

# NIC-MNI (WATER) CENTER PROJECT OVERVIEW

AANIIH NAKODA COLLEGE

MICHAEL KINSEY

1984

# AANIHH NAKODA COLLEGE

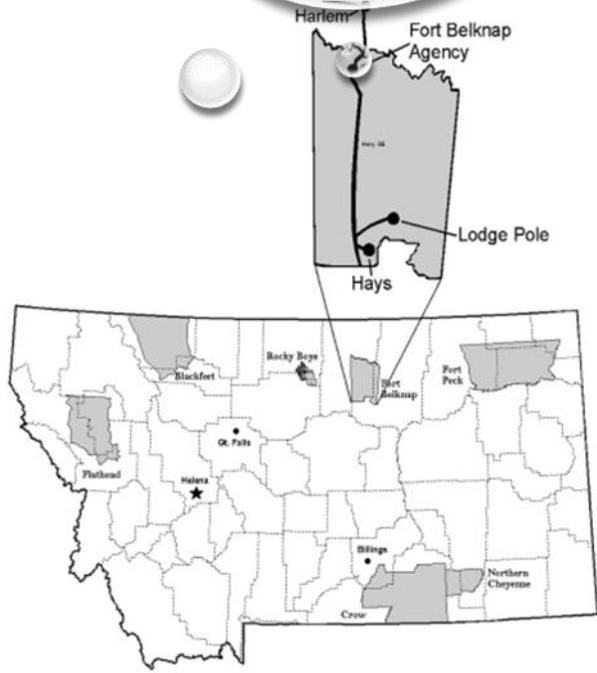
- AANIHH NAKODA COLLEGE (ANC) IS A TRIBALLY CONTROLLED COLLEGE LOCATED ON THE FORT BELKNAP INDIAN RESERVATION IN NORTHCENTRAL MONTANA.
- THE COLLEGE WAS CHARTERED IN 1983 BY THE FORT BELKNAP INDIAN COMMUNITY COUNCIL (FBICC), WHICH SERVES AS THE GOVERNING BODY OF THE AANIINEN (WHITE CLAY PEOPLE, ALSO KNOWN AS GROS VENTRE) AND NAKODA (ASSINIBOINE) NATIONS OF FORT BELKNAP.
- ORIGINALLY KNOWN AS FORT BELKNAP COLLEGE, AND CHANGED ITS NAME TO AANIHH NAKODA COLLEGE IN 2011



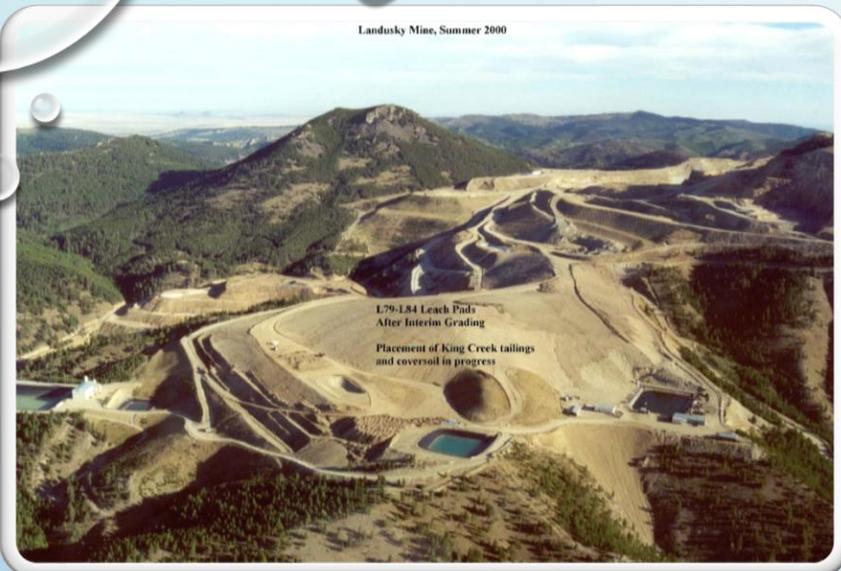


# AANIHH NAKODA COLLEGE

- THE MISSION OF AANIHH NAKODA COLLEGE IS TO PROVIDE QUALITY POST-SECONDARY EDUCATION FOR RESIDENTS OF THE FORT BELKNAP INDIAN RESERVATION AND SURROUNDING COMMUNITIES. THE COLLEGE PROMOTES INDIVIDUAL AND COMMUNITY DEVELOPMENT BY MAINTAINING AND REVITALIZING THE INDIGENOUS LIFEWAYS OF THE AANIINEN AND NAKODA TRIBES AND BY PREPARING STUDENTS TO SUCCEED IN AN AMERICAN TECHNOLOGICAL SOCIETY.



