

Appendix L

Well Field Contingency Plan

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L1.0 Planning and Preparation

Under this contingency plan, which supersedes the *Well Field Contingency Plan* (DOE 1992b), any production capacity lost to the existing well field due to confirmed contaminant migration from the Weldon Spring Quarry (Quarry) will be replaced. While it is highly unlikely that such measures will be implemented, this plan defines the minimum planning and preparation required to facilitate a rapid and effective response. Planning and preparation measures include the following:

- Selection of a reliable alternate source of water to replace or supplement the existing well field.
- Preparation of a plan for data collection to facilitate development of the selected alternate source.
- Development of design criteria for use in design and construction of the alternate source infrastructure.

L1.1 Selection of Alternate Source

Criteria and alternatives for contingency planning were developed using modified value engineering principles. Modified value engineering is an alternative evaluation process that parallels the CERCLA philosophy of remedial alternative development that is not based upon cost unless all other criteria (i.e., effectiveness, implementability, etc.) are equal. This process was performed as outlined in *Alternative Evaluation Study Manual* (DOE 2000).

Two broad potential scenarios were considered as part of alternative evaluation: (1) a portion of the well field is threatened, requiring partial replacement of the water supply; and (2) the entire well field is threatened, requiring replacement of the entire water supply from the existing well field.

The criteria used to evaluate the alternatives were effectiveness, technical feasibility, degree of disruption, public acceptance, regulatory requirements, cost, and impact on the present treatment system. By applying these criteria, all but the top three alternatives for each scenario were quickly eliminated (Table L-1). Further evaluation of the remaining alternatives led to the selection of a proposed alternative. The evaluation and selection process is described in the report *St. Charles County Well Field Summary of Alternatives for Contingency Plans* (DOE 1992a).

Table L-1. Alternatives Considered for Water Supply Replacement Scenarios

Alternative	Rank of Alternative	
	Partial Replacement Scenario	Full Replacement Scenario
New well(s) in existing well field	2	7
New well(s) in Darst Bottoms upstream of existing well field	1	1
Modify existing well system	10	10
Change pumping scheme of existing wells	6	9
Utilize existing pipeline from St. Louis	5	11
New pipeline to Howard Bend Plant	4	3
Treat Missouri River surface water	3	2
Find bedrock source of water at another site	7	6
Treat and use contaminated water	11	8
Protect well field with a slurry wall	8	4
Redirection of existing capacities	9	5
No action	Not appropriate	Not appropriate

The selected alternative is the installation of additional water supply wells in the Darst Bottoms to the south of the present well field (Figure L-1). Although this location is within the same aquifer as the present well field, the replacement location is upgradient of the contaminant source, the Quarry. Hence, given that action levels for contaminants are conservative (low), the replacement well field location would be unaffected by contaminant migration either from the Quarry or a potentially tainted well field to the north.

