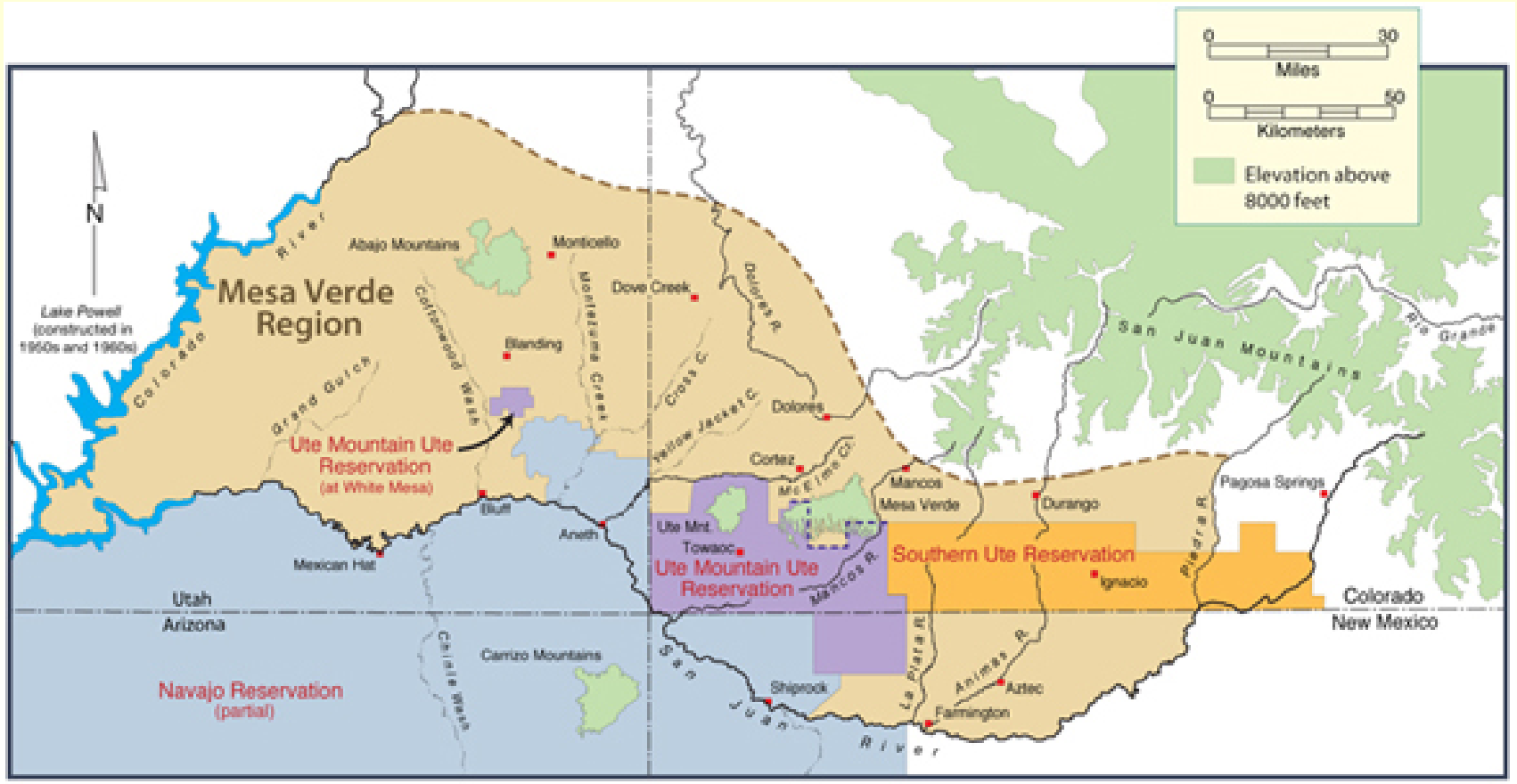
1-2 MW Community Scale Solar Feasibility Study

