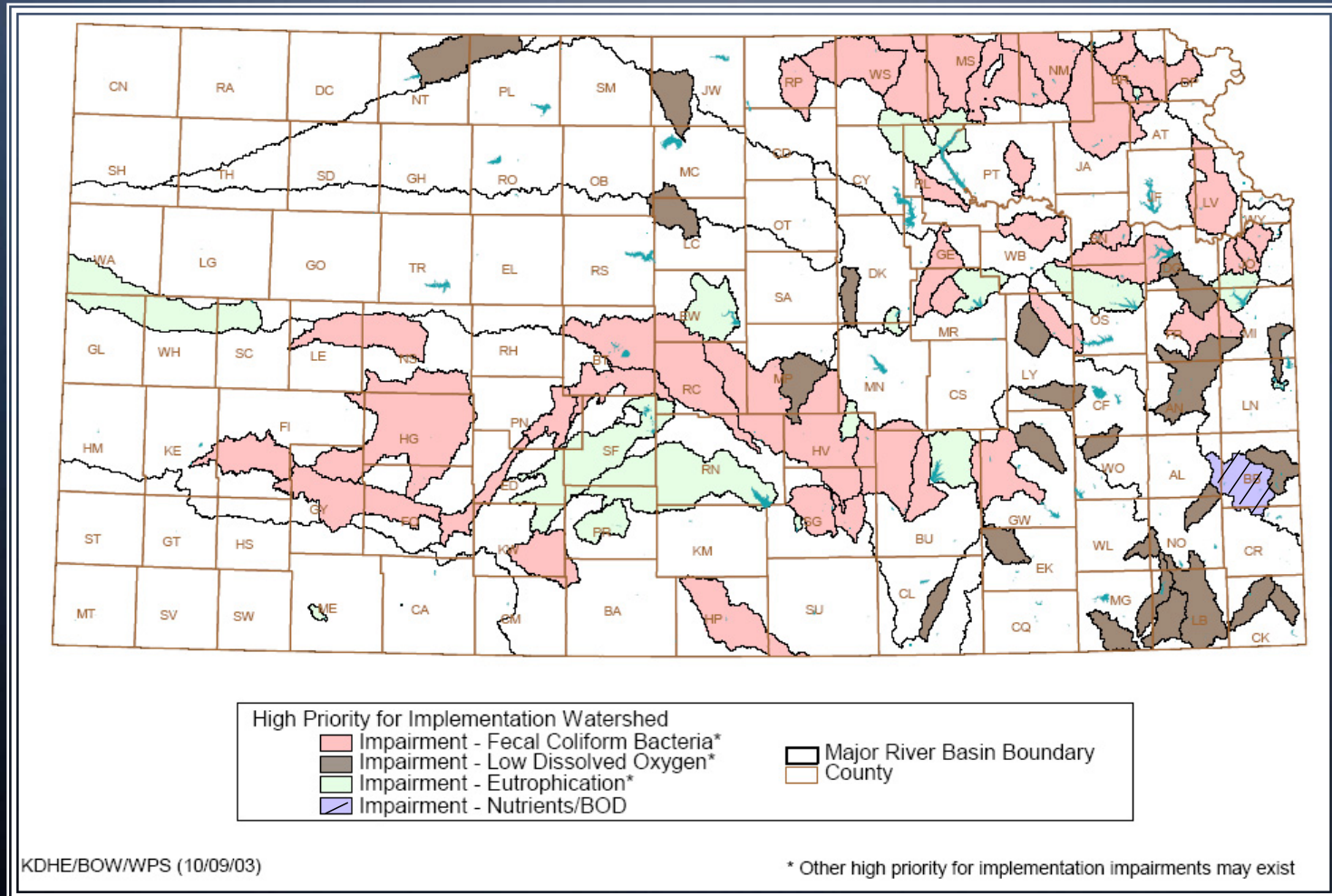


# Implementing Management Practices to Reduce Pollution Potential Contributed to Livestock Waste



# High Priority Watershed TMDLs in Kansas



# Overall Objective

In high priority watersheds in Kansas:

- Abatement of nonpoint sources of fecal coliform (*E. coli*) contamination
- Improve water quality through adoption of best management practices by livestock producers, farmers, homeowners, and landowners

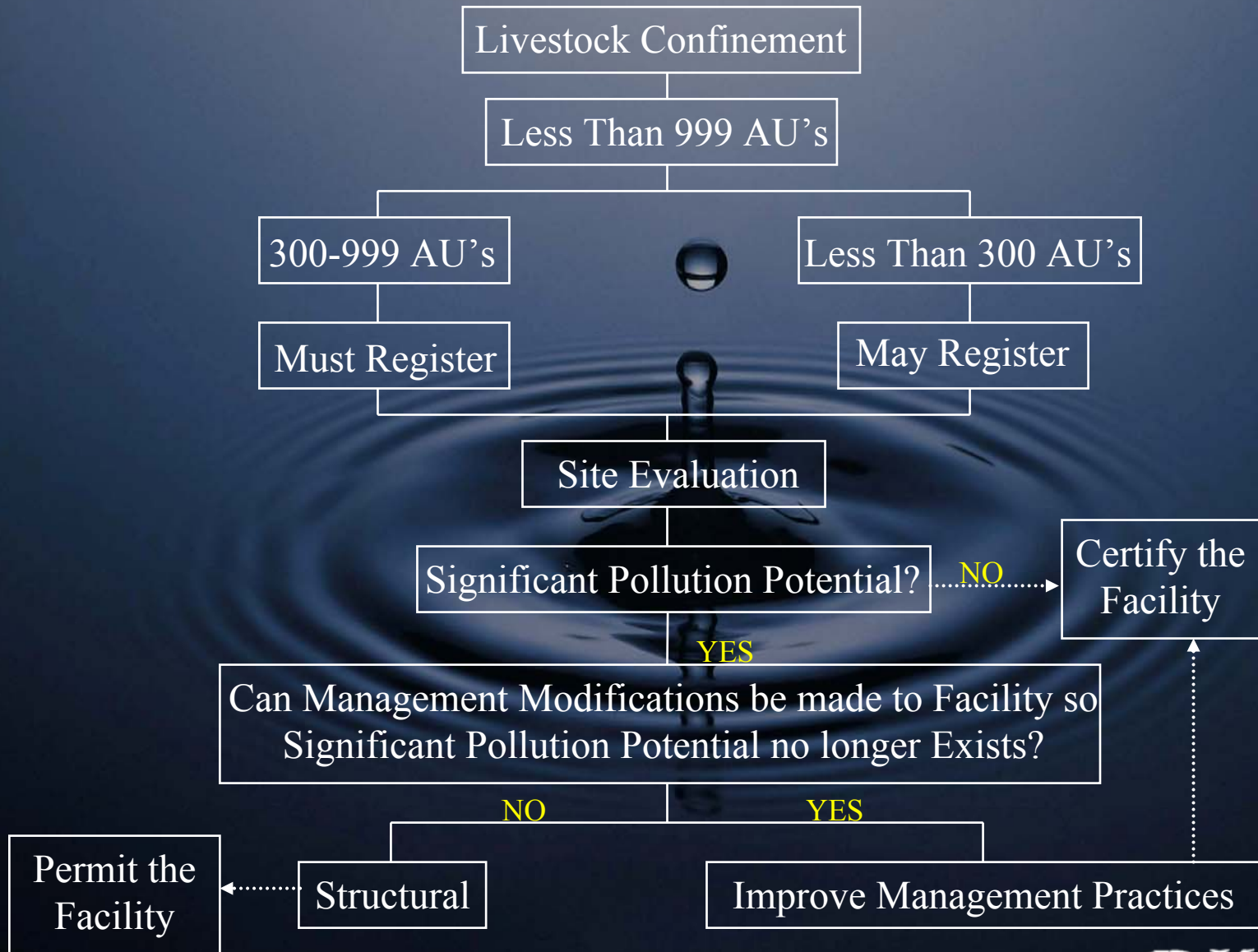
# Potential Sources of Fecal Coliform Bacteria

- Humans
  - Sewer outfalls and septic tank drainage
- Pets and Wildlife
  - Stormwater runoff
  - Runoff into streams and lakes
- Livestock
  - Effluents from food processing plants
  - Runoff from feedlots and grazinglands

# Implementing Best Management Practices on Livestock Facilities

- Integrate voluntary compliance of TMDL issues with state regulations addressing Confined Animal Feeding Operations (CAFOs)
- Work with producers to assess livestock facilities

# Facility Compliance Process



# Site Assessment Factors

- Number of animals
- Pen slope
- Slope below pen
- Distance to surface water
- Months of use
- Soil type below pen
- Buffer type and size
- Extraneous drainage
- Annual rainfall
- Rainfall intensity
- Depth to groundwater
- Distance to down gradient well

