



COMMONWEALTH OF VIRGINIA  
**COUNTY OF FAIRFAX**  
4100 CHAIN BRIDGE ROAD  
FAIRFAX, VIRGINIA 22030



June 24, 1982

STAFF REPORT

APPLICATION NUMBER RZ 82-C-016

CENTREVILLE DISTRICT

Applicant: Edward M. Smith, Tr., et. al.

Present Zoning: R-1

Requested Zoning: I-5

Proposed Use: Industrial

Acreage: 82.0011 acres

Subject Parcels: 24-4 ((1)) 3

Application Filed: February 19, 1982

Planning Commission Public Hearing : July 8, 1982

Board of Supervisors Public Hearing : July 26, 1982

Staff Recommendation: The staff recommends that the Zoning Ordinance as it applies to the subject property be amended from the R-1 District to the I-5 District as proffered.

It should be noted that it is not the intent of the staff to recommend that the Board, in adopting any conditions proffered by the owner, relieve the applicant/owner from compliance with the provisions of any applicable ordinances, regulations, or adopted standards.

RR  
0876Z

# REZONING APPLICATION

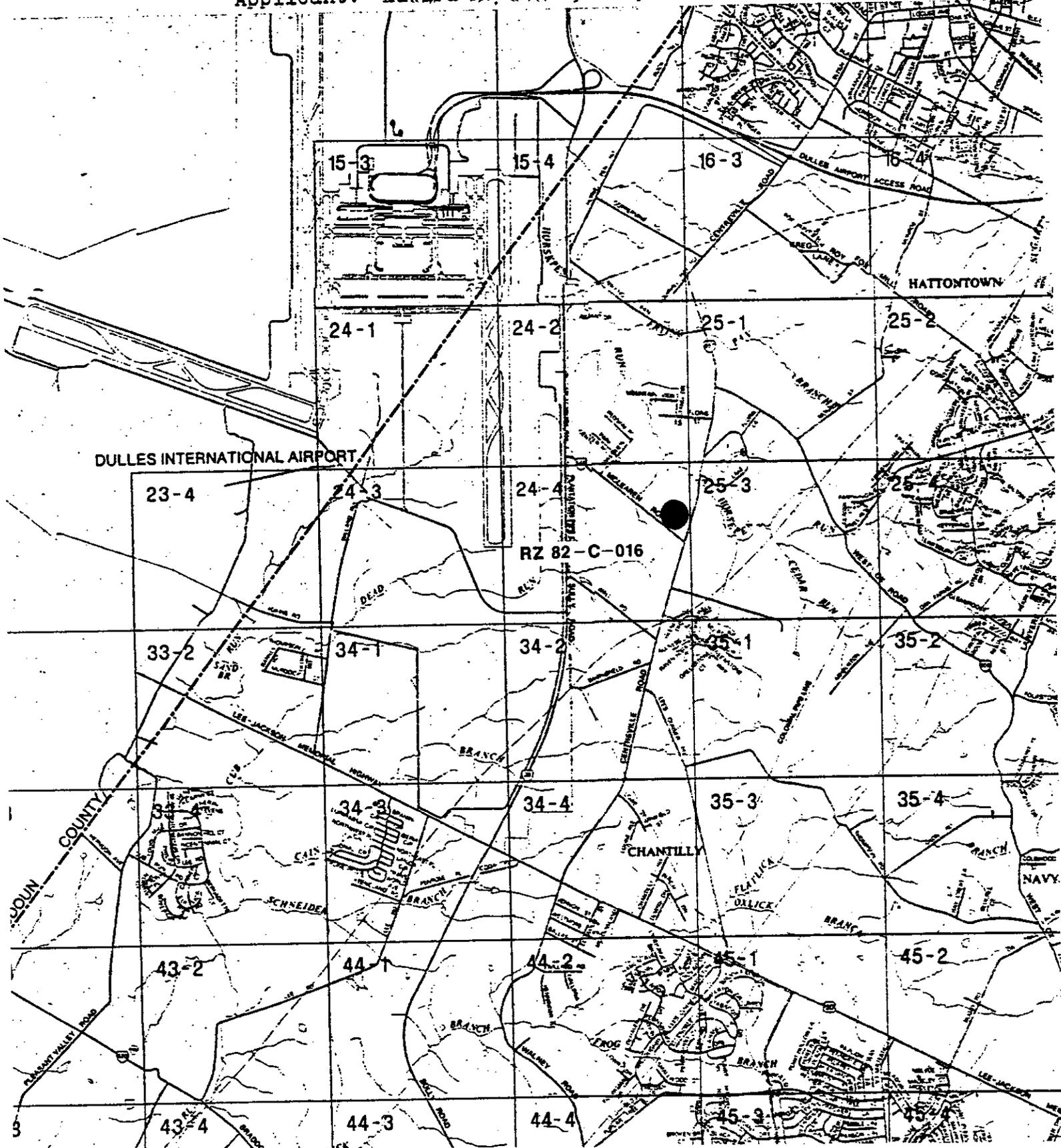


Number: RZ 82-C-016  
Acreage: 82.011  
From: R-1  
To: I-5

District: Centreville  
Section Sheet: 24-4  
Subdivision: ((1))  
Lot: 3



Applicant: Edward M. Smith, Tr., et. al



# REZONING APPLICATION



Number: RZ 82-C-016

District: Centreville

Acreage: 82.011

Section Sheet: 24-4

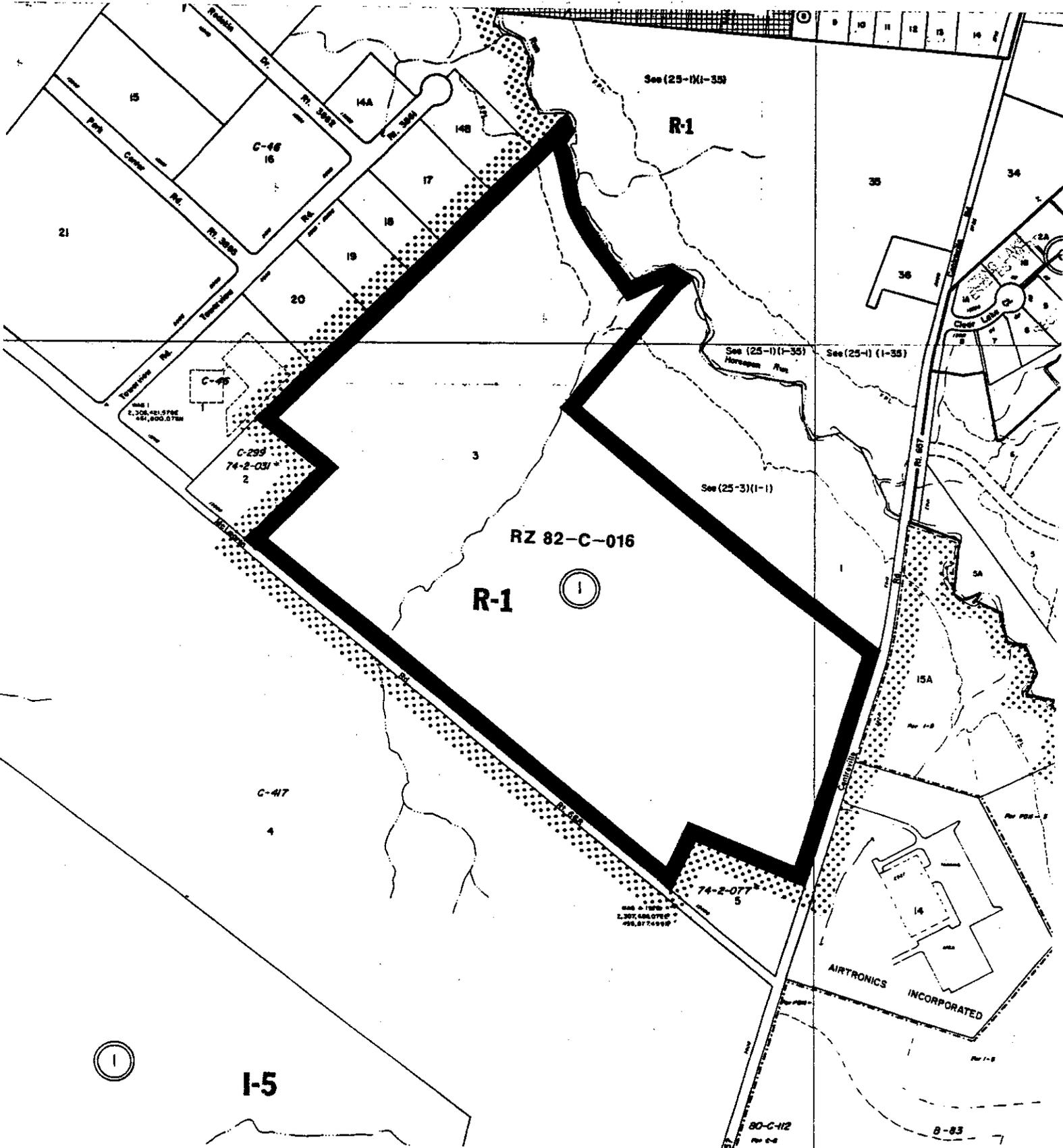
From: R-1

Subdivision: ((1))

