✓ 9-11-06

Variance File
14-2-3 Sp. Di

# VARIANCE REQUEST

**Iowa Department of Natural Resources**

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|---|---|---|---|
| 1. Date: | November 1, 2004 | 13. **Decision:** | |
| 2. Review Engineer: | Satya P. Chennupati | Date: | |
| 3. Date Received: | October 18, 2004 | | |
| 4. Facility Name: | Wapsie Valley High School | 14. **Appeal:** | |
| 5. County Number: | 9 (Bremer) | Date: | |
| 6. Program Area: | CP (Wastewater Construction) | | |
| 7. Facility Type : | C05 (Biological Treatment) | | |
| 8. Subject Area : | 308 | | |
| 9. Rule Reference: | 567-64.2(9)a | | |
| 10. Design Stds Ref: | 14.2.3 | | |
| 11. Consulting Engr: | MMS Consultants Inc. | | |
| 12. Variance Rule: | 567-64.2(9)c | | |

15. Description of Variance Request: Wapsie Valley High School is proposing to construct wastewater treatment system improvements consisting of six packed bed fabric type recirculating sand filters in fiberglass and FRP water-tight tanks in between the existing septic tanks and the soil absorption lateral field. The existing septic tanks are at a distance of 130-feet from the existing public deep well and the proposed recirculating filter tanks are at a distance of 140-feet from the public deep well. Section 14.2.3 of the Iowa Wastewater Design Standards and Section 64.2(3) IAC 567 requires a 400 feet of separation distance from treatment to the public deep well. The School is requesting a variance from the required 400-feet separation distance from treatment to a public deep well.

16. Consulting Engineer's Justifications

- The Wapsie Valley HS septic treatment system was built in 1959 preceding any DNR and local County wastewater regulations. The District does not have any record of const. permit issued for the system.
- The school public well is 810-feet deep with a casing and is classified as a deep well according to Chapter 3.0.4 of the Iowa Water supply Facilities Design Standards and attached driller logs of existing wells.
- Groundwater moves from east to west towards the Wapsipinicon River. The school well is located east of the existing and proposed treatment sites, and therefore, upstream of the sites.
- Iowa Wastewater Facilities Design Standards Chapter 14.2.3 and Rule 567 IAC 64.2(3) states that "when the above separation distances cannot be maintained for expansion, upgrading or replacement of the existing facilities, the separation distances shall be maintained at no less than 90% of the existing separation distances of the site, provided that no problem has existed or will be created." The School well has provided safe water for over 40 years. The absence of any negative water quality test or water quality complaints over this period shows no problem has existed.
- The proposed Advantex treatment system is comprised of a series of sturdy, watertight fiberglass basins. The basins are installed at grade and will be surrounded by impervious fill. The accompanying recirculation tank will be a fiberglass-reinforced plastic tank. The tank will be manufactured as a single unit and pressure tested for water tightness prior to shipment. The proposed improvements will not create a problem because all new construction will be enclosed and watertight. Since one of the existing septic tanks is 130-feet from the school well, it is permissible under 567 IAC 64.2(3) to locate the proposed treatment units and tanks no less than 117-feet from the school well.

- In addition, the existing and proposed locations of wastewater treatment units meet the requirements of 567 IAC Chapter 43. 567 IAC Chapter 43 only requires that deep wells maintain a 100-foot separation from septic tanks. The Advantex pod units and recirculation tank can be considered septic tanks as they are both manufactured as enclosed, watertight units. Wastewater is not released to the environment near the units. Treated effluent from the Advantex units will be pumped to the existing absorption lines.
- 567 IAC Chapter 43 only requires that deep wells maintain a 200-foot separation from soil absorption fields. The existing soil absorption lines are 260-feet from the school well. Based on 567 IAC Chapter 43, it is permissible to locate the proposed Advantex treatment units and recirculation tank at no less than 100-feet from the school well. Similarly, it is permissible to use the existing absorption lines at their current location.

