NOTICE OF PUBLIC HEARING

BIRMINGHAM CITY COMMISSION	
CONSIDERATION OF BROWNFIELD PLAN	
Meeting Date, Time, Location:	Thursday, October 27, 2016 7:30 PM Municipal Building, 151 Martin, Birmingham, MI
Location of Request:	856 North Old Woodward, Birmingham, MI 48009 (currently vacant property)
Nature of Hearing:	To consider adoption of a brownfield plan, in accordance with the provisions of the Brownfield Redevelopment Financing Authority Act, being act 381 of the Public Acts of the State of Michigan of 1996, as amended.
City Staff Contact:	Jana Ecker 248.530.1841 jecker@bhamgov.org
Notice Requirements:	Publish: October 16 & 23, 2016 Mail to: taxing jurisdictions that levy taxes subject to capture under this act.
Approved minutes may be reviewed & Maps, plats, and a description of the brownfield plan are available for public inspection at:	City Clerk's Office

All aspects of the brownfield plan are open for discussion at the public hearing.

At the hearing, all citizens, taxpayers and property owners of the City of Birmingham and officials from any taxing jurisdiction whose millage may be subject to capture under the proposed brownfield plan shall have the right to be heard in regard to the adoption of the brownfield plan.

Persons wishing to express their views may do so in person at the hearing or in writing addressed to City Clerk, City of Birmingham, 151 Martin, Birmingham, MI 48009.

Persons with disabilities needing accommodations for effective participation in this meeting should contact the City Clerk's Office at (248) 530-1880 (voice) or (248) 644-5115 (TDD) at least one day in advance to request mobility, visual, hearing or other assistance.

Notice of Public Hearing to Taxing Jurisdictions

The City of Birmingham City Commission will hold a public hearing on October 27, 2016, at 7:30 p.m. at the City Commission chambers located at 151 Martin Street, Birmingham, Michigan, concerning a brownfield plan for property located at **856 North Old Woodward**, Birmingham, Michigan.

The City of Birmingham (the City) has established a Brownfield Redevelopment Authority (the Authority) pursuant to the Brownfield Redevelopment Act, 1996 PA 381, as amended (Act 381). Act 381 authorizes local units of government to facilitate the revitalization of environmentally distressed areas through the use of brownfield plans incorporating tax increment financing. Tax increment financing allows the Authority to capture tax revenues attributable to increases in the taxable value of real and personal property located on eligible property, which may include adjacent or contiguous parcels. Increases in taxable value may be attributable to several factors, including new construction, rehabilitation, remodeling, alterations, additions, and the installation of personal property on eligible property.

The Authority has considered and recommended adoption of a brownfield plan related to the property located at **856 North Old Woodward**, Birmingham, Michigan (the Property). The proposed use for the Property is a mixed-use four-story development. The Property has been determined to contain hazardous substances as defined under applicable environmental laws and regulations. The brownfield plan proposes to capture some tax increment revenues generated on the Property for approved purposes. The attached schedule describes the estimated fiscal and economic implications of the proposed brownfield plan. The City Commission must approve the brownfield plan.

If you wish to express your views or recommendations, or if you have any questions or comments, concerning the brownfield plan, you have the right to be heard in regard to the adoption of the brownfield plan. A copy of the brownfield plan is available for review at the office of the City Clerk located at 151 Martin Street, Birmingham, Michigan. The attached public notice will be published pursuant to Act 381.

Dated: October 12, 2016
Laura M. Pierce
City Clerk
City of Birmingham, Michigan

City of Birmingham
A Walkable Community

MEMORANDUM

Planning Division

DATE: **October 18, 2016**

TO: **Joseph A. Valentine, City Manager**

FROM: **Jana L. Ecker, Planning Director**

SUBJECT: **Public Hearing for a Brownfield Plan for 856 N. Old Woodward (vacant property)**

The State Brownfield Redevelopment Statute (Public Act 381 of 1996, as amended) allows the City to approve a Brownfield Plan in order to help finance the cleanup of a contaminated site through the use of Tax Increment Financing (TIF).

In July 2016, the owner of the above-captioned property submitted a draft Brownfield Plan ("the Plan") to the City in anticipation of the construction of a new mixed use, four story development (The Pearl) proposed for the site. The Brownfield Plan outlines numerous environmental concerns on the site, including historical operations and contamination of the adjacent sites, and contamination on the subject site, including the presence of benzene, tetracholoroethylene, arsenic, selenium, and mercury in the soil, benzene, lead, vinyl chloride and silver in the groundwater on site, and m-dichlorobenzene and tetracholoroethylene in the soil gas samples taken on site.

City staff, the City Attorney and our environmental consultants at AKT Peerless reviewed the draft Plan and requested additional information on the extent of the contamination. The applicant submitted a more detailed Plan, and the City provided comments and suggested several changes. On September 16, 2016, the applicant submitted a revised Plan reflecting the changes discussed, but also making amendments based on new information on an increased volume of soil removal, and disposal costs. The applicant initially requested a reimbursement of $2,981,610 in costs in order to clean up the site to meet the Michigan Department of Environmental Quality ("MDEQ") standards.

On September 22, 2016, the Brownfield Redevelopment Authority reviewed the Brownfield Plan as submitted. Several issues were raised with regards to the causes of the contamination on the subject site, whether contamination continued to date, the potential liability of adjacent property owners, the costs to clean up and/or close out adjacent brownfield sites and MDEQ's perspective on allowing the capture of school taxes where there is a potentially liable party. The Brownfield Redevelopment Authority requested the applicant to research how long the adjacent dry cleaners had been operating, to meet with the MDEQ to determine the likelihood

of school taxes being approved, and to talk to adjacent property owners about cleanup costs, liability and potential site closure. The applicant agreed to provide an updated Plan with additional exhibits illustrating additional soil borings that have been taken, and to be prepared at the next meeting to update the Authority on discussions with adjacent property owners and the MDEQ.

On September 27, 2016, the Brownfield Redevelopment Authority discussed the additional information submitted by the applicant regarding the length of time the adjacent dry cleaners had been operating, the MDEQ's status on enforcement action for either of the adjoining properties to the north, and the status of discussion with Douglas Cleaners as far as any responsibility in assisting with cleanup efforts. The applicant also submitted a letter estimating the reasonable cost estimates for closure of the adjacent contaminated properties. After much discussion, the Brownfield Redevelopment Authority voted unanimously to recommend approval of the Plan to the City Commission with the following conditions:

1. If relevant State of Michigan agencies do not approve the school tax component of the Brownfield Plan, estimated to be $1,500,000 plus simple interest at 3%, the Brownfield Authority will not reimburse the developer for such amounts.
2. The Brownfield Authority will not reimburse amounts attributable to contamination caused by liable parties estimated to be $325,000.
3. The maximum reimbursement will be $2,656,610.
4. Reimbursement will occur for a maximum of 10 years.

The City Commission set a public hearing date for October 27, 2016 to consider approval of the revised Brownfield Plan as recommended by the Brownfield Redevelopment Authority on September 27, 2016, as well as the associated Reimbursement Agreement. Please find attached all relevant documents and the draft meeting minutes for your review.

SUGGESTED ACTION:

To approve the Brownfield Plan and Reimbursement Agreement for 856 N. Old Woodward, The Pearl.

Brownfield Redevelopment Authority
MINUTES
Thursday, September 22, 2016

3. Brownfield Plan Application for 856 N. Old Woodward Ave., The Pearl

Ms. Ecker recalled in July 2016, the owner of the above-captioned property submitted a draft Brownfield Plan ("the Plan") to the City in anticipation of the proposed for the site. The property owner has obtained Preliminary and Final Site Plan Approval for construction of a new mixed use, four-story development with retail on the first floor and three floors of residential on top of that. They also had to do a Community Impact Study to address environmental, traffic, and safety concerns.

Ms. Elizabeth Masserang outlined some of the environmental concerns. PM Environmental has been working with the development team over the past year trying to put together what the cost differential is that is directly associated with the contamination. With that the property does qualify for a Brownfield. The payback period is approximately fourteen years and includes the request for school tax capture from the MDEQ based on a post development taxable value of $5 million based on comparable properties in the area.

Mr. Adam Patton advised the eligible activities concern due care activities to document that the site qualifies for Redevelopment funds. They include excavation of some soils; transport and disposal of contaminated material; and installing a vapor barrier underneath the occupied portions of the building, as well as along the north wall that fronts the slope. In addition, funding is requested for chemical resistant gaskets and oversight by environmental professionals along with the preparation of post construction documentation.

Moving over to the soils, there is a line item for excavation of 6,705 tons as well as transport and disposal of 20,095 tons of total contaminated material that includes 13,390 tons of standard contaminated non-hazardous type soils and 6,705 tons of hazardous soils.

Mr. Haynes noted the two offsite contamination sources: Douglas Cleaners and the Amoco Station. There is a possibility that the State will refuse the school tax portion because it benefits a liable party. Ms. Masserang explained the DEQ viewed it within the realm of the hazardous soil excavation being eligible for the capture of school taxes. Mr. Haynes said it would be prudent to get something in writing from the DEQ to that effect. If the school taxes are not approved, then the City would have to pick up the difference. Ms. Masserang explained when they initially submitted the Plan they included a scenario of school capture and also a scenario for a local only Brownfield Plan, which would be the projection If for any reason school taxes are not captured. It would be projected out accordingly and double the payback time to 28 years.

Mr. Patton noted the site conditions and the contaminant concentrations associated with fill are significant from a volume and from a redevelopment standpoint. The volume of soil that needs to be removed relates to the non-hazardous component. However, from a dollar value the hazardous component of the costs is more significant than non-hazardous.

Chairperson Gotthelf thought this looks like a promising site that will generate the taxes for the City; although they are asking for $3 million. The question is who should be paying for clean-up costs. Should it be the City to encourage the redevelopment, or should it be the liable party, or should it be some blend of the two. If it is a blend, what should that blend look like. The Authority must consider how much the City is exposed to, versus the applicant.

Mr. Robertson did not believe the purchase price of $800 thousand is reflective of the true market value. It is probably worth $2.5 million. Additionally, how will there be a $5 million taxable value when the project is completed. They will spend a minimum of $15 million to construct the building. None of the numbers make sense as to why the City would put up $3 million on this property.

Mr. Scott Kreitzer answered that the proposed foundation system will cost well over $2 million. That cost was associated with the sale of the property and offsets the $800 thousand. They are asking for the bare minimum as far as the excavation portion. He agreed there must be something wrong with the $5 million number for taxable value. It should be a lot more.

Mr. Kulka noted this Plan does not contain any cost to take this to closure. It is only to implement due care and get the follow-up construction sampling showing the project is safe for residential purposes. If the taxable value turns out to be more than $5 million it will cut down the payback period.

Chairperson Gotthelf inquired what conversations the applicant has had with Douglas with respect to their responsibility in paying for some of this cost. Ms. Masserang indicated discussion went nowhere. Ms. Ecker added that the owner of the drycleaners came to a Planning Board public hearing and he said there was no contamination coming from the drycleaners.

Ms. Masserang said she found out the DEQ has records of Notice of Violations by Douglas relative to on-site procedures back in the early 2000s but no record of enforcement or clean-up activities on their part.

Mr. Haynes thought it would be prudent for the Authority to have an estimate of costs that ought to be borne by a liable party. Chairperson Gotthelf asked PM Environmental to have a conversation with Douglas and show them the evidence of the borings and perk from their site going into the river. Further, note this should be a high priority with DEQ and find out if they have insurance.

It was discussed that if the owners, environmental consultants, and the City pushed together, coming from different angles, collectively they might turn up the heat on Douglas.

Mr. Robertson announced this seems like a outrageous number for a not very hazardous site. Mr. Kulka responded the issue is where to take soil that is not that contaminated and it is very expensive. If the project goes forward and actual costs come down, then the payback period comes down. It is the Authority's mission to use the Brownfield to effectively redevelop the site.

Mr. Valentine said the chairperson presented a nice summation of the issues before the Authority. He added one other issue based on prior discussions of the Authority relative to the timeline of the TIF Table. There is a 14 year projection and potentially a 28 year projection based on changes that could occur, and if valuations exceed what is in the proposal then the timetable is shortened. Whether the 14 year term is too long is something the group may want to consider.

Mr. Haynes noted there could be some contingencies built into the approval that say <u>if the school tax is turned down by the DEQ the project is denied</u>. Or, there could be a contingency that says <u>if the school tax is disapproved by the DEQ that portion is dropped from the proposa</u>l and it will be funded at whatever the local share is at 14 years.

Once the Brownfield Plan is approved by the City Commission then the developer takes the work plan to DEQ and asks whether they will allow school taxes to be used. Then they say yes or no. If there is a liable party, it bars DEQ from approving the plan. Therefore, a contingency that says either the whole thing is disapproved if DEQ does not approve school taxes; or there is a portion that is just lopped off of the approval, is a prudent way to go.

The group explored the question of whether or not the perk is getting to the river. The boring closest to the river does not have tetrachloroethenes ("PCEs").

Mr. Kreitzer indicated ground water near the river is fairly discontinuous. There wasn't a lot of ground water over there to sample. Mr. Haynes said if the river is not contaminated there is no contamination of public properties. Mr. Kreitzer observed the soils should not result in an unacceptable discharge to the Rouge. Chairperson Gotthelf noted what would get DEQ's attention is whether the contamination is getting to the Rouge.

In response to the chairperson, Mr. Patton said the cost for the disposal of non-hazardous soil, 13,390 tons, is $153,985 and it is $1.5 million for the hazardous soil. They don't want to take out any more soil than they have to, and if they have to they need to physically dispose of it in accordance with all applicable laws. They still have to front the money.

Answering Mr. Haynes, Mr. Patton noted even though contaminants don't exceed criteria in the soil in place, they are listing them as hazardous waste for purposes of transport and disposal. He went on to explain that PCE from a drycleaning release is a spent solvent and on that basis there is no choice in the matter of how it is disposed because it is classified as a listed hazardous material.

Chairperson Gotthelf summed up the question for the Authority:

- approve the application as it is;
- approve it with contingencies:
  - Only approve the City part if DEQ does not approve the school part;
  - If DEQ won't approve the school part, the City will pick it up or a portion of it;
  - The City will pick up a portion after the applicant demonstrates they cannot get it from Douglas;
- gather more facts and bring it back.

Mr. Haynes added that another contingency the board would like to see is whether there would be a deduction for the cost of closure by Douglas.

Mr. Kulka indicated they hope to start construction in December. They need to come up with a Plan to finally make the project happen as it is a significant portion of the cost of construction.

Mr. Robertson asked the applicant to look again at the cost of excavation, extra transportation. Ms. Masserang said the costs are based on an actual bid they got. Mr. Runco agreed the cost is close. Mr. Robertson wanted to know where the hazardous soil will go and what it will cost. Mr. Kulka said it will go to Belleville and their prices have recently gone up 40%.

The chairperson suggested the Authority could reconvene next week rather than voting now in order to allow further thought after access to additional information. Mr. Kulka emphasized they need this approval in order to continue to move forward. Chairperson Gottlieb said the Authority has its obligation to the City to make sure they do their due diligence and to ensure the applicant has talked to DEQ and to Douglas.

For purposes of coming back, Mr. Haynes thought it would be prudent for the applicant to develop a cost of closure as-is, solely relative to the subject parcel. Chairperson Gottlieb felt the mass of contamination from earlier operations is still there and that is what is migrating and causing other problems.

Motion by Mr. Robertson
Seconded by Mr. Runco to table the Brownfield Plan Application for 856 N. Old Woodward Ave. to Tuesday, September 27 at 8 a.m.

Voice Vote: Yeas, Robertson, Runco, Gottlieb, Torcolacci
Nays, 0
Absent, 1 (Zabriskie)

Motion carried, 4-0.

In general, the group was not comfortable with the length of time for payback to occur. Mr. Haynes assured the Authority has discretion to do a lot of things such as shrinking the years or offering less money. He stated his intention to draft a new Resolution with the contingency that if the DEQ does not approve school taxes, the City will not pick it up.

Mr. Patton was requested to forward the pages of the Phase 1 Environmental that talk about the history in order to see who owned the parcel prior to Douglas. If it was another party that is out of business then there is a liable party that is not viable and that would be a reason to pick up the costs.

Mr. Haynes observed the soil borings show no other VOCs besides PCE. Ms. Ecker noted the DEQ has been monitoring wells at the south end of the gas station property for a long time. Mr. Runco thought it would be nice to know if there is no one else out there to go after. Mr. Haynes said the Authority can hold back funds pending an investigation by the applicant.

Brownfield Redevelopment Authority
DRAFT MINUTES
Tuesday, September 27, 2016

3. Brownfield Plan Application for 856 N. Old Woodward Ave., The Pearl

The chairperson summarized last week's meeting on this property. The applicant is asking for approximately $3 million in TIF which is payable over approximately fourteen years. It assumes that the DEQ will approve the portion of the TIF for the school taxes.

The reason the cost is so high is because approximately $1.5 million of the money requested is a result of contamination of perchloroethene ("PCE") that is a hazardous waste. The Authority had asked the developer and PM Environmental to gather some information and come back today so the request can be reconsidered. The group studied a list the City put together of approved Brownfield TIF reimbursements that have been passed so far, along with the number of payback years. This request is twice as much as any of the projects the Authority has approved to date.

Sales information on the Brownfield properties was considered as to whether the price already reflected the fact they had environmental challenges that lowered the value.

Ms. Elizabeth Masserang summarized the follow-up points they were asked to research:

- MDEQ status on any enforcement as it relates to the north adjoining property, Douglas Cleaners ("Douglas") site. The DEQ indicated that Douglas was not a site on their radar for any existing plans for enforcement. They are now taking a closer look.
- Further discussion as it relates to Douglas as far as any responsibility in assisting with cleanup efforts being made at the property. Efforts are ongoing between the current owner of the subject property and Douglas as far as researching potential insurance claims that could assist.
- Reasonable cost estimates at closure were included in a letter that defined the scope of each line item and its associated cost.

Mr. Adam Patton advised said ground water flow at the property is limited, perched and discontiguous. The flow would be expected to be east, towards the river. The eastern most borings adjacent to the Amoco station don't have perc in them. The small amount of contaminants that could be attributed to the Amoco Station is essentially negligible.

The contaminant has not degraded significantly so there is no way to age date it.

Ms. Ecker described the project as having below-grade parking, the next level is retail and parking, and then residential above.

Ms. Masserang advised that 6 to 7 thousand tons of carry-off soil is related directly to the caissons that have to be dug into the ground and the remainder is to grade the site.

Mr. Robertson named a number of things that bother him:

- There is a huge discount on the land price, at least $1.5 million;
- Caissons go well below everything;

- The assessment of $5 million is too low;
- The time or reimbursement is too long;
- Too much money for a not very dirty site.

Mr. Mike Kulka noted the challenges to this property and that it hasn't been capped in 30 years. There is no easy solution to just fill it in.

Chairperson Gotthelf reported a conversation she had with DEQ to the effect that if the liable party is not the one developing the property, then they are not benefitting. So in DEQ's eyes they would not see Douglas benefitting and that is a reason not to allow for school taxes. In approving this the Authority could say if DEQ does not approve the school taxes the City will not allow that recovery either.

Ms. Ecker noted this site is not in the Parking Assessment District so parking on-site would have to be provided no matter what type of development they did.

It was discussed that the applicant picked up $1.5 million discount on the purchase price for foundations. Chairperson Gotthelf reminded everyone that the Authority has a fiduciary responsibility that they would like to see the property put to a productive use that would return a tax base. However they also want to be careful of the tax dollars that everyone pays so as not to give too much away or not recover it.

Mr. Robertson suggested that the developer go back and figure out how to do this on a 10 year payback. Also, the Authority should specify a minimum taxable value. Further he thought the developer needs to look at the caisson system because they could probably do pilings that don't have a contamination issue with material that has to be hauled away. He hoped to see what Douglas' insurance company's ability is to help contribute to this situation. Mr. Kulka indicated it will take a long time to go through the process to try to get coverage. Mr. Robertson responded that the Authority doesn't want the City to give up their taxes for a liable party just because they are in a hurry.

Mr. Kulka advised that the developer paid more for the property than the seller had paid for it a year prior.

Mr. Runco recommended everyone look at a discounted number that perhaps both parties can agree upon.

Mr. Bennett Donaldson talked about the foundation system. To go down 50 ft. and support the weight of the building, caissons is the best option. They can't bring a pile driver onto this half acre site. Multiple augers are needed to support what one caisson would carry and the machine would sit there for 60 days drilling in the augers. The site has unique challenges, and to lessen the impact of the cost of the solutions would be a mistake because they are significant.

Chairperson Gotthelf suggested that the Authority could put a cap on the dollar amount or put a cap on a line item and/or years of payback.

Ms. Masserang stated PM Environmental has gone out a second time to try and minimize the dirt coming off, given the per tonnage cost of hauling it away.

Mr. Kulka said their job is to minimize the amount of soil and cost incurred. The developer has to front and finance all those costs so he is not going pick a more expensive option. Significant dollars have been spent for professionals to determine the most cost effective reliable solution. Hazardous waste removal is a significant component of this ask.

It was suggested that the Authority discuss the next item on the agenda in order to give the applicant time to talk about coming up with parameters for minimizing their costs.

Mr. Kulka offered to discount the cost of closure of the site to remain an open hole.

Motion by Mr. Robertson
Seconded by Ms. Torcolacci to table Brownfield Plan Application for 856 N. Old Woodward Ave., The Pearl

Vote: Yeas, 4
Nays, 0
Absent, 1 (Zabriskie)

Motion carried, 4-0.

At this time, Item 4 on the Agenda was discussed by the Authority.

Motion by Mr. Robertson
Seconded by Mr. Runco to bring back from the table Brownfield Plan Application for 856 N. Old Woodward Ave., The Pearl.

Vote: Yeas, 4
Nays, 0
Absent, 1 (Zabriskie)

Motion carried, 4-0.

Mr. Kulka offered an additional $325 thousand give on their original ask to reduce their reimbursable expense to $2.656 million. More than likely the taxable value will be significantly higher which will take their payback with school taxes to approximately 12.5 years.

A motion was made by Mr. Runco and seconded by Ms. Torcolacci to approve the $2.656 million ask at a maximum 12 year payback. The Authority will not pick up an amount equivalent to the school taxes if the DEQ does not approve those. Chairperson Gotthelf clarified that the share by the City is approximately half of the $2.656 million or approximately $1.3 million which would be the incremental increase of the taxes that would be refunded back through TIF. Payback would be up to a period of 12 years.

Mr. Dan Wells voiced his opinion that the applicant has been fairly conservative in their calculations. He recommended doing either a year cap or a dollar amount cap. In response to

the chairperson, Mr. Wells said it is a reasonable conclusion to assume the contamination is all coming from Douglas versus from the gas station.

Mr. Robertson moved to amend the motion to change the $325 thousand discount to a $500 thousand discount, bringing the ask close to $2.4 million and probably closer to 11 years on the payback. The rationale is the discount on the purchase price of the property. Ms. Torcolacci seconded.

Chairperson Gotthelf advised the motion doesn't address whether Douglas has insurance that might cover the cost, assuming the contamination is from Douglas. If it is found this is a newer release, then there is no insurance.

Mr. Robertson moved to withdraw his amendment and Ms. Torcolacci withdrew her second.

Motion by Mr. Robertson
Seconded by Ms. Torcolacci to approve the Brownfield Plan Application for 856 N. Old Woodward Ave., The Pearl, as follows:

Whereas, the City of Birmingham has created a Brownfield Redevelopment Authority and appointed members to serve on the Authority, pursuant to 1996 PA 381, and

Whereas, the Brownfield Redevelopment Authority is charged with the review of Brownfield Plans for Brownfield projects in the City of Birmingham, and

Whereas, FLS Properties #5 LLC, the owner and developer of 856 N. Old Woodward Avenue, Birmingham, Michigan, intends to develop a mixed-use residential/retail building with underground parking at 856 N. Old Woodward Avenue, and

Whereas, PM Environmental has prepared a Brownfield Plan for the site, dated July 26, 2016, as revised September 16, 2016, that estimates that eligible activities on this property will cost approximately $2,981,610, and

Whereas, the Brownfield Redevelopment Authority has reviewed the Brownfield Plan.

NOW THEREFORE BE IT RESOLVED THAT:

The Brownfield Redevelopment Authority approves the Brownfield Plan for 856 N. Old Woodward Avenue, subject to the following:

1. If relevant State of Michigan agencies do not approve the school tax component of the Brownfield Plan, estimated to be $1,500,000 plus simple interest at 3%, the Brownfield Authority will not reimburse the developer for such amounts.

2. The Brownfield Authority will not reimburse amounts attributable to contamination caused by liable parties estimated to be $325,000.

3. The maximum reimbursement will be $2,656,610.

4. Reimbursement will occur for a maximum of 10 years.

The Brownfield Authority requests the City Clerk to forward the Brownfield Plan and associated Reimbursement Agreement to the Birmingham City Commission for its review and approval pursuant to Act 381.

Vote: **Yeas, 4**
Nays, 0
Absent, 1 (Zabriskie)

Motion carried, 4-0.

RESOLUTION APPROVING THE BROWNFIELD PLAN FOR
856 N. OLD WOODWARD AVENUE

Whereas, the City of Birmingham has created a Brownfield Redevelopment Authority and appointed members to serve on the Authority, pursuant to 1996 PA 381, and

Whereas, the Brownfield Redevelopment Authority is charged with the review of Brownfield Plans for Brownfield projects in the City of Birmingham, and

Whereas, FLS Properties #5 LLC, the owner and developer of 856 N. Old Woodward Avenue, Birmingham, Michigan, intends to develop a mixed-use residential/retail building with underground parking at 856 N. Old Woodward Avenue, and

Whereas, PM Environmental has prepared a Brownfield Plan for the site, dated July 26, 2016, as revised September 16, 2016, that estimates that eligible activities on this property will cost approximately $2,981,610, and

Whereas, the Brownfield Redevelopment Authority has reviewed the Brownfield Plan.

NOW THEREFORE BE IT RESOLVED THAT:

The Brownfield Redevelopment Authority approves the Brownfield Plan for 856 N. Old Woodward Avenue, subject to the following:

1. If relevant State of Michigan agencies do not approve the school tax component of the Brownfield Plan, estimated to be $1,500,000 plus simple interest at 3%, the Brownfield Authority will not reimburse the developer for such amounts.

2. The Brownfield Authority will not reimburse amounts attributable to contamination caused by liable parties estimated to be $325,000.

3. The maximum reimbursement will be $2,656,610.

4. Reimbursement will occur for a maximum of 10 years.

The Brownfield Authority requests the City Clerk to forward the Brownfield Plan and associated Reimbursement Agreement to the Birmingham City Commission for its review and approval pursuant to Act 381.

Ayes: _____

Nayes: _____

Abstain: _____

BROWNFIELD REIMBURSEMENT AGREEMENT

THIS AGREEMENT (the "Agreement") dated _____, is entered into between the **CITY OF BIRMINGHAM** ("City") and the **CITY OF BIRMINGHAM BROWNFIELD REDEVELOPMENT AUTHORITY** (the "Authority"), an authority established pursuant to Act 381 of Public Acts of 1996, as amended ("Act 381"), whose addresses are 151 Martin Street, Birmingham, Michigan 48009; and **FLS PROPERTIES #5 LLC** (the "Developer"), a Michigan limited liability company, whose address is 2950 Walnut Lake Road, West Bloomfield, Michigan 48323.

Recitals

A. In accordance with Act 381, the Authority has adopted a Brownfield Plan for 856 N. Old Woodward Avenue, Birmingham, Michigan, that the City Commission of the City has approved (the "Brownfield Plan").

B. The Developer owns property in the City located at 856 N. Old Woodward Avenue, Birmingham, Michigan (the "Property"), which is described on the attached Exhibit A. The Property is included in the Brownfield Plan as an eligible Property because it is a Facility due to the presence of hazardous substances on the Property as described in the Brownfield Plan.

C. The Developer plans to redevelop the Property by constructing a mixed-use residential/retail building with underground parking (the "Improvements"). The Improvements are intended to create temporary construction jobs and new full time jobs, increase the tax base of the City, and otherwise enhance the economic vitality and quality of life of the City.

D. Act 381, as amended, authorizes the Authority to reimburse a developer for the costs of Eligible Activities on Eligible Property using Tax Increment Revenues generated by the redevelopment of the property.

E. To make the Improvements on the Property, the Developer may incur costs to conduct Eligible Activities—including Baseline Environmental Assessment Activities, Due Care Activities, Additional Response Activities, and the reasonable costs to prepare the Brownfield Plan—each of which will require the services of contractors, engineers, environmental consultants, and other professionals (the "Eligible Costs"). The Developer estimates the total Eligible Costs, including contingencies, to be approximately $2,981,610.

F. The Brownfield Plan authorizes the use of Tax Increment Revenues that are generated by Local and School Taxes imposed on the Property to reimburse the Developer for Eligible Costs.

G. The parties are entering into this Agreement to establish the procedure for reimbursing the Eligible Costs and using Tax Increment Revenues in accordance with Act 381, as amended, and the Brownfield Plan.

Accordingly, the parties agree with each other as follows:

1. The Brownfield Plan. The Brownfield Plan is attached as Exhibit B and incorporated in this Agreement. To the extent provisions of the Brownfield Plan conflict with this Agreement, this Agreement controls. To the extent provisions of the Brownfield Plan or this Agreement conflict with Act 381, as amended, Act 381 controls.

2. Term of Agreement. In accordance with the Brownfield Plan, the Authority will capture the Tax Increment Revenues generated by the Improvements on the Property to reimburse the Eligible Costs until the earlier of the date that all the Eligible Costs are fully reimbursed under this Agreement or 10 years after the date the Authority begins to capture Tax Increment Revenues under the Brownfield Plan.

3. Eligible Activities. The Authority will reimburse the Developer for Eligible Costs identified in the Brownfield Plan that were incurred before the Birmingham City Commission

approves the Brownfield Plan if permitted under Act 381, as amended. The Developer must diligently pursue completion of the Eligible Activities set forth in the Brownfield Plan.

4. Reimbursement Source. During the term of this Agreement, the Authority will capture the Tax Increment Revenues generated by the Improvements from Local and School Taxes imposed on the Property and any personal property located on the Property and use those Tax Increment Revenues to reimburse the Eligible Costs (including interest) in accordance with the Brownfield Plan and this Agreement.

5. Limitations on Reimbursement. The Authority will reimburse Eligible Costs up to but not exceeding the line item costs described in the Brownfield Plan, plus a maximum of 15% contingency for each line item. If relevant State of Michigan agencies do not approve the School Taxes Component of the Brownfield Plan, estimated to be $1,500,000, plus simple interest at 3%, the Brownfield Authority will not reimburse the developer for such amounts from the local Taxes component. The Brownfield Authority will not reimburse amounts attributable to costs of closure to residential standards estimated to be $325,000. Reimbursable Eligible Costs will not exceed $2,656,610.

6. Reimbursement Process. (a) On a quarterly basis, the Developer may submit to the Authority a request for cost reimbursement for the Eligible Costs the Developer incurred during the prior period. This request will be in the form attached as Exhibit C ("Petition"). The Petition will identify whether the Eligible Activities are: (1) Baseline Environmental Assessment Activities; (2) Due Care Activities; (3) Additional Response Activities; (4) the reasonable costs to prepare the Brownfield Plan; or (5) interest. The Petition must describe each activity claimed as an Eligible Activity and the associated costs of that activity. Documentation of the costs incurred must be included with the Petition, including proof of payment and detailed invoices for the

costs incurred sufficient to determine whether the costs incurred were for Eligible Activities. The Petition must be signed by an authorized representative of Developer.

(b) The Authority will review a Petition within 60 days after receiving the Petition. The Developer will cooperate with the Authority by providing information and documentation to supplement the Petition as requested by, and as deemed reasonable and necessary by, the Authority. Within such 60 days, the Authority will identify in writing to Developer (i) all costs approved for reimbursement, and (ii) any costs deemed ineligible for reimbursement and the basis for the determination. The Developer then has 45 days to provide supplemental information or documents to support of any costs deemed ineligible by the Authority. Within 30 days after the Developer provides the supplemental information or documents, the Authority will decide on the eligibility of the disputed cost and inform the Developer in writing of its decision. The Developer may appeal the Authority's decision pursuant to law.

(c) Twice a year, after the summer and winter taxes are collected on the Property, the Authority will capture the Tax Increment Revenues in accordance with the Brownfield Plan and will use those Tax Increment Revenues to reimburse the Developer for approved Eligible Costs (including accrued interest). The Authority is not obligated to reimburse the Developer for any approved Eligible Costs during any period of time that the Developer is delinquent in the payment of real or personal property taxes imposed on the Property or delinquent in the payment to the City for administrative, legal, or other costs invoiced to the Developer.

(d) If there are insufficient funds available from Tax Increment Revenues captured under subparagraph (c) at any time to pay all the Developer's unreimbursed Eligible Costs and accrued interest, the Authority is not required to reimburse the Developer from any other source. The Authority will, however, make additional payments toward the Developer's

remaining unreimbursed Eligible Costs and accrued interest in accordance with this Agreement as Tax Increment Revenues become available under subparagraph (c).

(e) Subject to Section 5(d), payment of Eligible Costs to the Developer is not conditioned on the completion of any of the Improvements at any time or in any sequence so long as Developer is in compliance with its obligations and duties under this Agreement.

(f) The Authority will reimburse the Developer for Eligible Costs as follows:

Check shall be payable to:	FLS Properties #5 LLC
Delivered to the following address:	2950 Walnut Lake Road West Bloomfield, MI 48323 Attn: Frank Simon

By certified mail.

(g) Developer may assign its payments to any person by providing 45 days' prior notice to the Authority of such assignment. Any such assignment does not discharge or release Developer from any of its obligations and duties under this Agreement.

7. Information. The Developer will provide to the Authority any information the Authority considers necessary to fulfill any reporting obligation to the State of Michigan under Act 381, as amended.

8. Legislative Authorization. This Agreement is governed by and subject to the restrictions set forth in Act 381, as amended. If legislation is enacted in the future that alters or affects the terms of this Agreement, including, but not limited to, the amount of Tax Increment Revenues subject to capture or the definition of Eligible Property or Eligible Activity, then the Developer's rights and the Authority's obligations under this Agreement may be modified accordingly by agreement of the parties.

9. Freedom of Information Act. All Petitions and documentation submitted by Developer are open to the public under the Freedom of Information Act, 1976 PA 442, as amended, MCL 15.231 *et seq*. The Developer will not bring any claim of trade secrets or other

privilege or exception to the Freedom of Information Act related to such Petitions and documentation.

10. Plan Modification. The Brownfield Plan may be modified to the extent allowed under Act 381, as amended, by mutual agreement of the parties.

11. Notices. All notices shall be given by registered or certified mail addressed to the parties at their respective addresses as shown above. Either party may change the address by written notice sent by registered or certified mail to the other party.

12. Assignment. The interest of any party under this Agreement shall not be assignable without the other party's written consent, which shall not be unreasonably withheld, except that the Developer may assign this Agreement for purposes of securing financing for the Improvements without the prior consent of the Authority.

13. Entire Agreement; Amendment. This Agreement constitutes the entire agreement between the parties. No other agreements, written, oral, express or implied, have been made or entered into by the parties concerning the subject matter of this Agreement. This Agreement may be modified or amended only by subsequent written agreement executed by all of the parties. This Agreement has been the subject of negotiations between the parties and may not be construed against any party as drafter.

14. Non-waiver. No delay or failure by either party to exercise any right under this Agreement, and no partial or single exercise of that right, will constitute a waiver of that or any other right, unless otherwise expressly provided in this Agreement.

15. Headings. Headings in this Agreement are for convenience only and may not be used to interpret or construe its provisions.

16. Governing Law. This Agreement is to be construed in accordance with and governed by the laws of the State of Michigan.

17. Counterparts. This Agreement may be executed in two or more counterparts, each of which shall be deemed an original but all of which together constitute one and the same instrument.

18. Binding Effect. The provisions of this Agreement are binding upon and inure to the benefit of each of the parties and their respective heirs, legal representatives, successors, and assigns.

19. Definitions. Unless otherwise defined in this Agreement, the following terms have the definitions given to them by Act 381, as amended:

(a) "Additional Response Activities" is defined by Section 2(a) of Act 381;

(b) "Baseline Environmental Assessment" is defined by Section 2(c) of Act 381;

(c) "Baseline Environmental Assessment Activities" is defined by Section 2(d) of Act 381;

(d) "Brownfield Plan" is defined by Section 2(g) of Act 381;

(e) "Due Care Activities" is defined by Section 2(l) of Act 381;

(f) "Eligible Activities" is defined by Section 2(n) of Act 381;

(g) "Eligible Property" is defined by Section 2(o) of Act 381;

(h) "Facility" is defined by Section 2(q) of Act 381;

(i) "Local Taxes" is defined by Section 2(y) of Act 381;

(j) "Tax Increment Revenues" is defined by Section 2(ii) of Act 381;

Subject to Section 1, if these definitions are amended during the term of this Agreement, the defined terms shall be construed to the fullest extent possible to conform to the provisions of this Agreement.

Subject to Section 1, if these definitions are amended during the term of this Agreement, the defined terms shall be construed to the fullest extent possible to conform to the provisions of this Agreement.

The parties have executed this Agreement of the dates set forth below.

CITY OF BIRMINGHAM

By: _____

Title: _____

By: _____

Title: _____

Date: _____

CITY OF BIRMINGHAM BROWNFIELD REDEVELOPMENT AUTHORITY

By: Bob Gorney

Title: Chair

Date: 10.20.16

FLS PROPERTIES #5 LLC

By: Frank R Simon

Title: President / OWNER

Date: 10-13-16

Exhibit A

Property Description

Located in the City of Birmingham, County of Oakland, State of Michigan, and described as:

T2N, R10E, SEC 25 ASSESSOR'S PLAT NO 29 LOTS 3 & 4, ALSO PART OF NW 1/4 BEG AT PT DIST S 88-16-00 E 10.15 FT FROM NW COR OF SD LOT 3, TH S 88-16-00 E 124.70 FT, TH N 49-21-00 W 46.41 FT, TH S 73-32-00 W 93.28 FT TO BEG

Tax ID #08-19-25-328-001

Exhibit B

Brownfield Plan

CITY OF BIRMINGHAM
BROWNFIELD REDEVELOPMENT AUTHORITY

BROWNFIELD PLAN

MIXED USE DEVELOPMENT
LOCATED AT 856 NORTH OLD WOODWARD AVENUE
BIRMINGHAM, MICHIGAN

July 26, 2016
Revised September 29, 2016

Approved by BRA: 9/27/2016
Approved by City Commission:

Prepared on Behalf of:

FLS Properties #5, LLC
2950 Walnut Lake Road
Contact Person: Mr. Frank Simon
Telephone: (248) 720-0290

Prepared By:

PM Environmental, Inc.
4080 West Eleven Mile Road
Berkley, Michigan 48072
Contact Person: Elizabeth Masserang
Telephone: (248) 414-1441

PM Environmental, Inc.
4080 West Eleven Mile Road
Berkley, Michigan 48072
Contact Person: Adam Patton, CHMM
Telephone: (248) 336-9988

PM ENVIRONMENTAL
Risk Well Managed

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PROJECT SUMMARY

Project Name:	Proposed Mixed-use Development
Project Location:	The property is located at 856 North Old Woodward Avenue in Birmingham, Oakland County, Michigan.
Type of Eligible Property:	Facility
Eligible Activities:	Baseline Environmental Assessments, Due Care Activities, and Preparation of a Brownfield Plan.
Reimbursable Costs:	Up to $2,656,610
Years to Complete Reimbursement:	Approximately 14 years is anticipated, however, the Birmingham Brownfield Redevelopment Authority (BBRA) has requested the payback period be limited to 10 years.
Estimated Capital Investment:	Approximately $14-16 million
Project Overview:	This project includes response activities for the remediation and redevelopment of a brownfield site, which currently consists of a vacant, underutilized eyesore for the city. The existing site conditions and contamination have deterred several past attempts to bring the vacant site into successful reuse. The proposed redevelopment entails the new construction of a mixed-use residential/retail building with underground parking. The proposed redevelopment involves significant investment. Remediation and redevelopment is anticipated to commence in late 2016/early 2017 and create 20 to 30 permanent jobs.

I. INTRODUCTION AND PURPOSE

In order to promote the revitalization of environmentally distressed areas within the boundaries of Birmingham ("the City"), the City has established the Birmingham Brownfield Redevelopment Authority (BBRA) the "Authority" pursuant to the Brownfield Redevelopment Financing Act, Michigan Public Act (PA) 381 of 1996, as amended.

The primary purpose of this Brownfield Plan ("Plan") is to promote the redevelopment of and private investment in certain "Brownfield" properties within the City. Inclusion of property within this Plan will facilitate financing of environmental response and other eligible activities at eligible properties, and will also provide tax incentives to eligible tax payers willing to invest in revitalization of eligible sites, commonly referred to as Brownfields. By facilitating redevelopment of Brownfield properties, this Plan is intended to promote economic growth for the benefit of the residents of the City.

The Property is currently zoned 0-2 Office Commercial and within the Downtown Overlay Boundary, is currently vacant property that is an underutilized eyesore, and is located at the intersection of North Old Woodward Avenue and Oak Avenue. The surrounding area is characterized by commercial and residential properties.

