North Dakota State Laboratory

HB1004
House Appropriations - Human Resources Subcommittee

01.19.2023

- Introductions
- Project Vision & Goals
- Design Process
    - Space Programming
    - Design Concepts
- Site Selection Process
- Preliminary Cost Estimate
- Operating Cost Projections
- Schedule

Project Vision & Goals

State laboratories support ***critical department functions...***

To accomplish our mission, the **North Dakota Department of Health** is committed to: ***improving the health status*** of the people of North Dakota; ***improving access to and delivery of*** quality health care and wellness services; ***promoting a state of emergency readiness*** and response; ***achieving strategic outcomes*** using all available resources; ***strengthening and sustaining stakeholder engagement*** and collaboration; and ***managing emerging public health challenges.***

The **North Dakota Department of Environmental Quality's** vision is for a ***sustainable, high quality environment*** for current and future generations. Our mission is to c***onserve and protect*** the quality of North Dakota's ***air, land, and water resources*** following science and the law.

....but our facilities are ***approaching the end*** of their useful life.

A Lack of Space for Office Functions

- Officing tasks occur in labs (safety issue)

B Incoming Sample/Specimen Workflows

- Lack of dedicated sample/specimen receipt areas.
- DOH specimen receipt in hallways
- Separated sample storage required to preserve DEQ sample integrity

C Lack of Space for Growth

- Instrumentation updates in DOH fill current lab footprints
- No space for new DOH programs (ie Corrections, LNR-C, Biosurveillance, Newborn Testing)
- DEQ testing to parts-per-trillion level requires clean spaces and separated functions to avoid cross-contamination
- Anticipated growth in DEQ volumes due to updated PFAS, copper, and lead regulations

D BSL-3 Lab Deficiencies

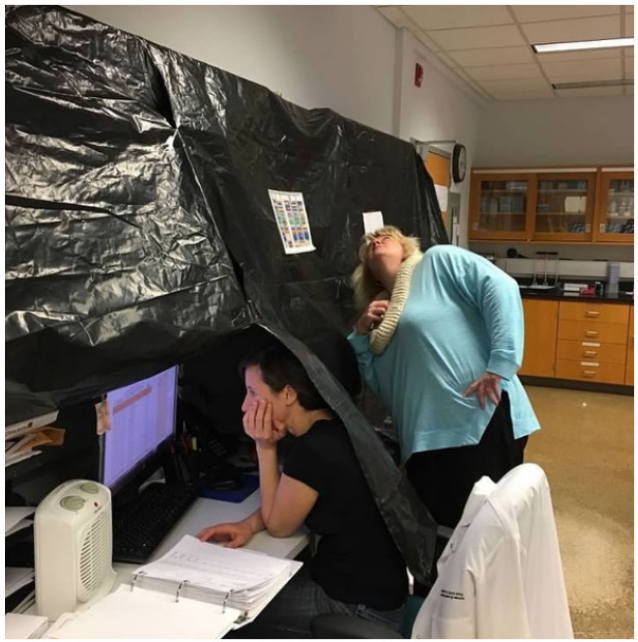
- Lack of vestibules/anterooms in existing BSL-3 Labs
- Single-aisle labs limit flexibility and efficiency