# FORT BELKNAP INDIAN RESERVATION



# ZORTMAN LANDUSKY MINE HISTORY

- 1890S – PROSPECTORS ILLEGALLY TRESPASSED ON THE RESERVATION AND STRUCK GOLD
- 1895 – GRINNELL AGREEMENT LED TO REMOVAL OF RESERVATION LANDS NOW REFERRED TO AS THE “GRINNELL NOTCH”
- 1900S – MINERS TUNNELED FOR GOLD THROUGHOUT THE MOUNTAINS’ HEADWATERS
- 1979 – MINING OPERATIONS INCREASED AND THE ZORTMAN LANDUSKY MINES WERE OPEN
- 80S AND 90S – ESTABLISHED THE LARGEST CYANIDE HEAP LEACH GOLD MINING COMPLEX IN NORTH AMERICA
- 1998 – ZORTMAN MINING, INC. DECLARED BANKRUPTCY

# FORT BELKNAP COLLEGE WATER LAB AND AQUATIC STUDY



- FROM 1999 TO 2003 THE FORT BELKNAP COLLEGE WATER QUALITY LAB (WATER LAB) WAS ESTABLISHED
- CONDUCTED SURFACE AND GROUND WATER MONITORING AND ANALYSIS
- SIGNIFICANT IMPAIRMENTS IN 3 MINE IMPACTED STREAMS FLOWING ON THE RESERVATION
  - KING CREEK, SWIFT GULCH (SOUTH BIGHORN CREEK), LODGEPOLE CREEK
- **KING CREEK**
  - ACID ROCK DRAINAGE (ARD)
    - LOW PH, HEAVY METALS
  - MIGRATION OF MINE WASTE ROCK AND TAILINGS
- **SWIFT GULCH**
  - ARD
    - LOW PH, HEAVY METALS
    - TOXICITY STUDY: RAPID DEATH OF *DAPHNIA SP.*
- **LODGEPOLE CREEK**
  - DEWATERING DUE TO MINING ACTIVITIES

# FORT BELKNAP COLLEGE WATER LAB AND AQUATIC STUDY

- GROUNDWATER SAMPLES COLLECTED FROM MONITORING WELLS ALSO DETECTED CYANIDE AND OTHER CONTAMINANTS IN CONCENTRATIONS APPROACHING OR EXCEEDING STANDARDS FOR HUMAN HEALTH.
- FBC WATER LAB CLOSED IN 2007 DUE TO LACK OF FUNDING

## Fort Belknap College Receives CUP Grant



Top, l to r: Dan Kinsey, Tribal Wet Lands Coordinator, Dr. Liz McClain, College Instructor, Katherine Halver, Island Mountain Representative, Second Row: Blake Stiffarm, Student, Dennis Longknife, Tribal Environmental Technician, Kenneth "Gus" Helegesen, Island Mountain Representative, Front Row: Scott Friskics, Clarena M. Werk and Ina Nez Perce, Tribal EPA Director. Not pictured is Davy Belgarde, Water Quality Coordinator.

# FUNDING

- FUNDED BY NATIONAL SCIENCE FOUNDATION (NSF)  
TRIBAL COLLEGES AND UNIVERSITIES, ENTERPRISE  
ADVANCEMENT CENTER (TEA)
- \$3,500,000.00 FOR FIVE-YEAR PROJECT
- FUNDING IS USED TO ESTABLISH AND OPERATE THE  
AANIHH NAKODA NIC?-MNI (WATER) CENTER



