Memorandum

Date: December 5, 2008

To: Members of the Transportation and Environment Committee: Chair Linda Coop, Vice-Chair Sheffie Kadane, Jerry R. Allen, Carolyn R. Davis, Vonciel Jones Hill, Angela Hunt, Pauline Medrano, and Ron Natinsky

Subject: The Path to 2060: Dallas’ Water Plan Update Reuse Partnership with North Texas Municipal Water District

Attached is a briefing that will be presented to the Transportation and Environment Committee on Monday, December 8, 2006.

The purpose of this briefing is to provide a summary of the Contract between Dallas and the North Texas Municipal Water District (NTMWD) for the temporary pass-through of water through Lake Ray Hubbard, the water swap of Dallas’ permitted reuse from its Central and/or Southside Wastewater treatment plants in return for NTMWD’s permitted reuse discharges in Lake Ray Hubbard, and to obtain the committee’s recommendation for approval of the December 10, 2008 Council Agenda Item # 75.

Please let me know if you have any questions or comments.

Ramon F. Miguez, P.E.
Assistant City Manager

C: Honorable Mayor and Members of the City Council
Mary K. Suhm, City Manager
Deborah A. Watkins, City Secretary
Thomas Perkins, City Attorney
Craig D. Kinton, City Auditor
Judge Victor Lander, Administrative Judge
Ryan S. Evans, Assistant City Manager
Forest Turner, Assistant City Manager (Interim)
Ramon F. Miguez, P.E., Assistant City Manager
Jill A. Jordan, P.E., Assistant City Manager
A.C. Gonzalez, Assistant City Manager
Dave K. Cook, Chief Financial Officer
The Path to 2060: Dallas’ Water Plan Update
Reuse Partnership with North Texas Municipal Water District

The State’s 16 Regional Planning areas are identified by the letters A to P. Dallas is in Region C.

Transportation and Environment Committee
December 8, 2008
Purpose of Briefing

- Provide an update on Dallas’ implementation of its indirect reuse water management strategy
- Provide an update on Dallas’ continuing efforts to develop water supply partnerships
- Discuss the obligations and benefits of a contract with North Texas Municipal Water District for the exchange (i.e., swap) of reuse water
Dallas’ Water Supply Management Strategies

- Existing Supplies: 375.9 MGD
- Lake Fork Connection: 107 MGD
- Lake Palestine Connection: 100 MGD
- Direct Reuse: 18.25 MGD
- Conservation: 47.4 MGD
- Return Flows: 71.02 MGD
- Lake Ray Hubbard Reuse: 60 MGD
- Lewisville Lake Reuse: 60 MGD
- Wright Patman Flood Pool Reallocation: 100 MGD
- Lake Fastrill: 100 MGD
### The Path to 2060 – Water Supply of 1,040.57 MGD

<table>
<thead>
<tr>
<th>Current</th>
<th>Underway</th>
<th>Likely</th>
<th>At Some Risk</th>
<th>Total Need (MGD)</th>
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</thead>
<tbody>
<tr>
<td>Ray Roberts/Lewisville</td>
<td>Lake Fork - 2009 (107.00 MGD)</td>
<td>Contract for Return Flows - various dates (71.02 MGD)</td>
<td>Wright Patman Flood Pool - 2035 (100.00 MGD)</td>
<td>200.00</td>
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<tr>
<td>Grapevine</td>
<td>Lake Palestine - 2015 (100.00 MGD)</td>
<td>Ray Hubbard Indirect Reuse - permitted - 2012 (60.00 MGD)</td>
<td>Fastrill - 2045 (100.00 MGD)</td>
<td>1,040.57</td>
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<td>Ray Hubbard</td>
<td>Conservation - various dates (47.40 MGD)</td>
<td>Lewisville Indirect Reuse - permitted - 2022 (60.00 MGD)</td>
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<tr>
<td>Tawakoni</td>
<td>Direct Reuse - various dates (18.25 MGD)</td>
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<tr>
<td>Elm Fork of Trinity</td>
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<tr>
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<td>376.90</td>
<td>272.65</td>
<td>191.02</td>
<td>200.00</td>
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</tbody>
</table>

- Our water supply in 2060 totals 1040.57 MGD
- Currently we have 376.90 MGD connected
- We are reasonably assured of an additional 272.65 MGD (underway)
- An additional 191.02 MGD is likely
- Wright Patman and Fastrill, totaling 200 MGD, are at some risk

- 80 percent of 2060 water needs are reasonably assured, which meets Dallas’ water needs through the year 2035
Outline

