# Opportunities for Biosolids EQ Compost for Green Stormwater Infrastructure

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Metropolitan Water Reclamation District of Greater Chicago

# Metropolitan Water Reclamation District of Greater Chicago (MWRD)

- **Mission**:
  - ✓ Protect water quality of Lake Michigan
  - ✓ Improve quality of local waterways
- **Servicing Chicago + 125 suburban communities**
  - ✓ ~883.5 sq. mile



# Resource Recovery Perspective for Urban Sustainability

# Composting

## ➢Raw Materials

- Biosolids (B)
- Wood chips (W)

## ➢Process

- Blending – B+W @ 1:3 by volume
- Compost for 23 days @ 55° C
- Cure for 16 weeks
- Quality control (testing)
- Meets USEPA/IEPA composting standards

## ➢Final Product – EQ Compost

- Screening
- Distribution


# Exceptional Quality (EQ) Compost

# EQ Compost

## ……..in Bags

# Regulatory Metal Limits

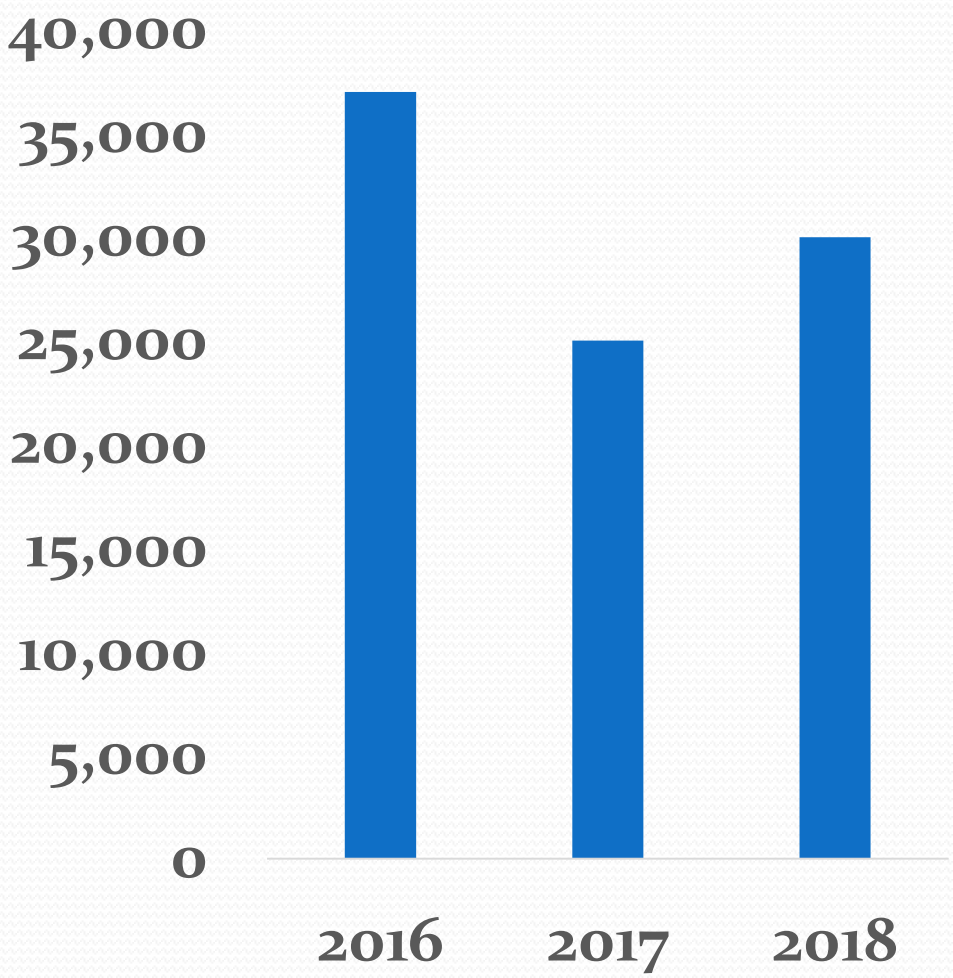
| Trace Metal | Part 503 Allowable | Exceptional Quality | EQ Compost |
|---|---|---|---|
| | ---------- | mg/kg | ---------- |
| Arsenic | 75 | 41 | <5 |
| Cadmium | 85 | 39 | 1-2 |
| Copper† | 4,300 | 1,500 | 303-477 |
| Mercury | 57 | 17 | 0.4-0.9 |
| Molybdenum † | 75 | 75 | 3.5-6 |
| Nickel † | 420 | 420 | 21-41 |
| Lead | 840 | 300 | 59-88 |
| Selenium † | 100 | 100 | <5 |
| Zinc † | 7,500 | 2,800 | 519-889 |