This Plan is intended to apply to the eligible property identified in this Plan and, to identify and authorize the eligible activities to be funded. Any change in the proposed use of the eligible property shall not necessitate an amendment to this Plan, affect the application of this Plan to the eligible property, or impair the rights available to the Authority under this Plan.

This Plan is intended to be a living document which may be modified or amended as necessary to achieve the purposes of PA 381. The applicable sections of PA 381 are noted throughout the Plan for reference purposes.

This Brownfield Plan contains information required by Section 13(1) of PA 381.

II. GENERAL DEFINITIONS AS USED IN THIS PLAN

Terms used in this Brownfield Plan are defined as provided in the following statutes, as appropriate:

The Brownfield Redevelopment Financing Act, 1996 Mich. Pub. Acts. 502 which amended Pub. Act 381, M.C.L. § 125.2651 et seq., as amended.

III. BROWNFIELD PROJECT

DECRIPTION OF THE ELIGIBLE PROPERTY AND THE PROJECT

The Eligible Property consists of one legal parcel totaling 0.57 acres with a street address of 856 North Old Woodward Avenue in Birmingham, Oakland County, Michigan and the tax ID number of 08-19-25-328-001 (the "Property").

This parcel and all tangible personal property located thereon will comprise the eligible property and is referred to herein as the "Property." The legal description is included in Appendix A.

FLS Properties #5 LLC or any affiliate, as approved by the Authority, are collectively the project developer ("Developer").

The property is currently vacant land, located between North Old Woodward Avenue and the Rouge River, south of Oak Avenue. The Property was used as a gas station from 1937 to 1940, a gift shop from 1940 to 1949, and a restaurant from 1949 to 1988, when the former building was demolished. Since that time, the property has been used as a debris and dumping site and is currently a vacant underutilized eyesore. Numerous impediments have deterred developer investment in to subject property due to known contamination and challenging geotechnical conditions.

The proposed redevelopment includes site improvements and new construction of a four story mixed-use commercial and residential property. The new building includes the creation of approximately 27 residential units with an anticipated 3,500 square feet of retail space on the first floor and underground parking. Each residential unit will range in size from 900 to 1,900 square feet. This project will result in the elimination of an eyesore in the City that has been vacant for decades. Redevelopment of this vacant underutilized property, will provide additional residential and commercial space in a key corridor, Old Woodward Avenue, as well as remediate and eliminate the existing conditions. The proposed underground parking creates a significant added cost to the developer while benefiting the surrounding area by increasing density.

Redevelopment activities are proposed for the end of 2016/early 2017. The developer will invest an estimated $12-14 Million dollars in the redevelopment and create approximately 20-25 construction jobs, and 20-30 permanent jobs.

Appendix C includes site maps of the parcel and an eligible property boundary map. Preliminary site plans are included in Appendix D.

BASIS OF ELIGIBILITY

The Property is considered "Eligible Property" as defined by Act 381, Section 2 because: (a) the Property was previously utilized as a commercial property; and (b) the parcel comprising the Property has been determined to be a "facility."

A Baseline Environmental Assessment (BEA) was completed in September 2015 and documents the following information. A copy of the BEA text, figures, and tables are also provided in Appendix B.

Subsurface investigations were completed on the subject property between 1996 and 2002, and in 2006 and 2015. Concentrations of benzene, tetrachloroethene, xylenes, arsenic, chromium, selenium, and mercury were detected in soil samples collected from the subject property above the Part 201 Residential and Nonresidential Drinking Water Protection (DWP), Groundwater Surface Water Interface Protection (GSIP), and/or the Residential Direct Contact (DC) cleanup criteria. Concentrations of benzene, methyl-tert-butyl ether (MTBE), vinyl chloride, lead, and silver were detected in groundwater samples collected from the subject property above the Part 201 Residential and Nonresidential Drinking Water (DW) and/or Groundwater Surface Water Interface (GSI) cleanup criteria. Concentrations of m-dichlorobenzene and tetrachloroethylene were detected in soil gas samples collected from the subject property above the Part 201 Residential Vapor Intrusion Screening Levels (VISLs). The concentrations detected are consistent with contaminants from gasoline dispensing stations, dry cleaning operations, and fill material.

A location where a hazardous substance is present in excess of the concentrations, which satisfy the requirements of subsection 20120a(1)(a) or (17), is a facility pursuant to Part 201. Section 20120a(1)(a) requirements are the Cleanup Criteria for unrestricted residential usage. Based upon the documented exceedances of the Part 201 cleanup criteria and MDEQ VISLs, the subject property is a facility under Part 201 of P.A. 451, as amended, and the rules promulgated thereunder.

A. Description of Costs to Be Paid for With Tax Increment Revenues and Summary of Eligible Activities

Tax Increment Financing revenues will be used to reimburse the costs of "eligible activities" (as defined by Section 2 of PA 381) as permitted under the Brownfield Redevelopment Financing Act that include: Due Care Activities, Additional Response Activities, and preparation of a Brownfield Plan and inclusion of interest as described in this Plan. An itemization of these activity expenses is included in Table 1 of Appendix E.

The project redevelopment activities are slated to commence late 2016/early 2017, with a completion goal of 2018.

The following eligible activities and budgeted costs are intended as part of the development of the property and are to be financed solely by the developer. The Authority is not responsible for any cost of eligible activities and will incur no debt.

1. Baseline Environmental Assessments; including a Phase I Environmental Site Assessment (ESA), Phase II ESA, BEA, and Documentation of Due Care Compliance (DDCC) at a cost of $16,155.

2. Due Care Activities; including cost difference for the transportation and disposal of approximately 13,390 tons of soil to a Type II Landfill (in comparison to the disposal of clean soil), the additional delineation of tetrachloroethylene contamination in soil and groundwater and the excavation, transport, and disposal of approximately 6,705 tons (of the total 20,095 tons) of soil as listed hazardous waste, excavation equipment decon, the associated oversight, sampling, and reporting, the management and disposal of up to 30,000 gallons of contaminated groundwater, and costs associated with brownfield and post-due care project management, for an estimated cost of $2,130,515.

a. Excavation of up to 6,705 tons of hazardous material totaling **$270,547**
    i. Excavation at a cost differential of $40.35/ton when compared to a similar excavation occurring at a greenfield site.

b. Transport of 20,095 tons of contaminated soil totaling **$412,553**
    i. Transport of up to 13,390 tons of soil to a Type II Landfill at $7/ton totaling $93,730.
    ii. Transport of up to 6,705 tons of hazardous material at $47.55/ton totaling $318,823.

c. Disposal of 20,095 tons of contaminated soil totaling **$1,159,735**:
    i. Disposal of up to 13,390 tons of soil to a Type II Landfill at $11.50/ton totaling $153,985.
    ii. Disposal of up to 6,705 tons of hazardous material at $150/ton totaling $1,005,750.

d. Excavation equipment decon and decon waste water handling totaling **$7,500**.

e. Additional delineation sampling of tetrachloroethylene soil concentrations identified along the northern and eastern subject property boundaries and totaling **$21,945:**
    i. Mobilization, onsite labor for oversight, screening, and sample collection at an estimated $2,550
    ii. Consultant equipment and supplies at an estimated $600
    iii. Data evaluation and project management for reporting at an estimated $3,500
    iv. Drilling and operations at an estimated $5,275
    v. Lab analysis of 36 samples for VOCs at an estimated $2,520
    vi. Project management associated with hazardous material at an estimated $7,500

f. Associated excavation oversight, excavation verification sampling, and reporting accounts for the following and totaling **$28,475:**
    i. Mobilization, oversight, and sample collection at an estimated $12,375.
    ii. Consultant Equipment and Supplies at an estimated $1,200.
    iii. Data Evaluation, project management, and report preparation at an estimated $4,500.
    iv. Sampling for VOCs, PNAs, PCBs, Michigan 10 metals at an estimated $9,800 (28 samples at $350/sample)
    v. Up to one sample for TCLP at an estimated $600.

g. Management and disposal of up to 30,000 gallons of contaminated groundwater and totaling **$49,260**
    i. On-site storage management at an estimated $7,500.
    ii. Disposal at an estimated $1.40 per gallon, totaling $41,760.

h. The installation of chemcially resistant gaskets for sub-grade utilities to minimize degradation and installation of a chemically resistant vapor barrier with passive venting to cover the entire lower floor level to include the sub-grade vertical wall along the adjoining dry cleaner property to prevent vertical migration along preferential vertical pathways (i.e. stairwells, elevators, utilities, etc.) following the proposed soil removal and installation of gaskets resistant to chemical breakdown by the identified contamination, for an estimated cost of **$172,500.**
    i. Installation of chemically resistant gaskets for sub-grade utilities at an estimated $10,000
    ii. Design, bid specification, and coordination at an estimated $5,000
    iii. Vapor barrier installation and initial testing at an estimated $125,000
    iv. Vapor installation oversight at an estimated $10,000
    v. Post installation testing at an estimated $7,500
    vi. Project management and reporting at an estimated $15,000

i. Costs associated with project management and brownfield financial management, for an estimated cost of **$3,000.**

j. Post-construction due care plan for an estimated cost of **$5,000.**

Under Section 7a of Part 201, the current owner has “due care” obligations to prevent unacceptable human exposures, prevent exacerbation, and take reasonable precautions against the reasonably foreseeable acts or omissions of a third party relative to existing contamination and the activities at the subject property. Contaminated soil and groundwater cannot be relocated or moved from one portion of the subject property to another without proper characterization, appropriate notices and/or the use of engineering controls (i.e., liners, surface cover, etc.), in accordance with Section 20c of Part 201, or offsite disposal at a licensed disposal facility in accordance with Parts 111 and/or 115, as applicable.

PM completed a Phase II ESA, which documented that the existing soils are contaminated (identified above Part 201 Residential and Nonresidential Drinking Water Protection (DWP), Groundwater Surface Water Interface Protection (GSIP), and/or the Residential Direct Contact (DC) cleanup criteria).

Excavation of hazardous material

Typical excavation would not be considered an eligible brownfield activity since the activity is required regardless of the environmental impact at the property. However, a portion of contaminated soils (approximately 6,705 of the identified 20,095 tons) proposed for excavation and located along the northern property boundary are anticipated to require special considerations as a listed hazardous waste. This includes additional costs associated with personal protective equipment (PPE), labor, handling, and equipment (including roll off box rental and liners). Only the cost difference associated is included in the Brownfield Plan.

Transport and disposal of contaminated soils

Based on existing soil conditions, topography, and the preliminary grading plan, approximately 20,095 tons of soils require transportation and disposal. Should this development have occurred, the same amount of clean soil removal would have been required. Therefore, this Brownfield

Plan accounts only for the added expense of proper transport and disposal of contaminated soils at a Type II Landfill. In comparison, should the soils anticipated for removal have been clean (as assumed if found on a greenfield site), the cost to the developer would be zero sum (i.e. the coordination of disposal costs negated by the successful reuse at another site). A portion of contaminated soils (approximately 6,705 of the identified 20,095 tons), located along the northern property boundary are anticipated to require disposal as a listed hazardous waste.

Excavation Equipment Decon and Decon Wastewater Handling

It will be required that all excavation equipment is decontaminated because site soils are contaminated. Costs included within this estimate account for mud mat and truck waste removal from excavation equipment which is necessary to prevent migration of contamination off-site.

Additional delineation and sampling of Tetrachloroethylene soils

Additional delineation activities are to be completed to fully define the extent of the hazardous waste concentrations to allow compliant handling and disposal and to avoid over excavation of soils at the increased hazardous waste disposal rate.

Associated excavation oversight, verification sampling, and reporting

Assessment, oversight, sampling, and reporting is also included to document and verify site conditions following soil removal activities and provide guidance for the removal of soil identified as listed hazardous waste.

Transport and disposal of contaminated groundwater

Development activities require the excavation of/handling of groundwater present within excavated areas of the subject property; therefore, the developer is required to properly to handle and dispose of contaminated media encountered/generated in association with the proposed redevelopment. This is necessary to ensure successful completion of project.

The incremental difference between clean versus dirty pumping and digging cannot be substantiated. Therefore, the requested expenses are only associated with additional costs required for the on-site storage management and disposal of contaminated groundwater.

Installation of a vapor barrier and gaskets resistant to chemical breakdown

This brownfield plan includes the installation of a chemically resistant vapor barrier with passive venting prior to occupancy. The installation of a vapor barrier will occur to control migration via potential preferential vertical migration pathways including stairwells and elevator pits covering an estimated 20,000 square feet of floor space and 1,500 square feet of the northwestern wall following the proposed soil removal. This also includes the installation of gaskets resistant to chemical breakdown by the identified contamination. PCE contaminated soils are being removed; however, PCE concentrations will not be completely remediated by the removal activities.

Brownfield project and financial management

Costs associated with brownfield project and financial management of this project are included. Activities consist of coordination of proper and compliant financial tracking and reporting, as required in relation to due care, additional response, and brownfield related activities being submitted for reimbursement.

Post-construction due care plan

Preparation of a post-construction due care plan is also included, which will document and verify site conditions and owner obligations following redevelopment activities.

3. Preparation of Brownfield Plan and 381 Work Plan and associated activities (e.g. meetings with BBRA, etc.) at a cost of approximately $9,000.

Should the use of school taxes not be approved, reimbursement of the eligible expense shall be made utilizing tax increment revenues from local tax capture, if, and as available during the duration of this Brownfield Plan.

All activities are intended to be "Eligible Activities" under the Brownfield Redevelopment Financing Act. The total estimated cost of Eligible Activities subject to reimbursement from tax increment revenues is approximately $2,153,670. This plan as includes a 15% contingency of $319,577 and interest ($508,364).

Per the request made at the September 27, 2016, BBRA meeting, the total requested amount has been reduced by $325,000. Therefore, the total no-to-exceed amount under this request is $2,656,610.

B. Estimate of Captured Taxable Value and Tax Increment Revenues

Incremental taxes on real property included in the redevelopment project will be captured under this Brownfield Plan to reimburse eligible activity expenses. Tax increment revenue capture is estimated to begin in 2018. The taxable value of the real property for base year 2016 is $322,450; no personal property is associated with the site. The estimated taxable value of the completed development is $5,000,000. This assumes a one-year phase-in for completion of the redevelopment, which has been incorporated into the tax increment financing assumptions for this plan. An annual increase in taxable value of 1% has been used for calculation of future tax increments in this plan.

C. Estimated Impact of Tax Increment Financing on Revenues of Taxing Jurisdictions

The following estimates assume the limit of a 10-year reimbursement period.

Taxes will continue to be generated to taxing jurisdictions on local captured millages at the base taxable value of $322,450 throughout the duration of this plan totaling approximately $77,390 or $7,739 annually.

Non-capturable millages; including debt millages, the zoo authority and art institute, will see an immediate increase in tax revenue following redevelopment and will provide anticipated new tax revenue of $254,342 throughout the duration of this plan.

For a complete breakdown of the captured millages and developer reimbursement please see "Table 2" in Appendix E.

D. Method of Financing and Description of Advances by the Municipality

Redevelopment activities at the property will be funded by FLS Properties #5 LLC. Costs for eligible activities funded by FLS Properties #5 LLC will be repaid with incremental taxes generated by future development of the property and administered through the BBRA. No advances will be made by the BBRA for this project. All reimbursements authorized under this Brownfield Plan shall be governed by the Reimbursement Agreement.

E. Maximum Amount of Note or Bonded Indebtedness

No note or bonded indebtedness will be incurred by any local unit of government for this project.

F. Duration of Brownfield Plan

In no event shall the duration of the Plan exceed 35 years following the date of the resolution approving the Plan, nor shall the duration of the tax capture exceed the lesser of the period authorized under subsection (4) and (5) of Section 13 of Act 381 or 30 years. Further, in no event shall the beginning date of the capture of tax increment revenues be later than five years after the date of the resolution approving the Plan.

Under approval granted by the BBRA, a reimbursement period limitation of 10 years has been imposed.

G. Effective Date of Inclusion in Brownfield Plan

The Property will become part of this Plan on the date this Plan is approved by the City of Birmingham City Commission.

H. Displacement/Relocation of Individuals on Eligible Property

There will be no displacement or relocation of persons or businesses under this Plan.

I. Local Site Remediation Revolving Fund ("LSRRF")

The BBRA has not established a Local Site Remediation Revolving Fund (LSRRF), therefore, use of a Local Site Remediation Revolving Fund is not part of the scope of this project.

J. Other Material that the Authority or Governing Body Considers Pertinent

The Developer and its affiliates shall comply with all applicable laws, ordinances, executive orders, or other regulations imposed by the City or any other properly constituted governmental authority with respect to the Property and shall use the Property in accordance with this Plan.

Appendix A

PM ENVIRONMENTAL Environmental & Engineering Services

LEGAL DESCRIPTION

T2N, R10E, SEC 25 ASSESSOR'S PLAT NO 29 LOTS 3 & 4, ALSO PART OF NW 1/4 BEG AT PT DIST S 88-16-00 E 10.15 FT FROM NW COR OF SD LOT 3, TH S 88-16-00 E 124.70 FT, TH N 49-21-00 W 46.41 FT, TH S 73-32-00 W 93.28 FT TO BEG

Appendix B

PM ENVIRONMENTAL Environmental & Engineering Services

PM ENVIRONMENTAL
Risk Well Managed

Detroit
4080 W. 11 Mile Road
Berkley, MI 48072
f: 877.884.6775
t: 248.336.9988

Lansing
3340 Ranger Road
Lansing, MI 48906
f: 877.884.6775
t: 517.321.3331

Grand Rapids
560 5th Street NW,
Suite 301
Grand Rapids, MI 49504
f: 877.884.6775
t: 616.285.8857

September 4, 2015

District Supervisor
Michigan Department of Environmental Quality
Southeastern Michigan District Office
27700 Donald Court
Warren, Michigan 48092

RE: Baseline Environmental Assessment for the Vacant Land located at 856 North Old Woodward Avenue, Birmingham, Michigan
Parcel ID: 08-19-25-328-001
PM Environmental, Inc. Project No. 01-5889-0-001

Dear District Supervisor:

Enclosed is a copy of the Baseline Environmental Assessment prepared for the above referenced subject property in accordance with Section 20126(1)(c) of Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act (NREPA), P.A. 451 of 1994 (Part 201), as amended.

If you have any questions regarding the information in this report, please contact us at 248-336-9988.

Sincerely,
PM ENVIRONMENTAL, INC.

Nicole Kane
Staff Scientist

Jennifer Ritchie, CPG
Regional Site Investigation Manager

Enclosure

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September 4, 2015

Mr. Frank R. Simon
FLS Properties #5, LLC
P.O. Box 689
Bloomfield Hills, Michigan 48303

RE: Baseline Environmental Assessment for the Vacant Land located at 856 North Old Woodward Avenue, Birmingham, Michigan
Parcel ID: 08-19-25-328-001
PM Environmental, Inc. Project No. 01-5889-0-001

Mr. Simon:

Enclosed is a copy of the above-referenced document prepared in accordance with Section 20126(1)(c) of Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act (NREPA), P.A. 451 of 1994 (Part 201), as amended.

THIS BASELINE ENVIRONMENTAL ASSESSMENT WAS PERFORMED FOR THE EXCLUSIVE USE OF FLS PROPERTIES #5, LLC, WHO MAY RELY ON THE REPORT'S CONTENTS.

If you have any questions regarding the information in this report, please contact our office at 248-336-9988.

Sincerely,
PM ENVIRONMENTAL, INC.

Nicole Kane
Staff Scientist

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1.0 INTRODUCTION AND DISCUSSION

PM Environmental, Inc. (PM) completed a Baseline Environmental Assessment (BEA) for the vacant land (Parcel ID: 08-19-25-328-001) located at 856 North Old Woodward Avenue, Birmingham, Oakland County, Michigan 48009 (hereafter referred to as the subject property). The subject property consists of one 0.57 acre parcel and is located east of North Old Woodward, west of the Rouge River and Woodward Avenue, and south of Oak Avenue (Figure 1). The subject property consists of vacant land with asphalt paved parking in the northeastern portion, remnants of a building foundation in the northern portion, and grass in the remaining portions (Figure 2). The property has a down-gradient slope from North Old Woodward Avenue east to where it adjoins the Rouge River, which is an elevation difference of approximately 15 feet.

Standard and other historical sources documented that the subject property was developed in at least 1937 with a gasoline dispensing station and one other structure, likely a residential dwelling, in the northern and eastern portions of the subject property. In 1940, the gasoline dispensing station was converted to a gift shop. By 1946, a residential dwelling was reportedly converted into a tea room and restaurant in the western portion of the subject property. The gift shop appears to have been demolished by 1949. The tea room and restaurant operated until 1988, when the commercial building was demolished.

1.1 Owner/Operator Information

FLS Properties #5, LLC, P.O. Box 689, Bloomfield Hills, Michigan 48303 purchased the property July 28, 2015.

1.2 Intended Use of the Subject Property

FLS Properties #5, LLC intends to redevelop the property for mixed commercial and residential use with no significant chemical use and storage greater than household quantities. The proposed building will consist of open underground parking, first floor parking with limited commercial space, and second, third, and fourth floor residential apartments. The intended use is consistent with a residential and nonresidential property use in accordance with Part 201.

Municipal water and sewer, as well as natural gas, and electrical utilities are available to the subject property. No water supply wells exist or will be installed in association with the subject property.

1.3 Summary of All Appropriate Inquiry Phase I Environmental Assessment

ASTI Environmental (ASTI) performed a Phase I Environmental Site Assessment (ESA) for the subject property dated April 10, 2015, in conformance with the scope and limitations of ASTM Practice E 1527-13 (i.e., the 'ASTM Standard'). A copy of the April 2015 Phase I ESA, including photographs of the subject property, is included in Appendix A.

The following onsite recognized environmental conditions (RECs) were identified in ASTI's April 2015, Phase I ESA:

- Review of historical records document that the subject property was occupied by a gasoline dispensing station from at least 1937 to 1940. No records are available documenting the presence or removal of former underground storage tanks (USTs). No documentation of site assessment activities were available for review documenting

assessment of the former fueling and UST areas. Based on this information, the potential exists for orphan USTs to be present and/or for releases to have occurred from the UST systems and/or former fueling operations.

- Review of historical records document a permit was issued for the use of a 220-gallon fuel oil tank in May 1947 in association with the former commercial building in the western portion of the subject property. An investigation as to the presence of a buried fuel oil tank has not been conducted. The potential exists that the former commercial building was heated with fuel oil stored within an aboveground storage tank (AST) or UST. The potential exists for an orphan UST to be present on the subject property and/or for a release of fuel oil to have occurred.

- The subject property is an Inventory site and a BEA site as a result of previous site assessment activities completed between 2002 and 2006 that document soil and groundwater contamination onsite above the current Michigan Department of Environmental Quality (MDEQ) Part 201 Residential and Nonresidential cleanup criteria. Based on these analytical results, the subject property meets the definition of a "facility," in accordance with Part 201 of P.A. 451 of the Michigan Natural Resources Environmental Protection Act (NREPA), as amended.

- Fill material was identified on the subject property ranging in depths between 5.0 feet below ground surface (bgs) to 24.0 feet bgs, containing construction-like rubble increasing in quantity toward the northern portion of the subject property. Based on this information, the potential exists for landfilling to have also occurred on the subject property and for contamination to be present from buried materials and/or leachate generated as a result of the percolation of water through waste. Additionally, landfill gas (i.e. methane) could be present due to decomposition of the waste.

The following adjoining and/or nearby RECs were identified:

- The northeast adjoining property, 35975 Woodward Avenue, was occupied by a gasoline dispensing station from at least 1960 to the early 2000s and is an open Leaking Underground Storage Tank (LUST) site. Previous site assessment activities completed in 2005 and 2006 document soil and groundwater contamination remains onsite above the current MDEQ Part 213 RBSLs. Additionally, at least four monitoring wells were installed on the subject property in association with the adjoining open LUST site. The monitoring wells were sampled in 2004 and groundwater contamination above the current MDEQ Part 213 RBSLs was documented to have migrated onto the subject property from the northeast adjoining property.

- The north adjoining property, 900 North Old Woodward Avenue, has been occupied by a dry cleaner since at least 1970. Dry cleaning operations commonly involve the usage of general hazardous substances and/or petroleum products, which, if improperly managed and/or disposed of, can be a source of contamination. The potential exists that a release has occurred on this property and migrated onto the subject property.

- The west adjoining property, 887 North Old Woodward Avenue, was occupied by a gasoline service station from at least 1930 to the early 1950s. No documentation of site assessment activities were available for review documenting assessment of the former fueling, UST, and automotive service areas. Based on this information and the close

proximity of the west adjoining property to the subject property, the potential exists that contamination has migrated onto the property.

1.3.1 Phase I ESA Exceptions or Deletions

There were no exceptions or deletions from the Federal All Appropriate Inquiry Rule under 40 CFR 312, or the ASTM Standard during the completion of the ASTI's April 2015 Phase I ESA. No special terms or conditions applied to the preparation of the Phase I ESA.

1.3.2 Phase I ESA Data Gaps

ASTI did not identify any significant data gaps during the completion of the April 2015 Phase I ESA.

1.4 Summary of Previous Site Investigations

PM reviewed the following previous environmental reports for the subject property which are included within ASTI's April 2015 Phase I ESA, which is included within Appendix A. Tables and figures from the previous subsurface investigations are included within Appendix B.

Name of Report	Date of Report	Company that Prepared Report
Phase I ESA	October 23, 2006	Soils and Materials Engineers, Inc. (SME)
BEA	November 6, 2006	SME

Phase I ESA, October 2006, SME – SME completed a Phase I ESA dated October 23, 2006. At the time of SME's Phase I ESA, the subject property was vacant land. SME identified RECs in association with the 1) debris and fill material located on the subject property; 2) the fuel oil tank identified in historical records; 3) volatile organic compounds (VOCs) and lead detected in soil and groundwater samples collected from the subject property above the Part 201 Residential and Nonresidential cleanup criteria; and, 4) the north adjoining dry cleaner.

BEA, November 2006, SME – SME completed a BEA dated November 6, 2006. The BEA summarizes subsurface investigation activities completed by SME on September 26, 2006 to assess the RECs identified in the September 2006 Phase I ESA, a Geotechnical Investigation report dated October 20, 2006 completed as part of a proposed future development at the time, and two previous subsurface investigations completed in 2002 and 2005.

On September 26, 2006 SME completed a scope of work that consisted of the advancement of seven soil borings (SP1 through SP7), the installation of four temporary monitoring wells (SP1, SP2, SP4, and SP7), and the collection of six soil samples and three groundwater samples for laboratory analysis of VOCs, polynuclear aromatic compounds (PNAs), and metals (cadmium, chromium, and lead) to assess the RECs identified in the September 2006 Phase I ESA. Concentrations of benzene, tetrachloroethene, and xylenes were detected in the soil sample collected at SP6 (7.0-8.0 feet bgs) above the Part 201 Residential and Nonresidential Drinking Water Protection (DWP) and Groundwater Surface Water Interface Protection (GSIP) cleanup criteria. Concentrations of benzene, lead, and MTBE were detected in the groundwater samples collected at SP2 and SP7 above the Part 201 Residential and Nonresidential Drinking Water (DW) and Groundwater Surface Water Interface (GSI) cleanup criteria. No other concentrations of

VOCs, PNAs, and metals were detected in the soil and groundwater samples collected from the subject property above the laboratory method detection limits (MDLs) and/or the most restrictive Part 201 Residential cleanup criteria.

SME completed a Geotechnical Investigation dated October 20, 2006, in which on September 21 and 22, 2006 SME completed a scope of work consisting of the advancement of six soil borings (B1 through B6) as part of a proposed future development. The soil stratigraphy at the subject property was identified as consisting of sand/clay fill containing concrete, brick, asphalt, and cinder fragment with trace amount of organics to 26.0 feet bgs in the northeastern portion of the subject property, 10.0 feet bgs in the southeastern portion of the subject property, 3.5 feet bgs in the northwestern and southwestern portions of the subject property, and 11.0 feet bgs in the central portion of the subject property. The fill material was identified as being underlain by native interbedded clay and sand to a depth of 74.0 feet bgs, the maximum depth explored. Perched and discontinuous groundwater was encountered at various depths between 9.0 and 29.5 feet bgs within the fill material and the native sand seams. SME recommended a partial undercut of the existing fill within the below-grade parking and other pavement areas, installing soldier piles and lagging to protect adjacent structures during construction, not using the existing fill material as engineered fill, completing moisture conditioning for suitable compaction of the native clay, drilling piers to support the proposed building, and using standard sump and pit methods or crushed aggregate to prevent disturbance from groundwater accumulation.

A subsurface investigation was reportedly completed on the subject property in 2002, in which the scope of work consisted of the advancement of six soil borings and the installation of four monitoring wells. Concentrations of benzene, ethylbenzene, methyl-tert-butyl ether (MTBE), naphthalene, and lead were detected in the samples collected from the subject property above the Part 213 Risk-Based Screening Levels (RBSLs) in the northern portion of the subject property; however, these analytical results were not available for review. The concentrations reportedly migrated onto the subject property from the northeast adjoining gasoline dispensing station and open Leaking Underground Storage Tank (LUST) site identified as 35975 Woodward Avenue.

Delta Environmental Consultants, Inc. (Delta) installed five monitoring wells (TW-1, TM3, TW-4, OW-10, and OW-11) on the subject property in 1996 as part of LUST investigation activities for the northeast adjoining open LUST site. Subsequent to installation a series of groundwater monitoring events were completed on the subject property between 1996 and 2006. The most recent documented events available for review occurred in October 2005, February 2006, and April 2006 and were completed by PM. Groundwater samples were collected from TW-1, TW-4, and OW-11 and submitted for laboratory analysis of VOCs and lead, or some combination thereof. TW-3 and OW-10 did not produce groundwater sufficient for groundwater collection. Concentrations of benzene, MTBE, vinyl chloride, and lead were detected in the groundwater samples collected at TW-1 and TW-4 above the Part 213 Residential and Nonresidential DW and/or GSI RBSLs. No concentrations of other VOCs were detected in the groundwater samples collected at TW-1 and TW-4 above the laboratory MDLs or the most restrictive Part 213 Residential RBSLs. No concentrations of VOCs were detected in the groundwater sample collected at OW-11 above the laboratory MDLs. Groundwater flow was calculated to flow southeast towards the Rouge River. PM was unable to locate the permanent monitoring wells during the August 2015 subsurface investigation, discussed below and in Section 1.5.

1.5 Current Site Investigation

Prior to the commencement of field activities, MISSDIG, a utility locating service, was contacted to locate utilities on or adjacent to the subject property. Utilities were marked by the respective utility companies where they entered or were located adjacent to the subject property. In addition, PM cleared all soil boring locations of private utilities with ground penetrating radar (GPR).

1.5.1 Geophysical Survey Investigation

On August 11, 2015 PM completed a geophysical survey utilizing GPR at the subject property (Figure 2) to investigate the presence of potential orphan USTs. The Geophysical Survey Investigation Report is included as Appendix C.

No anomalies consistent with orphan USTs were identified. A suspect fill port pipe was visually identified during PM's GPR survey in the central portion of the subject property and the pipe was traced using a PL 2000 cable locator. PM advanced a shallow hand auger to 5.0 feet bgs in the area where the pipe terminated, and no anomalies where encountered.

Based upon the results of PM's GPR survey, orphan USTs are not believed to be present at the subject property. However, the potential exists that USTs could be present and not identified by the GPR survey if the location was directly below a limitation as indicated within the GPR report, located outside of the survey area, and/or deeper than the 3.5 feet bgs physical limits of the GPR survey. If orphan USTs are identified during redevelopment activities, the UST will be properly removed in accordance with state guidelines.

1.5.2 Subsurface Investigation

On August 13, 2015 PM completed a scope of work consisting of the advancement of six soil borings (SB-1 through SB-6), the installation of two temporary monitoring wells (TMW-1 and TMW-2), the installation of six soil gas sampling points (SG-1 through SG-6), and the collection of seven soil samples, two groundwater samples, and six soil gas samples for laboratory analysis of VOCs, PNAs, polychlorinated biphenyls (PCBs), and Michigan Ten Metals (arsenic, barium, cadmium, chromium, copper, lead, mercury, selenium, silver, and zinc), and methane, or some combination thereof, to assess the RECs identified in ASTI's April 2015 Phase I ESA.

Figures 3, 4, and 5 depict the location of the soil borings/temporary monitoring wells/soil gas sampling points installed at the subject property by PM along with a summary of the analytical results.

The soil boring logs, which depicts site-specific geology, PID readings, and soil, groundwater, and soil gas sample intervals are included within Appendix D.

The table below summarizes the Phase II ESA activities conducted by PM, including location, sample depth, analysis, objective, and sample selection justification.

Description of Soil Boring/Temporary Monitoring Well/Soil Gas Locations

Location and Total Depth (feet bgs)	Sample/ Screen Depth [DTW] (feet bgs)	Analysis	Objectives	Sample Selection (Justification)
SB/TMW/ SG-1 (20.0)	**Soil** 5.5-6.5	VOCs, PNAs, PCBs, and Michigan Ten Metals	Assess fill material and former fuel oil tank	**Soil:** A sample was collected above crushed stone debris and saturated soil. **GW:** Sampled. **Soil Gas:** Sampled.
	GW 5.00-10.00 [6.57]	VOCs, PNAs, and Michigan Ten Metals		
	Soil Gas 5.5	Methane	Assess a potential vapor intrusion condition	
SB/TMW/ SG-2 (20.0)	**Soil** 6.0-7.0	VOCs, PNAs, PCBs, and Michigan Ten Metals	Assess fill material and former gasoline dispensing operations	**Soil:** A sample was collected at the shallow sand/clay interface below concrete debris. **GW:** Sampled. **Soil Gas:** Sampled.
	GW 10.00-15.00 [12.57]	VOCs, PNAs, and Michigan Ten Metals		
	Soil Gas 4.5	VOCs	Assess a potential vapor intrusion condition	
SB/SG-3 (20.0)	**Soil** 19.0-20.0	VOCs, PNAs, PCBs, and Michigan Ten Metals	Assess fill material and potential migration of contamination from west adjoining former gasoline service station	**Soil:** Based on the absence of field evidence of impact, a sample was collected at the end of the boring. **GW:** Not encountered. **Soil Gas:** Sampled.
	Soil Gas 3.5	VOCs and Methane	Assess a potential vapor intrusion condition	
SB/SG-4 (20.0)	**Soil** 7.5-8.5 and 13.0-14.0	VOCs, PNAs, PCBs, and Michigan Ten Metals	Assess fill material, former gasoline dispensing operations, and migration of contamination from north adjoining dry cleaner	**Soil:** Samples were collected at the shallow and deeper sand/clay interfaces below concrete debris. **GW:** Not encountered. **Soil Gas:** Sampled.
	Soil Gas 7.5	VOCs and Methane	Assess a potential vapor intrusion condition	
SB/SG-5 (16.0)	**Soil** 15.0-16.0	VOCs, PNAs, PCBs, and Michigan Ten Metals	Assess fill material and migration of contamination from northeast adjoining open LUST site	**Soil:** A deep sample was collected within stained soil below concrete debris. **GW:** Not encountered. **Soil Gas:** Sampled.
	Soil Gas 3.5	VOCs and Methane	Assess a potential vapor intrusion condition	

Location and Total Depth (feet bgs)	Sample/ Screen Depth [DTW] (feet bgs)	Analysis	Objectives	Sample Selection (Justification)
SB/SG-6 (20.0)	**Soil** 4.0-5.0	VOCs, PNAs, PCBs, and Michigan Ten Metals	Assess fill material and migration of contamination from northeast adjoining open LUST site	**Soil:** A sample was collected at concrete debris. **GW:** Not encountered. **Soil Gas:** Sampled.
	Soil Gas 5.5	Methane	Assess a potential vapor intrusion condition	

bgs – below ground surface; DTW – depth to water; GW – Groundwater

1.5.3 Investigation Techniques and Quality Control/Quality Assurance (QA/QC)

The soil borings were advanced to the desired depth using a model 6712-DT Geoprobe® drill rig. Soil sampling was performed for soil classification, verification of subsurface geologic conditions, and for investigating the potential and/or extent of soil and groundwater contamination at the subject property. Soil samples were generally collected on a continuous basis using a 5-foot long macro-core sampler.

During drilling operations, the drilling equipment was cleaned to minimize the possibility of cross contamination. These procedures included cleaning equipment with a phosphate free solution (i.e., Alkanox®) and rinsing with distilled water after each sample collection. Drilling and sampling equipment was also cleaned in this manner prior to initiating field activities. Soil collected from 1-foot sample intervals was screened using a photoionization detector (PID) to determine if VOCs were present. Soil from specific depths was placed in plastic bags and allowed to volatilize. The headspace within each bag was then monitored with the PID. The PID is able to detect trace levels of organic compounds in the air space within the plastic bag. Soil samples for VOC analysis were preserved with methanol, in accordance with U.S. Environmental Protection Agency (EPA) method 5035.

Temporary monitoring wells were installed at two of the six soil boring locations (TMW-1 and TMW-2) for groundwater sample collection. At each location, a new well assembly, consisting of a 5-foot 0.010-inch slot, schedule 40, poly-vinyl chloride (PVC) screen and PVC casing was lowered into the borehole to intersect the water table. After the screen for the well was set to the desired depth, an artificial sand pack or natural sands were allowed to collapse around the well screen. The groundwater samples were collected with care taken to avoid the potential for cross contamination between the samples and to prevent loss of volatiles to the atmosphere. The groundwater samples for laboratory analyses were transferred directly from the low-flow pump discharge line into appropriately labeled sample containers with Teflon lined lids. Purge water was maintained separate and returned to the wells.

The soil and groundwater samples were placed in appropriately labeled containers with Teflon® lined lids and/or sanitized glass jars and then placed in an ice-packed cooler and transported under chain of custody procedures for laboratory analysis within applicable holding times.

The soil gas sampling was completed in general accordance with the guidelines established in the May 2013 MDEQ Guidance Document for the Vapor Intrusion Pathway.

Sampling of soil gas points consisted of using of a polyethylene implant approximately two inches in length and affixed to appropriate length tubing for sample collection. Upon completion of the bore hole, a sampling interval is established by filling the hole with bentonite to the desired lower depth, as needed, inserting the sample implant and tubing, creating a sand pack of no more than one foot with the sampling implant in the center, and filling the remainder of the bore hole with bentonite.

Prior to the collection of each soil gas sample, the sampling apparatus was determined to be leak free utilizing an isolation chamber that encompassed tubing and associated connections as well as the sampling point. The chamber was charged with helium prior to purging the sampling point of a maximum of three volumes. A helium detector was then applied to the sampling line to ensure no leaks had occurred. The sample was collected using vacuum canister methods, for laboratory analysis of VOCs. The vacuum canisters were regulated with a flow rate of 200 ml/minute, which was pre-set at the laboratory. Soil gas samples were transported under chain of custody procedures for laboratory analysis within applicable holding times.

Upon completion of the investigation, the temporary monitoring well/soil gas sampling point material was removed and the soil borings were abandoned by placing the soil cuttings back into the borehole, filling the void with bentonite chips, hydrating the chips, resurfacing and returning the area to its pre-drilling condition.

1.6 Geology and Hydrogeology

Based on review of PM's August 2015 soil boring logs, the soil stratigraphy at the subject property generally consists of sand and/or clay fill to depth ranging between 8.0 feet bgs and 18.0 feet bgs, underlain by native sand and clay lenses to a depth of at least 20.0 feet bgs, the maximum depth explored. Fill material was encountered at a depth of approximately 8.0 feet bgs at SB-1 and SB-4, 6.5 feet bgs at SB-2, 16.0 feet bgs at SB-5, and 18.0 feet bgs at SB-6. In general, the fill material increases in quantity and depth towards the northeastern portion of the subject property. Discontinuous and perched groundwater was encountered at SB-1 at a depth of approximately 7.0 feet bgs and at SB-2 at a depth of approximately 14.0 feet bgs. No groundwater was encountered in the remaining four soil borings advanced by PM. Additionally, the eastern portion of the subject property is located within a floodway area that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights. The base flood elevation is approximately 740 feet per the FEMA Flood Insurance Study (FIS). This geology is consistent with the geology encountered in previous subsurface investigations discussed in Section 1.4 above.

The soil boring logs are included in Appendix D, which consist of site specific geology, sample depths, and temporary monitoring well details.

2.0 LOCATION OF CONTAMINATED MEDIA ON THE SUBJECT PROPERTY

PM compared the soil and groundwater analytical results collected during PM's August 2015 site investigation with the MDEQ cleanup criteria as presented in Part 201 Rules 299.1 through 299.50, dated December 30, 2013 entitled "Cleanup Criteria Requirements for Response Activity", in accordance with Section 20120a(1) using the Residential and Nonresidential cleanup criteria. PM compared the soil gas analytical results collected during PM's August 2015 site investigation

with the MDEQ Residential and Nonresidential Vapor Intrusion Screening Levels (VISLs) as presented in the Guidance Document for the Vapor Intrusion Pathway, dated May 2013.

The analytical results from the site investigation activities completed by PM are summarized in Tables 1 through 4 (including CAS#) and on Figures 3 through 5. Appendix E contains the laboratory analytical report.