To: I-5

Lot: 3

Applicant: Edward M. Smith, Tr., et.al



A GLOSSARY OF TERMS FREQUENTLY  
USED IN STAFF REPORTS WILL BE  
FOUND AT THE BACK OF THIS REPORT

DESCRIPTION OF THE APPLICATION

The proposal is to rezone approximately 82 acres from the R-1 District to the I-5 District. The Generalized Development Plan was waived because the applicant has no uses or potential development in mind. The applicant has submitted proffers to address the development issues associated with the proposed development of the property.

The applicant's letter of justification and draft proffers are attached as Appendixes 2 and 3 respectively.

LOCATION AND CHARACTER OF THE AREA

The application property is located on the west side of Centreville Road approximately 400 feet north of its intersection with McLearen Road. The property also fronts on McLearen Road.

The surrounding properties are predominately zoned I-5 but are not currently developed. An industrial park is developing to the west which includes Redskin Park and the Rolls Royce/British Aerospace building. To the east is the Airtronics Incorporated building which is zoned I-5. Properties to the north are zoned R-1 and planned for residential uses, the Horsepen Run stream valley area is the boundary between the areas planned for residential and industrial uses.

COMPREHENSIVE PLAN RECOMMENDATION

The subject property is located in Option Area 2 and in the Areas Related to Dulles Airport and Access Road of the Upper Potomac Planning District in Area III. On page 313, under Recommendation for the Southern Sector, the Plan states the following:

"Southern Sector

The area which extends south of Horsepen Run along Route 28 and to Route 50, south of Route 50 in the high noise zone, and to the Loudoun County boundary. The area has potentially good regional access, but not the prestige locations available in the Northern Sector.

The following should be considered in planning development in the Southern Sector:

- o Commercial uses should be related to the major industrial and commercial uses.

- o A comprehensive access and circulation plan should be developed to organize transportation serving the sector.
- o Land use and site development should be made compatible with noise effects in the severe noise zones south and east of the airport.

The same type of development as planned for the Northern Sector is an option in the Southern Sector. A variety of other industrial and commercial uses are probably more appropriate, however. These include, but are not limited to, warehousing, freight distribution centers, offices, light manufacturing and assembly plants, heavy equipment storage and sales, and other miscellaneous industrial and commercial uses. Ancillary commercial services need to be provided for the major uses. These include motels, restaurants, banks, cleaners, drug store, etc. These uses should not be provided in shopping centers designed for residential consumption, but in facilities related to industrial and major commercial development."

Additional relevant Plan text is found on page 305, under Recommendations (B), (D), and (H), which states:

"B. Major employment uses should be confined to areas fronting on the Dulles Access Road and the area west of Centreville Road, except land currently used or zoned for industrial use on the east side of Centreville Road south of Floris. Because of the topography, there are interesting vistas of the Dulles terminal (listed on the historic sites inventory as an architectural landmark) and the mountains to the west. Multi-story, well-sited R&D employment uses and airport-oriented uses could be attracted to this area, supported by motel and restaurant uses.

D. Low-density industrial uses should be located south of Frying Pan Road. Because of its environmental significance, the industrial area between Sully and Centreville Roads should be planned to include major open space recreation areas. The Floris community should be buffered from the employment centers to preserve its identity.

H. It is desirable that the area in general be developed as a series of well-planned industrial parks, which are related to each other to make optimum use of roads and other public facilities. Ideally, it would be advantageous to form a committee of all land owners in the Sully-Centreville Road corridor to oversee development in cooperation with the County."

The Area III Plan map indicates the subject property as planned for industrial use.

### PUBLIC FACILITIES ANALYSIS

Information regarding sanitary sewer, water service, Fire and Rescue services, schools and Fairfax County Park Authority recommendations may be found in Appendices 4 through 7 respectively. There appears to be no problem associated with this application.

### TRANSPORTATION ANALYSIS

The Transportation issues relate to the intensity of potential development in the I-5 District at the allowed 1.0 FAR; the limiting of entrances from McLearen Road to two; and if an entrance is necessary from Centreville Road, limit of one, opposite the entrance to Airtronics site. At least one stub street connection should also be provided to parcel 1 to the north. Parcel 1 is planned for industrial use and should not have direct access to Centreville Road because of the poor sight distances.

Reverse frontage should be utilized along McLearen Road and Centreville Road. Parcels 2 and 5 should also have access from the subject property, however, they have been zoned with access to McLearen Road. Ideally, both parcels should be consolidated with the application property.

The Transportation Analysis is attached as Appendix 8.

### ENVIRONMENTAL SITE ANALYSIS

This 82 acre site is characterized by high ground and gently rolling terrain which drains into Horsepen Run which borders the northernmost portion of the site. The site is abandoned farm land which has been permitted to revert toward climax vegetation. Tree cover consists of a variety of hardwoods.

The environmental concerns which relate to the development of this site include: location of Horsepen Run, its floodplain and EQC, natural swales which cross the site which drain into Horsepen Run, location over an aquifer, impacts to water quality, steep slopes, problem soils, and the need for visual buffering and screening along roadways and for open storage areas.

Many environmental impacts can be mitigated by preserving the EQC and natural swales in their natural vegetative cover. A spill containment program can be provided to avoid the potential for surface and groundwater contamination. In addition, the retention of natural vegetation which is supplemented with plantings can be used to mitigate negative visual impacts. Appendix 3 contains proffers in which the applicant has adequately addressed issues relating to EQC protection and spill containment. The intent of the proffer about the screening of outside storage appears to be adequate. A more specific landscaping plan to assist staff in evaluating the screening of outside storage would be helpful. The applicant can work with the County Arborist to develop such a plan.

See Appendix 9 for a detailed discussion of impacts and mitigation measures.

#### DEVELOPMENT PLAN ANALYSIS

As previously noted, the GDP was waived because of the lack of exact uses being proposed. Development issues can be addressed by the offering of proffers by the applicant.

The land uses contemplated for the area are industrial and the adjacent properties are zoned and developing under the I-5 District. With regard to traffic impact, if office uses are contemplated the FAR should be restricted to no greater than 0.5. The applicant has proffered to restrict office uses to an FAR of 0.5.

The I-5 District also allows outside storage, but it would be desirable to fence and screen any outside storage adjacent to the residential uses to the north and adjacent to Centreville Road. Since McLearn Road would be the main entrance to the proposed industrial park, it may also be desirable to fence and screen any outside storage from McLearn Road also. That would make for a more attractive industrial park. The applicant's draft proffer addresses the screening issue.

McLearn Road and Centreville Road should be dedicated to 45 feet from the centerline and widened to 35 feet from the centerline to match existing development in the area. The applicant has proffered these improvements.

Only two entrances to the industrial park should be provided from McLearn Road and reverse frontage should be utilized. This would allow freer flow of industrial traffic into the site and the surrounding industrial developments. These entrances should be coordinated with any site plans for the large industrially zoned property to the south. The applicant has proffered to limit McLearn Road to two entrances.

Because it is a cross county road that serves the residential as well as the industrial areas from Chantilly to Herndon, it would be most desirable not to have any access to the application property from Centreville Road. However, if an entrance is necessary for the development of the property, there should be only one and it should line up with the entrance to Airtronics for proper sight distance. The applicant has provided such a proffer.

