You Can't Improve What You Don't Measure

Performance Tracking at Solid Waste Facilities

APRIL 5, 2022

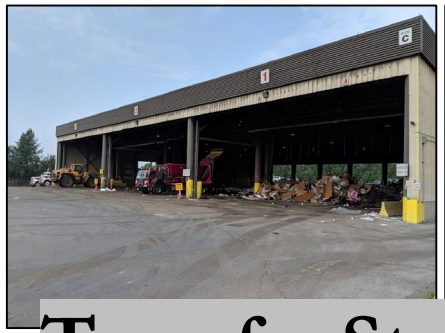
Sam Marchant, P.E.

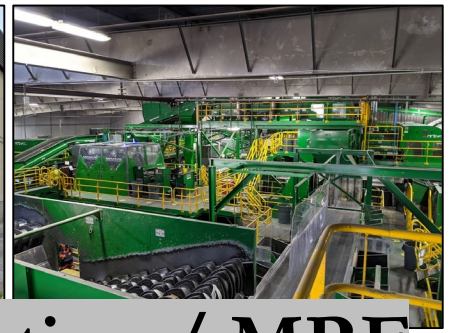
- Developed dozens of custom performance tracking systems
- Provides engineering and operations support to solid waste facilities across the US
- Head of BRS Drone Services Division

Who is joining us today?

Landfill

Organics





Transfer Station / MRF

Collections


YOU CAN'T
IMPROVE WHAT
YOU DON'T
MEASURE

Caught Up in the Daily Grind

- Managers and operators have enough on their plate to simply get material from the curb to its final destination
- Do not have time to step back and assess our performance
- "How are we doing?"

Basic Performance Tracking

- Most likely, all of you do track performance (at a certain level)
  - Densities
  - Payloads
  - Revenues
  - Production
  - Recycling/ Diversion Rates
  - Waste Generation
  - Waste Stream
  - Transactions
  - Material Tonnages
  - Customer Data

- These are important, but is there more "useful" data to track?

Taking it To the Next Level

- Drilling down into the more detailed metrics…
- The metrics that dictate your bottom line…
- Arguably, the most important metrics…
- **Operational Metrics!**