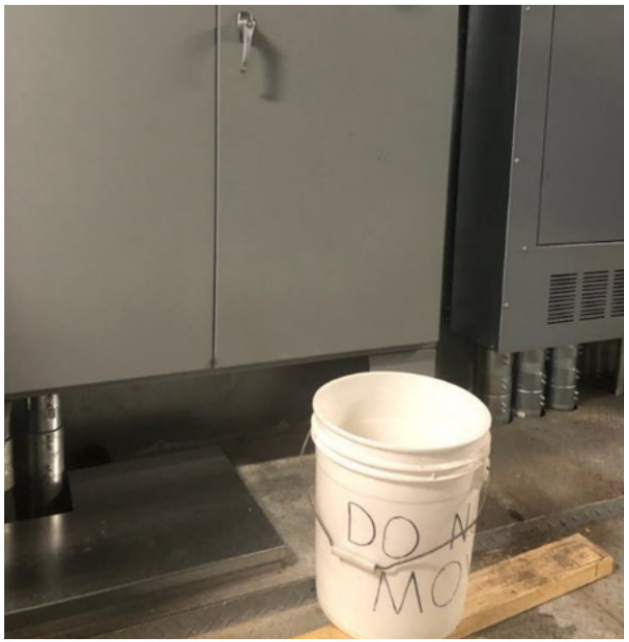
E Lack of Citizen-Focused Engagement

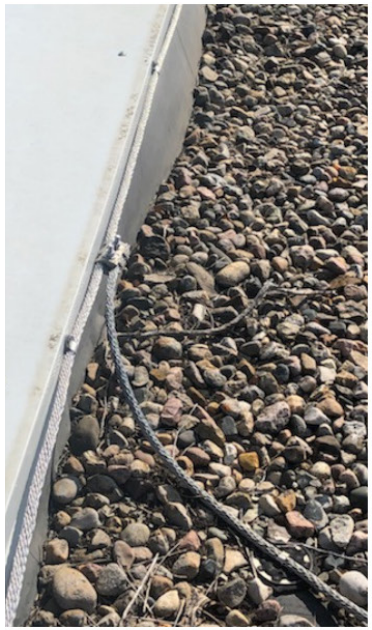
- No space for outside visitors to experience lab functions, understand workflows, or develop interest in STEM functions

F Mechanical System Deficiencies & Reliability

- Lack of separation of airflows between DOH & DEQ leads to cross-contamination risk
- Reliability issues for power and mechanical equipment compromises testing capability







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A new State Lab facility will preserve and advance our ability to

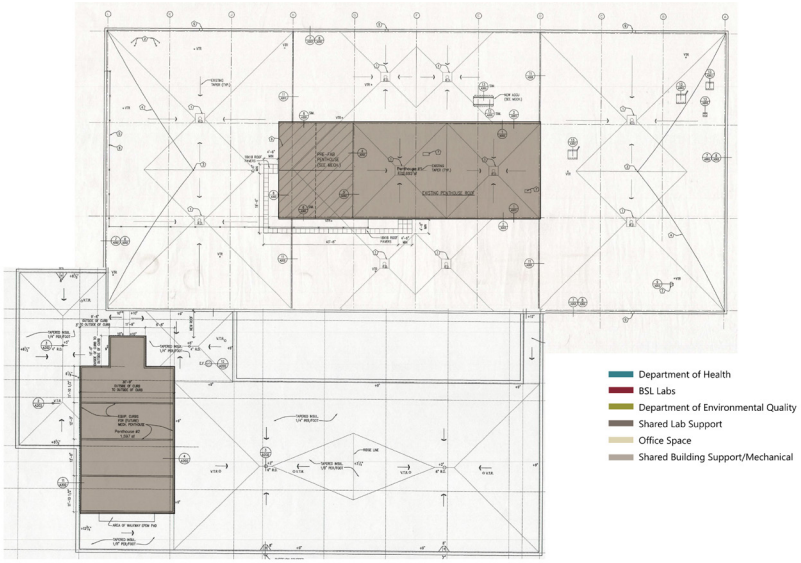
protect North Dakota's public health & environment.

The proposed laboratory will provide Public Health & DEQ with:

- ***Improved regulatory compliance*** to ensure continued access to testing programs
- ***Additional programs*** and access to testing
- ***Adequate space*** to support current and future testing needs
- ***Optimized workflows*** to enable more efficient testing
- ***Safe and inviting*** working environment for staff.
- ***State-of-the-art utility systems*** with minimized cross-contamination risks
- ***Citizen-focused spaces*** to share our work, collaborate with universities, and inspire future scientists

Design Process


Department of Health
BSL Labs
Department of Environmental Quality
Shared Lab Support
Office Space
Shared Building Support/Mechanical
FLOOR PLAN


Department of Health
BSL Labs
Department of Environmental Quality
Shared Lab Support
Office Space
Shared Building Support/Mechanical


Warehouse
10,000 sf
Vermont Ave


Storage Building
3,200 sf
Mobile Lab
442 sf

Visual Program & Adjacency Diagrams

Molecular Notes
Sample Prep
(2) Refrigerator, (2) Freezer
(2) BSC
Extraction
(3) BSC
Clean Room

Instrumentation
Access to Autoclave

Special Microbiology Notes
Virology
(4) M2000
(1) BSC
Alinity
Temp Controlled Room (23C +2)
Immunology - Panther
Requires access to autoclave
Door between all spaces in suite required
Separate M2000 from Panther space to avoid cyanide gas