Ute Mountain Ute Tribe

Ute Mountain Ute Tribe- Towaoc, CO

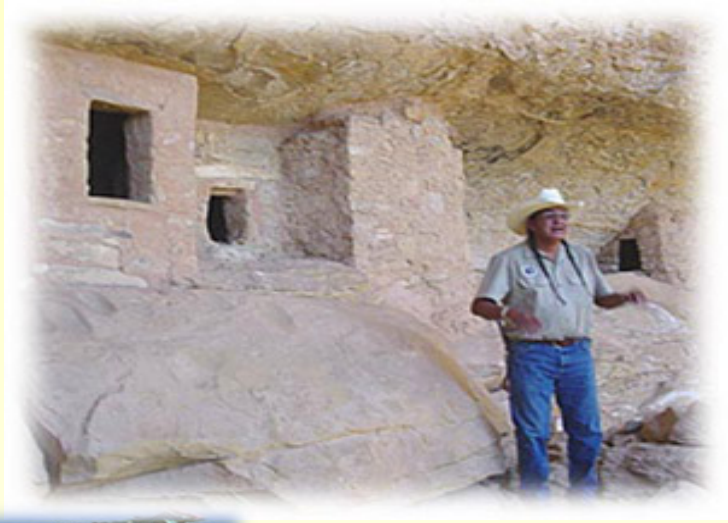


Total Acres= 582,321.53

- ***TRUST***
- CO- 431,910.45
- NM- 104,964.00
- UT- 4,334.80

- ***FEE***
- CO- 39,429.96
- UT- 1,682.28


UTE MOUNTAIN POTTERY



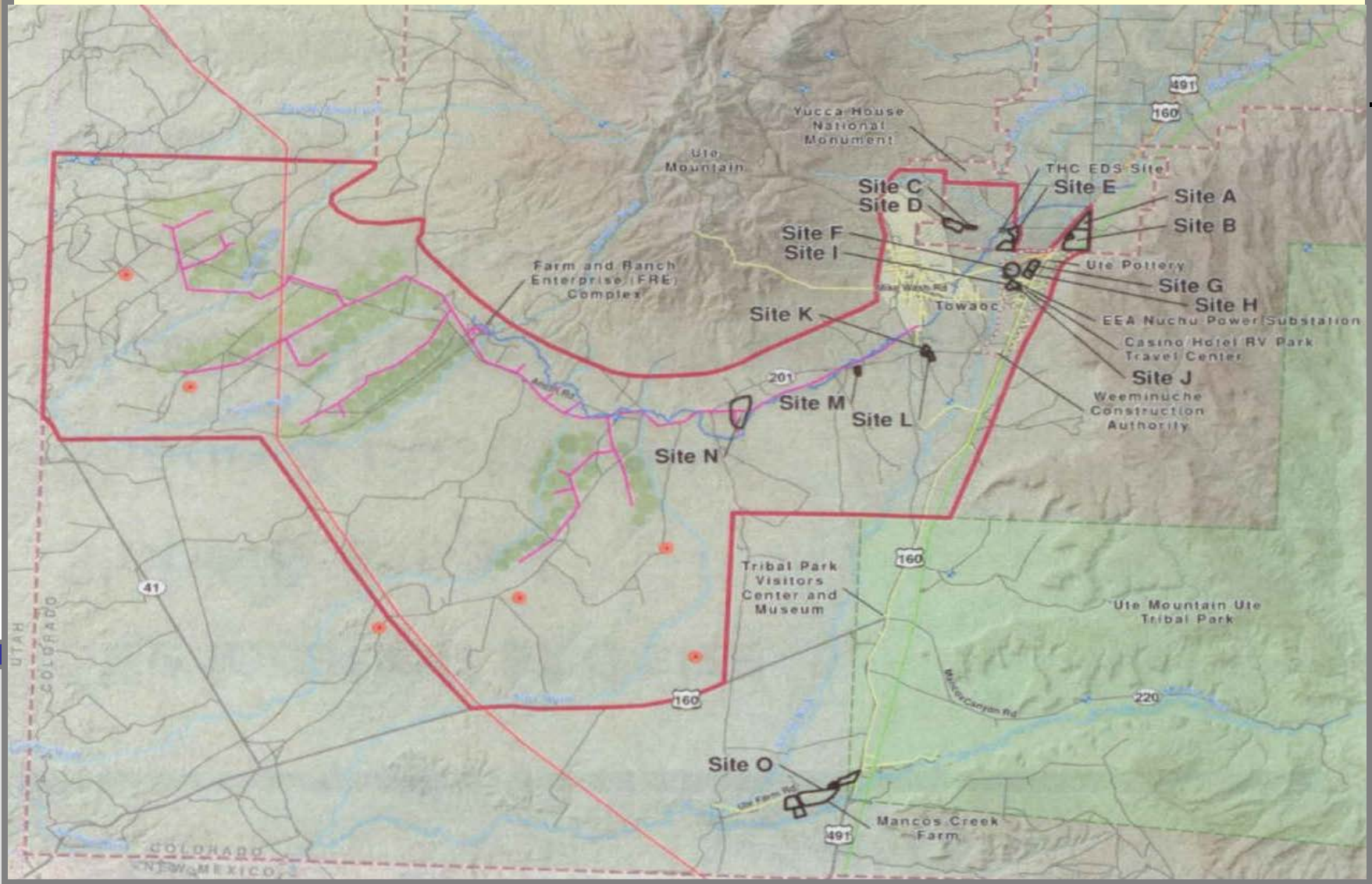

CASINO


WEEMINUCHE CONSTRUCTION AUTHORITY
WEEMINUCHE CONSTRUCTION AUTHORITY

Overview

- 1-2 MW Community Scale Solar Farm
  - 18 sites
  - Fixed Panel/Single Axis

Project Location



Project Participants

UTE MOUNTAIN UTE TRIBE

Gary Hayes- Tribal Chairman
Bradley Height- Tribal Vice Chairman
Troy Ralstin- Tribal Executive Director
Terry Knight- Tribal Historic Preservation Office
Celene Hawkins- Associate General Counsel
Madonna Whyte- Economic Development
