THE USE OF SOIL SAMPLING AND INVESTIGATIONS TO IMPROVE RECLAMATION COSTS

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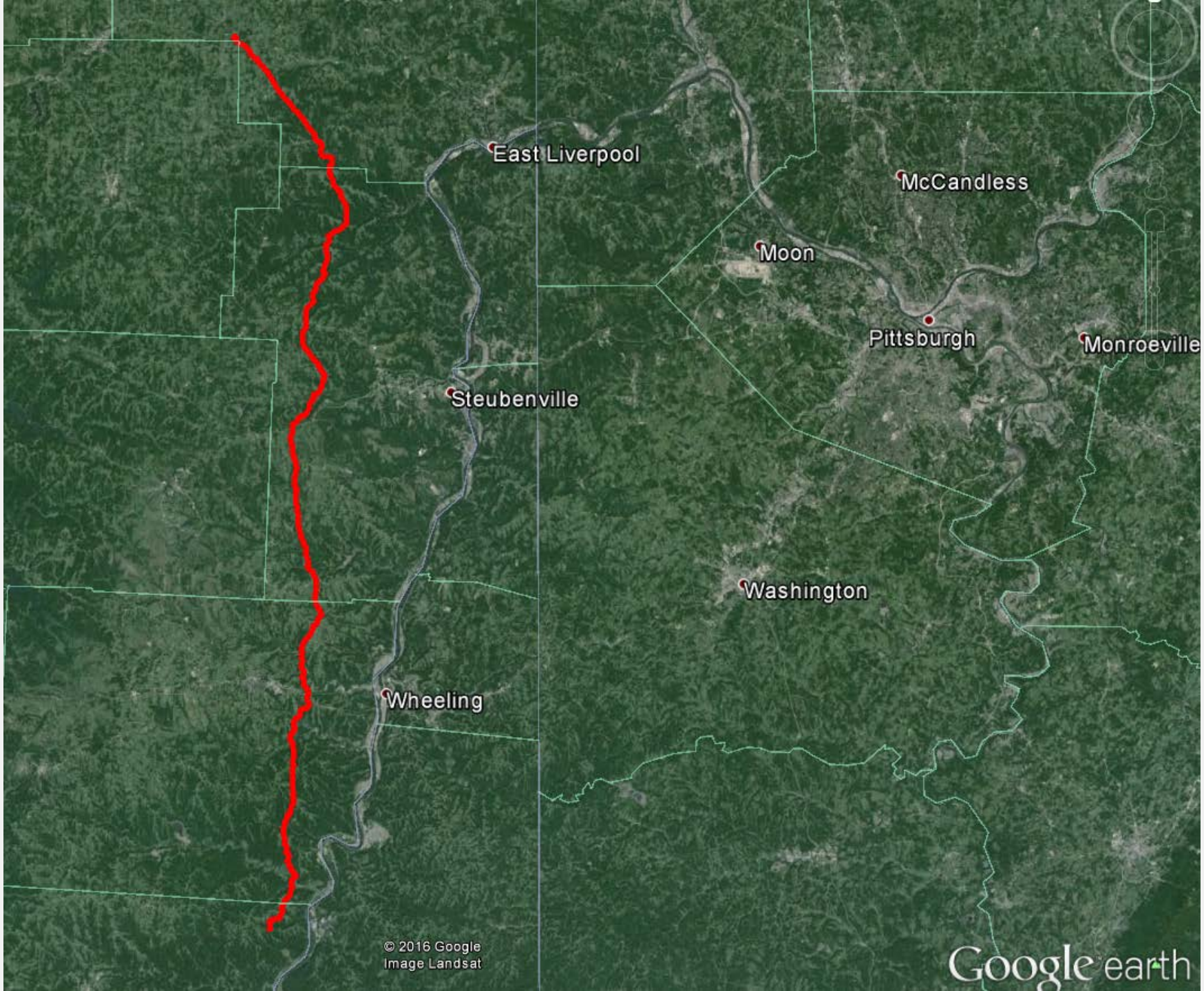
DURAROOT
ENVIRONMENTAL CONSULTING