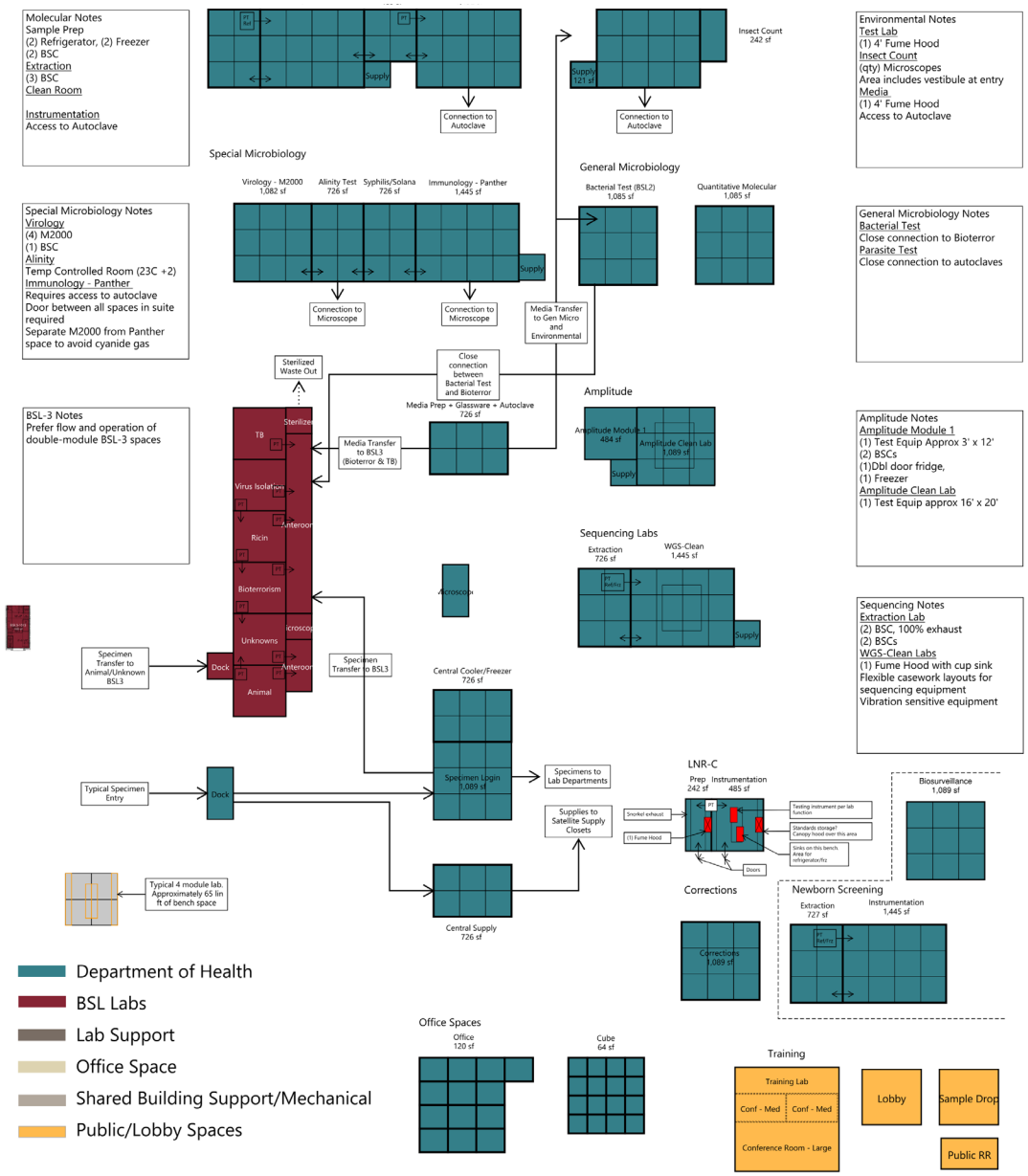
BSL-3 Notes
Prefer flow and operation of double-module BSL-3 spaces

Environmental Notes
Test Lab
(1) 4' Fume Hood
Insect Count
(qty) Microscopes
Area includes vestibule at entry
Media
(1) 4' Fume Hood
Access to Autoclave

General Microbiology Notes
Bacterial Test
Close connection to Bioterror
Parasite Test
Close connection to autoclaves

Amplitude Notes
Amplitude Module 1
(1) Test Equip Approx 3' x 12'
(2) BSCs
(1)Dbl door fridge,
(1) Freezer
Amplitude Clean Lab
(1) Test Equip approx 16' x 20'

Sequencing Notes
Extraction Lab
(2) BSC, 100% exhaust
(2) BSCs
WGS-Clean Labs
(1) Fume Hood with cup sink
Flexible casework layouts for sequencing equipment
Vibration sensitive equipment



- Department of Health
- BSL Labs
- Lab Support
- Office Space
- Shared Building Support/Mechanical
- Public/Lobby Spaces

DEQ Lab Vision:
Suites equipped with technology to support specific testing.
Each suite - Larger prep area, smaller test area. Approx 1/3 prep, 2/3 test
Establish size of suite based on quantity of instrumentation within - see diagrams