17. Department's Justifications

- **Recommend Approval.**
- The proposed Advantex wastewater treatment tanks are watertight tanks and leak tested. Therefore, any possible adverse effects on the environment, water quality, or aesthetics should be minimized.
- The existing was built before any state or local county wastewater design standards were in place.
- The existing facility was built at 130-feet from the public water supply deep well. The proposed Advantex treatment tanks will be at 140-feet from the deep well which is farther than the existing distance. Based on the no less than 90% of the existing separation distance, the proposed wastewater system qualifies for the exception when upgrading the existing facility.
- The direction of groundwater flow is towards west, to the Wapsipinicon River. The school well is located east of the existing and proposed treatment sites, and therefore, upstream of the sites, and hence no potential contamination. Water supply tests negative for contamination for 40 years.
- Based on the Rule 567 IAC 43 of the drinking water rule, a minimum separation distance of 100 feet between the deep well and the wastewater septic tanks is acceptable.

18. Precedents Used

Stoney Point Subdivision - Johnson Co., Winchester Heights Addition – Johnson Co., Promontory Point Subdivision – Panora, First Christian Church, Council Bluffs

19. Staff Reviewer: Satya Chennupati Date: 11/1/04

20. Supervisor: Date:

21. Authorized by: Date: 11/1/04

Iowa
Fields of Opportunities

# STATE OF IOWA

THOMAS J. VILSACK, GOVERNOR
SALLY J. PEDERSON, LT. GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
JEFFREY R. VONK, DIRECTOR

November 1, 2004

Mr. Dan Peterson
Wapsie Valley Community School Dt.
2535 Viking Avenue
Fairbank, IA 50629

Subject: Variance Request from IA 14.2.3 & 64.2(3)c IAC 567
Wapsie Valley High School Wastewater system, Bremer County, Iowa

Dear Mr. Peterson:

The Iowa Department has considered and *approved* your October 12, 2004 request for a variance from Rule 64.2(3)c of the Iowa Administrative Code and Chapter 14.2.3 of the Iowa Wastewater Facilities Design Standards, which requires separation distance of 400 feet from the wastewater treatment or lagoon water surface to the public deep well. Based on the documentation presented by the Engineer, it is the determination of this Department that satisfactory justification has been presented to warrant the granting of a variance for separation distance.

This decision is based on our review of justification presented to support the request and our concurrence that the resulting project will provide substantially equivalent effectiveness as would be provided by technical compliance with the design standard on this issue.

If you have any questions, please call Satya P. Chennupati, P.E. at 515-281-8995.

Sincerely,

Wayne Farrand, P.E.
Wastewater Section Supervisor

cc: Field Office #1
MMS Consultants, Inc.
DNR Sewage File 6-10-25-5-01

# MMS CONSULTANTS, INC.

1917 S. GILBERT STREET • IOWA CITY • IOWA 52240-4363
OFFICE: 319-351-8282 • FAX: 319-351-8476
EMAIL: MMS@MMSCONSULTANTS.NET


B2005-0048
Read 10/18/04


| | |
|---|---|
| Robert D. Mickelson | L.S. (Retired) |
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| Christopher M. Stephan | P.E. |
| Glen D. Meisner | L.S. & P.E. |
| Ronald L. Amelon | P.E. |
| James E. Lichty | L.S. |
| Duane A. Musser | L.A. |
| Randy L. Williams | M.C.P. |
| Paul V. Anderson | P.E. |
| Edward H. Brinton | P.E. |
| Kelly J. Beckler | P.E. |
| Mark A. Stein | L.S. |
| Cary J. Solberg | P.E. |
| Lucas C. Newton | L.A. |
| Scott B. Pottorff | P.E. |




October 12, 2004

6580-003

Mr. Satya Chennupati, P.E.
Iowa Department of Natural Resources
Wastewater Section
502 East 9th Street
Des Moines, Iowa 50319

well → Ex. drain tiles = 130'
well → Proposed drinker = 140'

Re: Wapsie Valley High School - Wastewater Treatment System Improvements

Dear Satya:

We received your September 29 letter and attached site survey report from Field Office #1. We would like to offer additional information to justify and support the current plan as shown and described in our engineering feasibility study.

The Wapsie Valley High School facility was originally constructed in 1959. It is our understanding that this construction predates any Iowa DNR wastewater regulations. Doug Bird at Bremer County confirmed county wastewater ordinances were not in place when the system was constructed. The Wapsie Valley School District has no record of any permits that were issued for system construction. However, the system is well constructed and maintained relative to other systems over 40-years old.