ARNOLD'S
CUSTOM SEEDING

PROJECT DESCRIPTION

- 47-miles of linear disturbance
- Eastern Ohio
- Steep terrain (>15%)
  - Helicopters
- Summer and fall of 2015
- Specified lime application rate: 4.5 tons/acre
- $750,000 for amendment costs
- Limiting factor was acidic soils


East Liverpool
McCandless
Moon
Pittsburgh
Monroeville
Steubenville
Washington
Wheeling
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Google earth

SITE SOIL INVESTIGATION

- Site investigated by soil scientist and superintendent
- Soil and vegetation conditions were observed and noted
- Natural Resource Conservation Services soil data was reviewed


GIC
BeB
BeE3
GIB
WeD
DoC
WeB
GIB
BeC
CaB
DtF
WeB
UpB
BeE3
WeC
BeD
GID
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GIC
WeC
BeD
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BeD
GIB
BeC3
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WeC3
DtD
WeB
WeB
UpB
GkB
Ld
© 2016 Google
GID3
GIC

SITE SOIL SAMPLING

- Soil samples collected every mile
- Penn State's Agricultural Analytical Services Laboratory
- pH, N, P, K, Mg, Ca, Zn, Cu, and CEC
- Laboratory analysis costs total $630
- Seed mixes prescribed for low pH soils

PENNSTATE

(814) 863-0841 Fax: (814) 863-4540

Agricultural Analytical Services Laboratory
The Pennsylvania State University
University Park, PA 16802
www.aasl.psu.edu

SOIL TEST REPORT FOR:	ADDITIONAL COPY TO:
DUSTIN BUCKALEW ARNOLD CUSTOM SEEDING 118 VALLEY GROVE RD VALLEY GROVE WV 26060	KELLEY HOUSE DURAROOT & ENVIRONMENTAL CONSULTING 4626 WCR 65 KEENESBURG CO 80643

DATE	LAB #	SERIAL #	COUNTY	ACRES	ASCS ID	FIELD ID	SOIL
10/13/2015	S15-36782		OUT OF STATE			FARMINGTON RD	

SOIL NUTRIENT LEVELS			Below Optimum	Optimum	Above Optimum
[1]Soil pH	5.5				
[2]Phosphorus (P)	17	ppm			
[2]Potassium (K)	189	ppm			
[2]Magnesium (Mg)	98	ppm			

