

From: [Helms, A. Dale](#)
To: [Deborah Beatty](#)
Cc: [Srivastava, Saurabh](#); [Sabatino, Anthony](#)
Subject: RE: NeoCity and TWA Judge Farms Project Pollutant Removal - Updated Estimates
Date: Thursday, May 2, 2019 4:31:39 PM
Attachments: [JF Nutrient Removal Estimates Summary_may2019.pdf](#)
[JF Nutrient Removal Estimates_may2019.xlsx](#)

Deb,

As you requested, WSP reviewed the Dewberry calculations and the 2012 CDM feasibility report. We understand the technical basis for the computations and are comfortable that we can provide you with updated estimates based on the current Judge Farms reservoir/system design and WUP conditions.

For your review and use, attached is an updated analysis that estimates approximate Lake Toho nutrient (TN and TP) loading removal amounts likely to occur as a result of the project.

We prepared these estimates for two primary scenarios:

- Scenario 1: Reservoir (West Pond) is used for NeoCity stormwater treatment only (no TWA water supply project occurs). Only NeoCity stormwater volume would be treated, and nutrient removal would be achieved by wet detention residence time.
- Scenario 2: Reservoir receives NeoCity stormwater plus tributary diversions, and TWA withdraws from the reservoir for water supply. Nutrient removal is achieved primarily due to the extraction of water (and the nutrients they carry) from the system. The extracted water volume would be used elsewhere by TWA for water supply, and would therefore no longer flow into Lake Toho. To put a range on the potential estimates, two alternatives are included —TWA long-term average withdrawals from the reservoir at 3 MGD ADF or at 6 MGD ADF.

I expect that the results for Scenario 2, full-size (6 MGD) TWA project, are what you would want for discussion purposes.

A summary of results:

- For the entire tributary (ECD, MS, JF) drainage area, the existing total annual loading to Lake Toho is estimated as 71,838 lb/yr TN and 7,743 lb/yr TP (based on CDM 2012 report).
- For Scenario 1 (wet detention treatment of NeoCity stormwater only), *net* removal amounts of 3,225 lb/yr TN and 523 lb/yr TP are estimated.
- For Scenario 2 (TWA water supply withdrawals), net removal amounts are estimated as:
 - o Assuming a 3-MGD ADF annual average TWA withdrawal, removal of 13,636 lb/yr TN and 1,470 lb/yr TP (about 19% of all the loading coming from the tributaries to the lake).
 - o Assuming a 6-MGD ADF annual average TWA withdrawal, removal of 25,523 lb/yr TN and 2,751 lb/yr TP (about 36% of all the loading from the tributaries).

Please let me know if you have any questions or need anything else.

P.S. – Just as an FYI, CDM's 2012 report values of potential nutrient loading removal amounts appear to be incorrect. The way they were computed, the values in the report assumed treatment/reduction on the entire tributary streamflow, which is an error. In reality, per the report, only 19%-27% of the flows in the tributaries would actually be diverted into the reservoir, and nutrient removal can only occur on this portion of the flow. Therefore, unless I am missing something, the nutrient removal amounts estimated in the report are too high by a factor of 4 to 5 times what they should have been.

Best,
Dale

A. Dale Helms, PE
WSP USA
Phone: +1 407 587 7825
Mobile: +1 407 247 2455

From: Deborah Beatty [<mailto:DBeatty@tohowater.com>]
Sent: Wednesday, May 01, 2019 12:59 PM
To: Helms, A. Dale <Dale.Helms@wsp.com>
Subject: FW: NeoCity: Pollutant Removal

Dale – your team probably needs to start with this info. Apparently Kevin is providing updated info and also some info on TN removal. Please let me know if you have any questions, and thanks again for your help.

Thanks,
Deb

From: Koehler, Kevin [<mailto:kkoehler@Dewberry.com>]
Sent: Tuesday, April 30, 2019 2:14 PM
To: Deborah Beatty <DBeatty@tohowater.com>
Cc: Lee, Clayton <clee@Dewberry.com>
Subject: NeoCity: Pollutant Removal

Deb,

As a follow up to your conversation with Clayton Lee earlier today, for NeoCity permitting we had utilized the Phosphorus removal equations found in the Harper Harper Report 2007. The equations equal a curve that shows an average of 80% Phosphorus removal and 40% Nitrogen removal in Wet Detention ponds.

I've also attached an updated phosphorus removal calculation that accounts for the addition of 100% (maximum) impervious areas in the center of the NeoCity project.

Feel free to contact Clayton or myself if you have any additional questions.

Kevin M. Koehler, P.E.
Transportation Engineer - Drainage
Dewberry
800 North Magnolia Ave, Suite 1000
Orlando, FL 32803
Office: 407.843.5120
Direct: 321.354.9751
www.dewberry.com
kkoehler@dewberry.com

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