Summary of Soil/Groundwater/Soil Gas Exceedances

Location and Total Depth (feet bgs)	Sample/ Screen Depth [DTW] (feet bgs)	Analysis	Objectives	MDEQ Part 201 Generic Cleanup Criteria and/or VISLs Exceedances
SB/TMW/ SG-1 (20.0)	**Soil** 5.5-6.5	VOCs, PNAs, PCBs, and Michigan Ten Metals	Assess fill material and former fuel oil tank	**Arsenic: DWP, GSIP, (R) DC**
	GW 5.00-10.00 [6.57]	VOCs, PNAs, and Michigan Ten Metals		**Silver: GSI**
	Soil Gas 5.5	Methane	Assess a potential vapor intrusion condition	NONE
SB/TMW/ SG-2 (20.0)	**Soil** 6.0-7.0	VOCs, PNAs, PCBs, and Michigan Ten Metals	Assess fill material and former gasoline dispensing operations	**Arsenic: DWP, GSIP, (R) DC** **Selenium: GSIP**
	GW 10.00-15.00 [12.57]	VOCs, PNAs, and Michigan Ten Metals		**Silver: GSI**
	Soil Gas 4.5	VOCs	Assess a potential vapor intrusion condition	NONE
SB/SG-3 (20.0)	**Soil:** 19.0-20.0	VOCs, PNAs, PCBs, and Michigan Ten Metals	Assess fill material and potential migration of contamination from west adjoining former gasoline service station	**Arsenic: DWP, GSIP, (R) DC** **Chromium: GSIP**
	Soil Gas 3.5	VOCs and Methane	Assess a potential vapor intrusion condition	NONE
SB/SG-4 (20.0)	**Soil:** 7.5-8.5	VOCs, PNAs, PCBs, and Michigan Ten Metals	Assess fill material, former gasoline dispensing operations, and migration of contamination from north adjoining dry cleaner	**Tetrachloroethene: DWP, GSIP** **Arsenic: DWP, GSIP, (R) DC** **Selenium: GSIP**
	Soil: 13.0-14.0			**Tetrachloroethene: DWP** **Arsenic: DWP, GSIP, (R) DC** **Chromium: GSIP**
	Soil Gas 7.5	VOCs and Methane	Assess a potential vapor intrusion condition	NONE

Location and Total Depth (feet bgs)	Sample/ Screen Depth [DTW] (feet bgs)	Analysis	Objectives	MDEQ Part 201 Generic Cleanup Criteria and/or VISLs Exceedances
SB/SG-5 (16.0)	**Soil:** 15.0-16.0	VOCs, PNAs, PCBs, and Michigan Ten Metals	Assess fill material and migration of contamination from northeast adjoining open LUST site	**Arsenic: DWP, GSIP, (R) DC Selenium: GSIP**
	Soil Gas 3.5	VOCs and Methane	Assess a potential vapor intrusion condition	**Tetrachloroethene: (R) VISLs**
SB/SG-6 (20.0)	**Soil:** 4.0-5.0	VOCs, PNAs, PCBs, and Michigan Ten Metals	Assess fill material and migration of contamination from northeast adjoining open LUST site	**Arsenic: DWP, GSIP, (R) DC Chromium and Mercury: GSIP**
	Soil Gas 5.5	Methane	Assess a potential vapor intrusion condition	NONE

bgs – below ground surface; DTW – depth to water; (R) – Residential; DC – Direct Contact; GW – Groundwater; GSI – Groundwater Surface Water Interface; VISLs – Vapor Intrusion Screening Levels; GSIP – Groundwater Surface Water Interface Protection; (NR) - Nonresidential

2.1 Soil Analytical Results

The soil analytical results are summarized in Tables 1 and 2 and on Figure 3.

Concentrations of tetrachloroethylene were detected in the soil samples collected at SB-4 (7.5-8.5 feet bgs) and (13.0-14.0 feet bgs) above the Part 201 Residential and Nonresidential DWP and/or GSIP cleanup criteria. Concentrations of other various VOCs were detected in the soil samples collected at SB-4 (7.5-8.5 feet bgs), SB-5 (15.0-16.0 feet bgs), and SB-6 (4.0-5.0 feet bgs) above the laboratory method detection limits (MDLs), but below the most restrictive Part 201 Residential cleanup criteria. No concentrations of VOCs were detected in the remaining soil sample collected from the subject property above laboratory MDLs.

Concentrations of various PNAs were detected in the soil samples collected SB-5 (15.0-16.0 feet bgs) and SB-6 (4.0-5.0 feet bgs) above laboratory MDLs, but below the most restrictive Part 201 Residential cleanup criteria. No concentrations of PNAs were detected in the remaining soil samples collected above laboratory MDLs.

No concentrations of PCBs were detected in any of the selected soil samples collected from the subject property above the laboratory MDLs.

Concentrations of arsenic were detected in all of the soil samples collected from the subject property above the Part 201 Residential and Nonresidential DWP, GSIP and Residential DC cleanup criteria. Concentrations of chromium were detected in the soil samples collected at SB-3 (19.0-20.0 feet bgs), SB-4 (13.0-14.0 feet bgs), and SB-6 (4.0-5.0 feet bgs) above the Part 201 GSIP cleanup criteria. Concentrations of selenium were detected in the soil samples collected at SB-2 (6.0-7.0 feet bgs), SB-4 (7.5-8.5 feet bgs), and SB-5 (15.0-16.0 feet bgs) above the Part 201 GSIP cleanup criteria. A concentration of mercury was detected in the soil sample collected at SB-6 (4.0-5.0 feet bgs) above the Part 201 GSIP cleanup criteria. Concentrations of chromium and selenium were detected in the remaining soil samples collected from the subject property

above the laboratory MDLs, but below the Michigan Statewide Default Background Levels (SDBLs). No concentrations of barium, cadmium, copper, lead, mercury, silver, and zinc were detected in any of the soil samples collected from the subject property above the laboratory MDLs, the Michigan SDBLs, and/or the most restrictive Part 201 Residential cleanup criteria.

2.2 Groundwater Analytical Results

The groundwater analytical results are summarized in Table 3 and on Figure 4.

No concentrations of VOCs and PNAs were detected in any of the groundwater samples collected from the subject property above the laboratory MDLs.

Concentrations of silver were detected in both groundwater samples collected from the subject property above the Part 201 GSI cleanup criteria. No concentrations of arsenic, barium, cadmium, chromium, copper, lead, mercury, and zinc were detected in the groundwater samples collected from the subject property above the laboratory MDLs and/or the most restrictive Part 201 Residential cleanup criteria.

2.3 Soil Gas Analytical Results

The soil gas analytical results are summarized in Table 4 and on Figure 5.

A concentration of tetrachloroethylene was detected in the soil gas sample collected at SG-5 (3.5 feet bgs) above the Part 201 Residential VISLs, and not ten times below the Part 201 Nonresidential VISLs. A concentration of tetrachloroethylene was detected in the soil gas sample collected at SG-4 (7.5 feet bgs) below the Part 201 Residential and Nonresidential VISLs, but not at a concentration ten times below the Part 201 Residential VISLs. No concentrations of tetrachloroethylene were detected in the remaining soil gas samples collected from the subject property. Concentrations of m-dichlorobenzene and trichloroethylene were detected in the soil gas samples collected at SG-3 (3.5 feet bgs) and/or SG-5 (3.5 feet bgs) below the Part 201 Residential and Nonresidential VISLs, but not at concentrations ten times below the Part 201 Residential VISLs. Various concentrations of other VOCs were detected in the remaining soil gas samples collected from the subject property above the laboratory MDLs, but below the Part 201 Residential and Nonresidential VISLs and at concentrations ten times below the Residential VISLs.

No concentrations of methane were detected in the selected soil gas samples collected from the subject property above the laboratory MDLs.

Based on the planned redevelopment of the subject property for residential use, further investigation may be warranted of the soil gas concentrations detected at SG-3, SG-4, and SG-5 that are not below the Residential VISLs and/or ten times below the Residential VISLs. Further investigation would be contingent upon the future site plans and remediation activities.

2.4 Subject Property Facility Status

A location where a hazardous substance is present in excess of the concentrations, which satisfy the requirements of subsection 20120a(1)(a) or (17), is a facility pursuant to Part 201. Section 20120a(1)(a) requirements are the Cleanup Criteria for unrestricted residential usage.

Contaminant concentrations identified on the subject property in soil and groundwater indicate exceedances to the Part 201 Residential and Nonresidential DWP, GSI/GSIP and Residential DC cleanup criteria. Additionally, contaminant concentrations were identified in soil gas samples collected from the subject property above the Residential VISLs and/or not ten times below the Residential and/or Nonresidential VISLs. Therefore, the subject property is a facility under Part 201 of P.A. 451, as amended, and the rules promulgated thereunder.

3.0 PROPERTY INFORMATION

3.1 Legal Description of Subject Property

A copy of the legal description is included in Appendix F as part of the assessing information.

3.2 Map of Subject Property

Refer to Figure 1, Property Location Map; and Figure 2, Generalized Diagram of the Subject Property and Surrounding Area with GPR Survey Area which depicts the property/parcel boundaries.

3.3 Subject Location and Analytical Summary Maps

Figures 3, 4, and 5 provide scaled maps of the subject property with site structures and soil boring, temporary monitoring well, and soil gas sampling point locations with analytical results.

3.4 Subject Property Location Map

Figures 1 and 2 provide scaled area maps depicting the subject property location in relation to the surrounding area.

3.5 Subject Property Address

As indicated in Section 1.0, the subject property (Parcel ID: 08-19-25-328-001) is located at 856 North Old Woodward Avenue, Birmingham, Oakland County, Michigan 48009 (Figure 1).

3.6 Subject Spatial Data

As depicted on Figure 1, the subject property is located in township two North (T.2N), range 10 East (R.10E), section 25, northwest quarter, southeast quarter-quarter, Birmingham, Oakland County, Michigan.

According to the MDEQ Groundwater Mapping Project Website, the center of the subject property is located at latitude 42.5532 and a longitude of -83.2190.

4.0 FACILITY STATUS OF SUBJECT PROPERTY

As indicated in Section 2.1, based upon documented soil and groundwater exceedances to the Part 201 Residential and Nonresidential DWP, GSI/GSIP and Residential DC cleanup criteria. Additionally, contaminant concentrations were identified in soil gas samples collected from the subject property above the Residential VISLs and/or not ten times below the Residential and/or Nonresidential VISLs. Therefore, the subject property is a facility under Part 201 of P.A. 451, as amended, and the rules promulgated thereunder.

4.1 Summary Data Tables

The analytical results were compared with the MDEQ cleanup criteria and Screening Levels as presented in Part 201 Rules 299.1 through 299.50, dated August 30, 2014 entitled "Cleanup Criteria Requirements for Response Activity", in accordance with Section 20120a(1) using the Residential and Nonresidential cleanup criteria. PM compared the soil gas analytical results collected during PM's August 2015 site investigation with the MDEQ Residential and Nonresidential VISLs as presented in the Guidance Document for the Vapor Intrusion Pathway, dated May 2013.

The soil, groundwater, and soil gas analytical results as compared to current cleanup criteria are summarized in Tables 1 through 4. A summary of Part 201 cleanup criteria exceedances are included in Section 2.0.

4.2 Laboratory Reports and Chain of Custody Documentation

Soil, groundwater, and soil gas samples collected were submitted to Brighton Analytical, LLC in Brighton, Michigan for chemical analysis under chain of custody procedures and within applicable holding times. Refer to the laboratory analytical in Appendix E for the associated chain of custody documentation.

5.0 IDENTIFICATION OF BEA AUTHOR

This BEA was conducted on September 4, 2015, by Ms. Nicole Kane and reviewed by Ms. Jennifer Ritchie, CPG, Regional Manager of Site Investigation Services, PM Environmental, Inc., which is prior to or within 45 days of becoming the owner or operator. Qualification statements are provided as Appendix G.

I declare that, to the best of my professional knowledge and belief, I meet the definition of *Environmental Professional* as defined in §312.10 of 40 CFR 312 and I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed the all appropriate inquires in conformance with the standards and practices set forth in 40 CFR Part 312.

Jennifer L. Ritchie, CPG
Regional Site Investigation Manager

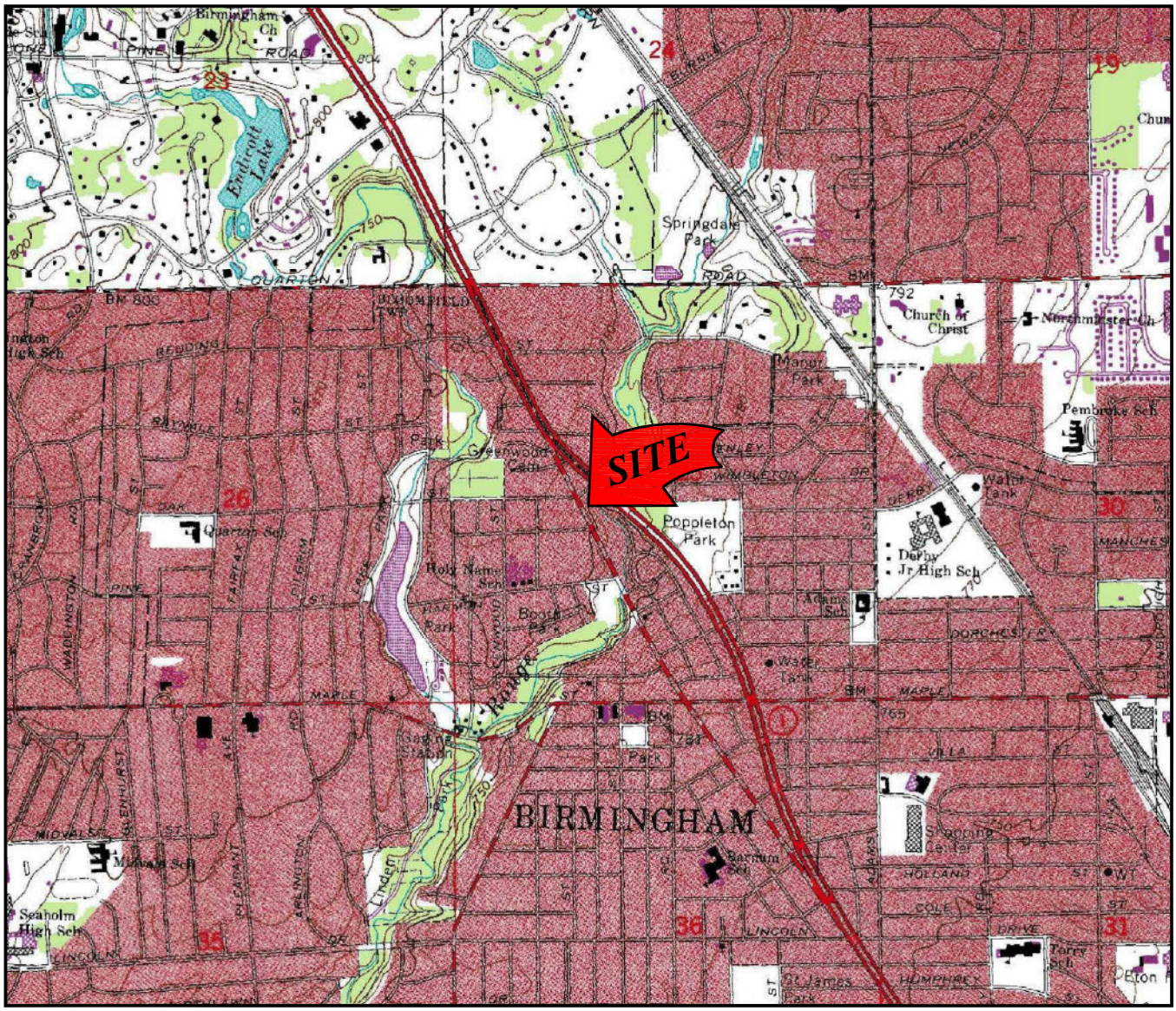
6.0 AAI REPORT OR ASTM PHASE I ESA

As indicated in Section 1.3, ASTI performed a Phase I ESA of the subject property dated April 10, 2015, in accordance with the United States Environmental Protection Agency (EPA) 40 CFR Part 312: Standards and Practices for All Appropriate Inquiries; Final Rule (AAI) and the scope an limitations of ASTM Practice E 1527-13 of the subject property (Parcel ID: 08-19-25-328-001) located at 856 North Old Woodward Avenue, Birmingham, Oakland County, Michigan 48009. The scope of the Phase I ESA included consideration of hazardous substances as defined in Section 20101(1)(y) of P.A 451 of 1994, as amended, and constituted the performance of an All Appropriate Inquiry in conformance with the standards and practices set forth in 40 CFR Part 312.

A copy of ASTI's April 10, 2015 Phase I ESA is included in Appendix A.

7.0 REFERENCES

- "Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels," Revised August 2014 and in accordance with Section 20120a(1);
- MDEQ Operational Memorandum No. 4 "Site Characterization and Remediation Verification – Attachment 10, Peer Review Draft Groundwater Not in an Aquifer," February 2007;
- MDEQ Operational Memorandum No. 2 "Sampling and Analysis," October 22, 2004, Revised July 5, 2007;
- MDEQ Guidance Document for the Vapor Intrusion Pathway, May 2014;
- Baseline Environmental Submittal Form (EQP 4025), February 2015;
- Phase I ESA, SME, October 23, 2006;
- BEA, SME, November 6, 2006; and,
- Phase I ESA, April 10, 2015, ASTI.



MICHIGAN QUADRANGLE LOCATION

OAKLAND COUNTY

SCALE 1:24,000

1 MILE 1/2 MILE 0 1 MILE

FIGURE 1

PROPERTY VICINITY MAP

USGS, 7.5 MINUTE SERIES

BIRMINGHAM, MI QUADRANGLE, 1968. PHOTO REVISED 1981.

PM ENVIRONMENTAL — Environmental & Engineering Services	PROJ: VACANT LAND 856 NORTH OLD WOODWARD AVENUE BIRMINGHAM, MI	THIS IS NOT A LEGAL SURVEY	DRN BY: ES	DATE: 8/13/2015
		VERIFY SCALE 0 2,000' IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.	CHKD BY: NK	SCALE: 1" = 2,000'
			FILE NAME: 01-5889-0-001F01R00	

36101 WOODWARD AVENUE
COMMERCIAL BUILDING
AND GAS STATION

35975 WOODWARD AVENUE
FORMER GAS STATION
(OPEN LUST SITE)

WOODWARD AVENUE

900 NORTH OLD
WOODWARD AVENUE
DOUGLAS CLEANERS

APPROXIMATE LOCATION OF
FORMER GASOLINE DISPENSING STATION

GPR LIMITATION:
STEEP HILL

ASPHALT
PAVED

ASPHALT
PAVED/
GRAVEL

GRASS

ELEC

D

NORTH OLD WOODWARD AVENUE

ROUGE RIVER

887 NORTH OLD
WOODWARD AVENUE
FORMER GAS STATION

700-800 NORTH OLD
WOODWARD AVENUE
MULTI-TENANT
COMMERCIAL BUILDING

MULTI-FAMILY
RESIDENTIAL

794 NORTH OLD
WOODWARD AVENUE
FORMER DRY CLEANER

N

LEGEND:

- SUBJECT PROPERTY
- FENCE
- ELECTRIC
- PROPOSED SITE FEATURES
- PARCEL / LOT BOUNDARIES
- POLE MOUNTED TRANSFORMER
- GPR SURVEY AREA

PM ENVIRONMENTAL | Environmental & Engineering Services

FIGURE 2

GENERALIZED DIAGRAM OF THE SUBJECT PROPERTY AND ADJOINING PROPERTIES WITH GPR SURVEY AREA

PROJ:
VACANT LAND
856 NORTH OLD WOODWARD AVENUE
BIRMINGHAM, MI

THIS IS NOT A LEGAL SURVEY	DRN BY: ES/KS/ES	DATE: 9/2/2015
VERIFY SCALE 0 — 40' IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.	CHKD BY: NK	SCALE: 1" = 40'
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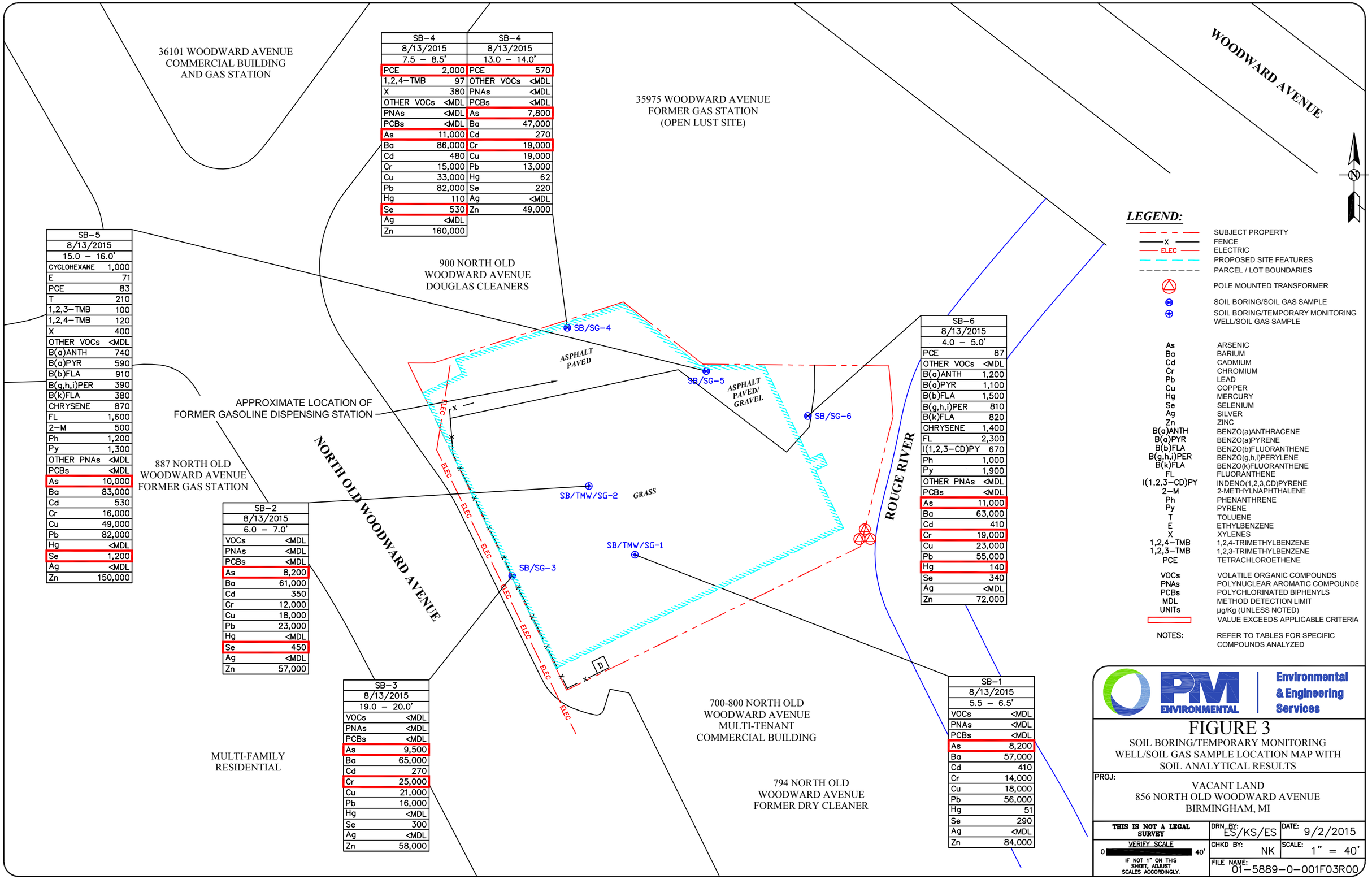

SB-4	
8/13/2015	
7.5 – 8.5'	
PCE	2,000
1,2,4-TMB	97
X	380
OTHER VOCs	<MDL
PNAs	<MDL
PCBs	<MDL
As	11,000
Ba	86,000
Cd	480
Cr	15,000
Cu	33,000
Pb	82,000
Hg	110
Se	530
Ag	<MDL
Zn	160,000

SB-4	
8/13/2015	
13.0 – 14.0'	
PCE	570
OTHER VOCs	<MDL
PNAs	<MDL
PCBs	<MDL
As	7,800
Ba	47,000
Cd	270
Cr	19,000
Cu	19,000
Pb	13,000
Hg	62
Se	220
Ag	<MDL
Zn	49,000

SB-5	
8/13/2015	
15.0 – 16.0'	
CYCLOHEXANE	1,000
E	71
PCE	83
T	210
1,2,3-TMB	100
1,2,4-TMB	120
X	400
OTHER VOCs	<MDL
B(a)ANTH	740
B(a)PYR	590
B(b)FLA	910
B(g,h,i)PER	390
B(k)FLA	380
CHRYSENE	870
FL	1,600
2-M	500
Ph	1,200
Py	1,300
OTHER PNAs	<MDL
PCBs	<MDL
As	10,000
Ba	83,000
Cd	530
Cr	16,000
Cu	49,000
Pb	82,000
Hg	<MDL
Se	1,200
Ag	<MDL
Zn	150,000

SB-2	
8/13/2015	
6.0 – 7.0'	
VOCs	<MDL
PNAs	<MDL
PCBs	<MDL
As	8,200
Ba	61,000
Cd	350
Cr	12,000
Cu	18,000
Pb	23,000
Hg	<MDL
Se	450
Ag	<MDL
Zn	57,000

SB-3	
8/13/2015	
19.0 – 20.0'	
VOCs	<MDL
PNAs	<MDL
PCBs	<MDL
As	9,500
Ba	65,000
Cd	270
Cr	25,000
Cu	21,000
Pb	16,000
Hg	<MDL
Se	300
Ag	<MDL
Zn	58,000

SB-6	
8/13/2015	
4.0 – 5.0'	
PCE	87
OTHER VOCs	<MDL
B(a)ANTH	1,200
B(a)PYR	1,100
B(b)FLA	1,500
B(g,h,i)PER	810
B(k)FLA	820
CHRYSENE	1,400
FL	2,300
I(1,2,3-CD)PY	670
Ph	1,000
Py	1,900
OTHER PNAs	<MDL
PCBs	<MDL
As	11,000
Ba	63,000
Cd	410
Cr	19,000
Cu	23,000
Pb	55,000
Hg	140
Se	340
Ag	<MDL
Zn	72,000

SB-1	
8/13/2015	
5.5 – 6.5'	
VOCs	<MDL
PNAs	<MDL
PCBs	<MDL
As	8,200
Ba	57,000
Cd	410
Cr	14,000
Cu	18,000
Pb	56,000
Hg	51
Se	290
Ag	<MDL
Zn	84,000

LEGEND:

- SUBJECT PROPERTY
- FENCE
- ELECTRIC
- PROPOSED SITE FEATURES
- PARCEL / LOT BOUNDARIES
- POLE MOUNTED TRANSFORMER
- SOIL BORING/SOIL GAS SAMPLE
- SOIL BORING/TEMPORARY MONITORING WELL/SOIL GAS SAMPLE

As	ARSENIC
Ba	BARIUM
Cd	CADMIUM
Cr	CHROMIUM
Pb	LEAD
Cu	COPPER
Hg	MERCURY
Se	SELENIUM
Ag	SILVER
Zn	ZINC
B(a)ANTH	BENZO(a)ANTHRACENE
B(a)PYR	BENZO(a)PYRENE
B(b)FLA	BENZO(b)FLUORANTHENE
B(g,h,i)PER	BENZO(g,h,i)PERYLENE
B(k)FLA	BENZO(k)FLUORANTHENE
FL	FLUORANTHENE
I(1,2,3-CD)PY	INDENO(1,2,3,CD)PYRENE
2-M	2-METHYLNAPHTHALENE
Ph	PHENANTHRENE
Py	PYRENE
T	TOLUENE
E	ETHYLBENZENE
X	XYLENES
1,2,4-TMB	1,2,4-TRIMETHYLBENZENE
1,2,3-TMB	1,2,3-TRIMETHYLBENZENE
PCE	TETRACHLOROETHENE
VOCs	VOLATILE ORGANIC COMPOUNDS
PNAs	POLYNUCLEAR AROMATIC COMPOUNDS
PCBs	POLYCHLORINATED BIPHENYLS
MDL	METHOD DETECTION LIMIT
UNITs	µg/Kg (UNLESS NOTED)
	VALUE EXCEEDS APPLICABLE CRITERIA

NOTES: REFER TO TABLES FOR SPECIFIC COMPOUNDS ANALYZED

PM ENVIRONMENTAL | Environmental & Engineering Services

FIGURE 3

SOIL BORING/TEMPORARY MONITORING WELL/SOIL GAS SAMPLE LOCATION MAP WITH SOIL ANALYTICAL RESULTS

PROJ:

VACANT LAND
856 NORTH OLD WOODWARD AVENUE
BIRMINGHAM, MI

THIS IS NOT A LEGAL SURVEY

VERIFY SCALE 0 40'
IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DRN BY: ES/KS/ES
DATE: 9/2/2015
CHKD BY: NK
SCALE: 1" = 40'
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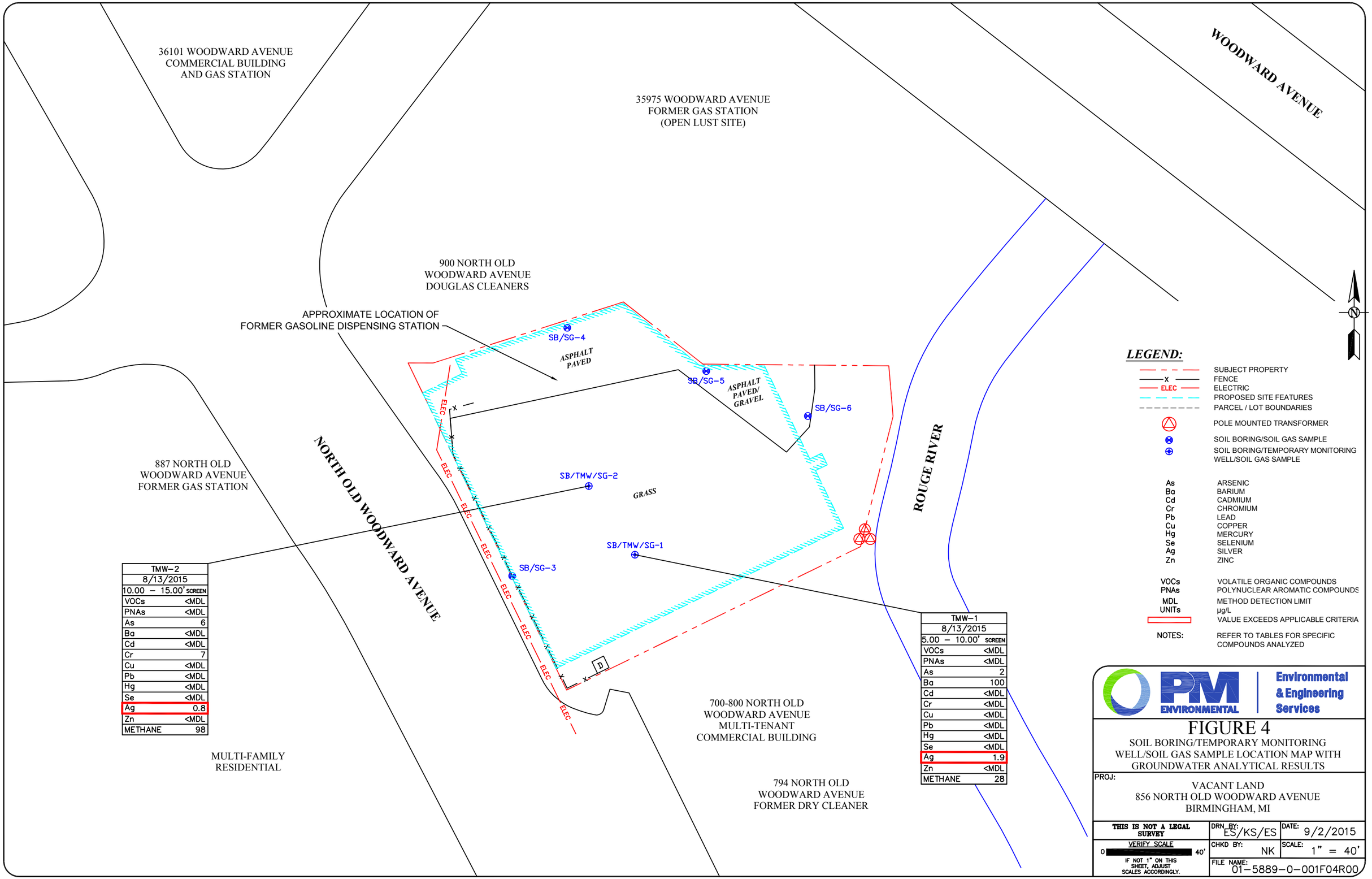
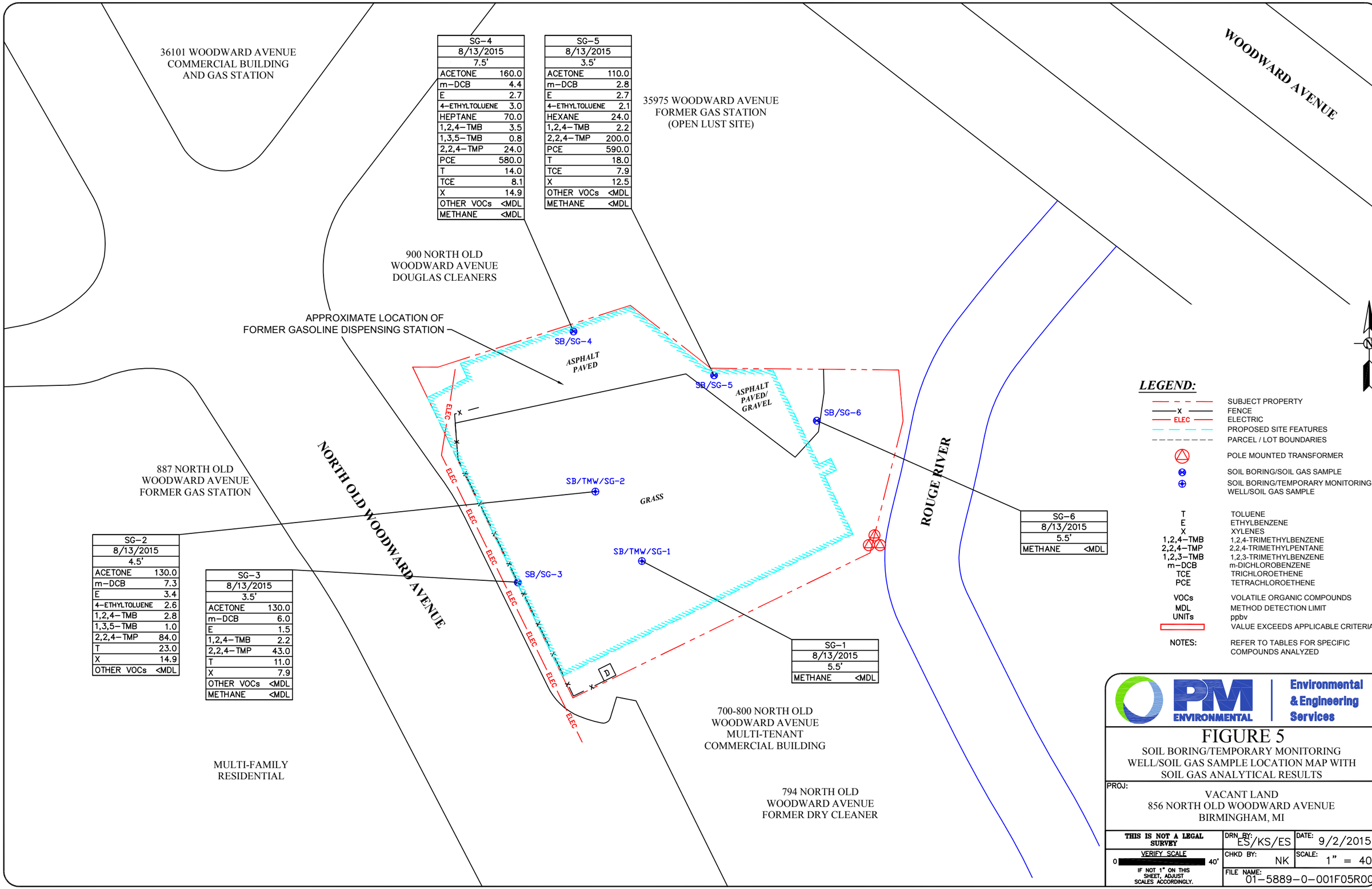


TMW-2	
8/13/2015	
10.00 – 15.00' SCREEN	
VOCs	<MDL
PNAs	<MDL
As	6
Ba	<MDL
Cd	<MDL
Cr	7
Cu	<MDL
Pb	<MDL
Hg	<MDL
Se	<MDL
Ag	0.8
Zn	<MDL
METHANE	98

TMW-1	
8/13/2015	
5.00 – 10.00' SCREEN	
VOCs	<MDL
PNAs	<MDL
As	2
Ba	100
Cd	<MDL
Cr	<MDL
Cu	<MDL
Pb	<MDL
Hg	<MDL
Se	<MDL
Ag	1.9
Zn	<MDL
METHANE	28



SG-4	
8/13/2015	
7.5'	
ACETONE	160.0
m-DCB	4.4
E	2.7
4-ETHYLTOLUENE	3.0
HEPTANE	70.0
1,2,4-TMB	3.5
1,3,5-TMB	0.8
2,2,4-TMP	24.0
PCE	580.0
T	14.0
TCE	8.1
X	14.9
OTHER VOCs	<MDL
METHANE	<MDL

SG-5	
8/13/2015	
3.5'	
ACETONE	110.0
m-DCB	2.8
E	2.7
4-ETHYLTOLUENE	2.1
HEXANE	24.0
1,2,4-TMB	2.2
2,2,4-TMP	200.0
PCE	590.0
T	18.0
TCE	7.9
X	12.5
OTHER VOCs	<MDL
METHANE	<MDL

SG-2	
8/13/2015	
4.5'	
ACETONE	130.0
m-DCB	7.3
E	3.4
4-ETHYLTOLUENE	2.6
1,2,4-TMB	2.8
1,3,5-TMB	1.0
2,2,4-TMP	84.0
T	23.0
X	14.9
OTHER VOCs	<MDL

SG-3	
8/13/2015	
3.5'	
ACETONE	130.0
m-DCB	6.0
E	1.5
1,2,4-TMB	2.2
2,2,4-TMP	43.0
T	11.0
X	7.9
OTHER VOCs	<MDL
METHANE	<MDL

SG-1	
8/13/2015	
5.5'	
METHANE	<MDL

SG-6	
8/13/2015	
5.5'	
METHANE	<MDL

TABLE 1
SUMMARY OF SOIL ANALYTICAL RESULTS
VOLATILE ORGANIC COMPOUNDS AND POLYNUCLEAR AROMATIC COMPOUNDS
856 NORTH OLD WOODWARD AVENUE, BIRMINGHAM, MICHIGAN
PM PROJECT # 01-5889-0-001