Variance for Separation Distance

MMS Consultants, on behalf of the Wapsie Valley School District, requests a variance to allow Orenco Advantex treatment units and recirculation tank to be placed within 400-feet of the school well. The school well is 810-feet deep with a casing. The school well is classified as a deep well under chapter 3.0.4 of the Iowa Water Supply Facilities Design Standards. We attached a location map and several driller logs from neighboring wells for your review. All wells shown are deep wells. We expect the geological formation and construction techniques of the Wapsie Valley School well to be similar to details shown in the attached well logs.

Groundwater moves from east to west towards the Wapsipinicon River. The school well is located east of the existing and proposed treatment sites. Relative to both surface and ground water flow, the well is located upstream of the existing and proposed treatment sites. The attached sketch shows the general movement of surface and groundwater across the site.

Iowa Wastewater Facilities Design Standards Chapter 14.2.3 [567 IAC Chapter 64.2(3)] states

created". The school well has provided safe water for over 40-years. The absence of any negative water quality tests or water quality complaints over this period shows no problem has existed.

The Advantex system is comprised of a series of sturdy, watertight fiberglass basins. The basins are installed at grade and will be surrounded by impervious fill. The accompanying recirculation tank will be a fiberglass-reinforced plastic tank. The tank will be manufactured as a single unit and pressure tested for water tightness prior to shipment. The proposed improvements will not create a problem because all new construction will be enclosed and watertight. Since the one of the existing septic tanks is 130-feet from the school well, it is permissible under 567 IAC Chapter 64.2(3) to locate the proposed treatment units and tanks no less than 117-feet from the school well.

In addition, the existing and proposed locations of wastewater treatment units meet the requirements of 563 IAC Chapter 43. 563 IAC Chapter 43 only requires that deep wells maintain a 100-foot separation from septic tanks. The Advantex pod units and recirculation tank can be considered septic tanks as they are both manufactured as enclosed, watertight units. Wastewater is not released to the environment near the units. Treated effluent from the Advantex units will be pumped to the existing absorption lines.

563 IAC Chapter 43 only requires that deep wells maintain a 200-foot separation from soil absorption fields. The existing soil absorption lines are 260-feet from the school well. Based on 563 IAC Chapter 43, it is permissible to locate the proposed Advantex treatment units and recirculation tank no less than 100-feet from the school well. Similarly, it is permissible to use the existing absorption lines at their current location. We ask that you concur with our evaluation of separation requirements for this site.

Existing Absorption Lines

We believe it is premature to completely rebuild the existing absorption line system. The existing lines have lost some capacity due to the formation of a clogging mat at the native soil interface. The clogging mat is likely formed because more oxygen demanding material and solids are entering the lines than they are able to handle.

The existing absorption lines were originally designed and constructed to function more equally as both a treatment and absorption unit. The lines currently receive untreated septic tank effluent. Recent water quality tests show the septic tank effluent has BOD greater than 150 mg/l and TSS greater than 50 mg/L. After the Orenco Advantex units are installed, the existing absorption lines will receive treated effluent. Treated effluent will contain less than 20 mg/L BOD and 20 mg/L TSS. In this case, the lines will act almost exclusively as a wastewater dispersal unit. Research by the University of Wisconsin-Madison has shown that treated effluent with BOD and TSS concentrations less than 25 mg/L will not form a clogging mat. The lines will more readily accept the treated effluent when compared to the untreated effluent from the septic tank.

The existing absorption lines handle the majority of the untreated septic tank effluent. Research at the University of Wisconsin-Madison shows that treated effluent will renovate systems failing due to the formation of a clogging layer. We believe the existing absorption lines are good candidates for renovation with treated effluent. Reconditioning work, including jetting and cleaning, will be performed as part of the proposed improvements. This work will help to restore the lines to their original working condition. An aggressive monitoring and preventative maintenance program will also protect the system.

We trust this information will allow the Iowa DNR to approve separation distances at the treatment site. Please call me at 319-351-8282 if you have any questions.

Sincerely,

MMS Consultants, Inc.