RECOMMENDATIONS: *(See back messages for important information)*

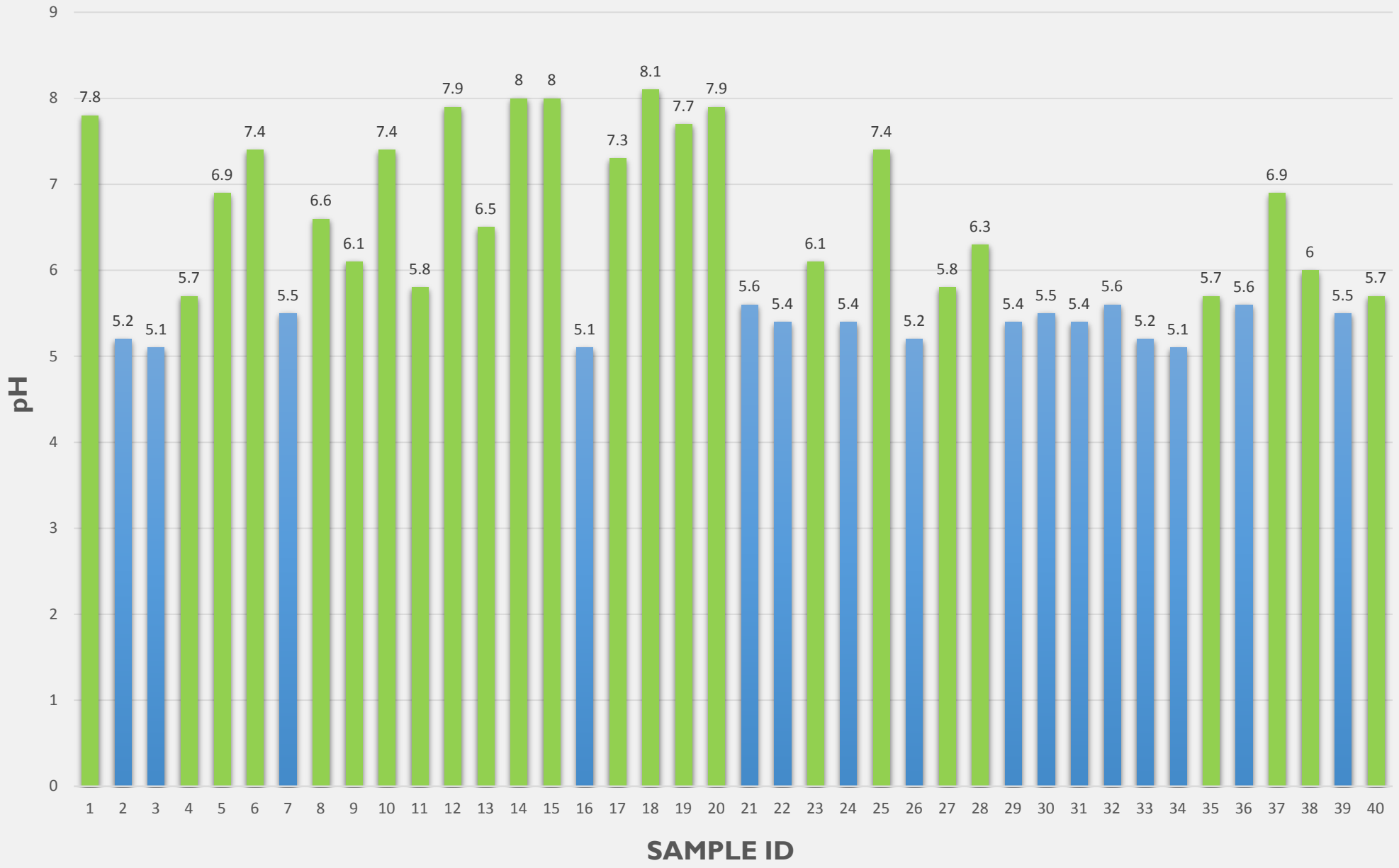
Limestone*: 9000 lb/A for a target pH of 6.5. **Magnesium (Mg):** NONE

**Calcium Carbonate equivalent*

Plant Nutrients: *(If manure will be applied, adjust these recommendations accordingly. See back of report.)*

Year	Crop	Expected Yield	Nitrogen (lb N/A)	Phosphate (lb P_2O_5/A)	Potash (lb K_2O/A)	
1	Other	0	0	0	0	*See ST2 for other crop recommendations*

No crop was specified. Therefore no recommendation is given.


