

COLORADO Division of Reclamation, Mining and Safety Department of Natural Resources

1313 Sherman Street, Room 215 Denver, Colorado 80203

December 19, 2014

Ben Frei Albert Frei & Sons Inc. P.O. Box 700 Henderson, CO 80640

### Re: Hatchery Pit, DRMS File No. M-2014-043, 112 Construction Materials Reclamation Permit Application, Third Adequacy Review

Dear Mr. Frei:

The Division of Reclamation Mining and Safety (DRMS) has reviewed your submittals received on December 4, 2014 and December 15, 2014 in which you provided responses to DRMS's adequacy review letter dated October 24, 2014 and November 24, 2014. Responses are fully adequate for the following comments: 9, 11, 16, 27, and 28, our follow-up comments for questions 3 through 5, 15, 20, 21, and 29 are addressed in the Memo from DRMS staff reviewing the slope stability Analysis; and we provided new comments, which are 30 and 31.

## 6.4.5 EXHIBIT E - Reclamation Plan

- **15**) Please clarify how the inert material will be placed into the pit. It is DRMS's understanding that the applicant plans to place inert fill into the pit in two separate main phases. The first phase the applicant will place inert material from the pit floor to roughly 10 below the final site elevation. The second phase will consist of placing fines and other material to bring the site to the final elevation. DRMS would request the applicant place both phases of the inert fill in 2 to 4 foot lifts. DRMS believes this method would help mitigate void space and settling.
- **30**) Please provide a seeding rate for the western wheatgrass described in option 2. In the application, the applicant stated in the reclamation plan for option 2 that they would like to request release of the site after seeding has occurred. DRMS will not release the site until there is well-established vegetation to control erosion or the site is being developed as commercial or industrial land. Please change the permit text to reflect that the site will not be eligible for final release until there is well established vegetation or commercial development.

## **General Comments and Questions**

**29**) Please address and respond to the following 5 questions asked in the attached Memo from DRMS's staff. The attached memo addressed the review of slope stability provided by Deere and Adult.

Albert Frei & Sons Inc. December 19, 2014 Page **2** of **2** 

**31**) Please review the attached financial warranty calculation. DRMS calculated the financial warranty for the worst-case scenario. DRMS estimated the financial warranty for a scenario were no inert fill is placed in Phase 2. In this case, DRMS would need to backfill all slopes to 3H1:1V, spread topsoil, and seed the entire site with the option 1 seed mix.

The current decision deadline for this application is December 24, 2014. Please provide responses to the above comments soon enough for the Division to review the responses and complete a follow-up exchange of comments and responses prior to the decision deadline. If you are unable to provide satisfactory responses to any inadequacies prior to the decision deadline, **it will be your responsibility to request an extension of time to allow for continued review of this application.** If there are still unresolved issues when the decision date arrives and no extension has been requested, the application will be denied.

If you need additional information please contact me at the Division of Reclamation, Mining and Safety, 1313 Sherman St., Room 215, Denver, CO 80203, by telephone at 303-866-3567, extension 8131, or by email at Tyler.ODonnell@state.co.us.

Sincerely,

Eler Dommell

Tyler O'Donnell Environmental Protection Specialist

- Enclosure: DRMS Memo addressing slope stability DRMS draft financial warranty calculation
- cc: Tom Kaldenbach, DRMS Peter Hays, DRMS

Steve O'Brian Environment, Inc. 7985 Vance Dr., #205A Arvada, CO 80003

Ed Lanyon City of Thornton Infrastructure Maintenance Center 12450 Washington St. Thornton, CO 80241



**COLORADO** Division of Reclamation, Mining and Safety Department of Natural Resources

1313 Sherman Street, Room 215 Denver, CO 80203

December 18, 2014

To: Tyler O'Donnell, Division of Reclamation, Mining & Safety

From: Peter Hays, Division of Reclamation, Mining & Safety

Re: Second review of Slope Stability Analysis, Albert Frei & Sons Inc., Hatchery Pit, File No. M-2014-043

The Division of Reclamation, Mining and Safety (Division) staff has reviewed the stability analysis response dated December 12, 2014.

Items #1 through #9 and Item #11 from the Slope Stability Analysis review memo dated November 21, 2014 were answered satisfactorily by the Applicant.

- In response to Item #10, the Applicant stated electronic copies of the Geo Studio files for the Deere & Ault slope stability analysis data are available upon request. Please submit hard copies of the stability analysis data so the information is part of the public record and the Division can duplicate the Deere & Ault models accurately.
- 2. The Deere & Ault stability analysis was based on generalized conditions and produced a factor of safety less than 1.3 in three of the five models (cross-sections B-B, C-C and E-E). Since the factor of safety was less than 1.3, the Division will require the Applicant to obtain structure agreements for all property, including easement holders, and structure owners within two hundred feet of the affected land. Alternatively, the Applicant may revise the model perimeters to increase the factor of safety to 1.3 or greater. Please note the Division has not verified the 1.3 factor of safety for cross-section D-D.
- 3. Please review cross-sections C-C and D-D on Deere & Ault Figure 6 and Map Exhibit C-1 Mining Plan Map. It appears the offset distance and Monaco Street loading was illustrated on the incorrect cross-section. The stability analysis models, Deere & Ault Figures 1 and 2, appear to represent the cross-sections accurately.
- 4. Please update the stability analysis cross-section D-D model to include surcharge load from the proposed haul road.



5. Please update the stability analysis cross-section B-B model to include surcharge load from 88<sup>th</sup> Avenue.

The Division will verify the Applicant's stability analysis models using Clover Technology's Galena v6.0 slope stability software following the Applicant's response to this letter.

If you have any questions, please contact me at (303) 866-3567 Ext. 8124.

Sincerely,

Peter S. Hays Environmental Protection Specialist

Cc: Tom Kaldenbach, Division of Reclamation, Mining & Safety

## COST SUMMARY WORK

| Task description: | <b>Reclaim Hatchery</b> | Pit      |                |                      |           | _             |
|-------------------|-------------------------|----------|----------------|----------------------|-----------|---------------|
| Site: Hatchery    | Pit                     |          | Permit Action: | New Application 2014 | Permit/Jo | ob#: M2014043 |
| PROJECT           | <u>IDENTIFICATI</u>     | ON       |                |                      |           |               |
| Task #:           | 999                     | State:   | Colorado       | Abbre                | viation:  | None          |
| Date:             | 12/19/2014              | County:  | Adams          | Fi                   | lename:   | M043-999      |
| User:             | TOD                     | •        |                |                      | -         |               |
| Ag                | ency or organization    | name: DF | RMS            |                      |           |               |

## TASK LIST (DIRECT COSTS)

| Task | Description                                  | Form<br>Used        | Fleet<br>Size | Task<br>Hours | Cost         |
|------|--|---------------------|---------------|---------------|--------------|
| 001  | Build Phase 1 slury wall                     | SITEMAINT<br>ENANCE | 1             | 0.00          | \$190,680.00 |
| 002  | Build Phase 2 slury wall                     | SITEMAINT<br>ENANCE | 1             | 0.00          | \$258,825.00 |
| 003  | Backfill slope D-D of phase 2 to 3H:1V       | DOZER               | 2             | 48.86         | \$21,057.00  |
| 004  | Backfill slope C-C of phase 2 to 3H:1V       | DOZER               | 2             | 115.31        | \$49,696.00  |
| 005  | Backfill slope B-B of phase 2 to 3H:1V       | DOZER               | 2             | 68.09         | \$29,346.00  |
| 006  | Backfill west slope of phase 2 to 3H:1V      | DOZER               | 2             | 22.02         | \$9,488.00   |
| 008  | Spread 10 inches of topsoil over 37.25 acres | SCRAPER1            | 1             | 46.98         | \$45,657.00  |
| 009  | Revegetation                                 | REVEGE              | ] 1           | 174.00        | \$24,280.00  |
| 010  | Mobilization /demobilization                 | MOBILIZE            | 1             | 4.66          | \$7,552.00   |
|      |  | <u>SUBTO</u>        | TALS:         | 479.92        | \$636,581    |