At least one stub street should be provided to parcel 1 to the north. That property is planned for industrial use and should not have direct access to Centreville Road because of the poor sight distance. It would be desirable to consolidate the subject property with parcels 2 and 5 and have only the two entrances to McLearn Road as previously discussed, however those two parcels have already been zoned industrial and have access to McLearn Road. Access to Parcel 1 has been addressed by the applicant's draft proffer.

The Park Authority has requested that the Floodplain area be dedicated to the Authority as per the stream valley policy. Limits of clearing should also be provided to include the Environmental Quality Corridor and the floodplain thus preserving the vegetation and providing a substantial buffer to the residentially planned area to the north. Access to the area to be dedicated to the Park Authority should also be provided. These issues have been addressed by proffer with the exception of the access to the park area.

A spill containment program should also be provided to assure that any chemicals or petroleum products do not contaminate the ground water. Appropriate proffers have been provided.

Because of the transportation issues and the environmental concerns, the staff recommends that the site plans and subdivision plans be returned to the Board of Supervisors for final approval.

## CONCLUSIONS AND RECOMMENDATIONS ON THE REZONING

### Conclusions

The Area III Comprehensive Plan recommends high quality industrial uses for the area including the subject application. The surrounding properties are zoned and developing under the I-5 District.

The public facilities are generally available with the exception of needed road improvements which the applicant has proffered.

The environmental issues have been addressed by proffers submitted by the applicant.

Recommendation

The staff recommends that the Zoning Ordinance as it applies to the subject property be amended from the R-1 District to the I-5 District with proffer as submitted in draft.

It should be noted that it is not the intent of the staff to recommend that the Board, in adopting any conditions proffered by the owner, relieve the applicant/owner from compliance with the provisions of any applicable ordinances, regulations, or adopted standards.

Appendixes

1. Rezoning Affidavit
2. Letter of Justification
3. Draft proffers
4. Sanitary sewer
5. Water service
6. Fire & Rescue services
7. Park Authority Memorandum
8. Transportation Analysis
9. Environmental Analysis
10. Glossary

I, Edward M. Smith, do hereby make oath or affirmation that I am an applicant in Rezoning Application Number RZ 82-C-016 and that to the best of my knowledge and belief, the following information is true:

1. (a) That the following constitutes a listing of names and last known addresses of all applicants, title owners, contract purchasers, and lessees of the land described in the application, and if any of the foregoing is a trustee, each beneficiary having an interest in such land, and all attorneys, real estate brokers, architects, engineers, planners, surveyors, and all agents who have acted on behalf of any of the foregoing with respect to the application:

| Name                          | Address   | Relationship                  |
|-------------------------------|---|-------------------------------|
| <u>Howard W. Smith, Jr.</u>   | <u>120 S. Fairfax Street, Alexandria, Va. 22314</u>   | <u>Beneficiary</u>            |
| <u>Edward M. Smith</u>        | <u>2300 9th Street South, Arlington, Va. 22201</u>    | <u>Beneficiary</u>            |
| <u>Benjamin M. Smith, Jr.</u> | <u>2300 9th Street South, Arlington, Va. 22201</u>    | <u>Beneficiary</u>            |
| <u>David D. Peete</u>         | <u>2829 Cleave Drive, Falls Church, Va. 22042</u>     | <u>Beneficiary</u>            |
| <u>Charles Henry Smith</u>    | <u>120 N. St. Asaph Street, Alexandria, Va. 22314</u> | <u>Attorney for Applicant</u> |
| <u>DeLashmurt Associates</u>  | <u>Court House Square, Arlington, Va. 22201</u>       | <u>Land Surveyor</u>          |

(b) That the following constitutes a listing of the shareholders of all corporations of the foregoing who own ten (10) per cent or more of any class of stock issued by said corporation, and where such corporation has ten (10) or less shareholders, a listing of all the shareholders:

| Name | Address | Relationship |
|------|---------|--------------|
|      |         |              |
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(c) That the following constitutes a listing of all partners, both general and limited, in any partnership of the foregoing:

| Name | Address | Relationship |
|------|---------|--------------|
|      |         |              |
|      |         |              |
|      |         |              |

2. That no member of the Fairfax County Board of Supervisors or Planning Commission owns or has any interest in the land to be rezoned or has any interest in the outcome of the decision. EXCEPT AS FOLLOWS: (If none, so state)

None

3. That within the five (5) years prior to the filing of this application, no member of the Fairfax County Board of Supervisors or Planning Commission or any member of his immediate household and family, either directly or by way of partnership in which any of them is a partner, employee, agent, or attorney, or through a partner of any of them, or through a corporation in which any of them is an officer, director, employee, agent, or attorney, or holds outstanding bonds or shares of stock with a value in excess of fifty dollars (\$50), has or has had any business or financial relationship, other than any ordinary depositor or customer relationship with or by a retail establishment, public utility, or bank, including any gift or donation having a value of fifty dollars (\$50) or more with any of those listed in Par. 1 above. EXCEPT AS FOLLOWS: (If none, so state)

None

WITNESS the following signature:

[Signature]  
Applicant

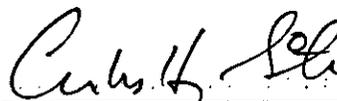
The above affidavit was subscribed and confirmed by oath or affirmation before me this \_\_\_\_\_ day of \_\_\_\_\_ 19\_\_\_\_ in the State of \_\_\_\_\_  
My commission expires: \_\_\_\_\_ Notary Public

STATEMENT OF JUSTIFICATION

This property is located just east of Dulles Airport, between Sully Road (Rt. 28) and Centreville Road (Rt. 657), with frontage on the north side of McLearen Road (Rt. 668). Presently zoned R-1, the parcel is designated on the Area III Land Use Plan as industrial, consistent with its proximity to Dulles Airport. This area is described in "Areas Related to Dulles Airport and Access Road" in the Area III Plan as one where industrial land use and site development would be compatible with the noise impact in the severe noise zones south and east of the Airport. There is ample access to the site for commercial and industrial traffic via Sully Road and McLearen Road.

While the applicant has no present plan to develop the property, the I-5 category provides for a wide range of industrial and industrially oriented commercial activities. Further the property is surrounded on three sides by industrially zoned land, and Horsepen Run on the fourth side provides a natural buffer to the adjoining unimproved residentially zoned land.

Rezoning of the subject parcel to an I-5 industrial category in accordance with the Land Use Plan will provide future support facilities for Dulles area industrial development without adversely impacting fringe residential communities in the area.



2/8/82

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Charles Henry Smith  
Counsel for Applicant

GENERALIZED DEVELOPMENT PLAN

The Applicant has no generalized development plan for the subject property. The Applicant has no present intent to develop the property, and the property is not presently being marketed for sale. By this application it is the sole intent of the Applicant to bring this parcel into conformance with the Land Use Plan.

CHARLES HENRY SMITH  
ATTORNEY AND COUNSELOR AT LAW  
120 N. ST. ASAPH STREET  
P.O. DRAWER 1299  
ALEXANDRIA, VIRGINIA 22314  
549-9000

June 8, 1982

Mr. Sidney R. Steele, Chief  
Zoning Evaluation Branch, ZAD  
Office of Comprehensive Planning  
4100 Chain Bridge Road  
Fairfax, Virginia 22030

Re: RZ 82-C-016

Dear Mr. Steele:

On behalf of the owner applicant, I hereby offer the following proffers in connection with this application for rezoning of the subject property. The owners will agree:

1. To dedicate for public right of way that frontage on McLearen Road and Centreville Road to forty five (45) feet from the centerline of each road, with the understanding that curbs may be constructed thirty five (35) feet from the centerline, provided that the property retains FAR density credit for the area dedicated.
2. To limit McLearen Road frontage to two (2) street curb cuts, and to limit Centreville Road frontage to one (1) curb cut, which will be at the present intersection of Centreville Road and the entrance to Parcel 25-3-01-0014.
3. To dedicate to the Fairfax County Park Authority that portion of the property within the hundred year flood plain, provided the remaining property retains FAR density and open space credit for the area dedicated.
4. Not to grade or clear the Environmental Quality Corridor, comprised of 12A and 77D2 soils, as marked in red on the attached plat, except as may be necessary to provide one (1) street crossing in the EQC area south of the northwest-southeast border of the subject property and adjoining Parcel 25-3-01-0001.

