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100-140 Ouellette Place, Windsor ON N8X 1L9

November 27, 2019
File: 165620102-214

Town of Kingsville
2021 Division Road North
Kingsville, Ontario, N9Y 2Y9

**Attention: Mr. Andrew Plancke, CET
Director of Municipal Services**

Dear Andrew:

**Reference: JEM Farms Ltd.
Proposed 17.5 Acre Phase 3 Greenhouse Expansion
1581 & 1583 County Road 34 East - Water Availability**

We have examined the "Application for Greenhouse Water Supply/Connection" submitted by Mr. Paul Mastronardi of JEM Farms Ltd. (JFL) with regards to water availability, flow control and onsite storage in support of a proposed Phase 3 greenhouse expansion and report below.

JFL seeks the Town of Kingsville's (Town) approval to use municipal water to service a proposed 17.5-acre expansion to an existing 28.3-acre hydroponic tomato & pepper greenhouse operation spread over one land parcel owned by JFL having PIN No. 751450321 and Municipal No's 1581 & 1583 County Road 34 East located just north of the Community of Ruthven as shown in the attached Figure 1.

The proposed 17.5-acre expansion represents Phase 3 of an overall 3 phase plan to expand to an ultimate 45.8 acres on the current land parcel owned by JFL. As both water delivery and water treatment capacity cannot be reserved for future expansions or developments; consideration of future phases (if contemplated) have not been included in this assessment. Future phases (if contemplated) will require JFL to submit a new application at time of expansion with no guarantee that additional water treatment and/or delivery capacity will be available at that time.

Background

In May 2004, JFL applied and was approved for additional water treatment and delivery capacity to support an 8.3-acre Phase 1 greenhouse expansion to their existing 6-acre greenhouse operation for a total of 14.3 acres. As part of the approval, JFL was allocated an increased water treatment and water delivery capacity totaling 114,400 Imp. gallons per day (Igcd). This allocation was supplied at a regulated rate of 95 Imp. gallons per minute (Ilgpm) using a water flow control system (WFCS) and onsite storage system. This capacity allowance was based on a projected maximum day water demand of 8,000 Igal per acre per day (Igpapd).

In July 2012, JFL applied and was approved for additional water treatment and delivery capacity to support a 14-acre Phase 2 expansion to their existing 14.3-acre greenhouse operation for a total of 28.3 acres. As part of the approval, JFL was allocated an increased water treatment and water delivery capacity totaling 226,400 Igpd. This allocation was supplied at an increased regulated rate of 189 Igpm using an upgraded WFCS and expanded onsite storage system based on a projected maximum day water demand of 8,000 Igpapd.

The existing greenhouse operation is currently serviced with municipal water from a 150mm dia. water service connection (WSC) off the existing 300mm dia. Union trunk watermain running along County Road 34. This WSC runs through a meter chamber at the property line and extends for approximately 60 meters prior to entering the greenhouse service building where it is fitted with a WFCS regulating inflow up to a maximum of 189 Igpm over 20 hours to limit total water delivery volume to the current approved allocation of 226,400 Igpd. The WFCS discharges into an underground fresh-water storage system located in the existing service building having a reported total working capacity of 186,000 Imp. Gallons (Igal).



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Evaluation

Based on JFL's application and revisions thereto, the total expanded 45.8-acre greenhouse operation is to be used to grow tomatoes and peppers having an overall projected maximum water consumption rate of up to 0.429 Imp. Gallons per plant per day (Igpdd) at a projected overall plant density of up to 14,000 plants per acre (ppa). This arrangement would result in a projected maximum day water demand of approximately 6,000 Igpdd and a projected total maximum day water demand of approximately 274,800 Igpdd.

To support the above projected total maximum day water demand would require that the municipal water distribution system be capable of delivering water at a regulated uniform rate of 191 Igpm over a 24-hour period to an on-site fresh-water storage system having a minimum working capacity of approximately 275,000 Igal.

Currently, the facility has an existing onsite fresh-water above-ground storage system with a reported total working capacity of approximately 186,000 Igal. Based on the above minimum storage requirement of 275,000 Igal, an additional 89,000 Igal of fresh-water storage working capacity will be required to support the Phase 3 expansion.

