Formal Task Assignment Document

2019 – 2022 SNOHOMISH COUNTY ON-CALL TASK ASSIGNMENT

Name of Project:	Climate Change Vulnerability and Risk Assessment		
Project Number:	PDS		
Discipline:	Planning & Development Services		
Task No.:	TA#4	Completion Date:	03/30/2023

The COUNTY desires to authorize services pursuant to the AGREEMENT entered into with **BERK Consulting, Inc.** and executed on December 24, 2018, as amended by Supplement No. 1 on May 24, 2019, as amended by Supplement No. 2 on August 6, 2019, as amended by Supplement No. 3 on August 12, 2020, as amended by Supplement No. 4 on August 25, 2021 and identified as Agreement No. **OCC19-3-1(D)**, On-Call Consultant Services for **Comprehensive Plan Review.**

All provisions in the AGREEMENT remain in effect except as expressly modified by this TASK ASSIGNMENT, and are incorporated herein by reference.

ATTACHED TO THIS TASK ASSIGNMENT

- Scope of Work
- Cost Estimate with Total Hours to Perform Work
- Items unique to the project not included in the AGREEMENT and which are to be reimbursed at cost with no markup.

The **Total Amount Authorized** under this TASK ASSIGNMENT, inclusive of all fees and other costs is **$70,985.00**. **No other payment shall be allowed unless a TASK ASSIGNMENT Supplement for changed Scope of Work has been signed and authorized before work is performed**.

All work under this TASK ASSIGNMENT shall be performed pursuant to the terms, conditions, specifications, and limitations contained in the AGREEMENT.

If you concur with this TASK ASSIGNMENT and agree to the items as stated above, please sign and date in the appropriate spaces below and return to the COUNTY for final action.

Lisa Grueter

Digitally signed by Lisa Grueter
DN: C=US, OU="Principal in Charge ", O="BERK Consulting ", CN=Lisa Grueter, E=Lisa@berkconsulting.com
Reason: I am the author of this document
Location: your signing location here
Date: 2022.11.29 19:55:30-08'00'
Foxit PhantomPDF Version: 10.1.3

Consultant Signature

11/29/202

Date

Ken Klein
Executive Director

Klein, Kenneth 2022.12.16 12:52:38 -08'00'

Approving Authority

Date

SCOPE OF WORK

Berk Consulting
Snohomish County
Climate Vulnerability and Risk Assessment

INTRODUCTION

Berk Consulting and Parametrix (consultants) will produce for Snohomish County (County) a Climate Vulnerability and Risk Assessment using best available science (BAS) with deliverables including GIS tools, spreadsheets, suggested adaptation or policy responses, and a final report. The County will be using the deliverables from this scope of work to inform the 2024 update to the Snohomish County GMA Comprehensive Plan, in particular, a proposed climate change element. Vulnerability assessments are used to ascertain the susceptibility of a natural and human system to sustaining damage (or benefiting) from the effects of climate change. Vulnerability is a function of exposure, sensitivity, and adaptive capacity. Vulnerability assessments differ from impact assessments in that they more fully consider adaptive management or policy responses that may lessen negative impacts (or enhance positive impacts) of climate change.

Using current, best available science, the consultants will work with the County to conduct a climate change vulnerability and risk assessment for Snohomish County that:

- Identifies and describes climate-related trends and current and anticipated climate change impacts based on 20, 50, and 100-year or early, mid, and late century projections for Snohomish County.
- Identifies vulnerable populations and assets (social, economic, infrastructure, environmental) to the identified current and anticipated climate change impacts.
- Characterizes the risks for assets (social, economic, infrastructure, environmental) from current and anticipated impacts of climate change.
- Provides a suite of potential adaptation strategies and policy responses to address the areas of high risk for assets (social, economic, infrastructure, environmental)

TASK 01 – CURRENT & PROJECTED CLIMATE IMPACTS

Identify current and projected climate impacts for Snohomish County. A spreadsheet of available data will be produced and vetted by the consultant and shared with the County with recommendations on which dataset to use for each metric within the vulnerability assessment.