Tawnie Knight- Economic Development
Bernadette Cuthair- Planning & Transportation
Gary Shaw- Planning & Transportation
Paul Evans- Farm & Ranch Enterprise
Simon Martinez- Farm & Ranch Enterprise
Eric Whyte- Farm & Ranch Enterprise
Tom Hall- Weeminuche Construction Authority
Brendon Adams- Weeminuche Construction Authority
Joann Lemmon- Ute Mountain Housing Authority
Benny Cordova- Ute Mountain Housing Authority
Robert Brooker- Ute Mountain Casino
Gordon Hammond- Energy Department
Scott Clow- Environmental Department
Colin Larrick- Environmental Department

Bureau of Indian Affairs

Priscilla Bancroft
Keith Yessilth
Lyman Clayton

Empire Electric Association

Douglas Sparks

Parametrix, Inc.

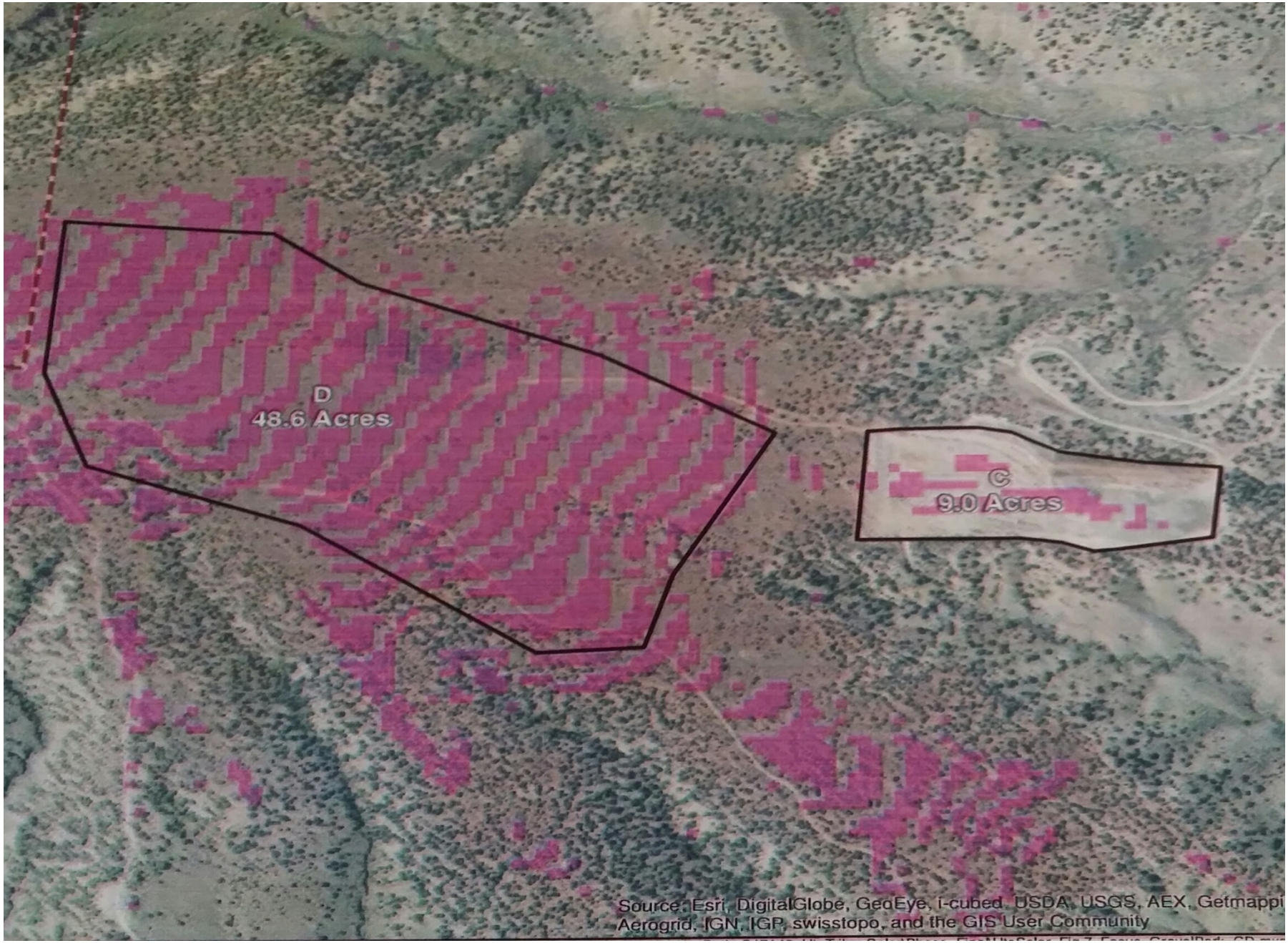
Jim Rapp
Steve Albert
Anne Radil
George Culbertson