# Other Assessment Issues

- Distance to rural water line
  - Must be 25 ft. away
- Distance to nearest neighbor
  - Must be  $\frac{1}{4}$  mile or obtain releases on  $\geq 300$  AUs
- Distance to property line
  - Must be 100 ft away
- Animal waste stockpile
- Land available to apply nutrients



# Factors that can be Influenced

- Number and/or size of animals
- Distance to stream
- Months of use
- Buffer type
- Buffer size
- Extraneous drainage

**Livestock Waste Management Program**  
 Determination of Significant Pollution Potential Worksheet

Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Address: \_\_\_\_\_ Permit: \_\_\_\_\_  
 City/State/Zip: \_\_\_\_\_ Site No.: \_\_\_\_\_  
 Location S-T-R: \_\_\_\_\_ Inspector: \_\_\_\_\_ Title: \_\_\_\_\_

**Section B**

1. Capacity (AU's)

< 50	1	
50 - 100	2	
100 - 500	3	
500 - 700	4	
700 - 999	5	

2. Pen Slope

< 1%	1	
1 - 2%	2	
2 - 3%	3	
3 - 4%	4	
4 - 5%	5	
> 5%	6	

3. Slope from pens to protected water body

< 1%	1	
1 - 2%	2	
2 - 3%	3	
3 - 4%	4	
4 - 5%	5	
> 5%	6	

4. Distance, pens to protected water body

< 50'	1	
50' - 525'	2	
525' - 1000'	3	
1000' - 2640'	4	
2640' - 10000'	5	
10000' - 100000'	6	
100000' - 500000'	7	
500000' - 1000000'	8	
> 1000000'	9	

5. Utilization

Clay	1	
Silty Clay	2	
Silt	3	
Silty Sand	4	
Sand	5	

6. Soils between pens and water body

< 3'	1	
3 - 4'	2	
4 - 6'	3	
> 6'	4	

7. Buffer

Dense cover of grass	1	
Grass with woody plants	2	
Cultivated crop ground	3	
Bare earth	4	

8. Buffer Size

> 2 x Pen Area	1	
1 - 2 x Pen Area	2	
0.5 - 1 x Pen Area	3	
< 0.5 x Pen Area	4	

9. Extraneous Drainage

< 1 x Pen Area	1	
1 - 3 x Pen Area	2	
3 - 5 x Pen Area	3	
> 5 x Pen Area	4	

10. Annual Rainfall

< 20"	1	
20 - 25"	2	
25 - 30"	3	
30 - 35"	4	
35 - 40"	5	
> 40"	6	

11. Rainfall Intensity (25-Yr, 24-Hr. Storm)

< 4.0"	1	
4.0 - 5"	2	
5.0 - 5.5"	3	
5.5 - 6"	4	
6 - 6.5"	5	
> 6.5"	6	

Section B Total: 0

**Section A**

Permit Required

1. Over 1000 AU's, meets NPDES definition, or 300 AU's and discharges through a manmade device	Yes/No
2. Has one or more lagoons, pits, or tanks for waste storage through or adjacent to pipes	Yes/No
3. Has a permit, intermittent or ephemeral stream	Yes/No
4. Uses improper waste collection, handling, or disposal	Yes/No
5. Has a daily discharge	Yes/No

Additional Comments: \_\_\_\_\_

**Section C**

1. Capacity (AU's)

< 50	1	
50 - 100	2	
100 - 500	3	
500 - 700	4	
700 - 999	5	

2. Annual Rainfall

< 20"	1	
20 - 25"	2	
25 - 30"	3	
30 - 35"	4	
35 - 40"	5	
> 40"	6	

3. Depth to groundwater

> 100'	1	
25 - 100'	2	
10 - 25'	3	
5 - 10'	4	
< 5'	5	

4. Soils receiving runoff

Clay	1	
Silty Clay	2	
Silt	3	
Silty Sand	4	
Sand	5	

5. Distance to nearest well (water, gas, oil) potentially impacted (down gradient)

200' - 600'	1	
100' - 200'	2	
50' - 100'	3	
0 - 50'	4	
< 50'	5	

Section C Total: 0

**Section D**

Special Conditions

1. Springs, seeps, rock outcrops in pens or direct runoff area	Yes/No
2. Located in sensitive groundwater area	Yes/No
3. Is the protected water body an Outstanding Natural Resource or Special Aquatic Life Use Surface Water?	Yes/No

**Section E**

Evaluation

1. Section A - any "Yes" answer requires controls	
2. Section B - sum of risk values > 60 is a significant risk	
3. Section C - sum of risk values > 60 is a significant risk	
4. Section D - sum of risk values > 60 is a significant risk	
5. Section E - any "Yes" answer requires controls	

# Livestock Waste Management Program

## Determination of Significant Pollution Potential Worksheet

Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Address: \_\_\_\_\_ Permit: \_\_\_\_\_  
 City/State/Zip: \_\_\_\_\_ Site No.: \_\_\_\_\_  
 Location S-T-R: \_\_\_\_\_  
 Inspector: \_\_\_\_\_ Title: \_\_\_\_\_

Additional Comments:  
 KDNE has final determination on SPP assessment. Their results may vary from this assessment.

Section B	Surface Water Protection	Comments														
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Section B Total: 0

Section A	Permit Required	Yes/No
1.	Over 1,000 AU's, meets NPDES definition, or 300 AU's and discharges through a manmade device	
2.	Has one or more lagoons, pits, or tanks for waste storage	
3.	Has a potential intermittent or ephemeral stream through	
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Section C	Groundwater														
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## Capacity (AU's)

< 50	1
50 - 100	3
100 - 300	5
300 - 500	7
500 - 700	8
700 - 999	9

Section D	Special Conditions	Yes/No
1.	Springs, seeps, rock outcrops in pens or direct runoff areas	
2.	Located in sensitive groundwater area	
3.	Is the protected water body an Outstanding Natural Resource or Special Aquatic Life Use Surface Water?	

- Section E Evaluation**
- Section A - any "yes" answer requires controls and a permit.
  - Section B - Sum of risk values > 60 is a significant pollution potential which requires controls and a permit or modification for operations.
  - Section C - Sum of risk values > 25 is a significant pollution potential which requires controls and a permit or modification for operations.
  - Section D -
    - If D1 or D2 is "yes" and groundwater Potential is > 20, a permit is required.
    - If D3 is "yes" and Surface Water Potential is > 50, a permit is required.
  - Section E - If facility evaluation does not require a permit, the facility is eligible for certification. Prior to the certification, the inspector shall review all applicable separation distances for final eligibility determination.

# Livestock Waste Management Program

## Determination of Significant Pollution Potential Worksheet

Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Address: \_\_\_\_\_ Permit: \_\_\_\_\_  
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## Distance, pens to protected water body

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# Livestock Waste Management Program

## Determination of Significant Pollution Potential Worksheet

Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Address: \_\_\_\_\_ Permit: \_\_\_\_\_  
 City/State/Zip: \_\_\_\_\_ Site No.: \_\_\_\_\_  
 Location S-T-R: \_\_\_\_\_  
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## Utilization - months

< 3

1

3 - 4

4

4 - 6

6

> 7

9

# Livestock Waste Management Program

## Determination of Significant Pollution Potential Worksheet

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5.	Has a	

Section C	Groundwater
1. Capacity (AU's)	
2. Annual Rainfall	
3. Depth to groundwater	
4. Soils receiving runoff	
5. Distance to nearest	

Section D	Special Conditions	Yes/No
1.	Springs, seeps, rock outcrops in pens or direct runoff area	
2.	Located in sensitive groundwater area	
3.	Is the protected water body an Outstanding Natural Resource or Special Aquatic Life Use Surface Water?	

**Section E Evaluation**

- Section A - any "yes" answer requires controls and a permit.
- Section B - Sum of risk values > 60 is a significant pollution potential which requires controls and a permit or modification for operations.
- Section C - Sum of risk values > 25 is a significant pollution potential which requires controls and a permit or modification for operations.
- Section D -
  - e. If D1 or D2 is "yes" and groundwater Potential is > 20, a permit is required.
  - f. If D3 is "yes" and Surface Water Potential is > 50, a permit is required.
- Section E - If facility evaluation does not require a permit, the facility is eligible for certification. Prior to the certification, the inspector shall review all applicable separation distances for final eligibility determination.