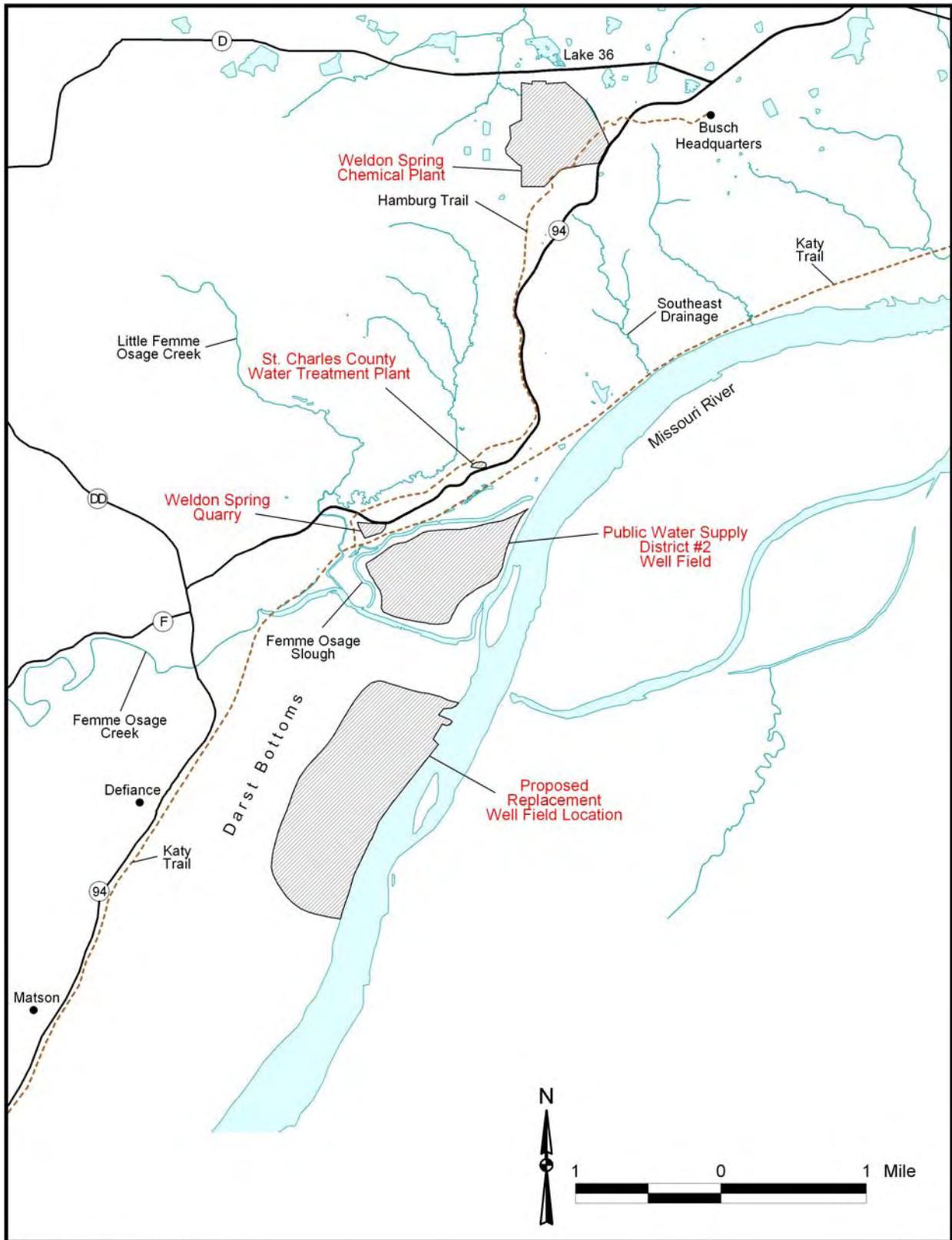
L1.2 Preparation of a Plan for Hydrogeologic Investigation

A plan will be prepared for a hydrogeologic investigation required to obtain the information necessary to develop the alternate source of groundwater. This plan will identify the activities, sampling, and testing required to assess the hydrogeologic characteristics of the replacement well field area. While the hydrogeologic characteristics of the replacement well field location are probably quite similar to the present well field, additional data and testing will be required to ensure an adequate assessment, and to ensure that engineering design is optimized to meet production needs.

L1.3 Design Criteria

Engineering design criteria will be established for use in design and construction of the alternate water supply. Design criteria will address:

- Functional requirements relative to interface with the existing well field and treatment plant.
- Performance requirements relative to production capacity.
- Phased response (requirements for partial versus full replacement).
- Water quality requirements.
- Well sitting and construction.



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Figure L-1. Proposed Replacement Well Field Location

In the event an alternate source of drinking water is required, engineering design and construction shall proceed based on the design criteria established under this plan.

L1.4 Access

Should the need arise, access for data collection purposes, well installation, and pipe line construction will be coordinated with the affected private landowners and St. Charles County officials. As an interim measure, private landowners who would be affected by construction of a replacement well field were contacted by a U.S. Department of Energy (DOE) representative who explained the contingency plan and outlined the potential for a request for access to be made at some future time.

L1.5 Installation of Replacement Wells

In the event that contaminants from the Quarry are detected above action levels established under this plan, the following steps will be taken to install a replacement well field:

- Access will be obtained from affected landowners.
- Subcontractor services will be procured for drilling of production and test wells and acquisition of other data prescribed as part of the hydrogeologic investigation.
- Field activities will be initiated as detailed in the hydrogeologic investigation plan.
- Design of components necessary to perform drilling, install wells, pumps, and piping, and construct pumping facilities and controls will be accelerated.
- Procurement of materials will be accelerated for pumps, piping, casing, screens, and all appurtenances required to complete construction of the replacement well field to production standards.
- The replacement well field will be installed under the direction of DOE.

L1.6 Permits

Construction permits would be required from the MDNR and St. Charles County as well as a permit from the Darst Bottoms Levee District in order to install the replacement wells. The permit process is estimated to take between 60 and 90 days (DOE 1992b).