In accordance with municipal policies and bylaws controlling greenhouse operations, expansions and developments, the municipal water supply to the entire greenhouse development/operation shall be regulated using an automatic WFCS together with a properly sized onsite fresh-water storage system.

Note that this assessment purposely ignores the benefit of any supplemental water that is or could be provided by on-site wells and/or recycling initiatives due to reliability of supply issues. A mechanical breakdown, loss of water quality or quantity from onsite wells or bacteriological contamination from recycling leach water would require the municipal water system to be available as backup and capable of supplying the total projected water demand.

Water Availability

➤ Water Treatment Capacity

JFL currently has a total water treatment allocation of 226,400 Igpdd from the Union Water Supply System (UWSS) to support the existing 28.3-acre greenhouse operation. Based on the greater of the projected maximum day water demand of 274,800 Igpdd and JFL's reassessed maximum total water delivery allocation of 285,800 Igpdd (as derived in the section below on Water Delivery Capacity) to support the expanded 45.8-acre greenhouse operation, an additional 59,400 Igpdd of treatment capacity will be required from the UWSS for a total of 285,800 Igpdd as a condition of supporting the Phase 3 expansion.

An application for sufficient water treatment plant capacity to support the proposed expansion has been submitted to the UWSS by the Town and is currently under consideration. Final review and approval is on hold pending the submission and approval of this Engineer's report.

➤ Water Delivery Capacity

With the aid of the UWSS hydraulic computer model using existing and future residential population projections, the existing 300mm dia. municipal watermain fronting the existing greenhouse operation along County Road 34 has sufficient unreserved capacity to deliver the increased 191 Igpm peak flow rate to support an expanded 45.8-acre greenhouse operation without having a significant impact on the remainder of the water distribution system.



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However, with this new application, JFL's total water delivery allocation will require to be reassessed to a total of 285,800 lgpd at a regulated flow rate of 198 lgp/m to conform to the Town's currently recognized maximum consumption rate policy of 6,000 lgp/d as follows:

- that the original total water delivery allocation of 114,400 lgp/d granted under the 2004 Phase 1 expansion to 14.3 acres on the basis of a projected maximum day water demand of 8,000 lgp/d be reassessed to conform to the Town's current recognized maximum greenhouse consumption rate policy of 6,000 lgp/d for a revised total water delivery capacity of 85,800 lgp/d.
- that JFL maintain a water delivery allocation of 200,000 lgp/d purchased as a participant in the 2001 Kingsville Northeast Trunk Watermain project.

Considering that JFL's lands will be fully occupied following the proposed Phase 3 expansion, it is our recommendation that JFL be approved for the full delivery allocation of 285,800 lgp/d at the regulated delivery rate of 198 lgp/m.

➤ Water Service Connection

It is our opinion that the existing 150mm dia. WSC will be sufficient to deliver the projected regulated flow rate of 198 lgp/m to the expanded 45.8-acre operation without experiencing a significant loss in pressure at the greenhouse structure and adequately service the expansion.

However, should fire protection be required by JFL and/or by the Chief Building Official (CBO), then an additional new 300mm dia. combination fire-main/wsc twinning will be required in accordance with the recommendations in the section below on "Fire Protection".

To service the expanded operation, the regulated flow rate setting on the existing WFCS will need to be increased from its current 189 lgp/m set-point to the new set-point of 198 lgp/m; provided the existing WFCS is capable. Should it be found that the existing WFCS is not capable, then JFL will be required to upgrade the WFCS to the technical satisfaction of the Town.

In all cases, it will be JFL responsibility to ensure that the design of the upgraded WFCS is carried out in coordination with the existing water service piping (or any new combination fire-main/wsc piping) to ensure proper operation can be achieved during both present and future scenarios to prevent a shortage of water to the greenhouse facility.

➤ Fire Protection

Specific requirements for fire protection have not been assessed in this report. Fire protection requirements are under the jurisdiction of Kingsville Building Services and its Chief Building Official (CBO). Consideration of any fire protection schemes using a fire-main concept would require a significantly larger municipal water supply and water service connection than that required to only supply the domestic & irrigational demands of the greenhouse.