# AANIHH NAKODA NIC?-MNI (WATER) CENTER

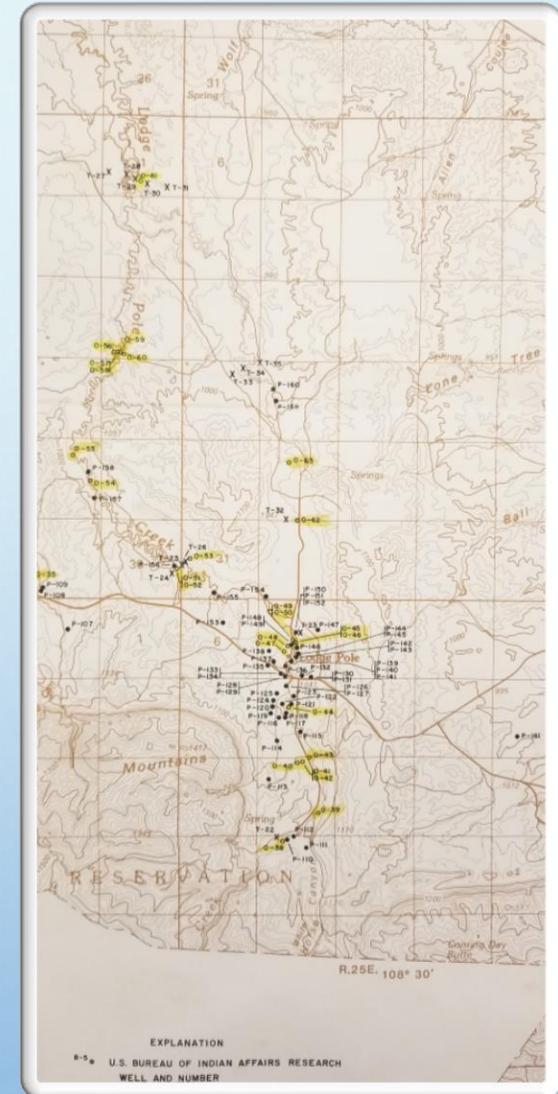
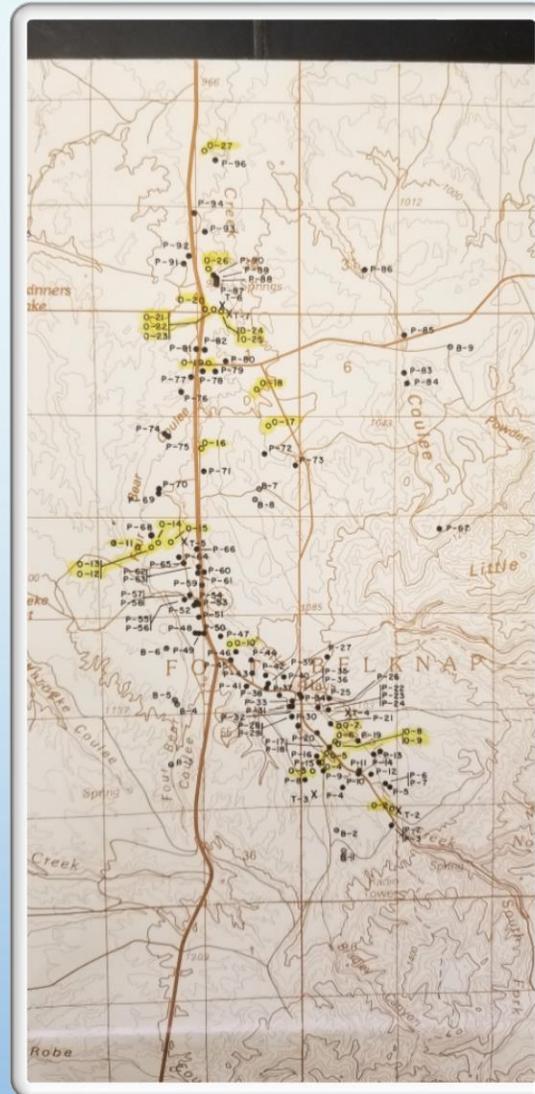
- INTEGRATE AND EXPAND ANC'S SCIENTIFIC AND EDUCATIONAL CAPACITY IN THE AREAS OF WATER RESEARCH AND EDUCATION AND TO APPLY THAT CAPACITY IN A MANNER THAT SUPPORTS AND ASSISTS THE FORT BELKNAP INDIAN COMMUNITY (FBIC) IN ADDRESSING ITS MOST CRITICAL WATER-RELATED NEEDS.
- MAIN OBJECTIVES
  - CONDUCT RESEARCH
  - OFFER TRAINING AND EDUCATION
  - GATHER AND SHARE INFORMATION