Equipment Costs

Tons per Hour

Airspace Utilization

Cycle Times

Cover Ratio

SAMPLE

Landfill Performance Tracking

Waste Cell Displayed
02/03/2020 - 02/11/2020

Duration of Waste Cell

6.5 Days Average

8.0 Days Selected Waste Cell

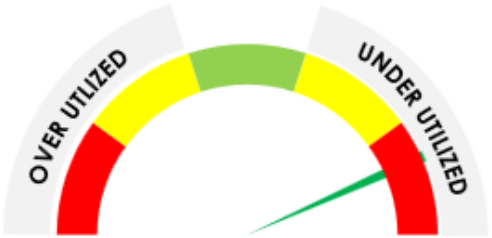
Borrow Area Cover Soil Used

1,256 CY Minimum

4,715 CY Selected Waste Cell

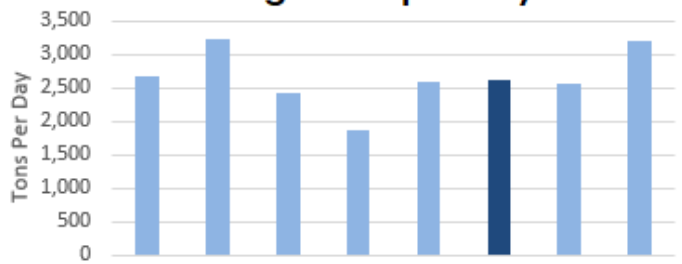
7,205 CY Maximum

Compactor Production Rate



252 Tons per Hour
100 Tons per Hour Optimum

Average Tons per Day



Selected Waste Cell

Other Waste Cells

Waste : Cover Soil Ratio

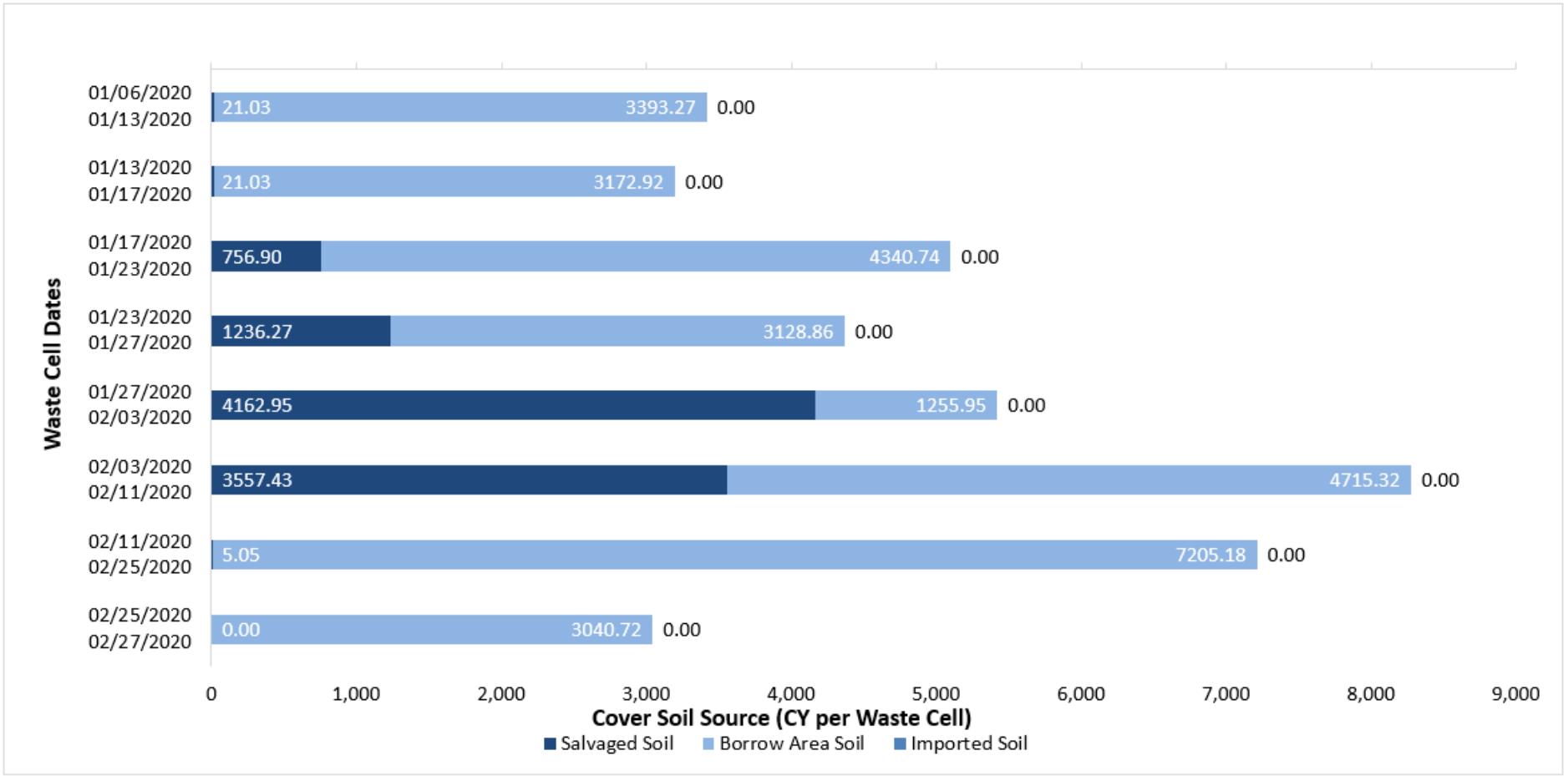
5.2 : 1 Average