L1.7 Schedule

Assuming that construction would proceed on several tasks simultaneously, it is estimated that a minimum of 2 months will be required for construction after permits are obtained. Allowing 60 days for engineering and the preparation of permit applications, about 200 days would be required from the start of engineering through the start up of the pumps (DOE 1992b). The estimated implementation schedule is illustrated in Figure L-2.

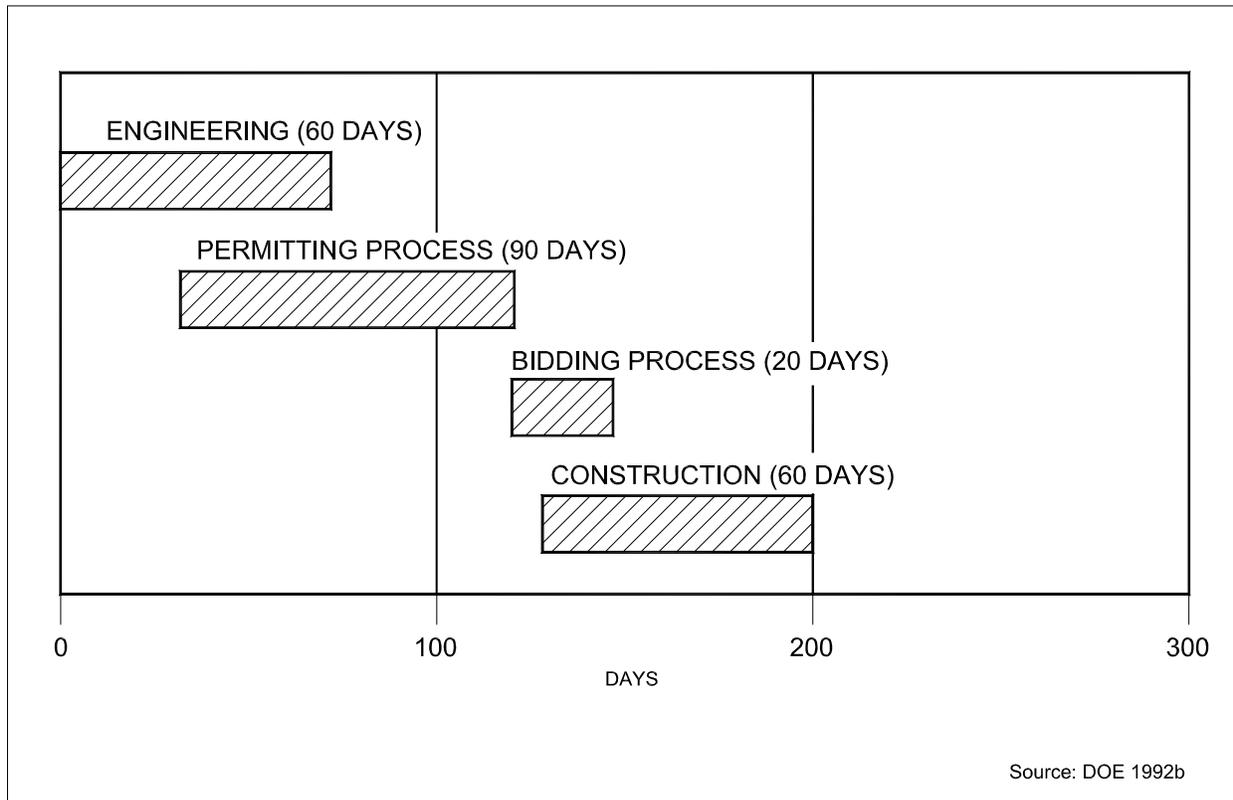


Figure L-2. Estimated Replacement Well Field Installation Schedule

During the period of time required to complete installation of the replacement well field, the present well field would operate without the reserve provided by the affected wells. In a worst case scenario, the present well field might not meet production demands during the period of new well field construction. In this instance, service demands for Public Water Supply District #2 Plant No. 1 would have to be met through an alternate source or rationing (such as water used for lawn care and car washing, etc.) until the replacement well field went on line or demand subsided due to the normal demand cycle.