VOLATILE ORGANIC COMPOUNDS (VOCs), POLYNUCLEAR AROMATIC COMPOUNDS (PNAs), (µg/Kg)			Cyclohexane	Ethyl benzene	Tetrachloroethene	Toluene	1,2,3-Trimethylbenzene[1]	1,2,4-Trimethylbenzene	Xylenes	Other VOCs	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Fluoranthene	Indeno(1,2,3-cd)pyrene	2-Methylnaphthalene	Phenanthrene	Pyrene
Chemical Abstract Service Number (CAS#)			110827	100414	127184	108883	526738	95636	1330207	Various	56553	50328	205992	191242	207089	218019	206440	193395	91576	85018	129000
Sample ID	**Sample Date**	**Sample Depth (feet bgs)**	**VOCs**								**PNAs**										
SB-1	8/13/2015	5.5-6.5	<500	<50	<50	<50	<50	<50	<150	ND	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330
SB-2	8/13/2015	6.0-7.0	<500	<50	<50	<50	<50	<50	<150	ND	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330
SB-3	8/13/2015	19.0-20.0	<500	<50	<50	<50	<50	<50	<150	ND	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330
SB-4	8/13/2015	7.5-8.5	<500	<50	**2,000**	<50	<50	97	380	ND	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330
SB-4	8/13/2015	13.0-14.0	<500	<50	**570**	<50	<50	<50	<150	ND	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330
SB-5	8/13/2015	15.0-16.0	1,000	71	83	210	100	120	400	ND	740	590	910	390	380	870	1,600	<330	500	1,200	1,300
SB-6	8/13/2015	4.0-5.0	<500	<50	87	<50	<50	<50	<150	ND	1,200	1,100	1,500	810	820	1,400	2,300	670	<330	1,000	1,900
Cleanup Criteria Requirements for Response Activity (R 299.1 - R 299.50) **Generic Soil Cleanup Criteria Tables 2 and 3: Residential and Non-Residential Part 201 Generic Cleanup Criteria and Screening Levels/Part 213 Risk-Based Screening Levels, December 30, 2013** **MDEQ Guidance Document For The Vapor Intrusion Pathway, Policy and Procedure Number: 09-017, Appendix D Vapor Intrusion Screening Values, May 2013**																					
Residential (µg/Kg)																					
Statewide Default Background Levels			NL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Drinking Water Protection (Res DWP)			NL	1,500	100	16,000	1,800	2,100	5,600	Various	NLL	NLL	NLL	NLL	NLL	NLL	7.30E+05	NLL	57,000	56,000	4.80E+05
Groundwater Surface Water Interface Protection (GSIP)			NL	360	1,200 {X}	5,400	570	570	820	Various	NLL	NLL	NLL	NLL	NLL	NLL	5,500	NLL	4,200	2,100	ID
Soil Volatilization to Indoor Air Inhalation (Res SVII)			NL	87,000	11,000	3.3E+05 {C}	2.6E+06 {C}	4.3E+06 {C}	6.3E+06 {C}	Various	NLV	NLV	ID	NLV	NLV	ID	1.0E+9 {D}	NLV	2.70E+06	2.8E+06	1.0E+9 {D}
Ambient Air Infinite Source Volatile Soil Inhalation (Res VSI)			NL	7.20E+05	1.70E+05	2.80E+06	1.60E+07	2.10E+07	4.60E+07	Various	NLV	NLV	ID	NLV	NLV	ID	7.40E+08	NLV	1.50E+06	1.60E+05	6.5E+08
Ambient Air Finite VSI for 5 Meter Source Thickness			NL	1.00E+06	4.80E+05	5.10E+06	3.80E+08	5.00E+08	6.10E+07	Various	NLV	NLV	ID	NLV	NLV	ID	7.4E+08	NLV	1.50E+06	1.60E+05	6.5E+08
Ambient Air Finite VSI for 2 Meter Source Thickness			NL	2.20E+06	1.1E+06	1.20E+07	3.80E+08	5.00E+08	1.30E+08	Various	NLV	NLV	ID	NLV	NLV	ID	7.4E+08	NLV	1.50E+06	1.60E+05	6.5E+08
Ambient Air Particulate Soil Inhalation (Res PSI)			NL	1.00E+10	2.7E+09	2.70E+10	8.20E+10	8.20E+10	2.90E+11	Various	ID	1.5E+06	ID	8.0E+08	ID	ID	9.3E+09	ID	6.70E+08	6.7E+06	6.7E+09
Direct Contact (Res DC)			NL	2.2E+07 {C}	2.0E+05 {C}	5.0E+07 {C}	3.2E+07 {C}	3.2E+07 {C}	4.1E+08 {C}	Various	20,000	2,000	20,000	2.5E+06	2.00E+05	2.0E+06	4.6E+07	20,000	8.10E+06	1.6E+06	2.9E+07
Nonresidential (µg/Kg)																					
Drinking Water Protection (Nonres DWP)			NL	1,500	100	16,000	1,800	2,100	5,600	Various	NLL	NLL	NLL	NLL	NLL	NLL	7.30E+05	NLL	1.70E+05	1.60E+05	4.80E+05
Soil Volatilization to Indoor Air Inhalation (Nonres SVII)			NL	4.6E+05 {C}	21,000	6.1E+05 {C}	4.8E+06 {C}	8.0E+06 {C}	1.2E+07 {C}	Various	NLV	NLV	ID	NLV	NLV	ID	1.0E+9 {D}	NLV	4.90E+06	5.1E+06	1.0E+9 {D}
Ambient Air Infinite Source Volatile Soil Inhalation (Nonres VSI)			NL	2.40E+06	2.10E+05	3.30E+06	1.90E+07	2.50E+07	5.40E+07	Various	NLV	NLV	ID	NLV	NLV	ID	8.9E+08	NLV	1.80E+06	1.90E+05	7.8E+08
Ambient Air Finite VSI for 5 Meter Source Thickness			NL	3.10E+06	4.90E+05	3.60E+07	4.60E+08	6.00E+08	6.50E+07	Various	NLV	NLV	ID	NLV	NLV	ID	8.8E+08	NLV	1.80E+06	1.90E+05	7.8E+08
Ambient Air Finite VSI for 2 Meter Source Thickness			NL	6.50E+06	1.1E+06	3.60E+07	4.60E+08	6.00E+08	1.30E+08	Various	NLV	NLV	ID	NLV	NLV	ID	8.8E+08	NLV	1.80E+06	1.90E+05	7.8E+08
Ambient Air Particulate Soil Inhalation (Nonres PSI)			NL	1.30E+10	1.2E+09	1.20E+10	3.60E+10	3.60E+10	1.30E+11	Various	ID	1.9E+06	ID	3.5E+08	ID	ID	4.1E+09	ID	2.90E+08	2.9E+06	2.9E+09
Direct Contact (Nonres DC)			NL	7.1E+07 {C}	9.3E+05 {C}	1.6E+08 {C}	1.0E+08 {C}	1.0E+08 {C}	1.0E+09 {C}	Various	80,000	8,000	80,000	7.0E+06	8.00E+05	8.0E+06	1.3E+08	80,000	2.60E+07	5.2E+06	8.4E+07
Screening Levels (µg/Kg)																					
Soil Saturation Concentration Screening Levels (Csat)			NL	1.40E+05	88,000	2.50E+05	94,000	1.10E+05	1.50E+05	Various	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Residential Vapor Intrusion Soil Screening Levels ($S_{VI\text{-}res}$)			NL	200	52	10,000	3,200	2,200	290	Various	NL	NL	NL	NL	NL	NL	NL	NL	7,500	5,100	6.47E+07
Nonresidential Vapor Intrusion Soil Screening Levels ($S_{VI\text{-}nr}$)			NL	4,000	1,000	1.69E+05	53,000	37,000	4,900	Various	NL	NL	NL	NL	NL	NL	NL	NL	1.26E+05	86,000	1.09E+09

Applicable Criterion/RBSL Exceeded
BOLD Value Exceeds Applicable Criterion/RBSL
bgs Below Ground Surface (feet)
1 1,2,3-Trimethylbenzene RBSLs based on the more restrictive of 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene.
ND Non-detected at levels above laboratory method detection limit (MDL)
NA/NL/ID Not Applicable/Not Listed/Insufficient Data
NLL/NLV Not Likely to Leach/Not Likely to Volatilizae

TABLE 2
SUMMARY OF SOIL ANALYTICAL RESULTS
POLYCHLORINATED BIPHENYLS AND MICHIGAN TEN METALS
856 NORTH OLD WOODWARD AVENUE, BIRMINGHAM, MICHIGAN
PM PROJECT # 01-5889-0-001

POLYCHLORINATED BIPHENYLS (PCBs) AND MICHIGAN TEN METALS (µg/Kg)			PCBs	Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver	Zinc
Chemical Abstract Service Number (CAS#)			1336363	7440382	7440393	7440439	16065831	7440508	7439921	7439976	7782492	7440224	7440666
Sample ID	**Sample Date**	**Sample Depth (feet bgs)**	**PCBs**	**Michigan Ten Metals**									
SB-1	8/13/2015	5.5-6.5	ND	**8,200**	57,000	410	14,000	18,000	56,000	51	290	<100	84,000
SB-2	8/13/2015	6.0-7.0	ND	**8,200**	61,000	350	12,000	18,000	23,000	<50	**450**	<100	57,000
SB-3	8/13/2015	19.0-20.0	ND	**9,500**	65,000	270	**25,000**	21,000	16,000	<50	300	<100	58,000
SB-4	8/13/2015	7.5-8.5	ND	**11,000**	86,000	480	15,000	33,000	82,000	110	**530**	<100	160,000
SB-4	8/13/2015	13.0-14.0	ND	**7,800**	47,000	270	**19,000**	19,000	13,000	62	220	<100	49,000
SB-5	8/13/2015	15.0-16.0	ND	**10,000**	83,000	530	16,000	49,000	82,000	<50	**1,200**	<100	150,000
SB-6	8/13/2015	4.0-5.0	ND	**11,000**	63,000	410	**19,000**	23,000	55,000	**140**	340	<100	72,000
Cleanup Criteria Requirements for Response Activity (R 299.1 - R 299.50) **Generic Soil Cleanup Criteria Tables 2 and 3: Residential and Non-Residential Part 201 Generic Cleanup Criteria and Screening Levels/Part 213 Risk-Based Screening Levels, December 30, 2013** **MDEQ Guidance Document For The Vapor Intrusion Pathway, Policy and Procedure Number: 09-017, Appendix D Vapor Intrusion Screening Values, May 2013**													
Residential (µg/Kg)													
Statewide Default Background Levels			NA	5,800	75,000	1,200	18,000	32,000	21,000	130	410	1,000	47,000
Drinking Water Protection (Res DWP)			NLL	4,600	1.30E+06	6,000	30,000	5.80E+06	7.00E+05	1,700	4,000	4,500	2.40E+06
Groundwater Surface Water Interface Protection (GSIP)			NLL	4,600	1.3E+06 {G}	7,700 {G,X}	3,300	1.8E+05 {G}	8.2E+06 {G,X}	50 {M}; 1.2	400	100 {M}; 27	3.9E+05 {G}
Soil Volatilization to Indoor Air Inhalation (Res SVII)			3.0E+06	NLV	NLV	NLV	NLV	NLV	NLV	48,000	NLV	NLV	NLV
Ambient Air Infinite Source Volatile Soil Inhalation (Res VSI)			2.40E+05	NLV	NLV	NLV	NLV	NLV	NLV	52,000	NLV	NLV	NLV
Ambient Air Finite VSI for 5 Meter Source Thickness			7.9E+06	NLV	NLV	NLV	NLV	NLV	NLV	52,000	NLV	NLV	NLV
Ambient Air Finite VSI for 2 Meter Source Thickness			7.9E+06	NLV	NLV	NLV	NLV	NLV	NLV	52,000	NLV	NLV	NLV
Ambient Air Particulate Soil Inhalation (Res PSI)			5.2E+06	7.20E+05	3.30E+08	1.70E+06	2.60E+05	1.30E+08	1.00E+08	2.00E+07	1.30E+08	6.70E+06	ID
Direct Contact (Res DC)			{T}	7,600	3.70E+07	5.50E+05	2.50E+06	2.00E+07	4.00E+05	1.60E+05	2.60E+06	2.50E+06	1.70E+08
Nonresidential (µg/Kg)													
Drinking Water Protection (Nonres DWP)			NLL	4,600	1.30E+06	6,000	30,000	5.80E+06	7.00E+05	1,700	4,000	4,500	5.00E+06
Soil Volatilization to Indoor Air Inhalation (Nonres SVII)			1.6E+07	NLV	NLV	NLV	NLV	NLV	NLV	89,000	NLV	NLV	NLV
Ambient Air Infinite Source Volatile Soil Inhalation (Nonres VSI)			8.10E+05	NLV	NLV	NLV	NLV	NLV	NLV	62,000	NLV	NLV	NLV
Ambient Air Finite VSI for 5 Meter Source Thickness			2.8E+07	NLV	NLV	NLV	NLV	NLV	NLV	62,000	NLV	NLV	NLV
Ambient Air Finite VSI for 2 Meter Source Thickness			2.8E+07	NLV	NLV	NLV	NLV	NLV	NLV	62,000	NLV	NLV	NLV
Ambient Air Particulate Soil Inhalation (Nonres PSI)			6.5E+06	9.10E+05	1.50E+08	2.20E+06	2.40E+05	5.90E+07	4.40E+07	8.80E+06	5.90E+07	2.90E+06	ID
Direct Contact (Nonres DC)			{T}	37,000	1.30E+08	2.10E+06	9.20E+06	7.30E+07	9.0E+5 (DD)	5.80E+05	9.60E+06	9.00E+06	6.30E+08
Screening Levels (µg/Kg)													
Soil Saturation Concentration Screening Levels (Csat)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Residential Vapor Intrusion Soil Screening Levels ($S_{VI\text{-}res}$)			1,900	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL
Nonresidential Vapor Intrusion Soil Screening Levels ($S_{VI\text{-}nr}$)			39,000	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL

	Applicable Criterion/RBSL Exceeded
BOLD	Value Exceeds Applicable Criterion/RBSL
bgs	Below Ground Surface (feet)
ND	Non-detected at levels above laboratory method detection limit (MDL)
NA/NL/ID	Not Applicable/Not Listed/Insufficient Data
NLL/NLV	Not Likely to Leach/Not Likely to Volatilize
{G}	Metal GSIP Criteria for Surface Water Not Protected for Drinking Water Use based on 418 mg/L CaCO3 Hardness: Station ID 630003, Rouge River, near Troy, MI

TABLE 3
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
VOLATILE ORGANIC COMPOUNDS, POLYNUCLEAR AROMATIC COMPOUNDS, MICHIGAN TEN METALS, AND METHANE
856 NORTH OLD WOODWARD AVENUE, BIRMINGHAM, MICHIGAN
PM PROJECT # 01-5889-0-001

VOLATILE ORGANIC COMPOUNDS (VOCs), POLYNUCLEAR AROMATIC COMPOUNDS (PNAs), MICHIGAN TEN METALS, AND METHANE (µg/L)				VOCs	PNAs	Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver	Zinc	Methane
Chemical Abstract Service Number (CAS#)				Various	Various	7440382	7440393	7440439	16065831	7440508	7439921	7439976	7782492	7440224	7440666	74828
Sample ID	**Sample Date**	**Screen Depth (feet bgs)**	**Depth to Groundwater (feet bgs)**	**VOCs**	**PNAs**	**Michigan Ten Metals**										**Methane**
TMW-1	8/13/2015	5.00-10.00	6.57	ND	ND	2	100	<0.2	<5	<4	<3	<0.2	<5	**1.9**	<10	28
TMW-2	8/13/2015	10.00-15.00	12.57	ND	ND	6	<100	<0.2	7	<4	<3	<0.2	<5	**0.8**	<10	98
Cleanup Criteria Requirements for Response Activity (R 299.1 - R 299.50) **Generic Groundwater Cleanup Criteria Table 1: Residential and Non-Residential Part 201 Generic Cleanup Criteria and Screening Levels/Part 213 Risk-Based Screening Levels, December 30, 2013** **MDEQ Guidance Document For The Vapor Intrusion Pathway, Policy and Procedure Number: 09-017, Appendix D Vapor Intrusion Screening Values, May 2013**																
Residential/Nonresidential (µg/L)																
Residential Drinking Water (Res DW)				Various	Various	10 {A}	2,000 {A}	5.0 {A}	100 {A}	1,000 {E}	4.0 {L}	2.0 {A}	50 {A}	34	2,400	ID
Residential Health Based Drinking Water Values				Various	Various	NL	NL	NL	NL	1,400 {E}	NL	NL	NL	NL	NL	NL
Nonresidential Drinking Water (Nonres DW)				Various	Various	10 {A}	2,000 {A}	5.0 {A}	100 {A}	1,000 {E}	4.0 {L}	2.0 {A}	50 {A}	98	5,000 {E}	ID
Nonresidential Health Based Drinking Water Values				Various	Various	NL	NL	NL	NL	4,000 {E}	NL	NL	NL	NL	NL	NL
Groundwater Surface Water Interface (GSI)				Various	Various	10	2,000 {G}	6.4 {G,X}	11	30 {G}	47 {G,X}	0.0013	5.0	0.2 {M}; 0.06	400 {G}	NA
Residential Groundwater Volatilization to Indoor Air Inhalation (Res GVII) [2]				Various	Various	NLV	NLV	NLV	NLV	NLV	NLV	56 {S}	NLV	NLV	NLV	(K)
Nonresidential Groundwater Volatilizationto Indoor Air Inhalation (Nonres GVII) [2]				Various	Various	NLV	NLV	NLV	NLV	NLV	NLV	56 {S}	NLV	NLV	NLV	(K)
Screening Levels (µg/L)																
Residential Groundwater Vapor Intrusion Screening Levels ($GW_{VI\text{-}res}$) [3]				Various	Various	NL	NL	NL	NL	NL	NL	ID	NL	NL	NL	520
Nonresidential Groundwater Vapor Intrusion Screening Levels ($GW_{VI\text{-}nr}$) [3]				Various	Various	NL	NL	NL	NL	NL	NL	ID	NL	NL	NL	520
Residential Vapor Intrusion Shallow Groundwater Screening Levels ($GW_{VI\text{-}sump\text{-}res}$) [4]				Various	Various	NL	NL	NL	NL	NL	NL	ID	NL	NL	NL	520
Nonresidential Vapor Intrusion Shallow Groundwater Screening Levels ($GW_{VI\text{-}sump\text{-}nr}$) [4]				Various	Various	NL	NL	NL	NL	NL	NL	ID	NL	NL	NL	520
Water Solubility				Various	Various	NA	NA	NA	NA	NA	NA	56	NA	NA	NA	NA
Flammability and Explosivity Screening Level				Various	Various	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	28,000
Acute Vapor Intrusion Screening Levels for Groundwater (µg/L)																
IRASL Groundwater (AGW_{vi})				Various	Various	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL
IRASL Groundwater In Contact With Structure ($AGW_{vi\text{-}sump}$)				Various	Various	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL

	Applicable Criteria/RBSL Exceeded
BOLD	Value Exceeds Applicable Criteria
bgs	Below Ground Surface (feet)
ND	Not detected at levels above the laboratory Method Detection Limit (MDL) or Minimum Quantitative Level (MQL)
[1]	Rule 323.1057 of Part 4 Water Quality Standards
[2]	Tier 1 GVII Criteria based on 3 meter (or greater) groundwater depth
[3]	(2013 Vapor Intrusion Guidance) Screening Levels based on depth to groundwater less than 1.5 meters and not in contact with building foundation
[4]	(2013 Vapor Intrusion Guidance) Screening levels based on groundwater in contact with the building foundation or within a sump
NA/NL/ID	Not Applicable/Not Listed/Insufficient Data
NLV	Not Likely to Volatilize
{G}	Metal GSIP Criteria for Surface Water Not Protected for Drinking Water Use based on 418 mg/L CaCO3 Hardness: Station ID 630003, Rouge River, near Troy, MI

TABLE 4
SUMMARY OF SOIL VAPOR ANALYTICAL RESULTS
VOLATILE ORGANIC COMPOUNDS AND METHANE
856 NORTH OLD WOODWARD AVENUE, BIRMINGHAM, MICHIGAN
PM PROJECT # 01-5889-0-001

VOLATILE ORGANIC COMPOUNDS (VOCs) AND METHANE (ppbv)			Acetone	m-Dichlorobenzene	Ethylbenzene	4-Ethyltoluene	Heptane	Hexane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2,2,4-Trimethylpentane	Tetrachloroethylene	Toluene	Trichloroethylene	m,p-Xylene	o-Xylene	Xylenes (total)	Other VOCs	Methane
Chemical Abstract Service Number (CAS#)			67641	541731	100414	622968	142825	110543	95636	108678	540841	127184	108883	79016	1330207	95476	1330207	Various	74828
Sample ID	**Sample Date**	**Sample Depth (feet bgs)**	**VOCs**																**Methane**
SG-1	8/13/2015	5.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND
SG-2	8/13/2015	4.5	130.0	7.3	3.4	2.6	<0.80	<0.80	2.8	1.0	84.0	<0.16	23.0	<0.16	11.0	3.9	14.9	ND	NA
SG-3	8/13/2015	3.5	130.0	6.0	1.5	<0.80	<0.80	<0.80	2.2	<0.80	43.0	<0.16	11.0	<0.16	5.7	2.2	7.9	ND	ND
SG-4	8/13/2015	7.5	160.0	4.4	2.7	3.0	70.0	<0.80	3.5	0.8	24.0	580.0	14.0	8.1	11.0	3.9	14.9	ND	ND
SG-5	8/13/2015	3.5	110.0	2.8	2.7	2.1	<0.80	24.0	2.2	<0.80	200.0	**590.0**	18.0	7.9	9.3	3.2	12.5	ND	ND
SG-6	8/13/2015	5.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	A	NA	NA	ND
MDEQ Guidance Document For The Vapor Intrusion Pathway, Policy and Procedure Number: 09-017, Appendix D Vapor Intrusion Screening Values, May 2013																			
Residential Screening Levels (ppbv)																			
Vapor Intrusion Indoor Air Screening Levels (IA_{VI})			2,500	0.49	19	NDC	850	200	44	44	740	5.0	1,300	0.37	23	23	23	Various	1.25E+04 (g)
Vapor Intrusion Shallow Sub-Slab Soil Gas Screening Levels (≤ 1.5m bgs) (SG_{VI-SS})			82,000	16	640	NDC	28,000	6,600	1,500	1,500	25,000	170	44,000	12	760	760	760	Various	1.25E+04 (g)
Vapor Intrusion Deep Soil Gas Screening Levels (SG_{VI})			8.20E+05	160	6,400	NDC	2.80E+05	66,000	15,000	15,000	2.50E+05	1,700	4.40E+05	120	7,600	7,600	7,600	Various	1.25E+04 (g)
Nonresidential Screening Levels (ppbv)																			
Vapor Intrusion Indoor Air Screening Levels (IA_{VI})			10,000	2.1	96	NDC	3,600	830	190	190	3,100	25	5,500	1.5	96	96	96	Various	1.25E+04 (g)
Vapor Intrusion Shallow Sub-Slab Soil Gas Screening Levels (≤ 1.5m bgs) (SG_{VI-SS})			1.40E+06	280	13,000	NDC	4.70E+05	1.10E+05	25,000	25,000	4.20E+05	3,300	7.40E+05	210	13,000	13,000	13,000	Various	1.25E+04 (g)
Vapor Intrusion Deep Soil Gas Screening Levels (SG_{VI})			1.40E+07	2,800	1.30E+05	NDC	4.70E+06	1.10E+06	2.50E+05	2.50E+05	4.20E+06	33,000	7.40E+06	2,100	1.30E+05	1.30E+05	1.30E+05	Various	1.25E+04 (g)
DRAFT Acute Vapor Intrusion Screening Levels for Indoor Air and Soil Gas; Residential and Nonresidential Land Use, February 2013 (ppbv)																			
IRASL Indoor Air (AIA_{vi})			25,000	NDC	NDC	NDC	NDC	NDC	NDC	NDC	NDC	2,800	9,300	74,000	4,800	4,800	4,800	Various	NDC
IRASL Soil Gas (ASG_{vi})			8.28E+05	NDC	NDC	NDC	NDC	NDC	NDC	NDC	NDC	93,000	3.10E+05	2.48E+06	1.60E+05	1.60E+05	1.60E+05	Various	NDC

Applicable Criteria/RBSL Exceeded
BOLD Value Exceeds Applicable Criteria
bgs Below Ground Surface (feet)
ND Not detected at levels above the laboratory Method Detection Limit (MDL) or Minimum Quantitative Level (MQL)
NA Not Applicable
NDC "No Defined Criteria" by the Michigan Department of Environmental Quality (MDEQ)
[1] The IAC and SGC presented in this table are health-based values. The applicable IAC and SGC are based on the higher of the health-based value and the appropriate analytical reporting limit.
IRASL Immediate Response Acute Vapor Intrusion Screening Levels

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SITE INVESTIGATION REPORT

856 North Old Woodward Avenue | Birmingham, Michigan
PM Project Number 01-5889-0-0003

Prepared for:

FLS Properties #5, LLC
P.O. Box 689
Bloomfield Hills, Michigan 48303

Prepared by:

PM Environmental, Inc.
4080 West 11 Mile Road
Berkley, Michigan 48072

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June 20, 2016

Mr. Frank R. Simon
FLS Properties #5, LLC
P.O. Box 689
Bloomfield Hills, Michigan 48303

RE: Summary Report for the Site Investigation Activities at the Vacant Land located at 856 North Old Woodward Avenue, Birmingham, Michigan
Parcel ID: 08-19-25-328-001
PM Environmental, Inc. Project No. 01-5889-0-001

Dear Mr. Simon:

PM Environmental, Inc. (PM) completed site investigation activities for the vacant land (Parcel ID: 08-19-25-328-001) located at 856 North Old Woodward Avenue, Birmingham, Oakland County, Michigan 48009 (hereafter referred to as the subject property). This report summarizes the activities completed by PM in May 2016 to further define potentially listed hazardous waste soil contamination, and associated conclusions and recommendations.

THIS REPORT WAS PREPARED FOR THE EXCLUSIVE USE OF FLS PROPERTIES #5, LLC, WHO MAY RELY ON ITS CONTENTS AND CONCLUSIONS.

SITE DESCRIPTION AND BACKGROUND

The subject property consists of vacant land with asphalt paved parking in the northeastern portion, remnants of a building foundation in the northern portion, and grass in the remaining portions (Figure 2). The property has a down-gradient slope from North Old Woodward Avenue east to where it adjoins the Rouge River, which is an elevation difference of approximately 15 feet.

Standard and other historical sources documented that the subject property was developed in at least 1937 with a gasoline dispensing station and one other structure, likely a residential dwelling, in the northern and eastern portions of the subject property. In 1940, the gasoline dispensing station was converted to a gift shop. By 1946, a residential dwelling was reportedly converted into a tea room and restaurant in the western portion of the subject property. The gift shop appears to have been demolished by 1949. The tea room and restaurant operated until 1988, when the commercial building was demolished.

PREVIOUS SITE INVESTIGATION

PM reviewed the following previous environmental reports for the subject property which are included within ASTI's April 2015 Phase I Environmental Site Assessment (ESA).

Name of Report	Date of Report	Company that Prepared Report
Phase I ESA	October 23, 2006	Soils and Materials Engineers, Inc. (SME)

Name of Report	Date of Report	Company that Prepared Report
Baseline Environmental Assessment (BEA)	November 6, 2006	SME
Phase I ESA	April 10, 2015	ASTI Environmental (ASTI)
BEA	September 4, 2015	PM

Phase I ESA, October 2006, SME: SME completed a Phase I ESA dated October 23, 2006. At the time of SME's Phase I ESA, the subject property was vacant land. SME identified RECs in association with the 1) debris and fill material located on the subject property; 2) the fuel oil tank identified in historical records; 3) volatile organic compounds (VOCs) and lead detected in soil and groundwater samples collected from the subject property above the Part 201 Residential and Nonresidential cleanup criteria; and, 4) the north adjoining dry cleaner.

BEA, November 2006, SME: SME completed a BEA dated November 6, 2006. The BEA summarizes subsurface investigation activities completed by SME on September 26, 2006 to assess the RECs identified in the September 2006 Phase I ESA, a Geotechnical Investigation report dated October 20, 2006 completed as part of a proposed future development at the time, and two previous subsurface investigations completed in 2002 and 2005.

On September 26, 2006 SME completed a scope of work that consisted of the advancement of seven soil borings (SP1 through SP7), the installation of four temporary monitoring wells (SP1, SP2, SP4, and SP7), and the collection of six soil samples and three groundwater samples for laboratory analysis of VOCs, polynuclear aromatic compounds (PNAs), and metals (cadmium, chromium, and lead) to assess the RECs identified in the September 2006 Phase I ESA. Concentrations of benzene, tetrachloroethene (PCE), and xylenes were detected in the soil sample collected at SP6 (7.0-8.0 feet bgs) above the Part 201 Residential and Nonresidential Drinking Water Protection (DWP) and Groundwater Surface Water Interface Protection (GSIP) cleanup criteria. Concentrations of benzene, lead, and methyl-tert-butyl ether (MTBE) were detected in the groundwater samples collected at SP2 and SP7 above the Part 201 Residential and Nonresidential Drinking Water (DW) and Groundwater Surface Water Interface (GSI) cleanup criteria. No other concentrations of VOCs, PNAs, or metals were detected in the soil and groundwater samples collected from the subject property above the laboratory method detection limits (MDLs) and/or the most restrictive Part 201 Residential cleanup criteria.

SME completed a Geotechnical Investigation dated October 20, 2006, in which on September 21 and 22, 2006 SME completed a scope of work consisting of the advancement of six soil borings (B1 through B6) as part of a proposed future development. The soil stratigraphy at the subject property was identified as consisting of sand/clay fill containing concrete, brick, asphalt, and cinder fragment with trace amount of organics to 26.0 feet bgs in the northeastern portion of the subject property, 10.0 feet bgs in the southeastern portion of the subject property, 3.5 feet bgs in the northwestern and southwestern portions of the subject property, and 11.0 feet bgs in the central portion of the subject property. The fill material was identified as being underlain by native interbedded clay and sand to a depth of 74.0 feet bgs, the maximum depth explored. Perched and discontinuous groundwater was encountered at various depths between 9.0 and 29.5 feet bgs within the fill material and the native sand seams. SME recommended a partial undercut of the existing fill within the below-grade parking and other pavement areas, installing soldier piles and lagging to protect adjacent structures during construction, not using the

existing fill material as engineered fill, completing moisture conditioning for suitable compaction of the native clay, drilling piers to support the proposed building, and using standard sump and pit methods or crushed aggregate to prevent disturbance from groundwater accumulation.

A subsurface investigation was reportedly completed on the subject property in 2002, in which the scope of work consisted of the advancement of six soil borings and the installation of four monitoring wells. Concentrations of benzene, ethylbenzene, MTBE, naphthalene, and lead were detected in the samples collected from the subject property above the Part 213 Risk-Based Screening Levels (RBSLs) in the northern portion of the subject property; however, these analytical results were not available for review. The concentrations reportedly migrated onto the subject property from the northeast adjoining gasoline dispensing station and open Leaking Underground Storage Tank (LUST) site identified as 35975 Woodward Avenue.

Delta Environmental Consultants, Inc. (Delta) installed five monitoring wells (TW-1, TM3, TW-4, OW-10, and OW-11) on the subject property in 1996 as part of LUST investigation activities for the northeast adjoining open LUST site. Subsequent to installation a series of groundwater monitoring events were completed on the subject property between 1996 and 2006. The most recent documented events available for review occurred in October 2005, February 2006, and April 2006 and were completed by PM. Groundwater samples were collected from TW-1, TW-4, and OW-11 and submitted for laboratory analysis of VOCs and lead, or some combination thereof. TW-3 and OW-10 did not produce groundwater sufficient for groundwater collection. Concentrations of benzene, MTBE, vinyl chloride, and lead were detected in the groundwater samples collected at TW-1 and TW-4 above the Part 213 Residential and Nonresidential DW and/or GSI RBSLs. No concentrations of other VOCs were detected in the groundwater samples collected at TW-1 and TW-4 above the laboratory MDLs or the most restrictive Part 213 Residential RBSLs. No concentrations of VOCs were detected in the groundwater sample collected at OW-11 above the laboratory MDLs. Groundwater flow was calculated to flow southeast towards the Rouge River. PM was unable to locate the permanent monitoring wells during the August 2015 subsurface investigation, discussed below and in Section 1.5.

Phase I ESA (2015): ASTI identified RECs associated with the1) former gasoline dispensing operations; 2) potential for orphan USTs associated with the gasoline dispensing operations and former fuel oil use; 3) existing contamination; 4) unknown fill material; and 5) the potential for migration from adjoining gasoline dispensing station and a dry cleaner.

BEA (2015): On August 11, 2015 PM completed a geophysical survey utilizing GPR at the subject property (Figure 2) to investigate the presence of potential orphan USTs.

No anomalies consistent with orphan USTs were identified. A suspect fill port pipe was visually identified during PM's GPR survey in the central portion of the subject property and the pipe was traced using a PL 2000 utility locator. PM advanced a shallow hand auger to 5.0 feet bgs in the area where the pipe terminated, and no anomalies where encountered.

On August 13, 2015 PM completed a scope of work consisting of the advancement of six soil borings (SB-1 through SB-6), the installation of two temporary monitoring wells (TMW-1 and TMW-2), the installation of six soil gas sampling points (SG-1 through SG-6), and the collection of seven soil samples, two groundwater samples, and six soil gas samples for laboratory analysis of VOCs, PNAs, polychlorinated biphenyls (PCBs), and Michigan Ten Metals (arsenic, barium, cadmium, chromium, copper, lead, mercury, selenium, silver, and zinc), and methane, or some combination thereof, to assess the RECs identified in ASTI's April 2015 Phase I ESA.

Analytical results identified concentrations of PCE in various location on the property that included exceedances of Part 201 Residential and Nonresidential DWP and/or GSIP cleanup criteria. Soil gas analytical results identified concentrations of PCE above MDEQ Residential Vapor Intrusion Screening Levels (VISLs) in SG-4 and SG-5.

Due to the presence of an adjoining dry cleaner, the PCE concentrations are likely from a dry cleaning release, therefore, PCE impacted soils removed from the property during redevelopment would be a "listed" hazardous waste under Michigan Part 111 and the Federal Resource Conservation and Recovery Act (RCRA). In addition to the PCE, concentrations of xylenes and various metals were above Part 201 Residential and Nonresidential DWP, GSIP, and/or Residential DC cleanup criteria in the soil samples collected. Concentrations of silver in groundwater were above Part 201 GSI cleanup criteria.

MAY 2016 SITE INVESTIGATION ACTIVITIES

On May 26, 2016, PM completed a scope of work consisting of the advancement of nine soil borings (SB-7 through SB-15) and installation of two temporary monitoring wells (TMW-11 and TMW-13) to further define the horizontal extent of chlorinated solvent soil and/or groundwater impacts (i.e. PCE and related compounds at the subject property). Fifteen soil and two groundwater samples were collected for analysis of VOCs. Refer to Figures 3 and 4 for the locations of soil borings and temporary monitoring wells completed by PM in 2016.

The purpose of the May 2016 activities was to evaluate and document the extent of chlorinated solvent concentrations in the sampled media.

DESCRIPTION OF MAY 2016 SOIL BORING LOCATIONS

Location and Total Depth (feet bgs)	Soil Sample Depth (feet bgs)	TMW Screen Interval and [DTW] (feet bgs)	Analysis	Objectives	Sample Selection (justification)
SB-7 (20.0)	5.0-6.0 and 9.5-10.5	NA	VOCs	Delineate the horizontal extent of chlorinated solvent impacts	**Soil:** Intermediate and deeper sand/clay interface samples collected based on the lack of field evidence of contamination. **GW:** Not encountered.
SB-8 (16.0)	8.0-9.0 and 15.0-16.0	NA	VOCs	Delineate the horizontal extent of chlorinated solvent impacts	**Soil:** Sample collected from the interval with the highest PID reading (17.0 ppm) and from the end of the boring. **GW:** Not encountered.
SB-9 (20.0)	4.0-5.0 and 10.0-11.0	NA	VOCs	Delineate the horizontal extent of chlorinated solvent impacts	**Soil:** Samples collected from the interval with observed fill material and from the sand/clay interface. **GW:** Not encountered.
SB-10 (20.0)	4.0-5.0 and 10.0-11.0	NA	VOCs	Delineate the horizontal extent of chlorinated solvent impacts	**Soil:** Samples collected from intervals with observed fill material and from the sand/clay interface. **GW:** Not encountered.

Location and Total Depth (feet bgs)	Soil Sample Depth (feet bgs)	TMW Screen Interval and [DTW] (feet bgs)	Analysis	Objectives	Sample Selection (justification)
SB/TMW-11 (18.0)	2.5-3.5 and 10.0-11.0	13.1-18.1 [16.19]	VOCs	Delineate the horizontal extent of chlorinated solvent impacts	**Soil:** Samples collected from the interval with observed fill material and from the sand/clay interface. **GW:** Sampled.
SB-12 (20.0)	5.5-6.5 and 10.5-11.5	NA	VOCs	Delineate the horizontal extent of chlorinated solvent impacts	**Soil:** Intermediate and deeper sand/clay interface samples collected based on the lack of field evidence of contamination. **GW:** Not encountered.
SB/TMW-13 (10.0*)	2.0-3.0*	3.7-8.7 [5.93]	VOCs	Delineate the horizontal extent of chlorinated solvent impacts	**Soil:** Sample collected above saturated zone based on the lack of field evidence of contamination. **GW:** Sampled.
SB-14 (10.0*)	2.0-3.0*	NA	VOCs	Delineate the horizontal extent of chlorinated solvent impacts	**Soil:** Sample collected from interval with observed staining. **GW:** Not encountered.
SB-15 (10.0*)	2.0-3.0*	NA	VOCs	Delineate the horizontal extent of chlorinated solvent impacts	**Soil:** Shallow sample collected to evaluate soils for removal. **GW:** Not encountered.

GW – Groundwater NA – Not Applicable bgs – below ground surface
PID – photoionization detector ppm – parts per million
* Depth measured from surface that is approximately 10 feet below street level elevation

Investigation Techniques and QA/QC Procedures

The soil borings were advanced to the desired depth using a direct push drill rig and/or stainless steel hand auger. Soil sampling was performed for soil classification, verification of subsurface geologic conditions, and for investigating the potential and/or extent of soil and groundwater (if encountered) contamination at the subject property.

During drilling operations, the drilling equipment was cleaned to minimize the possibility of cross contamination. These procedures included cleaning equipment with a phosphate free solution (i.e., Alconox®) and rinsing with distilled water after each sample collection. Drilling and sampling equipment was also cleaned in this manner prior to initiating field activities.

Soils collected from discrete sample intervals were screened using a PID to determine if VOCs were present. Soil from specific depths was placed in plastic bags, sealed, and allowed to volatilize. The headspace within each bag was then monitored with the PID. The PID is able to detect trace levels of organic compounds in the air space within the plastic bag. The PID utilizes a 10.6 electron volts (eV) lamp. Soil samples were collected from the soil borings based upon the highest PID reading, visual/olfactory evidence, a change in geology, surficial soil, and/or directly above saturated soil.

Soil samples for VOC analysis were preserved with methanol, in accordance with USEPA method 5035. The soil samples were placed in appropriately labeled containers with Teflon lined lids and/or sanitized glass jars, placed in an ice packed cooler, and transported under chain of custody procedures for laboratory analysis within applicable holding times.

The temporary monitoring wells were installed to collect groundwater samples for chemical analysis. New well assemblies were used for the temporary wells, consisting of a 5-foot long, one-inch diameter, 0.010-inch slot, schedule 40, PVC screen and a 1-inch diameter PVC casing. After the screen for the well was set to the desired depth, natural sands were allowed to collapse around the well screen. The wells were developed using either a new disposable 0.9-inch diameter bailer or peristaltic pump equipped with new, chemically inert, 3/8-inch diameter polyethylene and silicon tubing. Well development was performed by purging until clear, turbid free groundwater was observed coming from the well.

Groundwater samples collected from the temporary monitoring wells were generally collected using low flow sampling methods and protocols using a peristaltic pump equipped with new, chemically inert, 3/8-inch diameter polyethylene and silicon tubing. The samples were collected into preserved vials or bottles or within unpreserved bottles or jars, as applicable for the analyte and/or method.

All samples collected were transported under chain of custody procedures for laboratory analysis within applicable holding times. Upon completion of the investigation, the temporary monitoring wells were removed from the soil borings and the soil borings were abandoned by placing the soil cuttings back into the borehole, filling the void with bentonite chips, hydrating the chips, resurfacing and returning the area to its pre-drilling condition.

GEOLOGY/HYDROGEOLOGY

Based on review of soil boring logs from site investigations completed between 2006 and 2016, the soil stratigraphy at the subject property generally consists of sand and/or clay fill to depth ranging between 8.0 feet bgs and 18.0 feet bgs, underlain by native sand and clay lenses (i.e. interbedded sand and clay) to a depth of at least 74.0 feet bgs, the maximum depth explored. Fill material and debris was encountered at varying thicknesses between the surface to a depth of approximately 18.0 feet bgs. In general, the fill material increases in quantity and depth towards the northeastern portion of the subject property.

Limited, discontinuous, and perched groundwater was at varying depths in four of the 15 soil borings completed by PM in 2015 and 2016 between depths of 15.0 and 25 feet below street level elevation. Additionally, the eastern portion of the subject property is located within a flood plain area that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights. The base flood elevation is approximately 740 feet per the FEMA Flood Insurance Study (FIS).

The soil boring logs for soil borings advanced by PM are included in Appendix A, which consist of site specific geology, sample depths, and temporary monitoring well details.

LOCATION OF CONTAMINATED MEDIA ON THE SUBJECT PROPERTY

The analytical results for the samples collected during site investigation activities conducted between 2006 and 2016 were compared with the MDEQ Generic Cleanup Criteria and Screening Levels as presented in Part 201 Rules 299.1 through 299.50, dated December 30,

2013 entitled "Cleanup Criteria Requirements for Response Activity", in accordance with Section 20120a(1) using the Residential and Nonresidential cleanup criteria. Analytical results, when applicable, were compared to VISLs presented in the MDEQ May 2013 Guidance Document for the Vapor Intrusion Pathway.

The analytical results are summarized on Figures 3 and 4 and in Tables 1 through 4. The laboratory analytical reports are included in Appendix B.

Soil Analytical Results

The table below summarizes the analytical results in soil samples from site investigation activities completed between 2006 and 2016 for target analytes that may represent listed hazardous waste. Any detectable concentrations would be representative of a listed hazardous waste as the presumed source is from dry cleaning operations. All soil analytical results are summarized on Figure 3 and in Tables 1 through 3.