Identify the assets (social, economic, infrastructure, environmental) for Snohomish County. A spreadsheet of available data will be produced and vetted by the consultant and shared with the County with recommendations on which dataset to use for each metric within the vulnerability assessment.

a. People
b. Economy
c. Environment
d. Infrastructure & capital facilities

The following sources are examples data that could be used, and the data that is used will meet WAC 365-19 (Best Available Science for GMA).The County will provide relevant studies or assessments conducted by Snohomish County to add to the list as potential sources. The County and consultant will determine if the County's studies or assessments will be used as a data source for this County-wide vulnerability assessment.

Table 1. *Potential list of data and sources for Snohomish County Vulnerability and Risk Assessment*

Demographics/Economics	Environmental	Climate Exposure	Infrastructure
Census/ACS PSRC Race, ethnicity, income, age, disability, linguistic isolation Longitudinal Employer-Household Dynamics (LEHD) Job characteristics, earnings, and commute (car ownership, transit use) Human Health Cost-burdened households Risk for displacement	USDA Tree canopy and impervious cover EPA (EJ Screen) Environmental hazards CDC Health disparity – asthma, high blood pressure, COPD, mental health, vulnerable populations WA DOH-Disparities	NOAA King County Open-Source Data for Climate Change Weather and urban heat island FEMA National risk indexes for extreme heat, wildfire, drought, flooding, sea-level rise, precipitation, landslide, reduced snowpack, streamflow, stream temperature. UWCIG Climate risks and actionable science Ecology-Climate Change	Snohomish County Parks, road, bridges, green infrastructure, stormwater facilities, etc. WSDOT Bridges, road facilities

Deliverables

- A description of the climate-related trends and current and anticipated climate change impacts for Snohomish County that will become part of the final report. To include but not limited to increasing extreme heat events, storm events, flooding, snowpack levels, wildfire risk, precipitation, streamflow, drought, sea-level rise, and air quality.
- Excel spreadsheet with data sources recommended and reviewed by County citing the best available science resources for climate change.
- Excel spreadsheet with data for the County's assets (social, economic, infrastructure, environmental)

Assumptions

- The County will provide any related studies, assessments, data, or reports from County departments.
- The Consultant can access publicly available GIS data. The County will provide GIS data correlating to other vulnerability assessments and infrastructure not publicly available.

TASK 02 – CLIMATE VULNERABILITY INDEX

The consultant will develop a Climate Vulnerability Index (CVI) for the County - a geospatial tool that synthesizes key climate, environmental, and community data to inform the suite of potential adaptation strategies and options that are a deliverable in Task 3. The CVI sums the climate and assets data gathered in Task 1 and identifies which census block groups in Snohomish County have vulnerability, relative to other areas in the County. It is a planning level tool to help the team investigate areas in more detail, and then better understand the nuance of a particular area of the County. The CVI will provide a visual representation of the County's climate vulnerabilities for people, environment, economy, and infrastructure/capital facilities.

The Third Assessment Report (TAR) of the International Panel on Climate Change (IPCC) defines vulnerability as: ''the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, its sensitivity, and its adaptive capacity''

Vulnerability = Exposure + Sensitivity + Adaptive Capacity

Each climate change impact with County assets will be an independent map layer and then combined to create an index, scaling each census block of the County.

Deliverables

- A Climate Vulnerability Index (CVI) for the County- a geospatial tool that synthesizes key climate, environmental, and community data and identifies which census block groups in Snohomish County have vulnerability, relative to other areas in the County. The CVI should have the capacity to be updated by County GIS staff as BAS and other data is updated.
- Document methodology for the development of the CVI to be included as part of the final report. deliverable.

Assumptions

- Data will display at the census block level. However, if there are better scales of representation to depict the levels of vulnerability for a specific climate change impact, then it will be considered.
- Census blocks are larger with less population, if there is divergent data for the exposure, sensitivity or adaptive capacity, the worst-case scenario will be used for that census block. The data will not be averaged.
- The assessment will cover the entire geographic area of Snohomish County, however, the risk assessment in Task 3 will only be conducted for unincorporated areas of Snohomish County.

TASK 03 – RISK ASSESSMENT & MITIGATION STRATEGIES

Identify the risks for the people, environment, and infrastructure / capital facilities as described in task description 2, in terms of sensitivity and capacity to adapt. Through the index, the Consultant will work with the County to Identify the County's vulnerabilities and risks to the current and projected impacts of climate for:

- People
- Economy
- Environment
- Infrastructure & capital facilities

Develop a suite of potential adaptation strategies and actions for the County's assets for which have been identified as at risk in terms of sensitivity and capacity to adapt.