## **INDIRECT COSTS**

#### OVERHEAD AND PROFIT:

| Liability insurance: | 2.02%      | Total =                                | \$12,858.94  |
|----------------------|------------|--|--------------|
| Performance bond:    | 1.05%      | Total =                                | \$6,684.10   |
| Job superintendent:  | 120.00 hrs | Total =                                | \$9,019.20   |
| Profit:              | 10.00%     | Total =                                | \$63,658.10  |
|                      |            | TOTAL O & P =                          | \$92,220.34  |
|                      |            | CONTRACT AMOUNT (direct + O & P) = $($ | \$728,801.34 |
|                      |            |  |              |

#### LEGAL - ENGINEERING - PROJECT MANAGEMENT:

| Financial warranty processing (legal/related costs): | 500.00        | Total =              | 500.00       |
|--|---------------|----------------------|--------------|
| Engineering work and/or contract/bid preparation:    | 6.00%         | Total =              | \$43,728.08  |
| Reclamation management and/or administration:        | 5.00%         | -                    | \$36,440.07  |
|  |               | -                    |              |
| CONTINGENCY:   | 0.00          | Total =              | \$0.00       |
|  |               |                      |              |
|  | TOTAL II      | NDIRECT COST =       | \$172,888.49 |
|  |               |                      |              |
| TOTAL B  | OND AMOUNT (d | lirect + indirect) = | \$809,469.49 |

## SITE MAINTENANCE

| sk description:  | <b>Build Phas</b>   | e 1 slury wall  |   |  |   |   |
|------------------|---|---|---|--|---|---|
| Iatchery Pit     |   | Permit Action:  | New Application 2014  | Permit/J   | lob#:   | M2014043  |
| T IDENTIFICATION | <u>N</u>  |   |   |  |   |   |
| 001              | State:  | Colorado  | А   | bbreviation:   | None  |   |
| 12/19/2014       | County:   | Adams   |   | Filename:  | M043  | 3-001   |
| TOD              | •   |   |   | -  |   |   |
|                  | Iatchery Pit <b>T IDENTIFICATION</b> 001           12/19/2014 | Intervention         Intervention           001         State:           12/19/2014         County: | Hatchery Pit       Permit Action:         T IDENTIFICATION       Old         001       State:       Colorado         12/19/2014       County:       Adams | Hatchery Pit       Permit Action: New Application 2014         T IDENTIFICATION       Ool       State: Colorado       A         12/19/2014       County: Adams       Adams | Hatchery Pit       Permit Action: New Application 2014       Permit/D         T IDENTIFICATION       Ool       State:       Colorado       Abbreviation:         001       State:       Colorado       Filename:         12/19/2014       County:       Adams       Filename: | Hatchery Pit       Permit Action: New Application 2014       Permit/Job#:         T IDENTIFICATION       O01       State:       Colorado       Abbreviation:       None         12/19/2014       County:       Adams       Filename:       M043 |

## UNIT COSTS

| Maintenance Item             | Hours per<br>Year | Menu Selection        | Quantity  | Unit | Unit<br>Cost | Total Cost   |
|------------------------------|-------------------|-----------------------|-----------|------|--------------|--------------|
| Build Phase 1 slurry<br>wall | 1.00              | USER PROVIDED<br>ITEM | 63,560.00 | sqft | \$3.00       | \$190,680.00 |

Job Hours: 0.00

Total Cost: \$190,680.00

## SITE MAINTENANCE

| ask description: | Build Phase  | e 2 slury wall  |   |  |  |  |
|------------------|--|---|---|--|--|--|
| Hatchery Pit     |  | Permit Action:  | New Application 2014  | Permit/J   | ob#:   | M2014043   |
| T IDENTIFICATIO  | <u>N</u>   |   |   |  |  |  |
| 002              | State:   | Colorado  | At  | breviation:  | None   | ;  |
| 12/19/2014       | County:  | Adams   |   | Filename:  | M04  | 3-002  |
| TOD              | -  |   |   | -  |  |  |
| ł                | Hatchery Pit <u>T IDENTIFICATIO</u> 002 12/19/2014 | Hatchery Pit T IDENTIFICATION 002 State: 12/19/2014 County: | Hatchery Pit       Permit Action:         T IDENTIFICATION       002         002       State:       Colorado         12/19/2014       County:       Adams | Hatchery Pit       Permit Action: New Application 2014         T IDENTIFICATION         002       State: Colorado       At         12/19/2014       County: Adams       At | Hatchery Pit       Permit Action: New Application 2014       Permit/J         T IDENTIFICATION       002       State: Colorado       Abbreviation: Filename: Filenam | Hatchery Pit       Permit Action: New Application 2014       Permit/Job#:         T IDENTIFICATION |

## UNIT COSTS

| Maintenance Item          | Hours per<br>Year | Menu Selection        | Quantity  | Unit | Unit<br>Cost | Total Cost   |
|---------------------------|-------------------|-----------------------|-----------|------|--------------|--------------|
| Build Phase 2 slurry wall | 1.00              | USER PROVIDED<br>ITEM | 86,275.00 | sqft | \$3.00       | \$258,825.00 |

Job Hours: 0.00

Total Cost: \$258,825.00

## BULLDOZER WORK

| Task description:                                 | Ba                                 | ckfill slope D-       | D of phase 2   | 2 to 3H:1V               |               |          |
|---|------------------------------------|-----------------------|----------------|--------------------------|---------------|----------|
| : <u>Hatchery Pit</u>                             |                                    | Peri                  | mit Action:    | New Application 2014     | Permit/Job#:  | M2014043 |
| PROJECT IDE                                       | ENTIFICAT                          | <u>TION</u>           |                |                          |               |          |
| Task #: 003                                       |                                    | State:                | Colorado       |                          | Abbreviation: | None     |
|   | 19/2014                            | County:               | Adams          |                          | Filename:     | M043-003 |
| User: TO  | D                                  | _                     |                |                          |               |          |
| Agency  | or organizatio                     | on name: DR           | RMS            |                          |               |          |
| HOURLY EQU  | JIPMENT                            | <u>COST</u>           |                |                          |               |          |
| Basic Machine                                     |                                    | - 8U                  |                |                          |               |          |
| Horsepower  |                                    |                       |                |                          |               |          |
| Blade Type  |                                    |                       |                |                          |               |          |
| Attachment  |                                    |                       |                |                          |               |          |
| Shift Basis                                       | : 1 per day                        | 7                     |                |                          |               |          |
| Data Source                                       | : (CRG)                            |                       |                |                          |               |          |
| Cost Breakdown:                                   |                                    |                       |                |                          |               |          |
|   |                                    |                       |                | Utilization %            |               |          |
| Ownership Cost                                    | /Hour:                             | \$69.05               |                | NA                       |               |          |
| Operating Cost                                    | /Hour:                             | \$107.59              |                | 100                      |               |          |
| Ripper op. Cost                                   |                                    | \$0.00                |                | 0                        |               |          |
| Operator Cost                                     |                                    | \$38.85               |                | NA                       |               |          |
| Total unit Cost/II                                | • <u>•</u> •••                     | 5 10                  |                |                          |               |          |
| Total unit Cost/H<br>Total Fleet Cost/H           |                                    | .5.48<br><b>60.96</b> |                |                          |               |          |
|   | φτ.                                | ,0,70                 |                |                          |               |          |
| Initial Volume:<br>Swell factor:<br>Loose volume: | 8,389<br>1.115<br><b>9,354</b> LCY | Ŷ                     |                |                          |               |          |
| Source of estimat                                 |                                    |                       | 0              | average depth is 21 feet |               |          |
| HOURLY PRO  | DUCTION                            | I                     |                |                          |               |          |
|   |                                    | -                     |                |                          |               |          |
| Average push dis                                  |                                    | 245 feet              | 4              |                          |               |          |
| Unadjusted hourly                                 | y production:                      | 410.8 LCY/            | nr             |                          |               |          |
| Materials consiste                                | ency descripti                     | on: <u>Compa</u>      | cted fill or e | mbankment 0.9            |               |          |
| Average push gra<br>Average site altitu           |                                    | %<br>00 feet          |                |                          |               |          |
| Material weight:                                  | 2,1                                | 00 lbs/LCY            |                |                          | _             |          |
| Weight description                                | n: <u>Ear</u>                      | th - Loam             |                |                          |               |          |
| Job Condition Co                                  | rrection Facto                     | or                    |                | Source                   |               |          |
|   | perator Skill:                     |                       | 750            | (AVG.)                   |               |          |
|   | consistency:                       | 0.                    | 900            | (CAT HB))                |               |          |
|   | zing method:                       |                       | 000            | (GEN.)                   |               |          |
|   | Visibility:                        | -                     | 000            | (AVG.)                   |               |          |
| Ic  | b efficiency:                      |                       | 830            | (1 SHIFT/DAY)            | )             |          |
| 30  | Spoil pile:                        |                       | 900            | (SSD-FC)                 | ,             |          |
|   | spon pne:                          | 0.                    | 700            | (JJ-UCO)                 |               |          |