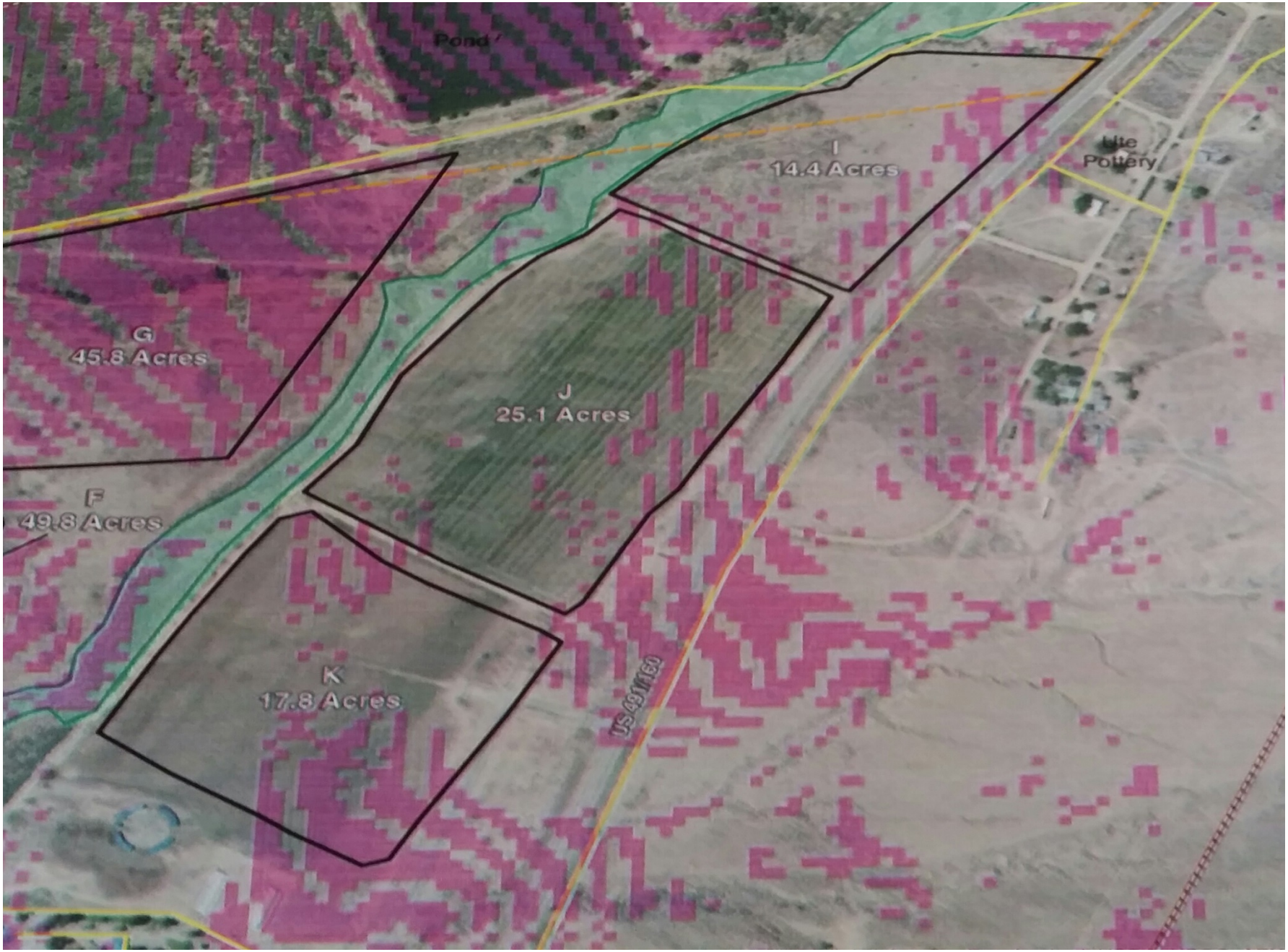
Project Objectives

- Work with local electric cooperative
- Costs, benefits for Tribe
- Understanding solar power development
- Clean energy
- GO RENEWABLE!