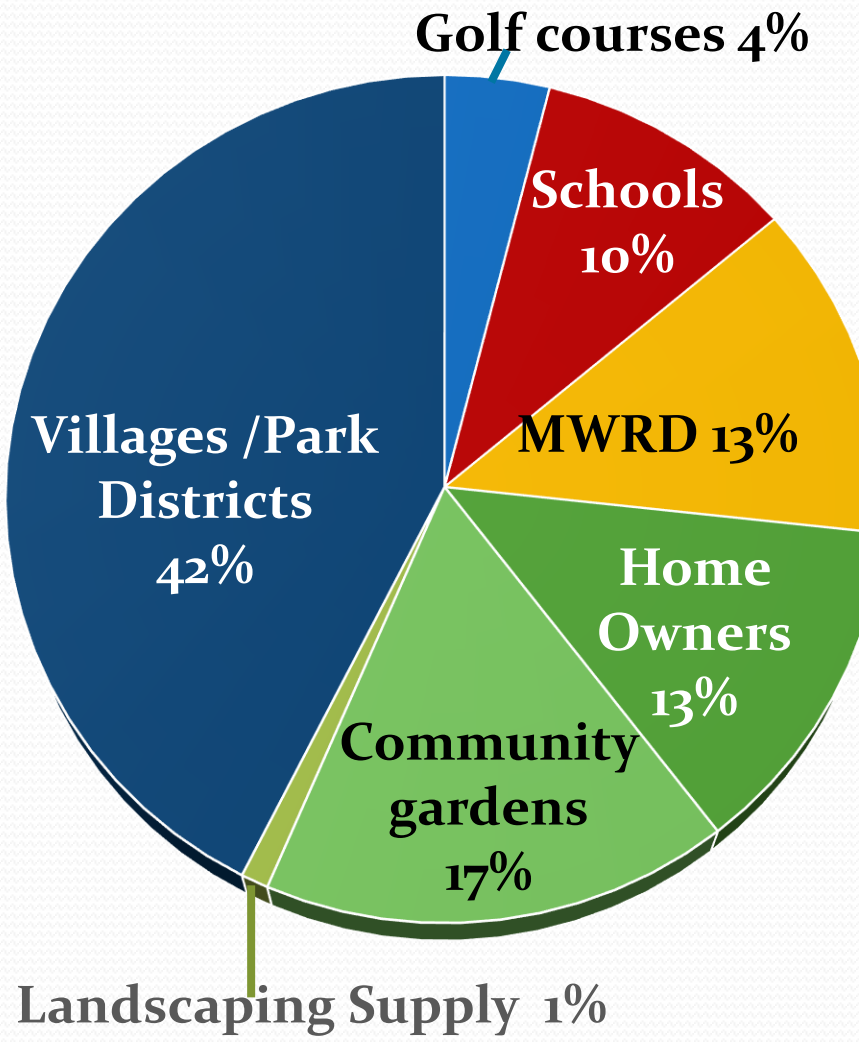
† Essential plant nutrient

# EQ Compost Productions & Distributions

## Production (cu. yd)




## Distributions (%)



# EQ Compost

- **Excellent soil amendment**
  - Improve and maintain productive soils

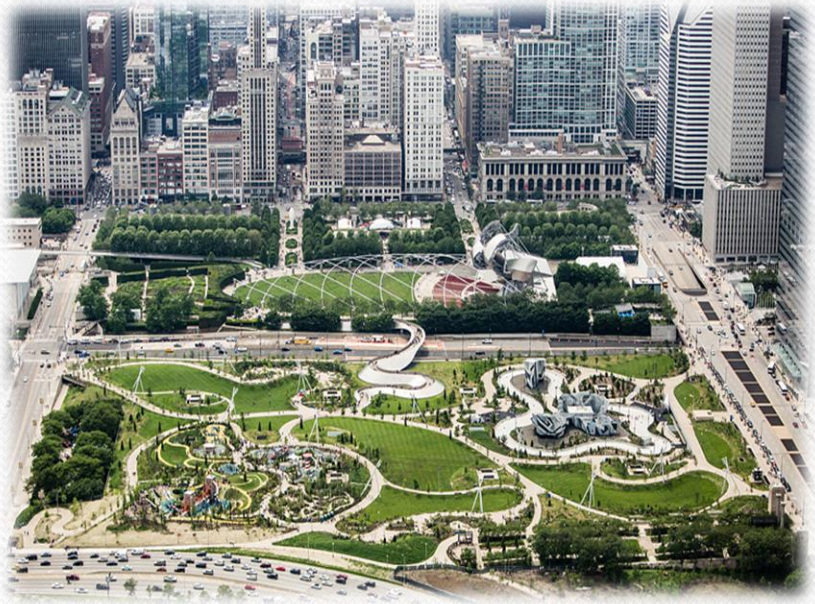
    - Biological, - chemical, and - physical properties of soils
  - Enhance water and nutrient retention in soils
- **Mulch, potting soil blends, other landscaping use**

# EQ Compost

| Commercial Compost | MWRD EQ Compost |
| --- | --- |


# Urban Utilization Program

- Turning  vacant neighborhood lots into gardens.
- Landscaping beds and tree planting
- Park Districts, schools, landscaping companies