Task # 003

| Push gradient:   | 0.422 | (CAT HB) |
|------------------|-------|----------|
| Altitude:        | 1.000 | (CAT HB) |
| Material Weight: | 1.095 | (CAT HB) |
| Blade type:      | 1.000 | (PAT)    |

| Net correction             | on: 0.2330           |
|----------------------------|----------------------|
| Adjusted unit production:  | 95.72 LCY/hr         |
| Adjusted fleet production: | <b>191.44</b> LCY/hr |

| Fleet size: | 2 Dozer(s)  |
|-------------|-------------|
| Unit cost:  | \$2.251/LCY |

| Total job time: | 48.86 Hours |
|-----------------|-------------|
| Total job cost: | \$21,057    |

## BULLDOZER WORK

| Task description:  | Backfi  | ll slope C-C of phase 2   | 2 to 3H:1V   |               |          |
|--|---|---|--|---------------|----------|
| : Hatchery Pit   |   | Permit Action:  | New Application 2014   | Permit/Job#:  | M2014043 |
| PROJECT IDEN   | <b>TIFICATIO</b>  | N   |  |               |          |
| Task #: 004  |   | State: Colorado   |  | Abbreviation: | None     |
| Date: 12/19/2  | 2014  | County: Adams   |  | Filename:     | M043-004 |
| User: TOD  |   | ·   |  | -             |          |
| Agency or o  | organization n  | ame: DRMS   |  |               |          |
| HOURLY EQUIE   | PMENT COS   | <u>ST</u>   |  |               |          |
| Basic Machine:   | Cat D8T - 8U  | 1   |  |               |          |
| Horsepower:  | 310   |   |  |               |          |
| Blade Type:  | Universal   |   |  |               |          |
| Attachment:  | 3-shank rippe   | er  |  |               |          |
| Shift Basis:   | 1 per day   |   |  |               |          |
| Data Source:   | (CRG)   |   |  |               |          |
| Cost Breakdown:  |   |   |  |               |          |
| COSt Dicardown.  |   |   | Utilization %  |               |          |
| Ownership Cost/Ho  | our:  | \$69.05   | NA   |               |          |
| Operating Cost/Ho  |   | \$107.59  | 100  |               |          |
| Ripper op. Cost/Ho   |   | \$0.00  | 0  |               |          |
|  | -   | \$38.85   | NA   |               |          |
| Underator Cost/Ho  |   |   | 1111   |               |          |
| Operator Cost/Ho   |   |   |  |               |          |
| Total unit Cost/Hour   | · · ·   |   |  |               |          |
| Total unit Cost/Hour<br>Total Fleet Cost/Hou<br>MATERIAL QUA   | ır: <b>\$430.9</b> 0  |   |  |               |          |
| Total unit Cost/Hour<br>Total Fleet Cost/Hour<br>MATERIAL QUA<br>Initial Volume:<br>Swell factor:<br>Loose volume:   | r: <b>\$430.90</b><br>ANTITIES<br>21,886<br>1.115<br><b>24,403</b> LCY  | \$  |  |               |          |
| Total unit Cost/Hour<br>Total Fleet Cost/Hou<br><u>MATERIAL QUA</u><br>Initial Volume:<br>Swell factor:  | r: <b>\$430.90</b><br><b>ANTITIES</b><br>21,886<br>1.115<br><b>24,403</b> LCY<br>volume:  | \$  | g average depth is 23 feet                                   |               |          |
| Total unit Cost/Hour<br>Total Fleet Cost/Hour<br>MATERIAL QUA<br>Initial Volume:<br>Swell factor:<br>Loose volume:   | \$430.90         ANTITIES         21,886         1.115         24,403 LCY         volume:         swell factor:   | Slope is1450 feet long  | g average depth is 23 feet                                   |               |          |
| Total unit Cost/Hour<br>Total Fleet Cost/Hour<br>MATERIAL QUA<br>Initial Volume:<br>Swell factor:<br>Loose volume:<br>Source of estimated source of estimated source of estimated source source source of estimated source s | r: \$430.90<br>ANTITIES<br>21,886<br>1.115<br>24,403 LCY<br>volume:<br>swell factor:<br>UCTION<br>ce:   | Slope is1450 feet long  | g average depth is 23 feet                                   |               |          |
| Total unit Cost/Hour<br>Total Fleet Cost/Hour<br>MATERIAL QUA<br>Initial Volume:<br>Swell factor:<br>Loose volume:<br>Source of estimated source of estimated source of<br>Source of estimated source of<br>Nource of estimated source of<br>Average push distance   | \$430.90         ANTITIES         21,886         1.115         24,403 LCY         volume:         swell factor:         UCTION         ce:       2         roduction:       2   | Slope is1450 feet long<br>Cat Handbook  |  |               |          |
| Total unit Cost/Hour<br>Total Fleet Cost/Hour<br>MATERIAL QUA<br>Initial Volume:<br>Swell factor:<br>Loose volume:<br>Source of estimated source | xr:       \$430.90         ANTITIES         21,886         1.115         24,403 LCY         volume:         swell factor:         UCTION         ce:       2         roduction:       2         y description:         nt:       25 %   | Slope is1450 feet long<br>Cat Handbook<br>25 feet<br>54.1 LCY/hr<br>Compacted fill or e   |  |               |          |
| Total unit Cost/Hour<br>Total Fleet Cost/Hour<br>MATERIAL QUA<br>Initial Volume:<br>Swell factor:<br>Loose volume:<br>Source of estimated s<br>Source of estimated s<br>HOURLY PROD<br>Average push distance<br>Unadjusted hourly pu<br>Materials consistency  | xr:       \$430.90         ANTITIES         21,886         1.115         24,403 LCY         volume:         swell factor:         UCTION         ce:       2         roduction:       2         y description:         nt:       25 %   | Slope is1450 feet long<br>Cat Handbook<br>25 feet<br>54.1 LCY/hr<br>Compacted fill or energy  |  |               |          |
| Total unit Cost/Hour<br>Total Fleet Cost/Hour<br>MATERIAL QUA<br>Initial Volume:<br>Swell factor:<br>Loose volume:<br>Source of estimated s<br>Source of estimated s<br>HOURLY PROD<br>Average push distand<br>Unadjusted hourly pr<br>Materials consistency<br>Average push gradie<br>Average site altitude   | antimes         21,886         1.115         24,403 LCY         volume:         swell factor:         UCTION         ce:       2         roduction:       2         y description:         nt:       25 %         :       5,100 fe  | Slope is1450 feet long<br>Cat Handbook<br>25 feet<br>54.1 LCY/hr<br>Compacted fill or en-<br>ceet   |  |               |          |
| Total unit Cost/Hour<br>Total Fleet Cost/Hour<br>MATERIAL QUA<br>Initial Volume:<br>Swell factor:<br>Loose volume:<br>Source of estimated of<br>Source of estimated of<br>Source of estimated of<br>Average push distand<br>Unadjusted hourly pu<br>Materials consistency<br>Average push gradie<br>Average site altitude<br>Material weight:  | antimes         antimes         21,886         1.115         24,403 LCY         volume:         swell factor:         UCTION         ce:       2         roduction:       2         y description:         nt:       25 %         :       5,100 fd         2,100 ll         Earth -   | Slope is1450 feet long<br>Cat Handbook<br>25 feet<br>54.1 LCY/hr<br>Compacted fill or en-<br>ceet   |  |               |          |
| Total unit Cost/Hour<br>Total Fleet Cost/Hour<br>MATERIAL QUA<br>Initial Volume:<br>Swell factor:<br>Loose volume:<br>Source of estimated of<br>Source of estimated of<br>Source of estimated of<br>Source of estimated of<br>Average push distand<br>Unadjusted hourly pu<br>Materials consistency<br>Average push gradie<br>Average site altitude<br>Material weight:<br>Weight description:<br>Job Condition Correct<br>Operation   | xr:       \$430.90         ANTITIES       21,886         1.115       24,403 LCY         volume:       swell factor:         swell factor:       2         UCTION       2         ce:       2         roduction:       2         y description:       2         nt:       25 %         :       5,100 fd  | Slope is1450 feet long<br>Cat Handbook<br>25 feet<br>54.1 LCY/hr<br>Compacted fill or en<br>eet<br>os/LCY<br>Loam<br>0.750                  | mbankment 0.9  |               |          |
| Total unit Cost/Hour<br>Total Fleet Cost/Hour<br>MATERIAL QUA<br>Initial Volume:<br>Swell factor:<br>Loose volume:<br>Source of estimated of<br>Source of estimated of<br>Source of estimated of<br>Average push distand<br>Unadjusted hourly pu<br>Materials consistency<br>Average push gradie:<br>Average site altitude<br>Material weight:<br>Weight description:<br>Job Condition Correct<br>Oper-<br>Material con  | antifies         21,886         1.115         24,403 LCY         volume:         swell factor:         UCTION         ce:       2         roduction:       2         y description:         nt:       25 %         :       5,100 fd   | Slope is1450 feet long<br>Cat Handbook<br>25 feet<br>54.1 LCY/hr<br>Compacted fill or ent<br>set<br>bs/LCY<br>Loam<br>0.750<br>0.900        |  |               |          |
| Total unit Cost/Hour<br>Total Fleet Cost/Hour<br>MATERIAL QUA<br>Initial Volume:<br>Swell factor:<br>Loose volume:<br>Source of estimated of<br>Source of estimated of<br>Source of estimated of<br>Average push distand<br>Unadjusted hourly pr<br>Materials consistency<br>Average push gradie<br>Average site altitude<br>Material weight:<br>Weight description:<br>Job Condition Correct<br>Oper:<br>Material con<br>Dozing   | antifies         antifies         21,886         1.115         24,403 LCY         volume:         swell factor:         UCTION         ce:       2         roduction:       2         y description:         nt:       25 %         5,100 fd  | Slope is1450 feet long<br>Cat Handbook<br>25 feet<br>54.1 LCY/hr<br>Compacted fill or e<br>eet<br>bs/LCY<br>Loam<br>0.750<br>0.900<br>1.000 | Source           (AVG.)           (CAT HB))           (GEN.) | -             |          |
| Total unit Cost/Hour<br>Total Fleet Cost/Hour<br>MATERIAL QUA<br>Initial Volume:<br>Swell factor:<br>Loose volume:<br>Source of estimated of<br>Source of estimated of<br>Source of estimated of<br>Source of estimated of<br>Average push distand<br>Unadjusted hourly pu<br>Materials consistency<br>Average push gradie:<br>Average site altitude<br>Material weight:<br>Weight description:<br>Job Condition Correct<br>Opera<br>Material con<br>Dozing  | r: $$430.96$ ANTITIES 21,886 1.115 24,403 LCY volume: swell factor: UCTION ce: 2 roduction: 2 r | Slope is1450 feet long<br>Cat Handbook<br>25 feet<br>54.1 LCY/hr<br>Compacted fill or end<br>cet<br>0.750<br>0.900<br>1.000<br>1.000        | Source           (AVG.)           (GEN.)           (AVG.)    | -             |          |
| Total unit Cost/Hour<br>Total Fleet Cost/Hour<br>MATERIAL QUA<br>Initial Volume:<br>Swell factor:<br>Loose volume:<br>Source of estimated of<br>Source of estimated of<br>Source of estimated of<br>Source of estimated of<br>Average push distand<br>Unadjusted hourly pu<br>Materials consistency<br>Average push gradie:<br>Average site altitude<br>Material weight:<br>Weight description:<br>Job Condition Correct<br>Opera<br>Material con<br>Dozing  | antifies         antifies         21,886         1.115         24,403 LCY         volume:         swell factor:         UCTION         ce:       2         roduction:       2         y description:         nt:       25 %         5,100 fd  | Slope is1450 feet long<br>Cat Handbook<br>25 feet<br>54.1 LCY/hr<br>Compacted fill or e<br>eet<br>bs/LCY<br>Loam<br>0.750<br>0.900<br>1.000 | Source<br>(AVG.)           (CAT HB))           (GEN.)        |               |          |