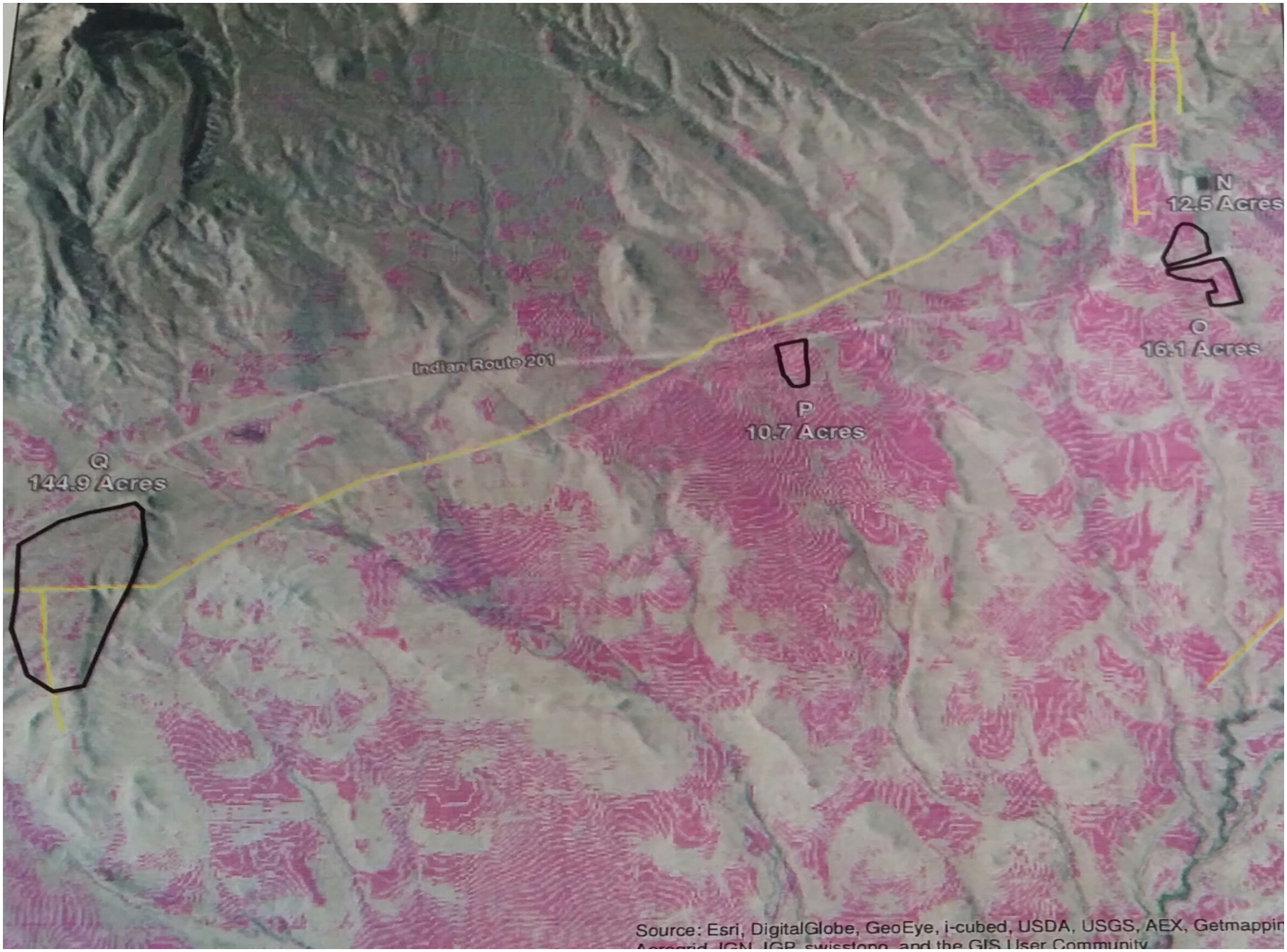
Top Reservation Power Consumers		
1	Casino/Hotel/RV Park	34%
2	All Residential Uses	32%
3	BIA Detention Center	5.1%
4	Travel Center	4.8%
5	Farm & Ranch Enterprise	3.8%
6	Recreation Center	3.6%
7	Tribal Administration Building	2.5%
8	Weeminuche Construction	2.5%
9	Casino Sign	1.6%
10	Indian Health Service Building	1.1%