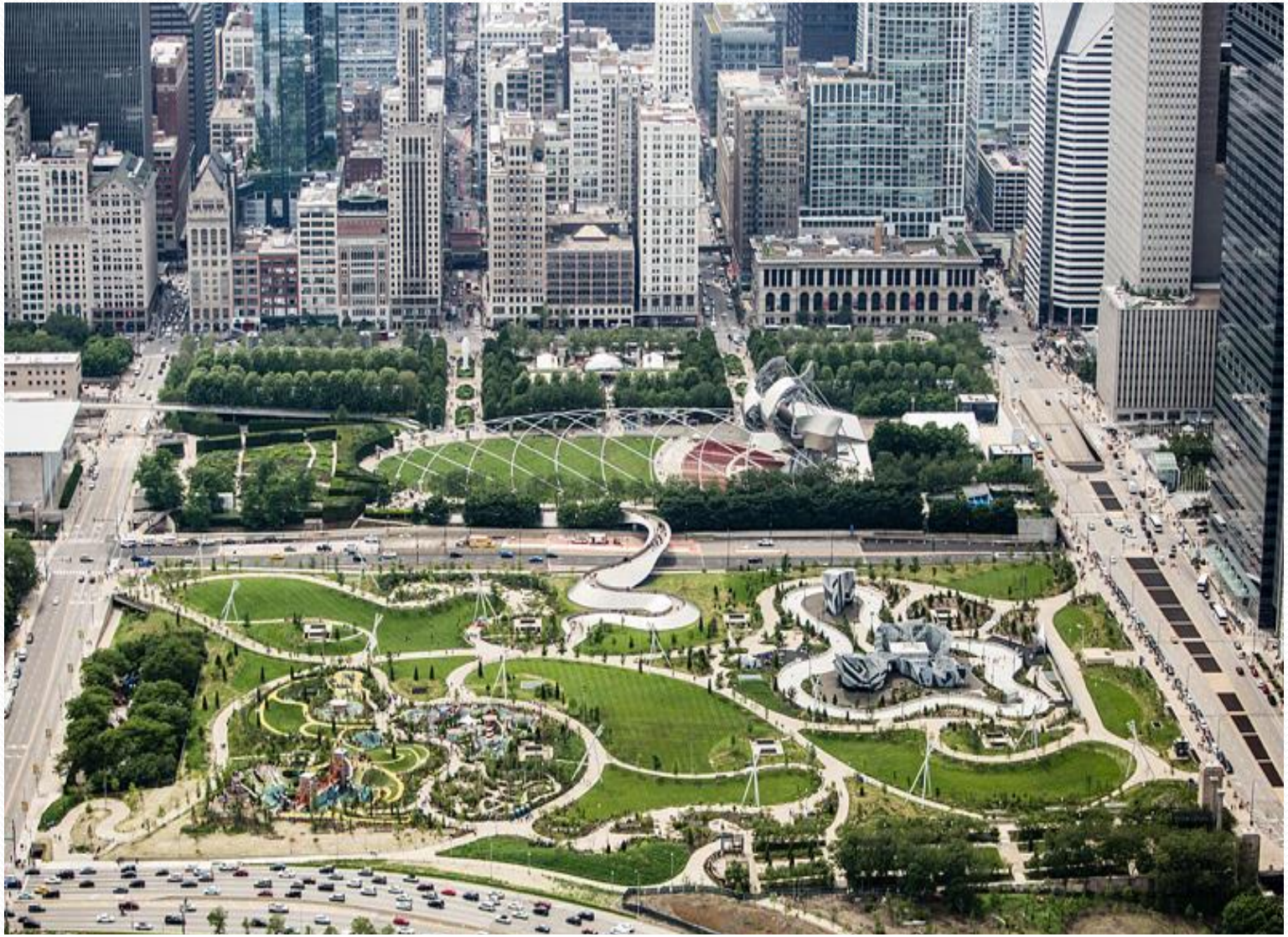


# Potential Uses

| | |
|---|---|
| Agronomic | Soil amendment, fertilizer |
| Nurseries | Seed starter, container mix |
| Landscaping | Topsoil blending, mulch, soil |
| Turf | Seed starter, topsoil blending |
| Forestry | Mulch, soil amendment |
| Residential | Seed starter, topsoil blending, mulch |
| Commercial | Landscape Suppliers: Retail stores |