Task # 004

| Push gradient:   | 0.422 | (CAT HB) |
|------------------|-------|----------|
| Altitude:        | 1.000 | (CAT HB) |
| Material Weight: | 1.095 | (CAT HB) |
| Blade type:      | 1.000 | (PAT)    |
|                  |       |          |

| Net correction             | on: 0.2330           |
|----------------------------|----------------------|
| Adjusted unit production:  | 105.81 LCY/hr        |
| Adjusted fleet production: | <b>211.62</b> LCY/hr |

| Fleet size: | 2 Dozer(s)  |
|-------------|-------------|
| Unit cost:  | \$2.036/LCY |

| Total job time: | 115.31 Hours |
|-----------------|--------------|
| Total job cost: | \$49,696     |

## BULLDOZER WORK

| Task description:  | Backfill   | slope B-B of phase 2   | 2 10 3H:1V  |                            |                  |
|--|--|--|---|----------------------------|------------------|
| Hatchery Pit   |  | Permit Action:   | New Application 2014                                      | Permit/Job#:               | M2014043         |
| PROJECT IDENTI   | FICATION   |  |   |                            |                  |
| Task #:         005           Date:         12/19/20           User:         TOD   | 14 0   | State: Colorado<br>County: Adams   |   | Abbreviation:<br>Filename: | None<br>M043-005 |
| Agency or org  | ganization nam   | e: DRMS  |   |                            |                  |
| HOURLY EQUIPM  | 1ENT COST  | -  |   |                            |                  |
|  | Cat D8T - 8U   |  |   |                            |                  |
| 1 <u> </u>   | Jniversal  |  |   |                            |                  |
|  | shank ripper   |  |   |                            |                  |
|  | per day  |  |   |                            |                  |
|  | CRG)   |  |   |                            |                  |
|  | CKO)   |  |   |                            |                  |
| Cost Breakdown:  |  |  |   |                            |                  |
|  |  | <b>.</b>   | <u>Utilization %</u>                                      |                            |                  |
| Ownership Cost/Hour  |  | \$69.05  | NA  |                            |                  |
| Operating Cost/Hour  |  | \$107.59   | 100   |                            |                  |
| Ripper op. Cost/Hour   |  | \$0.00   | 0   |                            |                  |
| Operator Cost/Hour   | r:   | \$38.85  | NA  |                            |                  |
|  |  |  |   |                            |                  |
| Total unit Cost/Hour   | \$215.48   |  |   |                            |                  |
| Total unit Cost/Hour:<br>Total Fleet Cost/Hour:  | \$215.48<br><b>\$430.96</b>  |  |   |                            |                  |
| Total Fleet Cost/Hour:<br>MATERIAL QUAN  | \$430.96   |  |   |                            |                  |
| Total Fleet Cost/Hour:<br><u>MATERIAL QUAN</u><br>Initial Volume: <u>15</u><br>Swell factor: <u>1.</u>   | \$430.96   |  |   |                            |                  |
| Total Fleet Cost/Hour:<br><u>MATERIAL QUAN</u><br>Initial Volume: <u>15</u><br>Swell factor: <u>1.</u>   | \$430.96<br><b>NTITIES</b><br>5,937<br>115<br><b>7,770</b> LCY<br>lume:  | Slope is 1300 feet lon   | g average depth is 23 feet                                |                            |                  |
| Total Fleet Cost/Hour:         MATERIAL QUAN         Initial Volume:       15         Swell factor:       1.7         Loose volume:       17         Source of estimated volume       5         Source of estimated sw       5   | \$430.96<br><b>NTITIES</b><br>5,937<br>115<br>7,770 LCY<br>lume: <u>S</u><br>vell factor: <u>C</u>   | 1  | g average depth is 23 feet                                |                            |                  |
| Total Fleet Cost/Hour:         MATERIAL QUAN         Initial Volume:       15         Swell factor:       1.         Loose volume:       17         Source of estimated voi       Source of estimated sw         HOURLY PRODUCE       10   | \$430.96<br><b>NTITIES</b><br>5,937<br>115<br>7,770 LCY<br>lume: <u>S</u><br>vell factor: <u>C</u><br>CTION  | Cat Handbook   | g average depth is 23 feet                                |                            |                  |
| Total Fleet Cost/Hour:         MATERIAL QUAN         Initial Volume:       15         Swell factor:       1.7         Loose volume:       17         Source of estimated volume       5         Source of estimated sw       5   | \$430.96<br><b>NTITIES</b><br>5,937<br>115<br>7,770 LCY<br>lume: <u>5</u><br>vell factor: <u>6</u><br>CTION<br>185   | 1  | g average depth is 23 feet                                |                            |                  |
| Total Fleet Cost/Hour:<br>MATERIAL QUAN<br>Initial Volume: 15<br>Swell factor: 1.<br>Loose volume: 17<br>Source of estimated vol<br>Source of estimated sw<br>HOURLY PRODUC<br>Average push distance:  | \$430.96         NTITIES         5,937         115         7,770 LCY         lume:       5         vell factor:       6         CTION         :       185         duction:       560   | Cat Handbook   |   |                            |                  |
| Total Fleet Cost/Hour:<br>MATERIAL QUAN<br>Initial Volume: 15<br>Swell factor: 1.<br>Loose volume: 17<br>Source of estimated vol<br>Source of estimated vol<br>Source of estimated sw<br>HOURLY PRODUC<br>Average push distance:<br>Unadjusted hourly proc   | \$430.96           NTITIES           5,937           115           7,770 LCY           lume:         \$           vell factor:         \$           CTION           :         185           duction:         \$           lescription:         \$  | Cat Handbook<br>5 feet<br>0.0 LCY/hr<br>Compacted fill or e  |   |                            |                  |
| Total Fleet Cost/Hour:<br>MATERIAL QUAN<br>Initial Volume: 15<br>Swell factor: 1.<br>Loose volume: 17<br>Source of estimated volume<br>Source of estimated volume<br>Source of estimated swell<br>HOURLY PRODUC<br>Average push distance:<br>Unadjusted hourly proc<br>Materials consistency of<br>Average push gradient:  | \$430.96<br><b>NTITIES</b><br>5,937<br>115<br>7,770 LCY<br>lume: <u>\$</u><br>vell factor: <u>0</u><br><b>CTION</b><br>: <u>185</u><br>duction: <u>560</u><br>description:<br>: <u>25 %</u>  | Cat Handbook<br>5 feet<br>0.0 LCY/hr<br>Compacted fill or e  |   |                            |                  |