Mr. Sidney R. Steele  
Page 2  
June 8, 1982

5. To provide, upon development of the property, a street access and curb cut to the property line of adjoining Parcel 25-3-01-0001 at a location to be determined in the sole discretion of this property owner, provided, however, that the owner of Parcel 25-3-01-0001 has surrendered a right to permanent curb cut on Centreville Road by development plan, subdivision plat or site plan approval.

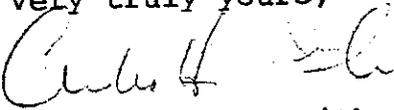
6. To limit office development to an FAR of 0.5., with the understanding that all other use permitted in I-5 will be subject to the higher 1.0 FAR density.

7. That in the event that there is any outside storage of materials along McLearn Road or Centreville Road, that portion of the storage area facing either road will be fenced and planted.

8. That in the event chemical or petroleum products are stored on the property, spill containment procedures will be implemented, which may include berming around storage area, impermeable seals beneath the areas, on-site straw bails or other suitable on-site retention, or other suitable storage.

Should you have any questions regarding these proffers, please call me.

Very truly yours,



Charles Henry Smith

CHS:gs

Enc.

cc: Edward M. Smith  
Howard W. Smith, Jr.



Date 3/9/82

TO: Staff Coordinator (Tel: 691-3387)  
Plan Implementation Branch, OCP  
5th Floor, Massey Building

FROM: Robert W. Morris (Tel: 691-2191)  
Systems Analysis Section, Office of Waste Management,  
Department of Public Works

SUBJECT: Sanitary Sewer Analysis, Rezoning Application 82-C-016

The following information is submitted in response to your request for a sanitary sewer analysis for subject rezoning application:

1. The application property is located in the Horsepen Crk. (A) Watershed. It would be sewerred into the Blue Plains Treatment Plant.

2. (Standard statement for the appropriate treatment facility.)

Based upon current and committed flow, excess capacity is available at this time. For purposes of this report, committed flow shall be deemed as active and valid building permits in accordance with the context of the Blue Plains Agreement of 1974.

Construction is currently under way which will provide from 4 to 10 million gallons per day from a pump-down to the Southern County facilities.

3. An 24-inch line located in an easement and approx. 200 feet from the property is ~~is not~~ adequate for the proposed use.

4. The following table indicates the condition of all related sewer facilities and the total effect of this application.

| <u>Sewer Network</u> | <u>Existing Use + Application</u> |                | <u>Existing Use + Application + Previous Rezoning</u> |                | <u>Existing Use + Application + Comp. Plan</u> |                |
|----------------------|-----------------------------------|----------------|---|----------------|--|----------------|
|                      | <u>Adeq.</u>                      | <u>Inadeq.</u> | <u>Adeq.</u>  | <u>Inadeq.</u> | <u>Adeq.</u>                                   | <u>Inadeq.</u> |
| Collector            | _____                             | _____          | _____   | _____          | _____  | _____          |
| Submain              | _____                             | _____          | _____   | _____          | _____  | _____          |
| Main/Trunk           | <u>X</u>                          | _____          | <u>X</u>  | _____          | <u>X</u>                                       | _____          |
| Interceptor          | _____                             | _____          | _____   | _____          | _____  | _____          |
| Outfall              | _____                             | _____          | _____   | _____          | _____  | _____          |

5. Other pertinent information or comments: Tract is located within the Horsepen Creek sanitary sewer reimbursement shed. Additional acreage charge applicable prior to issuance of plumbing permits.

Date March 22, 1982

TO: Staff Coordinator (Tel: 691-3387)  
Zoning Evaluation Branch  
5th Floor, Massey Building

FROM: Chief, Planning and Engineering (Tel: 698-5600 )  
Engineering and Construction Division  
Fairfax County Water Authority

SUBJECT: Water Service Analysis, Rezoning Application RZ-82=C-016

The following information is submitted in response to your request for a water service analysis for subject rezoning application:

1. The application property is located within the franchise area of the Fairfax County Water Authority.

2. Adequate water service is available at the site.

Yes

No

3. Offsite water main extension is required to provide

Domestic Service  Fire Protection Service  Not Applicable

4. The nearest adequate water main available to provide

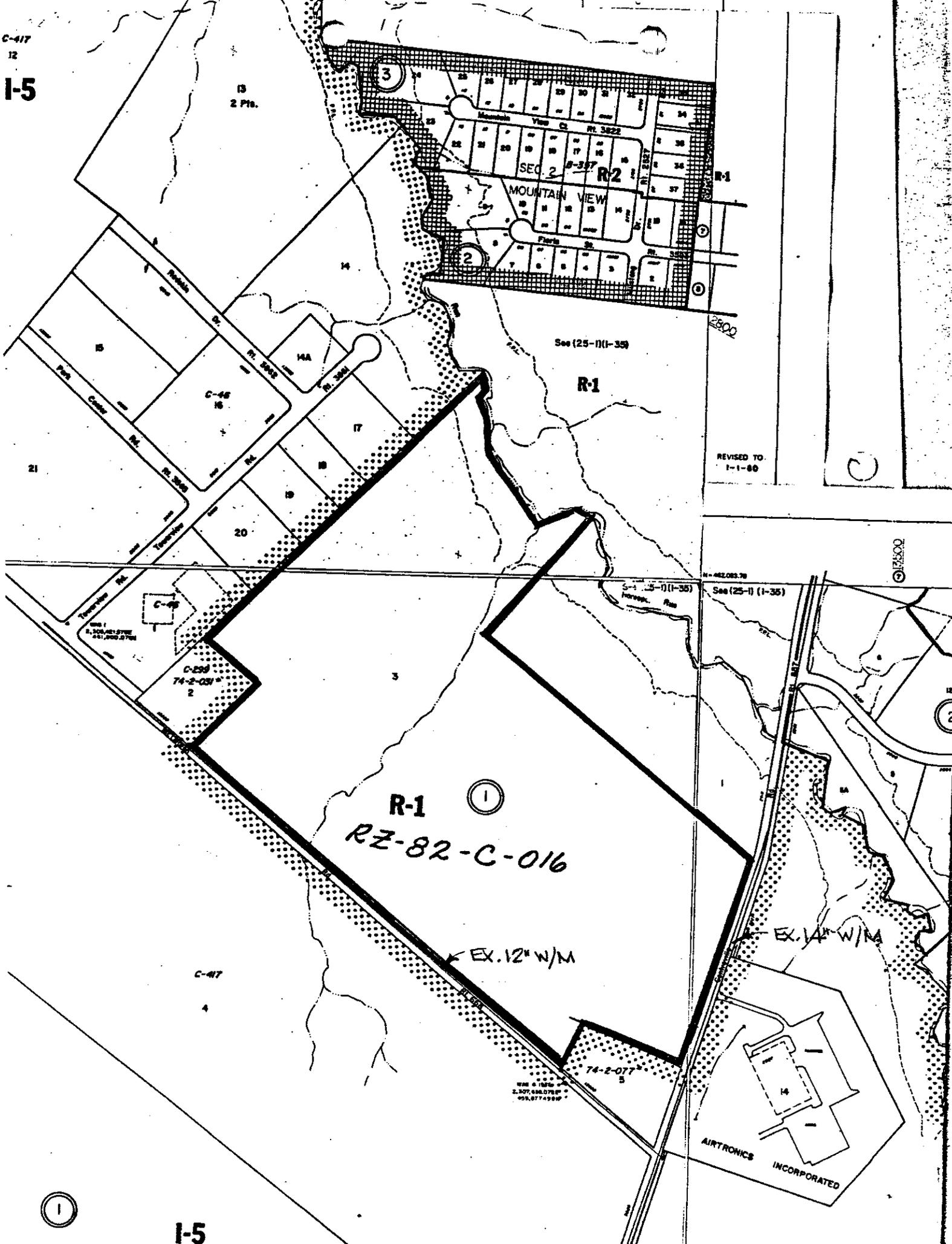
Domestic Service  Fire Protection Service

is a 12 and 14 inch main located          at          ~~feet~~~~from~~  
the property. See enclosed property map.

5. Other pertinent information or comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



13  
2 Pts.

