

CONTENTS

- Abstract..... 1
- Introduction 2
- Ground-Water Monitoring Plan 3
 - Ground-Water Monitoring Well Network 3
 - Well Sampling Schedule and Constituents of Analysis 4
 - Methods of Sample Collection and Analysis 5
- Water-Quality Results 6
 - Physical Properties, Bacteria, Major Ions, Trace Elements, and Cyanide 6
 - Nutrients 7
 - Enzyme Linked Immunosorbent Assay (ELISA) 8
 - Initial Sampling 8
- Spatial and Temporal Variability of Selected Agricultural Chemicals in Ground Water 8
- Summary..... 14
- References 19

FIGURES

- 1. Map showing ground-water monitoring well network for the Independence, Missouri, well field..... 4
- 2. –7. Graphs showing:
 - 2. Frequency of detection and concentration of dissolved ammonia, nitrite plus nitrate, and orthophosphorus for samples grouped by well depth 10
 - 3. Frequency of detection and concentration of dissolved ammonia, nitrite plus nitrate, and orthophosphorus for samples grouped by month, 1998–2000 11
 - 4. Dissolved ammonia, nitrite plus nitrate, and orthophosphorus in water samples from selected monitoring wells, the Independence well field, and the Missouri River at St. Joseph, Missouri 12
 - 5. Frequency of detection and concentration of alachlor and atrazine for samples grouped by well depth..... 15
 - 6. Frequency of detection and concentration of alachlor and atrazine for samples grouped by month, 1998–2000 16
 - 7. Alachlor and atrazine concentration in water samples from selected monitoring wells, the Independence well field, and the Missouri River at Hermann, Missouri..... 17

TABLES

1. Monitoring well or sample location names, potential contamination source types, locations, and well construction information	23
2. Potential ground-water contamination sources and associated laboratory analyses.....	25
3. Sampling schedule for Independence monitoring well network.....	26
4. Physical properties, bacteria, major ions, trace elements, and nutrients analyses and methods.....	28
5. Reporting levels and cross-reactive compounds for total benzene, toluene, ethyl benzene, and xylene (BTEX), atrazine, and alachlor from enzyme linked immunosorbent assay (ELISA).....	30
6. Volatile organic compounds analyzed for and detected in initial sampling.....	31
7. Semi-volatile organic compounds analyzed for in initial sampling.....	33
8. Pesticides, polychlorinated biphenyls, polychlorinated naphthalenes, and herbicides analyzed for and detected in initial sampling	35
9. Concentrations of major ions and trace elements in samples from well 8-2 year and from well 23-5 year.....	38
10. Concentration of nutrients in samples, replicates, and blanks	39
11. Concentration and percent recovery of pesticides in field spiked samples from well 8-2 year.....	41
12. Selected constituents and physical properties measured in samples from wells, combined Independence well field pumpage, and the Missouri River	42
13. Densities of fecal coliform and fecal streptococci in bacteria samples from wells and the Missouri River	49
14. Median concentrations of major ions and iron in samples from wells, combined Independence well field pumpage, and the Missouri River	50
15. Dissolved major ions and iron detected in samples from wells, combined Independence well field pumpage, and the Missouri River	51
16. Dissolved trace elements in samples from wells and combined Independence well field pumpage.....	53
17. Dissolved nutrients in samples from wells, combined Independence well field pumpage, and the Missouri River.....	57
18. Enzyme linked immunosorbent assay results for total benzene, toluene, ethyl benzene, and xylene (BTEX) detections in samples from wells and combined Independence well field pumpage.....	65
19. Enzyme linked immunosorbent assay results for atrazine and alachlor in samples from wells and combined Independence well field pumpage.....	66