) 10-14" p.z.

b) Site not as above ... R052XC217MT – Silty (Si) 10-14" p.z.

3) Clay content is $> 32\%$ in surface mineral 4" of mineral soil (ribbon > 2 " long)

a) Soil 32% to 45% clay within surface mineral 4" ... R052XC205MT – Clayey (Cy) 10-14" p.z.

b) Soil $> 45\%$ clay within surface mineral 2" ... R052XC206MT – Dense Clay (DC) 10-14" p.z.

b. Slope $\geq 15\%$

2) Clay content is $< 32\%$ (ribbon < 2 " long) in surface mineral 4" ... R052XC223MT – Silty-Steep (SiStp) 10-14" p.z.

ii. Soil skeletal to within 20" of soil surface (averages $> 35\%$ rock fragments in the 10"-20" layer)

a. Sandy-skeletal within 10-20" of soil surface & typically consists of gravels and/or cobbles ... R052XC216MT – Shallow to Gravel (SwGr) 10-14" p.z.

1 Soils shallow to very shallow (< 20 " deep to bedrock, lithic, or paralithic root restrictive layer)

i. Clay content $< 32\%$ in surface mineral 4" (able to make a ribbon < 2 " long) ... R052XC214MT – Shallow (Sw) 10-14" p.z.

ii. Clay content $> 32\%$ in surface mineral 4" (ribbon length > 2 " long) ... R052XC215MT – Shallow Clay (SwC) 10-14" p.z.

MLRA 52X Legacy RRU North Key

I. Site receives additional effective moisture¹

A. Soil saline ($EC > 4$ within surface 4")

1 Seasonal high water table ≥ 40 " from ground surface; salt tolerant plants dominate site; site regularly receives more than normal soil moisture because of run-in or stream overflow ... R052XN171MT – Saline Overflow (SOv) 10-14" p.z.

B. Site not as above

1 Seasonal high water table ≥ 40 " from ground surface; site regularly receives more than normal soil moisture because of run-in or stream overflow ... R052XN166MT – Overflow (Ov) 10-14" p.z.

2 Seasonal high water table < 40 " from ground surface ... R052XN169MT – Subirrigated (Sb) 10-14" p.z.

II. Site does not receive additional effective moisture¹

A. Soil saline or saline-sodic within surface 20" or soils with natric or relic natric horizons.

1 No columnar structure; site dominated by salt tolerant plants – Saline Upland (SU) ... R052XN170MT – Saline Upland (SU) 10-14" p.z.

2 Columnar structure present, abrupt root or water restrictive clay layer present within 8" of soil surface ... R052XN086MT – Claypan (Cp) 10-14" p.z.

B. Site not as above

2 Soils moderately deep, deep, or very deep (≥ 20 " deep to bedrock, lithic, or paralithic root restrictive layer)

i. Soil not skeletal within 20" of soil surface (averages $< 35\%$ rock fragments in the 10"-20" layer)

a. Slope $< 15\%$

2) Clay content is $< 32\%$ in surface mineral 4" ... R052XN161MT – Silty (Si) 10-14" p.z.

3) Clay content is $> 32\%$ in surface mineral 4" of mineral soil (ribbon > 2 " long)

a) Soil 32% to 45% clay within surface mineral 4" ... R052XN162MT – Clayey (Cy) 10-14" p.z.

b) Soil $> 45\%$ clay within surface mineral 2" ... R052XN172MT – Dense Clay (DC) 10-14" p.z.

b. Slope $\geq 15\%$

1) Clay content is $> 32\%$ (ribbon > 2 " long) in surface mineral 4" ... R052XN164MT – Clayey-Steep (CyStp) 10-14" p.z.

2) Clay content is $< 32\%$ (ribbon < 2 " long) in surface mineral 4" ... R052XN168MT – Silty-Steep (SiStp) 10-14" p.z.

ii. Soil skeletal to within 20" of soil surface (averages $> 35\%$ rock fragments in the 10"-20" layer)

a. Sandy-skeletal within 10-20" of soil surface & typically consists of gravels and/or cobbles ... R052XN176MT – Shallow to Gravel (SwGr) 10-14" p.z.

1 Soils shallow to very shallow (< 20 " deep to bedrock, lithic, or paralithic root restrictive layer)

i. Clay content $< 32\%$ in surface mineral 4" (able to make a ribbon < 2 " long) ... R052XN178MT – Shallow (Sw) 10-14" p.z.

ii. Clay content $> 32\%$ in surface mineral 4" (ribbon length > 2 " long) ... R052XN179MT – Shallow Clay (SwC) 10-14" p.z.