4.4 : 1 Selected Waste Cell

Total Equipment Cost per Ton

Other Waste Cells

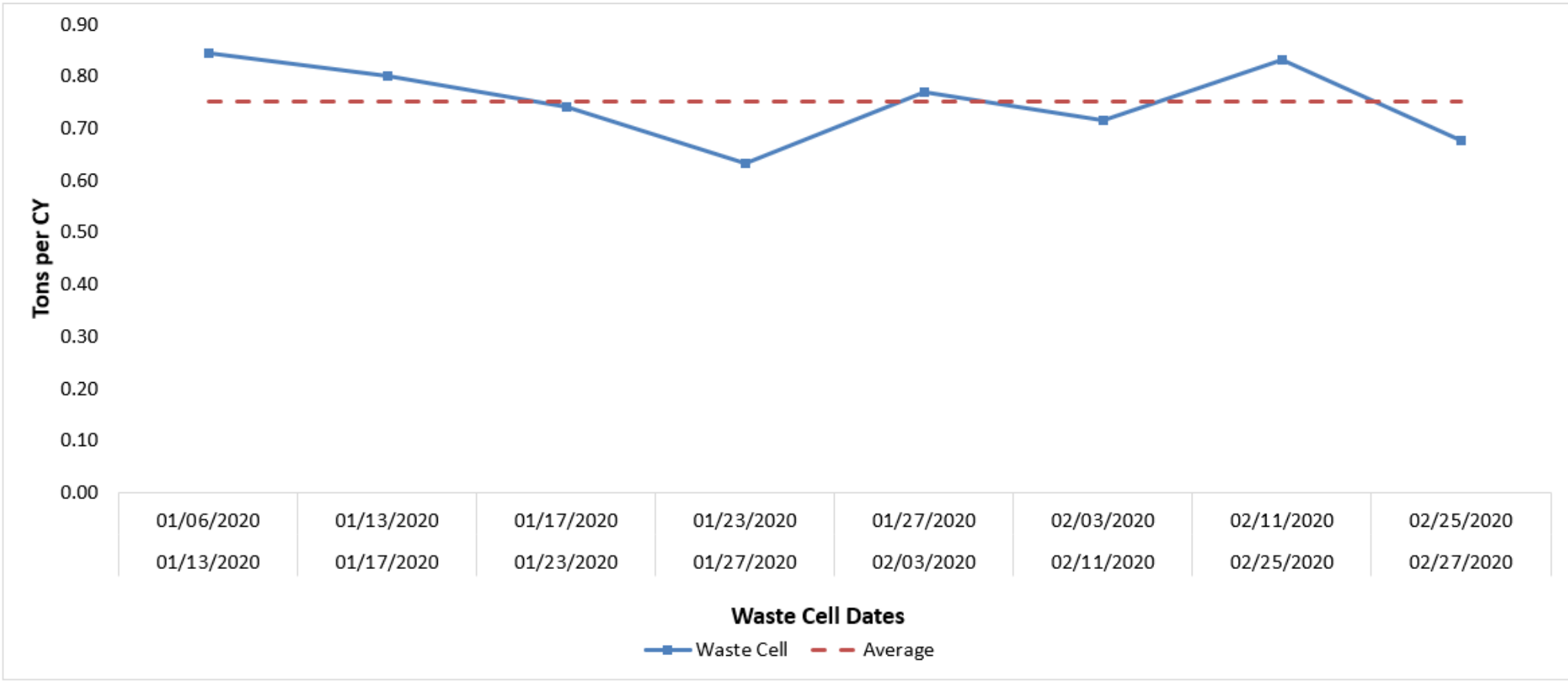
Selected Waste Cell


Waste Cell Dates
01/06/2020 01/13/2020
21.03
3393.27
0.00
01/13/2020 01/17/2020
21.03
3172.92
0.00
01/17/2020 01/23/2020
756.90
4340.74
0.00
01/23/2020 01/27/2020
1236.27
3128.86
0.00
01/27/2020 02/03/2020
4162.95
1255.95
0.00
02/03/2020 02/11/2020
3557.43
4715.32
0.00
02/11/2020 02/25/2020
5.05
7205.18
0.00
02/25/2020 02/27/2020
0.00
3040.72
0.00
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000
9,000
Cover Soil Source (CY per Waste Cell)
Salvaged Soil
Borrow Area Soil
Imported Soil