### Buffer Type

- Dense cover of grass 1
- Grass with woody plants 4
- Cultivated crop ground 6
- Bare ground 10

# Livestock Waste Management Program

## Determination of Significant Pollution Potential Worksheet

Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Address: \_\_\_\_\_ Permit: \_\_\_\_\_  
 City/State/Zip: \_\_\_\_\_ Site No.: \_\_\_\_\_  
 Location S-T-R: \_\_\_\_\_  
 Inspector: \_\_\_\_\_ Title: \_\_\_\_\_

Additional Comments:  
 KDNE has final determination on SPP assessment. Their results may vary from this assessment.

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## Buffer Size

- > 2 x Pen Area 1
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# Livestock Waste Management Program

## Determination of Significant Pollution Potential Worksheet

Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Address: \_\_\_\_\_ Permit: \_\_\_\_\_  
 City/State/Zip: \_\_\_\_\_ Site No.: \_\_\_\_\_  
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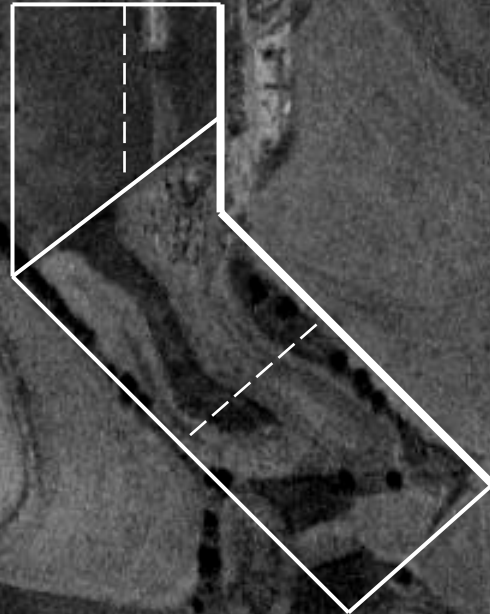
**Section E Evaluation**

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## Extraneous Drainage

< 1 x Pen Area	1
1 - 3 x Pen Area	4
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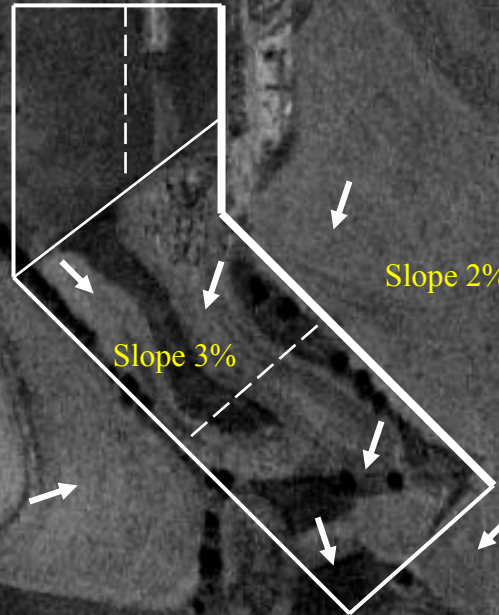
# BMP Plan