pH
SAMPLE ID
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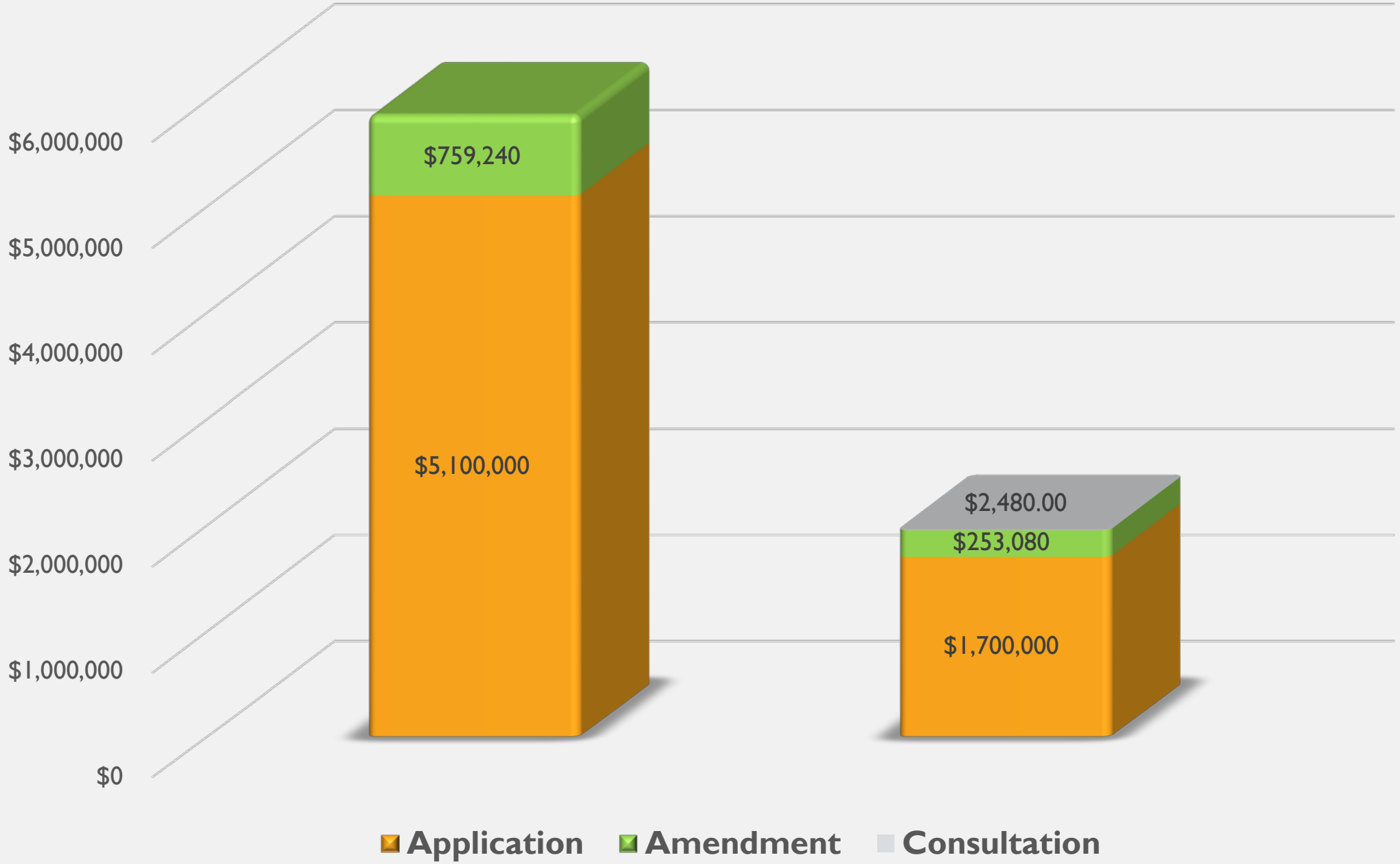
1
2
3
4
5
6
7
8
9
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
7.8 5.2 5.1 5.7 6.9 7.4 5.5 6.6 6.1 7.4 5.8 7.9 6.5 8 8 5.1 7.3 8.1 7.7 7.9 5.6 5.4 6.1 5.4 7.4 5.2 5.8 6.3 5.4 5.5 5.4 5.6 5.2 5.1 5.7 5.6 6.9 6 5.5 5.7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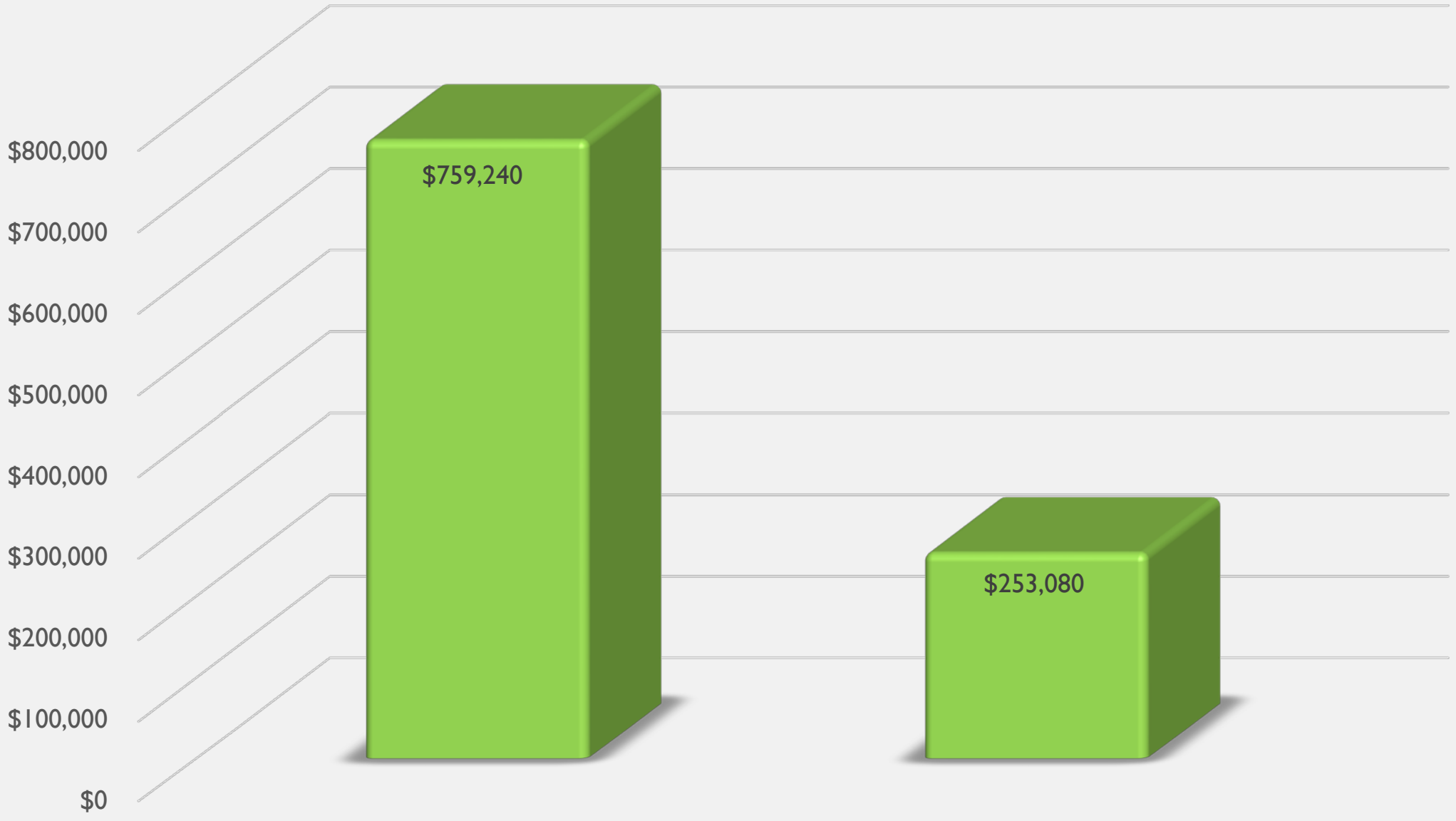
$5,000,000
$4,000,000
$3,000,000
$2,000,000
$1,000,000
$0
$759,240
$5,100,000
$2,480.00
$253,080
$1,700,000
Application
Amendment
Consultation