| Total Fleet Cost/Hour:<br>MATERIAL QUAN<br>Initial Volume: 15<br>Swell factor: 1.<br>Loose volume: 17<br>Source of estimated vol<br>Source of estimated sw<br>HOURLY PRODUC<br>Average push distance:<br>Unadjusted hourly proc<br>Materials consistency c<br>Average push gradient:<br>Average site altitude:   | \$430.96         NTITIES         5,937         115         7,770 LCY         lume:       \$         yell factor:       \$         CTION         :       185         duction:       \$         description:         :       25 %         5,100 feet   | Cat Handbook<br>5 feet<br>).0 LCY/hr<br>Compacted fill or e<br>LCY   |   |                            |                  |
| Total Fleet Cost/Hour:<br>MATERIAL QUAN<br>Initial Volume: 15<br>Swell factor: 1.<br>Loose volume: 17<br>Source of estimated volume<br>Source of estimated swell<br>HOURLY PRODUC<br>Average push distance:<br>Unadjusted hourly proce<br>Materials consistency of<br>Average push gradient:<br>Average site altitude:<br>Material weight:<br>Weight description:  | \$430.96         NTITIES         5,937         115         7,770 LCY         lume:       \$         yell factor:       \$         CTION         construction:       \$         25 %       \$         5,100 feet         2,100 lbs/         Earth - Lo  | Cat Handbook<br>5 feet<br>).0 LCY/hr<br>Compacted fill or e<br>LCY   | mbankment 0.9   |                            |                  |
| Total Fleet Cost/Hour:         MATERIAL QUAN         Initial Volume:       15         Swell factor:       1.         Loose volume:       17         Source of estimated vol       Source of estimated sw         HOURLY PRODUC         Average push distance:         Unadjusted hourly proc         Materials consistency d         Average site altitude:         Material weight:         Weight description:         Job Condition Correction  | \$430.96         NTITIES         5,937         115         7,770 LCY         lume:       \$         yell factor:       \$         CTION         c       \$         duction:       \$         \$       \$         duction:       \$         \$       \$ | Cat Handbook 5 feet 0.0 LCY/hr Compacted fill or e LCY bam   | mbankment 0.9   |                            |                  |
| Total Fleet Cost/Hour:<br>MATERIAL QUAN<br>Initial Volume: 15<br>Swell factor: 1.<br>Loose volume: 17<br>Source of estimated volume<br>Source of estimated volume<br>Source of estimated volume<br>Source of estimated volume<br>MOURLY PRODUC<br>Average push distance:<br>Unadjusted hourly proce<br>Materials consistency of<br>Average push gradient:<br>Average site altitude:<br>Material weight:<br>Weight description:<br>Job Condition Correction<br>Operator   | \$430.96         NTITIES         5,937         115         7,770 LCY         lume:   | Cat Handbook 5 feet 0.0 LCY/hr Compacted fill or e LCY 0.750   |   |                            |                  |
| Total Fleet Cost/Hour:         MATERIAL QUAN         Initial Volume:       15         Swell factor:       1.1         Loose volume:       17         Source of estimated vol       Source of estimated vol         Source of estimated sw       HOURLY PRODUC         Average push distance:       Unadjusted hourly proc         Materials consistency d       Average site altitude:         Material weight:       Weight description:         Job Condition Correction       Operator         Material consi       Consistency d   | \$430.96         NTITIES         5,937         115         7,770 LCY         lume:   | Cat Handbook 5 feet 0.0 LCY/hr Compacted fill or e LCY bam 0.750 0.900   |   |                            |                  |
| Total Fleet Cost/Hour:<br>MATERIAL QUAN<br>Initial Volume: 15<br>Swell factor: 1.<br>Loose volume: 17<br>Source of estimated volume<br>Source of estimated volume<br>Source of estimated volume<br>Source of estimated swell<br>HOURLY PRODUC<br>Average push distance:<br>Unadjusted hourly proce<br>Materials consistency of<br>Average push gradient:<br>Average site altitude:<br>Material weight:<br>Weight description:<br>Job Condition Correction<br>Material consistency of<br>Material con | \$430.96         NTITIES         5,937         115         7,770 LCY         lume:       \$         vell factor:       \$         vell factor:       \$         CTION       \$         centron       \$         duction:       \$         2,100 lbs/       \$         Earth - Lco       \$         on Factor       \$         or Skill:       \$         istency:       \$         nethod:       \$  | Cat Handbook 5 feet 0.0 LCY/hr Compacted fill or e LCY 0am 0.750 0.900 1.000   | Source<br>(AVG.)           (CAT HB))           (GEN.)     |                            |                  |
| Total Fleet Cost/Hour:<br>MATERIAL QUAN<br>Initial Volume: 15<br>Swell factor: 1.<br>Loose volume: 17<br>Source of estimated volume<br>Source of estimated volume<br>Source of estimated swell<br>HOURLY PRODUC<br>Average push distance:<br>Unadjusted hourly proce<br>Materials consistency of<br>Average push gradient:<br>Average site altitude:<br>Material weight:<br>Weight description:<br>Job Condition Correction<br>Operator<br>Material consi<br>Dozing r<br>Vis   | \$430.96         NTITIES         5,937         115         7,770 LCY         lume:       9         vell factor:       0         CTION         :       185         duction:       560         description:         :       25 %   | Cat Handbook<br>5 feet<br>0.0 LCY/hr<br>Compacted fill or e<br>LCY<br>bam<br>0.750<br>0.900<br>1.000<br>1.000<br>1.000 | Source           (AVG.)           (GEN.)           (AVG.) |                            |                  |
| Total Fleet Cost/Hour:<br>MATERIAL QUAN<br>Initial Volume: 15<br>Swell factor: 1.<br>Loose volume: 17<br>Source of estimated vol<br>Source of estimated sw<br>HOURLY PRODUC<br>Average push distance:<br>Unadjusted hourly proc<br>Materials consistency of<br>Average push gradient:<br>Average site altitude:<br>Material weight:<br>Weight description:<br>Job Condition Correction<br>Material consi<br>Dozing r<br>Vis<br>Job effi  | \$430.96         NTITIES         5,937         115         7,770 LCY         lume:       \$         vell factor:       \$         vell factor:       \$         CTION       \$         centron       \$         duction:       \$         2,100 lbs/       \$         Earth - Lco       \$         on Factor       \$         or Skill:       \$         istency:       \$         nethod:       \$  | Cat Handbook 5 feet 0.0 LCY/hr Compacted fill or e LCY 0am 0.750 0.900 1.000   | Source<br>(AVG.)           (CAT HB))           (GEN.)     |                            |                  |