# BMP Plan

Extraneous Drainage  
Buffer size  
Buffer type  
Animal size



Ephemeral Stream

# BMP Plan

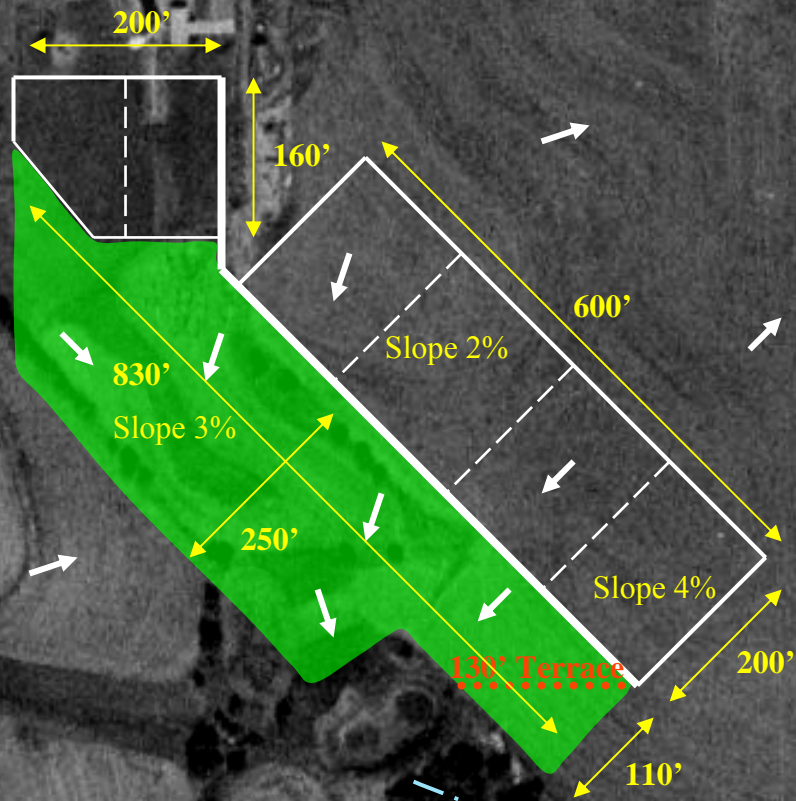


# BMP Plan



Ephemeral Stream

# BMP Plan



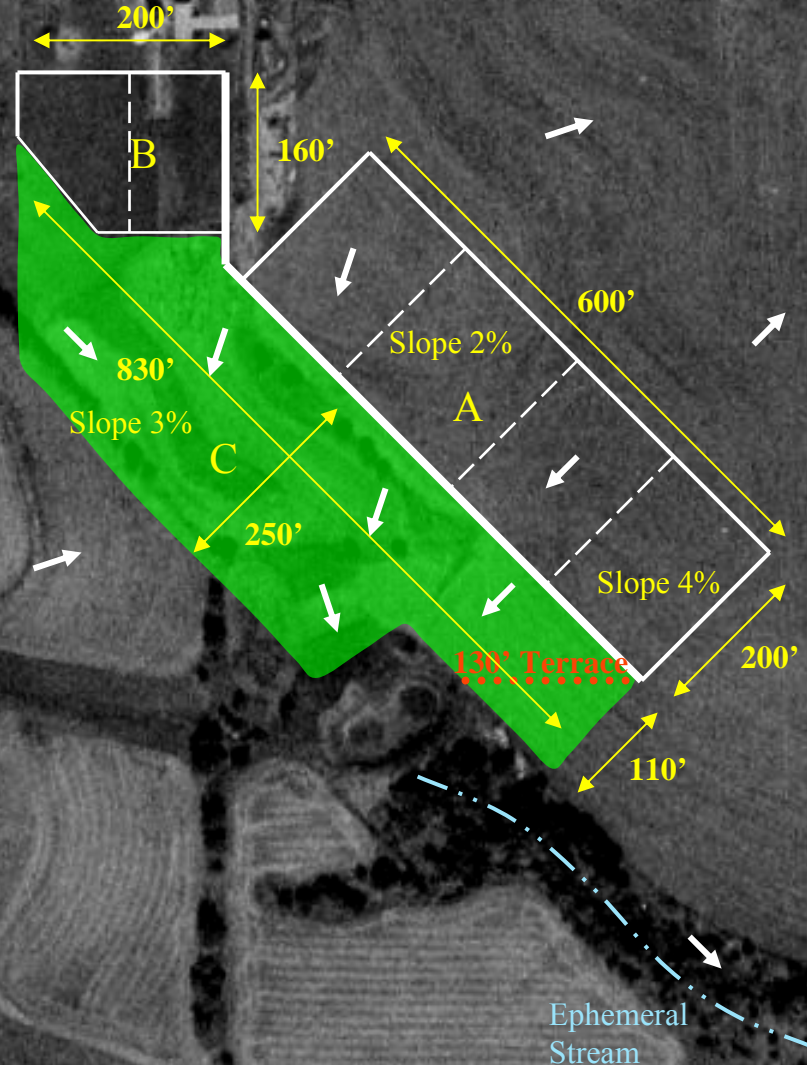
Ephemeral Stream

# BMP Plan

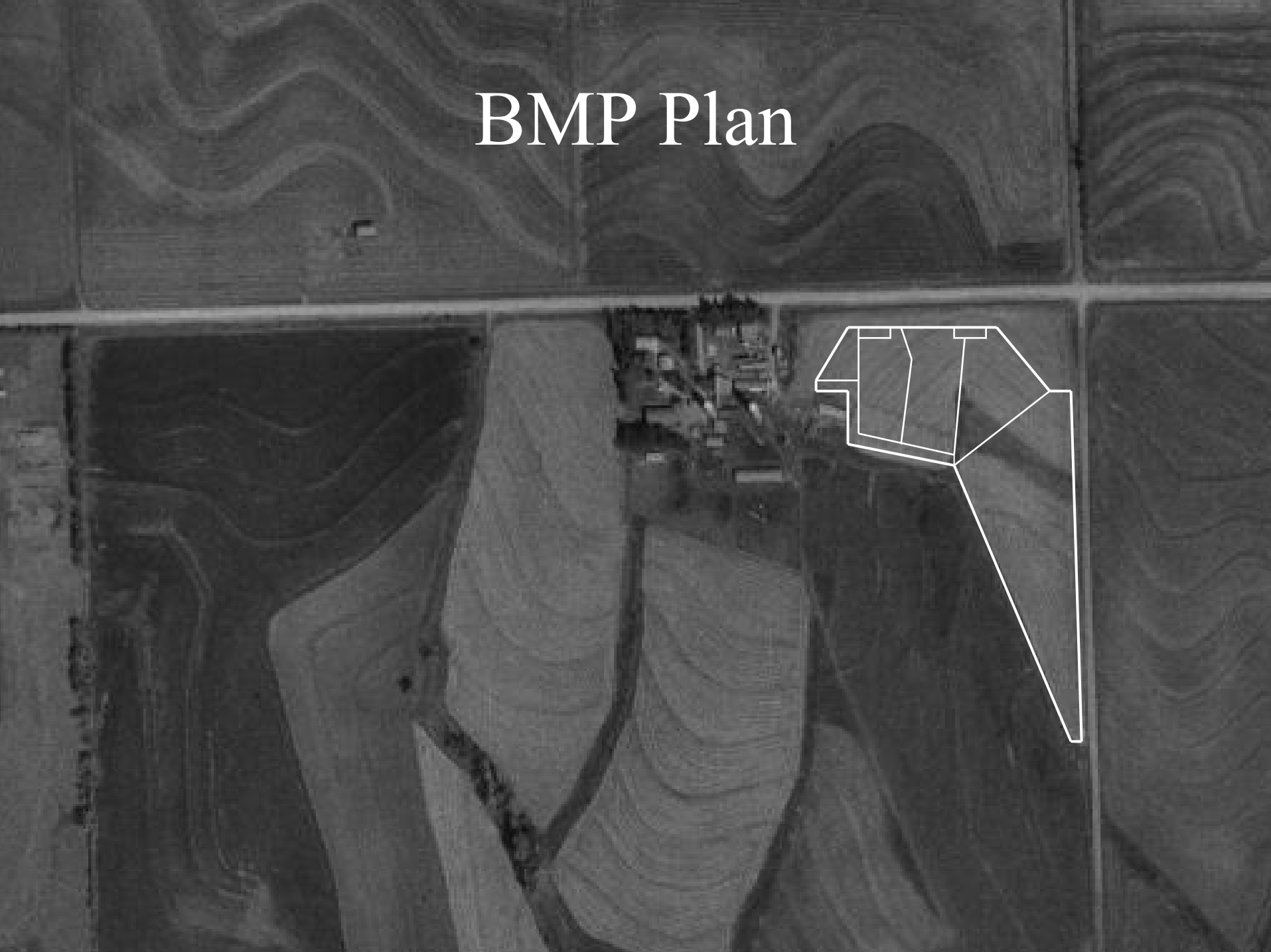
A- New feeding pens, 200'x600' divided into 4 pens, 150'x200'. Will hold 400 head total under 700#. There will be a 10' alley at the bottom of the pens connecting to existing pens. The slope of the pens is 2% on the north and 4% on the south.

B- Existing 2 pens, with west pen shorten, used for accumulating and conditioning (together 60'x200'). Will hold 75 head under 700#.

C- Old feeding pens, ditch and 50' west of ditch planted to brome grass. The maximum length is 830' with the main body being 660'. 250' at the widest and 110' at the narrowest on the south. The slope average is 3% east to west and 3% north to south. Will put in a 130' terrace to flow back from south end. Flow from the brome grass will enter old pond. The distance to the perennial stream is over ¼ mile.

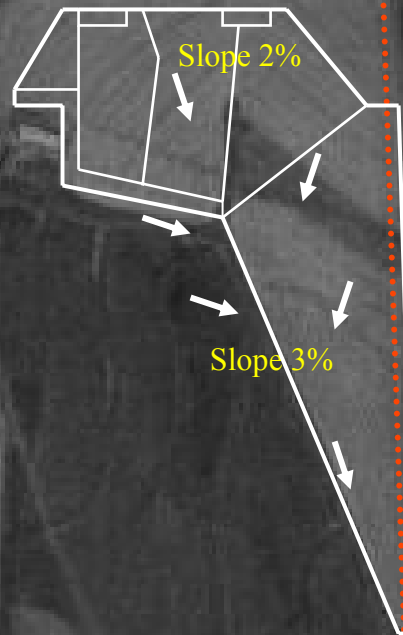


# BMP Plan



# BMP Plan

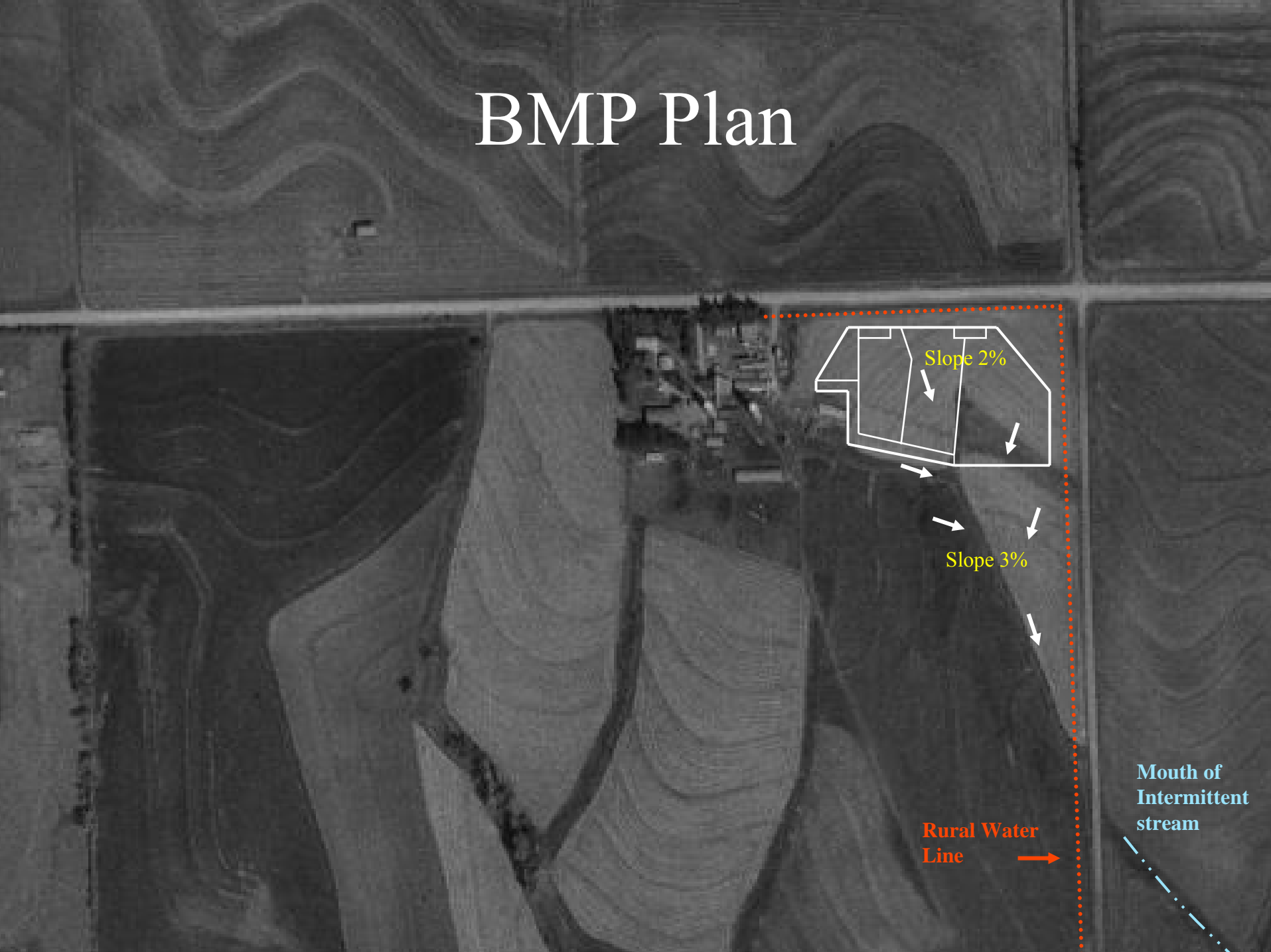
Buffer Size  
Buffer Type  
Number of Months