With the aid of the UWSS hydraulic computer model, it was observed that the existing 300mm municipal watermain running along County Road 34 where it fronts the existing greenhouse operation has sufficient capacity to provide fire-flows of up to 2,000 lgp/m while maintaining the required min. 20 psi residual pressure benchmark in the remainder of the water distribution system during maximum day flow conditions.

To convey the min. 2,000 lgp/m fire-flow threshold onto private property would require the existing 150mm dia. WSC to be twinned with a new combination 300mm dia. fire-main/wsc from the existing 300mm dia. Union trunk watermain and fitted with multiple hydrants placed at strategic locations.



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Hence, the above water distribution system performance will need to be acknowledged when considering fire protection strategies and alternatives should fire protection be a requirement of the expansion and/or the CBO currently or in the future.

Recommendations

Based on the above considerations, it is our recommendation that,

“JFL be granted access to the municipal water distribution system on the existing 300mm dia. Union trunk watermain along County Road 34 East to service a proposed 17.5-acre Phase 3 expansion to an existing 28.3-acre hydroponic greenhouse operation at 1581 & 1583 County Road 34 East having PIN No. 751450321 for a total acreage of 45.8-acres; and that granting of additional water treatment and water delivery capacity be contingent on all the following conditions”:

1. *That JFL receive written approval from the UWSS for an additional 59,400 lgpd of water treatment capacity to supplement their current treatment allocation of 226,400 lgpd for a total water treatment capacity allocation of 285,800 lgpd, all to the satisfaction of the Town.*
2. *That JFL receive written approval from the Town to reassess their total water delivery capacity allocation to 285,800 lgpd @ 198 lqpm to conform to current Town policies, all to the satisfaction of the Town;*
3. *That JFL execute an indemnity agreement with the Town with respect to “understanding of water availability” and “limits of liability” for the expanded 45.8-acre greenhouse operation.*
4. *That JFL together with the Town undertake to modify the existing automatic water flow control system in the existing greenhouse operation to regulate total water inflow to a revised flow rate setpoint not exceeding 198 lqpm to limit total water delivery volume to a revised total water treatment capacity allocation of 285,800 lgpd over a 24-hour period; all to the satisfaction and technical requirements of the Town.*
5. *That JFL supplement their existing onsite fresh-water storage system having a reported total working capacity of approximately 186,000 lgal with an additional 89,000 lgal of fresh-water storage capacity for a total onsite fresh-water storage system having a minimum total working capacity of 275,000 lgal or greater to support the expanded facility; all to the satisfaction and technical requirements of the Town.*
6. *That the Town and its Agents retain the right to enter onto private property to ensure that all the above conditions have been complied with.*
7. *Should JFL be granted access to the municipal water system to support the expansion irrespective of size, while abiding by all the conditions imposed above; then JFL shall be:*
 - a. *Given a time limit of 6 months to obtain a building permit from the Town for the proposed expansion corresponding to the size proposed herein from the date of municipal council and/or administration approval or the approval for water treatment capacity from the UWSS and water delivery capacity from the Town shall lapse;*
 - b. *Given a time limit of 12 months to implement the greenhouse conditions stated herein and use the availed water treatment & water delivery capacity from the date of issuance of a municipal building permit (subject to condition 1 above) or the approval for treatment capacity from the UWSS and delivery capacity from the Town shall lapse;*



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- c. *Advised that approval is issued for the applicant, landowner and property designated in the application and this report; and shall not be transferable to another property or to another applicant / landowner without the express written permission of the UWSS and the Town.*

Please contact me directly should you have any questions or concerns or require additional information.

Sincerely yours,

STANTEC CONSULTING LTD.

Tony Berardi, P.Eng.