L1.8 Well Design

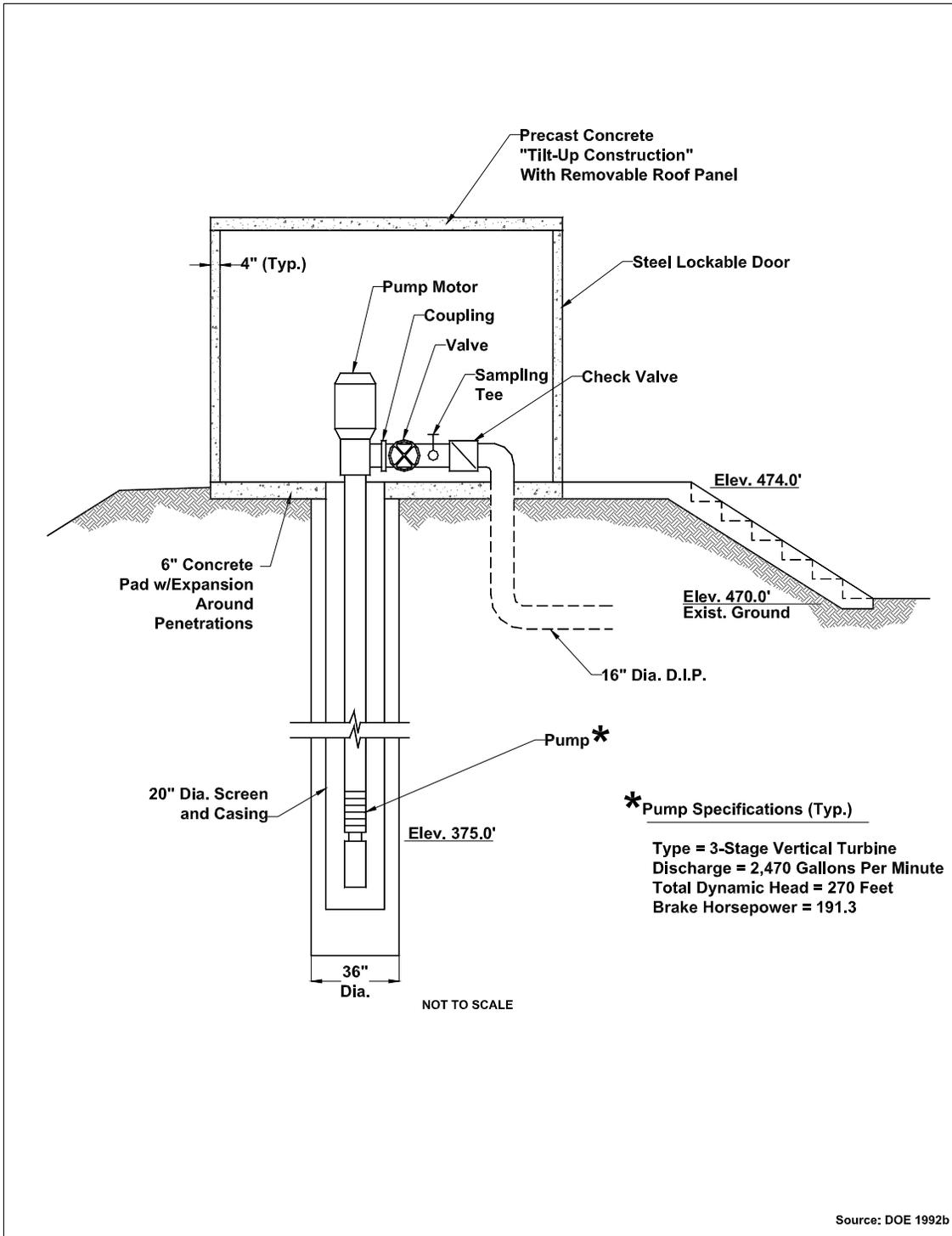
Figure L-3 illustrates the preliminary design of the replacement wells.

L2.0 References

DOE (U.S. Department of Energy), 1992a. *St. Charles County Well Field Summary of Alternatives for Contingency Plans*, DOE/OR/21548-285, prepared by L.G. Zambrana Consultants, Inc. and Woodward-Clyde Consultants for the U.S. Department of Energy Oak Ridge Operations Office, Weldon Spring Site Remedial Action Project, Weldon Spring, Missouri, May.

DOE (U.S. Department of Energy), 1992b. *Well Field Contingency Plan*, DOE/OR/21548-340, U.S. Department of Energy Oak Ridge Operations Office, Weldon Spring Site Remedial Action Project, Weldon Spring, Missouri, November.

DOE (U.S. Department of Energy), 2000. *Alternative Evaluation Study Manual*, Rev. 1, DOE/OR/21548-640, U.S. Department of Energy Oak Ridge Operations Office, Weldon Spring Site Remedial Action Project, Weldon Spring, Missouri, January.



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Figure L-3. Proposed Typical Replacement Well Schematic

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