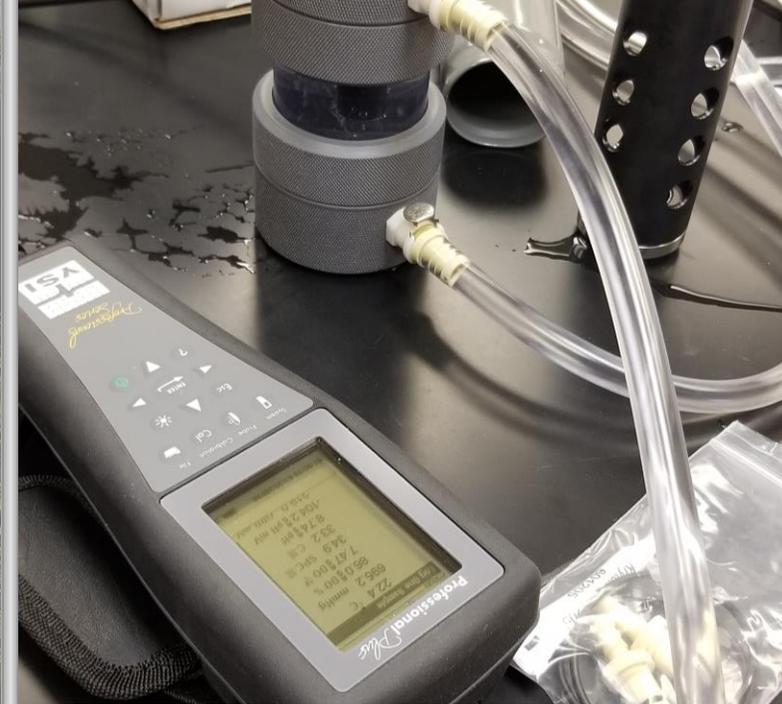
# RESEARCH ON WATER ISSUES

- INVESTIGATION OF GROUNDWATER RESOURCES ON THE SOUTHERN END OF THE RESERVATION
- BIOASSESSMENT OF STREAMS IN THE LITTLE ROCKIES
- BIOASSESSMENT OF THE MIDDLE OF THE MILK RIVER
- SUBSURFACE IRRIGATION SYSTEMS IN THE MILK RIVER FLOODPLAIN

# INVESTIGATION OF GROUNDWATER RESOURCES ON THE SOUTHERN END OF THE RESERVATION

- CHARACTERIZE THE IMPACT OF MINING ACTIVITIES TO GROUNDWATER QUALITY
- CHARACTERIZE AQUIFER PROPERTIES TO DETERMINE THE RATE OF POSSIBLE CONTAMINANT MOVEMENT IN THE LOCAL SYSTEM.
- DONE BY COLLECTING SAMPLES FROM USGS MONITORING WELLS



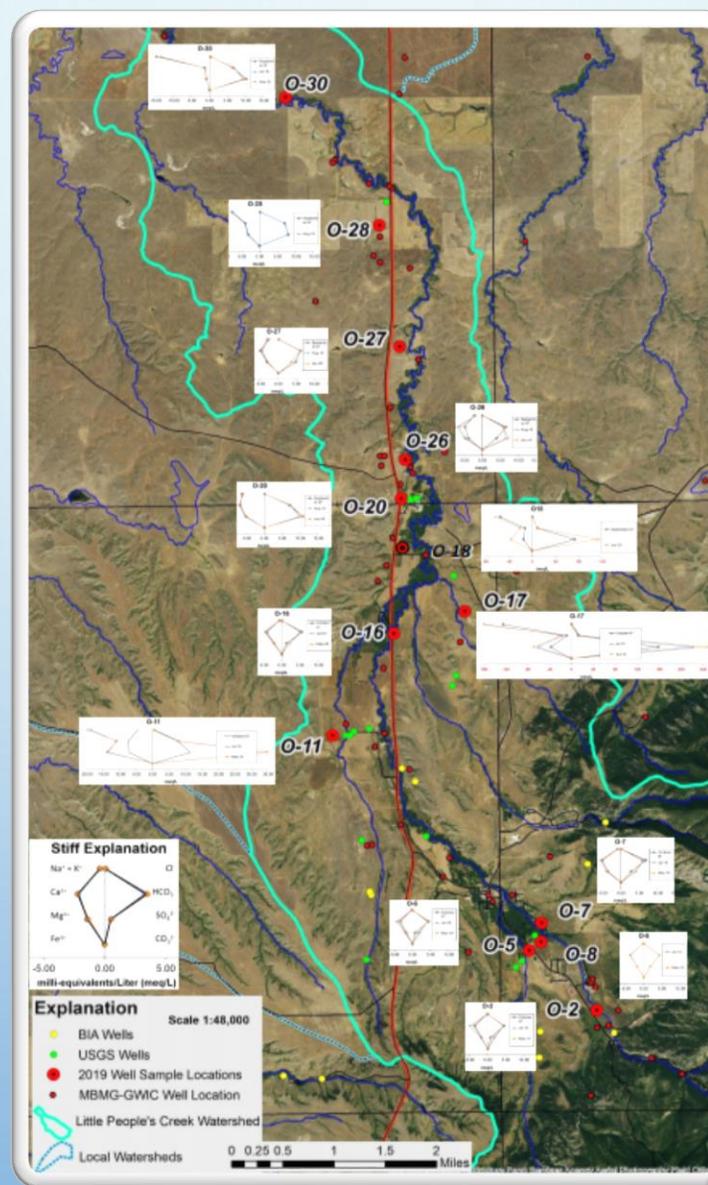
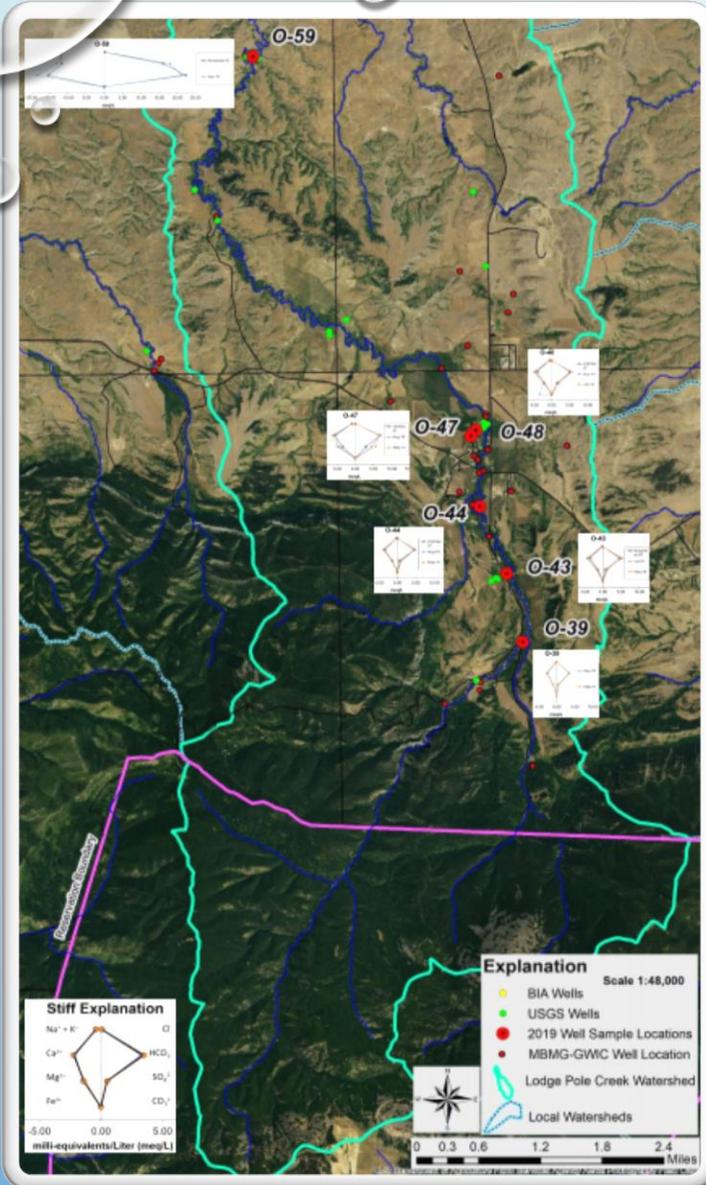


