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**BEST MANAGEMENT PRACTICES
POTENTIAL GROUNDWATER RECHARGE IMPACTS
OF
CENTERPOINT INTERMODAL CENTER NORTH PROJECT**

In developing the proposed Phase One land plan for CIC North, conservation design and best management practice (BMP) principles were incorporated wherever feasible. In particular, the site plan and preliminary engineering designs follow the guidelines established by the U.S. Army Corps of Engineers (COE) in its Regional Permit checklist. The site design also closely follows the conservation design and BMP recommendations of the City of Joliet's *South Side Comprehensive Plan*.

In summary, the resultant design approach emphasizes practices and techniques that maximize the opportunity to naturally infiltrate clean runoff into the local groundwater aquifers. This both preserves the recharge of local aquifers that are used for water supply and also preserves the shallow groundwater levels that are essential to the health of local streams and wetlands.

To be more specific, the design incorporates a comprehensive "treatment train" approach (also known as a runoff reduction hierarchy) that seeks to minimize adverse water quality and hydrologic impacts of runoff through practices such as:

- Impervious area reduction
- Stone ballast in rail yards
- Parking lot edge bio-swales
- Bio-swales along roadways
- Natural landscaping throughout common areas and on landscape berms
- Naturalized detention basins

These terms are admittedly somewhat technical and will be described further below.

To contrast the proposed BMP approach with a more conventional design, the principal difference is in:

- 1) how much stormwater runoff is generated and
- 2) how that runoff is routed off the site.

A conventional design emphasizes the rapid conveyance of runoff via sewers and channels to detention basins before it leaves the site. A "conservation-based design" seeks to first minimize the amount of runoff and then utilizes BMPs that give runoff a chance to run across the land where it can be cleansed and infiltrated into the soil.

Impervious Area Reduction

Impervious areas such as parking lots, roads, and rooftops can greatly reduce the amount of rain water that infiltrates into the ground. For that reason, environmentally friendly designs first seek to minimize the amount of new impervious surfaces that are created.

At the proposed intermodal facility, the effective area of impervious surface is being reduced as a result of a major financial investment in technology and efficient design. CenterPoint is utilizing state-of-the-art intermodal facility technology, including wide-span cranes and related technological improvements. As a result, the site footprint is being reduced by approximately 43% over more traditional designs, such as the nearby Deer run intermodal facility. In effect, the proposed site design approach accommodates a greater amount of freight movement with a substantially smaller impervious footprint than a conventional development.

Stone Ballast in Rail Yards

Stone ballast will be utilized along all rail lines and in the major rail yards. The porous stone will provide significant capacity to store and infiltrate rainwater, as well as filter and infiltrate runoff from adjacent parking lots.

Parking Lot Edge Bio-swales

Because of the large size of the parking lots and the need to generally have them uninterrupted with landscaping to facilitate efficient truck traffic and storage, most interior parking areas will need to be drained with storm sewers. However, along the perimeter of the intermodal site, runoff from the edges of the parking lots will be directed to vegetated swales, filter strips, and bio-swales.

These approaches are effective alternatives to conventional storm sewer drainage. They take advantage of the natural ability of soil to infiltrate and cleanse runoff. Most of these areas also will be landscaped with deep-rooted native plants (see below). The deep root zones of the native plants are more effective than conventional landscaping in helping water soak into the ground. Bio-swales add an additional design element – and underlying layer of sand and gravel – to further enhance infiltration.

Swales and Bio-swales Along Roadways

The engineering details of road design are being negotiated with the City of Joliet. In some cases, conventional road designs that utilize curb and gutter and storm sewers will be preferred. However, there also are circumstances where creative, BMP-based roadway designs may be appropriate. BMPs for roads generally entail swales or bioswales that run parallel to the road. (Swales are essentially ditches with flatter bottoms.) These BMPs can soak up and filter much of the runoff from small storm events and help to recharge groundwater. Larger flows that can't soak in are conveyed to downstream detention areas.

There are two basic options for these roadway BMP designs. This first is known as a rural cross-section roadway that doesn't utilize curbs. The second option utilizes curbs, but the curbs are designed with openings (i.e., curb cuts) that allow runoff to flow into adjacent vegetated swales.

Natural Landscaping throughout Common Areas and on Landscape Berms

Substantial areas of green space are being preserved in and around the proposed intermodal facility. These areas generally will be landscaped with deep-rooted natural landscaping. Natural landscaping utilizes native prairie grasses, wildflowers, trees, and shrubs as an alternative to conventional turf grass landscaping. This has several advantages.

As mentioned, deep-rooted native vegetation is much more effective than shallow-rooted turf grass in soaking up rainfall and runoff. This is due to the soil pathways created by the root systems. The native vegetation has other important benefits with respect to groundwater protection. First, natural landscapes do not require fertilizers or other chemicals that are commonly applied to lawn areas. Also, natural landscapes do not require any irrigation water after they're established, thereby reducing the demand for scarce groundwater.

A final consideration for natural landscaping is aesthetics. The natural landscaping approach proposed by CenterPoint is to utilize "low-profile" plantings. These generally are grass and wildflower species that grow to 2-3 feet tall and, consequently, provide a more tidy appearance.

Naturalized Detention Basins

The final BMP in the "treatment train" is stormwater detention. Unlike traditional basins with dry bottoms, the proposed "naturalized" basins are designed with wet or wetland-type bottoms. And side slopes will be landscaped with native wetland and prairie vegetation. This design approach greatly improves the ability of detention areas to filter out and transform much of the pollution that is found in stormwater runoff. Because of the deep-rooted vegetation, naturalized basins also can soak up slightly more runoff than traditional "manicured" basins.

Other BMPs for Groundwater Protection

In addition to the various BMPs described above, CenterPoint is evaluating and implementing other approaches to protect groundwater and surface water quality. These include:

- Pavement Deicing: Efforts will be made to minimize the usage of salt in pavement deicing operations for onsite roads and parking lots.
- Reduced Landscape Fertilizer, Herbicide, and Irrigation Usage: as referenced above, the use of natural landscaping will greatly reduce long-term needs for fertilizer and herbicide applications. In addition, a landscape maintenance plan will be developed for conventionally landscaped areas to stipulate reduced chemical usage.
- Pollutant Source Reduction: The railroads are utilizing state-of-the-art concrete railroad ties in lieu of creosote treated wood timber ties. This will eliminate the potential for pollutants associated with creosote. Also, intermodal operations are being designed with an emphasis on pollution control, including an industrial pre-treatment facility for locomotive maintenance operations.

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