FINAL
Thunder Basin Phase II Watershed Management Plan
Level I Watershed Study
Lance and Lightning Creek

Submitted to:
Wyoming Water Development Commission

Prepared by:
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In Association With:
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September 2011
Volume II

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STUDY AREA LOCATION
Thunder Basin LLC Watershed Management Plan
Level I Watershed Study
Converse and Niobrara Counties


DATE: August 8, 2011

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STUDY AREA LOCATION (Southwest Quadrant)
Thunder Basin LLC Watershed Management Plan
Level I Watershed Study
Converse and Niobrara Counties
ECOLOGICAL SITES

- CLAYEY (10-14NP)
- CLAYEY OVERFLOW (10-14NP)
- DENSE CLAY (10-14NP)
- LOAMY (10-14NP)
- LOAMY (12-17SP)
- LOAMY (15-17SP)
- SANDS (10-14NP)
- SANDS (15-17SP)
- SALINE LOWLAND (10-14NP)
- SALINE UPLAND (10-14NP)
- SHALLOWCLAYEY (10-14NP)
- SHALLOW LOAMY (10-14NP)
- ROCK OUTCROP
- SANDS (10-14NP)
- SANDS (15-17SP)
- SANDY (10-14NP)
- SANDY (12-17SP)
- SANDY (15-17SP)
- SHALE (10-14NP)
- SUBIRRIGATED (10-14NP)
- WATER
- LOWLAND (10-14NP)
- OVERFLOW (10-14NP)
- POROUS CLAY (10-14NP)
- SHALLOW SANDY (10-14NP)
- SHALLOW SANDY (15-17SP)
- SHALLOW SANDY (10-14NP)
- SHALLOW SANDY (15-17SP)


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Thunder Basin LLC Watershed Management Plan
Level I Watershed Study
Converse and Niobrara Counties
SURFICIAL GEOLOGY
Thunder Basin LLC Watershed Management Plan
Level I Watershed Study
Converse and Niobrara Counties

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LEGEND
Study Area
Counties
Cities
Major Streams
Major Waterbodies
Major Roads

Bedrock/Residuum/Mined
Mi: Mined areas
ri: Residuum mixed with alluvium and eolian
ki: Clinker
Ri: Bedrock

River valley deposits
ai: Alluvium w/ terrace and slopewash
tre: Shallow terrace deposits
rii: Terrace deposits
tdi: Dissected terrace deposits
fi: Alluvial fan

Upland deposits
ei: Eolian w/ scattered alluvium
bdi: Dissected bench
sci: Slopewash
bi: Bench

t Source: Streams, 2006, ESRI; Watershed, 2002, WYGISC; DEM, 2008, USGS
Rocks, 1997, TIGER; Counties, 2007, SDVC; Cities, 2006, ESRI;
Surficial Geology, 2002, WWDC

MAP
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SURFICIAL GEOLOGY
Thunder Basin LLC Watershed Management Plan
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Upland deposits
ei: Eolian w/ scattered alluvium
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sci: Slopewash
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Source: Streams, 2006, ESRI; Watershed, 2002, WYGISC; DEM, 2008, USGS
Rocks, 1997, TIGER; Counties, 2007, SDVC; Cities, 2006, ESRI;
Surficial Geology, 2002, WWDC

MAP
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There are no active or historic coal mines found within the watershed study area.
Irrigated Land Capability Classes

Water (1,864 ac)

- Soils have slight limitations that restrict their use.

Class I (0 ac)

- Soils have moderate limitations that reduce the choice of plants or require moderate conservation practices.

Class II (0 ac)

- Soils have severe limitations that reduce the choice of plants or require special conservation practices, or both.

Class III (339,480 ac)

- Soils have very severe limitations that reduce the choice of plants or require very careful management, or both.

Class IV (381,843 ac)

- Soils have life or no hazard of erosion but have other limitations, impractical to remove, that limit their use mainly to pasture, range, forestland, or wildlife food and cover.

Class V (1,533 ac)

- Soils have severe limitations that make them generally unsuited to cultivation and that limit their use mainly to pasture, range, forestland, or wildlife food and cover.

Class VI (217,280 ac)

- Soils have very severe limitations that make them generally unsuited to cultivation and that limit their use mainly to grazing, forestland, or wildlife.

Class VII (614,615 ac)

- Soils have very severe limitations that make them unsuited to cultivation and that limit their use mainly to grazing, forestland, or wildlife.

Class VIII (15,650 ac)

- Soils and miscellaneous areas have limitations that preclude their use for commercial plant production and limit their use to recreation, wildlife, or water supply or for aesthetic purposes.