Deliverables

- Risk and vulnerability matrix in Excel spreadsheet
- A suite of potential adaptation strategies and actions for the County's assets for which have been identified as at risk in terms of sensitivity and capacity to adapt.
- Facilitate two, one-hour virtual risk workshops with community members and County staff. The objective of these workshops is to inform the public and County staff of the identified risks to the County assets (unincorporated) and gather input for adaptation strategies and other actions.
- Meeting note summary for workshop attendees to report out next steps and contact information. Allow for individual feedback on draft report as well as workshop feedback.

Assumptions

- The Consultant will conduct a high-level screening of risks based on the CVI.
- The workshop can be two one-hour sessions. The County will send invitations to environmental groups, BIPOC communities, community health groups, and other representatives from those assets identified at risk from the impact of climate change.
- The County will invite County staff, the consultant will host the workshop(s) on Microsoft Teams or other platform conducive to hosting public meetings.
- The risk assessment will only be conducted for unincorporated areas of Snohomish County.
- Definitions – the County will provide its list of definitions that pertain to this climate change vulnerability and risk assessment. If definitions preferred by the consultant differ from definitions supplied by the County, the County shall determine which terms will be applied.
    - People – vulnerable populations including but not limited to historically underrepresented, low-income, BIPOC, mobility-impaired, cost- burdened households
    - Economy – vulnerable businesses, local and regional employment centers
    - Environment – including but not limited to critical areas (including fish and fish habitat), open spaces, waterways / waterbodies, tree canopy, watersheds
    - Infrastructure / capital facilities – such as roads, bridges, parks, green infrastructure, stormwater facilities, solid waste facilities, buildings.
- Strategies and actions will be developed from existing lists of potential mitigation strategies from Washington Department of Commerce, and other Washington Counties.

TASK 04 – FINAL REPORT

The Consultant will produce a final report that synthesizes the information.

Deliverables

- Final report (10-15 pages).

- Check-ins every 3-4 weeks with County staff- on progress and to obtain feedback and input. The final report will include the methodology used for the development of the findings and the CVI.

Assumptions -

- The consultant will produce a draft report for County review in Microsoft Word and track changes
- The consultant will address each comment in Word.
- The final report will be in Word and an Adobe acrobat PDF.
- The GIS data/data layers, including the Climate Vulnerability Index (CVI) created as part of this work will be delivered to Snohomish County Planning and Development Services GIS team. The GIS/data layers should be in a format that can be updated as BAS science and data is refreshed.

TASK 05 – PROJECT MANAGEMENT

This task includes general management functions that include the following:

- Project Planning – Document and communicate the scope of work, budget, and schedule as a road map for the project team. Coordinate project team and issues throughout the project.
- Budget and Schedule Tracking – Track the project budget using Parametrix in-house tools to verify that progress is keeping pace with spending.
- Bi-weekly design team meetings with an issues list to document project design decisions.
- Monthly Progress Reports – Prepare a monthly invoice for services performed by Parametrix.
- Correspondence – Prepare written correspondence as needed to document project management issues and/or concerns.

Deliverables

- Miscellaneous correspondence to document project management issues.
- Monthly progress reports enclosed with invoices.

Assumptions

- Project duration is 5 months.
- Budget assumes 10 bi-weekly meetings.