3

MOUNTAIN VIEW SEC. 2

SEC. 2

MOUNTAIN VIEW

2

See (25-1)(1-35)

R-1

REVISED TO:  
1-1-60

N-482,085.78

See (25-1)(1-35)  
Intersect. Pine

See (25-1)(1-35)

R-1

RZ-82-C-016

1

EX. 12' W/M

EX. 14' W/M

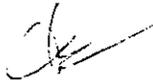
AIRTRONICS  
INCORPORATED

74-2-077  
2,307,080.078  
959,077.498

C-417  
4

March 17, 1982

TO: Staff Coordinator (691-3387)  
Zoning Evaluation Branch, OCP  
5th floor, Massey Building

FROM: JoAnn Knight, Supervisor (691-4385)   
Research and Planning Division  
Fire and Rescue Services

SUBJECT: Fire and Rescue Services Preliminary Analysis,  
Rezoning Application RZ-82-C-016 I-5

The following information is submitted in response to your request for a preliminary Fire and Rescue Services analysis for the subject rezoning application:

1. The Fire and Rescue Services' protection guidelines for this type of development is that the development should be no farther than 1-2 miles from a properly manned fire station. The Insurance Services Office mileage guideline for maximum insurance benefits for this property is 1 miles.
2. The application property is 2.6 miles from the Chantilly Fire Department, Company number 15.
3. This fire department is equipped with the following apparatus:  
2 piece engine company  
Truck  
Ambulance
4. This fire department is authorized 31 personnel. As of 7/81, the department was ~~XXXXXX~~/short/~~XXXX~~ 9 personnel in providing proper staffing of its apparatus, or 3 paid firefighters short/~~over~~ per shift.
5. After construction programmed for FY 84, this property will be serviced by the Frying Pan Fire Department which will be .8 miles away. This distance is/~~XXXX~~ adequate under the minimum mileage response criteria.
6. In summary, the Fire and Rescue Services considers that fire protection:
  - a. is adequate now
  - b. would be adequate with satisfactory personnel allocation
  - XXX c. will be adequate when the proposed fire station becomes fully operational
  - d. is not adequate and will not become adequate without an additional facility which is not currently planned or funded.

## Fairfax County Park Authority



## M E M O R A N D U M

**To:** Sidney R. Steele, for Staff Coordinators  
Chief, Zoning Evaluation Branch - OCP

**Date:** 6-3-82

**From:** Dorothea L. Stefen, Assistant Superintendent *DLS*  
Division of Land Acquisition - FCPA

**Subject:** RZ-82-C-016  
Loc: 24-4((1))3

The Fairfax County Park Authority staff and Centreville District representative have reviewed the above referenced Rezoning Application and have made the following recommendations:

- The Fairfax County Park Authority requests dedication of 100-Year floodplain and slopes exceeding 15% associated with Horsepen Run in accordance with the County's adopted Stream Valley Policy.
- A 20' wide (min.) vehicular access either as dedication or public access easement should be provided for maintenance access.
- Access should be 8'-0" wide asphalt.
- Request that all easements on land conveyed to the Fairfax County Park Authority by land dedication be subject to the provision of FCPA Policy 301 - Easements, in force at the time of conveyance. No work shall be performed without first gaining a permit or letter of agreement from the Fairfax County Park Authority. Contact the Division of Land Acquisition.
- Request that, prior to actual deeding of the land to be dedicated, the Fairfax County Park Authority be allowed to inspect the site. Should the site be disturbed or disrupted in any fashion, (i.e., erosion or filled with debris), the owner/developer will take corrective actions as outlined by the Park Authority Division of Land Acquisition prior to the Park Authority taking title.

CC: Frederick M. Crabtree - FCPA Member (Centreville Dist.)  
Oscar Hendrickson - DEM  
Edwin R. Spann - OCP

## FAIRFAX COUNTY, VIRGINIA

## MEMORANDUM

TO: Sidney R. Steele, Chief  
Zoning Evaluation Branch, OCP      DATE June 18, 1982

FROM: Robert L. Moore *RLM*  
Office of Transportation

FILE NO: 3-4

SUBJECT: Transportation Impact

REFERENCE: RZ82-C-016; E. M. Smith, Tr.; 24-4 ((1)) 3

IMPACT ANALYSISCompatibility with the Adopted Plan

The site subject to this application has frontage on two existing roads that are recommended for improvement in the adopted Plan and is traversed by a planned industrial collector road. The transportation element of the Countywide Plan includes recommendations for improvement of McLearen Road to a four lane divided facility and for improvement of Centreville Road to current two lane facility standards. The industrial collector road is planned as part of an overall access and circulation system for this industrial area and should be constructed to a standard commensurate with its anticipated traffic volume.

It should be noted that while the Adopted Plan recommends improvement of Centreville Road to current two lane facility standards, this improvement would address only general traffic growth through the 1990 time frame of the Plan. Right-of-way dedication should be provided to accommodate improvements necessitated by traffic growth that would occur after 1990. Improvements should be committed with this application as needed to ameliorate site specific development impacts.

Traffic Impact

No specific development proposal has been included as part of this application and it is, therefore, not possible to provide a definitive traffic analysis. However, trip generation estimates can be made for uses found in typical industrial areas in Fairfax County. Representative uses and their trip generation estimates are shown in the table on the following page.

| <u>USE</u>    | <u>INTENSITY</u> <sup>(1)</sup> | <u>RATE</u> <sup>(2)</sup> | <u>VOLUME</u> |
|---------------|---------------------------------|----------------------------|---------------|
| Existing R-1  | 1 du/ac                         | 10 vpd/du                  | 820 vpd       |
| Industrial    |                                 |                            |               |
| General Ind.  | 0.3 FAR                         | 5.46 vpd/1000 s.f.         | 5,850 vpd     |
| Warehousing   | 0.7 FAR                         | 5.01 vpd/1000 s.f.         | 12,525 vpd    |
| Ind. Park     | 0.4 FAR                         | 7.26 vpd/1000 s.f.         | 10,370 vpd    |
| R and D       | 0.4 FAR                         | 9.33 vpd/1000 s.f.         | 13,330 vpd    |
| Office (low)  | 0.4 FAR                         | 12.3 vpd/1000 s.f.         | 17,575 vpd    |
| Office (high) | 1.0 FAR                         | 12.3 vpd/1000 s.f.         | 43,935 vpd    |

(1) The floor area ratios shown reflect staff experience with similar applications. Two office intensities are shown to illustrate the difference between developments without and with structured parking. The 0.4 FAR is about the practical maximum with surface parking. The 1.0 FAR is the limit imposed by the applied for I-5 category. It should be noted that even at a 0.4 FAR the site would support over 1,400,000 square feet of building floor area.

(2) These trip generation rates are from the ITE Trip Generation report and are based on gross floor area.

As can be seen from the table, these potential uses would have heavy traffic impacts. Unless adequate commitments are made to ameliorate these impacts, approval of the application would not be appropriate. These commitments could include proffers for road construction, elimination of high trip generation uses, and/or limitation of the floor area ratio.

In addition to the trips generated by the subject site, the roads in this area will be impacted by traffic from other developments. The potential trip generation of land subject to recent rezoning actions in the Centreville Road corridor is now between 336,000 and 509,000 vpd, depending on the type of development that actually takes place.

The roads that would be most directly impacted by traffic from this site are listed below. The Sully Road volume is from the 1980 VDH&T interstate, arterial, and primary route ADT data. The other volumes are from the 1981 VDH&T secondary road tabulation.

June 18, 1982

|                                      |            |
|--------------------------------------|------------|
| McLearen Road (Rt. 668)              |            |
| Centreville Road to Towerview Road   | 1,652 vpd  |
| Towerview Road to Sully Road         | 2,008 vpd  |
| Centreville Road (Rt. 657)           |            |
| Herndon to Parcher Avenue            | 15,868 vpd |
| Parcher Avenue to Horse Pen Road     | 11,475 vpd |
| Horse Pen Road to Fox Mill Road      | 9,610 vpd  |
| Fox Mill Road to West Ox Road        | 7,357 vpd  |
| West Ox Road to McLearen Road        | 8,464 vpd  |
| McLearen Road to Lees Corner Road    | 8,333 vpd  |
| Lees Corner Road to Lee-Jackson Hwy. | 6,270 vpd  |
| Sully Road (Rt. 28)                  | 9,160 vpd  |

McLearen Road is a two lane road with a narrow pavement and inadequate shoulders. This minor arterial does not meet Fairfax County Public Facilities Manual criteria or current VDH&T design standards and should not be considered adequate for anticipated traffic increases. The addition of the traffic expected from the subject application alone would push McLearen Road into level of service F.