Task # 005

| Push gradient:   | 0.422  | (CAT HB) |
|------------------|--------|----------|
| Altitude:        | 1.000  | (CAT HB) |
| Material Weight: | 1.095  | (CAT HB) |
| Blade type:      | 1.000  | (PAT)    |
|                  |        |          |
| Net correction:  | 0.2330 |          |

| Adjusted unit production:  | 130.48 LCY/hr |
|----------------------------|---------------|
| Adjusted fleet production: | 260.96 LCY/hr |

| Fleet size: | 2 Dozer(s)  |
|-------------|-------------|
| Unit cost:  | \$1.651/LCY |

| Total job time: | 68.09 Hours |
|-----------------|-------------|
| Total job cost: | \$29,346    |

## BULLDOZER WORK

| Task description:                         | Backf            | ill west sloj          | pe of phase 2  | 2 to 3H:1V                 |               |          |
|---|------------------|------------------------|----------------|----------------------------|---------------|----------|
| : Hatchery Pit                            |                  | Per                    | mit Action:    | New Application 2014       | Permit/Job#:  | M2014043 |
| PROJECT IDE                               | NTIFICATIO       | <u>N</u>               |                |                            |               |          |
| Task #: 006                               |                  | State:                 | Colorado       |                            | Abbreviation: | None     |
|   | 9/2014           | County:                | Adams          |                            | Filename:     | M043-006 |
| User: TOD                                 | )                | ·                      |                |                            | -             |          |
| Agency of                                 | r organization n | ame: DF                | RMS            |                            |               |          |
| HOURLY EQU                                | IPMENT CO        | <u>ST</u>              |                |                            |               |          |
| Basic Machine:                            | Cat D8T - 80     | J                      |                |                            |               |          |
| Horsepower:                               | 310              |                        |                |                            |               |          |
| Blade Type:                               | Universal        |                        |                |                            |               |          |
| Attachment:                               | 3-shank ripp     | er                     |                |                            |               |          |
| Shift Basis:                              | 1 per day        |                        |                |                            |               |          |
| Data Source:                              | (CRG)            |                        |                |                            |               |          |
| Cost Breakdown:                           |                  |                        |                |                            |               |          |
|   |                  |                        |                | Utilization %              |               |          |
| Ownership Cost/                           | Hour:            | \$69.05                |                | NA                         |               |          |
| Operating Cost/l                          |                  | \$107.59               | )              | 100                        |               |          |
| Ripper op. Cost/                          |                  | \$0.00                 |                | 0                          |               |          |
| Operator Cost/                            |                  | \$38.85                |                | NA                         |               |          |
| Total unit Cost/Ho                        | \$215 A          | 0                      |                |                            |               |          |
| Total Fleet Cost/Ho                       |                  |                        |                |                            |               |          |
| Initial Volume:<br>Swell factor:          | 6,829<br>1.115   |                        |                |                            |               |          |
| Loose volume:                             | <b>7,614</b> LCY |                        |                |                            |               |          |
| Source of estimate Source of estimate     |                  | Slope is 1<br>Cat Hand |                | g average depth is 10 feet |               |          |
| HOURLY PRO                                | DUCTION          |                        |                |                            |               |          |
| Average push dista                        | nce:             | 180 feet               |                |                            |               |          |
| Unadjusted hourly                         |                  | 574.7 LCY              | /hr            |                            |               |          |
| Materials consister                       | icy description: | Compa                  | cted fill or e | mbankment 0.9              |               |          |
| Average push grad<br>Average site altitud |                  | eet                    |                |                            |               |          |
| Material weight:                          |                  | bs/LCY                 |                |                            | _             |          |
| Weight description                        | : Earth -        | Loam                   |                |                            |               |          |
| Job Condition Cor                         | rection Factor   |                        |                | Source                     |               |          |
|   | erator Skill:    | 0.                     | 750            | (AVG.)                     |               |          |
|   | consistency:     |                        | 900            | (CAT HB))                  |               |          |
|   | ing method:      |                        | 000            | (GEN.)                     |               |          |
|   | Visibility:      |                        | 000            | (AVG.)                     |               |          |
| Int                                       | efficiency:      |                        | 830            | (1 SHIFT/DAY)              |               |          |
| JOL                                       | Spoil pile:      |                        | 900            | (SSD-FC)                   | ·             |          |
|   | spon pne:        | 0.                     | 900            | (SSD-FC)                   |               |          |

Task # 006

| Push gradient:   | 0.545 | (CAT HB) |
|------------------|-------|----------|
| Altitude:        | 1.000 | (CAT HB) |
| Material Weight: | 1.095 | (CAT HB) |
| Blade type:      | 1.000 | (PAT)    |
|                  |       |          |

| Net correctio              | on: 0.3009           |  |
|----------------------------|----------------------|--|
| Adjusted unit production:  | 172.93 LCY/hr        |  |
| Adjusted fleet production: | <b>345.86</b> LCY/hr |  |

| Fleet size: | 2 Dozer(s)  |
|-------------|-------------|
| Unit cost:  | \$1.246/LCY |

| Total job time: | 22.02 Hours |
|-----------------|-------------|
| Total job cost: | \$9,488     |