Vacuum pumps - noise control required (closet for vac pumps or sound insulated cabinets)

Prep Rooms
(1) or (2) fume hoods, sometimes two fume hoods, or canopy hood
Bench snorkels as shown on diagram

Instrument/Test rooms
Always have a sink somewhere, but have movable tables for instrumentation.
Space for (1) refrigerator or freezer for reagent storage
Overhead carriers with gas connection

Suites discussed (Instrument qty per DEQ input)
1) LC, GC, GCMS - (8) Instruments
2) GCMS/MS - (6) Instruments
3) ICP, ICPMS - (6) Instruments - Low metal lab
4) LCMS/MS - (6) Instruments - Clean Lab, Low PFAS Lab
5) ICMS/MS - (4) Instruments - Clean Lab
6) VOC - (4) Instruments - Clean Lab
7) FIA and IC - (6) Instruments
8) Petroleum - (4) Instruments
9) Feed/Fertilizer - (4) Instruments
10) Miscellaneous Testing - (4) Instruments
11) Kit Prep - (4) Instruments
12) Dirty - (4) Instruments

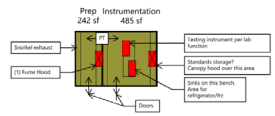
Additional Functions
1) Griding
2) Sample Login
3) Admin Assistant
4) Demands Lab
5) Engines

Sample Login Notes
Dedicated dock for sample receipt
Sample Login
(2) Staff
Bench space for sample receipt, temp and PH checks
(2) Fume Hood for sample prep
Secure Sample Storage
(qty) Refrigerator
(qty) Freezer
Bench space
High-density storage racks for samples requiring chain of custody
Sample Storage
Bench space
Refrigerator
Freezer
Storage Racks
Central Supply
Engine Room
Soundproofed walls
100% Exhaust
Existing equipment for octane testing
Direct connection to exterior for solvent vault
Demand Lab
Prep and testing can occur in the same space.
Surge capacity needed due to new water quality rules - 50% larger than existing footprint requested
Grinding Lab
Soundproofed walls
100% Exhaust

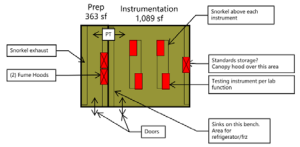
Central Utility Services - DEQ Labs
RO Water
Compressed air (central system)
Plumbed Lab Gases
Nitrogen
Helium
Hydrogen
Argon
Oxygen

Acid Neutralization System
Backup Power with UPS
Data Backbone - use state-of-the-art cabling, wiring, etc