SUMMARY OF PCE/TCE SOIL ANALYTICAL RESULTS

Part 201 Cleanup Criteria	Target Analyte	Soil Sample Location(s)		
<MDL	PCE/TCE	SP1 (4.0-5.0) SP5 (3.0-4.0) SB-2 (6.0-7.0) SB-8 (15.0-16.0) SB-12 (10.5-11.5)	SP2 (4.5-5.5) SP7 (9.0-10.0) SB-3 (19.0-20.0) SB-10 (4.0-5.0) SB-13 (2.0-3.0)	SP3 (0.0-2.0) SB-1 (5.5-6.5) SB-8 (8.0-9.0) SB-10 (10.0-11.0) SB-15 (2.0-3.0)
>MDL and Part 201 Criteria not exceeded	PCE	SB-5 (15.0-16.0)	SB-6 (4.0-5.0)	
DWP (R/NR)	PCE	SP6 (7.0-8.0) SB-7 (5.0-6.0) SB-9 (10.0-11.0) SB-12 (5.5-6.5)	SB-4 (7.5-8.5) SB-7 (9.5-10.5) SB-11 (2.5-3.5) SB-14 (2.0-3.0)	SB-4 (13.0-14.0) SB-9 (4.0-5.0) SB-11 (10.0-11.0)
	TCE	SB-7 (9.5-10.5)		
GSIP	PCE	SP6 (7.0-8.0) SB-12 (5.5-6.5)	SB-4 (7.5-8.5)	SB-7 (9.5-10.5)

MDL – method detection limit
R – Residential
NR – Nonresidential
PCE - Tetrachloroethylene
DWP – Drinking Water Protection
GSIP – Groundwater Surface Water Interface Protection
TCE - Trichloroethylene

In addition to the summarized results above, a concentration of xylenes was identified in SB-11 (10.0-11.0 feet bgs) above Part 201 GSIP cleanup criteria in the soil samples collected in May 2016. Concentrations of various petroleum VOCs were identified in SB-8, SB-10, SB-11, and SB-13 that are below the most restrictive Part 201 cleanup criteria.

Groundwater Analytical Results

Groundwater analytical results for site investigation activities conducted between 2006 and 2016 are presented on Figure 4 and in Table 4. A concentration of benzene was identified in TMW-11 above Part 201 Residential and Nonresidential DW cleanup criteria. Concentrations of PCE and/or cis-1,2-dichloroethylene were identified in each of the two groundwater samples collected, below the most restrictive Part 201 cleanup criteria.

Soil Gas Analytical Results

Soil gas analytical results identified concentrations of PCE above MDEQ Residential Vapor Intrusion Screening Levels (VISLs) in SG-4 and SG-5. Concentrations of various VOCs were identified in the reaming samples that are below the most restrictive MDEQ VISLs. Refer to Figure 5 and Table 5 for additional information on the soil gas sample locations and results.

CONCLUSIONS AND RECOMMENDATIONS

On May 26, 2016, PM completed a scope of work consisting of the advancement of nine soil borings (SB-7 through SB-15) and installation of two temporary monitoring wells (TMW-11 and TMW-13) to further define the horizontal extent of chlorinated solvent impacts in soil and groundwater at the subject property. Fifteen soil and two groundwater samples were collected for analysis of VOCs. Refer to Figures 3 and 4 for the locations of soil borings and temporary monitoring wells completed by PM in 2016.

Soil analytical results identified additional concentrations of chlorinated solvents exceeding Part 201 cleanup criteria. Limited groundwater analytical results identified concentrations of PCE in the two samples collected in 2016. The extent of soil and groundwater impact has not been fully defined. Due to the nature of the soil impacts (i.e. chlorinated solvents associated with dry cleaning operations, any soil and groundwater impacted with chlorinated solvents that are removed during development would require disposal as a listed hazardous waste. Based on the analytical results, the estimated in place volume of listed hazardous waste requiring removal as part of the development is 2,800 cubic yards that would represents approximately 4,500 tons of soils dependent on soil composition.

Listed hazardous waste requires specialized handling, disposal, and reporting related to soil and/or groundwater removal. Additional costs may also be incurred if the soil is determined to be land disposal restricted (LDR). To ensure potential development related disposal costs are well understood, PM recommends further delineation of chlorinated solvent soil impacts prior to removal. Additionally, removal of impacted soils requiring disposal as hazardous waste is to be completed prior to additional site work to minimize the volume of listed hazardous waste disposal and prevent exacerbation of the identified contamination during development activities.

If you have any questions related to this report, please do not hesitate to contact our office at (800) 313-2966.

Sincerely,
PM Environmental, Inc.

Jamie Antoniewicz, P.E.
Project Engineer

J. Adam Patton, CHMM
Manager of Site Investigation Services

FIGURES

Figure 1: Site Vicinity Diagram
Figure 2: Generalized Diagram of the Subject Property and Adjoining Properties
Figure 3: Soil Boring/Temporary Monitoring Well/Soil Gas Location Map with Soil Analytical Results
Figure 4: Soil Boring/Temporary Monitoring Well/Soil Gas Location Map with Groundwater Analytical Results
Figure 5: Soil Boring/Temporary Monitoring Well/Soil Gas Location Map with Soil Gas Analytical Results

TABLES

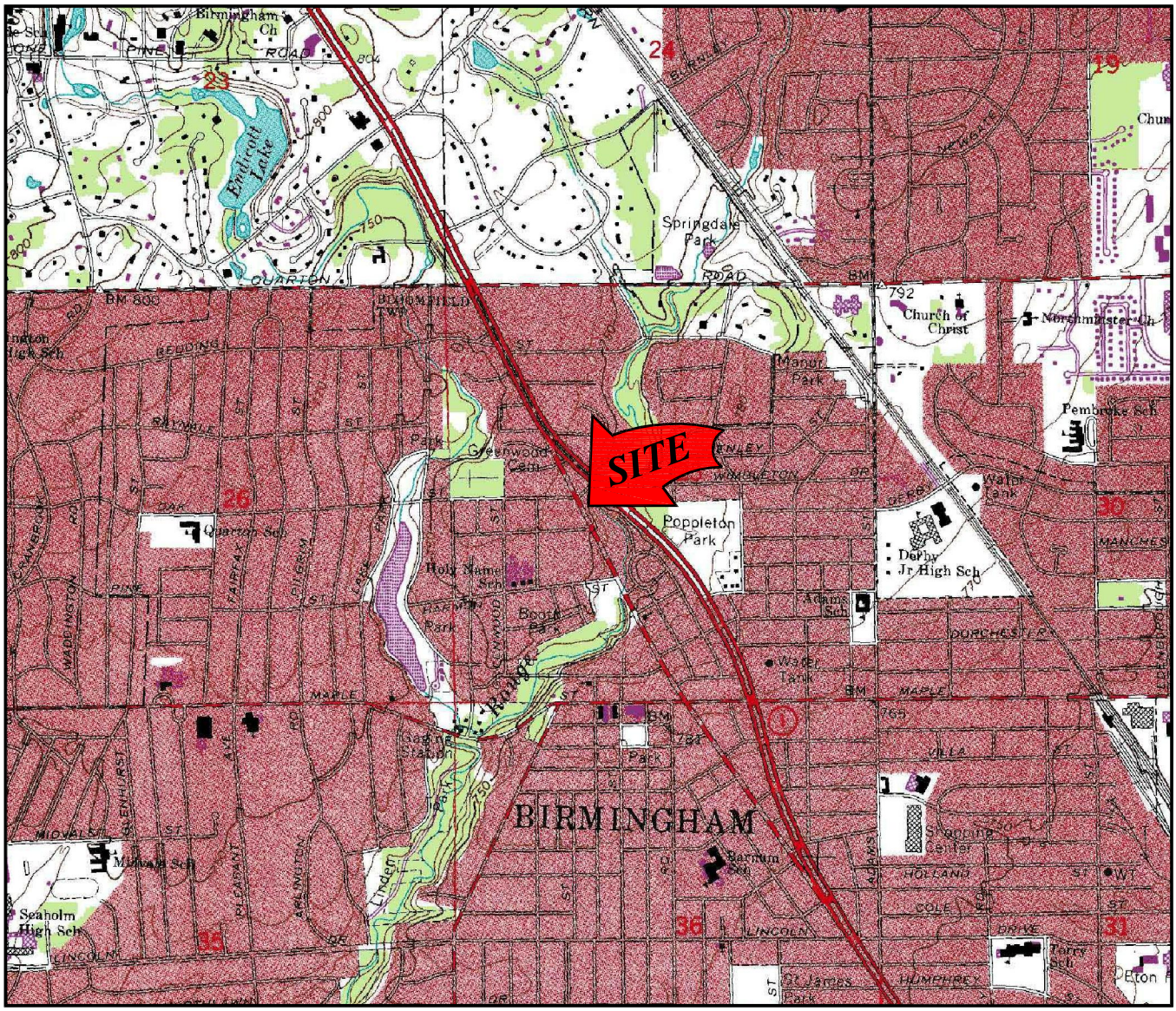
Table 1: Summary of Soil Analytical Results: VOCs
Table 2: Summary of Soil Analytical Results: PNAs
Table 3: Summary of Soil Analytical Results: PCBs and Metals
Table 4: Summary of Groundwater Analytical Results: VOCs, PNAs, Michigan 10 Metals, and Methane
Table 5: Summary of Soil Gas Analytical Results: VOCs and Methane

APPENDICES

Appendix A: Soil Boring Logs
Appendix B: Laboratory Analytical Reports

Figures

PM ENVIRONMENTAL Environmental & Engineering Services



OAKLAND COUNTY

SCALE 1:24,000

1 MILE 1/2 MILE 0 1 MILE

FIGURE 1

PROPERTY VICINITY MAP

USGS, 7.5 MINUTE SERIES

BIRMINGHAM, MI QUADRANGLE, 1968. PHOTO REVISED 1981.

PM ENVIRONMENTAL — Environmental & Engineering Services	PROJ: VACANT LAND 856 NORTH OLD WOODWARD AVENUE BIRMINGHAM, MI	THIS IS NOT A LEGAL SURVEY VERIFY SCALE 0 — 2,000' IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.	DRN BY: ES	DATE: 8/13/2015
			CHKD BY: NK	SCALE: 1" = 2,000'
			FILE NAME: 01-5889-0-001F01R00	

36101 WOODWARD AVENUE
COMMERCIAL BUILDING
AND GAS STATION

35975 WOODWARD AVENUE
FORMER GAS STATION
(OPEN LUST SITE)

WOODWARD AVENUE

900 NORTH OLD
WOODWARD AVENUE
DOUGLAS CLEANERS

APPROXIMATE LOCATION OF
FORMER GASOLINE DISPENSING STATION

GPR LIMITATION:
STEEP HILL

ASPHALT PAVED

ASPHALT PAVED/ GRAVEL

GRASS

ELEC

NORTH OLD WOODWARD AVENUE

887 NORTH OLD
WOODWARD AVENUE
FORMER GAS STATION

MULTI-FAMILY
RESIDENTIAL

700-800 NORTH OLD
WOODWARD AVENUE
MULTI-TENANT
COMMERCIAL BUILDING

794 NORTH OLD
WOODWARD AVENUE
FORMER DRY CLEANER

ROUGE RIVER

N

LEGEND:

- SUBJECT PROPERTY
- FENCE
- ELECTRIC
- PROPOSED SITE FEATURES
- PARCEL / LOT BOUNDARIES
- POLE MOUNTED TRANSFORMER
- GPR SURVEY AREA

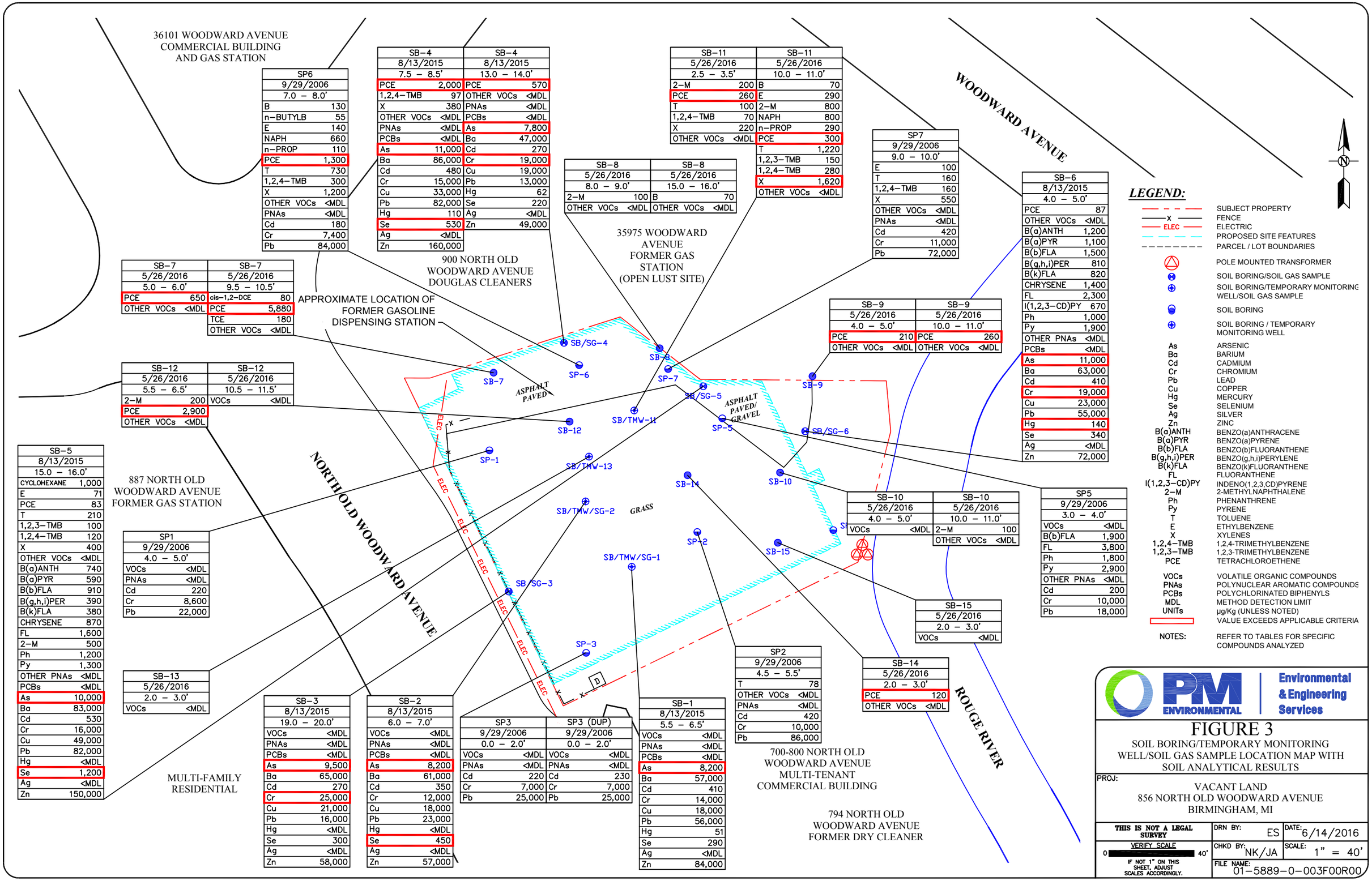
PM ENVIRONMENTAL | Environmental & Engineering Services

FIGURE 2

GENERALIZED DIAGRAM OF THE SUBJECT PROPERTY AND ADJOINING PROPERTIES WITH GPR SURVEY AREA

PROJ:
VACANT LAND
856 NORTH OLD WOODWARD AVENUE
BIRMINGHAM, MI

THIS IS NOT A LEGAL SURVEY	DRN BY: ES	DATE: 6/14/2016
VERIFY SCALE 0 [redacted] 40' IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.	CHKD BY: NK/JA	SCALE: 1" = 40'
	FILE NAME: 01-5889-0-003F00R00	



SP6	
9/29/2006	
7.0 – 8.0'	
B	130
n-BUTYLB	55
E	140
NAPH	660
n-PROP	110
PCE	1,300
T	730
1,2,4-TMB	300
X	1,200
OTHER VOCs	<MDL
PNAs	<MDL
Cd	180
Cr	7,400
Pb	84,000

SB-4	
8/13/2015	
7.5 – 8.5'	
PCE	2,000
1,2,4-TMB	97
X	380
OTHER VOCs	<MDL
PNAs	<MDL
PCBs	<MDL
As	11,000
Ba	86,000
Cd	480
Cr	15,000
Cu	33,000
Pb	82,000
Hg	110
Se	530
Ag	<MDL
Zn	160,000

SB-4	
8/13/2015	
13.0 – 14.0'	
PCE	570
OTHER VOCs	<MDL
PNAs	<MDL
PCBs	<MDL
As	7,800
Ba	47,000
Cd	270
Cr	19,000
Cu	19,000
Pb	13,000
Hg	62
Se	220
Ag	<MDL
Zn	49,000

SB-11	
5/26/2016	
2.5 – 3.5'	
2-M	200
PCE	260
T	100
1,2,4-TMB	70
X	220
OTHER VOCs	<MDL

SB-11	
5/26/2016	
10.0 – 11.0'	
B	70
E	290
2-M	800
NAPH	800
n-PROP	290
PCE	300
T	1,220
1,2,3-TMB	150
1,2,4-TMB	280
X	1,620
OTHER VOCs	<MDL

SB-8	
5/26/2016	
8.0 – 9.0'	
2-M	100
OTHER VOCs	<MDL

SB-8	
5/26/2016	
15.0 – 16.0'	
B	70
OTHER VOCs	<MDL

SP7	
9/29/2006	
9.0 – 10.0'	
E	100
T	160
1,2,4-TMB	160
X	550
OTHER VOCs	<MDL
PNAs	<MDL
Cd	420
Cr	11,000
Pb	72,000

SB-6	
8/13/2015	
4.0 – 5.0'	
PCE	87
OTHER VOCs	<MDL
B(a)ANTH	1,200
B(a)PYR	1,100
B(b)FLA	1,500
B(g,h,i)PER	810
B(k)FLA	820
CHRYSENE	1,400
FL	2,300
I(1,2,3-CD)PY	670
Ph	1,000
Py	1,900
OTHER PNAs	<MDL
PCBs	<MDL
As	11,000
Ba	63,000
Cd	410
Cr	19,000
Cu	23,000
Pb	55,000
Hg	140
Se	340
Ag	<MDL
Zn	72,000

SB-7	
5/26/2016	
5.0 – 6.0'	
PCE	650
OTHER VOCs	<MDL

SB-7	
5/26/2016	
9.5 – 10.5'	
cis-1,2-DCE	80
PCE	5,880
TCE	180
OTHER VOCs	<MDL

SB-9	
5/26/2016	
4.0 – 5.0'	
PCE	210
OTHER VOCs	<MDL

SB-9	
5/26/2016	
10.0 – 11.0'	
PCE	260
OTHER VOCs	<MDL

SB-12	
5/26/2016	
5.5 – 6.5'	
2-M	200
PCE	2,900
OTHER VOCs	<MDL

SB-12	
5/26/2016	
10.5 – 11.5'	
VOCs	<MDL

SB-5	
8/13/2015	
15.0 – 16.0'	
CYCLOHEXANE	1,000
E	71
PCE	83
T	210
1,2,3-TMB	100
1,2,4-TMB	120
X	400
OTHER VOCs	<MDL
B(a)ANTH	740
B(a)PYR	590
B(b)FLA	910
B(g,h,i)PER	390
B(k)FLA	380
CHRYSENE	870
FL	1,600
2-M	500
Ph	1,200
Py	1,300
OTHER PNAs	<MDL
PCBs	<MDL
As	10,000
Ba	83,000
Cd	530
Cr	16,000
Cu	49,000
Pb	82,000
Hg	<MDL
Se	1,200
Ag	<MDL
Zn	150,000

SP1	
9/29/2006	
4.0 – 5.0'	
VOCs	<MDL
PNAs	<MDL
Cd	220
Cr	8,600
Pb	22,000

SB-13	
5/26/2016	
2.0 – 3.0'	
VOCs	<MDL

SB-10	
5/26/2016	
4.0 – 5.0'	
VOCs	<MDL

SB-10	
5/26/2016	
10.0 – 11.0'	
2-M	100
OTHER VOCs	<MDL

SP5	
9/29/2006	
3.0 – 4.0'	
VOCs	<MDL
B(b)FLA	1,900
FL	3,800
Ph	1,800
Py	2,900
OTHER PNAs	<MDL
Cd	200
Cr	10,000
Pb	18,000

SB-15	
5/26/2016	
2.0 – 3.0'	
VOCs	<MDL

SP2	
9/29/2006	
4.5 – 5.5'	
T	78
OTHER VOCs	<MDL
PNAs	<MDL
Cd	420
Cr	10,000
Pb	86,000

SB-14	
5/26/2016	
2.0 – 3.0'	
PCE	120
OTHER VOCs	<MDL

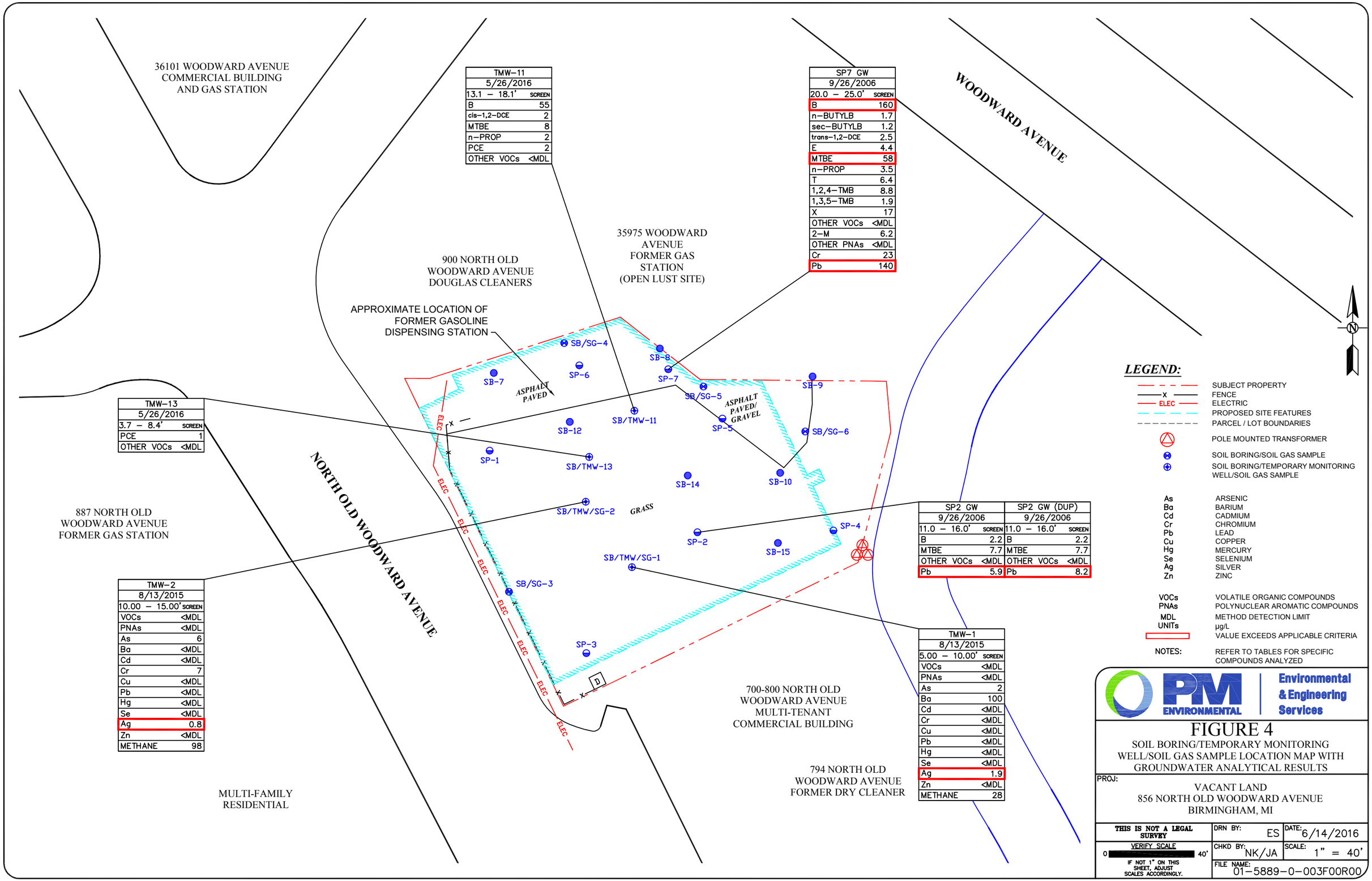
SB-3	
8/13/2015	
19.0 – 20.0'	
VOCs	<MDL
PNAs	<MDL
PCBs	<MDL
As	9,500
Ba	65,000
Cd	270
Cr	25,000
Cu	21,000
Pb	16,000
Hg	<MDL
Se	300
Ag	<MDL
Zn	58,000

SB-2	
8/13/2015	
6.0 – 7.0'	
VOCs	<MDL
PNAs	<MDL
PCBs	<MDL
As	8,200
Ba	61,000
Cd	350
Cr	12,000
Cu	18,000
Pb	23,000
Hg	<MDL
Se	450
Ag	<MDL
Zn	57,000

SP3	
9/29/2006	
0.0 – 2.0'	
VOCs	<MDL
PNAs	<MDL
Cd	220
Cr	7,000
Pb	25,000

SP3 (DUP)	
9/29/2006	
0.0 – 2.0'	
VOCs	<MDL
PNAs	<MDL
Cd	230
Cr	7,000
Pb	25,000

SB-1	
8/13/2015	
5.5 – 6.5'	
VOCs	<MDL
PNAs	<MDL
PCBs	<MDL
As	8,200
Ba	57,000
Cd	410
Cr	14,000
Cu	18,000
Pb	56,000
Hg	51
Se	290
Ag	<MDL
Zn	84,000



TMW-11	
5/26/2016	
13.1 – 18.1' SCREEN	
B	55
cis-1,2-DCE	2
MTBE	8
n-PROP	2
PCE	2
OTHER VOCs	<MDL

SP7 GW	
9/26/2006	
20.0 – 25.0' SCREEN	
B	160
n-BUTYLB	1.7
sec-BUTYLB	1.2
trans-1,2-DCE	2.5
E	4.4
MTBE	58
n-PROP	3.5
T	6.4
1,2,4-TMB	8.8
1,3,5-TMB	1.9
X	17
OTHER VOCs	<MDL
2-M	6.2
OTHER PNAs	<MDL
Cr	23
Pb	140

TMW-13	
5/26/2016	
3.7 – 8.4' SCREEN	
PCE	1
OTHER VOCs	<MDL

SP2 GW		SP2 GW (DUP)	
9/26/2006		9/26/2006	
11.0 – 16.0' SCREEN		11.0 – 16.0' SCREEN	
B	2.2	B	2.2
MTBE	7.7	MTBE	7.7
OTHER VOCs	<MDL	OTHER VOCs	<MDL
Pb	5.9	Pb	8.2

TMW-2	
8/13/2015	
10.00 – 15.00' SCREEN	
VOCs	<MDL
PNAs	<MDL
As	6
Ba	<MDL
Cd	<MDL
Cr	7
Cu	<MDL
Pb	<MDL
Hg	<MDL
Se	<MDL
Ag	0.8
Zn	<MDL
METHANE	98

TMW-1	
8/13/2015	
5.00 – 10.00' SCREEN	
VOCs	<MDL
PNAs	<MDL
As	2
Ba	100
Cd	<MDL
Cr	<MDL
Cu	<MDL
Pb	<MDL
Hg	<MDL
Se	<MDL
Ag	1.9
Zn	<MDL
METHANE	28

FIGURE 4

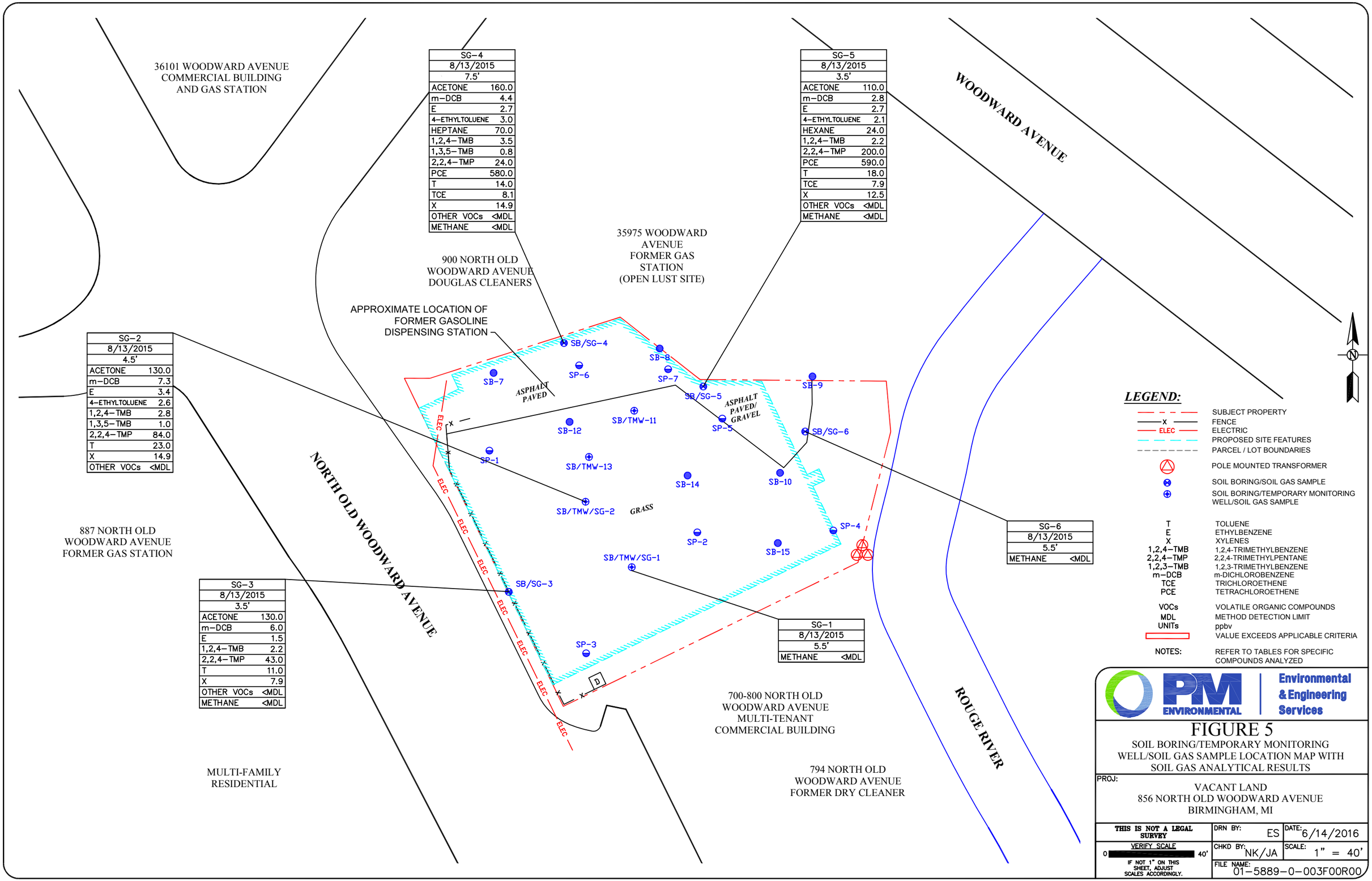
SOIL BORING/TEMPORARY MONITORING WELL/SOIL GAS SAMPLE LOCATION MAP WITH GROUNDWATER ANALYTICAL RESULTS

PROJ: VACANT LAND
856 NORTH OLD WOODWARD AVENUE
BIRMINGHAM, MI

THIS IS NOT A LEGAL SURVEY

VERIFY SCALE 0 40'
IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DRN BY: ES
DATE: 6/14/2016
CHKD BY: NK/JA
SCALE: 1" = 40'
FILE NAME: 01-5889-0-003F00R00



SG-4	
8/13/2015	
7.5'	
ACETONE	160.0
m-DCB	4.4
E	2.7
4-ETHYLTOLUENE	3.0
HEPTANE	70.0
1,2,4-TMB	3.5
1,3,5-TMB	0.8
2,2,4-TMP	24.0
PCE	580.0
T	14.0
TCE	8.1
X	14.9
OTHER VOCs	<MDL
METHANE	<MDL

SG-5	
8/13/2015	
3.5'	
ACETONE	110.0
m-DCB	2.8
E	2.7
4-ETHYLTOLUENE	2.1
HEXANE	24.0
1,2,4-TMB	2.2
2,2,4-TMP	200.0
PCE	590.0
T	18.0
TCE	7.9
X	12.5
OTHER VOCs	<MDL
METHANE	<MDL

SG-2	
8/13/2015	
4.5'	
ACETONE	130.0
m-DCB	7.3
E	3.4
4-ETHYLTOLUENE	2.6
1,2,4-TMB	2.8
1,3,5-TMB	1.0
2,2,4-TMP	84.0
T	23.0
X	14.9
OTHER VOCs	<MDL

SG-6	
8/13/2015	
5.5'	
METHANE	<MDL

SG-3	
8/13/2015	
3.5'	
ACETONE	130.0
m-DCB	6.0
E	1.5
1,2,4-TMB	2.2
2,2,4-TMP	43.0
T	11.0
X	7.9
OTHER VOCs	<MDL
METHANE	<MDL

SG-1	
8/13/2015	
5.5'	
METHANE	<MDL

Tables

PM ENVIRONMENTAL Environmental & Engineering Services

TABLE 1
SUMMARY OF SOIL ANALYTICAL RESULTS
VOCs
856 NORTH OLD WOODWARD AVENUE, BIRMINGHAM, MICHIGAN
PM PROJECT #01-5889-0-0003

VOLATILE ORGANIC COMPOUNDS (µg/Kg)			Benzene	n-Butylbenzene	Cyclohexane	cis-1,2-Dichloroethene	Ethyl benzene	2-Methylnaphthalene	Naphthalene	n-Propylbenzene	Tetrachloroethene	Toluene	Trichloroethene	1,2,3-Trimethylbenzene*	1,2,4-Trimethylbenzene	Xylenes	Other VOCs
Chemical Abstract Service Number (CAS#)			71432	104518	110827	156592	100414	91576	91203	103651	127184	108883	79016	526738	95636	1330207	Various
Sample ID	**Sample Date**	**Sample Depth (feet bgs)**	**VOCs**														
SP1	9/29/2006	4.0-5.0	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
SP2	9/29/2006	4.5-5.5*	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	78	<MDL	<MDL	<MDL	<MDL	<MDL
SP3	9/29/2006	0.0-2.0*	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
SP3 (DUP)			<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
SP5	9/29/2006	3.0-4.0	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
SP6	9/29/2006	7.0-8.0	130	55	<MDL	<MDL	140	<MDL	660	110	**1,300**	730	<MDL	<MDL	300	1,200	<MDL
SP7	9/29/2006	9.0-1.0	<MDL	<MDL	<MDL	<MDL	100	<MDL	<MDL	<MDL	<MDL	160	<MDL	<MDL	160	550	<MDL
SB-1	8/13/2015	5.5-6.5*	<50	<50	<50	<50	<50	<250	<250	<50	<50	<50	<50	<50	<50	<150	<MDL
SB-2	8/13/2015	6.0-7.0*	<50	<50	<50	<50	<50	<250	<250	<50	<50	<50	<50	<50	<50	<150	<MDL
SB-3	8/13/2015	19.0-20.0	<50	<50	<50	<50	<50	<250	<250	<50	<50	<50	<50	<50	<50	<150	<MDL
SB-4	8/13/2015	7.5-8.5	<50	<50	<50	<50	<50	<250	<250	<50	**2,000**	<50	<50	<50	97	380	<MDL
SB-4	8/13/2015	13.0-14.0	<50	<50	<50	<50	<50	<250	<250	<50	**570**	<50	<50	<50	<50	<150	<MDL
SB-5	8/13/2015	15.0-16.0	<50	<50	1,000	<50	71	<250	<250	<50	83	210	<50	100	120	400	<MDL
SB-6	8/13/2015	4.0-5.0	<50	<50	<50	<50	<50	<250	<250	<50	87	<50	<50	<50	<50	<150	<MDL
SB-7	5/26/2016	5.0-6.0	<70	<70	NA	<70	<70	<100	<300	<70	**650**	<70	<70	<70	<70	<170	<MDL
SB-7	5/26/2016	9.5-10.5	<80	<80	NA	80	<80	<200	<400	<80	**5,880**	<80	**180**	<80	<80	<280	<MDL
SB-8	5/26/2016	8.0-9.0	<70	<70	NA	<70	<70	100	<300	<70	<70	<70	<70	<70	<70	<170	<MDL
SB-8	5/26/2016	15.0-16.0	70	<60	NA	<60	<60	<100	<300	<60	<60	<60	<60	<60	<60	<160	<MDL
SB-9	5/26/2016	4.0-5.0	<70	<70	NA	<70	<70	<100	<300	<70	**210**	<70	<70	<70	<70	<170	<MDL
SB-9	5/26/2016	10.0-11.0	<70	<70	NA	<70	<70	<100	<300	<70	**260**	<70	<70	<70	<70	<170	<MDL
SB-10	5/26/2016	4.0-5.0	<60	<60	NA	<60	<60	<100	<300	<60	<60	<60	<60	<60	<60	<160	<MDL
SB-10	5/26/2016	10.0-11.0	<60	<60	NA	<60	<60	100	<300	<60	<60	<60	<60	<60	<60	<160	<MDL
SB-11	5/26/2016	2.5-3.5	<60	<60	NA	<60	<60	200	<300	<60	**260**	100	<60	<60	70	220	<MDL
SB-11	5/26/2016	10.0-11.0	70	<70	NA	<70	290	800	800	290	**300**	1,220	<70	150	280	**1,620**	<MDL
SB-12	5/26/2016	5.5-6.5	<70	<70	NA	<70	<70	200	<300	<70	**2,900**	<70	<70	<70	<70	<170	<MDL
SB-12	5/26/2016	10.5-11.5	<70	<70	NA	<70	<70	<100	<400	<70	<70	<70	<70	<70	<70	<170	<MDL
SB-13	5/26/2016	2.0-3.0*	<60	<60	NA	<60	<60	<100	<300	<60	<60	<60	<60	<60	<60	<160	<MDL
SB-14	5/26/2016	2.0-3.0*	<60	<60	NA	<60	<60	<100	<300	<60	**120**	<60	<60	<60	<60	<160	<MDL
SB-15	5/26/2016	2.0-3.0*	<70	<70	NA	<70	<70	<100	<300	<70	<70	<70	<70	<70	<70	<170	<MDL
Cleanup Criteria Requirements for Response Activity (R 299.1 - R 299.50) **Generic Soil Cleanup Criteria Tables 2 and 3: Residential and Non-Residential Part 201 Generic Cleanup Criteria and Screening Levels/Part 213 Risk-Based Screening Levels, December 30, 2013**																	
Residential (µg/Kg)																	
Drinking Water Protection (Res DWP)			100	1,600	NL	1,400	1,500	57,000	35,000	1,600	100	16,000	100	1,800	2,100	5,600	Various
Groundwater Surface Water Interface Protection (GSIP)			4,000 {X}	ID	NL	12,000	360	4,200	730	ID	1,200 {X}	5,400	4,000 {X}	570	570	820	Various
Soil Volatilization to Indoor Air Inhalation (Res SVII)			1,600	ID	NL	22,000	87,000	2.70E+06	2.50E+05	ID	11,000	3.3E+05 {C}	1,000	2.6E+06 {C}	4.3E+06 {C}	6.3E+06 {C}	Various
Ambient Air Infinite Source Volatile Soil Inhalation (Res VSI)			13,000	ID	NL	1.80E+05	7.20E+05	1.50E+06	3.00E+05	ID	1.70E+05	2.80E+06	11,000	1.60E+07	2.10E+07	4.60E+07	Various
Ambient Air Finite VSI for 5 Meter Source Thickness			34,000	ID	NL	4.20E+05	1.00E+06	1.50E+06	3.00E+05	ID	4.80E+05	5.10E+06	25,000	3.80E+08	5.00E+08	6.10E+07	Various
Ambient Air Finite VSI for 2 Meter Source Thickness			79,000	ID	NL	9.90E+05	2.20E+06	1.50E+06	3.00E+05	ID	1.1E+06	1.20E+07	57,000	3.80E+08	5.00E+08	1.30E+08	Various
Ambient Air Particulate Soil Inhalation (Res PSI)			3.80E+08	2.00E+09	NL	2.30E+09	1.00E+10	6.70E+08	2.00E+08	1.30E+09	2.7E+09	2.70E+10	1.30E+08	8.20E+10	8.20E+10	2.90E+11	Various
Direct Contact (Res DC)			1.80E+05	2.50E+06	NL	2.5E+06 {C}	2.2E+07 {C}	8.10E+06	1.60E+07	2.50E+06	2.0E+05 {C}	5.0E+07 {C}	5.0E+5 {C,DD}	3.2E+07 {C}	3.2E+07 {C}	4.1E+08 {C}	Various
Nonresidential (µg/Kg)																	
Drinking Water Protection (Nonres DWP)			100	4,600	NL	1,400	1,500	1.70E+05	1.00E+05	4,600	100	16,000	100	1,800	2,100	5,600	Various
Soil Volatilization to Indoor Air Inhalation (Nonres SVII)			8,400	ID	NL	41,000	4.6E+05 {C}	4.90E+06	4.70E+05	ID	21,000	6.1E+05 {C}	1,900	4.8E+06 {C}	8.0E+06 {C}	1.2E+07 {C}	Various
Ambient Air Infinite Source Volatile Soil Inhalation (Nonres VSI)			45,000	ID	NL	2.10E+05	2.40E+06	1.80E+06	3.50E+05	ID	2.10E+05	3.30E+06	14,000	1.90E+07	2.50E+07	5.40E+07	Various
Ambient Air Finite VSI for 5 Meter Source Thickness			99,000	ID	NL	4.30E+05	3.10E+06	1.80E+06	3.50E+05	ID	4.90E+05	3.60E+07	25,000	4.60E+08	6.00E+08	6.50E+07	Various
Ambient Air Finite VSI for 2 Meter Source Thickness			2.30E+05	ID	NL	1.00E+06	6.50E+06	1.80E+06	3.50E+05	ID	1.1E+06	3.60E+07	58,000	4.60E+08	6.00E+08	1.30E+08	Various
Ambient Air Particulate Soil Inhalation (Nonres PSI)			4.70E+08	ID	NL	1.00E+09	1.30E+10	2.90E+08	8.80E+07	5.90E+08	1.2E+09	1.20E+10	5.90E+07	3.60E+10	3.60E+10	1.30E+11	Various
Direct Contact (Nonres DC)			8.40E+05 {C}	8.00E+06	NL	8.0E+06 {C}	7.1E+07 {C}	2.60E+07	5.20E+07	8.00E+06	9.3E+05 {C}	1.6E+08 {C}	6.6E+05 {C,DD}	1.0E+08 {C}	1.0E+08 {C}	1.0E+09 {C}	Various
Screening Levels (µg/Kg)																	
Soil Saturation Concentration Screening Levels (Csat)			4.00E+05	1.00E+07	NL	6.40E+05	1.40E+05	NA	NA	1.00E+07	88,000	2.50E+05	5.00E+05	94,000	1.10E+05	1.50E+05	Various