Nearby intersections that would be traversed by traffic from this site can also be expected to become congested. The most directly impacted intersections would be the McLearen Road/Sully Road and McLearen Road/Centreville Road intersections. These intersections will need to be improved to maintain adequate levels of service as traffic volumes increase.

#### DESIGN CONSIDERATIONS

Without submission of a development plan it is not possible to make a detailed review of the proposed development. Generalized comments can, however, be made. Any development of the site should provide improvements in accordance with these comments.

Because the anticipated traffic generation of this site is high, it would be appropriate to provide substantial road improvements. These improvements should include:

- o On Centreville Road, right-of-way dedication, pavement widening, and restriction of access,
- o On McLearen Road, right-of-way dedication, pavement widening, limitation of access to two points with adequate separation,
- o Interparcel access to adjacent parcels, including accommodation of the Plan recommended collector road, and
- o Improvements at the intersections of McLearen Road with Sully Road and Centreville Road.

If improvements are not made, substantial congestion, affecting the quality of access to the site, can be anticipated.

SUMMARY

The subject application has the potential for creating a substantial impact on the surrounding road system. Unless these impacts are ameliorated by reduction of trip generation potential and/or provision of adequate transportation improvements, extreme congestion and inadequate levels of service can be anticipated. Since no transportation improvements have been committed to address these anticipated inadequate transportation conditions, approval of the application would not be appropriate.

RLM/JCH/thp

ENVIRONMENTAL SITE ANALYSIS

Project Number: 82-C-016 Location: 24-4 Appendix 9

Existing Zoning: R-1 Proposed Zoning and/or Use: I-5 Acreage: 82

| Site Features                                 | Presence |          | Comments  |
|---|----------|----------|---|
|   | yes      | no       |   |
| A. Geology: Coastal Plain, Piedmont, Triassic |          |          | A. Geology  |
| 1. shallow bedrock.....                       | <u>X</u> | —        | - Shallow bedrock may be located on site.   |
| 2. groundwater resource.....                  | <u>X</u> | —        | - Triassic siltstone aquifer (200-1000gal/min) mod-high and moderate (100-300gal/min) may be on site                                |
| 3. mineral resource.....                      | —        | <u>X</u> |   |
| B. Topography:                                |          |          | B. Topography   |
| 1. steep slopes.....                          | <u>X</u> | —        | - Slopes in excess of 15% exist in the proximity of the floodplain and natural swales which drain into Horsepen Run. See soils map. |
| 2. irregular landform.....                    | —        | <u>X</u> |   |
| C. Hydrology:                                 |          |          | C. Hydrology  |
| 1. water features.....                        | <u>X</u> | —        | Horsepen Run and tributaries. See Attachment 1  |
| 2. critical location in watershed....         | —        | <u>X</u> |   |
| 3. water supply watershed.....                | —        | <u>X</u> |   |
| D. Soils:                                     |          |          | D. Soils  |
| 1. marine clays.....                          | —        | —        | See Attachments 1 and 2.  |
| 2. shrink-swell clays.....                    | —        | —        |   |
| 3. highly erodible soils.....                 | —        | —        |   |
| 4. high water table soils.....                | <u>X</u> | —        |   |
| 5. soils with low bearing.....                | <u>X</u> | —        |   |
| 6. poor infiltration soils.....               | <u>X</u> | —        |   |
| E. Vegetation, Wildlife & Open Space:         |          |          | E. Vegetation, Wildlife & Open Space:   |
| 1. quality vegetation.....                    | <u>X</u> | —        | - Site is wooded with 14-20 year old hardwoods  |
| 2. wildlife habitat.....                      | <u>X</u> | —        | - EQC is defined on soils map and should be preserved in its natural vegetation cover.  |
| 3. adopted EQC.....                           | <u>X</u> | —        | - Natural vegetation should be preserved in the area lying within 50 feet of the main natural swale which transects the site        |

| Environmental Quality  | Problems |          | Comments   |
|--|----------|----------|--|
|  | yes      | no       |  |
| F. Noise:  |          |          |  |
| 1. airport noise.....  | —        | <u>X</u> |  |
| 2. highway noise.....  | —        | <u>X</u> |  |
| 3. railroad noise.....   | —        | <u>X</u> |  |
| 4. other types of noise.....   | —        | <u>X</u> |  |
| G. Water:  |          |          | G. Water   |
| 1. point source pollution.....   | <u>X</u> | —        | See Attachment 1 for comments on water quality and runoff  |
| 2. nonpoint source pollution.....  | <u>X</u> | —        |  |
| H. Air:  |          |          |  |
| 1. mobile source pollution.....  | —        | <u>X</u> |  |
| 2. stationary source pollution.....  | —        | <u>X</u> |  |
| I. Aesthetics: For example: internal views, views from site, views of site from adjacent development | —        | —        | I. Aesthetics<br>Visual buffering should be provided along roadways and storage areas should be screened |
| J. Other:.....   | —        | —        |  |

### Geology

The site is located over a triassic siltstone aquifer of moderate yield. Problems with groundwater contamination may occur if chemical or petroleum substances are stored on site. In order to avoid these problems, spill containment procedures should be implemented. These procedures may include berming around storage areas, impermeable seals beneath these areas, on-site straw bales, or other suitable on-site retention or storage. The applicant has addressed these issues in the proffer statement.

### Topography

Slopes in excess of 15 percent exist in the area adjacent to the Horsepen Run floodplain and along the natural swale which drains into Horsepen Run. The floodplain and its adjacent steep slopes form the on-site EQC. No grading or clearing should occur within this area. See EQC for further discussion.

### Water Quality and Run

Conversion of this site to its proposed use will increase runoff and decrease water quality of Horsepen Run. In order to mitigate adverse impacts to water quality, the following should be provided:

1. No grading or clearing should occur within the EQC as delineated on the soils map in Attachment 2.
2. No grading or clearing should occur within 50 feet of either side of the natural swales which drain the site.
3. Sedimentation and erosion controls should be adhered to strictly.
4. Stormwater management should be provided as directed by D.E.M. Stormwater management is important to this sensitive upstream location.
5. A spill containment program as discussed under Geology should be provided to avoid contamination of surface water.

### Soils

Attachment 2 contains the soils map. The soils map has been modified to delineate the EQC, floodplain soils, steep slopes, high water table soils, shallow bedrock, and well drained soils. The floodplain soils consists of Rowland soil (12) which is approximately 4 percent of the site. The floodplain soil rates poor for building support and groundwater recharge and has a high seasonal water table. This soil comprises a northwestern portion of the site adjacent to Horsepen Run. Adjacent to these soils, which are also in the EQC are Penn shaly silt loam soil (77D). Also on site are the Penn silt loam soils (73) of lesser slopes. The Penn soils (73) on slopes of less than 15 percent are well suited for building location, are good for building support and are well drained. The Penn soils (73, 77) comprise 68.5 acres of this site.

Ten percent of the property consists of Manassas (14) and Calverton (78) soils which have a high seasonal water table during wet seasons and following heavy rainfalls. Manassas soil (14) rates marginal for building support and poor for groundwater recharge. Calverton soil (78) rates marginal to poor for building support and poor for groundwater recharge. The remaining two percent of this site consists of Readington soils (273). This soil is shallow to hard shale, has a high seasonal water table, and rates good for building support and poor for ground water recharge. The Rowland (12A+), Manassas (14) and Penn (73BC) soils represent prime agricultural soils.

To alleviate problems associated with these soils:

1. No clearing, grading, or construction should occur within the EQC as defined by the Rowland soil (12A+) and the Penn shaley silt loam (77D2). See Attachment 2 for map. These should be kept in natural vegetative cover.
2. If basements are constructed, they should be engineered to ensure dryness.