# Maggie Daley Park in Chicago

**(one of the largest green roof in the world)**



**Maggie Dailey Park: used 6,000 cu yards of EQ compost for construction in 2015.**

# Maggie Daley Park in Chicago

# Other Project in Chicago

- Golf courses
- Parks
- Athletic fields
- Landscaping



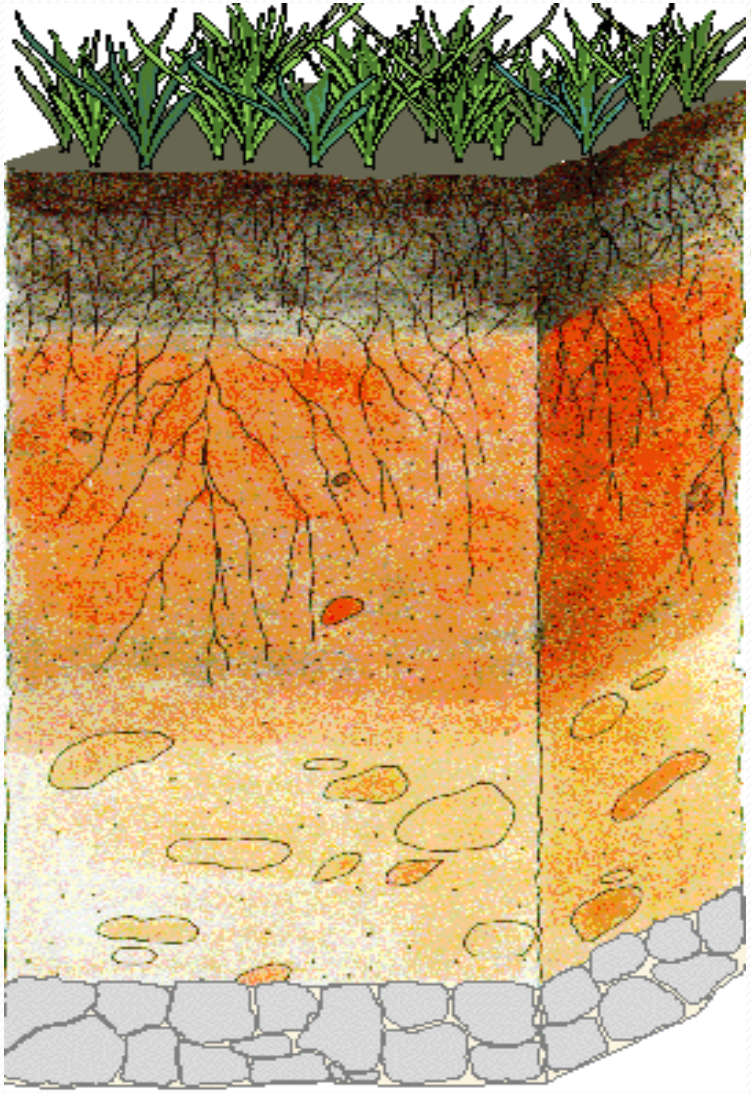



# Other Project in Chicago

- **Urban gardenings**


# Green Infrastructure
# &
# EQ Compost

# A Typical Soil Profile



A Horizon: Organic carbon, root zone, plant nutrients, moisture

B Horizon: Clay accumulation, meta oxides, water table fluctuations