[ ]	Applicable Criterion/RBSL Exceeded
BOLD	Value Exceeds Applicable Criterion/RBSL
bgs	Below Ground Surface (feet)
1	1,2,3-Trimethylbenzene RBSLs based on the more restrictive of 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene.
MDL	Laboratory method detection limit
NA	Not Applicable
NL	Not Listed
NLL	Not Likely to Leach
NLV	Not Likely to Volatilize
ID	Insufficient Data
*	Measured from a point approximately 10 feet below street elevation

TABLE 2
SUMMARY OF SOIL ANALYTICAL RESULTS
PNAs
856 NORTH OLD WOODWARD AVENUE, BIRMINGHAM, MICHIGAN
PM PROJECT # 01-5889-0-0003

POLYNUCLEAR AROMATIC COMPOUNDS (PNAs) (µg/Kg)			Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Fluoranthene	Indeno(1,2,3-cd)pyrene	2-Methylnaphthalene	Phenanthrene	Pyrene
Chemical Abstract Service Number (CAS#)			56553	50328	205992	191242	207089	218019	206440	193395	91576	85018	129000
Sample ID	**Sample Date**	**Sample Depth (feet bgs)**	**PNAs**										
SP1	9/29/2006	4.0-5.0	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
SP2	9/29/2006	4.5-5.5*	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
SP3	9/29/2006	0.0-2.0*	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
SP3 (DUP)			<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
SP5	9/29/2006	3.0-4.0	<MDL	<MDL	1,900	<MDL	<MDL	<MDL	3,800	<MDL	<MDL	1,800	2,900
SP6	9/29/2006	7.0-8.0	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
SP7	9/29/2006	9.0-1.0	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
SB-1	8/13/2015	5.5-6.5*	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330
SB-2	8/13/2015	6.0-7.0*	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330
SB-3	8/13/2015	19.0-20.0	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330
SB-4	8/13/2015	7.5-8.5	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330
SB-4	8/13/2015	13.0-14.0	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330	<330
SB-5	8/13/2015	15.0-16.0	740	590	910	390	380	870	1,600	<330	500	1,200	1,300
SB-6	8/13/2015	4.0-5.0	1,200	1,100	1,500	810	820	1,400	2,300	670	<330	1,000	1,900
Cleanup Criteria Requirements for Response Activity (R 299.1 - R 299.50) **Generic Soil Cleanup Criteria Tables 2 and 3: Residential and Non-Residential Part 201 Generic Cleanup Criteria and Screening Levels/Part 213 Risk-Based Screening Levels, December 30, 2013**													
Residential (µg/Kg)													
Statewide Default Background Levels			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Drinking Water Protection (Res DWP)			NLL	NLL	NLL	NLL	NLL	NLL	7.30E+05	NLL	57,000	56,000	4.80E+05
Groundwater Surface Water Interface Protection (GSIP)			NLL	NLL	NLL	NLL	NLL	NLL	5,500	NLL	4,200	2,100	ID
Soil Volatilization to Indoor Air Inhalation (Res SVII)			NLV	NLV	ID	NLV	NLV	ID	1.0E+9 {D}	NLV	2.70E+06	2.8E+06	1.0E+9 {D}
Ambient Air Infinite Source Volatile Soil Inhalation (Res VSI)			NLV	NLV	ID	NLV	NLV	ID	7.40E+08	NLV	1.50E+06	1.60E+05	6.5E+08
Ambient Air Finite VSI for 5 Meter Source Thickness			NLV	NLV	ID	NLV	NLV	ID	7.4E+08	NLV	1.50E+06	1.60E+05	6.5E+08
Ambient Air Finite VSI for 2 Meter Source Thickness			NLV	NLV	ID	NLV	NLV	ID	7.4E+08	NLV	1.50E+06	1.60E+05	6.5E+08
Ambient Air Particulate Soil Inhalation (Res PSI)			ID	1.5E+06	ID	8.0E+08	ID	ID	9.3E+09	ID	6.70E+08	6.7E+06	6.7E+09
Direct Contact (Res DC)			20,000	2,000	20,000	2.5E+06	2.00E+05	2.0E+06	4.6E+07	20,000	8.10E+06	1.6E+06	2.9E+07
Nonresidential (µg/Kg)													
Drinking Water Protection (Nonres DWP)			NLL	NLL	NLL	NLL	NLL	NLL	7.30E+05	NLL	1.70E+05	1.60E+05	4.80E+05
Soil Volatilization to Indoor Air Inhalation (Nonres SVII)			NLV	NLV	ID	NLV	NLV	ID	1.0E+9 {D}	NLV	4.90E+06	5.1E+06	1.0E+9 {D}
Ambient Air Infinite Source Volatile Soil Inhalation (Nonres VSI)			NLV	NLV	ID	NLV	NLV	ID	8.9E+08	NLV	1.80E+06	1.90E+05	7.8E+08
Ambient Air Finite VSI for 5 Meter Source Thickness			NLV	NLV	ID	NLV	NLV	ID	8.8E+08	NLV	1.80E+06	1.90E+05	7.8E+08
Ambient Air Finite VSI for 2 Meter Source Thickness			NLV	NLV	ID	NLV	NLV	ID	8.8E+08	NLV	1.80E+06	1.90E+05	7.8E+08
Ambient Air Particulate Soil Inhalation (Nonres PSI)			ID	1.9E+06	ID	3.5E+08	ID	ID	4.1E+09	ID	2.90E+08	2.9E+06	2.9E+09
Direct Contact (Nonres DC)			80,000	8,000	80,000	7.0E+06	8.00E+05	8.0E+06	1.3E+08	80,000	2.60E+07	5.2E+06	8.4E+07
Screening Levels (µg/Kg)													
Soil Saturation Concentration Screening Levels (Csat)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Applicable Criterion/RBSL Exceeded
BOLD Value Exceeds Applicable Criterion/RBSL
bgs Below Ground Surface (feet)
MDL Laboratory method detection limit
NA/NL/ID Not Applicable/Not Listed/Insufficient Data
NLL/NLV Not Likely to Leach/Not Likely to Volatilizae
* Measured from a point approximately 10 feet below street elevation

TABLE 3
SUMMARY OF SOIL ANALYTICAL RESULTS
PCBs AND METALS
856 NORTH OLD WOODWARD AVENUE, BIRMINGHAM, MICHIGAN
PM PROJECT # 01-5889-0-0003

POLYCHLORINATED BIPHENYLS (PCBs) AND MICHIGAN TEN METALS (µg/Kg)			PCBs	Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver	Zinc
Chemical Abstract Service Number (CAS#)			1336363	7440382	7440393	7440439	16065831	7440508	7439921	7439976	7782492	7440224	7440666
Sample ID	**Sample Date**	**Sample Depth (feet bgs)**	**PCBs**	**Michigan Ten Metals**									
SP1	9/29/2006	4.0-5.0	NA	NA	NA	220	8,600	NA	22,000	NA	NA	NA	NA
SP2	9/29/2006	4.5-5.5*	NA	NA	NA	420	10,000	NA	86,000	NA	NA	NA	NA
SP3	9/29/2006	0.0-2.0*	NA	NA	NA	220	7,000	NA	25,000	NA	NA	NA	NA
SP3 (DUP)			NA	NA	NA	230	7,000	NA	25,000	NA	NA	NA	NA
SP5	9/29/2006	3.0-4.0	NA	NA	NA	200	10,000	NA	18,000	NA	NA	NA	NA
SP6	9/29/2006	7.0-8.0	NA	NA	NA	180	7,400	NA	84,000	NA	NA	NA	NA
SP7	9/29/2006	9.0-1.0	NA	NA	NA	420	11,000	NA	72,000	NA	NA	NA	NA
SB-1	8/13/2015	5.5-6.5*	<MDL	**8,200**	57,000	410	14,000	18,000	56,000	51	290	<100	84,000
SB-2	8/13/2015	6.0-7.0*	<MDL	**8,200**	61,000	350	12,000	18,000	23,000	<50	**450**	<100	57,000
SB-3	8/13/2015	19.0-20.0	<MDL	**9,500**	65,000	270	**25,000**	21,000	16,000	<50	300	<100	58,000
SB-4	8/13/2015	7.5-8.5	<MDL	**11,000**	86,000	480	15,000	33,000	82,000	110	**530**	<100	160,000
SB-4	8/13/2015	13.0-14.0	<MDL	**7,800**	47,000	270	**19,000**	19,000	13,000	62	220	<100	49,000
SB-5	8/13/2015	15.0-16.0	<MDL	**10,000**	83,000	530	16,000	49,000	82,000	<50	**1,200**	<100	150,000
SB-6	8/13/2015	4.0-5.0	<MDL	**11,000**	63,000	410	**19,000**	23,000	55,000	**140**	340	<100	72,000
Cleanup Criteria Requirements for Response Activity (R 299.1 - R 299.50) **Generic Soil Cleanup Criteria Tables 2 and 3: Residential and Non-Residential Part 201 Generic Cleanup Criteria and Screening Levels/Part 213 Risk-Based Screening Levels, December 30, 2013**													
Residential (µg/Kg)													
Statewide Default Background Levels			NA	5,800	75,000	1,200	18,000	32,000	21,000	130	410	1,000	47,000
Drinking Water Protection (Res DWP)			NLL	4,600	1.30E+06	6,000	30,000	5.80E+06	7.00E+05	1,700	4,000	4,500	2.40E+06
Groundwater Surface Water Interface Protection (GSIP)			NLL	4,600	1.3E+06 {G}	7,700 {G,X}	3,300	1.8E+05 {G}	8.2E+06 {G,X}	50 {M}; 1.2	400	100 {M}; 27	3.9E+05 {G}
Soil Volatilization to Indoor Air Inhalation (Res SVII)			3.0E+06	NLV	NLV	NLV	NLV	NLV	NLV	48,000	NLV	NLV	NLV
Ambient Air Infinite Source Volatile Soil Inhalation (Res VSI)			2.40E+05	NLV	NLV	NLV	NLV	NLV	NLV	52,000	NLV	NLV	NLV
Ambient Air Finite VSI for 5 Meter Source Thickness			7.9E+06	NLV	NLV	NLV	NLV	NLV	NLV	52,000	NLV	NLV	NLV
Ambient Air Finite VSI for 2 Meter Source Thickness			7.9E+06	NLV	NLV	NLV	NLV	NLV	NLV	52,000	NLV	NLV	NLV
Ambient Air Particulate Soil Inhalation (Res PSI)			5.2E+06	7.20E+05	3.30E+08	1.70E+06	2.60E+05	1.30E+08	1.00E+08	2.00E+07	1.30E+08	6.70E+06	ID
Direct Contact (Res DC)			{T}	7,600	3.70E+07	5.50E+05	2.50E+06	2.00E+07	4.00E+05	1.60E+05	2.60E+06	2.50E+06	1.70E+08
Nonresidential (µg/Kg)													
Drinking Water Protection (Nonres DWP)			NLL	4,600	1.30E+06	6,000	30,000	5.80E+06	7.00E+05	1,700	4,000	4,500	5.00E+06
Soil Volatilization to Indoor Air Inhalation (Nonres SVII)			1.6E+07	NLV	NLV	NLV	NLV	NLV	NLV	89,000	NLV	NLV	NLV
Ambient Air Infinite Source Volatile Soil Inhalation (Nonres VSI)			8.10E+05	NLV	NLV	NLV	NLV	NLV	NLV	62,000	NLV	NLV	NLV
Ambient Air Finite VSI for 5 Meter Source Thickness			2.8E+07	NLV	NLV	NLV	NLV	NLV	NLV	62,000	NLV	NLV	NLV
Ambient Air Finite VSI for 2 Meter Source Thickness			2.8E+07	NLV	NLV	NLV	NLV	NLV	NLV	62,000	NLV	NLV	NLV
Ambient Air Particulate Soil Inhalation (Nonres PSI)			6.5E+06	9.10E+05	1.50E+08	2.20E+06	2.40E+05	5.90E+07	4.40E+07	8.80E+06	5.90E+07	2.90E+06	ID
Direct Contact (Nonres DC)			{T}	37,000	1.30E+08	2.10E+06	9.20E+06	7.30E+07	9.0E+5 (DD)	5.80E+05	9.60E+06	9.00E+06	6.30E+08
Screening Levels (µg/Kg)													
Soil Saturation Concentration Screening Levels (Csat)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Applicable Criterion/RBSL Exceeded
BOLD Value Exceeds Applicable Criterion/RBSL
bgs Below Ground Surface (feet)
MDL Laboratory method detection limit (MDL)
NA/NL/ID Not Applicable/Not Listed/Insufficient Data
NLL/NLV Not Likely to Leach/Not Likely to Volatilize
{G} Metal GSIP Criteria for Surface Water Not Protected for Drinking Water Use based on 418 mg/L CaCO3 Hardness: Station ID 630003, Rouge River, near Troy, MI
* Measured from a point approximately 10 feet below street elevation

TABLE 4
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
VOCs, PNAs, METALS, AND METHANE
856 NORTH OLD WOODWARD AVENUE, BIRMINGHAM, MICHIGAN
PM PROJECT # 01-5889-0-0003

VOLATILE ORGANIC COMPOUNDS (VOCs), POLYNUCLEAR AROMATIC COMPOUNDS (PNAs), MICHIGAN TEN METALS, AND METHANE (µg/L)				Benzene	n-Butylbenzene	sec-Butylbenzene	cis-1,2-Dichloroethylene	trans-1,2-Dichloroethylene	Ethylbenzene	Methyl-tert-butyl ether (MTBE)	n-Propylbenzene	Tetrachloroethylene	Toluene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Xylenes	VOCs	2-Methylnaphthalene	Other PNAs	Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver	Zinc	Methane
Chemical Abstract Service Number (CAS#)				71432	104518	135988	156592	156605	100414	1634044	103651	127184	108883	95636	108678	1330207	Various	91576	Various	7440382	7440393	7440439	16065831	7440508	7439921	7439976	7782492	7440224	7440666	74828
Sample ID	**Sample Date**	**Screen Depth (feet bgs)**	**Depth to Groundwater (feet bgs)**	**VOCs**														**PNAs**		**Michigan Ten Metals**										**Methane**
SP2 GW	9/26/2006	11.0-16.0	12.0	2.2	<MDL	<MDL	<MDL	<MDL	<MDL	7.7	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	NA	NA	NA	NA	<MDL	<MDL	NA	**5.9**	NA	NA	NA	NA	NA
SP2 GW (DUP)	9/26/2006			2.2	<MDL	<MDL	<MDL	<MDL	<MDL	7.7	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	NA	NA	NA	NA	<MDL	<MDL	NA	**8.2**	NA	NA	NA	NA	NA
SP7 GW	9/26/2006	20.0-25.0	20.0	**160**	1.7	1.2	<MDL	2.5	4.4	**58**	3.5	<MDL	6.4	8.8	1.9	17	<MDL	6.2	<MDL	NA	NA	<MDL	23	NA	**140**	NA	NA	NA	NA	NA
TMW-1	8/13/2015	5.00-10.00*	6.57*	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<3	<MDL	<5	<MDL	2	100	<0.2	<5	<4	<3	<0.2	<5	**1.9**	<10	28
TMW-2	8/13/2015	10.00-15.00*	12.57*	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<3	<MDL	<5	<MDL	6	<100	<0.2	7	<4	<3	<0.2	<5	**0.8**	<10	98
TMW-11	5/26/2016	13.1-18.1	16.19	**55**	<1	<1	2	<1	<1	8	2	2	<1	<1	<1	<3	<MDL	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TMW-13	5/26/2016	3.7-8.7*	5.93*	<1	<1	<1	<1	<1	<1	<5	<1	1	<1	<1	<1	<3	<MDL	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cleanup Criteria Requirements for Response Activity (R 299.1 - R 299.50) **Generic Groundwater Cleanup Criteria Table 1: Residential and Non-Residential Part 201 Generic Cleanup Criteria and Screening Levels/Part 213 Risk-Based Screening Levels, December 30, 2013** **MDEQ Guidance Document For The Vapor Intrusion Pathway, Policy and Procedure Number: 09-017, Appendix D Vapor Intrusion Screening Values, May 2013**																														
Residential/Nonresidential (µg/L)																														
Residential Drinking Water (Res DW)				5.0 {A}	80	80	70 {A}	100 {A}	74 {E}	40 {E}	80	5.0 {A}	790 {E}	63 {E}	72 {E}	280 {E}	Various	260	Various	10 {A}	2,000 {A}	5.0 {A}	100 {A}	1,000 {E}	4.0 {L}	2.0 {A}	50 {A}	34	2,400	ID
Nonresidential Drinking Water (Nonres DW)				5.0 {A}	230	230	70 {A}	100 {A}	74 {E}	40 {E}	230	5.0 {A}	790 {E}	63 {E}	72 {E}	280 {E}	Various	750	Various	10 {A}	2,000 {A}	5.0 {A}	100 {A}	1,000 {E}	4.0 {L}	2.0 {A}	50 {A}	98	5,000 {E}	ID
Groundwater Surface Water Interface (GSI)				200 {X}	ID	ID	620	1,500 {X}	18	7,100 {X}	ID	60 {X}	270	17	45	41	Various	19	Various	10	2,000 {G}	6.4 {G,X}	240 {G}	30 {G}	47 {G,X}	0.0013	5.0	0.2 {M}; 0.06	400 {G}	NA
Residential Groundwater Volatilization to Indoor Air Inhalation (Res GVII)[2]				5,600	ID	ID	93,000	85,000	1.10E+05	4.7E+7 {S}	ID	25,000	5.3E+5 {S}	56,000 {S}	61,000 {S}	1.9E+5 {S}	Various	25,000 {S}	Various	NLV	NLV	NLV	NLV	NLV	NLV	56 {S}	NLV	NLV	NLV	(K)
Nonresidential Groundwater Volatilization to Indoor Air Inhalation (Nonres GVII)[2]				35,000	ID	ID	2.10E+05	2.00E+05	1.7E+5 {S}	4.7E+7 {S}	ID	1.70E+05	5.3E+5 {S}	56,000 {S}	61,000 {S}	1.9E+5 {S}	Various	25,000 {S}	Various	NLV	NLV	NLV	NLV	NLV	NLV	56 {S}	NLV	NLV	NLV	(K)
Screening Levels (µg/L)																														
Residential Groundwater Vapor Intrusion Screening Levels ($GW_{VI\text{-}res}$)[3]				27	91	16	83	360	700	2.50E+05	92	94	36,000	1,700	1200	10,000	Various	940	Various	NL	NL	NL	NL	NL	NL	ID	NL	NL	NL	520
Nonresidential Groundwater Vapor Intrusion Screening Levels ($GW_{VI\text{-}nr}$)[3]				140	380	68	350	1,500	2600	1.00E+06	390	460	1.50E+05	7,300	5,100	10,000	Various	3,900	Various	NL	NL	NL	NL	NL	NL	ID	NL	NL	NL	520
Water Solubility				1.75E+06	NA	NA	3.50E+06	6.30E+06	1.69E+05	4.68E+07	NA	2.00E+05	5.26E+05	56,000	61,000	1.86E+05	Various	25,000	Various	NA	NA	NA	NA	NA	NA	56	NA	NA	NA	NA
Flammability and Explosivity Screening Level				68,000	ID	ID	5.30E+05	2.30E+05	43,000	ID	ID	ID	61,000	56,000 {S}	ID	70,000	Various	ID	Various	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	28,000

Applicable Criteria/RBSL Exceeded
BOLD Value Exceeds Applicable Criteria
bgs Below Ground Surface (feet)
MDL Laboratory Method Detection Limit
[2] Tier 1 GVII Criteria based on 3 meter (or greater) groundwater depth
[3] (2013 Vapor Intrusion Guidance) Screening Levels based on depth to groundwater less than 3.0 meters and not in contact with building foundation
NA/NL/ID Not Applicable/Not Listed/Insufficient Data
NLV Not Likely to Volatilize
{G} Metal GSIP Criteria for Surface Water Not Protected for Drinking Water Use based on 418 mg/L CaCO3 Hardness: Station ID 630003, Rouge River, near Troy, MI
* Measured from a point approximately 10 feet below street elevation

TABLE 5
SUMMARY OF SOIL GAS ANALYTICAL RESULTS
VOCs AND METHANE
856 NORTH OLD WOODWARD AVENUE, BIRMINGHAM, MICHIGAN
PM PROJECT # 01-5889-0-0003

VOLATILE ORGANIC COMPOUNDS (VOCs) AND METHANE (ppbv)			Acetone	m-Dichlorobenzene	Ethylbenzene	4-Ethyltoluene	Heptane	Hexane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2,2,4-Trimethylpentane	Tetrachloroethylene	Toluene	Trichloroethylene	m,p-Xylene	o-Xylene	Xylenes (total)	Other VOCs	Methane
Chemical Abstract Service Number (CAS#)			67641	541731	100414	622968	142825	110543	95636	108678	540841	127184	108883	79016	1330207	95476	1330207	Various	74828
Sample ID	**Sample Date**	**Sample Depth (feet bgs)**	**VOCs**																**Methane**
SG-1	8/13/2015	5.5*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND
SG-2	8/13/2015	4.5*	130.0	7.3	3.4	2.6	<0.80	<0.80	2.8	1.0	84.0	<0.16	23.0	<0.16	11.0	3.9	14.9	ND	NA
SG-3	8/13/2015	3.5	130.0	6.0	1.5	<0.80	<0.80	<0.80	2.2	<0.80	43.0	<0.16	11.0	<0.16	5.7	2.2	7.9	ND	ND
SG-4	8/13/2015	7.5	160.0	4.4	2.7	3.0	70.0	<0.80	3.5	0.8	24.0	580.0	14.0	8.1	11.0	3.9	14.9	ND	ND
SG-5	8/13/2015	3.5	110.0	2.8	2.7	2.1	<0.80	24.0	2.2	<0.80	200.0	**590.0**	18.0	7.9	9.3	3.2	12.5	ND	ND
SG-6	8/13/2015	5.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	A	NA	NA	ND
MDEQ Guidance Document For The Vapor Intrusion Pathway, Policy and Procedure Number: 09-017, Appendix D Vapor Intrusion Screening Values, May 2013																			
Residential Screening Levels (ppbv)																			
Vapor Intrusion Shallow Sub-Slab Soil Gas Screening Levels (≤ 1.5m bgs) (SG_{VI-SS})			82,000	16	640	NDC	28,000	6,600	1,500	1,500	25,000	170	44,000	12	760	760	760	Various	1.25E+04 (g)
Vapor Intrusion Deep Soil Gas Screening Levels (SG_{VI})			8.20E+05	160	6,400	NDC	2.80E+05	66,000	15,000	15,000	2.50E+05	1,700	4.40E+05	120	7,600	7,600	7,600	Various	1.25E+04 (g)
Nonresidential Screening Levels (ppbv)																			
Vapor Intrusion Shallow Sub-Slab Soil Gas Screening Levels (≤ 1.5m bgs) (SG_{VI-SS})			1.40E+06	280	13,000	NDC	4.70E+05	1.10E+05	25,000	25,000	4.20E+05	3,300	7.40E+05	210	13,000	13,000	13,000	Various	1.25E+04 (g)
Vapor Intrusion Deep Soil Gas Screening Levels (SG_{VI})			1.40E+07	2,800	1.30E+05	NDC	4.70E+06	1.10E+06	2.50E+05	2.50E+05	4.20E+06	33,000	7.40E+06	2,100	1.30E+05	1.30E+05	1.30E+05	Various	1.25E+04 (g)

Applicable Criteria/RBSL Exceeded

BOLD Value Exceeds Applicable Criteria
bgs Below Ground Surface (feet)
MDL Laboratory Method Detection Limit (MDL)
NA Not Applicable
NDC "No Defined Criteria" by the Michigan Department of Environmental Quality (MDEQ)
* Measured from a point approximately 10 feet below street elevation

Appendix A

PM ENVIRONMENTAL Environmental & Engineering Services

Boring Log .

Project No.: 01-5889-0-003
Boring No.: SB-7
Project Name: Vacant Land
Date Drilled: 5/26/2016
Facility ID#:
Drill Rig: 6712 DT
Logged By: JC
Sampling Method: 2 1/4"MC

PM ENVIRONMENTAL

SUBSURFACE PROFILE			SAMPLE			
Depth (ft.)	Boring Profile	Description and Comments	Sample # Depth	Blow Counts	PID (ppm)	No Well Installed
		Ground Surface				
0		***ASPHALT***		-	0.0	
		SP- (Loose) SAND (moist) Brown, fine, trace gravel		-	0.0	
2				-	0.0	
		SC- (Medium Dense) CLAYEY SAND (moist) Brown, fine		-	0.0	
4				-	0.0	
			SS-1 5.0 - 6.0'	-	0.0	
6		***CL- (Medium Stiff) CLAY (moist)*** Brown		-	0.0	
				-	0.0	
8				-	0.0	
			SS-2 9.5 - 10.5'	-	0.0	
10		***SM- (Medium Dense) SILTY SAND (moist)*** Brown, fine		-	0.0	
		CL- (Medium Stiff) CLAY (moist) Gray		-	0.0	
12				-	0.0	
			SS-3 13.0 - 14.0'	-	0.0	
14				-	0.0	
				-	0.0	
16				-	0.0	
				-	0.0	
18				-	0.0	
				-	0.0	
20						

Completion Notes: EOB @ 20' bgs. Hole filled with soil cuttings and bentonite.

1. The indicated stratification lines are approximate in situ. The transitions between materials may be gradual.
2. Boring backfilled with natural soils unless otherwise noted.

Boring Log .

Project No.: 01-5889-0-003
Boring No.: SB-8
Project Name: Vacant Land
Date Drilled: 5/26/2016
Facility ID#:
Drill Rig: 6712 DT
Logged By: JC
Sampling Method: 2 1/4"MC

PM ENVIRONMENTAL

SUBSURFACE PROFILE			SAMPLE			
Depth (ft.)	Boring Profile	Description and Comments	Sample # Depth	Blow Counts	PID (ppm)	No Well Installed
		Ground Surface				
0		***ASPHALT***				
		SC- (Medium Dense) CLAYEY SAND (moist) Brown/Gray, fine, (with glass/gravel 1 - 5' bgs)		-	0.0	
				-	0.0	
2				-	0.0	
				-	0.7	
4				-	2.9	
				-	6.2	
6				-	13.5	
				-	7.2	
8			SS-1 8.0 - 9.0'	-	17.0	
		CL- (Medium Stiff) CLAY (moist) Gray		-	12.6	
10				-	8.1	
				-	6.4	
12				-	2.7	
				-	0.9	
14				-	0.4	
			SS-2 15.0 - 16.0'	-	0.2	
16		***REFUSAL @ 16' bgs***				

Completion Notes: EOB @ 16' bgs. Hole filled with soil cuttings and bentonite.

1. The indicated stratification lines are approximate in situ. The transitions between materials may be gradual.
2. Boring backfilled with natural soils unless otherwise noted.

Boring Log .

Project No.: 01-5889-0-003
Boring No.: SB-9
Project Name: Vacant Land
Date Drilled: 5/26/2016
Facility ID#:
Drill Rig: 6712 DT
Logged By: JC
Sampling Method: 2 1/4"MC

PM ENVIRONMENTAL

SUBSURFACE PROFILE			SAMPLE			
Depth (ft.)	Boring Profile	Description and Comments	Sample # Depth	Blow Counts	PID (ppm)	No Well Installed
		Ground Surface				
0		***ASPHALT***		-	0.0	
		SP- (Loose) SAND (moist) Brown, fine, (with gravel and construction debris 0 - 9.5' bgs)		-	0.0	
2				-	0.0	
				-	0.0	
4			SS-1 4.0 - 5.0'	-	0.0	
				-	0.0	
6				-	0.0	
				-	0.0	
8				-	0.0	
				-	0.0	
10		***SM- (Medium Dense) SILTY SAND (moist)*** Brown, fine, (with construction debris)	SS-2 10.0 - 11.0'	-	0.0	
		CL- (Stiff) CLAY (moist) Brown		-	0.0	
12				-	0.0	
				-	0.0	
14		***CL- (Soft) CLAY (moist)*** Gray/Brown	SS-3 14.0 - 15.0'	-	0.0	
				-	0.0	
16				-	0.0	
				-	0.0	
18				-	0.0	
				-	0.0	
20						

Completion Notes: EOB @ 20' bgs. Hole filled with soil cuttings and bentonite.

1. The indicated stratification lines are approximate in situ. The transitions between materials may be gradual.
2. Boring backfilled with natural soils unless otherwise noted.

Boring Log .

Project No.: 01-5889-0-003
Boring No.: SB-10
Project Name: Vacant Land
Date Drilled: 5/26/2016
Facility ID#:
Drill Rig: 6712 DT
Logged By: JC
Sampling Method: 2 1/4"MC

SUBSURFACE PROFILE			SAMPLE			
Depth (ft.)	Boring Profile	Description and Comments	Sample # Depth	Blow Counts	PID (ppm)	No Well Installed
		Ground Surface				
0		**GRASS/TOP SOIL**		-	0.0	
		SC- (Medium Dense) CLAYEY SAND (moist) Brown/Gray, fine (with gravel and construction debris)		-	0.0	
2				-	0.0	
				-	0.0	
4			SS-1 4.0 - 5.0'	-	0.0	
				-	0.0	
6		**SP- (Loose) SAND (moist)** Brown, fine (with gravel and construction debris), black staining 10-11' bgs.		-	0.0	
				-	0.0	
8				-	0.0	
				-	0.0	
10			SS-2 10.0 - 11.0'	-	0.0	
				-	0.0	
12				-	0.0	
				-	0.0	
14				-	0.0	
				-	0.0	
16			SS-3 16.5 - 17.5'	-	0.0	
		CL- (Medium Stiff) CLAY (moist) Brown		-	0.0	
18				-	0.0	
				-	0.0	
20						

Completion Notes: EOB @ 20' bgs. Hole filled with soil cuttings and bentonite.

1. The indicated stratification lines are approximate in situ. The transitions between materials may be gradual.
2. Boring backfilled with natural soils unless otherwise noted.

Well Log .

Project No.: 01-5889-0-003
Well No.: SB/TMW-11
Project Name: Vacant Land
Date Drilled: 5/26/2016
Facility ID#:
Drill Rig: 6712 DT
Logged By: JC
Sampling Method: 2 1/4"MC

SUBSURFACE PROFILE

Ground Surface

GRASS/TOP SOIL

SP- (Loose) SAND (moist)
Brown, fine (with construction debris, gravel and concrete 3.5 - 4' bgs), black staining 3-3.5' and 8-11' bgs.

SM- (Medium Dense) SILTY SAND (moist)
Brown, fine (with construction debris 11.5 - 12' bgs)

SP- (Loose) SAND (moist)
Brown, fine, trace gravel

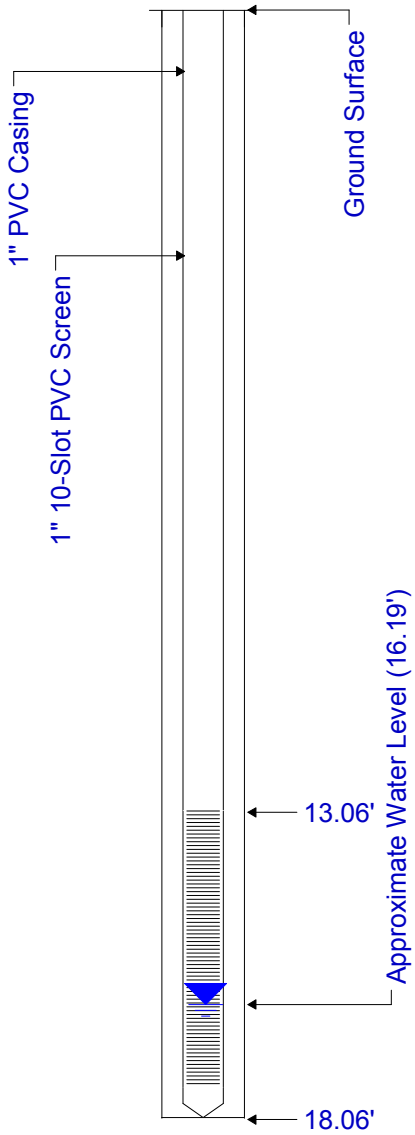
SP- (Loose) SAND (saturated)
Brown, fine, trace gravel

REFUSAL @ 18' bgs

SAMPLE

Sample #	Depth	Blow Counts	PID (ppm)
		-	0.0
		-	0.0
SS-1	2.5 - 3.5'	-	0.0
		-	0.0
		-	0.0
		-	0.0
		-	0.0
		-	0.0
		-	0.0
		-	0.0
SS-2	10.0 - 11.0'	-	0.0
		-	0.0
		-	0.0
		-	0.0
		-	0.0
		-	0.0
		-	0.0
		-	0.0

Groundwater Well Completion Details



Completion Notes: EOB @ 18' bgs. Hole filled with soil cuttings and bentonite.

1. The indicated stratification lines are approximate in situ. The transitions between materials may be gradual.
2. Boring backfilled with natural soils unless otherwise noted

Boring Log .

Project No.: 01-5889-0-003
Boring No.: SB-12
Project Name: Vacant Land
Date Drilled: 5/26/2016
Facility ID#:
Drill Rig: 6712 DT
Logged By: JC
Sampling Method: 2 1/4"MC

PM ENVIRONMENTAL

SUBSURFACE PROFILE			SAMPLE			
Depth (ft.)	Boring Profile	Description and Comments	Sample # Depth	Blow Counts	PID (ppm)	No Well Installed
		Ground Surface				
0		***ASPHALT***		-	0.0	
		SC- (Medium Dense) CLAYEY SAND (moist) Brown, fine		-	0.0	
2				-	0.0	
				-	0.0	
4				-	0.0	
			SS-1	-	0.0	
6		***CL- (Medium Stiff) CLAY (moist)*** Browm/Gray	5.5 - 6.5'	-	0.0	
		SC- (Medium Dense) CLAYEY SAND (moist) Brown, fine		-	0.0	
8				-	0.0	
		SM- (Medium Dense) SILTY SAND (moist) Brown, fine		-	0.0	
10			SS-2	-	0.0	
		CL- (Medium Stiff) CLAY (moist) Gray	10.5 - 11.5'	-	0.0	
12				-	0.0	
			SS-3	-	0.0	
14			13.0 - 14.0'	-	0.0	
				-	0.0	
16				-	0.0	
				-	0.0	
18				-	0.0	
20				-	0.0	

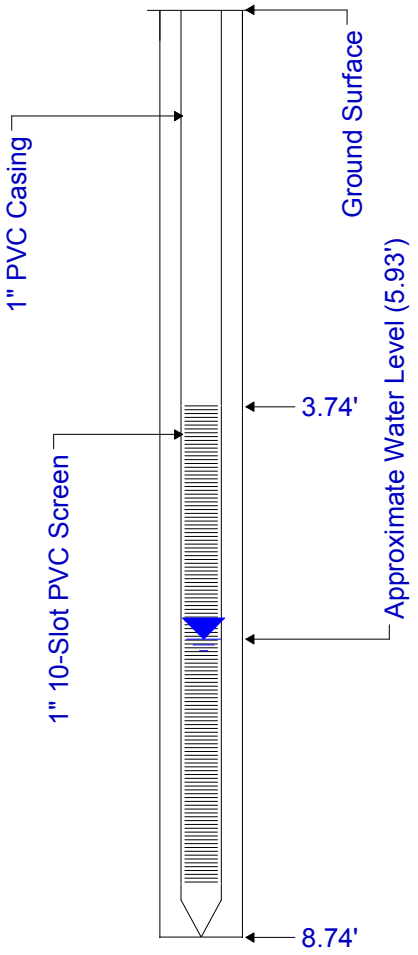
Completion Notes: EOB @ 20' bgs. Hole filled with soil cuttings and bentonite.

1. The indicated stratification lines are approximate in situ. The transitions between materials may be gradual.
2. Boring backfilled with natural soils unless otherwise noted.

Well Log .

Project No.: 01-5889-0-003
Well No.: SB/TMW-13
Project Name: Vacant Land
Date Drilled: 5/26/2016
Facility ID#:
Drill Rig: 6712 DT
Logged By: JC
Sampling Method: 2 1/4"MC

SUBSURFACE PROFILE			SAMPLE			
Depth (ft.)	Boring Profile	Description and Comments	Sample # Depth	Blow Counts	PID (ppm)	Groundwater Well Completion Details
		Ground Surface				
0		***GRASS/TOP SOIL***				
		SP- (Loose) SAND (moist) Brown, fine, trace gravel		-	0.0	
				-	0.0	
2			SS-1 2.0 - 3.0'	-	0.0	
				-	0.0	
4				-	0.0	
			SS-2 5.0 - 6.0'	-	0.0	
6		***SP- (Loose) SAND (saturated)*** Brown, fine, trace gravel		-	0.0	
		CL- (Soft) CLAY (moist) Gray		-	0.0	
8				-	0.0	
		SM- (Medium Dense) SILTY SAND (moist) Brown, fine		-	0.0	
10						



NOTE: MEASUREMENTS FROM 10 FEET BELOW STREET ELEVATION

Completion Notes: EOB @ 10' bgs. Hole filled with soil cuttings and bentonite.

1. The indicated stratification lines are approximate in situ. The transitions between materials may be gradual.
2. Boring backfilled with natural soils unless otherwise noted

Boring Log .

Project No.: 01-5889-0-003
Boring No.: SB-14
Project Name: Vacant Land
Date Drilled: 5/26/2016
Facility ID#:
Drill Rig: 6712 DT
Logged By: JC
Sampling Method: 2 1/4"MC

SUBSURFACE PROFILE			SAMPLE			
Depth (ft.)	Boring Profile	Description and Comments	Sample # Depth	Blow Counts	PID (ppm)	No Well Installed
		Ground Surface				
0		**GRASS/TOP SOIL**				
		SC- (Medium Dense) CLAYEY SAND (moist) Brown, fine, black staining 1.5 - 2.5' bgs		-	0.0	
				-	0.0	
2			SS-1 2.0 - 3.0'	-	0.0	
				-	0.0	
4				-	0.0	
				-	0.0	
6			SS-2 6.0 - 7.0'	-	0.0	
		CL- (Stiff) CLAY (moist) Gray		-	0.0	
8				-	0.0	
				-	0.0	NOTE: MEASUREMENTS FROM 10 FEET BELOW STREET ELEVATION
10						

Completion Notes: EOB @ 10' bgs. Hole filled with soil cuttings and bentonite.

1. The indicated stratification lines are approximate in situ. The transitions between materials may be gradual.
2. Boring backfilled with natural soils unless otherwise noted.

Boring Log .

Project No.: 01-5889-0-003
Boring No.: SB-15
Project Name: Vacant Land
Date Drilled: 5/26/2016
Facility ID#:
Drill Rig: 6712 DT
Logged By: JC
Sampling Method: 2 1/4"MC

SUBSURFACE PROFILE			SAMPLE			
Depth (ft.)	Boring Profile	Description and Comments	Sample # Depth	Blow Counts	PID (ppm)	No Well Installed
		Ground Surface				
0		***GRASS/TOP SOIL***				
		SC- (Medium Dense) CLAYEY SAND (moist) Brown, fine		-	0.0	
				-	0.0	
2			SS-1 2.0 - 3.0'	-	0.0	
				-	0.0	
4				-	0.0	
				-	0.0	
6		***CL- (Medium Stiff) CLAY (moist)*** Brown (constuction debris 7 - 8')		-	0.0	
			SS-2 7.0 - 8.0'	-	0.0	
8		***CL- (Soft) CLAY (moist)*** Gray		-	0.0	
				-	0.0	NOTE: MEASUREMENTS FROM 10 FEET BELOW STREET ELEVATION
10						

Completion Notes: EOB @ 10' bgs. Hole filled with soil cuttings and bentonite.