Rural Water  
Line →

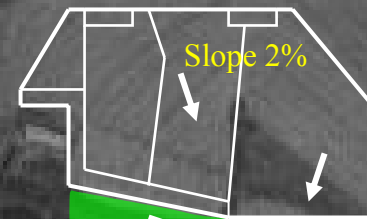
Mouth of  
Intermittent  
stream

# BMP Plan





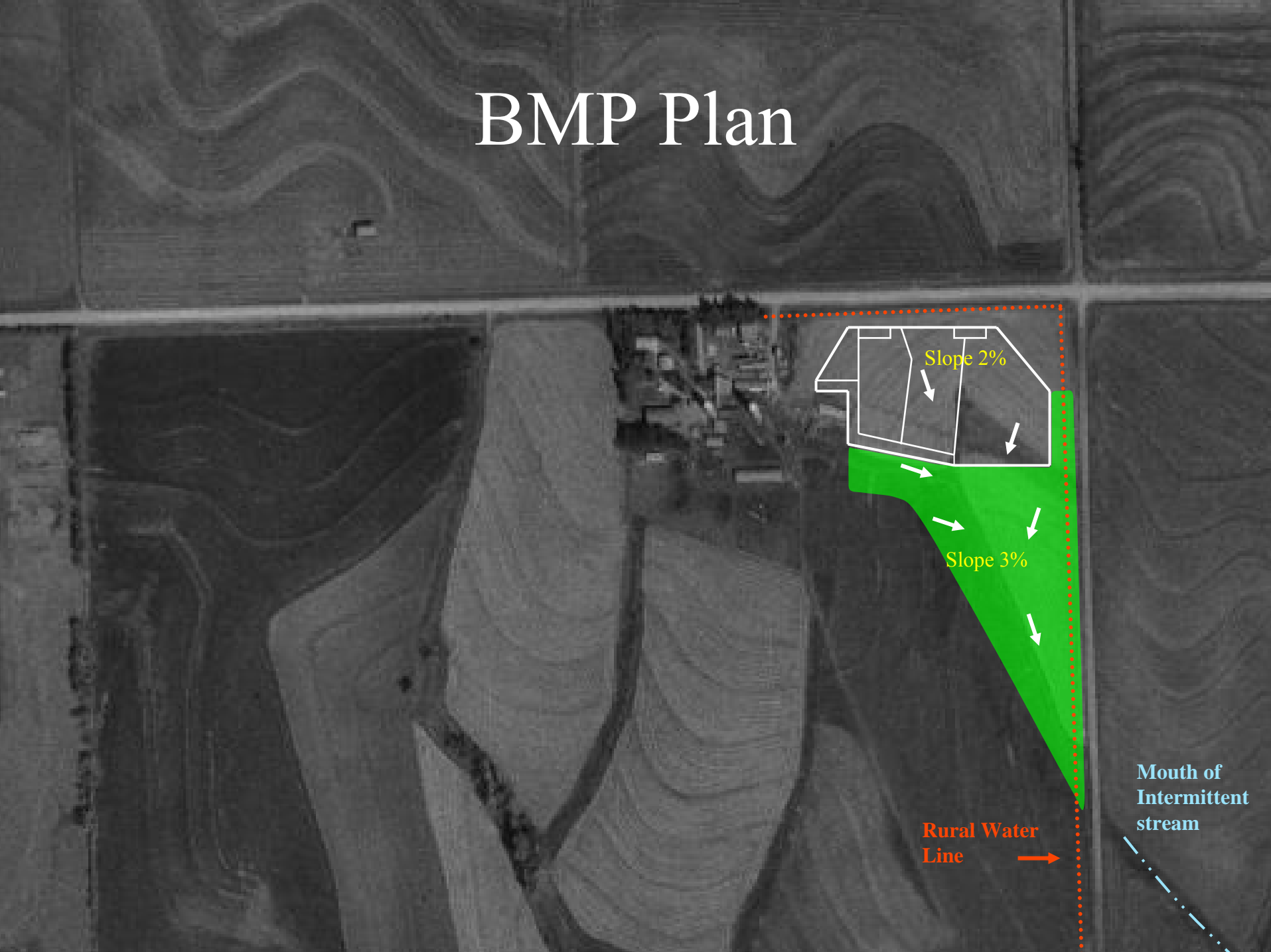
# BMP Plan



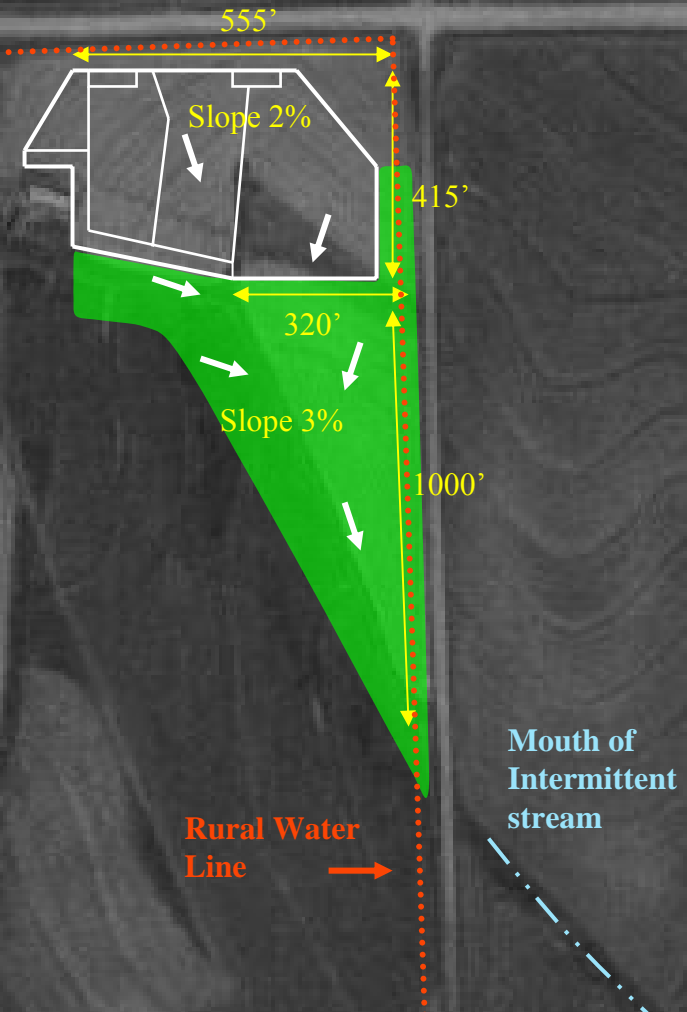
Slope 3%

Rural Water  
Line →

Mouth of  
Intermittent  
stream



# BMP Plan



# BMP Plan

Confined feeding area used about 6 months each year, feeding 90 animal units.

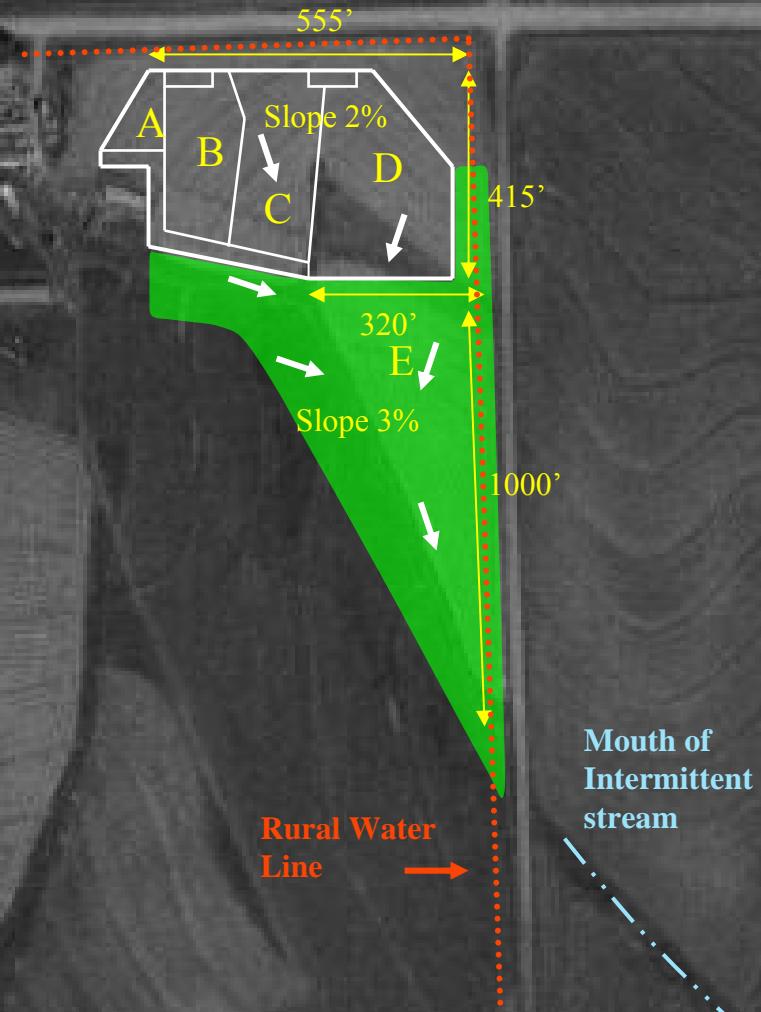
A – Utility lot

B – Lot is approximately 120' X 220' used to feed 40 head > 700#.