Landfill Performance Tracking

Airspace Utilization Factor

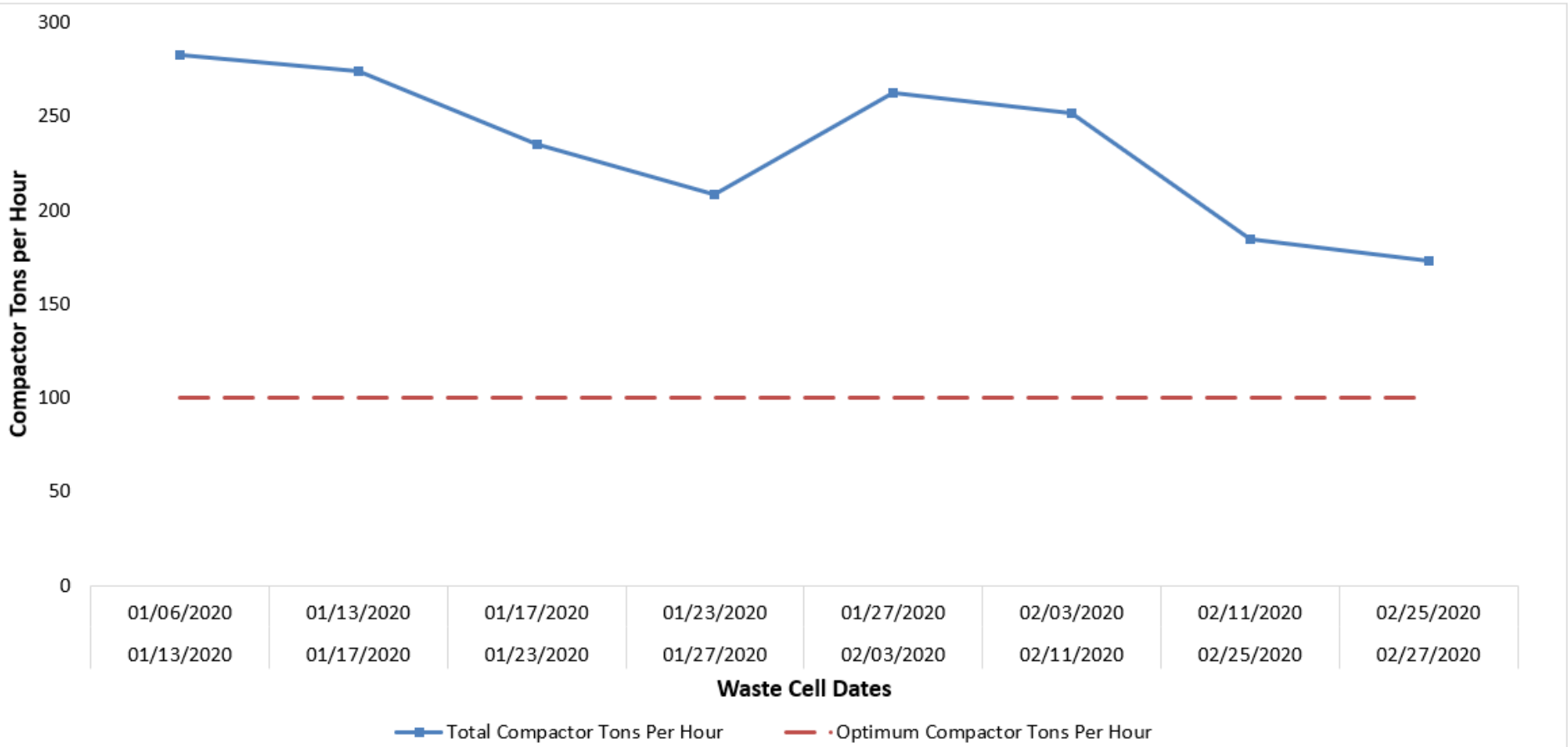
Waste Cell Range: 01/06/2020 – 02/27/2020