• Highlights
• Reuse Implementation Alternative Comparison
• North Texas Municipal Water District reuse plan
• Contract Obligations
• Contract Benefits
• Upcoming Dallas City Council Agenda Items
• Appendix
  – Reuse definitions
  – Reuse Planning and Implementation
  – Development of reuse contract with North Texas Municipal Water District
Highlights

- Dallas is developing a partnership with North Texas Municipal Water District (NTMWD) in the form of a water swap agreement.
- NTMWD will swap its permitted reuse water in Lake Ray Hubbard for an equal volume of Dallas’ permitted reuse delivered to NTMWD’s wetland.
- The agreement will implement approximately half (30MGD) of Dallas Lake Ray Hubbard Reuse Water Management Strategy.
- The agreement will increase Dallas’ firm yield as well as provide Dallas with significant capital, operation and maintenance savings.
- The agreement will increase NTMWD reuse reliability and stabilize its wetland operation.
- Dallas has been working with NTMWD to evaluate joint reuse scenarios.
- NTMWD has constructed a wetland on the East Fork of the Trinity River and a reuse transmission pipeline to Lake Lavon.
Alternative Comparison

Length
~37.4 Miles

Elevation Difference
~80 feet

Length
~11.8 Miles

Elevation Difference
~12 feet

Alignment identified in 2005 Long Range Water Supply Plan

Alignment considered in NTMWD Contract

Length
~37.4 Miles

Elevation Difference
~80 feet

Length
~11.8 Miles

Elevation Difference
~12 feet

Alignment identified in 2005 Long Range Water Supply Plan

Alignment considered in NTMWD Contract
North Texas Municipal Water District Reuse Plan
North Texas Municipal Water District's
EAST FORK WATER SUPPLY PROJECT
East Fork Raw Water Supply Project

Location

Lake Lavon

Lake Ray Hubbard

Constructed Wetland Project Site
A Perspective…

Lake Lavon Yield: 104,000 ac-ft/yr (93 MGD)

East Fork Water Supply Project: 102,000 ac-ft/yr (91 MGD)

Total Yield: 206,000 ac-ft/yr (184 MGD)
Project Site Characteristics

- **East Fork of Trinity**: 3.7 miles
- **Wetland easement**: (2000 acres)
- **Avg. Slope = 0.1%**
- **Direction of flow**: NORTH
- **1.4 miles**
- **East Fork of Trinity**
- **3.7 miles**
- **Direction of flow**
Pelicans
Obligations

• Dallas will temporarily pass NTMWD’s return flows in Lake Ray Hubbard through Forney Dam

• Dallas will construct facilities to deliver Central and/or Southside WWTP reuse flows to NTMWD’s wetland

• Dallas and NTMWD will swap an equal volume of permitted reuse flows
  – Dallas’ permitted reuse flows from Dallas’ Central and Southside WWTPs for NTMWD’s permitted reuse flows in Lake Ray Hubbard

• Dallas and NTMWD will develop an accounting plan and operational guidelines for the swap

• Dallas will file the following water rights applications:
  – to authorize the diversion point for Dallas Return Flows
  – for the use of the bed and banks of the Trinity River downstream of Dallas’ Central and Southside WWTPs to the mainstem intake
Benefits

• To Dallas
  – Implements reuse strategy from Dallas’ 2005 Long Range Water Supply Plan and water management strategy from the Region C Plan
  – Increases connected water supply
  – Initial capital cost savings estimate of $120 million
  – Operation and Maintenance cost savings

• To North Texas Municipal Water District
  – Implements water management strategy from Region C Plan
  – Provides water supply reliability
  – Provides for more uniform wetland operation (minimizes the impacts due to variations in the East Fork stream flows)
Upcoming City Council Agenda Items

• Consideration of the Contract with NTMWD to:
  – Exchange Dallas’ reuse flows from its Central and/or Southside WWTPs for a like amount of NTMWD reuse flows in Lake Ray Hubbard
  – Exchange Dallas’ reuse flows from its Central and/or Southside WWTP for a like amount of NTMWD reuse flows in Lewisville Lake
  – Pass NTMWD reuse flows through Lake Ray Hubbard until facilities can be constructed to provide NTMWD with Dallas’ reuse flows from its Central and/or Southside WWTP to NTMWD’s wetland
  – Item will be on the December 10 Council Agenda

• Consideration of an Engineering Services Contract with the firm of CH2M HILL for the Lake Ray Hubbard Indirect Recycled Water Phase I Flows Transfer Project that will:
  – Perform detailed analysis of alternative pipeline, intake structure, and pump station(s) to determine the most beneficial locations for each
  – Perform all work needed to begin final design with funding from the Texas Water Development Board
  – Item is being prepared for a January 2009 Council Agenda
APPENDIX
What is recycled (reuse) water?