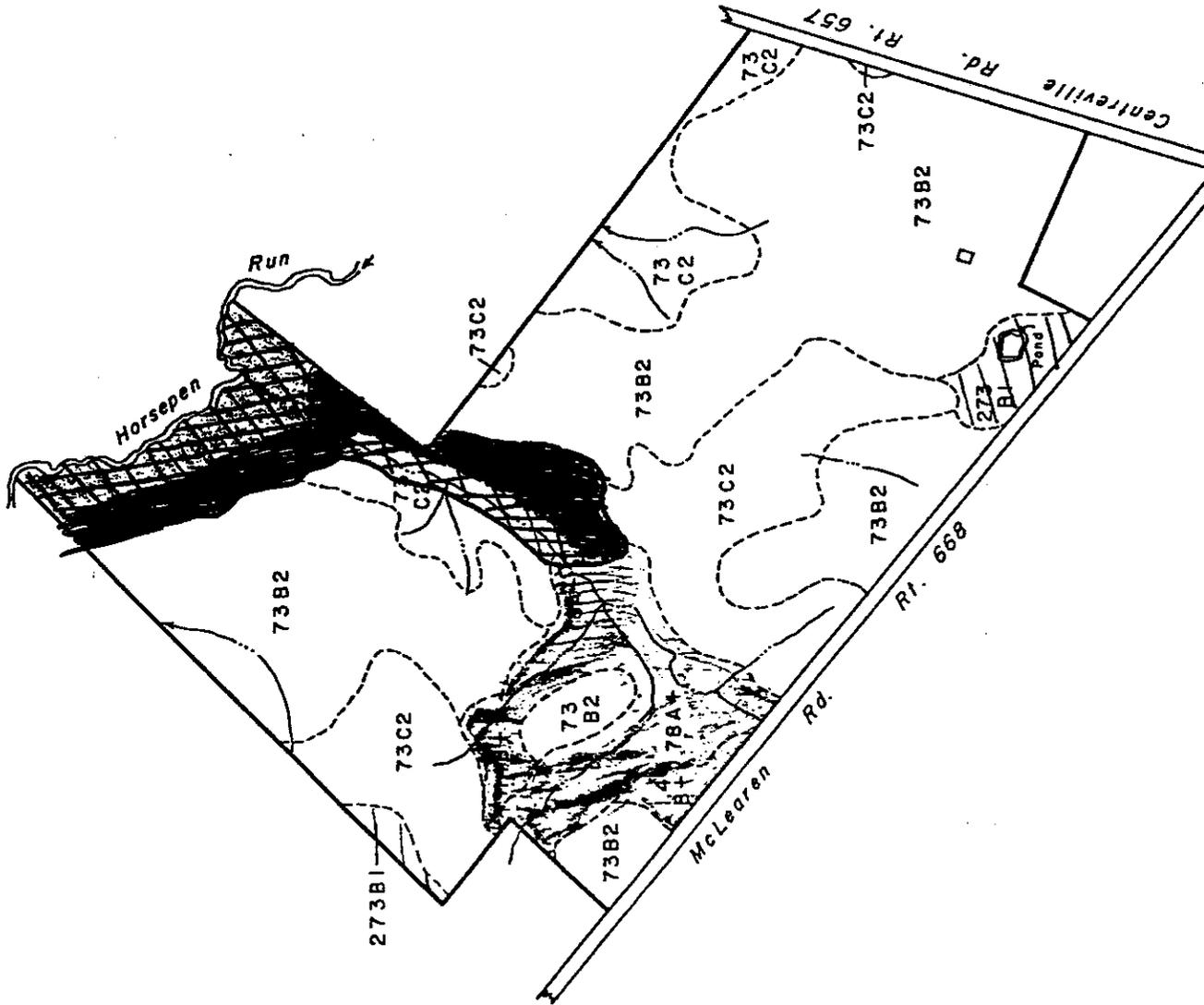
#### Vegetation and EQC

The site consists of farm land which has been permitted to revert back toward climax vegetation. The predominant tree cover on site is red cedar. Other tree species include black locust, wild cherry, and elm, sycamore and poplar along Horsepen Run. The County Forester recommends that the EQC be preserved in its natural cover and that a natural vegetative cover approximately 50 feet to each side of the main swale on site be retained. In addition to these measures, the limits of clearing and grading should be established in conjunction with the County Arborist. The applicant adequately addresses the EQC issue in the proffer statement. It would also be desirable to maintain the natural swale in natural vegetative cover. However, if the EQC is preserved adequate protection of water quality should be provided.

#### Visual Buffering

In addition, outdoor storage areas should be located away from the periphery of the site and screening through a combination of berming, plantings, and fencing should be provided. The location and screening of storage areas is important to mitigate any negative visual impacts that may be experienced by future residents who would be located in the planned residential development north of this site. The protection of existing vegetation in the EQC and along the northern periphery of the site will also serve to mitigate these potential impacts. Visual buffering through the use of natural vegetation supplemented with plantings should be used to screen views into the site. The applicant is encouraged to work with the County Arborists Office to develop a landscaping plan for the entire site and especially to screen outdoor storage areas.

SOIL TYPE MAP OF AN 82.0 ACRES PROPERTY PROPOSED FOR REZONING FROM R-1 TO I-5 (INDUSTRIAL GENERAL) USE, LOCATED ADJACENT TO AND S.W. OF HORSEPEN RUN, ADJACENT TO AND N.E. OF MC LEAREN ROAD, AND ADJACENT TO AND W. OF CENTREVILLE ROAD. REZONING REQUESTED BY: EDWARD M. SMITH, TR., ET. AL. CASE NUMBER: 82-C-016.



-  EQC
-  floodplain soils
-  steep slopes
-  high water table, marginal building support soils
-  well drained, good building support soils, may have shallow bedrock
-  shallow to hard shale, seasonal high water table, good building support soils

## Soil Symbol

12A+  
14B+  
73B2  
73C2  
77D2  
78A+  
273B1  
-----

## Soil Name

Rowland silt loam, 0-2% slopes  
Manassas silt loam, 2-7% slopes  
Penn silt loam, 2-7% slopes  
Penn silt loam, 7-14% slopes  
Penn shaly silt loam, 14-25% slopes  
Calverton silt loam, 0-2% slopes  
Readington silt loam, 2-7% slopes  
Soil Boundary

Scale:

1" = 500 feet

Map check:

James E. Belshan, Soil Scientist  
Fairfax County Soil Survey Office

Date:

April 22, 1982

LOCATION: Tax Map Section: 24-4-001-3

NOTE: Four percent, or 3.2 acres, of this property consists of Rowland (12) soil. This soil occurs within the Flood Plain. It has a high seasonal water table during wet seasons and following heavy rainfalls. Rowland (12) soil rates poor for both building support and recharge of groundwater.

Ten percent, or 8.5 acres, of this property consists of Manassas (14) and Calverton (78) soils. These soils have high seasonal water tables during wet seasons and following heavy rainfalls. Manassas (14) rates marginal for building support. Calverton (78) rates marginal to poor for building support, because it has a deeper clayey subsoil. Manassas (14) and Calverton (78) soils rate poor for recharge of groundwater.

Eighty-four percent, or 68.5 acres, of this property consists of Penn (73) (77) soils. These well drained soils, forming from shale, rate good for building support. They rate marginal for recharge of groundwater. Blasting may be required in the installation of utilities.

Two percent, or 1.8 acres, of this property consists of Readington (273) soil. This soil is shallow to hard shale, and has a high seasonal water table during wet seasons and following heavy rainfalls. Readington (273) soil rates good for building support. It rates poor for recharge of groundwater.

## GLOSSARY

This Glossary is presented to assist citizens in a better understanding of Staff Reports; it should not be construed as representing legal definitions.

**BUFFER** - A strip of land established as a transition between distinct land uses. May contain natural or planted shrubs, walls or fencing, singly or in combination.

**CLUSTER** - The "alternate density" provisions of the Zoning Ordinance, which permits smaller lots and pipestem lots, if specified open space is provided. Primary purpose is to preserve environmental features such as stream valleys, steep slopes, prime woodlands, etc.

**COVENANT** - A private legal restriction on the use of land, recorded in the land records of the County.

**DEVELOPMENT PLAN** - Conceptual, Final, Generalized. A Development Plan consists of graphic, textual or pictorial information, usually in combination, which shows the nature of development proposed for a parcel of land. The Zoning Ordinance contains specific instructions on the content of development plans, based upon the purpose which they are to serve. In general, development plans contain such information as: topography, location of streets and trails, means by which utilities and storm drainage are to be provided, general location and types of structures, open space, recreation facilities, etc. A Conceptual Development Plan is required to be submitted with an application for the PDH or PDC District; a Final Development Plan is a more detailed plan which is required to be submitted to the Planning Commission after approval of a PDH or PDC District and the related Conceptual Development Plan; a Generalized Development Plan is required to be submitted with all residential, commercial and industrial applications other than PDH or PDC.