Landfill Performance Tracking

Compactor Production Rate

Waste Cell Range: 01/06/2020 – 02/27/2020

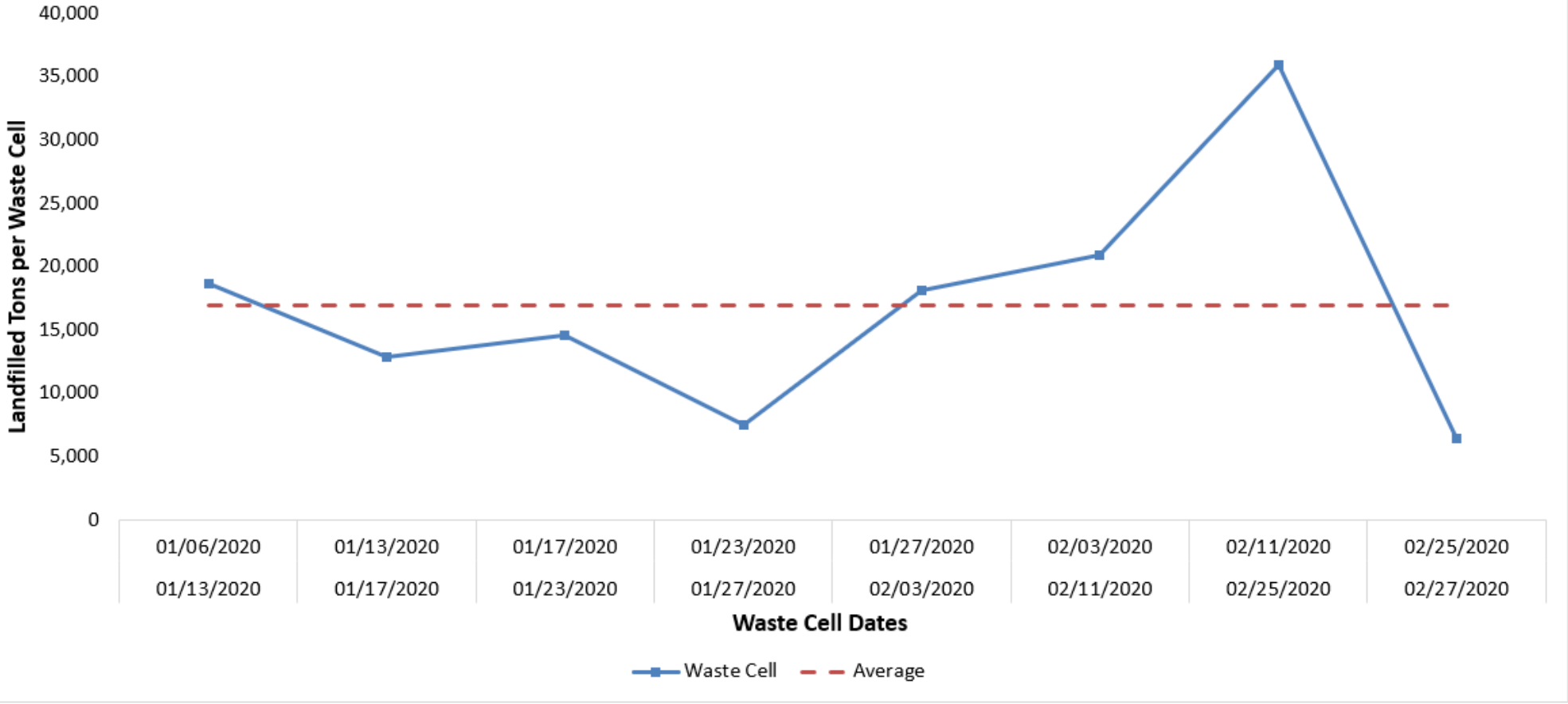


Landfill Performance Tracking

Tons Landfilled

Waste Cell Range: 01/06/2020 – 02/27/2020

Data Input
Overview
Tonnage
Cover Material
Equipment
Airspace
Cost
Database
Developer




Landfill
Performance Tracking
Total Equipment Cost
Waste Cell Range
01/06/2020
02/27/2020
Data Input
Overview
Tonnage
Cover Material
Equipment
Airspace
Cost
Database
Developer
$140,000
$120,000
$100,000
$80,000
$60,000
$40,000
$20,000
$0
Total Equipment Cost
01/06/2020
01/13/2020
01/13/2020
01/17/2020
01/17/2020
01/23/2020
01/23/2020
01/27/2020
01/27/2020
02/03/2020
02/03/2020
02/11/2020
02/11/2020
02/25/2020
02/25/2020
02/27/2020
Waste Cell Dates

Landfill Performance Tracking

This performance tracking spreadsheet is optimized for Microsoft Excel for Office 365. If you have any issues with the spreadsheet, please contact BRS at:

Jason Todaro jason@blueridgeservices.com
Sam Marchant sam@blueridgeservices.com
(805) 461-6850

DATE AND TIME

Cell Start Date		MM/DD/YYYY
Cell Start Time		HH:MM (24 Hour)
Cell End Date		MM/DD/YYYY
Cell End Time		HH:MM (24 Hour)