C – Lot is approximately 135' X 260' used to feed 40 head < 700#.

D – Lot is approximately 240' X 315' used to feed 60 head < 700#. Lot is a set back 100' west of road.

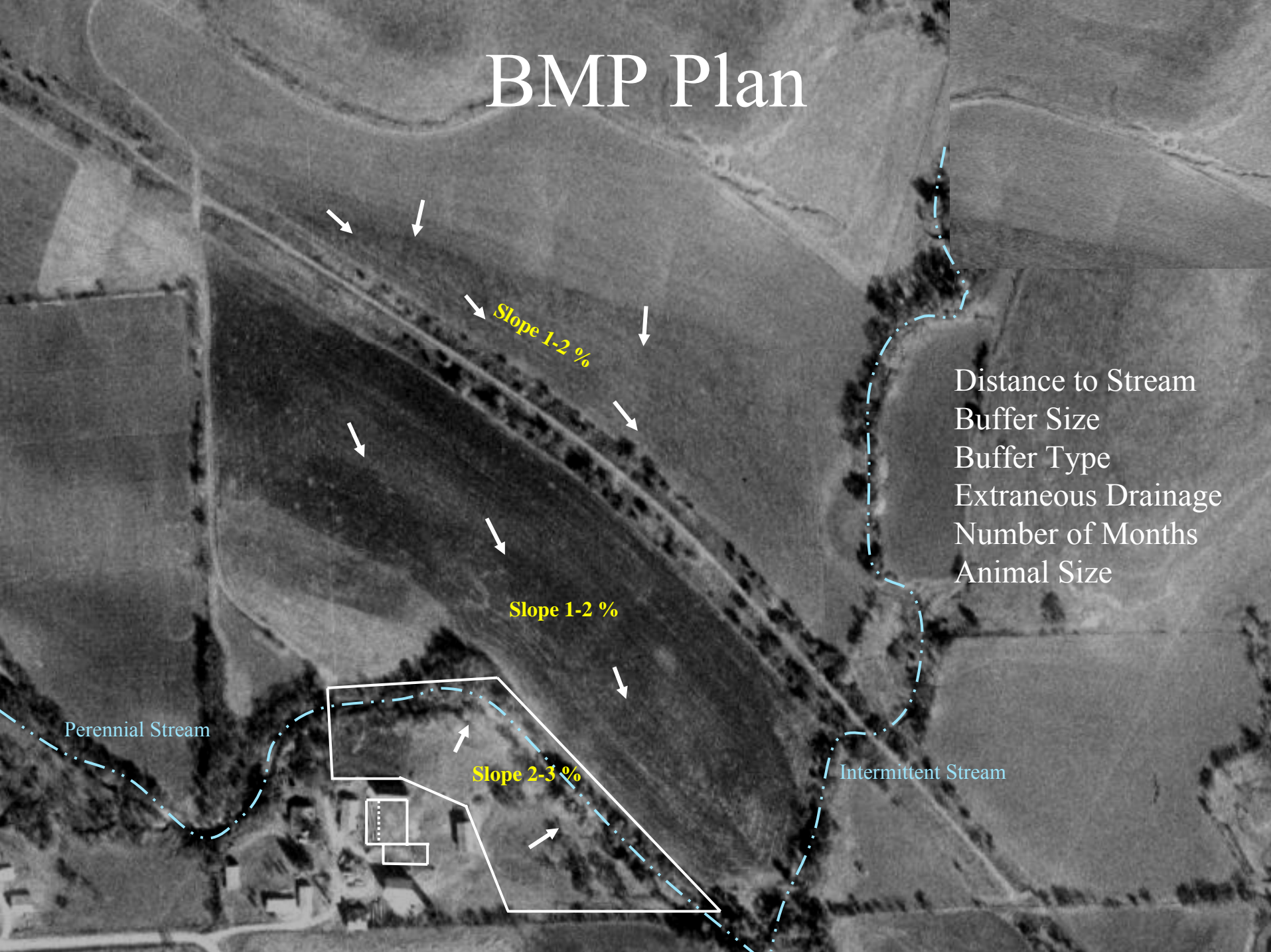
E – Previous feeding area will be abandoned and planted to brome grass.



# BMP Plan



# BMP Plan



- Distance to Stream
- Buffer Size
- Buffer Type
- Extraneous Drainage
- Number of Months
- Animal Size