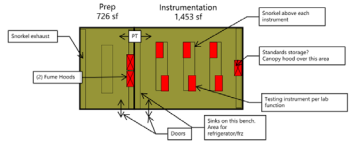
Typical Layout - (2) Instrument Lab



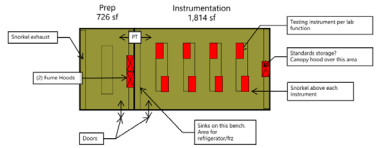
Typical Layout - (4) Instrument Lab

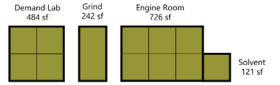


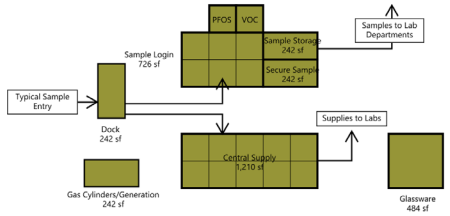
Typical Layout - (6) Instrument Lab

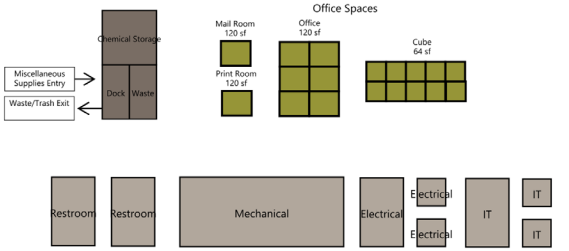


Typical Layout - (8) Instrument Lab









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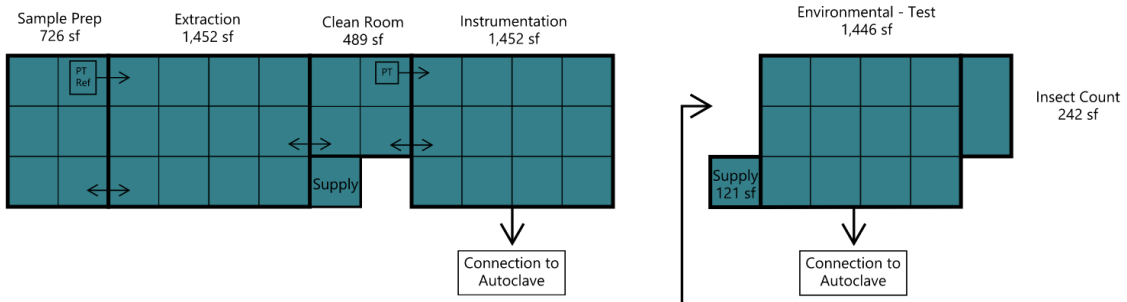
Visual Program & Adjacency Diagrams (DOH Detail)

Molecular Notes
Sample Prep
(2) Refrigerator, (2) Freezer
(2) BSC
Extraction
(3) BSC
Clean Room

Instrumentation
Access to Autoclave



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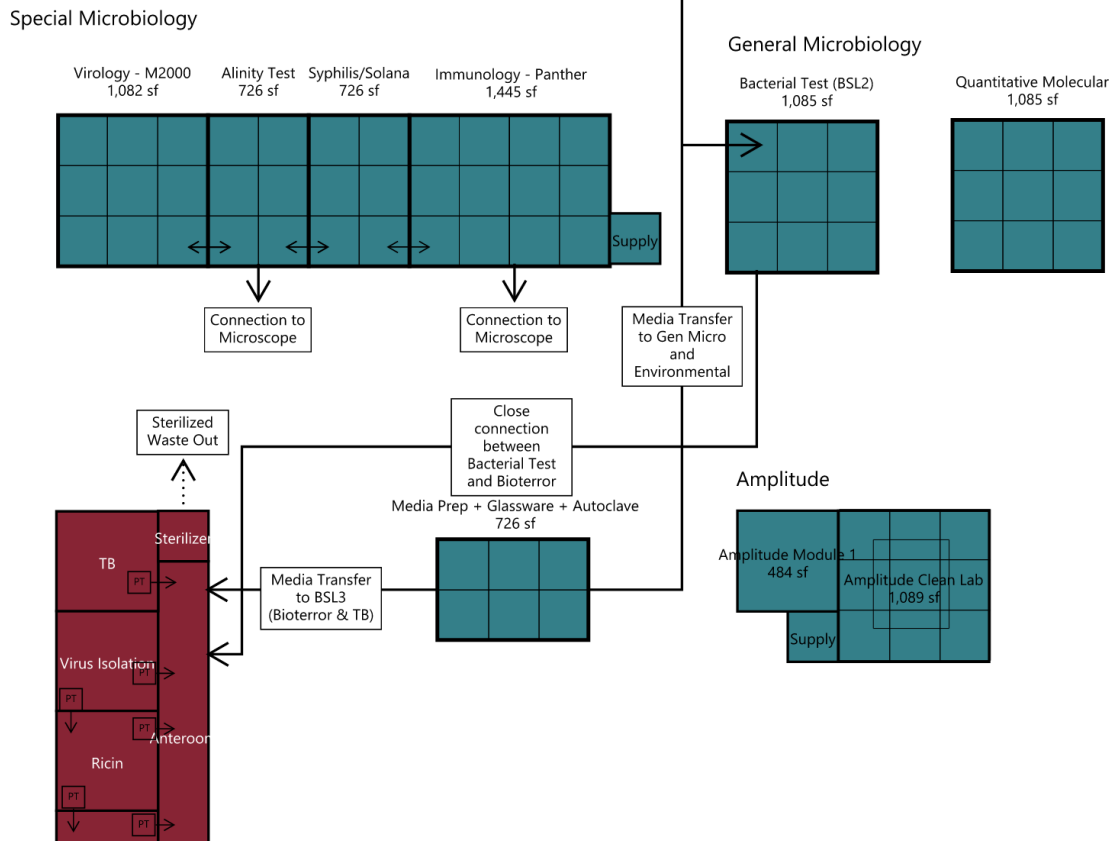