## INVESTIGATION OF GROUNDWATER RESOURCES ON THE SOUTHERN END OF THE RESERVATION

- DURING EACH SAMPLING EVENT
  - WATER ELEVATION DATA
  - WATER QUALITY SAMPLES
    - TESTED FOR POTENTIAL MINE-GENERATED CONTAMINATES
    - PARAMETERS MONITORED FOR PH, SPECIFIC CONDUCTIVITY, TEMPERATURE, AND DISSOLVED OXYGEN
    - ENERGY LABS FOR ANALYSIS

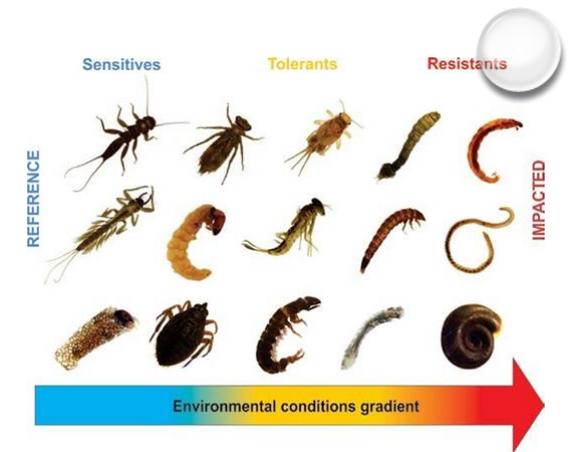
## INVESTIGATION OF GROUNDWATER RESOURCES ON THE SOUTHERN END OF THE RESERVATION

- MAJOR IONS, NUTRIENTS AND TRACE METALS
- SEVERAL WELLS SHOW CHANGES WITH INCREASE IN SODIUM, POTASSIUM, AND SULFATES
- THE CAUSE OF THESE CHANGES HAS NOT BEEN DETERMINED BUT MAY BE RELATED TO NATURAL CONDITIONS OR WASTEWATER MANAGEMENT.