**DEDICATE** - Transfer of property from private to public ownership.

**DENSITY** - Number of dwelling units divided by the gross acreage being developed (DU/AC). Density Bonus is an increase in the density otherwise allowed, and granted under specific provisions of the Zoning Ordinance when developer provides excess open space, recreation facilities, moderately priced housing, etc.

**DESIGN REVIEW** - The Division of the Department of Environmental Management which reviews all subdivision plats and site plans for conformance with County policies and requirements contained in the Zoning Ordinance, the Subdivision Control Ordinance, the Public Facilities Manual, the Building Code, etc, and for conformance with any proffered plans and/or conditions.

**EASEMENT** - A right given by the owner of land to another party for specific limited use of that land. For example, an owner may give or sell easements to allow passage of public utilities, access to another property, etc.

**OPEN SPACE** - The total area of land and/or water not improved with a building, structure, street, road or parking area, or containing only such improvements as are complementary, necessary or appropriate to use and enjoyment of the open area.

**Common** - All open space designed and set aside for use by all or designated portions of residents of a development, and not dedicated as public lands (dedicated to a homeowners association which then owns and maintains the property).

**Dedicated** - Open space which is conveyed to a public body for public use.

**Developed Recreation** - That portion of open space, whether common or dedicated, which is improved for recreation purposes.

**PROFFER** - A Development plan and/or written condition, which, when offered by an owner and accepted by the Board of Supervisors, becomes a legally binding part of the regulations of the zoning district pertaining to the property in question. Proffers, or proffered conditions, must be considered by the Planning Commission and submitted by an owner in writing prior to the Board of Supervisors public hearing on a rezoning application, and thereafter may be modified only by an application and hearing process similar to that required of a rezoning application.

**PUBLIC FACILITIES MANUAL** - The manual, adopted by the Board of Supervisors, which defines guidelines which govern the design of those facilities which must be constructed to serve new development. The guidelines include streets, drainage, sanitary sewers, erosion and sediment control and tree preservation and planting.

**SERVICE LEVEL** - An estimate of the effectiveness with which a roadway carries traffic, usually determined under peak anticipated load conditions.

**SETBACK, REQUIRED** - The distance from a lot line or other reference point, within which no structure may be located.

**SITE PLAN** - A detailed plan, to scale, depicting development of a parcel of land and containing all information required by the Zoning Ordinance. Site plans are required, in general, for all townhouse and multi-family residential development and for all commercial and industrial development.

**SUBDIVISION ORDINANCE** - An ordinance regulating the division of land into smaller parcels and which, together with the Zoning Ordinance, defines required conditions laid down by the Board of Supervisors for the design, dedication and improvement of land.

**SUBDIVISION PLAT** - A detailed drawing, to scale, depicting division of a parcel of land into two or more lots and containing engineering considerations and other information required by the Subdivision Ordinance.

**USE** - The specific purpose for which a parcel of land or a building, is designed, arranged, intended, occupied or maintained.

**Permitted** - Uses specifically permitted by the Zoning Ordinance Regulations of the Zoning District within which the parcel is located. Also described as a Conforming Use.

**Non-Conforming** - A use which is not permitted in the Zoning District in which the use is located but is allowed to continue due to its existence prior to the effective date of the Zoning Regulation(s) now governing.

USE - Continued.

**Special Permit** - A use specified in the Zoning Ordinance which may be authorized by the Board of Zoning Appeals or the Board of Supervisors in specified zoning districts, upon a finding that the use will not be detrimental to the character and development of the adjacent land and will be in harmony with the policies contained in the latest adopted comprehensive plan for the area in which the proposed use is to be located. A Special Permit is called a Special Exception when granted by the Board of Supervisors.

**Transitional** - A use which provides a moderation of intensity of use between uses of higher and lower intensity.

**VARIANCE** - A permit which grants a property owner relief from certain provisions of the Zoning Ordinance when, because of the particular physical surroundings, shape or topographical condition of the property, compliance would result in a particular hardship or practical difficulty which would deprive the owner of the reasonable use of the land or building involved. Variances may be granted by the Board of Zoning Appeals after notification, advertising, posting and conduct of a public hearing on the matter in question.

**VPD** - Vehicle trips per day (for example, the round trip to and from work equals two VPD). Also ADT - Average Daily Traffic.

ENVIRONMENTAL TERMS

**ACOUSTICAL BERM** - Usually a triangular-shaped earthen structure paralleling a highway noise source and extending up from the elevation of the roadway a distance sufficient to break the line of sight with vehicles on the roadway.

**AQUIFER** - A permeable underground geologic formation through which groundwater flows.

**AQUIFER RECHARGE AREA** - A place where surface runoff enters an aquifer.

**CHANNEL ENLARGEMENT** - A development-related phenomenon whereby the stream's bank full capacity is exceeded with a greater frequency than under natural undeveloped conditions, resulting in bank and stream bottom erosion. Hydrology literature suggests that flows produced by a storm event which occurs once in 1.3 years are the channel defining flows for that stream.

**COASTAL PLAIN GEOGRAPHIC PROVINCE** - In Fairfax County, it is the relatively flat southeastern 1/4 of the County, distinguished by low relief and a preponderance of sedimentary rocks and materials (sands, gravels, silts) and a tendency towards poorly drained soils.

**dB(A)** - Abbreviation for a decibel or measure of the noise level perceived by the ear in the A scale or range of best human response to a noise source.

**DRAINAGE DIVIDE** - The highest ground between two different watersheds or subheds.

**ENVIRONMENTAL LAND SUITABILITY** - A reference to a land use intensity or density which should occur on a site or area because of its environmental characteristics.

**ERODIBLE SOILS** - Soils susceptible to diminishing by exposure to elements such as wind or water.

**FLOODPLAIN** - Land area, adjacent to a stream or other surface waters, which may be submerged by flooding; usually the comparatively flat plain within which a stream or riverbed meanders.

**IMPERVIOUS SURFACE** - A natural or man-made surface (road, parking lot, roof top, patio) which forces rainfall to runoff rather than infiltrate.

**MONTELLONITIC CLAY** - A fine grained earth material whose properties cause the clay to swell when wet and shrink when dry. In addition, in Fairfax County these clays tend to slip or slump when they are excavated from slope situations.

**NEF** - Noise Exposure Forecast - A noise description for airport noise sources.

**PERCENT SLOPE** - The inclination of a landform surface from absolute horizontal: formula is vertical rise (feet) over horizontal distance (feet) or V/H.

**PIEDMONT GEOGRAPHIC PROVINCE** - The central portion of the County, characterized by gently rolling topography, substantial stream dissection, V-shaped stream valley, an underlying metamorphic rock matrix (schist, gneiss, greenstone) and generally good bearing soils.

**PIES/ENVIRONMENT** - Project Impact Evaluation - A systematic, comprehensive environmental review process used to identify and evaluate likely environmental impacts associated with individual project or area plan proposals.

**SHRINK-SWELL RATE** - The susceptibility for a soil's volume to change due to loss or gain in moisture content. High shrink-swell soils can buckle roads and crack foundations.

**SOIL BEARING CAPACITY** - The ability of the soil to support a vertical load (mass) from foundations, roads, etc.

**STREAM VALLEY** - Any stream and the land extending from either side of it to a line established by the high point of the concave/convex topography, as delineated on a map adopted by the Stream Valley Board. For purposes of stream valley acquisition, the five-criteria definition of stream valleys contained in "A Restudy of the Ponick Watershed" (1969) will apply. The two primary criteria include all the land within the 100-year floodplain and the area along the floodplain in slopes of 15 percent or more.

**STORM WATER MANAGEMENT** - An emerging art/science that attempts to treat storm water runoff at the source and as a resource. Storm water management programs seek to mitigate or abate quantity and quality impacts typically associated with development by the specific design of onsite systems such as Detention Devices which slow down runoff and in some cases improve quality, and Retention Systems, which hold back runoff.

**TRIASSIC GEOGRAPHIC PROVINCE** - The western 1/4 of Fairfax County, characterized by broad expanses of nearly level topography, subtle ridge lines, a shallow depth to sedimentary rocks which are locally intruded by igneous rocks and a tendency towards soils with high shrink-swell properties.