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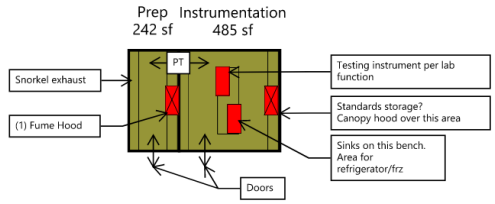
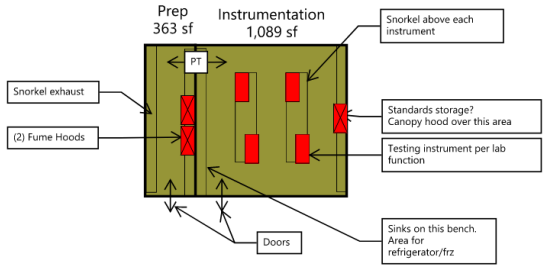
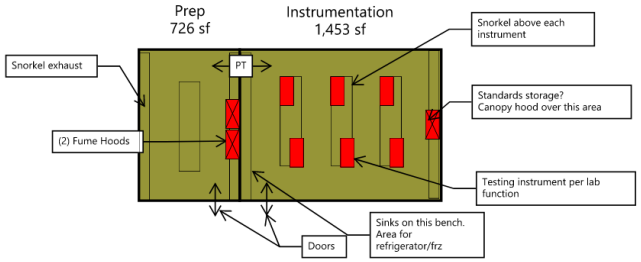


Typical Layout - (4) Instrument Lab



Typical Layout - (6) Instrument Lab



PROGRAM SUMMARY

Main Lab Building	Existing		Proposed		Delta
	Staff	*Square Feet (net)*	*Staff*	*Square Feet (net)*	*SF*
Departments					
Department of Health (DOH)	23	5,545	35	33,864	28,319
Department of Environmental Quality (DEQ)	12	7,671	16	26,571	18,900
Shared Lab Support		1,648		968	-680
Public/Lobby Spaces		0		2,209	
Office Space (Existing)		6,800			-6,800
Shared Staff Space		0		2,480	2,480
Shared Building Support/Mechanical		5,287		5,921	634
Program Contingency				2,500	
Subtotal Departmental Space Needs*	*35*	***26,951***	*51*	***74,513***	47,562
Building Gross Up (est) - walls, circulation, etc)	25%	6,258	35%	26,080	19,822
Total Building Needs (GSF)		***33,209***		***100,593***	**67,384**

** Departmental Square Footage includes 35% secondary circulation gross up.*

*** Staff headcounts include staff with dedicated office/cubicle space. Lab Techs without assigned office/cubicle are not included in these headcounts.*

Existing Ancillary Support Buildings	Existing
	Square Feet (gross)
DOH/DEQ Storage Building - 2635 E Main	3,200
DOH Warehouse - 26th & Vermont	10,000
DOH Mobile Lab 1	442
DOH Mobile Lab 2	442
Total Ancillary Support Building Square Footage	***14,084***

Total Existing Square Footage	***47,293***

Space Type	Area	Comment
Lab space	53,100 sf	A B C
Office Space:	8,493 sf	
Training Lab and Conferencing:	2,200 sf	D
Support space (lab support, mechanical/electrical, circulation):	36,800 sf	E F G
Total proposed:	100,593 sf	

A

Additional Lab Space

- Separated lab functions address cross-contamination concerns
- Dedicated space for sample receipt & storage
- Growth space for new programs

B

BSL-3 Growth Factors

- Lack of vestibules/anterooms in existing
- Additional area to improve workflow

C

General storage/supplies co-located with labs

- Allows more efficient utilization of storage square footage

D

Public-Facing Training and Conferencing

- Space provided for visitor training and conferencing, plus training lab for staff and outside training.

E

DOH Warehouse Exit Strategy

- Bulk storage space provided in program. Reduced COVID demands will drive eventual elimination of need for offsite warehouse space allowing 26th & Vermont warehouse lease to be terminated

F

Mechanical Equipment Strategy

- Indoor space for boilers, fire suppression, air compressors, vacuum process chillers, etc. Rooftop chillers, air handlers, exhaust fans with service vestibules. Design team is studying potential rooftop penthouse to allow indoor mechanical units

G

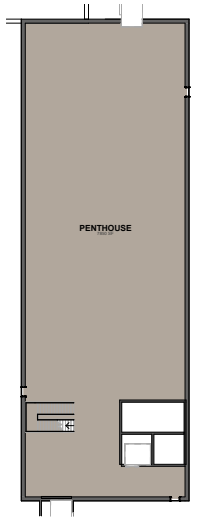
Building Gross-Up

- Additional gross-up to support vertical circulation, shafts, and wider hallways