# BIOASSESSMENT OF STREAMS IN THE LITTLE ROCKIES

- ASSESS THE IMPACTS OF GOLD MINING ON AQUATIC LIFE IN RESERVATION STREAMS IN THE LITTLE ROCKIES
- BENTHIC MACROINVERTEBRATES AND PERIPHYTON ARE COLLECTED
- MACROINVERTEBRATE SAMPLES ARE ANALYZED USING A MULTI-METRIC APPROACH TO DETERMINE LEVELS OF IMPAIRMENT AND BIOTIC INTEGRITY
- BENTHIC MACROINVERTEBRATES ARE IMPORTANT INDICATORS OF WATER QUALITY
- KING CREEK, SOUTH BIGHORN, NORTH FORK, BEAVER CREEK
- SPLIT SAMPLES ARE COLLECTED AND SENT FOR IDENTIFICATION AND ANALYSIS AT RHITHRON ASSOCIATES

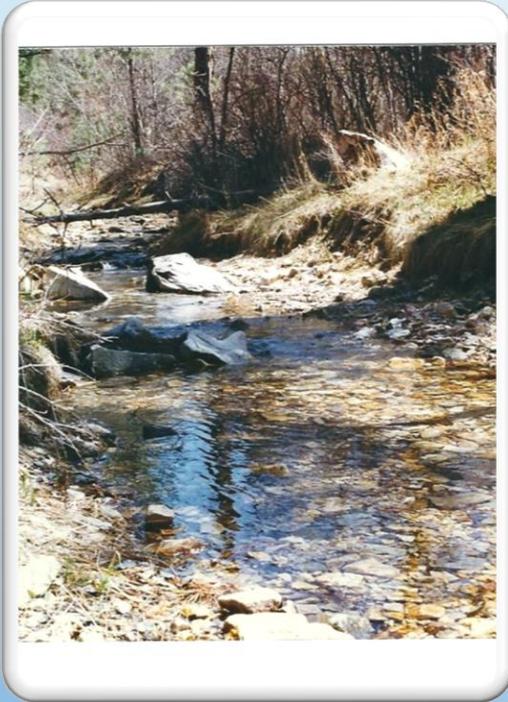




# BIOASSESSMENT OF STREAMS IN THE LITTLE ROCKIES

- SAMPLE SITES

# BIOASSESSMENT OF STREAMS IN THE LITTLE ROCKIES



Mine Impacted Stream:  
South Big Horn 1997



Current Condition

# MINE IMPACTED STREAM KING CREEK



Prior to Reclamation  
1995



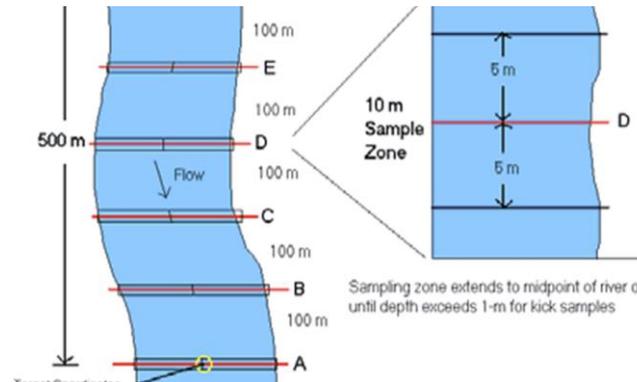
Current Condition

# NON-IMPACTED STREAM NORTH FORK LITTLE PEOPLES CREEK



# BIOASSESSMENT OF THE MIDDLE OF THE MILK RIVER

- THE PURPOSE OF THIS PROJECT IS TO COLLECT BIOINDICATOR DATA FROM BENTHIC MACROINVERTEBRATES AND PERIPHYTON TO ASSESS OVERALL WATER QUALITY AND DEGREE OF IMPAIRMENT.
- FIVE LOCATIONS ALONG THE MILK RIVER
- MACROINVERTEBRATE AND PERIPHYTON SAMPLES



# STUDY OF SUBSURFACE IRRIGATION SYSTEMS IN THE MILK RIVER FLOODPLAIN

- GOALS:
  - COMPARE WATER USAGE WITH ABOVE GROUND SPRINKLER IRRIGATION
  - COMPARE SOIL NUTRIENTS (NITROGEN AND PHOSPHATES) WITH ABOVE GROUND SPRINKLER IRRIGATION
  - COMPARE CROP YIELD WITH ABOVE GROUND SPRINKLER IRRIGATION
- STUDENT LEARNING OBJECTIVES:
  - IMPORTANCE OF WATER CONSERVATION RELATING TO AGRICULTURE
  - INSTALLATION, MANAGEMENT OF SUBSURFACE IRRIGATION SYSTEM
  - MONITORING AND CONTROLLING WATER
  - CONDUCTING ANALYTICAL TECHNIQUES TO STUDY MACRONUTRIENTS
  - DATA ANALYSIS