Page 1 of 2

# SCRAPER TEAM WORK

| Site:    | Hatchery Pit  |   | Permit               | Action:             | New application              | <u>n 2014</u> Per          | rmit/Job#:  | M2014043         |      |
|----------|---|---|----------------------|---------------------|------------------------------|----------------------------|-------------|------------------|------|
| ]        | PROJECT IDEN  | <b>TIFICATION</b>                         |                      |                     |                              |                            |             |                  |      |
|          | Task #:     008       Date:     12/19/2       User:     TOD |   |                      | Colorado<br>Adams   |                              |                            |             | None<br>M043-008 |      |
|          | Agency or o   | organization name                         | : DRM                | S                   |                              |                            |             |                  |      |
| <u>]</u> | HOURLY EQUIE  | PMENT                                     |                      |                     | COSTS                        | nift basis: <u>1 per c</u> | <u>day</u>  |                  |      |
|          |   |   |                      | Equipm              | ent Description              |                            |             |                  |      |
|          |   |   | Scraper:             | Cat 63              | 1G                           |                            |             |                  |      |
|          | C   |   | -Dozer:              | Cat D8              | ST - 8U                      |                            |             |                  |      |
|          | Suppo   | rt Equipment -Loa<br>Durr-                | id Area:<br>np Area: | NA<br>NA            |                              |                            |             |                  |      |
|          | Road Ma   | intenance –Motor                          |                      | CAT 1               | 4M                           |                            |             |                  |      |
|          |   | -Water                                    | r Truck:             | Water               | Tanker, 3,500 Gal            |                            |             |                  |      |
| (        | Cost Breakdown:   | Scraper Wo                                | ork Team             |                     | Support Equi                 | oment                      | Mainte      | enance Equip     | me   |
| 2        |   | Scraper                                   | Doz                  | zer                 | Load Area                    | Dump Area                  | Motor Gr    | * *              |      |
| %U       | tilization-machine:   | 100                                       | 10                   | 0                   | NA                           | NA                         | 50          |                  | 5    |
| Ov       | vnership cost/hour:   | \$80.91                                   | \$69                 | .05                 | NA                           | NA                         | \$42.0      | 3 \$             | \$10 |
| 0        | perating cost/hour:   | \$169.91                                  | \$107                | 7.59                | NA                           | NA                         | \$34.8      | 7 §              | \$18 |
| Ri       | pper op. cost/hour:   | NA  | \$7.                 | 31                  | NA                           | NA                         | \$0.00      | )                | \$0  |
| (        | Operator cost/hour:   | \$39.02                                   | \$38                 | .85                 | NA                           | NA                         | \$38.2      | 3 \$             | \$25 |
|          | Unit Subtotals:   | \$289.83                                  | \$222                | 2.80                | NA                           | NA                         | \$115.1     | 13 \$            | \$54 |
|          | Number of Units:  | 2   | 1                    |                     | 0                            | 0                          | 1           |                  |      |
|          | Group Subtotals:  | Work:                                     | \$802                | 2.46                | Support:                     | \$0.00                     | М           | faint: \$        | 16   |
| ]        | Fotal work team cost  | t/hour: <b>\$971.89</b>                   |                      |                     |                              |                            |             |                  |      |
| <u> </u> | MATERIAL QUA  | ANTITIES                                  |                      |                     |                              |                            |             |                  |      |
|          | Initial volume:   | 50,080                                    |                      | CCY                 | Swell fact                   | or: <u>1.115</u>           |             |                  |      |
|          | Loose volume:   | 55,839                                    |                      | LCY                 |                              |                            |             |                  |      |
|          |   | rce of estimated ve<br>of estimated swell |                      | Divisior<br>Cat Han | n of Reclamation, l<br>dbook | Mining & Safety            |             |                  |      |
| I        | HOURLY PROD   | UCTION                                    |                      |                     |                              |                            |             |                  |      |
| -        |   |   |                      |                     | Scraper Bo                   | owl (volume) Bas           | <u>sis:</u> |                  |      |
|          | Material weight:  | 2,100 lbs/LCY                             |                      |                     | Struck                       | Volume: 24.00              |             | LCY              |      |
| Ν        | laterial description:                                       | Earth - Loam                              |                      |                     | Heaped                       | Volume: 34.00              |             | LCY              |      |
|          | Rated Payload:  | 81,600 pounds                             |                      |                     | Average                      | Volume: 29.00              |             | LCY              |      |

0.80 Minutes

0.70 Minutes

Cycle Time:

#### Scraper Loading Time: Maneuver and Spread Time:

#### Job Condition Correction:

|                 | Scraper | Push Dozer | Source   |
|-----------------|---------|------------|----------|
| Altitude Adj:   | 1.000   | 1.000      | (CAT HB) |
| Job Efficiency: | 0.830   | 0.830      | (CAT HB) |
| Net Correction: | 0.830   | 0.830      |          |

#### Travel Time:

Road Condition: Hard, smooth, stabilized, surfaced, watered, maintained 2.0

#### Haul Route:

| Seg # | Haul Distance (Ft) | Grade<br>(%) | Roll. Res<br>(%) | Total Res<br>(%) | Velocity (fpm) | Travel Time<br>(min) |
|-------|--------------------|--------------|------------------|------------------|----------------|----------------------|
| 1     | 625.00             | -1.00        | 2.00             | 1.00             | 2872           | 0.49                 |

Haul Time: **0.49** minutes

Site Altitude: 5100 feet

| Return Ro | oute:   |                |                    |                    |                |                      |
|-----------|---|----------------|--------------------|--------------------|----------------|----------------------|
| Seg #     | Haul Distance (Ft)                            | Grade<br>(%)   | Roll. Res<br>(%)   | Total Res<br>(%)   | Velocity (fpm) | Travel Time<br>(min) |
| 1         | 625.00  | 1.00           | 2.00               | 3.00               | 2890           | 0.44                 |
|           |   |                |                    | Return Time:       | 0.44           | minutes              |
|           |   |                | Total Scraper      | team cycle time:   | 2.43           | minutes              |
|           |   |                | Adjusted for       | or job conditions: | 594.32         | LCY/Hour             |
|           |   |                | Selected Nur       | nber of Scrapers:  | 2              | Scraper(s)           |
|           | Adjusted                                      | i single scrap | oer team (unit) h  | ourly production:  | 1,188.64       | LCY/Hour             |
|           | Adjusted m                                    | ultiple scrap  | er team (fleet) he | ourly production:  | 1,188.64       | LCY/Hour             |
| Optimal   | Unadjusted unit pro-<br>Number of Scrapers pe |                |                    | LCY/Hour           |                |                      |

| Fleet size: | 1       | Team(s) | Total job time: | 46.98    | Hours |
|-------------|---------|---------|-----------------|----------|-------|
| Unit cost:  | \$0.818 | /LCY    | Total job cost: | \$45,657 |       |

# **REVEGETATION WORK**

| Т     | ask descrip        | otion:                          | Revegetation     |             |                      |               |          |
|-------|--------------------|---------------------------------|------------------|-------------|----------------------|---------------|----------|
| Site: | Hatchery           | Pit                             | Per              | mit Action: | New Application 2014 | Permit/Job#:  | M2014043 |
| Ē     | PROJECT<br>Task #: | <u><b>C IDENTIFI</b></u><br>009 | CATION<br>State: | Colorado    |                      | Abbreviation: | None     |
|       | Date:<br>User:     | 12/19/2014<br>TOD               | County:          | Adams       |                      | Filename:     | M043-009 |
|       | Ag                 | ency or organi                  | zation name: DF  | RMS         |                      |               |          |

## **FERTILIZING**

# Materials

| Description | Units /<br>Acre | Unit | Cost / Unit                   | Cost /Acre |
|-------------|-----------------|------|-------------------------------|------------|
|             |                 |      | \$                            | \$         |
|             |                 |      | Total Fertilizer<br>Materials |            |
|             |                 |      | Cost/Acre                     | \$0.00     |

### Application

| Description                            | Cost /Acre |
|--|------------|
|  | \$         |
| Total Fertilizer Application Cost/Acre | \$0.00     |

## **TILLING**

| Description                                      | Cost /Acre |
|--|------------|
| Disc harrowing, 6" deep (MEANS 32 91 13.23 6100) | \$98.01    |
| Weed control spraying (MEANS 31 31 16.13 3100)   | \$145.20   |
|  |            |
| Total Tilling Cost/Acre                          | \$243.21   |

# **SEEDING**

| Seed Mix                        | Rate –<br>PLS<br>LBS /<br>Acre | Seeds<br>per SQ.<br>FT | Cost /Acre |
|---------------------------------|--------------------------------|------------------------|------------|
| Blue Grama - Native             | 0.56                           | 9.14                   | \$5.80     |
| Buffalograss - Native/Plains    | 3.13                           | 3.02                   | \$42.13    |
| Little Bluestem - Native        | 0.56                           | 3.34                   | \$8.00     |
| Sideoats Grama - El Reno        | 1.13                           | 3.71                   | \$12.70    |
| Intermediate Wheatgrass - Rush  | 1.38                           | 2.95                   | \$3.09     |
| Oats - Russel                   | 0.56                           | 0.17                   | \$0.18     |
| Slender Wheatgrass - Native     | 1.48                           | 5.40                   | \$3.33     |
| Thickspike Wheatgrass - Critana | 9.00                           | 31.82                  | \$46.53    |
|                                 |                                | 59.54                  | \$121.76   |