1

2

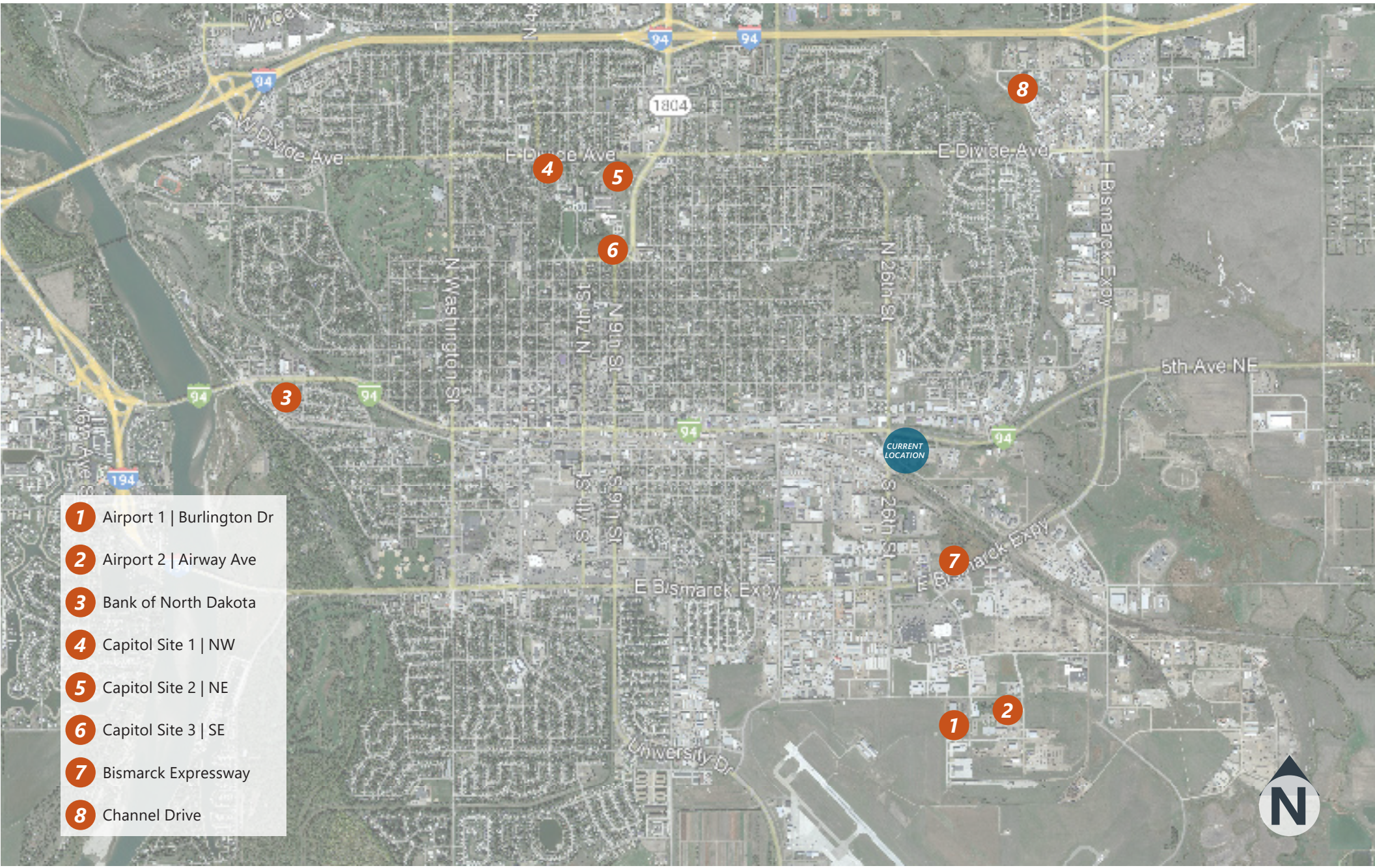
3



4 SCHEME A_PENTHOUSE FLOOR PLAN
SCALE: 1/16" = 1'-0"

- Currently planning for three story facility
  Level 1 - DOH/DEQ Labs, Training Labs, Warehouse
  Level 2 - DEQ Labs & Offices
  Level 3 - DOH Labs & Offices