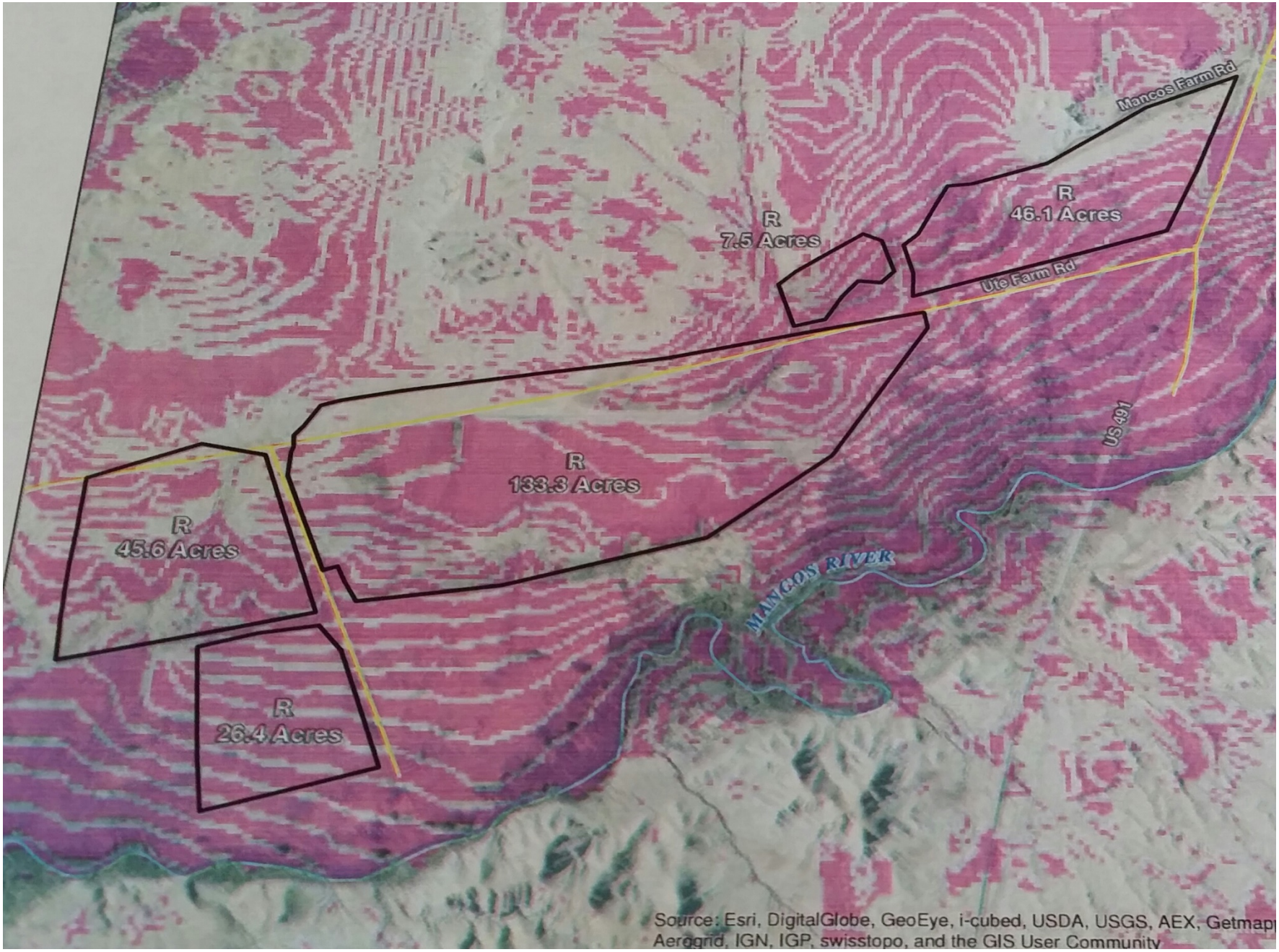
JOKE TIME!