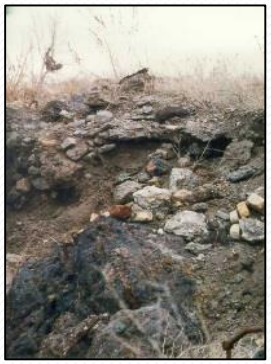
C Horizon: Parent material

Bedrock

# Chicago and Urban Landscape

**Characteristics:**

- compacted soils - limit infiltration
- vertical and spatial variability
- anthropogenic materials
- Contaminants
- elevated pH
- restricted aeration and drainage
- interrupted nutrient cycling
- modified biological community

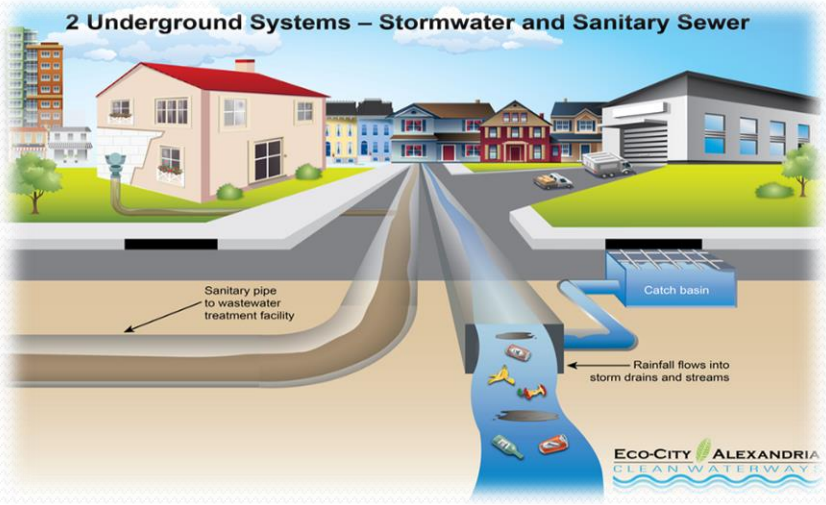



**Green infrastructure can help**

# Green Stormwater Infrastructure (GSI)

**Urban green spaces supports:**

- stormwater management
- healthier environments
- recreation
- pollutants mitigation
- wildlife habitat. ...