Site Selection



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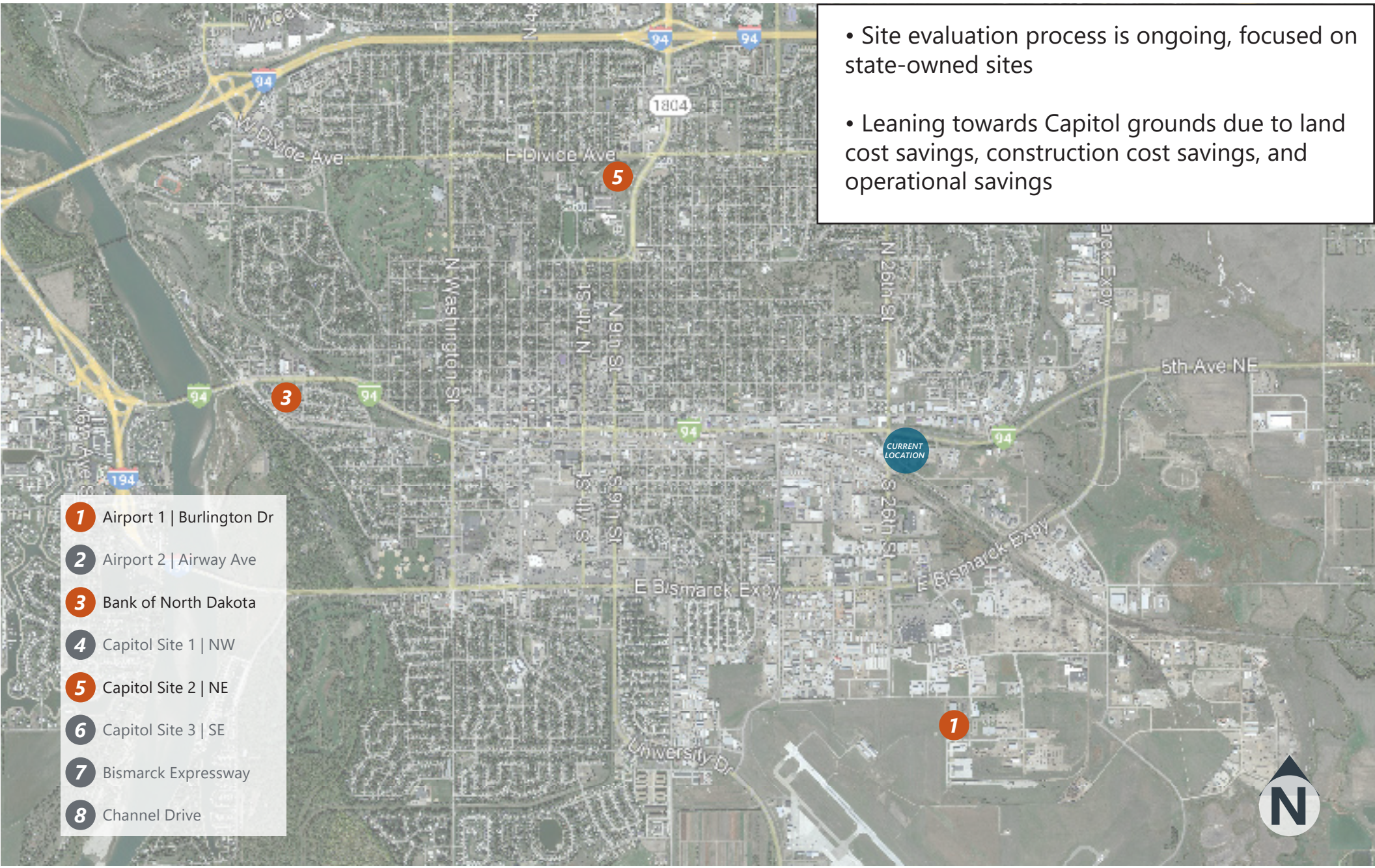
- Site evaluation process is ongoing, focused on state-owned sites
- Leaning towards Capitol grounds due to land cost savings, construction cost savings, and operational savings



Cost Estimate

- Cost estimates performed in predesign process were utilized to establish Governor's budget request

  $15 million (received in 2021-22 bienium)
  + $55 million budget request
  $70 million total project budget

- State has retained Kraus Anderson Construction as construction manager at risk for the project

- Early validation of predesign cost estimates confirms $70 million project budget is adequate*

*Construction costs contingent on funding approval 2Q 2023

Operating Cost Analysis

Energy Use

- Existing Building Energy Use Intensity = 402 kbtu/sf/yr
- Proposed Energy Use Intensity =180-240 kbtu/sf/yr
- Energy Cost = $ 367,000/yr (~$3.65/sf/yr)

Additional Operating Cost (Trash, snow removal, etc)

- Cost target dependent on site chosen and ability to share resources with adjacent state buildings
- Range of $5-$15/sf/yr

Operating Cost Projection

Low: $9/sf x 100,600 sf = $905,000 per year

High: $20/sf x 100,600 sf = $2,012,000 per year

Schedule

Milestone	Date
Finalize Site Selection	Q1 2023
Funding Secured	Q2 2023
Design Complete	Q3 2023
Construction Start	Q3 2023
Construction Complete	Q4 2025
Building Occupancy	Q1 2026

All approximate dates contingent on funding

Thanks!
Question/Answer