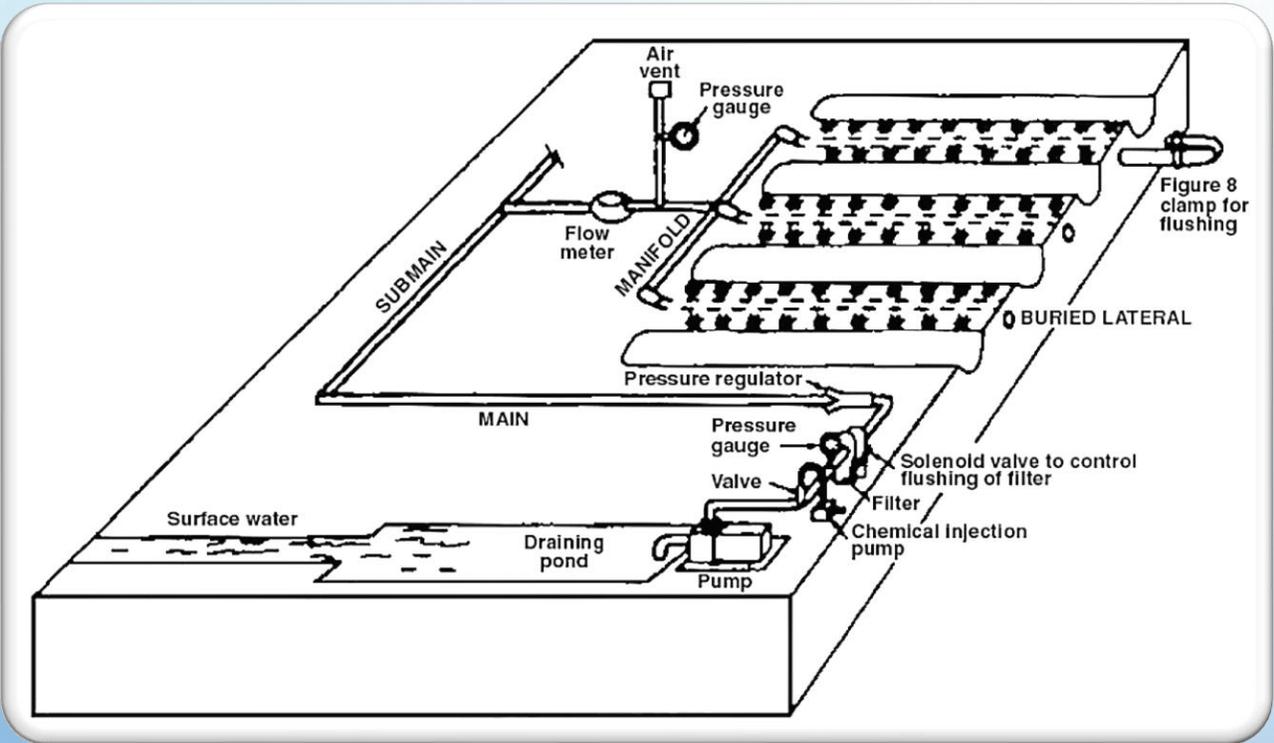
# STUDY OF SUBSURFACE IRRIGATION SYSTEMS IN THE MILK RIVER FLOODPLAIN



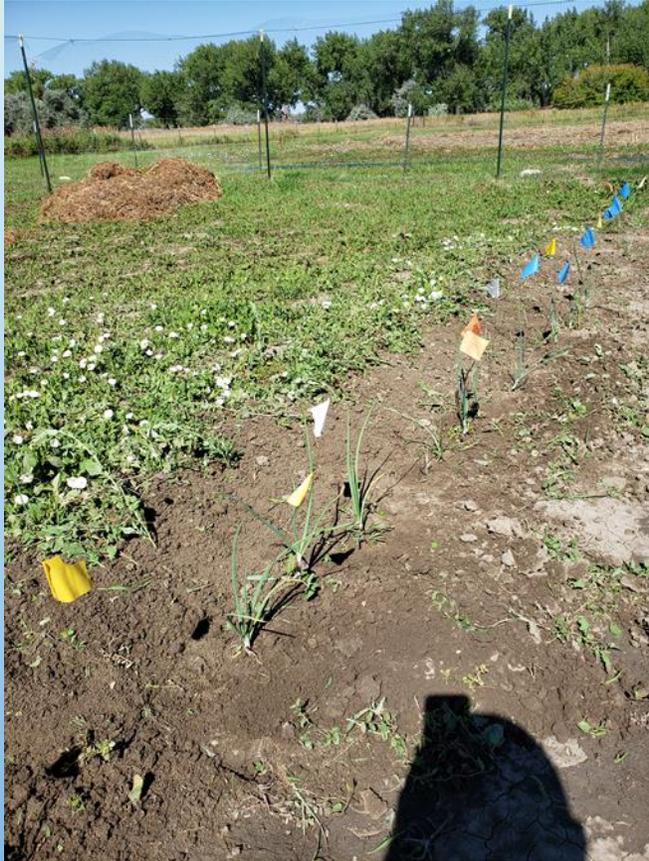
- TRADITIONAL ABOVE GROUND IRRIGATION



Subsurface Irrigation



# SUBSURFACE IRRIGATION PROJECT



Onions in Traditional  
Above Ground Irrigation



Onions in Subsurface  
Irrigated Plot

# SUBSURFACE IRRIGATION PROJECT



Onions from Traditional  
Irrigated Plot



Onions from Subsurface  
Irrigated Plot

# SUMMER INTERNSHIP

- 10 INTERNS WERE HIRED FOR THE DURATION OF 10 WEEKS
  - IN WATER RELATED DEPARTMENTS IN VARIOUS TRIBAL PROGRAMS
- STUDENT INTERNS PRESENT PROJECT ACTIVITIES AT AN IN-HOUSE SYMPOSIUM.





# SUMMER INTERNSHIPS

# ANNUAL WATER FORUM – APRIL 2021

## 2<sup>ND</sup> ANNUAL NIC-MNI (WATER) FORUM

### WHEN

**Thursday, April 22, 2021  
1 PM - 4:30 PM  
Via Zoom**

**FOR ZOOM LINK PLEASE CONTACT**

**MICHAEL KINSEY**

**WATER PROJECT MANAGER**

**Aaniiih Nakoda College**

**406-353-3926**

**MAKINSEY@ANCOLLEGE.EDU**



#### DAY 1 FEATURING

**Joanne H. Curry, and  
Woldezion Mesghinna,  
PH. D., P.E., - Fort  
Belknap Water  
Settlement**

**Wayne Jepson -  
Zortman Landusky  
Mine Update**

**James Sweirc -  
Groundwater Resource  
Assessment of the  
Southern Fort Belknap  
Reservation**

**Gene Talks Different -  
Prairie Mountain  
Utilities Water  
Treatment Process**

**Cody Shambo - Water  
Quality Mapping**

**Jeremy Walker - Water  
Quality Program**

#### DAY 2 FEATURING

**A Tour of the Prairie  
Mountain Utilities  
Water Treatment  