Cary J. Solberg, P.E.

cc: Mr. Dan Peterson - Wapsie Valley Community School District
Mr. Mike Wade - IDNR Field Office #1

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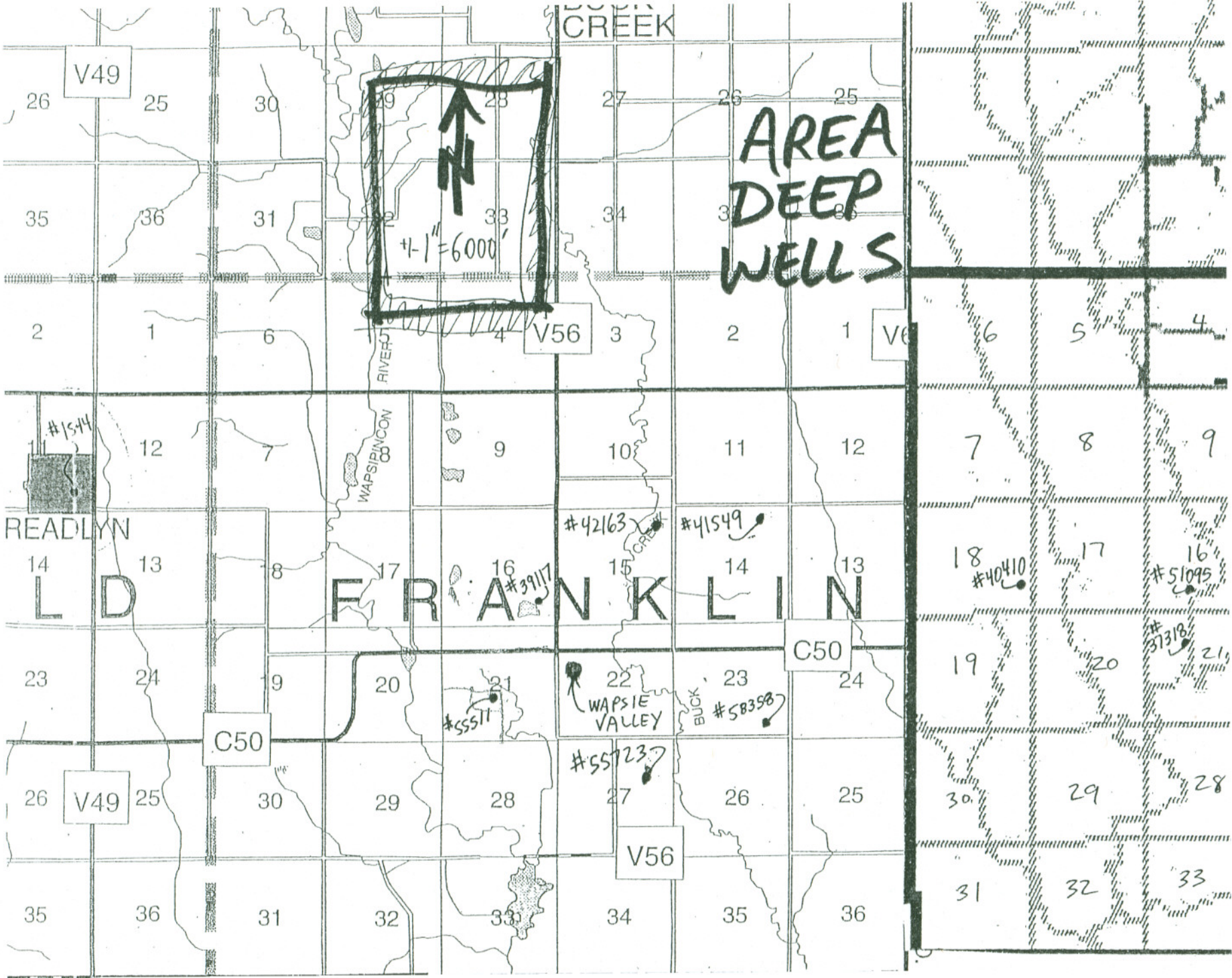
AREA
DEEP
WELLS
+/- 1" = 6000'
CREEK
V49
V56
C50
READLYN
FRANKLIN
WAPSIPINCON
RIVER
WAPSIE
VALLEY
BUCK
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#42163