$800,000
$700,000
$600,000
$500,000
$400,000
$300,000
$200,000
$100,000
$0
$759,240
$253,080

RECLAMATION DISCUSSION

- Reclamation success is dependent on the conditions of the soils before and after construction
- Having a knowledgeable team of scientists who can identify soil limiting factors can help the treatment of disturbed soils for reclamation purposes
- Interpreting and implementing available and laboratory data will improve reclamation success by identifying agronomical soil properties
- Simple techniques like soil investigations and sampling are cost-efficient ways to understand soils and plan for reclamation success

SOIL RECLAMATION PROCESS

1. **Site visit to identify current surface soil conditions**
   - Moisture levels
   - Nutrient deficiencies
   - Physical properties
2. **Implement soil sampling procedure**
   - Systematic design
   - Accredited soil laboratory
   - Identify adequate/inadequate agronomic properties
3. **Develop soil nutrient management plan**
   - Use proper amendments and fertilizers
   - Use proper equipment and application methods


FINN
HYDROSEEDING
EROSION CONTROL

QUESTIONS?

- **Dustin Buckalew**
  - **Arnold's Custom Seeding**
  - **303-710-0565**
- **James Hartsig**
  - **Duraroot Environmental Consulting**
  - **970-380-7448**
- **Andrew Harley**
  - **Duraroot Environmental Consulting**
  - **720-840-4703**

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