Facility**

- PROVIDED THE COMMUNITY WITH OPPORTUNITIES TO LEARN ABOUT IMPORTANT AND OFTEN COMPLEX WATER-RELATED ISSUES
- AGENDA INCLUDES PRESENTATIONS BY:
- JOANNE H. CURRY, AND WOLDEZION MESGHINNA, PH. D., P.E., - FORT BELKNAP WATER RIGHTS.
- WAYNE JEPSON, MT DEQ – UPDATE ON THE ZORTMAN/LANDUSKY MINE
- JAMES SWEIRC - GROUNDWATER RESOURCE ASSESSMENT OF THE SOUTHERN FORT BELKNAP RESERVATION
- GENE TALKS DIFFERENT, PRAIRIE MOUNTAIN UTILITIES – WATER TREATMENT PROCESS
- CODY SHAMBO, FORT BELKNAP ENVIRONMENTAL DEPARTMENT - WATER QUALITY MAPPING
- JEREMY WALKER, FORT BELKNAP ENVIRONMENTAL DEPARTMENT - WATER QUALITY PROGRAM
- SECOND DAY FEATURED A TOUR OF PRAIRIE MOUNTAIN UTILITIES WATER TREATMENT FACILITY

# BOOK PUBLICATION

- THE NIC? -MNI CENTER IS IN THE PROCESS OF PUBLISHING A BOOK RETELLING THE STORY OF THE AANIINEN AND NAKODA NATIONS' EFFORTS TO PROTECT RESERVATION WATERS AND THEIR WATER RIGHTS
- WE ARE WORKING WITH COMMUNITY MEMBERS
- CHAPTER TOPICS INCLUDE
  - HISTORICAL AND CULTURAL SIGNIFICANCE OF THE ISLAND/FUR CAP MOUNTAINS, GRINNELL AGREEMENT, WINTERS DOCTRINE, WATER RIGHTS NEGOTIATIONS, HISTORICAL AND MODERN-DAY GOLD MINING IN THE LITTLE ROCKIES, THE ROLE OF LOCAL CITIZEN ACTIVISTS, AND RELATIONS WITH GOVERNMENT AGENCIES

# FUTURE PLANS

- ANNUAL WATER FORUM – APRIL 22<sup>ND</sup> & 23<sup>RD</sup>
- SUMMER INTERNSHIPS
- CONTINUE RESEARCH PROJECTS
- OFFER TRAINING AND SHORT COURSES TO COMMUNITY MEMBERS
  - WATER TREATMENT OPERATOR CERTIFICATE COURSE
  - WETLAND DELINEATION TRAINING
  - GIS TRAINING