1. The indicated stratification lines are approximate in situ. The transitions between materials may be gradual.
2. Boring backfilled with natural soils unless otherwise noted.

Appendix C

PM ENVIRONMENTAL Environmental & Engineering Services

Assessors Map

2 Foot Contours
5 Foot Contours
FEMA Base Flood Elevations
FEMA Cross Sections
100 yr - FEMA Floodplain
100 yr (detailed) - FEMA Floodplain
500 yr - FEMA Floodplain
FLOODWAY - FEMA Floodplain

Disclaimer: The information provided herewith has been compiled from recorded deeds, plats, tax maps, surveys and other public records. It is not a legally recorded map or survey and is not intended to be used as one. Users should consult the information sources mentioned above when questions arise. FEMA Flooplain data may not always be present on the map.

OAKLAND COUNTY MICHIGAN
Economic Development & Community Affairs

L. Brooks Patterson
Oakland County Executive

Date Created: 4/20/2016

NORTH

1 inch = 100 feet

Appendix D

PM ENVIRONMENTAL Environmental & Engineering Services

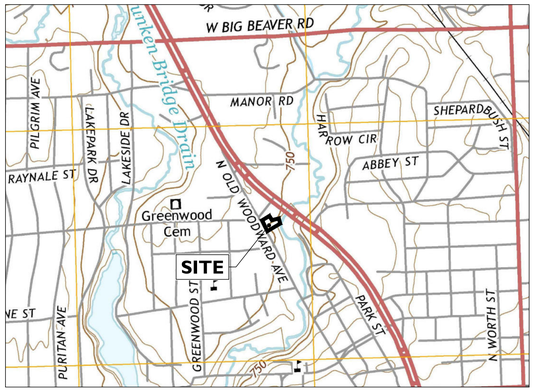
SITE DEVELOPMENT PLANS

FOR

856 OLD NORTH WOODWARD

PROPOSED 4 STORY MULTI-FAMILY BUILDING WITH RETAIL

PARCEL ID: 19-25-328-001
856 NORTH OLD WOODWARD AVENUE
CITY OF BIRMINGHAM, OAKLAND COUNTY, MICHIGAN



SOURCE: USGS MAPS

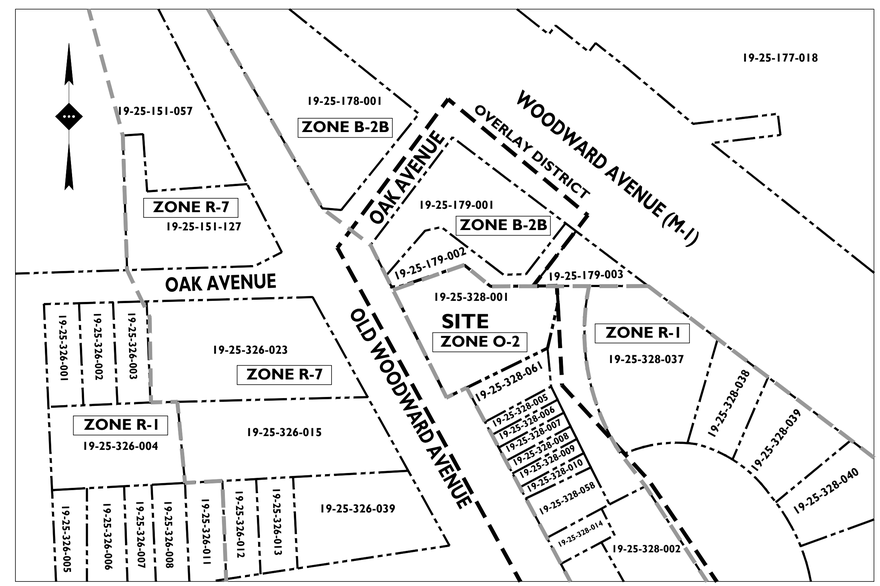
LOCATION MAP

SCALE: 1" = 2,000'±

SOURCE: GOOGLE EARTH PRO

AERIAL MAP

SCALE: 1" = 100'±



SOURCE: BIRMINGHAM ZONING MAPS & OAKLAND COUNTY PROPERTY GATEWAY

ZONING MAP

SCALE: 1" = 100'±

APPLICANT/OWNER

FLS PROPERTIES #5, LLC
2950 WALNUT LAKE ROAD
WEST BLOOMFIELD, MICHIGAN 48323

SURVEYOR

KEM-TEC ASSOCIATES
22556 GRATIOT AVENUE
EASTPOINTE, MICHIGAN 48021

PLAN REFERENCE MATERIALS:

1. THIS PLAN SET REFERENCES THE FOLLOWING DOCUMENTS INCLUDING, BUT NOT LIMITED TO:
   - ALTA/ACSM & TOPOGRAPHIC SURVEY PREPARED BY KEM-TEC ASSOCIATES, LAST REVISED 11/05/2015.
   - ARCHITECTURAL PLANS PREPARED BY MARUSICH ARCHITECTURE
   - GEOTECHNICAL REPORT PREPARED BY G2 CONSULTING GROUP
   - TRAFFIC REPORT PREPARED BY STONEFIELD ENGINEERING & DESIGN, LLC
   - BASELINE ENVIRONMENTAL ASSESSMENT PREPARED BY PM ENVIRONMENTAL
   - AERIAL MAP OBTAINED FROM GOOGLE EARTH PRO
   - ZONING MAP OBTAINED FROM THE CITY OF BIRMINGHAM ZONING MAP & OAKLAND COUNTY PROPERTY VIEWER
   - LOCATION MAP OBTAINED FROM USGS MAPS ONLINE
2. ALL REFERENCE MATERIAL LISTED ABOVE SHALL BE CONSIDERED A PART OF THIS PLAN SET AND ALL INFORMATION CONTAINED WITHIN THESE MATERIALS SHALL BE UTILIZED IN CONJUNCTION WITH THIS PLAN SET. THE CONTRACTOR IS RESPONSIBLE TO OBTAIN A COPY OF EACH REFERENCE AND REVIEW IT THOROUGHLY PRIOR TO THE START OF CONSTRUCTION.

Know what's **below**
Call before you dig.

PLANS PREPARED BY:

STONEFIELD
engineering & design, llc.

Bloomfield Hills, MI · Rutherford, NJ · Farmingdale, NY
www.stonefieldeng.com

2350 Franklin Road, Suite 210, Bloomfield Hills, MI 48302
Phone 248.247.1115

SHEET INDEX

DRAWING TITLE	*SHEET #*
COVER SHEET	C-1
EXISTING CONDITIONS PLAN	C-2
FIRST FLOOR SITE PLAN	C-3
GRADING PLAN	C-4
UTILITY PLAN	C-5
SOIL EROSION & SEDIMENT CONTROL PLAN	C-6

ISSUE	DATE	BY	DESCRIPTION
5	04/12/2016	JAM	REVISED PER CITY COMMENTS & ZONING BOARD SUBMISSION
4	03/10/2016	JAM	REVISED PER CITY COMMENTS & ZONING BOARD SUBMISSION
3	02/17/2016	JAM	REVISED PER CITY COMMENTS
2	01/06/2016	JAM	REVISED PER CITY REVIW LETTER COMMENTS
1	11/11/2015	JAM	SUBMISSION FOR PRELIMINARY SITE PLAN APPORAL

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Phone 248.247.1115

SITE DEVELOPMENT PLANS

856 OLD NORTH WOODWARD

PROPOSED 4 STORY MULTI-FAMILY BUILDING WITH RETAIL

PARCEL ID: 19-25-328-001
856 NORTH OLD WOODWARD ROAD
CITY OF BIRMINGHAM
OAKLAND COUNTY, MICHIGAN

MICHIGAN LICENSE No. 6201061061
LICENSED PROFESSIONAL ENGINEER

STONEFIELD
engineering & design, llc.

SCALE: AS SHOWN | PROJECT ID: M-15120

TITLE:

COVER SHEET

DRAWING:

C-1

V:\19020.194-1120-KEM-TEC-856 N. OLD WOODWARD, BIRMINGHAM, MI\CADD\PLOT\SDP-01-COVER.DWG

SYMBOL / DESCRIPTION

SYMBOL	DESCRIPTION
●	SET 1/2" REBAR WITH CAP P.S. 47976
	FOUND MONUMENT (AS NOTED)
	FOUND SECTION CORNER (AS NOTED)
(R&M)	RECORD AND MEASURED DIMENSION
(R)	RECORD DIMENSION
(M)	MEASURED DIMENSION
	UTILITY POLE
	GAS LINE MARKER
	SANITARY MANHOLE
	ROUND CATCH BASIN
	SQUARE CATCH BASIN
	FIRE HYDRANT
	WATER GATE MANHOLE
	WATER VALVE
	UNKOWN MANHOLE
	BOLLARD
	LIGHTPOST/LAMP POST
	SINGLE POST SIGN
	PARCEL BOUNDARY LINE
	PLATTED LOT LINE
	ADJOINER PARCEL LINE
	SECTION LINE
	EASEMENT (AS NOTED)
	EASEMENT CENTERLINE
	CONCRETE CURB
	EDGE OF CONCRETE (CONC.)
	EDGE OF ASPHALT (ASPH.)
	EDGE OF GRAVEL
	FENCE (AS NOTED)
	WALL (AS NOTED)
OH	OVERHEAD UTILITY LINE
S	SANITARY LINE
D	STORM LINE
W	WATER LINE

PROPERTY DESCRIPTION

LAND SITUATED IN THE CITY OF BIRMINGHAM, COUNTY OF OAKLAND, STATE OF MICHIGAN IS DESCRIBED AS FOLLOWS:

LOTS 3 AND 4, ASSESSOR'S PLAT No. 29 AS RECORDED IN LIBER 6, PAGE 45 OF PLATS, OAKLAND COUNTY RECORDS, ALSO PART OF THE NORTHWEST 1/4 OF SECTION 25, TOWN 2 NORTH, RANGE 10 EAST, CITY OF BIRMINGHAM, OAKLAND COUNTY, MICHIGAN, DESCRIBED AS BEGINNING AT A POINT DISTANT SOUTH 88 DEGREES 16 MINUTES 00 SECONDS EAST 10.15 FEET FROM THE NORTHWEST CORNER OF SAID LOT 3; THENCE SOUTH 88 DEGREES 16 MINUTES 00 SECONDS EAST 124.70 FEET; THENCE NORTH 49 DEGREES 21 MINUTES 00 SECONDS WEST 46.41 FEET; THENCE SOUTH 73 DEGREES 32 MINUTES 00 SECONDS WEST 93.28 FEET TO BEGINNING.

TITLE REPORT NOTE

ONLY THOSE EXCEPTIONS CONTAINED WITHIN THE LAND TITLE AGENCY, LLC COMMITMENT No. 201523630, DATED MAY 25, 2015, AND RELISTED BELOW WERE CONSIDERED FOR THIS SURVEY. NO OTHER RECORDS RESEARCH WAS PERFORMED BY THE CERTIFYING SURVEYOR.

5. TERMS AND CONDITIONS OF EASEMENT AGREEMENT AS DISCLOSED BY INSTRUMENT RECORDED IN LIBER 43760, PAGE(s) 251, OAKLAND COUNTY RECORDS. (AS SHOWN)

6. TERMS AND CONDITIONS OF AGREEMENT RESPECTING LAND AS DISCLOSED BY INSTRUMENT RECORDED IN LIBER 42730, PAGE(s) 32, OAKLAND COUNTY RECORDS. (AS SHOWN, SEE DOCUMENT FOR TERMS AND CONDITIONS)

7. BUILDING AND USE RESTRICTIONS AND OTHER PROVISIONS, BUT OMITTING RESTRICTIONS, IF ANY, BASED ON RACE, COLOR, RELIGION OR NATIONAL ORIGIN, AS CONTAINED IN THE INSTRUMENT RECORDED IN LIBER 38990, PAGE(s) 335, OAKLAND COUNTY RECORDS, WHICH APPLY SPECIFICALLY TO OTHER LANDS BUT MAY CONSTITUTE A GENERAL PLAN OF DEVELOPMENT. (DOCUMENT NOT PROVIDED AT TIME OF SURVEY)

SURVEYOR'S CERTIFICATION

TO FLS PROPERTIES #5, LLC, OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY AND LAND TITLE AGENCY, LLC:

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2011 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/ACSM LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDED ITEMS 1, 2, 4, 5, 7A, 8, 9 AND 11B OF TABLE A, THEREOF. THE FIELD WORK WAS COMPLETED ON AUGUST 21, 2015.

DATE OF PLAT OR MAP: AUGUST 25, 2015

SURVEY NOTES:

1. THE SURVEY LISTED WITHIN THE PLAN REFERENCES ON THE COVER SHEET SHALL BE CONSIDERED A PART OF THIS PLAN SET AND ALL INFORMATION CONTAINED WITHIN THE SURVEY AND ASSOCIATED DOCUMENTS SHALL BE UTILIZED IN CONJUNCTION WITH THIS PLAN SET. THE CONTRACTOR IS RESPONSIBLE TO OBTAIN A COPY OF THE SURVEY AND REVIEW IT THOROUGHLY PRIOR TO THE START OF CONSTRUCTION.

PARCEL AREA

24,719± SQUARE FEET = 0.57± ACRES

BASIS OF BEARING

SOUTH 23°57'44" EAST, BEING THE NORTHERLY RIGHT OF WAY LINE OF N. OLD WOODWARD AVENUE.

BENCHMARK

NORTHWEST BOLT OF STREET LIGHT, LOCATED ON THE EASTERLY SIDE OF N. OLD WOODWARD AVENUE, ELEVATION = 756.31' (CITY OF BIRMINGHAM DATUM)

FLOOD NOTE

SUBJECT PARCEL LIES WITHIN:

SPECIAL FLOOD HAZARD AREA (ZONE AE): BASE FLOOD ELEVATIONS DETERMINED.

FLOODWAY AREAS IN ZONE AE: THE FLOODWAY IS THE CHANNEL OF A STREAM PLUS ANY ADJACENT FLOODPLAIN AREAS THAT MUST BE KEPT FREE OF ENCROACHMENT SO THAT THE 1% ANNUAL CHANCE FLOOD CAN BE CARRIED WITHOUT SUBSTANTIAL INCREASES IN FLOOD HEIGHTS.

ZONE X: AREAS DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN.

AS SHOWN ON FLOOD INSURANCE RATE MAP: MAP NUMBER 26125C0537F, COMMUNITY - PANEL NUMBER 260168 0537 F, DATED SEPTEMBER 29, 2006, PUBLISHED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.

20' 0' 20' 40'

GRAPHIC SCALE IN FEET
1" = 20'

ISSUE	DATE	BY	DESCRIPTION
5	04/12/2016	JAM	REVISED PER CITY COMMENTS & ZONING BOARD SUBMISSION
4	03/10/2016	JAM	REVISED PER CITY COMMENTS & ZONING BOARD SUBMISSION
3	02/17/2016	JAM	REVISED PER CITY COMMENTS
2	01/06/2016	JAM	REVISED PER CITY REVIW LETTER COMMENTS
1	11/11/2015	JAM	SUBMISSION FOR PRELIMINARY SITE PLAN APPORAL

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Phone 248.247.1115

SITE DEVELOPMENT PLANS

856 OLD NORTH WOODWARD

PROPOSED 4 STORY MULTI-FAMILY BUILDING WITH RETAIL

PARCEL ID: 19-25-328-001
856 NORTH OLD WOODWARD ROAD
CITY OF BIRMINGHAM
OAKLAND COUNTY, MICHIGAN

MICHIGAN LICENSE No. 6201061061
LICENSED PROFESSIONAL ENGINEER

STONEFIELD engineering & design, llc.

SCALE: 1" = 20' | PROJECT ID: M-15120

TITLE:

EXISTING CONDITIONS PLAN

DRAWING:

C-2

V:\M2015\M-15120-MIN-TEC-856 N. OLD WOODWARD, BIRMINGHAM, MI\CADD\PLOT\SDP-02-EXIST.DWG

BASEMENT FLOOR LAYOUT

TABLE OF LAND USE AND ZONING

PARCEL ID: 19-25-328-001

DOWNTOWN BIRMINGHAM OVERLAY DISTRICT (D-2)

PROPOSED USE		
DWELLING-MULTIPLE-FAMILY	PERMITTED USE	
RETAIL	PERMITTED USE	
ZONING REQUIREMENT	**REQUIRED**	**PROPOSED**
MINIMUM LOT AREA	N/A	24,718 SF (0.56 AC)
MAXIMUM BUILDING HEIGHT	3 STORIES	4 STORIES (V)
MAXIMUM OVERALL HEIGHT	56 FT	56 FT
BUILDING FOOTPRINT AREA	N/A	20,428 SF
FRONT YARD SETBACK	0 FT	0 FT
MINIMUM FRONT YARD SETBACK(FACADE)	0 FT	10.8 FT
MINIMUM SIDE YARD SETBACK	0 FT	0 FT
MINIMUM REAR YARD SETBACK*	12.8 FT	12.8 FT

(V) VARIANCE
* THE NORTHERN ADJACENT BUILDING PROVIDES A 12.8 FT REAR YARD SETBACK PER § 3.04(B)

OFF-STREET PARKING REQUIREMENTS

CODE SECTION	REQUIRED	PROPOSED
§ 4.52 PK-08.A	**RESIDENTIAL (2 OR LESS ROOMS):** 1.5 SPACES PER UNIT (22 UNITS)(1.5/UNITS) = 33 SPACES **RESIDENTIAL (3 OR MORE ROOMS):** 2 SPACES PER UNIT (5 UNITS)(2/UNITS) = 10 SPACES **RETAIL** 1 SPACES PER 300 SF (4,500 SF)(1/300 SF) = 15 SPACES **TOTAL: 33 + 10 + 15 = 58 SPACES**	19 SPACES AT GROUND LEVEL 43 SPACES ON LOWER LEVEL **62 SPACES TOTAL ONSITE** 9 SPACES IN PUBLIC R.O.W **71 SPACES TOTAL**
§ 9-12	PARKING SPACE SIZE: 180 SF	180 SF (9 FT X 20 FT)
§ 3.04-C.7	MAXIMUM PARKING ACCESS WIDTH: 25 FT WIDE	22 FT

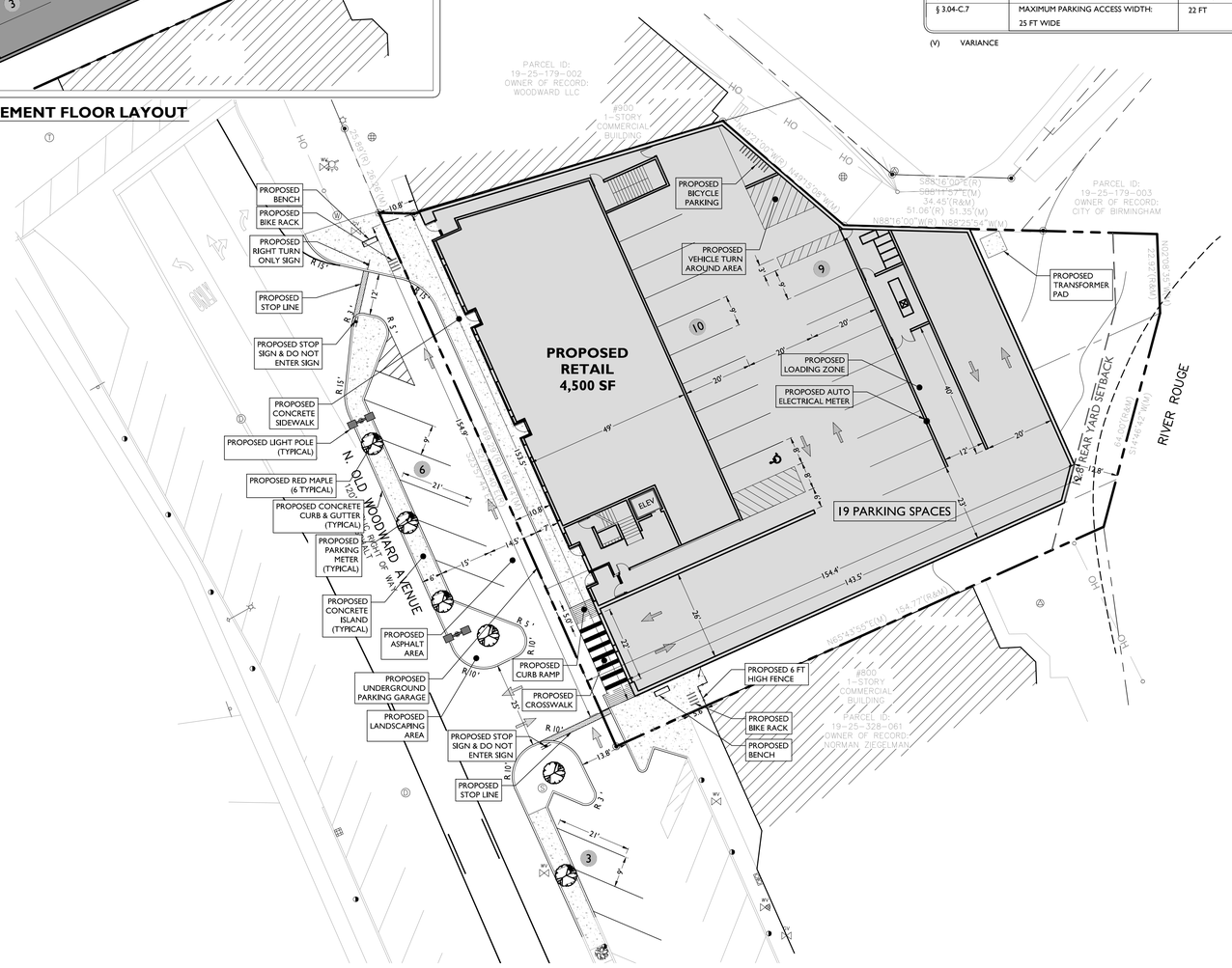
(V) VARIANCE

SYMBOL / DESCRIPTION

SYMBOL	DESCRIPTION
	PROPERTY LINE
	PROPOSED CURB
	PROPOSED FLUSH CURB
	PROPOSED SIGN
	PROPOSED BUILDING
	PROPOSED CONCRETE
	PROPOSED TRAFFIC FLOW MARKINGS
12	PARKING STALL COUNTER

GENERAL NOTES

1. THE CONTRACTOR SHALL VERIFY AND FAMILIARIZE THEMSELVES WITH THE EXISTING SITE CONDITIONS AND THE PROPOSED SCOPE OF WORK (INCLUDING DIMENSIONS, LAYOUT, ETC.) PRIOR TO INITIATING THE IMPROVEMENTS IDENTIFIED WITHIN THESE DOCUMENTS. SHOULD ANY DISCREPANCY BE FOUND BETWEEN THE EXISTING SITE CONDITIONS AND THE PROPOSED WORK THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC. PRIOR TO THE START OF CONSTRUCTION.
2. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND ENSURE THAT ALL REQUIRED APPROVALS HAVE BEEN OBTAINED PRIOR TO THE START OF CONSTRUCTION. COPIES OF ALL REQUIRED PERMITS AND APPROVALS SHALL BE KEPT ON SITE AT ALL TIMES DURING CONSTRUCTION.
3. ALL CONTRACTORS WILL, TO THE FULLEST EXTENT PERMITTED BY LAW, INDEMNIFY AND HOLD HARMLESS STONEFIELD ENGINEERING & DESIGN, LLC. AND IT'S SUB-CONSULTANTS FROM AND AGAINST ANY DAMAGES AND LIABILITIES INCLUDING ATTORNEY'S FEES ARISING OUT OF CLAIMS BY EMPLOYEES OF THE CONTRACTOR IN ADDITION TO CLAIMS CONNECTED TO THE PROJECT AS A RESULT OF NOT CARRYING THE PROPER INSURANCE FOR WORKERS COMPENSATION, LIABILITY INSURANCE, AND LIMITS OF COMMERCIAL GENERAL LIABILITY INSURANCE.
4. THE CONTRACTOR SHALL NOT DEVIATE FROM THE PROPOSED IMPROVEMENTS IDENTIFIED WITHIN THIS PLAN SET UNLESS APPROVAL IS PROVIDED IN WRITING BY STONEFIELD ENGINEERING & DESIGN, LLC.
5. THE CONTRACTOR IS RESPONSIBLE TO DETERMINE THE MEANS AND METHODS OF CONSTRUCTION.
6. THE CONTRACTOR SHALL NOT PERFORM ANY WORK OR CAUSE DISTURBANCE ON A PRIVATE PROPERTY NOT CONTROLLED BY THE PERSON OR ENTITY WHO HAS AUTHORIZED THE WORK WITHOUT PRIOR WRITTEN CONSENT FROM THE OWNER OF THE PRIVATE PROPERTY.
7. THE CONTRACTOR IS RESPONSIBLE TO RESTORE ANY DAMAGED OR UNDERMINED STRUCTURE OR SITE FEATURE THAT IS IDENTIFIED TO REMAIN ON THE PLAN SET. ALL REPAIRS SHALL USE NEW MATERIALS TO RESTORE THE FEATURE TO ITS EXISTING CONDITION AT THE CONTRACTORS EXPENSE.
8. CONTRACTOR IS RESPONSIBLE TO PROVIDE THE APPROPRIATE SHOP DRAWINGS, PRODUCT DATA, AND OTHER REQUIRED SUBMITTALS FOR REVIEW. STONEFIELD ENGINEERING & DESIGN, LLC. WILL REVIEW THE SUBMITTALS IN ACCORDANCE WITH THE DESIGN INTENT AS REFLECTED WITHIN THE PLAN SET.
9. THE CONTRACTOR IS RESPONSIBLE FOR TRAFFIC CONTROL IN ACCORDANCE WITH MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.
10. THE CONTRACTOR IS REQUIRED TO PERFORM ALL WORK IN THE PUBLIC RIGHT-OF-WAY IN ACCORDANCE WITH THE APPROPRIATE GOVERNING AUTHORITY AND SHALL BE RESPONSIBLE FOR THE PROCUREMENT OF STREET OPENING PERMITS.
11. THE CONTRACTOR IS REQUIRED TO RETAIN AN OSHA CERTIFIED SAFETY INSPECTOR TO BE PRESENT ON SITE AT ALL TIMES DURING CONSTRUCTION & DEMOLITION ACTIVITIES.
12. SHOULD AN EMPLOYEE OF STONEFIELD ENGINEERING & DESIGN, LLC. BE PRESENT ON SITE AT ANY TIME DURING CONSTRUCTION, IT DOES NOT RELIEVE THE CONTRACTOR OF ANY OF THE RESPONSIBILITIES AND REQUIREMENTS LISTED IN THE NOTES WITHIN THIS PLAN SET.



ZONING RELIEF TABLE

DESIGN STANDARDS	REQUIRED	PROPOSED
§ 3.04-A.1	MAXIMUM BUILDING HEIGHT: 3 STORIES (56 FT)	4 STORIES (56 FT)

(V) VARIANCE

20' 0' 20' 40'
GRAPHIC SCALE IN FEET
1" = 20'

ISSUE	DATE	BY	DESCRIPTION
5	04/12/2016	JAM	REVISED PER CITY COMMENTS & ZONING BOARD SUBMISSION
4	03/10/2016	JAM	REVISED PER CITY COMMENTS & ZONING BOARD SUBMISSION
3	02/17/2016	JAM	REVISED PER CITY COMMENTS
2	01/06/2016	JAM	REVISED PER CITY REVIW LETTER COMMENTS
1	11/11/2015	JAM	SUBMISSION FOR PRELIMINARY SITE PLAN APPORAL

NOT APPROVED FOR CONSTRUCTION

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2350 Franklin Road, Suite 210, Bloomfield Hills, MI 48302
Phone 248.247.1115

SITE DEVELOPMENT PLANS

856 OLD NORTH WOODWARD

PROPOSED 4 STORY MULTI-FAMILY BUILDING WITH RETAIL

PARCEL ID: 19-25-328-001
856 NORTH OLD WOODWARD ROAD
CITY OF BIRMINGHAM
OAKLAND COUNTY, MICHIGAN

MICHIGAN LICENSE No. 6201061061
LICENSED PROFESSIONAL ENGINEER

STONEFIELD engineering & design, llc.

SCALE: 1" = 20' | PROJECT ID: M-15120

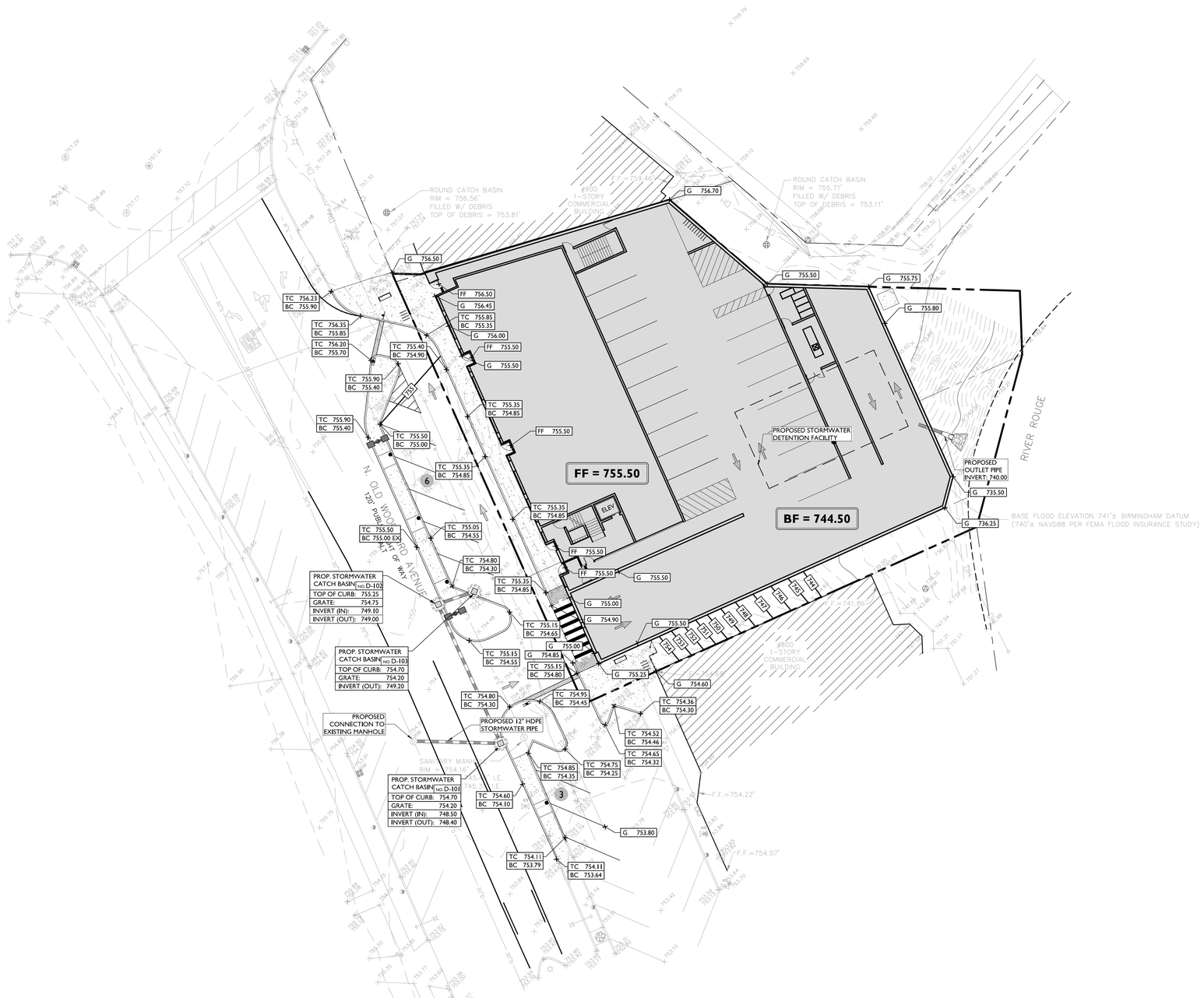
TITLE:

FIRST FLOOR SITE PLAN

DRAWING:

C-3

V:\P\M2015\M-15120-856 N. OLD WOODWARD, BIRMINGHAM, MI\CADD\PLOT\SDP-10-SITE.DWG



SYMBOL / DESCRIPTION

SYMBOL	DESCRIPTION
	PROPERTY LINE
100	PROPOSED GRADING CONTOUR
RIDGELINE	PROPOSED GRADING RIDGELINE
	PROPOSED DIRECTION OF DRAINAGE FLOW
G 100.00	PROPOSED GRADE SPOT SHOT
TC 100.50 / BC 100.00	PROPOSED TOP OF CURB / BOTTOM OF CURB SPOT SHOT
FC 100.00	PROPOSED FLUSH CURB SPOT SHOT
DC 100.12 / BC 100.00	PROPOSED DEPRESSED CURB / BOTTOM OF CURB SPOT SHOT
TW 102.00 / BW 100.00	PROPOSED TOP OF WALL / BOTTOM OF WALL SPOT SHOT

GRADING NOTES

1. ALL SOIL AND MATERIAL REMOVED FROM THE SITE SHALL BE DISPOSED OF IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS. ANY GROUNDWATER DE-WATERING PRACTICES SHALL BE PERFORMED UNDER THE SUPERVISION OF A QUALIFIED PROFESSIONAL. THE CONTRACTOR IS REQUIRED TO OBTAIN ALL NECESSARY PERMITS FOR THE DISCHARGE OF DE-WATERED GROUNDWATER. ALL SOIL IMPORTED TO THE SITE SHALL BE CERTIFIED CLEAN FILL. CONTRACTOR SHALL MAINTAIN RECORDS OF ALL FILL MATERIALS BROUGHT TO THE SITE.
2. THE CONTRACTOR IS REQUIRED TO PROVIDE TEMPORARY AND/OR PERMANENT SHORING WHERE REQUIRED DURING EXCAVATION ACTIVITIES, INCLUDING BUT NOT LIMITED TO UTILITY TRENCHES, TO ENSURE THE STRUCTURAL INTEGRITY OF NEARBY STRUCTURES AND STABILITY OF THE SURROUNDING SOILS.
3. PROPOSED TOP OF CURB ELEVATIONS ARE GENERALLY 4 INCHES TO 7 INCHES ABOVE EXISTING GRADES UNLESS OTHERWISE NOTED. THE CONTRACTOR WILL SUPPLY ALL STAKEOUT CURB GRADE SHEETS TO STONEFIELD ENGINEERING & DESIGN, LLC. FOR REVIEW AND APPROVAL PRIOR TO POURING CURBS.
4. THE CONTRACTOR IS RESPONSIBLE TO SET ALL PROPOSED UTILITY COVERS AND RESET ALL EXISTING UTILITY COVERS WITHIN THE PROJECT LIMITS TO PROPOSED GRADE IN ACCORDANCE WITH ANY APPLICABLE MUNICIPAL, COUNTY, STATE AND/OR UTILITY AUTHORITY REGULATIONS.
5. MINIMUM SLOPE REQUIREMENTS TO PREVENT PONDING SHALL BE AS FOLLOWS:
   - CURB GUTTER: 0.50%
   - CONCRETE SURFACES: 1.00%
   - ASPHALT SURFACES: 1.00%
5. A MINIMUM SLOPE OF 1.00% SHALL BE PROVIDED AWAY FROM ALL BUILDINGS. THE CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE FROM THE BUILDING IS ACHIEVED AND SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC. IF THIS CONDITION CANNOT BE MET.
6. FOR PROJECTS WHERE BASEMENTS ARE PROPOSED, THE DEVELOPER IS RESPONSIBLE TO DETERMINE THE DEPTH TO GROUNDWATER AT THE LOCATION OF THE PROPOSED STRUCTURE. IF GROUNDWATER IS ENCOUNTERED WITHIN THE BASEMENT AREA, SPECIAL CONSTRUCTION METHODS SHALL BE UTILIZED AND REVIEWED/APPROVED BY THE CONSTRUCTION CODE OFFICIAL. IF SUMP PUMPS ARE UTILIZED, ALL DISCHARGES SHALL BE CONNECTED DIRECTLY TO THE PUBLIC STORM SEWER SYSTEM WITH APPROVAL FROM THE GOVERNING STORM SEWER SYSTEM AUTHORITY.

ADA NOTES

1. THE CONTRACTOR SHALL MAINTAIN A MAXIMUM 2.00% SLOPE IN ANY DIRECTION WITHIN THE ADA PARKING SPACES AND ACCESS AISLES.
2. THE CONTRACTOR SHALL PROVIDE COMPLIANT SIGNAGE AT ALL ADA PARKING AREAS IN ACCORDANCE WITH STATE GUIDELINES.
3. THE CONTRACTOR SHALL MAINTAIN A MAXIMUM 5.00% RUNNING SLOPE AND A MAXIMUM OF 2.00% CROSS SLOPE ALONG WALKWAYS WITHIN THE ACCESSIBLE PATH OF TRAVEL (SEE THE SITE PLAN FOR THE LOCATION OF THE ACCESSIBLE PATH). THE CONTRACTOR IS RESPONSIBLE TO ENSURE THE ACCESSIBLE PATH OF TRAVEL IS 36 INCHES WIDE OR GREATER UNLESS INDICATED OTHERWISE WITHIN THE PLAN SET.
4. THE CONTRACTOR SHALL MAINTAIN A MAXIMUM 2.00% SLOPE IN ANY DIRECTION AT ALL LANDINGS. LANDINGS INCLUDE, BUT ARE NOT LIMITED TO, THE TOP AND BOTTOM OF AN ACCESSIBLE RAMP, AT ACCESSIBLE BUILDING ENTRANCES, AT AN AREA IN FRONT OF A WALK-UP ATM, AND AT TURNING SPACES ALONG THE ACCESSIBLE PATH OF TRAVEL. THE LANDING AREA SHALL HAVE A MINIMUM CLEAR AREA OF 60 INCHES BY 60 INCHES UNLESS INDICATED OTHERWISE WITHIN THE PLAN SET.
5. THE CONTRACTOR SHALL MAINTAIN A MAXIMUM 8.33% RUNNING SLOPE AND A MAXIMUM 2.00% CROSS SLOPE ON ANY CURB RAMPS ALONG THE ACCESSIBLE PATH OF TRAVEL. WHERE PROVIDED, CURB RAMP FLARES SHALL NOT HAVE A SLOPE GREATER THAN 10.00% IF A LANDING AREA IS PROVIDED AT THE TOP OF THE RAMP. FOR ALTERATIONS, A CURB RAMP FLARES SHALL NOT HAVE A SLOPE GREATER THAN 8.33% IF A LANDING AREA IS NOT PROVIDED AT THE TOP OF THE RAMP. CURBS RAMPS SHALL NOT RISE MORE THAN 6 INCHES IN ELEVATION WITHOUT A HANDRAIL. THE CLEAR WIDTH OF A CURB RAMP SHALL BE NO LESS THAN 36 INCHES WIDE.
6. ACCESSIBLE RAMPS WITH A RISE GREATER THAN 6 INCHES SHALL CONTAIN COMPLIANT HANDRAILS ON BOTH SIDES OF THE RAMP AND SHALL NOT RISE MORE THAN 30" IN ELEVATION WITHOUT A LANDING AREA IN BETWEEN RAMP RUNS. LANDING AREAS SHALL ALSO BE PROVIDED AT THE TOP AND BOTTOM OF THE RAMP.
7. A SLIP RESISTANT SURFACE ALL BE CONSTRUCTED ALONG THE ACCESSIBLE PATH AND WITHIN ADA PARKING AREAS.
8. THE CONTRACTOR SHALL ENSURE A MAXIMUM OF ¼ INCHES VERTICAL CHANGE IN LEVEL ALONG THE ACCESSIBLE PATH. WHERE A CHANGE IN LEVEL BETWEEN ¼ INCHES AND ½ INCHES EXISTS, CONTRACTOR SHALL ENSURE THAT THE TOP ¼ INCH CHANGE IN LEVEL IS BEVELED WITH A SLOPE NOT STEEPER THAN 1 UNIT VERTICAL AND 2 UNITS HORIZONTAL (2:1 SLOPE).
9. THE CONTRACTOR SHALL ENSURE THAT ANY OPENINGS (GAPS OR HORIZONTAL SEPARATION) ALONG THE ACCESSIBLE PATH SHALL NOT ALLOW PASSAGE OF A SPHERE GREATER THAN ½ INCH.

20' 0' 20' 40'
GRAPHIC SCALE IN FEET
1" = 20'

ISSUE	DATE	BY	DESCRIPTION
5	04/12/2016	JAM	REVISED PER CITY COMMENTS & ZONING BOARD SUBMISSION
4	03/10/2016	JAM	REVISED PER CITY COMMENTS & ZONING BOARD SUBMISSION
3	02/17/2016	JAM	REVISED PER CITY COMMENTS
2	01/06/2016	JAM	REVISED PER CITY REVIW LETTER COMMENTS
1	11/11/2015	JAM	SUBMISSION FOR PRELIMINARY SITE PLAN APPORAL

NOT APPROVED FOR CONSTRUCTION

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SITE DEVELOPMENT PLANS

856 OLD NORTH WOODWARD

PROPOSED 4 STORY MULTI-FAMILY BUILDING WITH RETAIL

PARCEL ID: 19-25-328-001
856 NORTH OLD WOODWARD ROAD
CITY OF BIRMINGHAM
OAKLAND COUNTY, MICHIGAN

MICHIGAN LICENSE No. 6201061061
LICENSED PROFESSIONAL ENGINEER

STONEFIELD
engineering & design, llc.