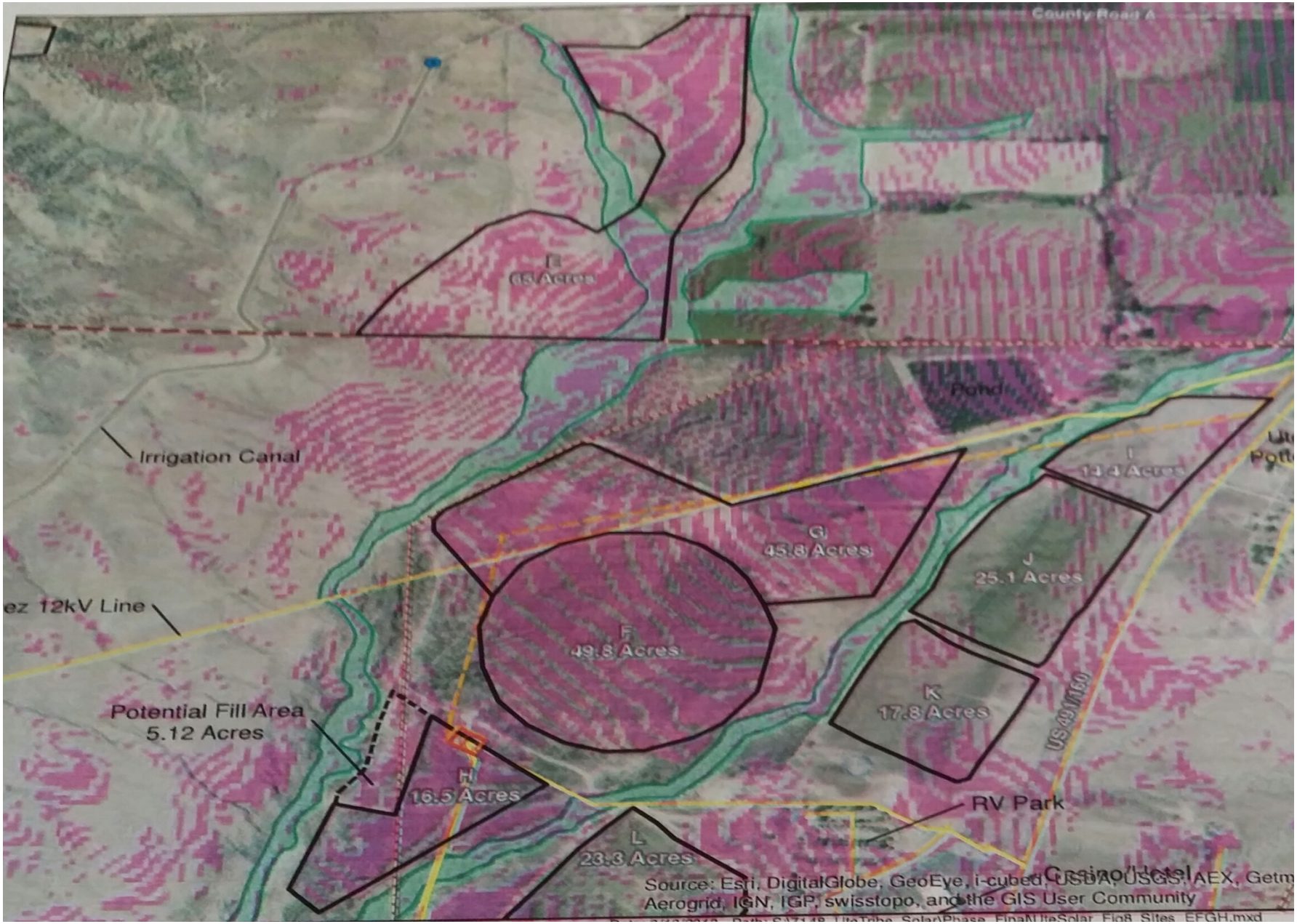

D
48.6 Acres
C
9.0 Acres
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmappi
Aerogrid, IGN, IGP, swisstopo, and the GIS User Community


Pond
I
14.4 Acres
Pottery
G
45.8 Acres
J
25.1 Acres
F
49.8 Acres
K
17.8 Acres
US 491/160


F
49.8 Acres
K
17.8 Acres
Potential Fill Area
5.12 Acres
H
16.5 Acres
RV Park
L
23.3 Acres
Casino/Ho
M
2.1 Acres
US 491
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USG


N
12.5 Acres
O
16.1 Acres
Indian Route 201
P
10.7 Acres
Q
144.9 Acres
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmappin


Mancos Farm Rd
R
46.1 Acres
R
7.5 Acres
Ute Farm Rd
US 491
R
133.3 Acres
R
45.6 Acres
MANCOS RIVER
R
26.4 Acres
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapp
Aerogrid, IGN, IGP, swisstopo, and the GIS User Community


County Road A
E
65 Acres
Pond
Irrigation Canal
I
14.3 Acres
G
45.8 Acres
J
25.1 Acres
ez 12kV Line
F
49.8 Acres
K
17.8 Acres
US 491/160
Potential Fill Area
5.12 Acres
H
16.5 Acres
RV Park
L
23.3 Acres
Casino/Hotel
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getm
Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Impact of Cost Mitigating Options