WASTE

Actual Tons		Tons
Phase / Cell Name		Description

PRIMARY LANDFILL EQUIPMENT HOURS

Caterpillar Compactor - 826K		Total Hours in Period
Caterpillar Bulldozer - D7E		Total Hours in Period
Caterpillar Bulldozer - D6N		Total Hours in Period
Caterpillar Quarry Truck - 725		Total Hours in Period

COVER MATERIAL

Salvaged Cover Soil		CY (Field Estimate)
Stockpile Cover Soil		Haul Truck Loads
Imported Cover Soil (Customers)		CY (Field Estimate)
Processed Green Waste (ADC)		CY (Field Estimate)
Processed Wood Waste (ADC)		CY (Field Estimate)

NOTES

SAVE WASTE CELL DATA

Custom Performance Tracking System

- You can track any metric that you have data for
- Can even integrate third-party data (CAT VisionLink, JDLink, etc.)
  - To track more detailed compactor performance
    - Time spent compacting vs time spent tarping vs time spent idling
- You have to be "all-in" in order to get the most out of it

Real World Example

Operator Performance

- Correlate operator performance to facility performance
  - Sam was on the compactor for this waste cell – and we can see that the compactor tons per hour is too high and the density is low

Real World Example

Track Costs & Resources

- Good way to quantify the costs of idling/non-value-added activities
  - Sam was on the wheel loader yesterday – and we can see that he ran it for 12 hours during his 12 hour shift, which increased our costs

Real World Example

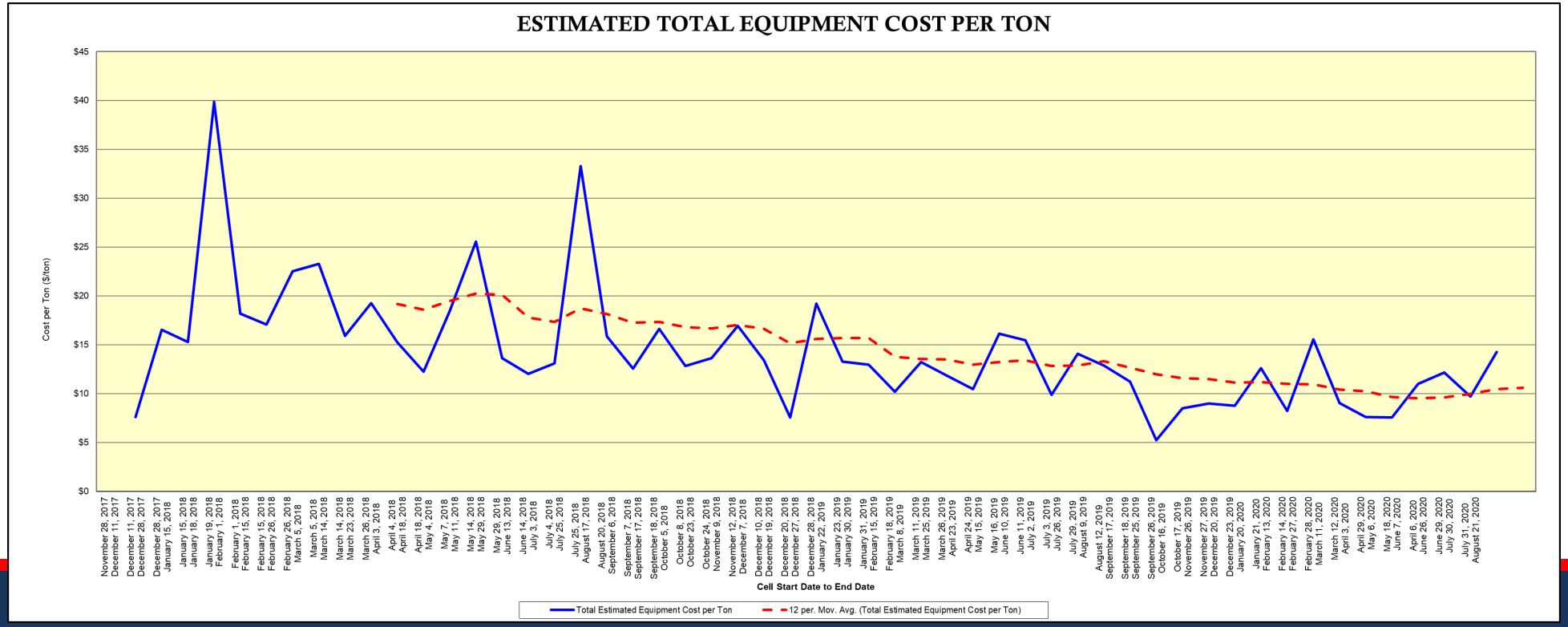
Cycle Time

- Easy to visually assess cycle times
  - One of Sam's cycles from the MRF to the landfill was 1 hour longer than all the others, and the longest trip he has ever recorded – why?