Source: Streams, 2006, ESRI; Watershed, 2002, WYGISC; DEM, 2008, USGS;
Roads, 1997, TIGER; Counties, 2007, SDVC; Cities, 2006, ESRI;
Watershed Boundaries, 2005, USGS

IRRIGATED LAND CAPABILITY CLASSES
Thunder Basin LLC Watershed Management Plan
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Legend:
- Study Area
- Counties
- Cities
- Major Streams
- Major Waterbodies
- Major Roads
POTENTIAL SURFACE WATER STORAGE SITES
Thunder Basin LLC Watershed Management Plan
Level I Watershed Study
Converse and Niobrara Counties

PROJECT: 010-1333
DRAWN BY: RD
DATE: August 8, 2011

LEGEND
- Study Area
- Counties
- Cities
- Major Roads
- Major Streams
- Existing Dam
- Potential Dam Centerline
- 100 Year Pool Boundary

Source: Streams, 2006, ESRI; Watershed, 2002, WYGISC; DEM, 2008, LROS2; Roads, 1997, TIGER; Counties, 2007, SDVC; Cities, 2006, ESRI; 2.75 0 5.5 8.25 Miles 1:348,480
Hammell Ranch

Install new storage area, dam and outlet structure

Permit #: P83093W
Uses: DOM, STO
Depth: 45 feet
Yield: 20 gpm
Applicant: GERALD MICHAEL & LINDA L. KANE

Project: 010-1333
Drawn by: RD


1 inch equals 1,000 feet

DATE: September 12, 2011

Hammeell Ranch

Thunder Basin L&LC Watershed Management Plan
Level I Watershed Study
Converse and Niobrara Counties
Field to be irrigated with proposed pumping system

Proposed pump pit area

Permit #: P40992W
Uses: DOM
Depth: 100 feet
Yield: 6 gpm
Applicant: ANNA (FLOYD) WILKISON

JENSEN RANCH
Thunder Basin L&LC Watershed Management Plan
Level I Watershed Study
Converse and Niobrara Counties

1 inch equals 500 feet
Permit #: P19881P
Uses: STO
Depth: 110 feet
Yield: 4 gpm
Applicant: WILLIAM D. & BETTY L. WEISS

Permit #: P12742P
Uses: STO
Depth: 1 feet
Yield: 4 gpm
Applicant: USDA FOREST SERVICE

Permit #: P14080P
Uses: STO
Depth: 348 feet
Yield: 4 gpm
Applicant: WILLIAM D. & BETTY L. WEISS

Permit #: P2826W
Uses: STO
Depth: 245 feet
Yield: 10 gpm
Applicant: W. A. STODDARD

Permit #: P8953P
Uses: STO
Depth: 395 feet
Yield: 4 gpm
Applicant: USDA FOREST SERVICE

Permit #: P12734P
Uses: STO
Depth: 141 feet
Yield: 4 gpm
Applicant: U.S.A. FOREST SERVICE

Permit #: P12735P
Uses: STO
Depth: -1 feet
Yield: 4 gpm
Applicant: U.S.A. FOREST SERVICE

Permit #: P14082P
Uses: STO
Depth: 110 feet
Yield: 4 gpm
Applicant: WILLIAM D. & BETTY L. WEISS

Permit #: P21566P
Uses: STO
Depth: 160 feet
Yield: 7 gpm
Applicant: JAKE JOHNSON, INC.

Permit #: P21565P
Uses: STO
Depth: 170 feet
Yield: 7 gpm
Applicant: JAKE JOHNSON, INC.

Permit #: P6976P
Uses: STO
Depth: 170 feet
Yield: 4 gpm
Applicant: USDA FOREST SERVICE

Permit #: P14060P
Uses: STO
Depth: 348 feet
Yield: 4 gpm
Applicant: WILLIAM D. & BETTY L. WEISS

Permit #: P6953P
Uses: STO
Depth: 395 feet
Yield: 4 gpm
Applicant: USDA FOREST SERVICE

Permit #: P28642P
Uses: STO
Depth: 450 feet
Yield: 7 gpm
Applicant: JAKE JOHNSON, INC.

Permit #: P28842P
Uses: STO
Depth: 450 feet
Yield: 7 gpm
Applicant: JAKE JOHNSON, INC.

Permit #: P21566P
Uses: STO
Depth: 160 feet
Yield: 7 gpm
Applicant: JAKE JOHNSON, INC.
Re-establish dam and spillway, install new outlet structure

Proposed dike improvements

Existing irrigated field 64.4 acres

Install new storage area, dam and outlet structure

Remove sediment from existing storage area
Install new storage area, dam and outlet structure
Install new storage area, dam and outlet structure

Snyder Ranch

Project: 010-1333
Drawn by: RD

DATE: September 12, 2011

1 inch equals 1,000 feet
CURRENT WATER DEVELOPMENT PROJECTS
Thunder Basin LLC Watershed Management Plan
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