Perennial Stream

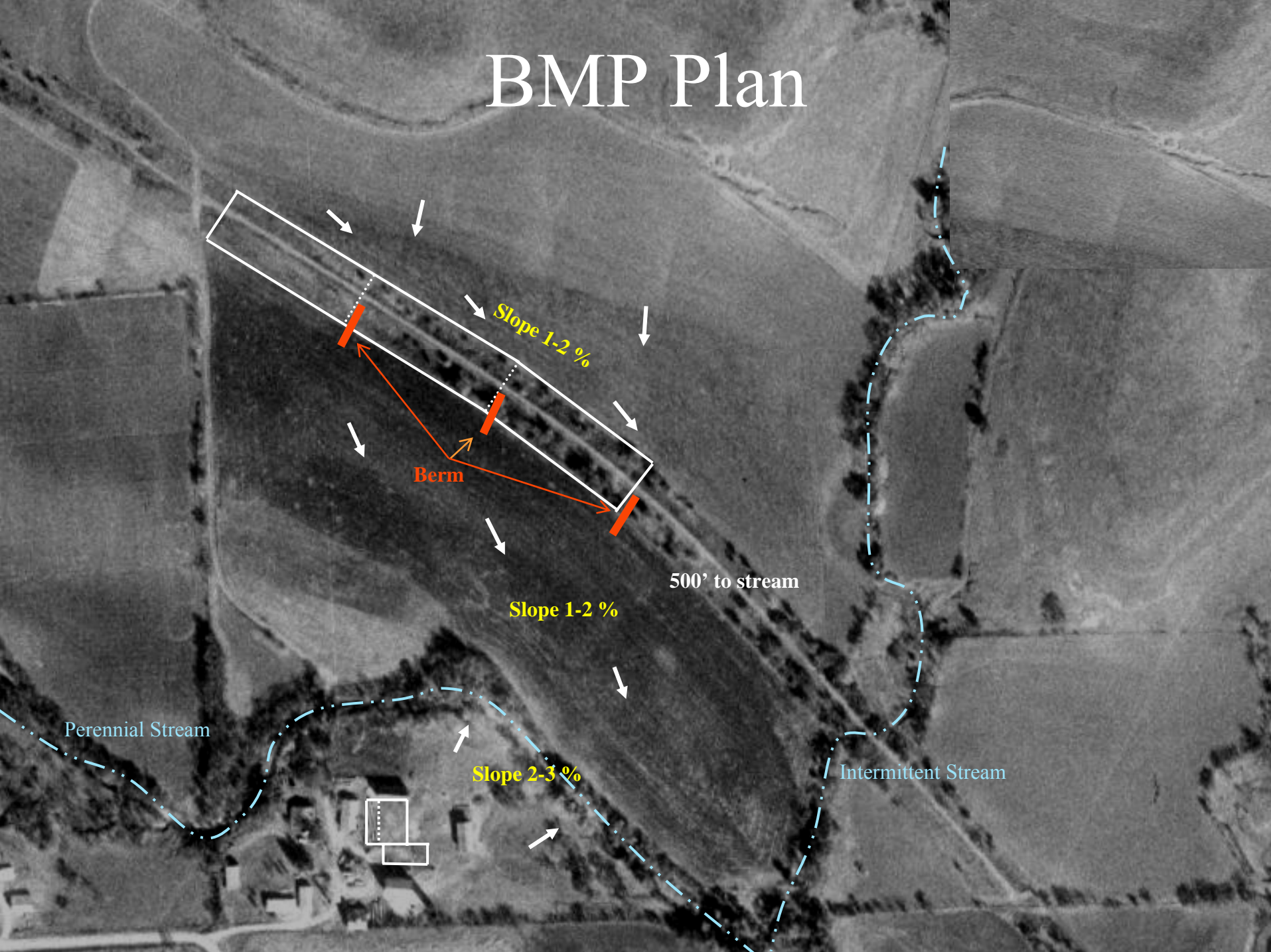
Intermittent Stream

Slope 1-2 %

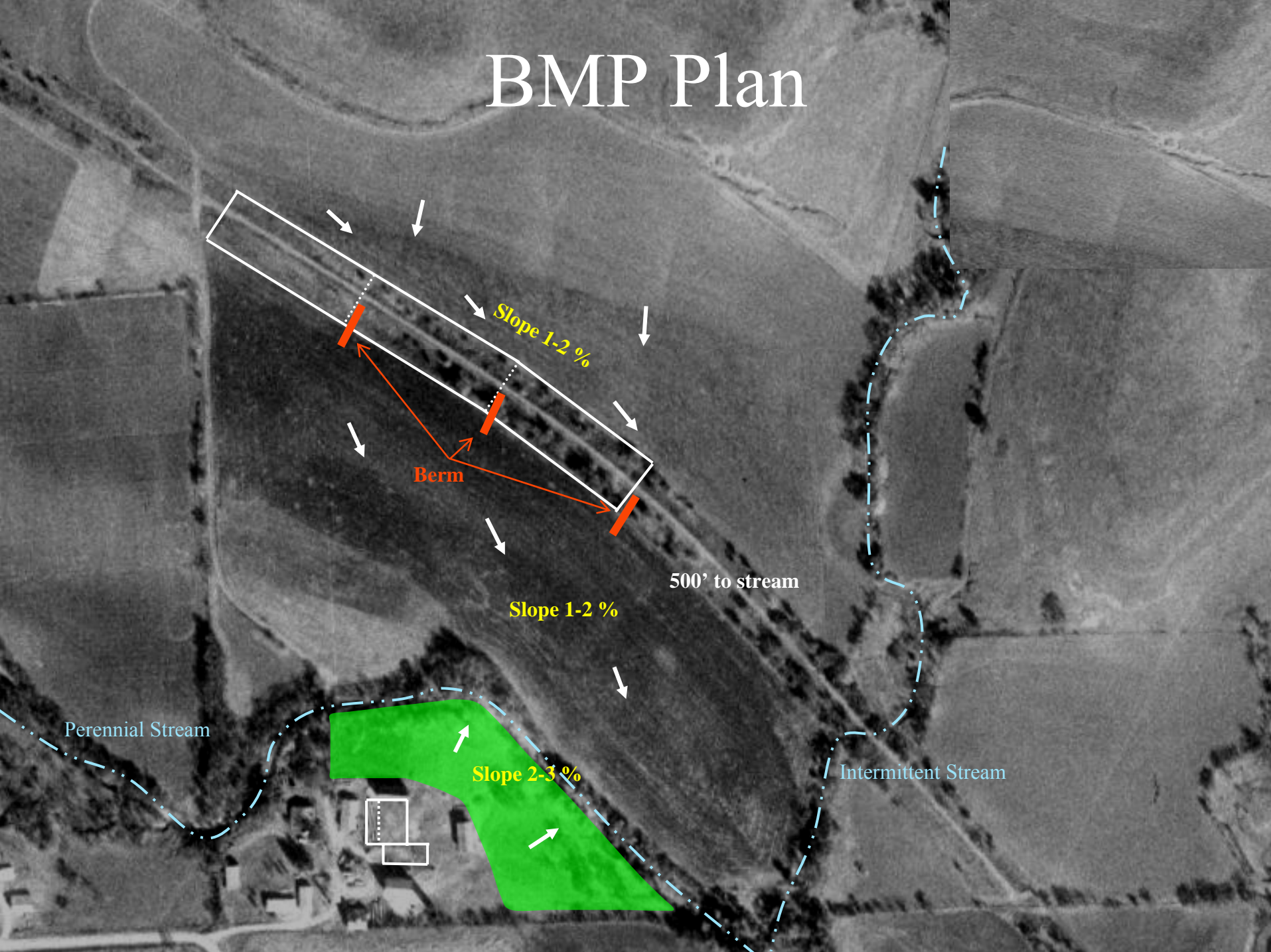
Slope 1-2 %

Slope 2-3 %

# BMP Plan



# BMP Plan



Slope 1-2 %

Berm

500' to stream

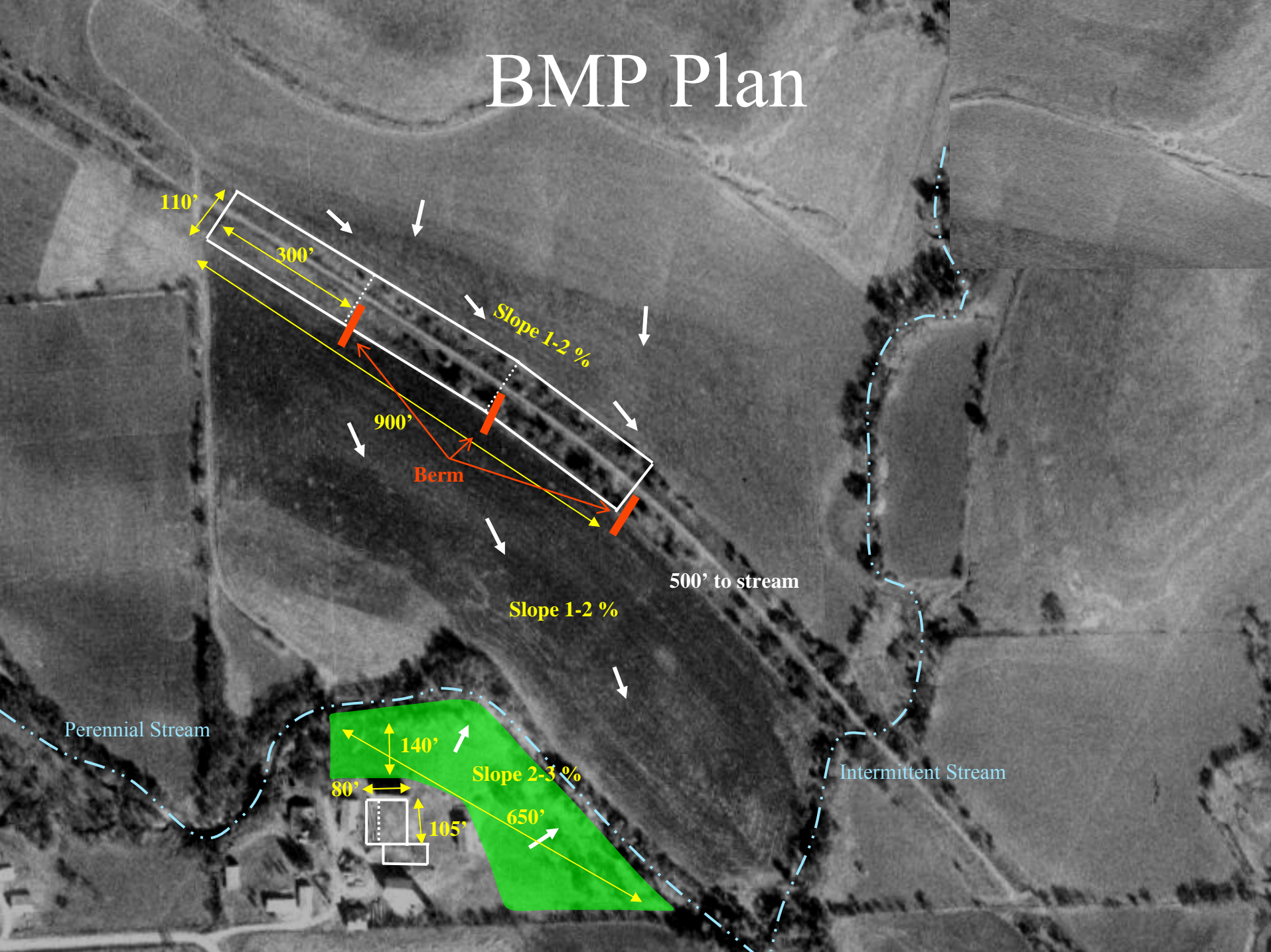
Slope 1-2 %

Slope 2-3 %

Perennial Stream

Intermittent Stream

# BMP Plan



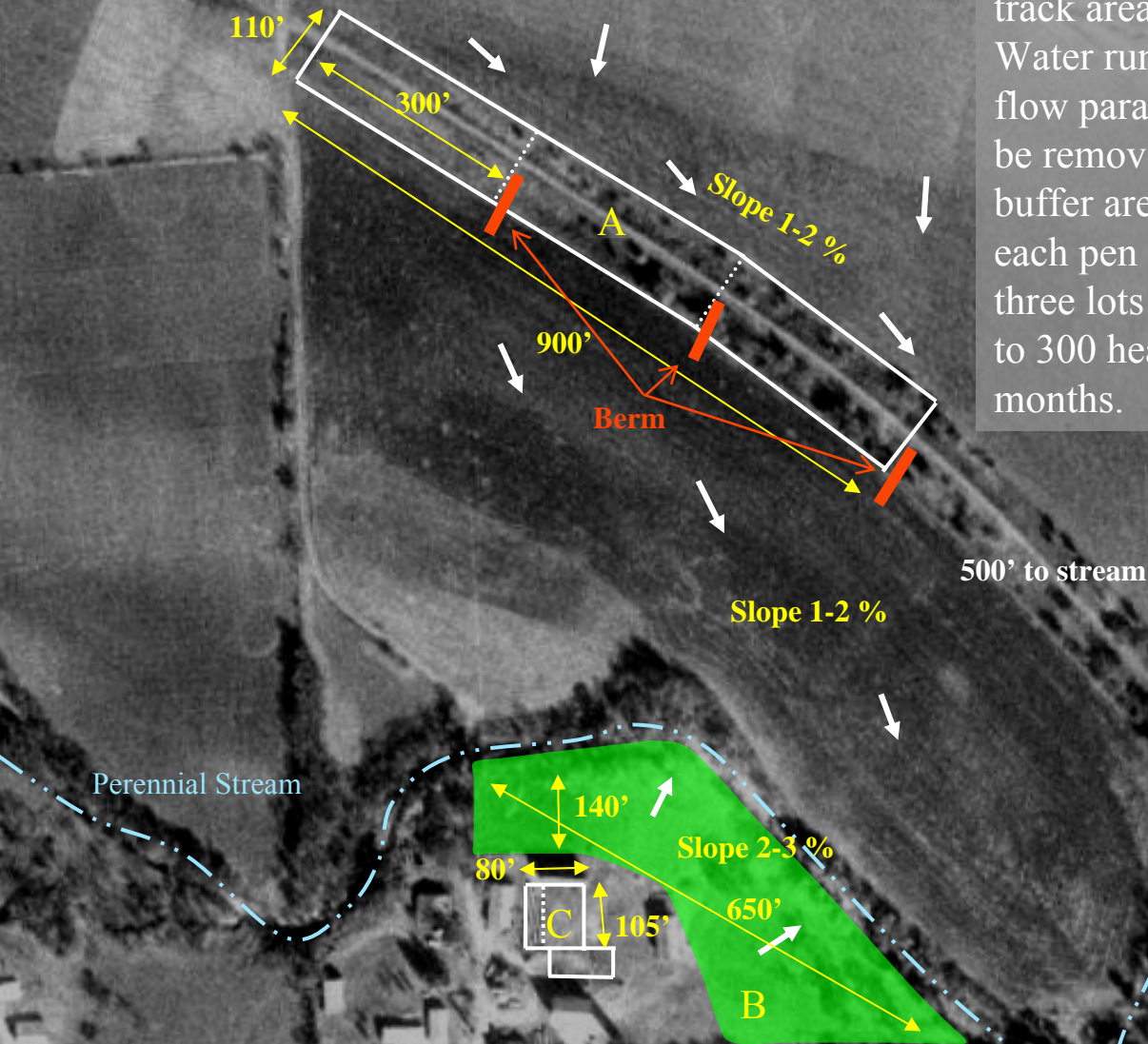


# BMP Plan

A- New feeding area on old railroad bed with old track area being the dividing line for water flow. Water runoff from pasture north of lots should flow parallel to the north edge of lots. Trees will be removed that are currently growing in the buffer area. Berms will be placed at the base of each pen to direct runoff across field. Plan to use three lots as weaning and backgrounding for up to 300 head under 700#. Utilization will be 4-6 months.

B- Old feeding area planted to brome grass.

C- Existing two pens used for gathering and holding. Also, some individual pens for 4-6 horses.