Suggested Sources of Data/Information

FEMA – Predicted Economic Loss Hazards, Social Vulnerability, Resilience	https://hazards.fema.gov/nri/map
UW-CIG • Fine-scale hydroclimate • Tulalip Tribes projections	https://cig.uw.edu/datasets/pnw-fine-scale-hydroclimate-projections/ https://climate.northwestknowledge.net/NWTOOLBOX/tribalProjections.php
Climate Mapping For Resilience and Adaptation-v1.0.4	https://livingatlas.arcgis.com/assessment-tool/explore/details
USDA/US Forest Service Climate Change Resource Center	https://www.fs.usda.gov/ccrc/library/climate-data
King County Open Source Data	https://climate-kingcounty.opendata.arcgis.com/pages/site-log
CDC-vulnerable populations	https://www.cdc.gov/disasters/extremeheat/specificgroups.html
Federal Highway Association – Climate Adaptation Framework	Adaptation Framework - Resilience - Sustainability - Environment - FHWA (dot.gov)
Climate Impacts on Water Management in the Puget Sound	https://www.eopugetsound.org/articles/climate-change-impacts-water-management-puget-sound-region
Washington Department of Health – Health Disparities Mapping	https://fortress.wa.gov/doh/wtnibl/WTNIBL/
Washington State Department of Ecology	https://ecology.wa.gov/Air-Climate/Climate-change https://ecology.wa.gov/Air-Climate/Climate-change/Climate-change-the-environment/Sea-level-rise
Washington Coastal Network	Sea Level Rise Projections | Washington Coastal Hazards Resilience Network (wacoastalnetwork.com)
Dept of Energy – Low income data tool	LEAD Tool | Department of Energy
Disadvantaged Communities Dashboard – Energy Justice	Energy Justice Dashboard (anl.gov) DAC
US Climate Resilience Toolkit	U.S. Climate Resilience Toolkit | U.S. Climate Resilience Toolkit
Sea-level rise projections CIG	https://cig.uw.edu/projects/interactive-sea-level-rise-data-visualizations/
Snohomish County / King County, Pierce County – GHG emission inventories	'The clearest call ever for immediate climate action': Executive Constantine announces new actions to rapidly reduce countywide greenhouse gas emissions - King County
PSRC – Opportunity Mapping	https://www.psrc.org/opportunity-mapping
Displacement Risk	https://www.psrc.org/our-work/displacement-risk-mapping
WA Dept of Commerce Climate Program	https://www.commerce.wa.gov/serving-communities/growth-management/growth-management-topics/climate-change/

	BERK Consulting			Parametrix					
	Lisa Grueter	Ben Han	Josh Linden	John Phillips	Mark Mazzola	Tyler Brenton	Chad Tinsley	Cortney Ziegler	Total Hours and Estimated Cost by Task
	Principal	Sr. Planner	Analyst	Sr. Consultant	Sr. Planner	Sr. Planner	Sr. GIS Analyst	Sr. GIS Analyst	
2022 Hourly Rate	$240.00 ✓	$144.04 ✓	$110.32 ✓	$220.00 ✓	$175.00 ✓	$175.00 ✓	$112.07 ✓	$112.07 ✓	
Task 01: Current & Projected Climate Impacts									
Consolidate GIS Layers			5	5			20	20	
BAS data sources spreadsheet	2	2	5	5	5		20	20	
Subtotal	**2**	**2**	**10**	**10**	**5**	**0**	**40**	**40**	**109**
									$13,912
Task 02: Climate Vulnerability Index									
Updated ArcMap				4			20	20	
Subtotal	**0**	**0**	**0**	**4**	**0**	**0**	**20**	**20**	**44**
									$5,363
Task 03: Risk Assessment									
Risk and Vulnerability Matrix	5	2	5	15		20	5	5	
Virtual Risk Workshop	6	24	15	20	6	20	6	12	
Subtotal	**11**	**26**	**20**	**35**	**6**	**40**	**11**	**17**	**166**
									$27,479
Task 04: Final Report									
Draft Report	6	10	15	20	10	10	8	10	
Final Report	4	2	2	4					
Subtotal	**10**	**12**	**17**	**24**	**10**	**10**	**8**	**10**	**101**
									$16,801
Task 05: Project Management									
Biweekly Meetings				20					
Ongoing Coordination	4								
Subtotal	**4**	**0**	**0**	**20**	**0**	**0**	**0**	**0**	**24**
									$5,360
Total Estimated Hours	**27**	**40**	**47**	**93**	**21**	**50**	**79**	**87**	**444**
Cost (Hours*Rate)	**$6,480**	**$5,762**	**$5,185**	**$20,460**	**$3,675**	**$8,750**	**$8,854**	**$9,750**	**$68,915**

Subtotal Consultant Cost	**$68,915** ✓
Project Expenses at ~3% of Project Budget	**$2,070**
Estimated Project Total	**$70,985** ✓

Contract Compliant

By: *Lori White* **Date:** *11/18/2022*