# Bioretention Systems (Components)

- Mulch
- Pore Space
- Coarse Sand
- Surface Area
- Complex Organics
- Microbes
- Biofilm
- Plants

**"Ecological Structure"**

Source: Bioretention "Rain Garden" Technical Seminar San Francisco Regional Water Quality Control Board
Santa Clara Valley Urban Runoff Pollution Prevention Program

# Bioretention & Compost - Water Management

**Composts enhances water <u>detention</u>, <u>retention</u> and <u>infiltration</u>**

**Detention**

- Holding water for some time before releasing it

**Retention**

- Holding water without releasing it

**Infiltration**

- Water percolating into the ground

# Bioretention & Compost - Mitigating Pollutants

- Volatilization - Pollutants evaporate.
- Sedimentation - heavier particles settle into the soil below.
- Adsorption - pollutants stick to soil particles
- Absorption - pollutants soak deeper into the soil
- Microbial action - break pollutants into less harmful forms

# Bioretention & Bacterial Removals

Enhance bacterial removal rates

| BMP | Fecal Coliform Removal Ability |
|---|---|
| Dry extended detention basin | Medium |
| Wet detention basin (wet pond) | Medium |
| Stormwater wetlands | Medium |
| Sand filter | High |
| Bioretention | High |
| Grassed swale | Low |

(NCDENR – Stormwater Best Management Practices Manual, 2007)

# Bioretention Systems (Processes)

- Sedimentation
- Filtration
- Adsorption
- Biomass Retention
- Plant Uptake
- Evaporation / Volatilization
- Microbial action:
  - decomposition
  - nitrification
  - denitrification

Source: Bioretention "Rain Garden" Technical Seminar San Francisco Regional Water Quality Control Board
Santa Clara Valley Urban Runoff Pollution Prevention Program

# Potential GSI that can benefit from EQ compost

- Rain Gardens
- Planter Boxes
- Bioswales
- Green Streets
- Urban Tree Canopy
- Green Roofs
- Wetlands

# Delivery and Pickup
# - Free !!

**1. Request:**

- Online: ordercompost.mwrd.org
- Email: compost@mwrd.org
- Call: (708) 588-4303


**2. Obtaining free EQ compost:**

- Bags pick up @ MWRD's open houses
- Bulk pick up at
  - 7430 Portage Trail, Forest View
  - 12600 S. Doty Ave., Chicago

**Wale Oladeji** 708-588-4246;

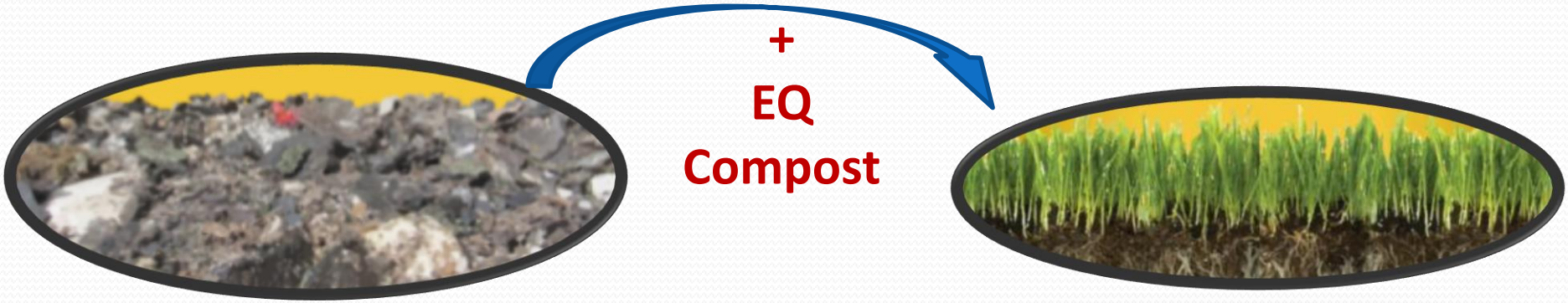
oladejio@mwrd.org

# Take Home

**High Quality Soil - the Foundation of a Healthy Ecosystem !**

- MWRD EQ Compost can be incorporated in GSI to improve urban soils:
  - improve soil water holding capacity
  - increase infiltration
  - enhance healthy vegetation/biomass
  - restore urban soils and green spaces

- It is currently free ($0)

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