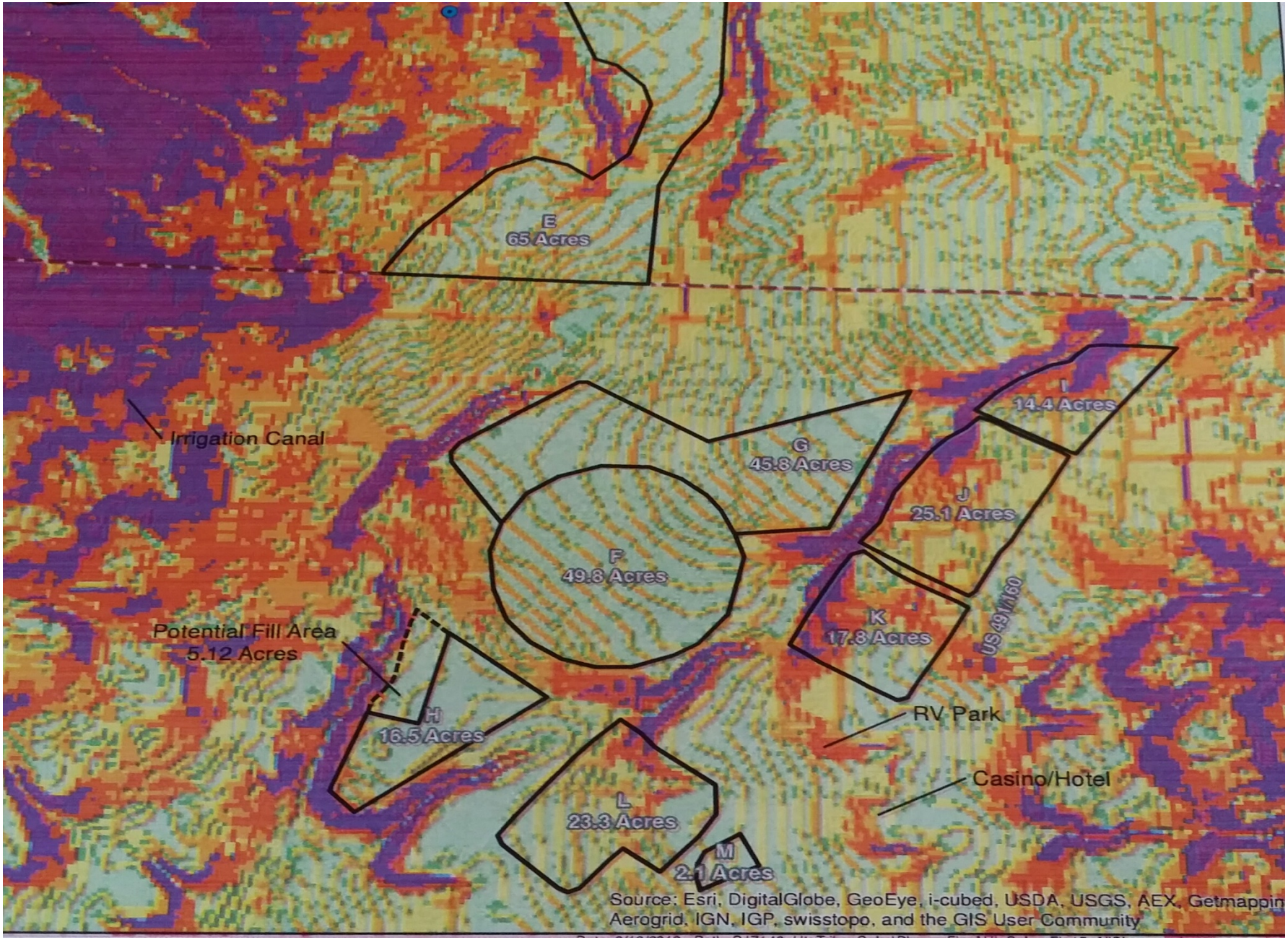
Purchased Energy Value				Produced Energy Value			
	Retail	Wholesale	Baseline	Grant	Interest	ITC	All
Fixed Panel	$0.11	$0.06	$0.15	$0.13	$0.11	$0.11	$0.06
Single Axis	$0.11	$0.06	$0.12	$0.11	$0.09	$0.08	$0.05

FIXED GROUND MOUNTED SOLAR PV	Retail	Wholesale
System Cost (Total $)	$9,000,000	$9,000,000
System Cost (wDC)	$3.00	$3.00
Solar Value	5.95 kWh/m2/day	5.95 kWh/m2/day
Power Generation	5,006 MWh	5,006 MWh
Average Purchased Energy Rate	$0.11 kWh	$0.06 kWh
Offset Purchased Energy Value	$551,000	$300,000
Produced Solar Energy Rate	$0.15 kWh	$0.15 kWh
Annual Production Cost	$751,000	$751,000
Gross Value	<$200,000>	<$451,000>
SREC Sales Value	$128,00	$128,000
Net Value (w/SREC)	<$72,000>	<$323,000>

SINGLE AXIS TRACKING SOLAR PV	Retail	Wholesale
System Cost (total $)	$10,050,000	$10,050,000
System Cost (wDC)	$3.35	$3.35
Solar Value	7.78 kWh/m2/day	7.78 kWh/m2/day
Power Generation (AC)	6,584 MWh	6,584 MWh
Average Purchased Energy Rate	$0.11 kWh	$0.06 kWh
Offset Purchase Energy Value	$724,000	$395,000
Produced Solar Energy Rate	$0.12 kWh	$0.12 kWh
Annual Production Cost	$810,000	$810,000
Gross Value	<$86,000>	<$415,000>
SREC Sales Value	$168,000	$168,000
Net Value (w/SREC)	$82,000	<$247,000>

Best Choices Are…

- 3 MW Community-Scale Single Axis Solar PV
- 95 acre “Hayfield” site
- Negotiation of retail net metering interconnection with EEA
- Hydropower
- Energy Conservation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Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping
Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Lessons Learned

- Site selection
- Site assumptions (rotating vs single axis)
- Different ideas on power load on reservation
- Hayfield boundaries (circle)

Future Plans

- Commercial scale
- Hydropower Station

(Bribe the DOE?)

Toy'way'yōk!

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