• Recycled water is highly treated wastewater effluent that is available for beneficial purposes
• Recycled water can be an effective and efficient supplement to Dallas’s water supply
Direct Recycling

Direct use is usually for irrigation (e.g. golf courses), and industrial uses.
Indirect Reuse

Indirect use augments drinking water supply (e.g. water supply reservoirs)
Reuse Planning and Implementation
Reuse Background

• May 2000 – Dallas filed permit amendment applications to its Lake Ray Hubbard and Lewisville Lake water rights permits to include reuse from its Southside and Central Wastewater Treatment Plants

• December 2001 - Dallas’ permit amendment applications for reuse were declared administratively complete

• August 2003 - Dallas’ City Council authorized the development of a reclaimed water implementation plan entitled Recycled Water Implementation Plan

• April 2004 – NTMWD filed permit amendment application to its Lake Lavon water rights permit to include reuse from its wastewater treatment plants

• September 2005 Dallas’ City Council authorized the City’s participation in a joint reuse study with NTMWD

• October 2005 – NTMWD’s permit amendment application for reuse was declared administratively complete

• October 2006 - Dallas received permit amendments for reuse from the State

• July 2007 – NTMWD received permit amendment for reuse from the State

• January 2008 - Received authorization from the State to implement direct reuse for any authorized non-potable use within Dallas’ service area via an amendment to Dallas’ Central and Southside WWTP discharge permits

• March 2008 - Dallas received a Texas Water Development Board (Water Infrastructure Funding) Loan commitments for the for Lake Ray Hubbard Indirect Recycled Water Phase I Flows Transfer Project and the Cedar Crest Recycled Water Pipeline Extension Project
Recycled Water Implementation Alternatives
(2005 Long Range Water Supply Plan)

In lieu of these alternatives, Dallas would trade water with NTMWD so Dallas would not have to build a pipeline to Lake Ray Hubbard.
Development of Reuse Contract with North Texas Municipal Water District
Joint Reuse Study

• In September 2005 the City Council authorized a collaborative study with the NTMWD to determine the feasibility of a joint reuse project in lieu of two independent projects in the same vicinity of the Elm Fork of the Trinity River

• Study evaluated seven joint scenarios

• Study compared joint scenarios with Dallas’ and NTMWD’s existing independent project plans

• Study identified a combined cost savings of a joint project as compared to independent projects of between $58M and $126M for Dallas and NTMWD

• The study coalesced the partnership between Dallas and NTMWD and lead to the development of the water swap agreement
Return Flows and Reuse

- The City has been negotiating with the North Texas Municipal Water District (NTMWD) to exchange NTMWD’s reuse flows in Lake Ray Hubbard.
- NTMWD has return flows in Lake Ray Hubbard permitted as reuse flows.

- NTMWD has constructed a wetland on the East Fork of the Trinity River near the main stem of the Trinity River.
- Dallas has return flows along the main stem of the Trinity River that are permitted as reuse flows.
- Proposed NTMWD contract will:
  - Exchange Dallas’ reuse flows from its Central and/or Southside WWTPs for a like amount of NTMWD reuse flows in Lake Ray Hubbard.
  - Exchange Dallas’ reuse flows from its Central and/or Southside WWTP for a like amount of NTMWD reuse flows in Lewisville Lake.
  - Pass NTMWD reuse flows through Lake Ray Hubbard until facilities can be constructed to provide NTMWD with Dallas’ reuse flows from its Central and/or Southside WWTP to NTMWD’s wetland.
  - Contract will be presented to Council for approval on the December 10, 2008 Council Agenda.
Proposed Dallas and NTMWD Reuse Implementation Schematic

- **NTMWD Existing Reuse Flows**
- **Dallas’ Reuse Flows Delivered to NTMWD Wetland**
- **Central WWTP**
- **Bachman WTP**
- **Elm Fork WTP**
- **Southside WWTP**
- **East Side WTP**
- **Mountain Creek Lake**
- **Grapevine Lake**
- **Lake Lavon**
- **Lewisville Lake**
- **Joe Pool Lake**
- **Ray Hubbard Lake**
- **Lake Arlington**
- **Denton**
- **Collin**
- **Rockwall**
- **Kaufman**

Legend:
- Green triangles: WTPs
- Red arrows: Proposed transmission lines
- Purple square: NTMWD existing wetland

**Map:**
- The map shows the proposed Dallas and NTMWD reuse implementation schematic with key water bodies and treatment plants marked. The map includes lines indicating existing and proposed lines, as well as symbols for water treatment plants and wetland areas.