Totals Seed Mix 17.80

#### Application

| Description                    | Cost /Acre              |
|--------------------------------|-------------------------|
| Drill seeding (DRMS Cost Data) | \$88.20                 |
|                                |                         |
| Total Seed Applic              | ation Cost/Acre \$88.20 |

## **MULCHING and MISCELLANEOUS**

#### Materials

| Description                               | Units /<br>Acre | Unit | Cost / Unit | Cost /Acre |
|---|-----------------|------|-------------|------------|
| Straw, delivered {MEANS 31 25 14.16 1200} | 2.00            | TON  | \$265.00    | \$530.00   |
| Total Mulch Materials Cost/Acre           |                 |      |             | \$530.00   |

## Application

| Description                              | Cost /Acre |
|--|------------|
| Crimping, with tractor {DMG survey data} | \$65.89    |
| Power mulcher (MEANS 32 91 13.16 0250)   | \$86.68    |
|  |            |
| Total Mulch Application Cost/Acre        | \$152.57   |

### **NURSERY STOCK PLANTING**

| Common Name | No /<br>Acre | Type and Size | Planting<br>Cost | Fertilizer<br>Pellet Cost | Cost /Acre |
|-------------|--------------|---------------|------------------|---------------------------|------------|
|             |              |               |                  |                           | \$         |
|             |              |               |                  |                           |            |
|             |              | Totals        | Nursery Stoc     | ek Cost / Acre            | \$0.00     |

| No. of Acres:                    | 43.5    | Cost /Acre:  | \$1,135.74 |
|----------------------------------|---------|--------------|------------|
| Estimated Failure Rate:          | 50%     | Cost /Acre*: | \$209.96   |
| *Selected Replanting Work Items: | SEEDING |              |            |
|                                  |         |              |            |

| Initial Job Cost:   | \$49,404.69 |
|---------------------|-------------|
| Reseeding Job Cost: | \$4,566.63  |
| Total Job Cost:     | \$53,971    |
| Job Hours:          | 174.00      |

# EQUIPMENT MOBILIZATION/DEMOBILIZATION

| Task description                      | : <u>Mo</u>      | bilization /demob  | ilization     |                |                  |                |             |
|---------------------------------------|------------------|--------------------|---------------|----------------|------------------|----------------|-------------|
| e: <u>Hatchery Pit</u>                |                  | Permit A           | Action: New A | Application 20 | Permit/J         | ob#: <u>M2</u> | 2014043     |
| PROJECT ID                            | ENTIFICAT        | ION                |               |                |                  |                |             |
| Task #: 01                            | 0                | State: Co          | olorado       |                | Abbreviati       | on: Noi        | ne          |
| Date: 12<br>User: TO                  | /19/2014<br>DD   | County: Ad         | lams          |                | Filenar          | ne: M0         | 43-010      |
| Agency                                | or organization  | n name: DRMS       |               |                |                  |                |             |
| <u>EQUIPMENT</u>                      | TRANSPOR         | <u>RT RIG COST</u> |               |                |                  |                |             |
|                                       |                  |                    |               |                | Shift basis:     | 1 per          |             |
|                                       |                  |                    |               | Co             | ost Data Source: | CRG I          | Data        |
| Tru                                   | ck Tractor Desc  | ription: GENI      | ERIC ON-HIGH  | IWAY TRUC      | CK TRACTOR, 62   | X4, DIESE      | EL POWERED, |
|                                       |                  |                    |               |                | ND HALF, 2006    |                |             |
| Tru                                   | ick Trailer Desc | ription: GENE      | RIC FOLDING   |                | CK, DROP DECK    | EQUIPM         | ENT TRAILER |
|                                       |                  |                    |               | (251, 5        | 0T, AND 100T)    |                |             |
| Cost Breakdown                        | <u>:</u>         |                    |               |                |                  |                |             |
| Available Rig C                       | apacities        | 0-25 Tons          | 26-50 Tons    | 51+7           | ons              |                |             |
| Ownersh                               | ip Cost/Hour:    | \$16.63            | \$18.37       | \$22           | .33              |                |             |
| Operatir                              | g Cost/Hour:     | \$44.38            | \$46.13       | \$50           | .07              |                |             |
| Operate                               | or Cost/Hour:    | \$27.66            | \$27.66       | \$27           | .66              |                |             |
| Help                                  | er Cost/Hour:    | \$0.00             | \$25.39       | \$25           | .39              |                |             |
| Total Un                              | it Cost/Hour:    | \$88.67            | \$117.55      | \$125          | .45              |                |             |
| NON ROADA                             | BLE EQUIP        | MENT:              |               |                |                  |                |             |
| Machine                               | Weight/          | Owner ship         | Haul Rig      | Fleet          | Haul Trip Ret    | urn Trip       | DOT Permit  |
| Description                           | Unit             | Cost/hr/ unit      | Cost/hr/unit  |                |                  | st/hr/ fleet   |             |
| · · · · · · · · · · · · · · · · · · · | (TONS)           |                    |               |                | fleet            |                |             |

| Widefinite    | W CIGILI | Owner sinp    | maar ng      | 1 1000  | maar mp              | r              |             |
|---------------|----------|---------------|--------------|---------|----------------------|----------------|-------------|
| Description   | Unit     | Cost/hr/ unit | Cost/hr/unit | Size    | Cost/hr/             | Cost/hr/ fleet | Cost/ fleet |
|               | (TONS)   |               |              |         | fleet                |                |             |
| Cat D8T - 8U  | 53.70    | \$69.05       | \$125.45     | 2       | \$388.99             | \$250.90       | \$500.00    |
| Cat 627G      | 41.80    | \$69.99       | \$117.55     | 2       | \$375.09             | \$235.10       | \$500.00    |
| CAT 14M       | 23.57    | \$45.44       | \$88.67      | 1       | \$134.11             | \$88.67        | \$250.00    |
| Power Mulcher | 6.00     | \$7.03        | \$88.67      | 1       | \$95.70              | \$88.67        | \$250.00    |
| (Reinco M90)  |          |               |              |         |                      |                |             |
|               |          |               |              | ~ • • • | <b>*************</b> | * • •          | *           |

Subtotals: **\$993.89 \$663.34 \$1,500.00** 

### **ROADABLE EQUIPMENT:**

| Machine Description      | Total Cost/hr/ unit | Fleet Size | Haul Trip<br>Cost/hr/ fleet | Return Trip<br>Cost/hr/ fleet |
|--------------------------|---------------------|------------|-----------------------------|-------------------------------|
| Water Tanker, 3,500 Gal. | \$72.40             | 1          | \$72.40                     | \$72.40                       |
|                          |                     | Subtotals: | \$72.40                     | \$72.40                       |

## **EQUIPMENT HAUL DISTANCE and Time**

| Nearest Major City or Town within project area region:<br>Total one-way travel distance:<br>Average Travel Speed: | DENVER<br>10.00<br>60.00 | miles mph |
|---|--------------------------|-----------|
| Total Non-Roadable Mob/Demob Cost *<br>'* two round trips with haul rig:  | \$7,527.97               |           |
| Total Roadable Mob/Demob Cost ** ** one round trip, no haul rig:  | \$24.13                  |           |

Transportation Cycle Time:

| Haul Time (Hours);      | Non-Roadable<br>Equipment | Roadable<br>Equipment<br>0.17 |
|-------------------------|---------------------------|-------------------------------|
| Haul Time (Hours):      | 0.17                      | 0.17                          |
| Return Time (Hours):    | 0.17                      | 0.17                          |
| Loading Time (Hours):   | 1.00                      | NA                            |
| Unloading Time (Hours): | 1.00                      | NA                            |
| Subtotals:              | 2.33                      | 0.33                          |

## JOB TIME AND COST

Total job time: **4.67** Hours

Total job cost: **\$7,552**