SCALE: 1" = 20' | PROJECT ID: M-15120

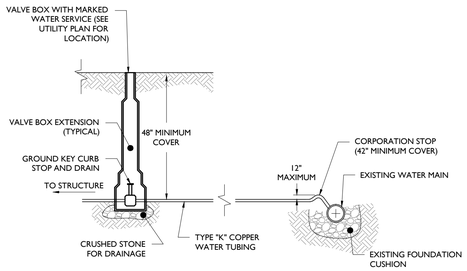
TITLE:

GRADING PLAN

DRAWING:

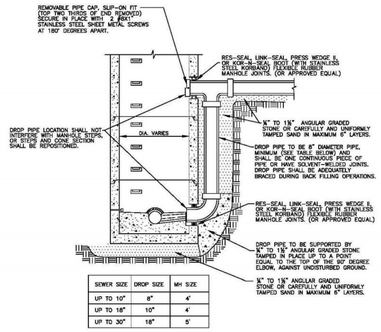
C-4

V:\PROJECTS\M-15120-SITE-856 N. OLD WOODWARD, BIRMINGHAM, MI\CADD\PLOT\SP-04-GRADING.DWG



WATER CONNECTION DETAIL

NOT TO SCALE



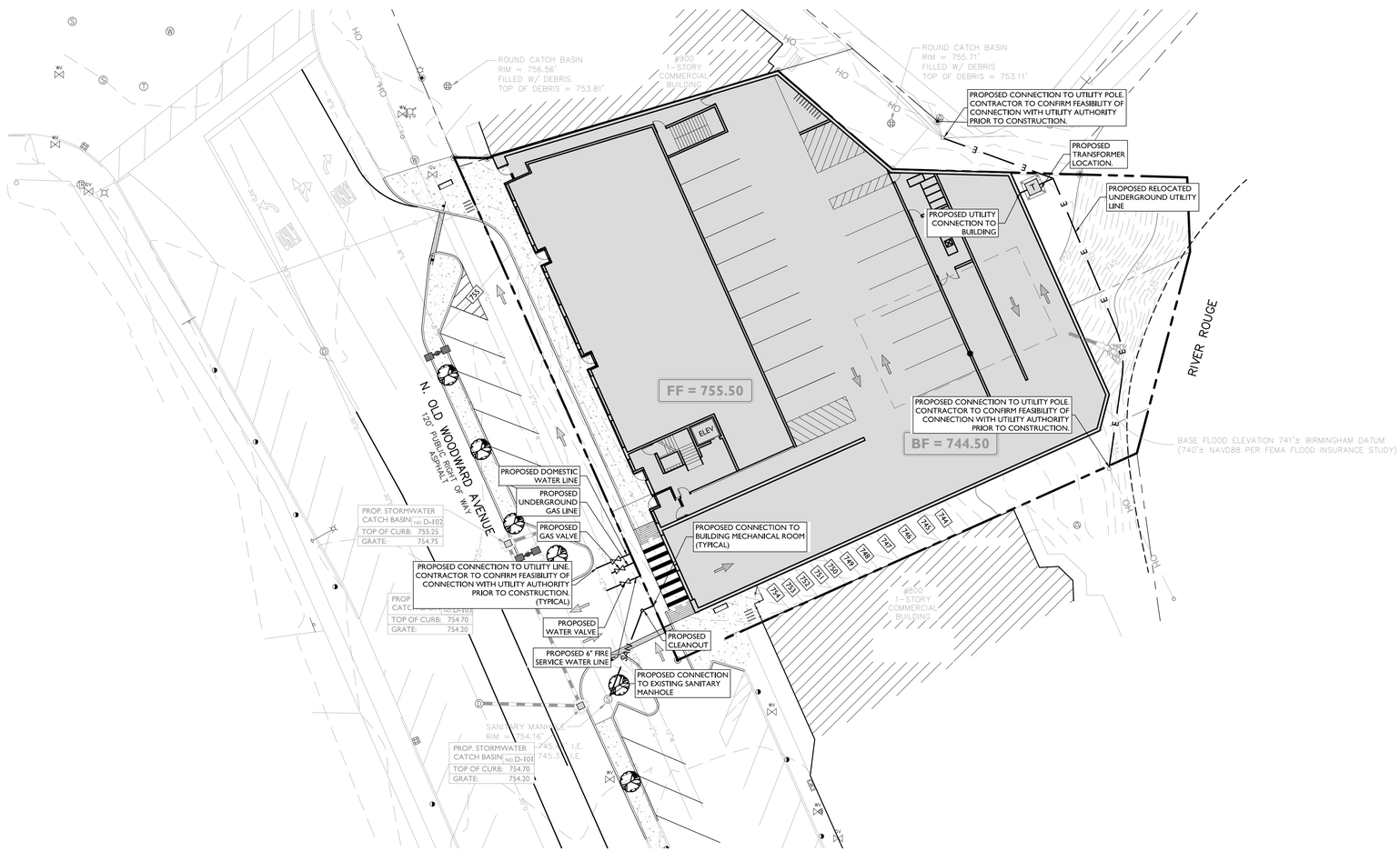
SEWER SIZE	DROP SIZE	MH SIZE
UP TO 10"	8"	4'
UP TO 18"	10"	4'
UP TO 30"	18"	5'

EXTERIOR DROP CONNECTION

SANITARY CONNECTION DETAIL

NOT TO SCALE

SYMBOL	DESCRIPTION
	PROPERTY BOUNDARY
SAN	PROPOSED SANITARY SEWER
2"W	PROPOSED UNDERGROUND WATER LINE
GAS	PROPOSED GAS LINE
E/T/C	PROPOSED UNDERGROUND ELECTRIC/PHONE/CABLE LINE
	PROPOSED STRUCTURES



DRAINAGE AND UTILITY NOTES

1. THE CONTRACTOR IS REQUIRED TO CALL THE APPROPRIATE AUTHORITY FOR NOTICE OF CONSTRUCTION/EXCAVATION AND UTILITY MARK OUT PRIOR TO THE START OF CONSTRUCTION IN ACCORDANCE WITH STATE LAW. CONTRACTOR IS REQUIRED TO CONFIRM THE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES IN THE FIELD. SHOULD A DISCREPANCY EXIST BETWEEN THE FIELD LOCATION OF A UTILITY AND THE LOCATION SHOWN ON THE PLAN SET OR SURVEY, THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC. IMMEDIATELY IN WRITING.
2. THE CONTRACTOR IS RESPONSIBLE TO PROTECT AND MAINTAIN IN OPERATION ALL UTILITIES NOT DESIGNATED TO BE REMOVED.
3. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE TO ANY EXISTING UTILITY IDENTIFIED TO REMAIN WITHIN THE LIMITS OF THE PROPOSED WORK DURING CONSTRUCTION.
4. A MINIMUM HORIZONTAL SEPARATION OF 10 FEET IS REQUIRED BETWEEN ANY SANITARY SEWER SERVICE AND ANY WATER LINES. IF THIS SEPARATION CANNOT BE PROVIDED. A CONCRETE ENCASEMENT SHALL BE UTILIZED FOR THE SANITARY SEWER SERVICE AS APPROVED BY STONEFIELD ENGINEERING & DESIGN, LLC.
5. ALL WATER LINES SHALL BE VERTICALLY SEPARATED ABOVE SANITARY SEWER LINES BY A MINIMUM DISTANCE OF 18 INCHES. IF THIS SEPARATION CANNOT BE PROVIDED, A CONCRETE ENCASEMENT SHALL BE UTILIZED FOR THE SANITARY SEWER SERVICE AS APPROVED BY STONEFIELD ENGINEERING & DESIGN, LLC.
6. THE CONTRACTOR TO PERFORM A TEST PIT PRIOR TO CONSTRUCTION (RECOMMEND 30 DAYS PRIOR) AT LOCATIONS OF EXISTING UTILITY CROSSINGS FOR WATER AND SANITARY SEWER CONNECTION IMPROVEMENTS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC. IN WRITING.
7. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING GAS, ELECTRIC AND TELECOMMUNICATION CONNECTIONS WITH THE APPROPRIATE GOVERNING AUTHORITY.
8. CONTRACTOR SHALL START CONSTRUCTION OF ANY GRAVITY SEWER AT THE LOWEST INVERT AND WORK UP-GRADIENT.
7. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN A RECORD SET OF PLANS REFLECTING THE LOCATION OF EXISTING UTILITIES THAT HAVE BEEN CAPPED, ABANDONED, OR RELOCATED BASED ON THE DEMOLITION/REMOVAL ACTIVITIES REQUIRED IN THIS PLAN SET. THIS DOCUMENT SHALL BE PROVIDED TO THE OWNER FOLLOWING COMPLETION OF WORK.
8. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN A RECORD OF THE AS-BUILT LOCATIONS OF ALL PROPOSED UNDERGROUND INFRASTRUCTURE. THE CONTRACTOR SHALL NOTE ANY DISCREPANCIES BETWEEN THE AS-BUILT LOCATIONS AND THE LOCATIONS DEPICTED WITHIN THE PLAN SET. THIS RECORD SHALL BE PROVIDED TO THE OWNER FOLLOWING COMPLETION OF WORK.

20' 0' 20' 40'

GRAPHIC SCALE IN FEET
1" = 20'

ISSUE	DATE	BY	DESCRIPTION
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SITE DEVELOPMENT PLANS

856 OLD NORTH WOODWARD

PROPOSED 4 STORY MULTI-FAMILY BUILDING WITH RETAIL

PARCEL ID: 19-25-328-001
856 NORTH OLD WOODWARD ROAD
CITY OF BIRMINGHAM
OAKLAND COUNTY, MICHIGAN

MICHIGAN LICENSE No. 6201061061
LICENSED PROFESSIONAL ENGINEER

STONEFIELD
engineering & design, llc.

SCALE: 1" = 20' | PROJECT ID: M-15120

TITLE:

UTILITY PLAN

DRAWING:

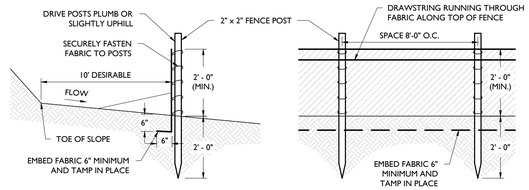
C-5

V:\19025\19-15128\DFN\TEC-856 N. OLD WOODWARD, BIRMINGHAM, MI\CADD\PLOT\SDP-05-UTIL.DWG

SOURCE: USGS MAP

LOCATION MAP

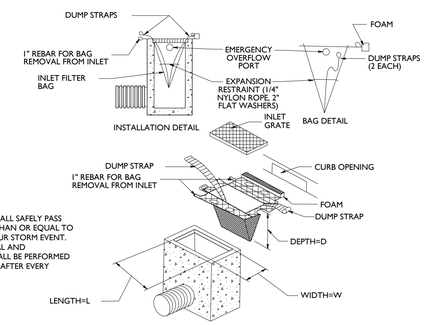
SCALE: 1" = 2000'±



NOTES:
1. SECURELY FASTEN GEOTEXTILE TO FENCE POST BY USE OF WIRE TIES, HOG RINGS, STAPLES OR POCKETS. FOUR TO SIX FASTENERS PER POST.
2. GEOTEXTILE FABRIC TO BE EMBEDDED 6" (MIN.) AND TAMP IN PLACE.
3. SECURELY FASTEN ENDS OF INDIVIDUAL ROLLS OF GEOTEXTILE TO A POST BY WRAPPING EACH END OF THE GEOTEXTILE AROUND THE POST TWICE AND ATTACHING AS SPECIFIED IN NOTE 1 ABOVE. SPLICING OF INDIVIDUAL ROLLS SHALL NOT OCCUR AT LOW POINTS.
4. SET SILT FENCE WITHIN PROJECT LIMITS. 10'-0" IS DESIRABLE.

SILT FENCE DETAIL

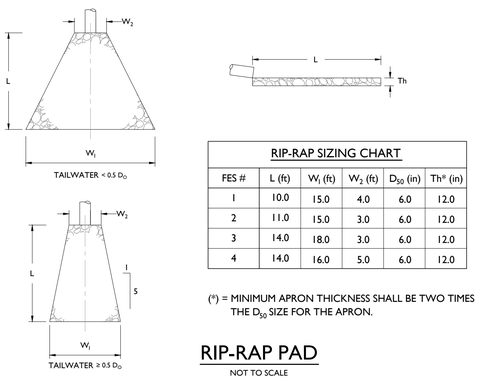
NOT TO SCALE



NOTES:
1. THE FILTER BAG SHALL SAFELY PASS FLOWS GREATER THAN OR EQUAL TO THE 1-YEAR 24-HOUR STORM EVENT.
2. SEDIMENT REMOVAL AND MAINTENANCE SHALL BE PERFORMED FREQUENTLY AND AFTER EVERY STORM EVENT.

INLET FILTER BAG DETAIL

NOT TO SCALE



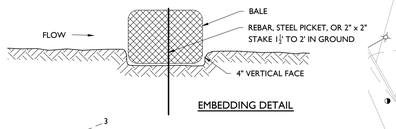
RIP-RAP SIZING CHART

FES #	L (ft)	W_1 (ft)	W_2 (ft)	D_{50} (in)	Th* (in)
1	10.0	15.0	4.0	6.0	12.0
2	11.0	15.0	3.0	6.0	12.0
3	14.0	18.0	3.0	6.0	12.0
4	14.0	16.0	5.0	6.0	12.0

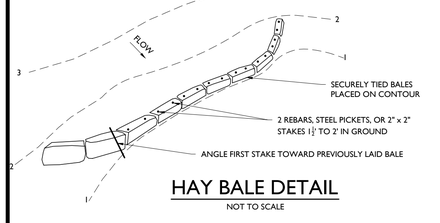
(*) = MINIMUM APRON THICKNESS SHALL BE TWO TIMES THE D_{50} SIZE FOR THE APRON.

RIP-RAP PAD

NOT TO SCALE

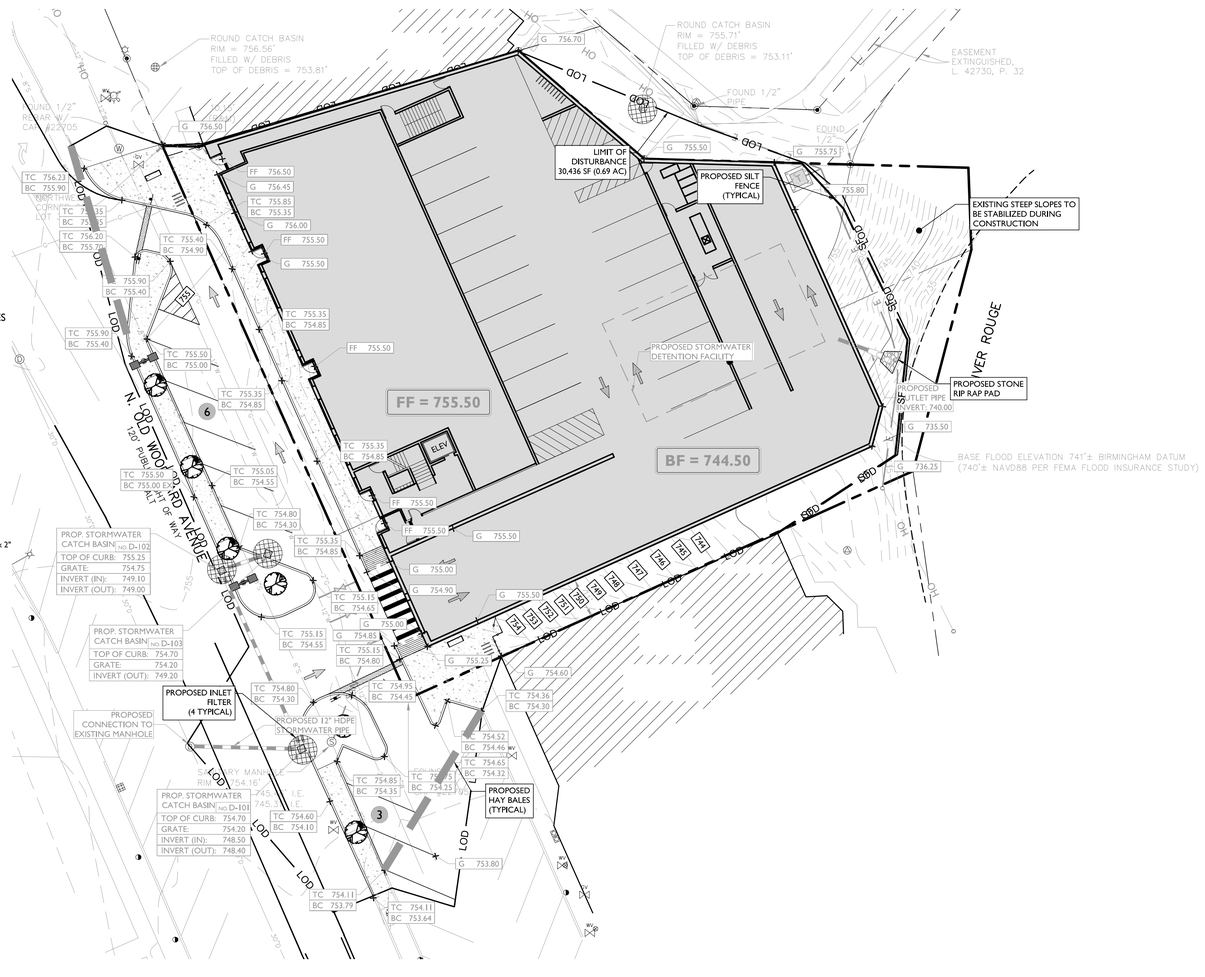


EMBEDDING DETAIL



HAY BALE DETAIL

NOT TO SCALE



SYMBOL	DESCRIPTION
LOD	LIMIT OF DISTURBANCE
SF	SILT FENCE
	PROPOSED INLET FILTER

59 - URBAN LAND	
SOIL CHARACTERISTICS	
HYDROLOGIC SOIL GROUP	D
DEPTH TO RESTRICTIVE LAYER	MORE THAN 200 INCHES
SOIL PERMEABILITY	N/A
DEPTH TO WATER TABLE	MORE THAN 80 INCHES

SEQUENCE OF CONSTRUCTION

1. INSTALL SILT FENCE AND CONSTRUCTION ENTRANCE (2 DAYS).
2. DEMOLISH EXISTING STRUCTURES, PAVEMENT, AND GRAVEL (45 DAYS).
3. ROUGH GRADING AND TEMPORARY SEEDING (20 DAYS).
4. EXCAVATE AND INSTALL UNDERGROUND BASIN, WATER QUALITY UNIT, DRAINAGE PIPING, AND INLETS (20 DAYS).
5. INSTALL INLET FILTERS (1 DAY).
6. BUILDING CONSTRUCTION AND SITE IMPROVEMENTS (275 DAYS).
7. CONSTRUCT RIGHT OF WAY IMPROVEMENTS (180 DAYS).
8. LANDSCAPING IMPROVEMENTS AND FINAL SEEDING (7 DAYS).
9. REMOVE SOIL EROSION MEASURES (1 DAY).

NOTE: TIME DURATIONS ARE APPROXIMATE AND ARE INTENDED TO ACT AS A GENERAL GUILE TO THE CONSTRUCTION TIMELINE. ALL DURATIONS ARE SUBJECT TO CHANGE BY CONTRACTOR. CONTRACTOR SHALL SUBMIT CONSTRUCTION SCHEDULE TO TOWNSHIP AND ENGINEER. CONTRACTOR SHALL PHASE CONSTRUCTION ACCORDINGLY

FLOOD HAZARD AREA NOTES:

1. THERE ARE NO RIPARIAN ZONES ON SITE.
2. THERE ARE FLOODWAYS ON SITE.
3. PORTIONS OF THE SITE ARE WITHIN THE 100-YR FLOOD AREA
4. ALL ELEVATIONS SHOWN ARE BASED ON THE CITY OF BIRMINGHAM DATUM.

ENVIRONMENTAL NOTES:

1. THERE ARE NO WETLANDS ON SITE.
2. THE ROUGE RIVER IS LOCATED ONSITE.
3. REFER TO STORMWATER MANAGEMENT REPORT FOR SOIL INFORMATION AND LAND USE FOR SURROUNDING AREA

PARCEL AREA

24,719± SQUARE FEET = 0.57± ACRES

BASIS OF BEARING

SOUTH 23°57'44" EAST, BEING THE NORTHERLY RIGHT OF WAY LINE OF N. OLD WOODWARD AVENUE.

BENCHMARK

NORTHWEST BOLT OF STREET LIGHT, LOCATED ON THE EASTERLY SIDE OF N. OLD WOODWARD AVENUE, ELEVATION = 756.31' (CITY OF BIRMINGHAM DATUM)

FLOOD NOTE

SUBJECT PARCEL LIES WITHIN:

SPECIAL FLOOD HAZARD AREA (ZONE AE): BASE FLOOD ELEVATIONS DETERMINED.

FLOODWAY AREAS IN ZONE AE: THE FLOODWAY IS THE CHANNEL OF A STREAM PLUS ANY ADJACENT FLOODPLAIN AREAS THAT MUST BE KEPT FREE OF ENCROACHMENT SO THAT THE 1% ANNUAL CHANCE FLOOD CAN BE CARRIED WITHOUT SUBSTANTIAL INCREASES IN FLOOD HEIGHTS.

ZONE X: AREAS DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOODPLAIN.

AS SHOWN ON FLOOD INSURANCE RATE MAP: MAP NUMBER 26125C0537F, COMMUNITY - PANEL NUMBER 260168 0537 F, DATED SEPTEMBER 29, 2006, PUBLISHED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.

PROPERTY DESCRIPTION

LAND SITUATED IN THE CITY OF BIRMINGHAM, COUNTY OF OAKLAND, STATE OF MICHIGAN IS DESCRIBED AS FOLLOWS:

LOTS 3 AND 4, ASSESSOR'S PLAT No. 29 AS RECORDED IN LIBER 6, PAGE 45 OF PLATS, OAKLAND COUNTY RECORDS, ALSO PART OF THE NORTHWEST 1/4 OF SECTION 25, TOWN 2 NORTH, RANGE 10 EAST, CITY OF BIRMINGHAM, OAKLAND COUNTY, MICHIGAN, DESCRIBED AS BEGINNING AT A POINT DISTANT SOUTH 88 DEGREES 16 MINUTES 00 SECONDS EAST 10.15 FEET FROM THE NORTHWEST CORNER OF SAID LOT 3; THENCE SOUTH 88 DEGREES 16 MINUTES 00 SECONDS EAST 124.70 FEET; THENCE NORTH 49 DEGREES 21 MINUTES 00 SECONDS WEST 46.41 FEET; THENCE SOUTH 73 DEGREES 32 MINUTES 00 SECONDS WEST 93.28 FEET TO BEGINNING.

EROSION AND SEDIMENT CONTROL NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR SOIL EROSION AND SEDIMENT CONTROL IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS.
2. THE CONTRACTOR IS RESPONSIBLE FOR DUST CONTROL AND COMPLIANCE WITH LOCAL, STATE, AND FEDERAL AIR QUALITY STANDARDS.
3. THE CONTRACTOR IS RESPONSIBLE TO INSPECT ALL SOIL EROSION MEASURES WEEKLY AND AFTER A PRECIPITATION EVENT GREATER THAN 1 INCH. THE CONTRACTOR SHALL MAINTAIN AN INSPECTION LOG ON SITE AND DOCUMENT CORRECTIVE ACTION AS REQUIRED TAKEN THROUGHOUT THE COURSE OF CONSTRUCTION.

20' 0' 20' 40'

GRAPHIC SCALE IN FEET
1" = 20'

ISSUE	DATE	BY	DESCRIPTION
5	04/12/2016	JAM	REVISED PER CITY COMMENTS & ZONING BOARD SUBMISSION
4	03/10/2016	JAM	REVISED PER CITY COMMENTS & ZONING BOARD SUBMISSION
3	02/17/2016	JAM	REVISED PER CITY COMMENTS
2	01/06/2016	JAM	REVISED PER CITY REVIW LETTER COMMENTS
1	11/11/2015	JAM	SUBMISSION FOR PRELIMINARY SITE PLAN APPORAL

NOT APPROVED FOR CONSTRUCTION

STONEFIELD engineering & design, llc.
Rutherford, NJ · Farmingdale, NY · Bloomfield Hills, MI
www.stonefieldeng.com
2350 Franklin Road, Suite 210, Bloomfield Hills, MI 48302
Phone 248.247.1115

SITE DEVELOPMENT PLANS

856 OLD NORTH WOODWARD

PROPOSED 4 STORY MULTI-FAMILY BUILDING WITH RETAIL

PARCEL ID: 19-25-328-001
856 NORTH OLD WOODWARD ROAD
CITY OF BIRMINGHAM
OAKLAND COUNTY, MICHIGAN

MICHIGAN LICENSE No. 6201061061
LICENSED PROFESSIONAL ENGINEER

STONEFIELD engineering & design, llc.

SCALE: 1" = 20' | PROJECT ID: M-15120

TITLE:
SOIL EROSION & SEDIMENT CONTROL PLAN

DRAWING:
C-6

V:\P\M015\M-15120-MIX-TEC-856 N. OLD WOODWARD, BIRMINGHAM, MI\CADD\PLOT\SDP-06-SESC.DWG

Appendix E

PM ENVIRONMENTAL Environmental & Engineering Services

Table 1: 856 North Old Woodward Ave, Birmingham - Eligible Activities Cost Estimates (incl. School Tax Capture)

Item/Activity	Brownfield Quantity	Greenfield Quantity	Units	Unit Cost (Brownfield)	Unit Cost (Greenfield)	Brownfield (Contaminated) Site Cost	Greenfield (Uncontaminated) Site Cost	Eligible Brownfield Cost (cost difference)
Baseline Environmental Assessments								
(a) Phase I ESA, Phase II ESA, BEA, DDCC	1	0	ea	$ 16,155.00	$ 2,000.00	$ 16,155	$ 2,000	**$ 14,155**
Due Care Activities								
(a) Excavation of hazardous material	6,705	6,705	tons	$ 63.35	$ 23.00	$ 424,762	$ 154,215	$ 270,547
(b) Transportation of contaminated soils								
Transport of soil to a Type II Landfill	13,390	13,390	tons	$ 7.00	$0.00	$ 93,730	$ -	$ 93,730
Transport of hazardous material	6,705	6,705	tons	$ 47.55	$0.00	$ 318,823	$ -	$ 318,823
(c) Disposal of contaminated soils								
Disposal of soil to a Type II Landfill	13,390	13,390	tons	$ 11.50	$0.00	$ 153,985	$ -	$ 153,985
Disposal of hazardous material	6,705	6,705	tons	$ 150.00	$0.00	$ 1,005,750	$ -	$ 1,005,750
(d) Excavation Equipment Decon and Decon Wastewater Handling	1	-	ea	$ 7,500.00	$0.00	$ 7,500	$ -	$ 7,500
(e) Additional delienation and sampling of Tetrachloroethylene soil concentrations								
Mobilization, onsite labor for oversight, screening, and sample collection	1	0	ea	$ 2,550.00	$0.00	$ 2,550	$ -	$ 2,550
Consultant equipment and supplies	1	0	ea	$ 600.00	$0.00	$ 600	$ -	$ 600
Data evaluation and project management for reporting	1	0	ea	$ 3,500.00	$0.00	$ 3,500	$ -	$ 3,500
Drilling and operations	1	0	ea	$ 5,275.00	$0.00	$ 5,275	$ -	$ 5,275
Lab analysis of 36 samples for VOCs	36	0	samples	$ 70.00	$0.00	$ 2,520	$ -	$ 2,520
Project management associated with hazardous material	1	0	ea	$ 7,500.00	$0.00	$ 7,500	$ -	$ 7,500
(f) Associated excavation oversight, excavation verification sampling, and reporting								
Mobilization, oversight, and sample collection	1	0	ea	$ 12,375.00	$0.00	$ 12,375	$ -	$ 12,375
Consultant equipment and supplies	1	0	ea	$ 1,200.00	$0.00	$ 1,200	$ -	$ 1,200
Data Evaluation, project management, and report preparation	1	0	ea	$ 4,500.00	$0.00	$ 4,500	$ -	$ 4,500
Sampling for VOCs, PNAs, PCBs, Michigan 10 metals	28	0	samples	$ 350.00	$0.00	$ 9,800	$ -	$ 9,800
Up to one sample for TCLP	1	0	samples	$ 600.00	$0.00	$ 600	$ -	$ 600
						$ -	$ -	
(g) Management and disposal of up to 30,000 gallons of contaminated groundwater						$ -	$ -	
On-site storage management	1	1	ea	$ 7,500.00	$0.00	$ 7,500	$ -	$ 7,500
Disposal	30,000	30,000	gallons	$ 1.40	$0.01	$ 42,000	$ 240	$ 41,760
(h) Installation of a vapor barrier and gaskets resistant to chemical breakdown								
Installation of chemically resistant gaskets	10	0	ea	$ 1,000.00	$0.00	$ 10,000	$ -	$ 10,000
Design, bid specification, and coordination	1	0	ea	$ 5,000.00	$0.00	$ 5,000	$ -	$ 5,000
Vapor barrier installation and initial testing	1	0	ea	$ 125,000.00	$0.00	$ 125,000	$ -	$ 125,000
Vapor installation oversight	1	0	ea	$ 10,000.00	$0.00	$ 10,000	$ -	$ 10,000
Post installation testing	1	0	ea	$ 7,500.00	$0.00	$ 7,500	$ -	$ 7,500
Project management and reporting	1	0	ea	$ 15,000.00	$0.00	$ 15,000	$ -	$ 15,000
(i) Costs associated with project management brownfield financial management	1	0	ea	$ 3,000.00	$0.00	$ 3,000	$ -	$ 3,000
(j) Post-construction due care plan and associated management and reporting	1	0	ea	$ 5,000.00	$0.00	$ 5,000	$ -	$ 5,000
							Sub-total	**$ 2,130,515**
Preparation of Brownfield Plan								
(a) Brownfield Plan/381 Workplan	1	0	ea	$ 9,000.00	$ -	$ 9,000	$ -	**$ 9,000**
Project Sub-Total								**$2,153,670**
15% Contingency*								$ 319,577
Project Sub-Totals with Contingency								**$2,473,247**
3% Interest								$ 508,364
Total Cost of Developer Eligible Activities to be Funded Through TIF								**$ 2,981,610**
BRA Requested Deduction								**$ 325,000**
Revised Total								**$ 2,656,610**

*Excludes contingencies for Baseline Environmental Assessment Activities and Brownfield Plan Preparation

Table 2: TIF Table

		2017	2018 YR1	2019 YR2	2020 YR3	2021 YR4	2022 YR5	2023 YR6	2024 YR7	2025 YR8	2026 YR9	2027 YR10	2028 YR11	2029 YR12	2030 YR13	2031 YR14	
Base Taxable Value		$ 322,450	$ 322,450	$ 322,450	$ 322,450	$ 322,450	$ 322,450	$ 322,450	$ 322,450	$ 322,450	$ 322,450	$ 322,450	$ 322,450	$ 322,450	$ 322,450	$ 322,450	
Estimated New Taxable Value (estimated increase of 1%/year)			$ 2,500,000	$ 5,000,000	$ 5,050,000	$ 5,100,500	$ 5,151,505	$ 5,203,020	$ 5,255,050	$ 5,307,601	$ 5,360,677	$ 5,414,284	$ 5,468,426	$ 5,523,111	$ 5,578,342	$ 5,634,125	
Incremental Difference (New Taxable Value *minus* Taxable Value)			$ 2,177,550	$ 4,677,550	$ 4,727,550	$ 4,778,050	$ 4,829,055	$ 4,880,570	$ 4,932,600	$ 4,985,151	$ 5,038,227	$ 5,091,834	$ 5,145,976	$ 5,200,661	$ 5,255,892	$ 5,311,675	
Local Taxes - Millage																	
County Operating	4.0900		$ 8,906	$ 19,131	$ 19,336	$ 19,542	$ 19,751	$ 19,962	$ 20,174	$ 20,389	$ 20,606	$ 20,826	$ 21,047	$ 21,271	$ 21,497	$ 21,725	**$ 654,721**
OIS Allocated	0.1999		$ 435	$ 935	$ 945	$ 955	$ 965	$ 976	$ 986	$ 997	$ 1,007	$ 1,018	$ 1,029	$ 1,040	$ 1,051	$ 1,062	**$ 32,000**
OIS Voted	3.1634		$ 6,888	$ 14,797	$ 14,955	$ 15,115	$ 15,276	$ 15,439	$ 15,604	$ 15,770	$ 15,938	$ 16,108	$ 16,279	$ 16,452	$ 16,626	$ 16,803	**$ 506,392**
OCC Voted	1.5819		$ 3,445	$ 7,399	$ 7,479	$ 7,558	$ 7,639	$ 7,721	$ 7,803	$ 7,886	$ 7,970	$ 8,055	$ 8,140	$ 8,227	$ 8,314	$ 8,403	**$ 253,228**
City Operating	11.4943		$ 25,029	$ 53,765	$ 54,340	$ 54,920	$ 55,507	$ 56,099	$ 56,697	$ 57,301	$ 57,911	$ 58,527	$ 59,149	$ 59,778	$ 60,413	$ 61,054	**$ 1,839,990**
Refuse	0.9170		$ 1,997	$ 4,289	$ 4,335	$ 4,381	$ 4,428	$ 4,475	$ 4,523	$ 4,571	$ 4,620	$ 4,669	$ 4,719	$ 4,769	$ 4,820	$ 4,871	**$ 146,792**
Library	1.1000		$ 2,395	$ 5,145	$ 5,200	$ 5,256	$ 5,312	$ 5,369	$ 5,426	$ 5,484	$ 5,542	$ 5,601	$ 5,661	$ 5,721	$ 5,781	$ 5,843	**$ 176,086**
County Pk & Rec	0.2410		$ 525	$ 1,127	$ 1,139	$ 1,152	$ 1,164	$ 1,176	$ 1,189	$ 1,201	$ 1,214	$ 1,227	$ 1,240	$ 1,253	$ 1,267	$ 1,280	**$ 38,579**
HCMA	0.2146		$ 467	$ 1,004	$ 1,015	$ 1,025	$ 1,036	$ 1,047	$ 1,059	$ 1,070	$ 1,081	$ 1,093	$ 1,104	$ 1,116	$ 1,128	$ 1,140	**$ 34,353**
OCPTA	0.9998		$ 2,177	$ 4,677	$ 4,727	$ 4,777	$ 4,828	$ 4,880	$ 4,932	$ 4,984	$ 5,037	$ 5,091	$ 5,145	$ 5,200	$ 5,255	$ 5,311	**$ 160,046**
Total Local Taxes (capturable)	**24.0019**		**$ 52,265**	**$ 112,270**	**$ 113,470**	**$ 114,682**	**$ 115,906**	**$ 117,143**	**$ 118,392**	**$ 119,653**	**$ 120,927**	**$ 122,214**	**$ 123,513**	**$ 124,826**	**$ 126,151**	**$ 127,490**	**$ 3,842,187**
School Taxes																	
School Operating	18.0000		$ 39,196	$ 84,196	$ 85,096	$ 86,005	$ 86,923	$ 87,850	$ 88,787	$ 89,733	$ 90,688	$ 91,653	$ 92,628	$ 93,612	$ 94,606	$ 95,610	**$ 830,126**
SET	6.0000		$ 13,065	$ 28,065	$ 28,365	$ 28,668	$ 28,974	$ 29,283	$ 29,596	$ 29,911	$ 30,229	$ 30,551	$ 30,876	$ 31,204	$ 31,535	$ 31,870	**$ 402,194**
Total School Taxes	**24.0000**		**$ 52,261**	**$ 112,261**	**$ 113,461**	**$ 114,673**	**$ 115,897**	**$ 117,134**	**$ 118,382**	**$ 119,644**	**$ 120,917**	**$ 122,204**	**$ 123,503**	**$ 124,816**	**$ 126,141**	**$ 127,480**	**$ 1,608,776**
Non-Capturable Millages																	
School Debt	3.9000		$ 8,492	$ 18,242	$ 18,437	$ 18,634	$ 18,833	$ 19,034	$ 19,237	$ 19,442	$ 19,649	$ 19,858	$ 20,069	$ 20,283	$ 20,498	$ 20,716	**$ 261,426**
City Debt	1.3156		$ 2,865	$ 6,154	$ 6,220	$ 6,286	$ 6,353	$ 6,421	$ 6,489	$ 6,558	$ 6,628	$ 6,699	$ 6,770	$ 6,842	$ 6,915	$ 6,988	**$ 88,188**
Zoo Authority	0.0998		$ 217	$ 467	$ 472	$ 477	$ 482	$ 487	$ 492	$ 498	$ 503	$ 508	$ 514	$ 519	$ 525	$ 530	**$ 6,690**
Art Institute	0.1996		$ 435	$ 934	$ 944	$ 954	$ 964	$ 974	$ 985	$ 995	$ 1,006	$ 1,016	$ 1,027	$ 1,038	$ 1,049	$ 1,060	**$ 13,380**
Total Non-Capturable Millages	**5.5150**		**$ 12,009**	**$ 25,797**	**$ 26,072**	**$ 26,351**	**$ 26,632**	**$ 26,916**	**$ 27,203**	**$ 27,493**	**$ 27,786**	**$ 28,081**	**$ 28,380**	**$ 28,682**	**$ 28,986**	**$ 29,294**	**$ 369,683**
Local Annual Tax Increment Revenue			$ 52,265	$ 112,270	$ 113,470	$ 114,682	$ 115,906	$ 117,143	$ 118,392	$ 119,653	$ 120,927	$ 122,214	$ 123,513	$ 124,826	$ 126,151	$ 127,490	
3 Mills of SET to State Brownfield Redevelopment Fund	3.0000		$ 6,533	$ 14,033	$ 14,183	$ 14,334	$ 14,487	$ 14,642	$ 14,798	$ 14,955	$ 15,115	$ 15,276	$ 15,438	$ 15,602	$ 15,768	$ 15,935	
School Annual Tax Increment Revenue (after State BF Fund)			$ 45,729	$ 98,229	$ 99,279	$ 100,339	$ 101,410	$ 102,492	$ 103,585	$ 104,688	$ 105,803	$ 106,929	$ 108,066	$ 109,214	$ 110,374	$ 111,545	
Annual Tax Increment Revenue			$ 97,994	$ 210,499	$ 212,749	$ 215,021	$ 217,317	$ 219,635	$ 221,976	$ 224,341	$ 226,730	$ 229,142	$ 231,579	$ 234,040	$ 236,525	$ 239,035	
Annual Cumulative Incremental Taxes			$ 97,994	$ 308,493	$ 521,241	$ 736,263	$ 953,579	$ 1,173,214	$ 1,395,191	$ 1,619,532	$ 1,846,262	$ 2,075,404	$ 2,306,982	$ 2,541,022	$ 2,777,547	$ 3,016,583	
MDEQ Reimbursed Expenses																	
Local Taxes			$ 52,265	$ 112,270	$ 113,470	$ 114,682	$ 115,906	$ 117,143	$ 118,392	$ 119,653	$ 120,927	$ 122,214	$ 123,513	$ 124,826	$ 57,796		$ 1,413,058
School Taxes			$ 45,729	$ 98,229	$ 99,279	$ 100,339	$ 101,410	$ 102,492	$ 103,585	$ 104,688	$ 105,803	$ 106,929	$ 108,066	$ 109,214	$ 57,792		$ 1,243,552
Unreimbursed Eligible Expenses		**$ 2,656,610**	**$ 2,558,616**	**$ 2,348,117**	**$ 2,135,369**	**$ 1,920,347**	**$ 1,703,031**	**$ 1,483,396**	**$ 1,261,419**	**$ 1,037,078**	**$ 810,348**	**$ 581,206**	**$ 349,628**	**$ 115,588**	**$ -**		$ 2,656,610

Proposed 10-year tax capture limit, as imposed by the BBRA

Tax Ratio	Millages	Percentage
Local Tax	24.0019	50.00%
School Tax	24.0000	50.00%
Total	48.0019	100.00%

Exhibit C

Brownfield Request for Cost Reimbursement
For Eligible Activities

Date: _____

Listed below are total costs expended for each eligible activity category for the expenses being submitted with this request. Attached is evidence of each cost item, including proof of payment and detailed invoices.

Eligible Activity Category		**Total Cost**
1.	Phase I/Phase II/BEA	
2.	Due Care Activities	
3.	Additional Response Activities	
4.	Brownfield Plan preparation	
5.	Interest	
	Total Cost Reimbursement Request	

I certify that the information submitted on and with this Request for Cost Reimbursement is accurate and is an eligible cost described in the Brownfield Plan for this project approved by the City Council of the City of Birmingham.

Developer: _____

Signature: _____

Title: _____

Address: _____

_____