Real World Example

Cost Savings

- Easy to visually assess costs related to waste handling



Implementing a Performance Tracking System

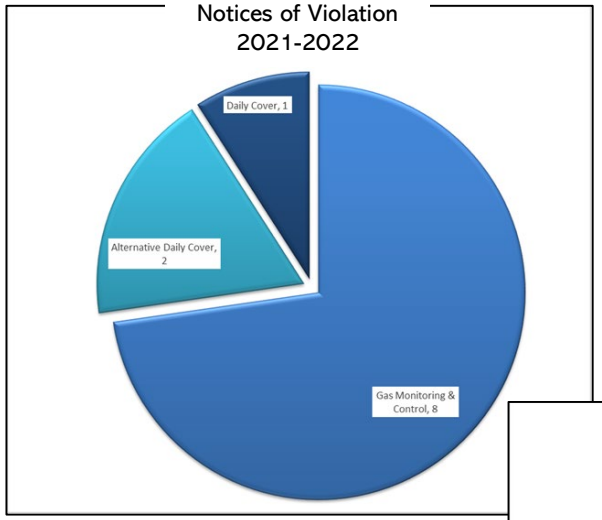
- At first, usually an iterative process
- How is the data entry process working, and how can I best assess performance?
- Do we need to add additional data points or metrics?

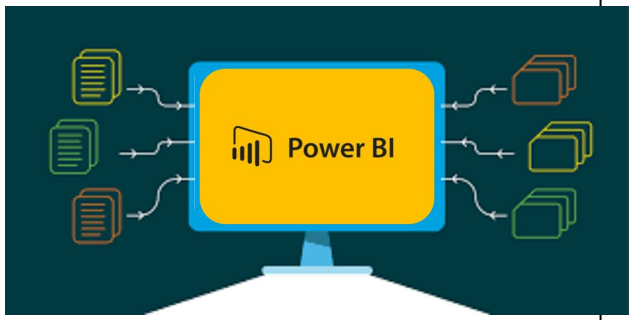
Maintaining a Performance Tracking System

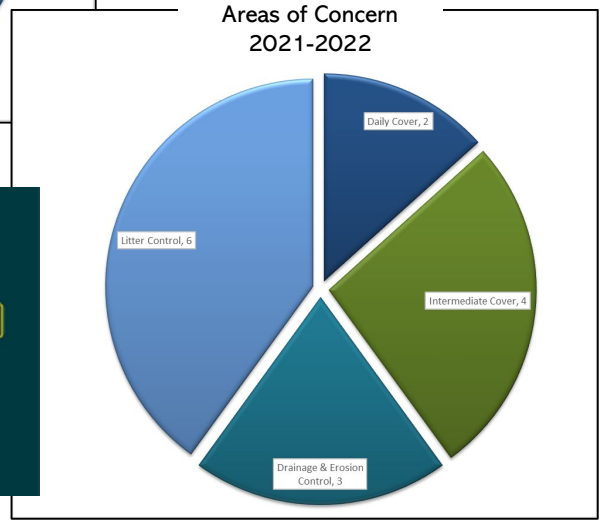
- Depending on platform, may be maintenance required
- If you accidentally input 20 tons instead of 200 tons, there may be miscalculations
- It is a computer program, so there will be opportunities for technical issues

What's to Come?

- Again, you can track any metric that you have data for
  - Regulatory Compliance
  - Environmental Controls
  - Staffing
  - Fleet Size
  - Maintenance
  - Downtime
  - Safety
- Integrations to allow automation







Bottom Line
Get the Most Out of Your Data!

- Let a performance tracking system do the number crunching for you
- Allows you to actually see/track trends, results, and improvements
- Quantify your operational performance
- Times are tough… but now is the time to track and improve the performance of your operation

Questions or Comments?

Sam Marchant

sam@blueridgeservices.com