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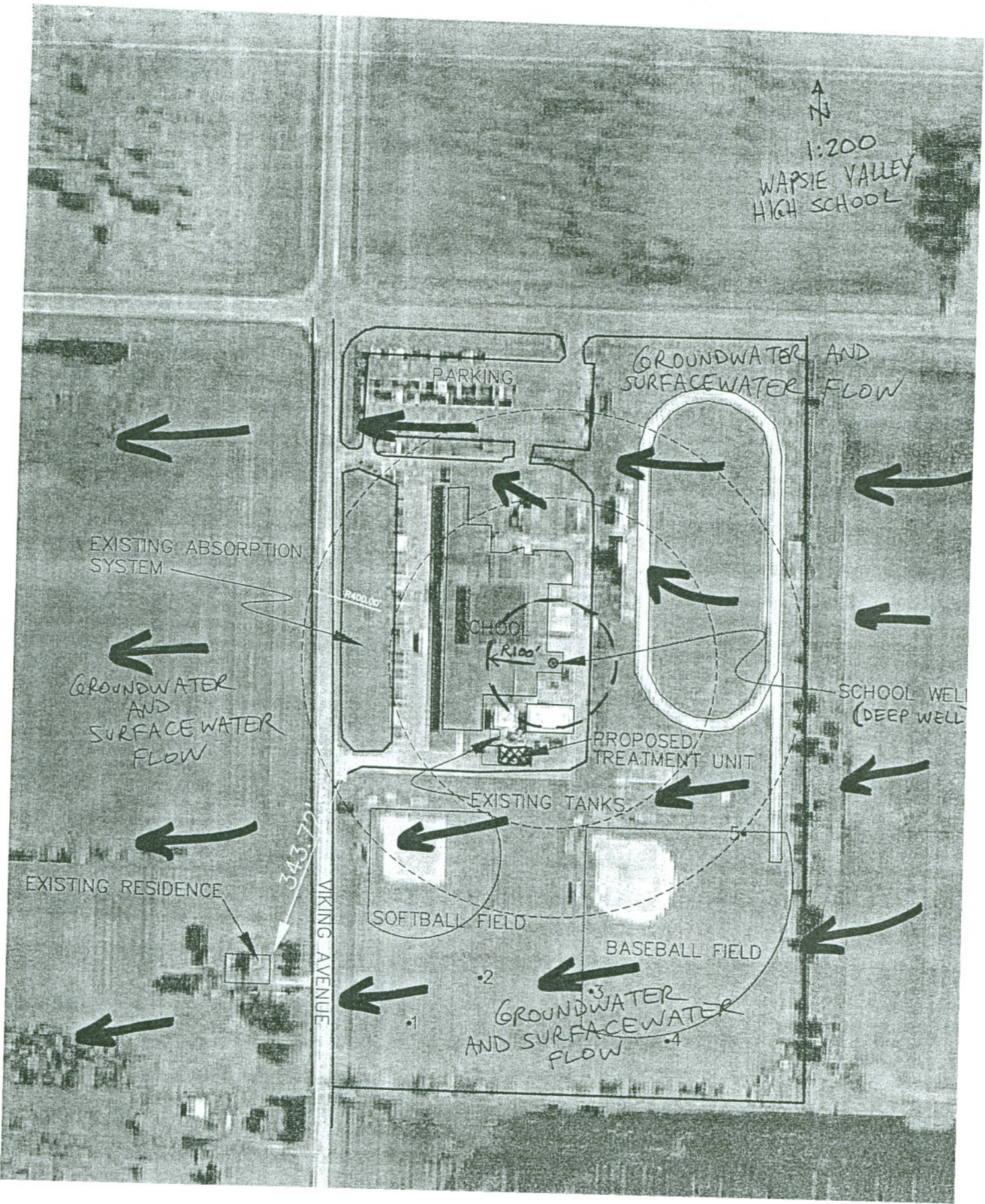
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WAPSIE VALLEY HIGH SCHOOL
PARKING
GROUNDWATER AND SURFACEWATER FLOW
EXISTING ABSORPTION SYSTEM
R400.00'
SCHOOL
R100'
SCHOOL WELL (DEEP WELL)
GROUNDWATER AND SURFACEWATER FLOW
PROPOSED TREATMENT UNIT
EXISTING TANKS
343.72'
EXISTING RESIDENCE
VIKING AVENUE
SOFTBALL FIELD
BASEBALL FIELD
GROUNDWATER AND SURFACEWATER FLOW
1
2
3
4
5