Principal & Sector Lead, Water

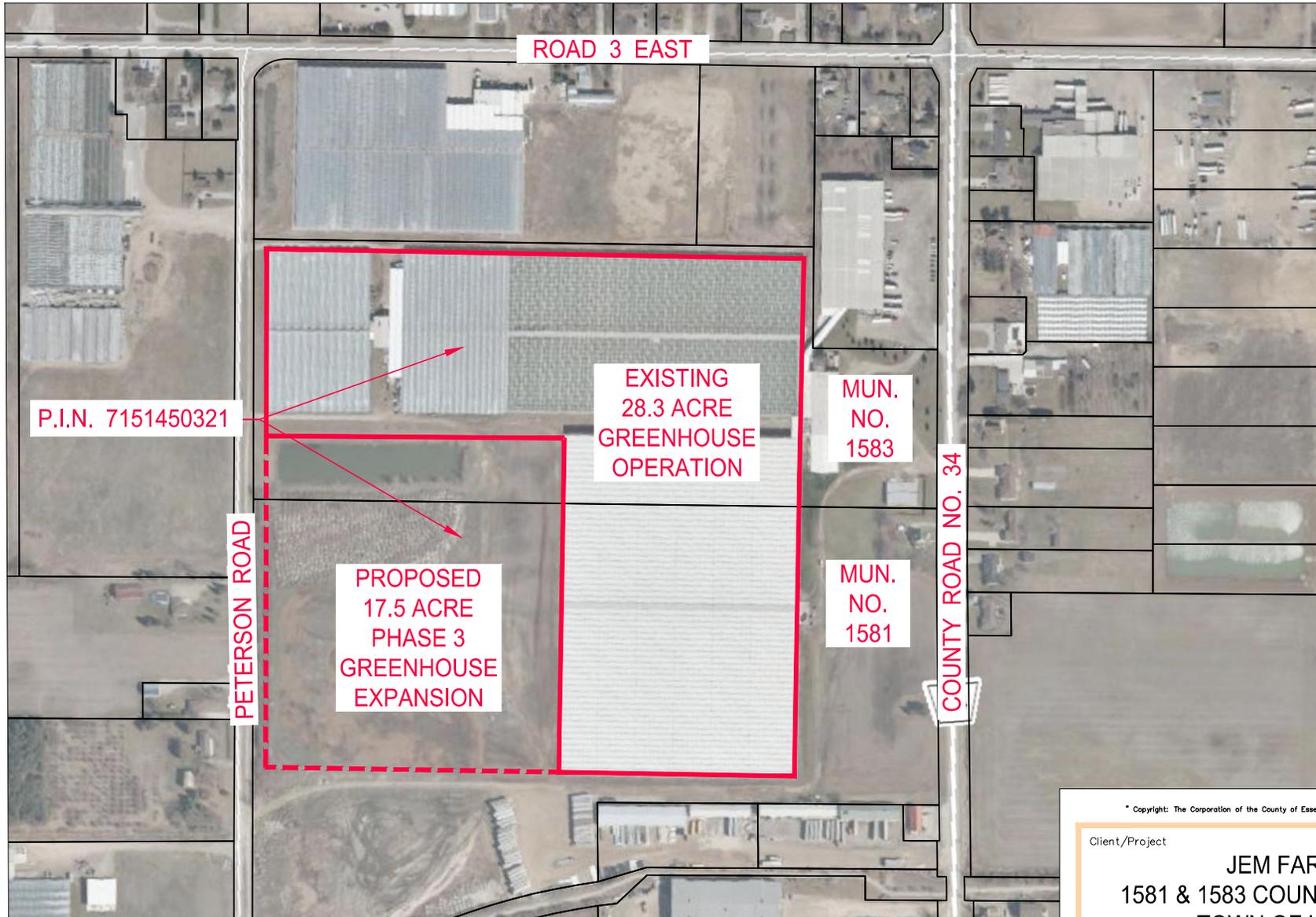
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Attachment: Figure 1

- c. Peter Valore - CBO & Manager of Building & Bylaw Services
Robert Brown – Manager of Planning Services - Kingsville
Rodney Bouchard - General Manager of Union Water Supply System
Heide Mikkelsen, P.Eng. – Principal - NJ Peralta Engineering Ltd.
Paul Mastronardi – Vice President – Jem Farms Ltd.



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Client/Project	JEM FARMS LTD. 1581 & 1583 COUNTY ROAD 34 EAST TOWN OF KINGSVILLE		
Title	WATER AVAILABILITY PROPOSED 17.5 ACRE GREENHOUSE EXPANSION		
Scale	1:5,000	Project	165620102-214
			FIGURE-1