# BMP Plan

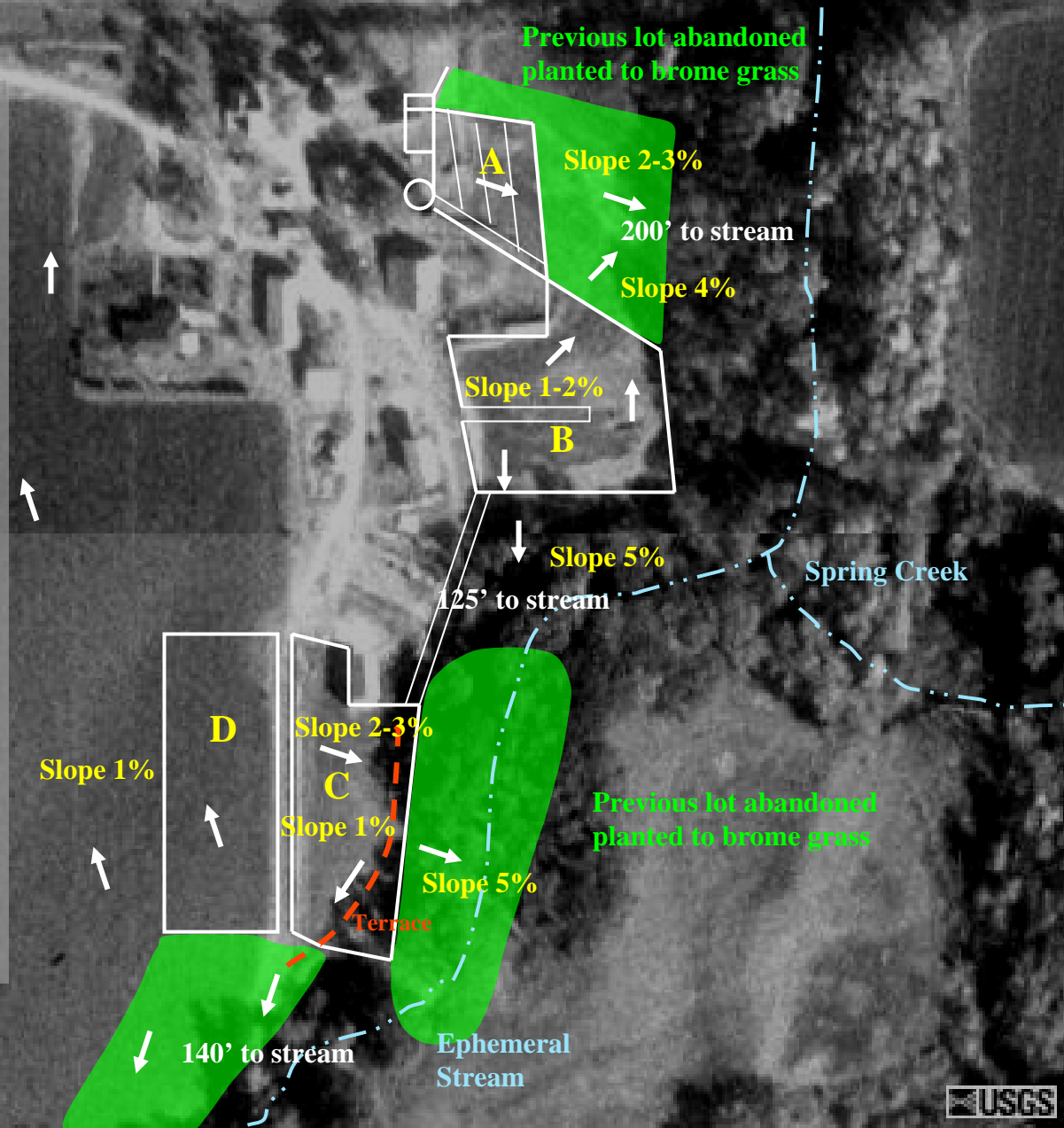
Cattle feeding facility for 450 head up to 700#. Pen utilization will be 6 months.

Area A is receiving & loading, working pens, and occasional sick pen.

Lot B is approximately 43,456 sq. ft. or 150' X 240' plus wing area. A feeding capacity of 145 head. No extraneous drainage.

Lot C is approximately 47,350 sq. ft. or 130' X 250' plus 50' X 60' wing. A feeding capacity of 155 head. No extraneous drainage.

Lot D will be a new feeding area approximately 43,500 sq. ft. or 140 X 320'. A feeding capacity of 145 head. No extraneous drainage.



# Management Practices that should be Implemented and Maintained

- Scrape lots and apply solids at agronomic rates
- Maintain vegetative cover in buffers
- Harvest vegetation to remove nutrients
- Prevent channeling of runoff onto vegetative system



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